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Adherent Stream Source

User Guide

for Release 2.1 of the Stream Source Product

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Stream Source Product
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AD991 Local Operation	SI163	2.1
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BS Digital Multiplexer	SI287	1.0

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Adherent Stream Source

Local Operation

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Stream Source Product Family - AD991 Stream Source

Adherent Document: SI163v21 Issue 2.1d

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Objectives

The objectives of this manual are as follows:

- To provide an overview of AD991 Stream Source, outlining the major applications incorporated.
- To explain how to install and use the AD991 Stream Source for correct and safe operation.
- To describe the physical and electrical features of the AD991 Stream Source unit to a level necessary for routine maintenance.
- To describe the functions available in AD991 Stream Source and how to access and use them via the software graphical user interface (GUI).

Layout and Content

The user guide has a hierarchical structure of sections and sub-sections.

It is suggested that after taking note of the *Safety Notices and Advice*, *Installation* and *General Operation* sections are read before attempting any activities.

A contents overview is provided at the front of the guide. A more detailed contents list is provided at the beginning of each section. A full index is provided at the back of the guide.

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Documentation Conventions

Safety advice

Warning or Caution



This caution symbol is used to mark procedural information that could prevent damage to equipment or personnel or which is important to the equipment's correct operation.

Failure to understand and implement the information given may result in equipment failure or injury to personnel.

Electric Shock



This sign indicates safety procedures or advice relating to the presence of high voltages.

Advice & Suggestions



This information direction symbol is used to mark important non-safety critical advice and suggestions for operation of the AD991 Stream Source.

Controls and Buttons

Screen text is represented thus:

'The **File size:** is dictated by the disc space available'

where **File size:** is the text which appears on the screen.

The same convention is used for button labels, for example, **Next** and **Prev** which represent the front panel buttons labelled Next and Prev respectively.

On-screen controls are represented thus:

To open a stream, select **Open**.

where **Open** represents the Open menu item.

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Safety Notices and Advice

This section contains important information for the safe installation and operation of the AD991 Stream Source unit.

Electrical and Physical Safety



Read the following safety warnings carefully before installing and applying power to the hardware. Check the technical specification in the *Reference* section of this manual for operating specifications such as mains supply voltage, fuse rating, supply frequency and external ambient temperature range.

Earthing

Make sure that the unit is earthed via the electrical power connection cord before the unit is switched on. Do not use a power outlet, extension lead or cable that does not have proper grounding.

Electric Shock

The unit must be connected to an easily accessible mains socket, to allow quick disconnection from mains power if necessary. Use only new fuses of the correct current, voltage and type (see *Technical Specification*).

Do not operate the AD991 Stream Source without all the covers and panels in place.

Multiphase Mains Supplies

Where there are multiphase mains supplies or distribution grids make sure that the AD991 Stream Source hardware and connected equipment comply with the local standards and legislation. If prohibited by local standards/legislation, do not connect the AD991 Stream Source to equipment that is on a different mains supply phase. Observe any local standards/legislation for connection to equipment on another phase if this is permitted.

If in any doubt about the polarity or earthing of a mains supply have it checked by a qualified electrician before connecting the AD991 Stream Source to the mains supply or to any other equipment which is connected to that supply.

Follow the operating and safety instructions of both the AD991 Stream Source hardware and all other equipment to which it is connected. Ensure that external equipment is correctly installed and electrically safe before connecting it to the AD991 Stream Source hardware.

General Operating Environment

Do not operate this equipment under unsuitable environmental conditions, or in the presence of flammable gases or fumes. Do not leave the unit near heat sources, in direct sunlight or in the presence of excessive dust or vibration. Do not block or obstruct the cooling vents at the front and rear of the unit. Allow at least 100mm (4in) clearance at the rear of the unit for cable access. The technical specification, which can be found in the *Reference* section of this manual, includes the environmental parameters.

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Storage Conditions

Only store the unit in clean, dry conditions. Do not store the unit near heat sources, in direct sunlight or in the presence of excessive dust or vibration.

If the unit has been stored in a very cold or hot environment, allow it to stand in the operating environment for up to 24 hours before applying power. This is to allow the internal components to reach an acceptable start-up temperature.

Modification and Maintenance

Under no circumstances should access to the unit be attempted. Where this does become necessary, on the advice your supplier or Adherent Technical Support, specific documentation and instructions will be provided.

Maintaining the air filter, which is recommended, is described in the following section.

Shutting Down AD991 Stream Source

It is essential to shut down all applications before the mains power at the rear of the unit is removed. The application shutdown procedure is initiated by pressing the **On/Off** switch at the front of the unit. If power is lost or the machine accidentally powered down while the software is running there may be problems on restarting. See the **Operation** chapter for details of the shutdown procedure.

Customer Support

For operational support, please use the email address or telephone number supplied at the front of this manual. For servicing information, please contact your local distributor.

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Introduction

This section describes the physical and electrical characteristics of AD991 Stream Source. Serviceable components are described and pin-outs for the rear panel connectors. Each of the available interface cards is described

Refer to the *Reference* section for the AD991 Stream Source technical specification, including the environmental parameters.

A technical specification for each of the interface cards is given in the *Interfaces* sub-section of this section.

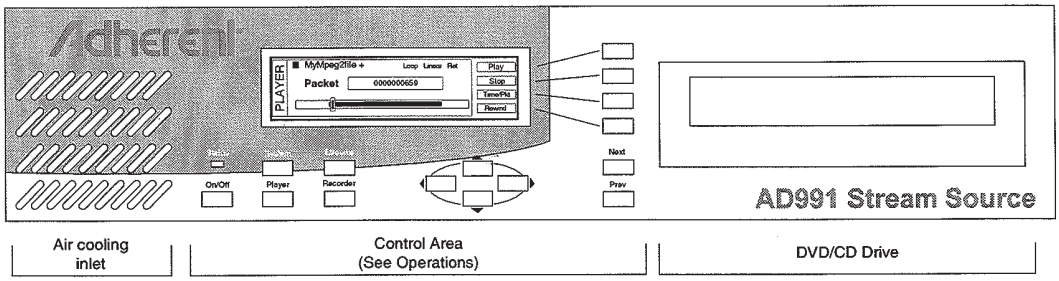
The AD991 Stream Source unit is a 2U, 19" rack-mounted unit. All controls, including the display, are mounted on the front panel. All connectors are accessible from the rear of the unit.

Little maintenance is required on AD991 Stream Source. Where it is recommended, it is described below; for example on the air filter.

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Front Panel

The AD991 Stream Source front panel contains all of the controls and displays necessary to the operation of the unit.



AD991 Stream Source front panel

DVD/CD Drive

The DVD/CD ROM drive is mounted on the right-hand side of the front panel. It has a slot-in loading mechanism.

VFD Display Maintenance

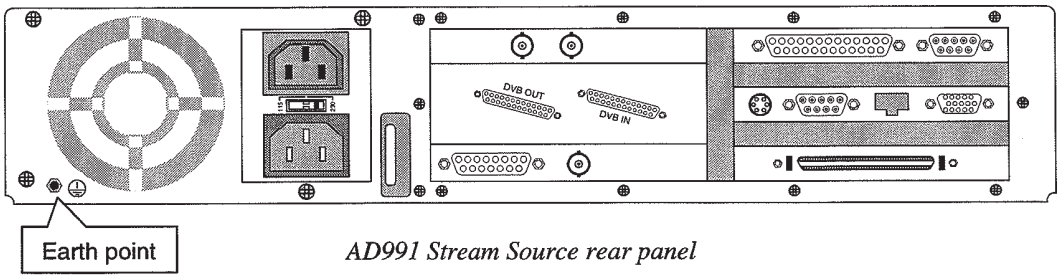
The only maintenance required by the vacuum fluorescent display (VFD) is occasionally to be cleaned. However, it is important that the correct materials and procedure are employed if the display is not to be damaged.

When the panel needs cleaning, it is usually sufficient to wipe it with an absorbent, soft, lint-free cloth or tissue. Water should not be allowed to come into contact with the display; if it does, it should be wiped away immediately since prolonged contact may cause spots or discolouration.

Solvents should not be used since they may attack the surface of the display panel.

Rear Panel

The rear panel contains all of the connectors necessary for connection of AD991 Stream Source.



AD991 Stream Source rear panel

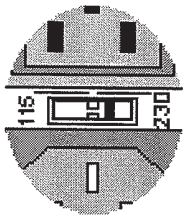
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Power Supply Module

The Power Supply module is located on the left-hand side of the unit at the rear. It contains no user-replaceable fuses. The connector panel, which is accessible from the rear of the unit, contains two mains connectors:

- a standard three-pin IEC mains output connector (chassis socket) (upper); **this connector must not be used.**
- A standard three-pin IEC mains input connector (chassis plug) (lower); **the mains supply should be connected here using the lead supplied.**

Between the two mains connectors is a voltage selector switch.





Before switching the unit on, ensure that the voltage selector switch is in the correct position for the local mains supply.

Air Cooling

The internal components of the unit are kept within their operating temperature range by means of two fans mounted behind the front panel. Ensure that the air-flow to both fans is unobstructed.

The power supply, located at the rear of the unit also contains an integral fan.

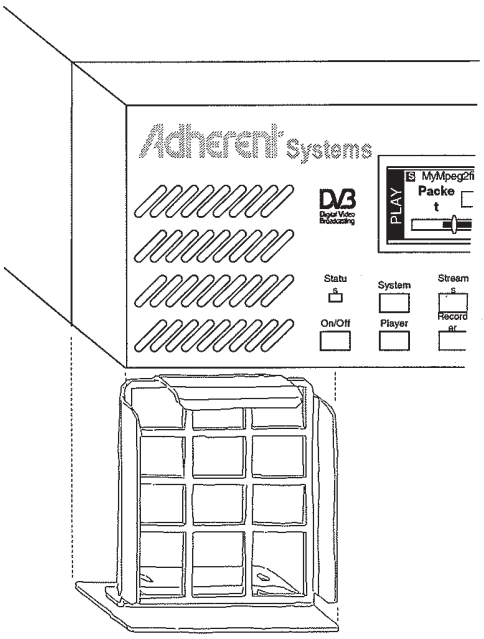
An air filter is located behind the front panel grill.

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Air Filter Maintenance

The air filter should be replaced at least once every 12 months; if there is a high level of dust in the operating environment, the air filter should be inspected more frequently and changed if necessary.

Material: Declon DEC6 30ppi Dimensions: 60mm x 70mm



Front Panel - Air Filter Holder
(shown without filter material in place)

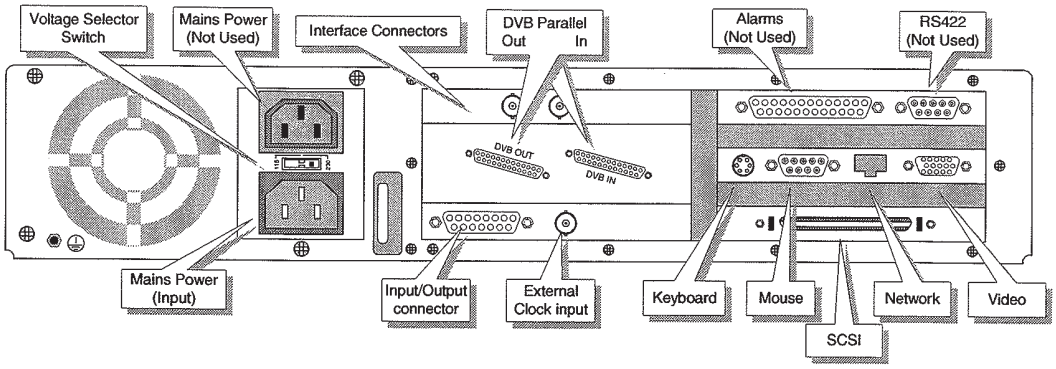
To replace the air filter, access will be required to the lower edge of the front left-hand side of the unit. If the unit is rack-mounted, it may be necessary to withdraw the unit sufficiently to expose the retaining screws located in the base of the air filter holder.

1. Power down the unit.
2. Disconnect the power supply cable.
3. Remove and retain the two screws retaining the air filter holder.
4 Allow the air filter holder to slide down and out of the unit.
5. Replace the air filter.
6. Refit the air filter holder and power up the unit.

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Rear Panel Connectors

There are a number of inputs and outputs at the rear of the unit. These are described in detail below. The individual interface card connectors are described later.



Back panel connectors



Stream Source *must* be shut down before connection and disconnection of any inputs or outputs. The shutdown procedure is described in Section 3, General Operation.

External Clock Input

If an external clock input is to be used, it should be connected via this BNC connector. This input controls the byte rate of the output data; the clock rate should be 1/8 of the desired output bitrate.

Signal Specification

Signal input..... : AC coupled -ve edge triggered
Min. signal level ..... : 200mV p-p
Max. signal level..... : 5v p-p (TTL signal level)
Duty cycle..... : 50:50 (typ.); 40:60 (max.)
Max. Frequency (fmax) ..... : 20MHz.
Input load..... : 50Ω
Connector format..... : BNC

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DVB Parallel Connectors

AD991 Stream Source provides DVB input and output interfaces on the rear of the unit using two 25-way D-Type connectors.

The incoming stream data from either the interface card or the DVB Input is looped through to the DVB output which allows the output to be connected (daisy-chained) to other external equipment. This output is available in addition to any outputs that may be available on the Interface card itself (see the Interface card specifications to determine if an output is provided).

The DVB parallel output is provided on a 25-way D-type connector on the rear panel of the unit. The connectors conform to the ISO document 2110 (1989).

Pin	Function
1	Clock A
2	System Ground
3	Data 7A (MSB)
4	Data 6A
5	Data 5A
6	Data 4A
7	Data 3A
8	Data 2A
9	Data 1A
10	Data 0A
11	DVALID A
12	PSYNC A
13	System Ground

Pin	Function
14	Clock B
15	System Ground
16	Data 7B
17	Data 6B
18	Data 5B
19	Data 4B
20	Data 3B
21	Data 2B
22	Data 1B
23	Data 0B
24	DVALID B
25	PSYNC B

Signal Specification

The following is the signal specification:

Min. signal level:.....200mV (differential)

Max. signal level: .....5V (differential)

Impedance: 100Ω

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Connectors and Cables

The 25-way D-type connectors for the MIC input and output cables should be bright tin plating and dimpled with a solder lug attached to the shell that should be connected to the cable screen. The shells for the connectors should be made from metal or metallised plastic and of a type which has provision for allowing a secure connection to the cable screen at the cable entry point.

Electrical interfaces for this connector conform with the reference document *Interfaces for CATV/SMATV Headends and similar Professional Equipment* [1].

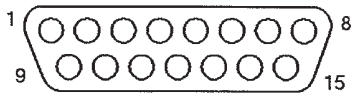
Interface Connectors

The interface card is normally installed in this position. See Interfaces, page 2-14, for details of each interface type.

I/O (15-Way D-type Connector)

The pin allocation for the I/O connector is as follows:

Trigger Input:		pin 14
Trigger Output:		pin 6
Clock Output:	CLK+:	pin 11
	CLK-:	pin 4
Clock Input:	CLK+:	pin 2
	CLK-:	pin 9
Ground	GND	pins 1, 7, 10



Trigger Interface

Stream Source schedules can be triggered to start stream recording using an external trigger event. The trigger interface is provided on a 15 pin D-type cannon connector with the following functionality and pin-out.

Signal Specification

Triggering .....: Edge sensitive (programmable; see Source Scheduler settings)
Signal Input.....: TTL (0V < VIL < 0.8V : 2.4V < VIH < 5V)
Signal Output.....: TTL (0V < VOL <0.8V : 2.4V < VOH <5V)

External Clock Input

	BNC	D-type (15-way)
Signal input	AC coupled, -ve edge triggered	LVDS
Min. signal level	200mV p-p	200mV p-p
Max. signal level	5V p-p	2.4V p-p
Duty cycle	50:50 (nominal); 45:55 (max.)	50:50 (nominal); 45:55 (max.)
Max. Frequency (fmax)	90MHz.	90MHz.
Min Freq	31.25kHz (min slope 7.5MV/s)	0Hz
Input load	50Ω	100Ω

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Precision Clock Output

A byte rate clock is supplied for reference during stream playout.

	BNC	D-type (15-way)
Signal level (nominal)	1.1v pk-pk +-5% square wave	LVDS
Output impedance	50Ω	100Ω
Duty cycle	50:50 (nominal)	50:50 (nominal)

Alarms Connector



This interface is provided for future expansion and is not currently used.

RS422 Connector

RS422 is a full-duplex, serial-line standard that specifies differential drivers and receivers. The electrical characteristics of RS422 are defined by the *TIA/EIA-422-B* standard.



This interface is provided for future expansion and is not currently used.

PC CPU Connectors

These are standard PC CPU connections; the connectors are (from left to right):

- PS/2 Keyboard (6-pin mini-DIN).
- Serial Mouse (9-pin D-type).
- LAN, 10 Base T/100 Base T support, full duplex.
- Video (15-pin D-type).

SCSI Connector

The SCSI connector is provided for future expansion. The active terminator supplied with the unit *must not* be removed unless the port is to be used when external drives or RAID arrays are used.

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Setting Up AD991 Stream Source

Unpacking AD991 Stream Source

Carefully remove the AD991 Stream Source from its packaging. Retain all of the packaging in case the AD991 Stream Source has to be relocated or returned to Adherent (or your local distributor) for servicing.

Check to ensure that all of the components listed in the Delivery Note are present and appear to be undamaged. Contact your supplier immediately if anything has been lost or damaged in transit. As a minimum, the following items should be included:

- AD991 Stream Source unit
- AD991 User Guide
- Mains lead
- Microsoft Windows™ NT license pack
- AD991 Stream Source installation disks
- Streams CD
- Two DVB parallel cables
- Rack Mounting kit (where applicable)

There may be additional items if any options have been purchased.

Installation

Follow the steps below to install the AD991 Stream Source unit and ensure that it is operational:

1. If the AD991 Stream Source has been stored or exposed to temperatures outside of the safe operating range it should be placed in the intended operating environment and allowed to attain the ambient temperature before continuing with installation. Under extreme differences of temperatures allow up to 24 hours to adjust.
2. Check the size and layout of the components against intended place of installation to ensure that they will fit and be able to operate safely. Read the safety notices to ensure that the AD991 Stream Source will be electrically safe, not subjected to extremes of heat (including sun, studio or other high intensity light sources), humidity or electro-magnetic interference.
3. Make all transport stream cable connections to the interface cards at the back panel.



Before switching the unit on, ensure that the voltage selector switch is in the correct position for the local mains supply (see Power Supply Module, page 2-3).

4. Plug in the mains lead and switch on.

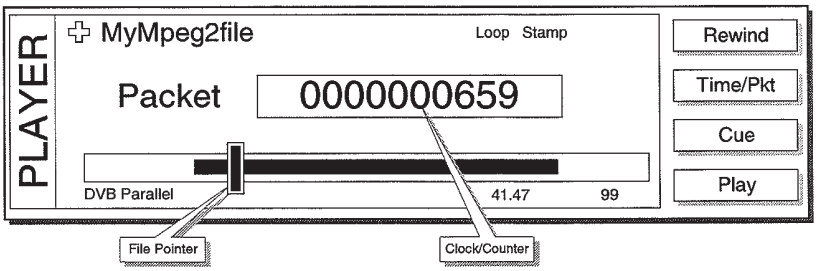


DO NOT make or break any connections on the back panel while the power is on. This may cause permanent damage to the hardware.

5. Note that the ***Adherent AD991*** logo is displayed almost immediately and that the Player application is displayed within two minutes.

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6. Open and play a stream. Observe that the file pointer is moving and that the clock/counter display is incrementing.



7. If the unit does not power up and play successfully, check all connections and retry. If it still fails, contact your local distributor.

Unit Configuration

The AD991 Stream Source unit can be free-standing or rack-mounted. A kit of parts is supplied with each new unit that includes the following:

- Rubber feet, self-adhesive, 2 off
- Rear support bracket, 2 off
- Screws
- Extender plate, 2 off
- Handle, 2 off
- Front bracket, 2 off

Free-Standing Unit

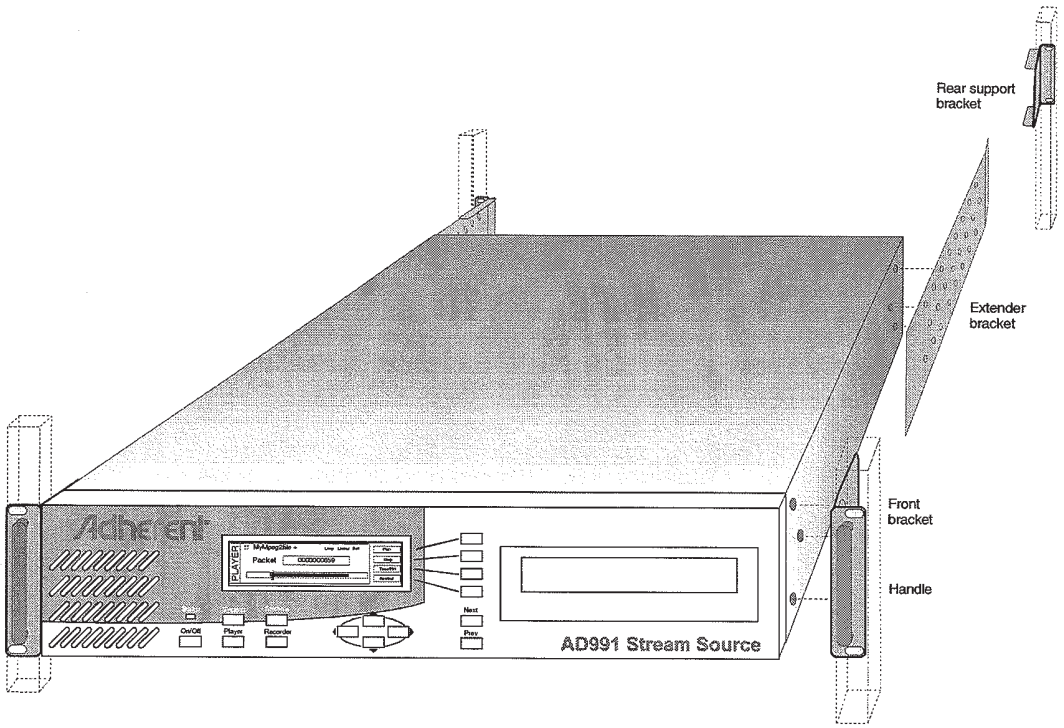
To make the unit free-standing simply requires the addition of the four self-adhesive rubber feet supplied with the unit.

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Rack-Mounted Unit

With the kit of parts supplied, the unit can be adapted to fit into a standard 19" rack.

The following diagram illustrates the application of the rack-mounting kit.



Rack Mounting

Interfaces

AD991 Stream Source can integrate into a wide variety of transmission environments; the following interface standards are currently supported:

Interface
DVB Synchronous Parallel interface
Asynchronous Serial interface (ASI)
DVB SMPTE 310M Serial interface
Synchronous Serial interface (SSI)
M2S

The following paragraphs provide a brief description and technical specification for each interface and notes regarding the connectors fitted

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ASI+ Interface Card

The Asynchronous Serial Interface Plus (ASI+) card allows connection to equipment with an interface compliant with the DVB Asynchronous Serial Interface as defined in DVB document A010 (*Interfaces for CATV/SMATV Headends and Similar professional equipment*).

It also allows connection to equipment with the Divicom M2S interface and provides burst mode packet transmission.

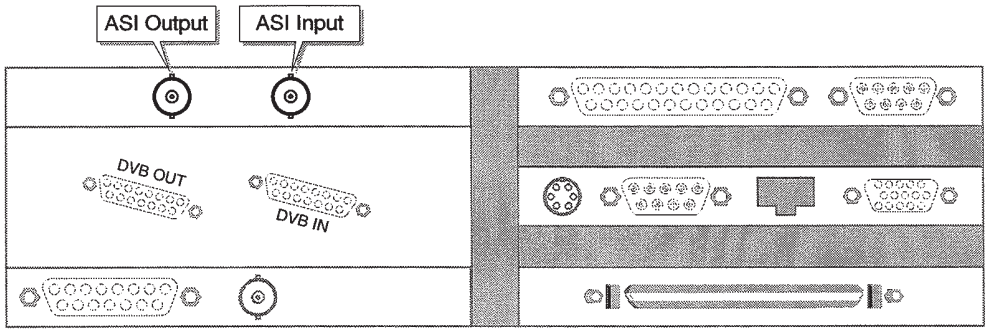
The ASI protocol uses a fixed rate data stream operating at 270Mbit/s. The ASI adapter allows playout and recording of transport streams; note that simultaneous playout and recording are not possible. When recording, the incoming data is looped through to the ASI output.

Signal specification

Output Signal level: .....800mV p-p ±10% into 75Ω
Output impedance: .....75Ω ±5%
Output type: .....Transformer coupled (i.e. DC blocked)
Output signal jitter: .....less than 10%
Maximum input signal: .....2V p-p
Minimum input signal: .....200mV p-p
Input impedance: .....75Ω ±5%
Maximum DC voltage allowed on
input (cable inner OR cable outer): .....0V DC (w.r.t. chassis)

Connectors and Cables

Use 75Ω BNC connectors with silver or nickel-plated body for the signal cable. The cable should also be 75Ω, single copper conductor 1/0.6mm, double screened with a capacitance of 68pF/m or better and attenuation of 1dB or better at 1MHz. The shield should be connected properly to the connector housing.



ASI+ connectors

Note that the data IN and data OUT connectors are with respect to the ASI adapter i.e. ASI data OUT acts as a signal source from the adapter.

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GPSI II Interface Card

The General Purpose Serial Interface (GPSI II) card allows connection to a broad range of ATSC and DVB equipment where a high-speed SMPTE/SSI serial interface is used.

Note that the data IN and OUT connectors are described with respect to the GPSI adapter i.e. GPSI OUT acts as a signal source from the adapter.

SMPTE 310M interface

Transmitter

Interface: ..... Bi-phase Code output

Data Rate: ..... 19,392,658.46bit/s @ 2.8ppm for 8VSB,
38,785,316.92bit/s @ 2.8ppm for 16VSB and
1 Mbit/s to 44 Mbit/s controlled by the user

Signal Level: ..... 800mVp-p nominal, 1Vp-p max

Data Channel: ..... 75Ω nominal. BNC connector.

Receiver

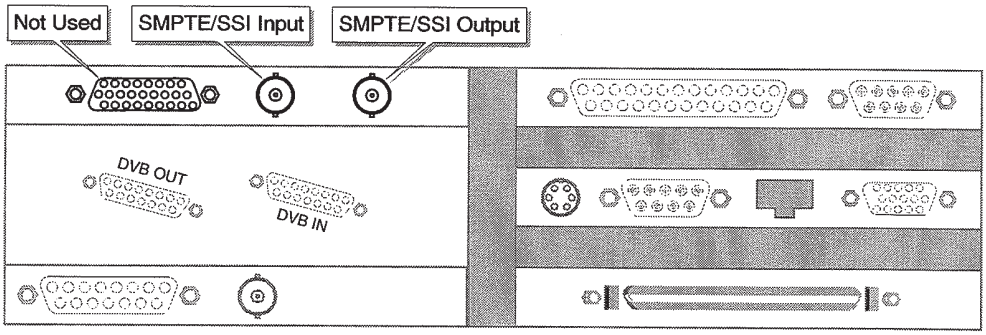
Interface: ..... Bi-phase Code Input

Data Rate: ..... 1 Mbit/s to 44 Mbit/s with automatic clock recovery.

Signal Level: ..... 200mVp-p minimum, 5Vp-p max

Data Channel: ..... 75Ω nominal. BNC connector.

Connectors and Cables



GPSI II Connectors

BNC Connectors

Use 75Ω BNC connectors with silver or nickel-plated body. The cable should be 75Ω, single copper conductor 1/0.6mm double-screened with a capacitance of 68pF/m or better and attenuation of 1dB or better at 1MHz. The cable shielding should be properly connected to the connector housing.

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Software

AD991 Stream Source is supplied with factory installed software.

If necessary, the software in the AD991 Stream Source unit can be updated via the DVD/CD-ROM drive. Installation of update software is described in the *Systems* section of this manual.

Installation

The CD-ROMs supplied with the AD991 Stream Source unit (or as part of an upgrade) contains software to update both the server (Stream Source) and a client (PC). The procedures are described in the following paragraphs. Instructions are also provided to allow a subset of the client software to be installed or upgraded on a Local Client Stream Source unit.

Server Upgrade

Upgrading the server (AD991 Stream Source) software is described in the *System Operation* section of this manual (see Installing New Software, page 7-2.).

Client Installation/Upgrade

The client software (listed below) can be installed on either:

- A local client
  That is on the same unit as server software,
- A remote client
  A PC. (The minimum system requirements of the client PC are given in the *Technical Specification* (see *Reference* section of this manual). For information about Networking, refer to *Appendix C Networking*.)
- AD953-II Stream Station

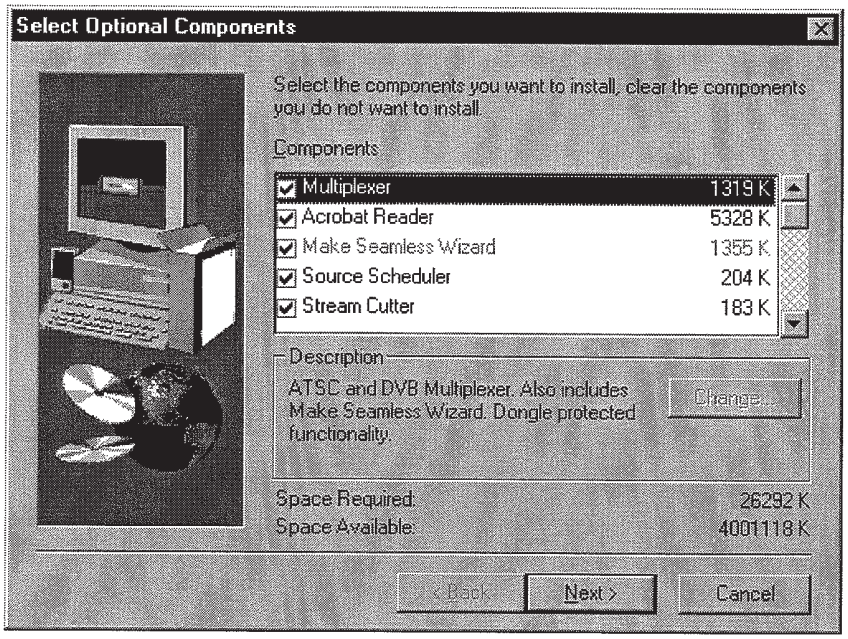
The installation program will detect which software components are enabled for installation and present them as options in the installation dialog.

a) Insert the 'Source Scheduler' CD into the CD-ROM drive of the client unit.

b) From the root directory on the CD, select `Setup.exe`.

After unpacking the installation files, a similar dialog to that shown below is displayed:

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The Components area of the dialog displays a list of the applications that can be installed or upgraded on the Client PC; the list will vary according to the type of installation. Note that the functionality of some applications is security protected; all selected applications will be installed but they cannot be accessed or they may have limited functionality unless the correct dongle is used. Where applications are already installed, they will only be overwritten if there is a newer version on the CD.

A dongle is a security protection device that plugs in to the PC parallel port.

Client Software Applications

The following applications are currently available for installation:

Multiplexer

ATSC and DVB Multiplexer. Also includes Make Seamless Wizard. Dongle protected functionality.

Acrobat Reader

This copies a compressed form of Acrobat Reader to the hard drive. Simply double click on the compressed file, ar40eng.exe, in the Acrobat sub-directory to install.

Make Seamless Wizard

This utility is used to make a stream appear seamless when used with looped playout. Dongle protected functionality.

Source Scheduler

This utility is used to remotely schedule the playout of a list of stream files. Single streams can also be played out and recorded. Dongle protected functionality.

Stream Cutter

This is a Wizard that creates a new transport stream file from a slice of an existing file.

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Stream Editor

This may be used to edit the contents of transport stream packets contained in a file. It displays packet contents in hexadecimal and provides an interpreted view of the header information. Dongle protected functionality.

Stream Maker

This is a Wizard that creates and initialises a file for recording transport streams into.

BS Digital Multiplexer

Provides off-line multiplexing of existing transport streams and TMCC information in order to produce ISDB-S transport streams. Dongle protected functionality.

Stream Source Product Family User Guide

The User Guide is in .pdf format. You will need to install Acrobat Reader in order to view these files.

c) Select the required components by ensuring that there is a tick in the adjacent checkbox: By default all components are selected.

d) Select **Next**. The installation will proceed. The unit will require a restart to complete the installation.

Local Client Installation

In order to configure the local client installation, it is necessary to connect a keyboard, monitor and mouse to the unit (refer to Rear Panel Connectors, page 2-5 for keyboard/monitor/mouse connections). Switch off the unit before making these connections.

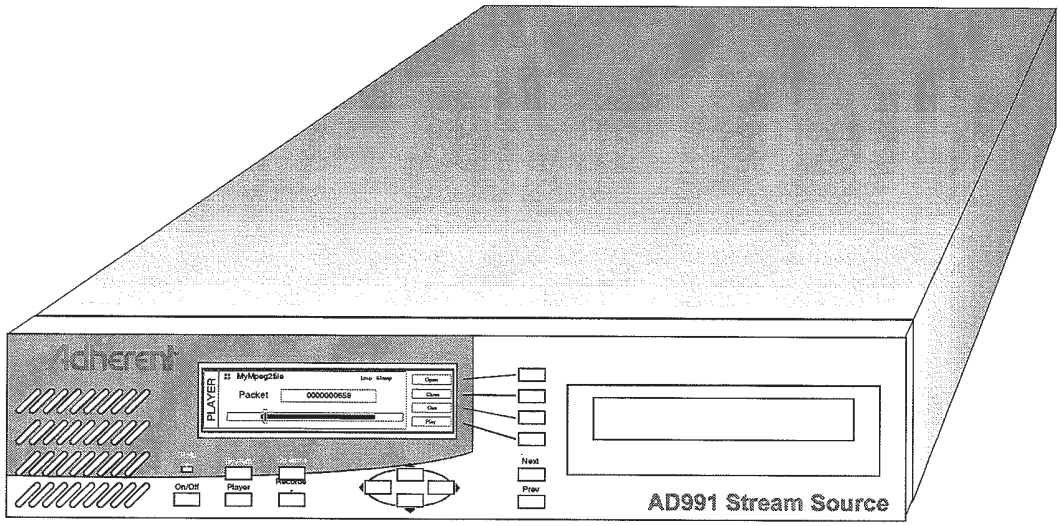
Follow the steps outlined in the Client Installation/Upgrade outlined in the previous paragraphs. Note that applications requiring a dongle in the client set-up are not included in the Local Client Component set.

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General Operation

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About AD991 Stream Source



AD991 Stream Source Unit

AD991 Stream Source is a flexible and cost-effective record and playout source for compressed digital video signals.

Key uses are:

- Test stream playout for development and production environments.
- Testing/commissioning of DVB/ATSC/ISDB transmission chains.
- Playout of pre-encoded transport streams.
- Standby signal source for use during equipment failure.

AD991 Stream Source provides the ability to playout transport streams within a range of applications, repeatably and without timing discontinuities. The extendable storage capacity means that a selection of streams can be stored on the unit (at 20 Mbit/s the standard unit provides over 45 minutes of transport stream playtime storage). Transport streams can be transferred on and off AD991 Stream Source, and recording enables real-time stream capture.

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Important features are:

Transport stream support

Supports MPEG-2, DVB, ATSC and ISDB transport streams.

Two variants synch control are available to ISDB streams: BSD SFsynch and BSD Psynch (see below).

Continuous Time Stamp Updating

Streams can be played out in single-shot mode, or looped repeatedly.

The continuous time stamp function allows the user to specify which time components in a transport stream should be modified to allow a stream to correct discontinuity errors and appear to be continuous when played repeatedly (looped).

When looping the following parameters can be updated in real time: continuity count, PCR, PTS, DTS, Time Offset Table (DVB TOT), Time and Date Table (DVB TDT) and System Time Table (ATSC STT).

Recording

Recording transport streams provides the ability to capture transport streams for later playout, or for transfer for use within other applications (e.g. archiving).

Pre-installed Transport Streams

AD991 Stream Source comes with a selection of multi-programme transport streams.

Make Seamless

This option provides an easy way to adjust certain parameters at the stream endpoints in order to make a programme seamless for subsequent looped playout. (This operation is dependent on the characteristics of the transport stream and does not guarantee disturbance-free picture decoding.)



BSD stands for Broadcast Satellite Digital; this is often referred to as ISDB-S.



BSD Synch Control - Packet synchronisation can use either the superframe synch pulse (SFsynch) at the start of each superframe or the packet synch pulse (Psynch) at the start of each packet.

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Applications

AD991 Stream Source comprises four applications – **Streams**, **Player**, **Recorder** and **System**.

Streams

The Streams application is a file navigator. Its main use is for browsing through the Streams available to AD991 Stream Source. From the Streams application it is possible to preview and alter file settings (play-out and record), to rename, cut, copy, paste and delete files or folders, and to create new files and folders. The standard NT filing system is used and it is possible, using the Streams application, to browse through other types of files. The Streams application is also used to view files on the DVD drive or any other external drives.

Player

The Player application is used to select and play-out Streams.

Recorder

The Recorder application is used to prepare and record Streams.

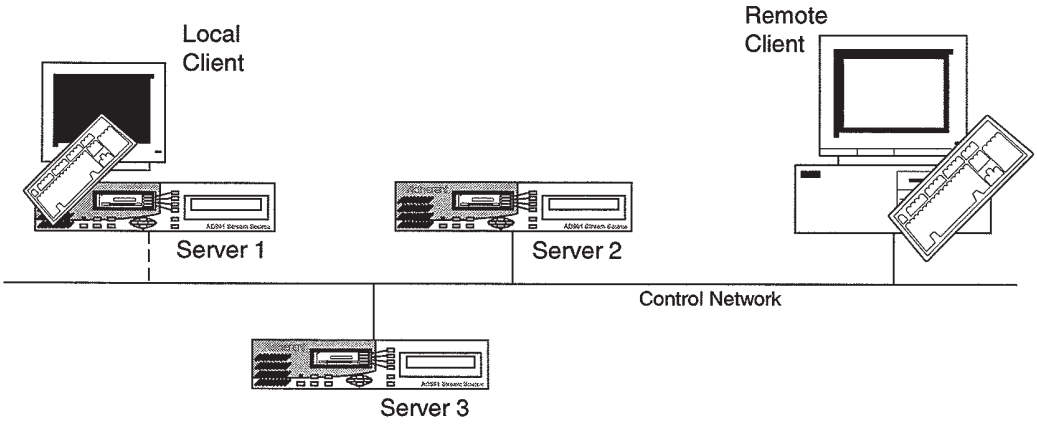
System

The System application provides facilities for system-wide configuration (e.g. current date and time), for installing new AD991 software and for accessing any additional features or applications provided on the unit.

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Client/Server Operation

In addition to the conventional applications described in this User Guide, networked AD991 Stream Source units can be installed in a client/server configuration. With this setup, additional software enables AD991 Stream Source units to act as servers; client software can be installed on either a compatible PC or also on an AD991 Stream Source unit (equipped with a monitor and keyboard). In the latter case (client and server software on a single AD991 Stream Source unit) it can be operated as a local client.



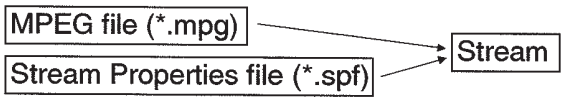
The main function offered by the client/server configuration is the **Source Scheduler**, which allows lists of streams to be assembled and scheduled for playout. A playout function is also available to allow single files to be selected and played out.

The **Source Scheduler** is described in the Source Scheduler User Guide (*Adherent Doc: SI253*).

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Stream Management

The AD991 Stream Source product introduces the concept of a *Stream*. A Stream comprises a single MPEG-2 transport stream file (MPEG file) and a set of data about the MPEG file; the latter is held in a Stream Properties file. The Stream Properties file and its associated MPEG file have the same file name but different file name extensions (.spf for Stream Properties files and .mpg for MPEG files).



- An *MPEG file* comprises one or more programs with one or more independent time bases in a single stream.
- A *Stream Properties file* can be viewed as an MPEG configuration file. It specifies such parameters as file size, content standard (MPEG/DVB/ATSC/ISDB) and bit rate. The parameters are, in part, derived from the associated MPEG file; although they may subsequently be modified by the user.

The AD991 Stream Source applications show a Stream (.spf and .mpg file-pair) as a single item.



It should be noted that an MPEG file can exist without a Stream Properties file and will be acknowledged and displayed by the Streams application (albeit with a different file icon). However, a Stream, comprising the MPEG file and a Stream Properties file, will need to be generated before the file can be opened in either the Player or Recorder applications.

In most cases, such as when copying a file, the Stream Properties file is copied automatically or created where necessary.

Starting AD991 Stream Source



Before switching the unit on, ensure that the voltage selector switch is in the correct position for the local mains supply (See *Intallation* section.)

AD991 Stream Source is started by pressing (and releasing) the **On/Off** button on the front panel. The boot-up process may take a few minutes, during which the **Status** LED is steady green and the legend ***Adherent AD991*** is scrolled across the display. Start-up is complete when the Player application is displayed.

Shutting down AD991 Stream Source

Press and hold down the **On/Off** button on the front panel for at least three seconds. AD991 Stream Source will start the shutdown procedure. The start of the shutdown will be indicated by the **Status** LED flashing red; as soon as the shutdown sequence starts (as indicated by the LED) release the On/Off button. The unit will switch off automatically when the shutdown is complete and the LED will be extinguished.

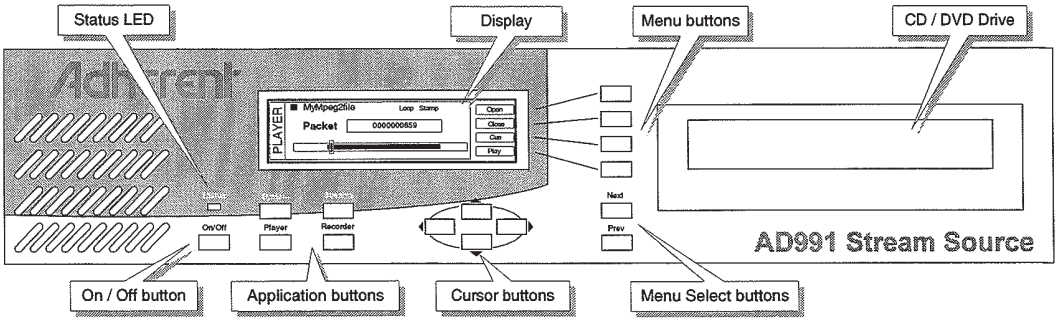
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Forced Shutdown

- **Normal shutdown** is as described above and is the preferred method.
- If, using Normal shutdown, the unit does not shutdown automatically within two minutes, a **forced shutdown** is available by pressing and holding down the On/Off button for ten seconds. Forced shutdown should only be used when the normal shutdown procedure fails to power down the unit.

Warning: It is important that the correct shutdown procedure is carried out before power is removed from the unit. If power is removed from the unit without following the shutdown procedure, the operating system may be corrupted due to files not being closed properly. This may cause the unit to fail during subsequent start-up.

Front Panel Layout



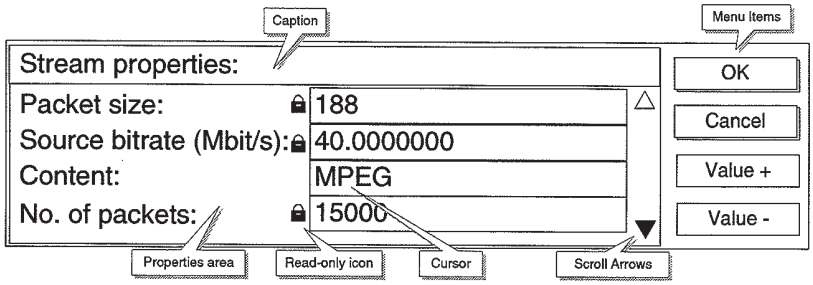
Front Panel Elements

Status LED	When illuminated steadily, the Status LED indicates that the unit is powered up.
Display	A VFD (vacuum fluorescent display) graphics display.
Menu buttons	Four dynamically assigned buttons that correspond to the Menu Items shown adjacently on the right-hand side of the display; the Menu Item assignments will vary with the display.
CD / DVD drive	DVD-ROM with CD-ROM support.
On/Off button	Allows AD991 Stream Source to be powered up or down. Using this button, the software is initiated and closed down in an orderly manner.
Application buttons	Four buttons that allow one of the four application modes to be selected: System, Streams, Player or Recorder.
Cursor buttons	Four buttons (up, down, left and right) which allow the cursor to be moved around the display.
Menu Select buttons	Two buttons (**Next** and **Prev**) that allow the Menu Items (see Display Layout below) to be scrolled right and left.

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Display Layout

The figure below shows a property editing screen (or dialog) for changing the property values associated with the stream. This example illustrates many of the features common to the AD991 Stream Source screens. Notable exceptions are the Player and Recorder main screens which are discussed in detail in their respective sections.



General Screen Layout

Caption — Identifies the screen. The caption may also show other 'fixed' information such as the current file name.

Menu items — Each screen displayed has a number of menu items associated with it. Menu controls enable control and interaction with the associated application
(see Common Operational Features, *Menu Items*, page 3-8).

Properties area — The properties area may display a simple list of items, for instance, file names, or a form-style area with titles and data entry fields.

Cursor — The cursor is manipulated with fields using the left and right cursor buttons.

Read-only icon — Indicates those fields that are currently read-only and therefore cannot be edited; often this property is context dependant.

Scroll arrows — If the data in the dialog properties area is more than can be shown on a single screen, the area may be scrolled using the up and down arrows. A filled arrow indicates that there is more information in that direction. The scroll action wraps around to the top field when the bottom field is reached (and vice versa).

Individual items in the properties area can be navigated using the four cursor buttons located below the display. Use the up and down cursor buttons to select a field or item; use the left and right cursor buttons to move the cursor within a field.

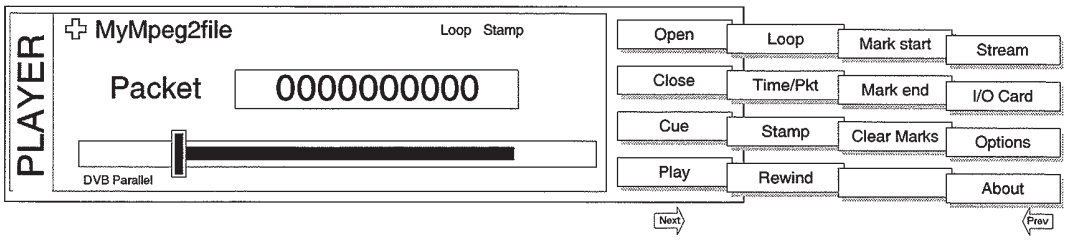
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Common Operational Features

Menu Items

Up to four menu items are displayed at a time, but for a particular screen or dialog, more may be available. At any moment, only the four displayed can be invoked using the adjacent menu buttons on the front panel. Where further items are available, they can be accessed using the **Next** and **Prev** buttons immediately below the menu buttons.

For example, in the Player screen shown below, the set of four items headed by **Rewind** might be currently displayed. A single press of the **Next** button would replace those items with the set of four headed by **Open**, and so on…



Menu Item Example

File Icons

Different file types are represented in the various displays. Each file type is assigned an icon which facilitates browsing by giving the file type a 'visual tag'. The file extension is also given, although this is usually not shown on the display (it being represented by the icon displayed).

Stream file -

Each Stream comprises a single MPEG-2 transport stream file (MPEG file) and a set of data about the MPEG file (Stream Properties File - *.spf).

MPEG file - - *.mpg

MPEG file refers to a transport stream file (MPEG/DVB/ATSC/ISDB) that, as yet, has no Stream Properties file associated with it. When an MPEG file is first activated, an option is offered to associate it with a Stream Properties file and thus create a Stream file.

Player Interface Properties File - - *.ipp

The Player Interface Properties files are used to configure the Player interface. Multiple properties files can be created to handle different uses of Player. Property files are created and manipulated in the Player application.

Recorder Interface Properties File - - *.ipr

The Recorder Interface Properties files are used to configure the Recorder interface. Multiple properties files can be created to handle different uses of Recorder. Property files are created and manipulated in the Recorder application.

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Executables - ⊠ - *.exe

This file type represents Windows™ NT executable files. They are identified for information only.

Unknown - ⊘ - *.*

Any file of a type other than those described above is 'unknown' to AD991 Stream Source. They are identified for information only.

Folders

Files are held in folders (or directories). Folders may contain both files and sub-folders; that is folders within folders.

Files and folders can be 'opened'. Opening a folder will result in the contents (files/sub-folders) being displayed. Opening a file may result in some activity, such as a file being opened in the Player application.

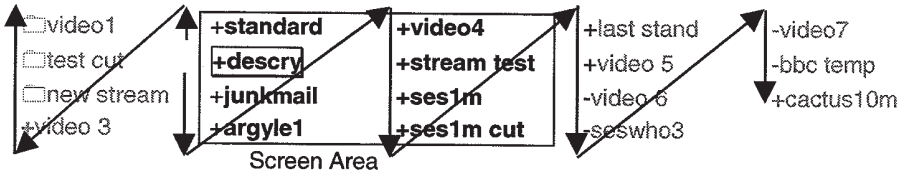
The AD991 Stream Source root folder is named **Video:**.

File Lists

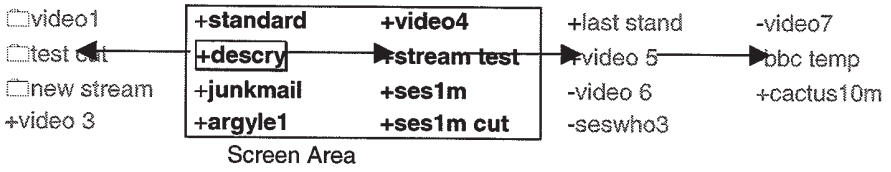
Use the cursor buttons to navigate a list of files; for instance when selecting a stream file to open. The selected file is highlighted.

The list of files is arranged in as many columns of four files as are needed; only two columns can be displayed at once.

If the Up and Down cursor keys are used, the selection will travel up or down each column in turn until the first or last file is reached.



If the Left and Right cursor keys are used, the selection will move across the columns until the first or last column is reached.



In normal use, all four of the cursor keys should be used to navigate to the required file in the most efficient manner.

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File Filters

All navigation style screens may be subject to file filtering and hence display only those files that are relevant to the application and the current function. For instance, when opening a Player Properties Interface file, only the files with the extension *.ipp () will be visible. If the same folder is inspected with the Streams application, all file types will be visible.

Field Types

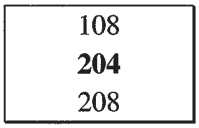
Spin List

A Spin List displays one choice at a time; the displayed value is the current selection. The selection is changed using the **Value+** and **Value-** menu items. 'Yes/No' selections are implemented as spin lists.



List

A List displays all choices; the current selection is highlighted. The selection is changed using the up and down cursor buttons.



Numeric

When a numeric field is selected, a cursor is also displayed in the field. The cursor can be moved within the numeric field using the left and right cursor buttons. The **Value+** and **Value-** menu items are used to increment or decrement the value of the numeral immediately to the right of the cursor. In the illustration on the right, pressing **Value+** once will increment the number '3' by one to '4'.



If the cursor is placed immediately to the left of the decimal point, the **Value+** and **Value-** menu items will move the decimal point one point to the left or right respectively; that is, effectively multiplying or dividing whole numeric by ten for each press.

See also Field Edit Controls below.

Alpha

When an alpha field is selected, a cursor is also displayed in the field. The cursor can be moved within the alpha field using the left and right cursor buttons. The **Value+** and **Value-** menu items are used to increment or decrement the value of the character immediately to the right of the cursor. In the illustration on the right, pressing **Value+** once will increment the character 'V' by one to 'W'.

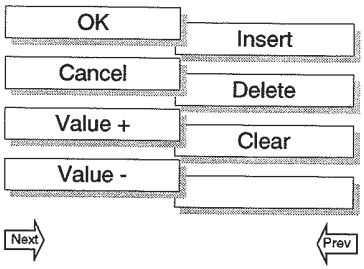


See also Field Edit Controls below.

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Field Edit Controls

The menu items shown below are those that are typically associated with screens that can be edited:



Field Edit Controls

The items operate as follows:

Ok — Accept changes and return to originating screen.

Cancel — Cancel all changes and return to originating screen.

Value + — In any field type, increment the value immediately to the right of the current cursor position.

Value - — In any field type, decrement the value immediately to the right of the current cursor position.

Insert — In alpha and numeric field types, insert a character immediately to the right of the current cursor position. The inserted character will be the first character in the set (.); the **Value+** and **Value-** menu items can then be used to set the required character.

Delete — For alpha and numeric field types, delete one character immediately to the right of the current cursor position.

Clear — In alpha field types, clear the currently selected field.
In numeric field types, set the value to 0.

The available character set is as follows:

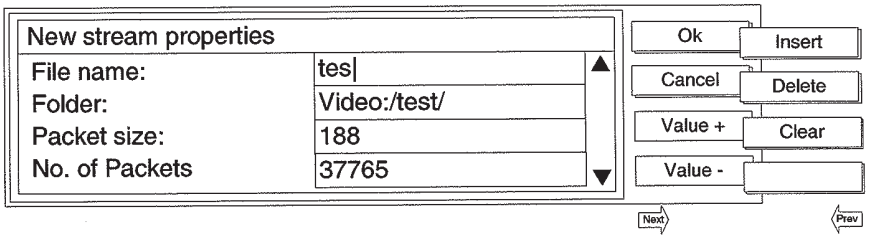
a b c d e f g h i j k l m n o p q r s t u v w x y z 0 1 2 3 4 5 6 7 8 9 ! £ $ % ^ & ( )
- + { } [ ] @ , ; ~ # ' A B C D E F G H I J K L M N O P Q R S T U V W X Y Z .

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Field Edit Example - Entering a File Name

A useful example of field editing is shown by entering a field name in the **New stream** dialog.

With the **New stream** dialog open:



1. Use the Up and Down cursor buttons to highlight the **File name:** field.
2. Use **Value+** and **Value-** to increment and decrement the first character until the required character is displayed.
3. Press the right cursor button once to move the cursor to the next character position.
4. Using **Value+** and **Value-** again to select the next character.

   Tip: If at any point the whole name is seen to be wrong, use **Clear** to clear the field (and start again).

   Tip: If a character is inadvertently omitted from the required string, use the left and right cursor buttons to place the cursor at the required position and use **Insert** to insert a character. Use **Value+** and **Value-** to select the required character.
5. Select **Ok** to confirm the file name and close the dialog. Select **Cancel** to reject the file name and close the dialog.

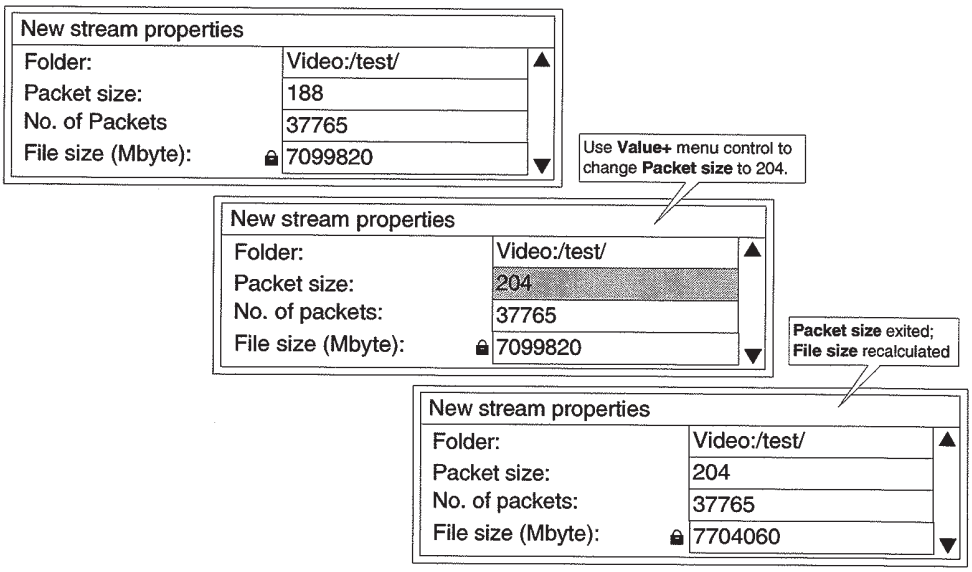
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Read-Only Icon

The read-only icon indicates those fields that are currently read-only and therefore cannot be edited; often this property is context dependant.

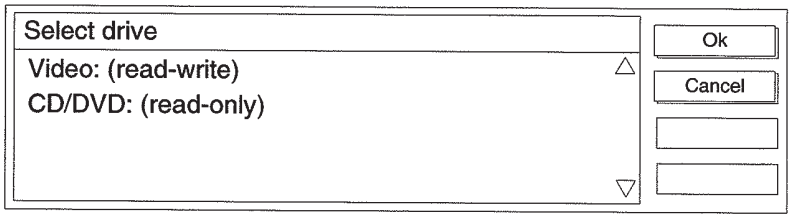
A read-only field may be automatically modified by values entered elsewhere in the dialog.

For example, in the New Stream Properties dialog, when a value is entered in either the **Packet size** or the **No. of packets**, the recalculated file size will only be apparent when the modified field is exited.



Drives

In a standard AD991 Stream Source, files are held on two drives: *Video* and an external CD/DVD. *Video* corresponds to the internal hard disk. The current drive is shown in the display caption of the Streams application. To move between drives, use the **Drive** menu item. Other drives may be available in enhanced AD991 Stream Source units.



External SCSI drives will be appended to the list using the name allocated in the ad991.resource file (see Appendix D Adding an External Drive).

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DVD/CD ROM Drive

The DVD/CD drive has a trayless slot-in loading mechanism.

The socket and rotary control located below the loading slot are not used.



The disk loading mechanism is electrically operated. The unit must be switched on to load and unload disks.

To load a disk:

Gently slide the disk into the loading slot until the loading mechanism engages and draws the disk into the unit. For the majority of disks, the shiny side should be facing down and the writing should be uppermost.

After inserting the disk into the drive, it may be necessary to wait for a few seconds for the disk to be loaded. Loading can be confirmed by attempting to access the disk.

To remove a disk:

Press the eject button immediately below the loading slot. Gently remove the disk and return it to its storage case.

To view the contents of a drive:

(See Drives, page 3-13.)

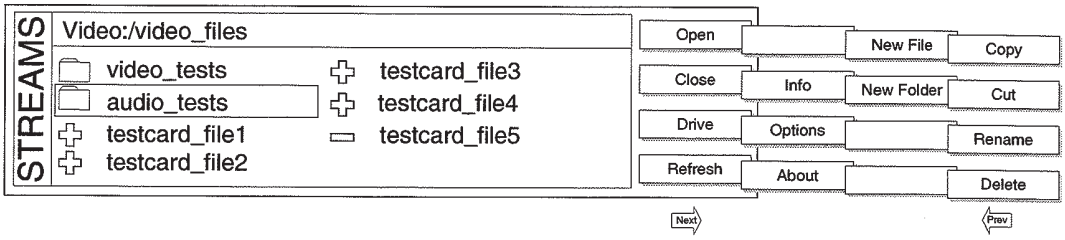
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Streams Operation

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Overview

The Streams navigator is the primary tool for browsing and manipulating AD991 Stream Source folders and files. The principles of operation are similar to standard Windows™ file handling and therefore will be easily accessible to most operators.



Streams Screen

The caption shows the current drive name (**Video:**) followed by the name of the current folder; if the name field is blank, the display shows the drive root folder. The properties area shows a list of files and sub-folders in the named folder.

The file list is displayed in columns; each column containing up to four entries. Only two columns are displayed at one time; scrolling is to the left and right and up and down using the cursor buttons.

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Getting Started with Streams

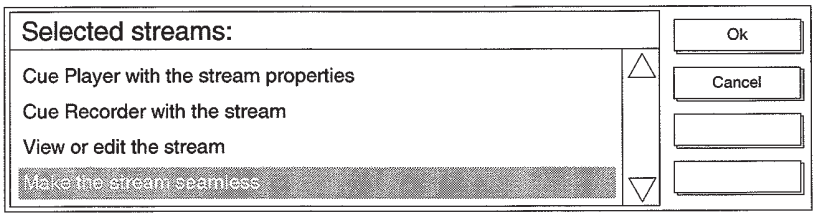
This section provides information on basic activities associated with Streams.

Opening a File

The file type being opened dictates the subsequent actions; opening streams and MPEG files are described in the following paragraphs.

Opening a Stream

When a Stream is highlighted and **Open** is pressed, the following options are offered:



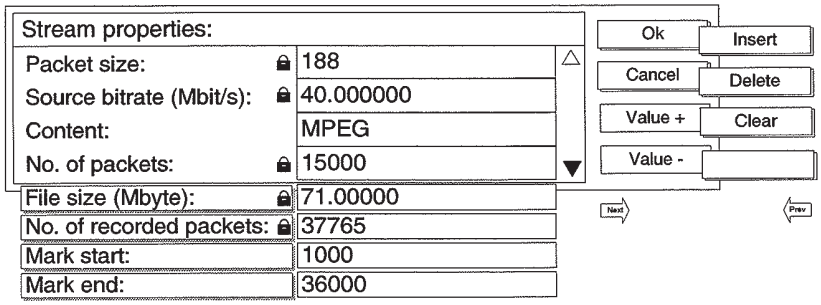
Stream Properties File Open

Four options are offered:

- View or edit the stream
- Cue Player with the stream
- Cue Recorder with the stream
- Make the stream seamless

The options are described in the following paragraphs:

View or edit the stream



Stream Properties dialog

The following parameters are displayed:

Packet size: (read-only) Packet size (bytes); 188/204 byte packet sizes are supported.

Source bitrate (Mbit/s): (read-only) The bitrate derived from the PCRs in the stream. If the bitrate cannot be deduced from the PCRs, a default value is set.

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Content: Broadcast standard: MPEG2/DVB/ATSC/BSD SFsynch/BSD Psynch.

The content standard (MPEG/DVB/ATSC/ISDB) of an MPEG file is not currently detected by the software and so must be set by the user. The content standard affects the Continuous Time Stamping process in that it determines whether TDT/TOT table, or STT table updating, or no table updating will be tried.

No. of packets: (read-only) Number of packets in the file.

File size: (read-only) File size (Mbytes).

No. of recorded packets: (read-only) This is dependant on each recording. If the designated file-space is not filled when a recording is made, this property is used to control the playout so that only the recorded section is played.

Mark start: The position of the Start marker (packet number). (see *Player Operation*)

Mark end: The position of the End marker (packet number). (see *Player Operation*)



Mark start: and **Mark end:** are not displayed if the selected stream has no recorded packets.

Cue Player with the stream

If Ok is selected, the selected stream is loaded into the Player and cued for playout. The Player screen is displayed (see also *Player Operation*).

If the Player (or Recorder) is already busy, a message will be displayed. After confirmation, the action will be terminated and the Streams screen redisplayed.

Cue Recorder with the stream

If Ok is selected, the selected stream is loaded into the Recorder and cued for recording. The Recorder screen is displayed (see also *Recorder Operation*).

If the Recorder is already busy, a message will be displayed. After confirmation, the action will be terminated and the Streams screen redisplayed.

Make the stream seamless

If Ok is selected, the Make Seamless wizard is invoked – see Make Seamless Wizard, page 4-10.

If the Stream is in use by another AD991 Stream Source application (Player or Recorder), a message will be displayed and the Streams screen redisplayed.

If Cancel is selected before Ok at any point, the action will be terminated. The Streams screen will be redisplayed unchanged.

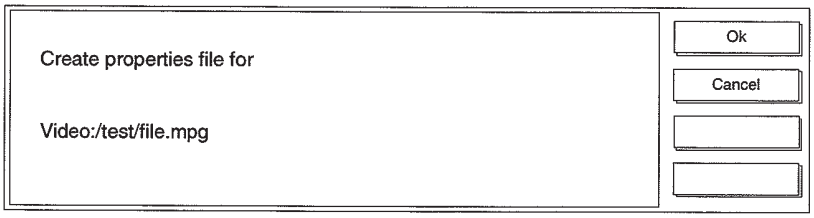
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Opening an MPEG File

To play from or record to an MPEG file, AD991 Stream Source requires a Stream Properties file to be associated with the MPEG file. This is done automatically (after operator confirmation) whenever an attempt is made to 'open' an MPEG-2 file (*.mpg). Both files are given the same name, which ensures that they are always handled together.

To be recognised by Stream Source, an MPEG file must have an 'mpg' extension. If necessary, files with other extensions, including ISDB files (e.g. *.isdb) should be renamed (see Renaming a Folder/File, page 4-7)

When an MPEG file is highlighted and **Open** is selected, the following dialog is displayed:



Create Stream Properties File

Select **Ok** to cause the Stream Properties file to be created; progress is reported. The Streams screen is redisplayed. Note that the MPEG file icon ( ) has now been replaced by the Stream file icon ( ).

Selecting **Cancel** will cancel the operation and return the display to the Streams screen.

Opening a Folder

Highlighting a folder name and selecting **Open** will open the folder and display the contents.

Closing a Folder

Highlighting a folder name and selecting **Close** will close the folder and display its parent and contents.

If the root (top) folder of the drive (Video: or CD/DVD) is displayed and **Close** is selected, the root folder will be redisplayed – Use **Drive** (see page 3-13) to change to another drive.

After inserting a disk into the DVD/CD drive, it may be necessary to wait for a few seconds for the disk to be loaded. Loading can be confirmed by attempting to access the disk.

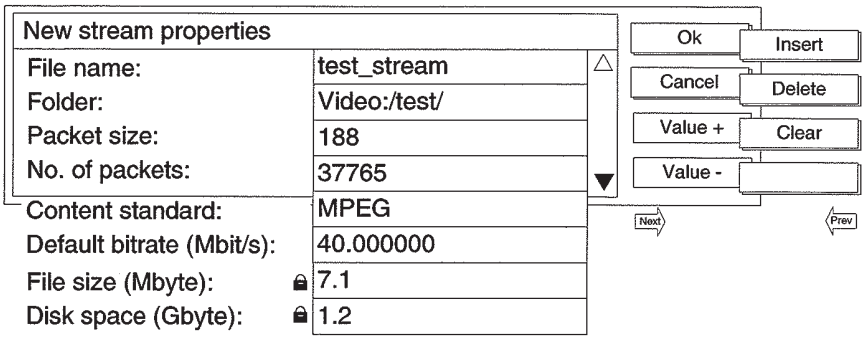
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Creating a New Stream

When a new file or Stream is created in order to record into it, both the Stream Properties file and the (empty) MPEG file are generated.

From the Streams screen:

1. Select the folder where the new stream is to be created and press **New File**. The **New stream properties** dialog is displayed:



2. Create the **File name:** that the new stream is to have. (This name will be applied to Stream Properties file and the (empty) MPEG file, with their respective file extensions, .spf and .mpg.)

3. Select the **Folder:** where the stream is to be stored. **Value+** and **Value-** open a second dialog which allows the folder to be identified.

4 Enter the **Packet size** (188/204) and the **No. of packets** that the new stream is to have.

   The **File size:** and **Disk space:**, which are a read-only fields, will be calculated automatically as a product of the packet size and the number of packets. The final file size is only limited by the disk space available; a message will be displayed if disk space is limited. The minimum permissible number of packets is 4600 packets of 188 bytes/packet.

   Note that **File size** field is updated in line with changes made to **Packet size** and/or **No. of packets**.

5. Select the **Content standard** (MPEG/DVB/ATSC/BSD SFsynch/BSD Psynch).

6. Enter the **Default bitrate** in Mbit/s.

7. Select **Ok** to confirm the new file details.

   If the file name already exists in the current folder, a message will be displayed and the **New stream properties** dialog redisplayed.

   The creation of the new stream is indicated by the progress dialog following. When complete the main Streams is redisplayed. Note that the new stream name is added to the current folder listing.

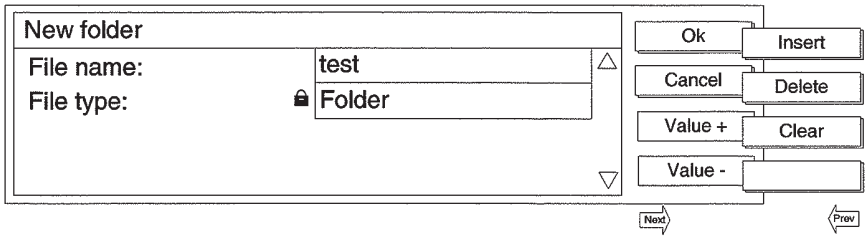
   To reject the file name and cancel creation of the new stream, select **Cancel**. The Streams screen will be redisplayed unchanged.

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It is not recommended that a new stream is created while a stream is being played in Player since it may result in temporary problems with the playout..

Creating a New Folder

From the Streams screen, select the folder in which the new folder is to be created and press **New Folder**. The New folder dialog will be displayed with the folder name blank; enter the required name. When complete, press **Ok**. If the new folder name is already used in the current folder, a message will be displayed and the New Folder dialog redisplayed.



Note that the new folder name is added to the screen listing.

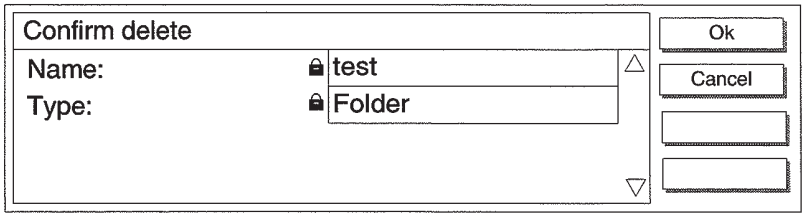
Deleting a Folder

On the Streams screen:

1. Highlight the folder to be deleted.

   Only empty folders can be deleted; a message is displayed if the folder is not empty. To delete a folder the files within the folder should be deleted first.

2. Select **Delete**. The Confirm delete dialog is displayed.



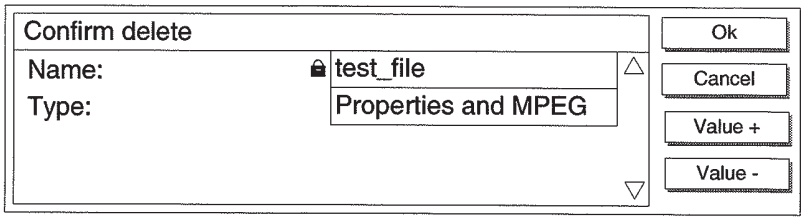
3. Select **Ok** to confirm the deletion or **Cancel** to abort the action.

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Deleting a File

On the Streams screen:

1. Highlight the file to be deleted.
2. Select **Delete**. The Confirm delete dialog is displayed.



Note that the file name selected is read only.

The Type field will vary depending on the file type selected. If the file type is 'singular' (e.g. MPEG, player interface properties file, etc), the file type is named and the file is read-only.

However, if it is a Stream file to be deleted, the user will be offered the choice of deleting the complete stream (**Properties and MPEG**) or only the stream properties file (**Properties only**) thus leaving the original MPEG file intact. Use **Value+** / **Value-** to make the required selection.

3. Select **Ok** to confirm the deletion or **Cancel** to abort the action.

Note on the redisplayed Streams screen that the selected item (file/folder) has been removed. If only the Stream file was selected for deletion, the only visible change on the Streams screen will be that the Stream icon (⊕) will have been replaced by the MPEG icon (▭).

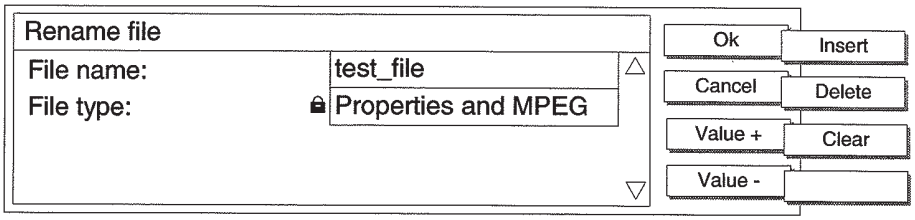


It is sometimes beneficial to delete a Stream properties file and then recreate it by re-importing the associated MPEG file (see Opening an MPEG File, page 4-4).

Renaming a Folder/File

Rename allows either files or folders to be renamed.

1. Select the file/folder to be renamed.
2. Select **Rename**. The Rename dialog is displayed with the field edit menu controls.



Rename Screen (typical)

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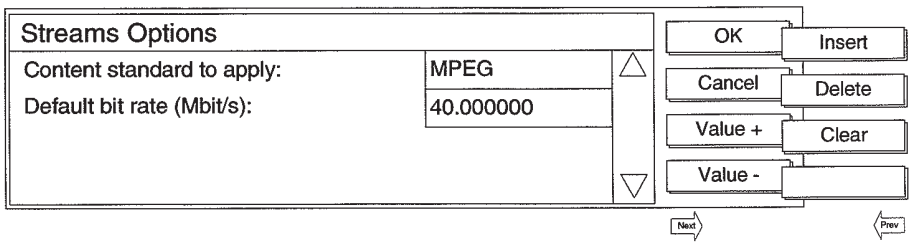
3. The details displayed are dependent upon the type of file/folder selected for renaming. Some detail fields are read-only as indicated by the field pointer; for example, **File type**.
4. Edit the file/folder details as required.
5. Select **Ok**.

Note that the Streams screen is displayed and that the file/folder details are updated.

If the file name selected already exists in the current folder, a warning message will be displayed. Selecting **Ok** in the message box will cause the rename dialog to be redisplayed.

Stream Options

The following system-level parameters can be set in the Streams **Options** dialog, Note that these options apply to *streams*, and therefore take effect wherever the stream is used (Player, Recorder):



Content standard to apply: Values: MPEG / DVB / ATSC/ BSD SFsynch / BSD Psynch
When a stream is created or imported, the selected content standard is set in the Stream Properties file. Note that when the file is actually recorded, the content standard dictated by the recorder options will be applied and override this setting if necessary.

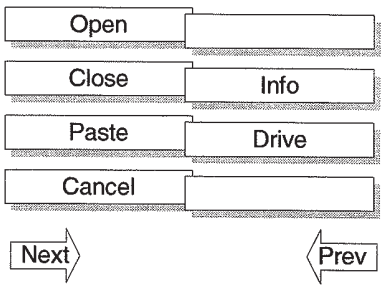
Note that this setting provides a default content standard setting. Individual streams can be modified during creation or subsequently via stream properties.

Default bit rate (Mbit/s): Value: 0.25 to 60.
When importing a stream, if the bitrate cannot be derived by analysis of the stream, then this value is set in the stream properties file.

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Paste Mode Menu

The Paste mode menu items are displayed when **Cut** or **Copy** are selected. Navigation using the cursor, **Open** and **Close**, is enabled to allow a destination for a copied file to be identified.



Paste Mode Controls →

Open	Opens the currently selected folder and displays the contents.
Close	Closes the current folder and displays the contents of the parent folder.
Paste	Pastes the last cut or copied file into the currently open folder.
Cancel	Cancels the Paste action and redisplays the main menu controls.
Info	Displays the space available on the current drive.
Drive	Allows another drive to be selected.

Copying a File

1. Select the file to be copied.
2. Select **Copy**. Note that the selected file is highlighted.
3. Use **Open** and **Close** to navigate to the destination folder.
4. Select **Paste**. Note that the file is copied to the destination folder.

   If **Cancel** is pressed at any time before **Paste**, the copy action will be terminated and the display returned to the normal state.

Cutting and Pasting a File

1. Select the file to be cut and pasted.
2. Select **Cut**. Note that the selected file is highlighted.
3. Use **Open** and **Close** to navigate to the destination folder.
4. Select **Paste**. Note that the file is moved to the destination folder.

   If **Cancel** is pressed at any time before **Paste**, the cut and paste action will be terminated and the display returned to the normal state.

Disk Usage



Any disk intensive activity such as creating or copying streams may affect the high bandwidth performance of either the Player or the Recorder.

The space available on the Video drive can be checked at any time.

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From the Streams screen, select **Info**. The free space is shown in giga-bytes. Use **Ok** to close the dialog.

Make Seamless Wizard

The Make Seamless wizard will guide the user through the process of updating a stream so that it may be played continuously with no discontinuities. When combined with Continuous Time Stamping (Stamp) (see page 5 - 11), minimal picture disturbance will be observed at the loop point.

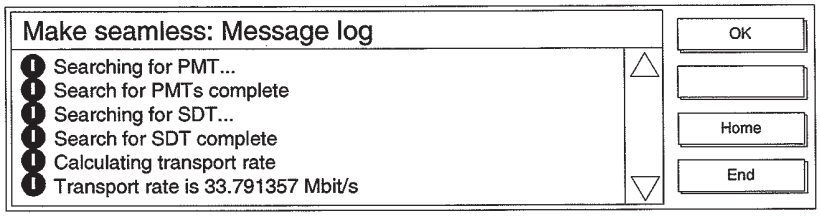
The wizard is accessed as an option on the Streams **Open** dialog. The wizard comprises three stages: Retrieval, Analysis, Multiplexing. They are described below.

Common Controls

Throughout the Make Seamless Wizard dialogs the buttons **View Log**, **Back** and **Cancel** are used. They are described below:

View Log At each stage in the make seamless process, a log file is maintained and made available for viewing on the Stream Source screen via the **View Log** button.

The illustration below shows a typical log file display.



Make Seamless Log File

Icons:

I General processing information.

W Messages which may mean that the output stream will contain errors.

E Messages indicating catastrophic information which will cause the wizard to disable the **Next** button and prevent any further progress.

Controls:

Ok Closes the log display.

Home/**End** Displays the top/bottom entry in the log file

◄ ► The left and right **Cursor Buttons** can be used to move the display to the left or right if the line length exceeds the display width.

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Back Selecting the **Back** button will return the user to the previous wizard dialog. The results of any activity (retrieval, analysis, etc) undertaken in the last step will be lost, but may be initiated again.

Cancel Selecting the **Cancel** button exits the Make Seamless wizard and returns the user to the main Streams screen. All results of activity by the wizard are lost.

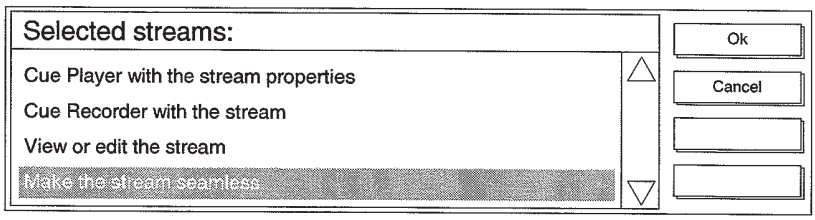
The remainder of this section describes the operation of the Make Seamless wizard.

Retrieval

A file is selected for making seamless via the Streams Open dialog.

The wizard can only be applied to Streams. If an MPEG file is selected, an option to create a Stream will be offered before the Make Seamless wizard is started. If the option is refused, the action is terminated and the Streams dialog is redisplayed.

1. From the Streams dialog, highlight the Stream to be made seamless.
2. Select **Open**
3. From the Open dialog, highlight the Make Seamless option and select **Ok**.



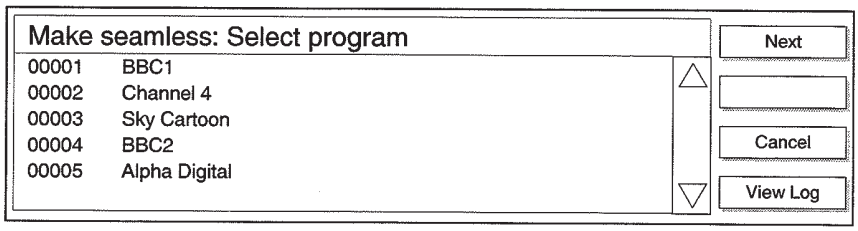
Stream Properties File Open

The selected stream is analysed to determine its program content; a progress screen will indicate progress. If analysis is unsuccessful in determining program content, an empty program list will be displayed; it may be possible to deduce the reason from the error log information.

Programs successfully analysed will be displayed on the Analyse dialog (see below).

Analysis

On completion of the Retrieval phase of make seamless, the Analyse dialog will be displayed

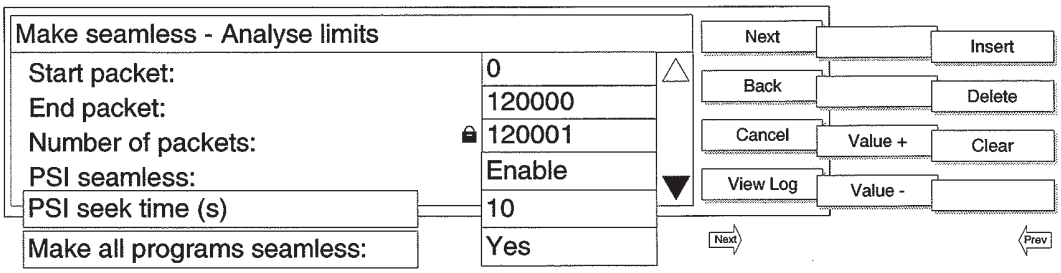


Make Seamless - Program listing

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The dialog lists the programs detected during the retrieval phase; each program comprises a number and a name derived from the stream. A program stream may be selected for analysis by highlighting the program name and selecting **Next**.

An opportunity is offered to define the **Start** and **End packets** for the make seamless operation. By default the true start and end points will be offered; the user can change these. The **Number of packets:** field reflects the difference between the start and end packets defined.



Make Seamless – Analyse Limits

The following parameters must also be set:

PSI seamless: Enabled/Disabled
When Enabled, the Program Specific Information (PSI) is made seamless in addition to the program information selected via the Make Seamless Wizard (page 4-10).

PSI seek time (s): Value: integer
When **PSI seamless** is enabled, this option sets the maximum seek allowable time for PSI. If PSI is not found within this period, a warning will be written into the Make Seamless Message Log that not all PIDs could be made seamless.
Note that the seek time is a fallback value only; it will normally be preset when the unit is started.

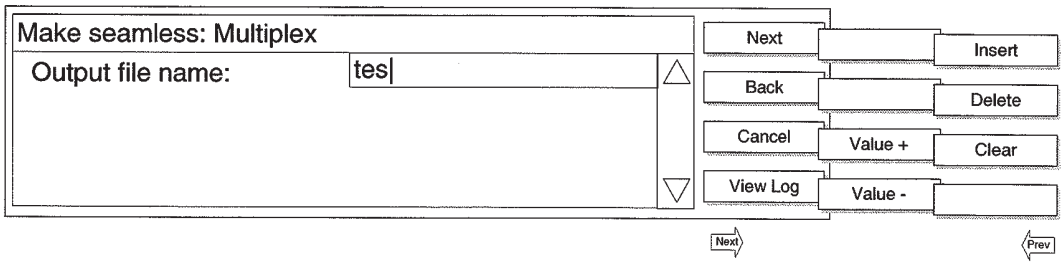
Make all programs seamless: Yes/No
When using the Make Seamless Wizard (page 4-10), a single program is identified in a stream to be made seamless. Setting this option to **Yes** will cause all programs in the stream to be made seamless. However, it should be noted that if any conflict arises, priority will be given to the program originally identified in the wizard.

When the parameters have been set, select **Next**. The selected stream is analysed to prove its suitability for the make seamless operation and the Multiplex phase of the wizard is entered with the display of the Multiplex dialog. A progress screen is displayed during the operation.

If the analysis is unsuccessful, the only buttons available with the dialog will be **Back**, **Cancel** and **View Log** (The actions of the buttons are described at the start of this section).

Successful analysis results in the following dialog:

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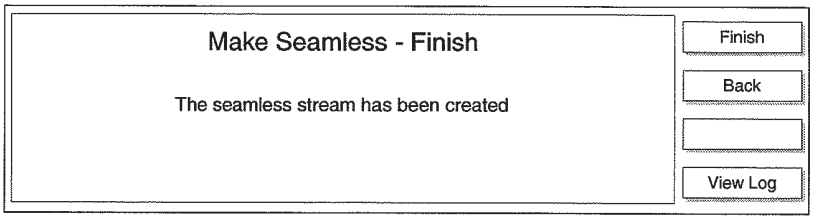
Make Seamless – Multiplexing

Multiplexing

The Multiplexing dialog offers the user the opportunity to name the new seamless stream. Note that the new stream will be created in the same folder as that of the originating stream. After completing the operation, it can be copied or moved in the usual manner (see Getting Started with Streams, page 4-2).

If a previously used file name is chosen, the user will be offered the opportunity to confirm that the file should be overwritten. If permission is denied, the operation is terminated and returned to the Multiplexing dialog.

If the name is accepted, the multiplexing process is started; a progress screen is displayed during the operation. Upon successful completion of the operation the following dialog is displayed:



Make Seamless – Finish

Select the **Finish** button to exit the wizard.

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Streams Menu Controls

The Streams menu items are briefly described (in alphabetical order) in the following paragraphs. (An ellipsis (...) following the control image indicates that more information is provided elsewhere in this section of the manual.)

About — About Navigator displays version information for the Streams application.

Close ... — Closes the current folder and displays the parent folder and it's contents. If the currently displayed folder is the root folder, the screen will simply refresh.

Copy ... — Highlights the file or folder to be copied and displays the Paste Mode menu controls (see Paste Mode Menu, page 4 - 9).

Cut ... — Highlights the file or folder to be cut and displays the Paste Mode menu controls (see Paste Mode Menu, page 4 - 9).

Delete ... — Opens a dialog that prompts for confirmation to delete the currently selected folder or file. All contents of the folder will be deleted including files and sub-folders.

Drive — Displays a drive selection dialog.

Info — Opens a status dialog which provides read-only access to system parameters.

New File ... — Creates a new file and opens a dialog that prompts for file type and file name to be created.

New Folder ... — Creates a new folder within the current folder. A dialog is opened prompting for a folder name.

Open ... — If a folder is selected (highlighted), opens the folder and displays the contents.
If a file is selected (highlighted) and there is only one possible action associated with the file then this action will be initiated.
If more than one action is associated with the file, a dialog will be displayed offering the range of actions.

Options... — Opens the Streams Options dialog that allows a selection of Streams operating parameters to be modified.

Refresh — Refreshes (updates) the current display.

Rename ... — Opens a dialog that allows the file or folder name to be changed. If the file being renamed is a Stream file and therefore associated with a transport stream file of the same name, both files are renamed.

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Player Operation

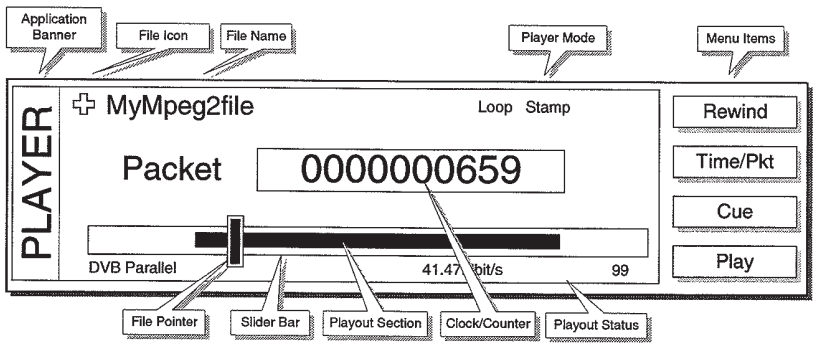
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Overview

The Player is used to play out Streams.

Streams can be opened in Player from one of three sources: from Player, cued from Streams or via the Player autoplay feature.

The screen illustrated below shows Player with the file MyMpeg2file open.



Player Screen

The Player screen comprises the following elements:

Application Banner Displays **PLAYER**.

File Icon Shows the Stream file icon (See *Streams Operation*).

File Name Shows the file name of the currently open stream. Blank if no stream is open.

Player Mode Two 'flags' are displayed; **Loop** and **Stamp**. They reflect the status of the **Loop** and **Stamp** functions (described below).

Clock/Counter Display Displays the current position of the pointer in the stream; this may be expressed in terms of Packets or Time depending on the selection made using the **Time/Pkt** control. The Packet count is shown as a ten-digit number. The Time is displayed in a 'hh:mm:ss.cc' format.

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Slider Bar — The Slider represents the whole Stream as an outline. The filled portion of the bar indicates the section (or whole) of the file marked for playout. The File Pointer indicates the current playout position. The sub-section of the file designated for playout is marked using the **Mark start** and **Mark end** controls (see below).

Playout Status — The Playout Status comprises three elements.

- Playout clock rate in Mbit/s
- No CTS Flag: Is displayed when the continuous time stamping is in error.
- Buffer: Indicates the state of the playout buffer. Normally showing 99 or 98, it drops to zero as the buffer empties at the end of the file playout.

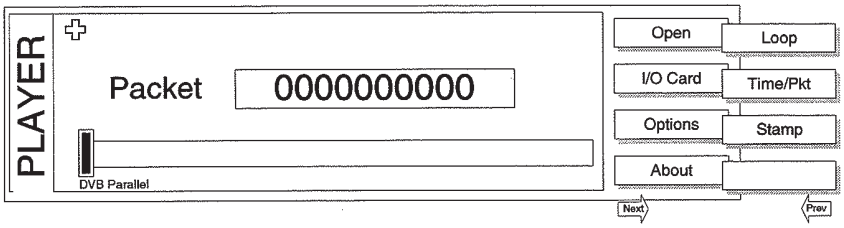
Menu Items — The Menu items are displayed at the right-hand side of the display and are activated by the corresponding adjacent buttons. Where further items are available, they are accessed cyclically using the **Next** and **Prev** buttons immediately below the menu control buttons. The player controls are described in the following section.

Player Modes

The Player application has four operational modes: idle, open, cue and play. Each operational mode displays a different set of menu items.

Idle

The **Idle** mode is active when the Player application is active but no Stream is loaded. In this mode the file name is blank.

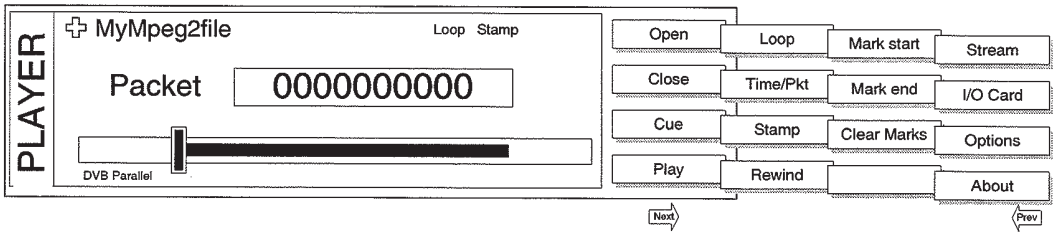


Idle Mode Menu Items

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Open

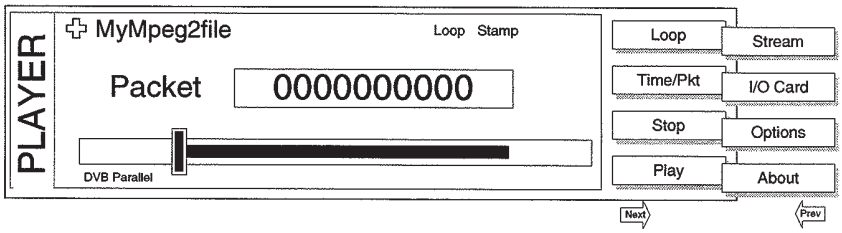
The **Open** mode is active when a Stream has been opened and its name is displayed at the top of the screen (in the file name field). The application performs some preliminary but basic analysis of the Stream in preparation for playout.



Open Mode Menu Items

Cue

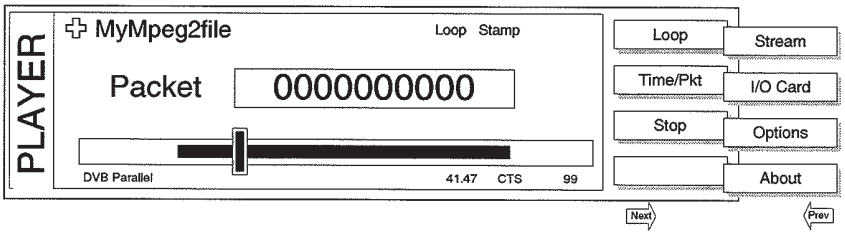
The **Cue** mode becomes active when a Stream is open and the **Cue** button is pressed. This enables the MIC card to prepare the Stream for playout. When the Player is cued a green LED illuminates the Player application button.



Cue Mode Menu Items

Play

The **Play** mode is active when a Stream is being played out.



Play Mode Menu Items

Playout is initiated by pressing the **Play** button. If the Player is in Cue mode when the **Play** button is pressed, playout will commence immediately. If the Player is in Open mode when the **Play** button is pressed, the playout will commence after a short interval (the interval depends upon file size, location, etc.).

When the Player is playing a green LED illuminates the Player application button.

An alphabetical list of the Player menu items is given at the end of this section (page 5-15).

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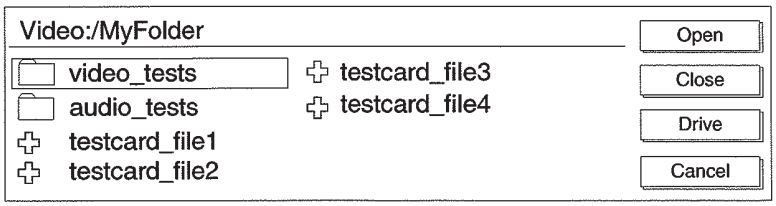
Getting Started with Player

This section provides information on basic activities associated with the Player.

Opening a Stream

Selecting **Open** displays a navigation screen similar to the Streams screen as shown below.

Highlight a stream and select **Open** to open the stream in Player. If the Stream Properties file has previously been edited the settings will be remembered and used; for instance, Mark Start and Mark End (See Stream Options in this section).



Player Open Stream dialog

The dialog caption shows the name of the folder that is currently open (e.g. MyFolder). The dialog properties area shows the Streams and folders available.

Open If a Stream is currently selected (highlighted), it is opened in the Player. If a folder is selected, the contents of the folder are displayed.

Close Closes the current folder and displays the contents of the parent folder.

Drive Allows the Video drive or any other read/write mapped media to be selected.

Cancel Closes the dialog, making no changes to Player or its currently selected stream.

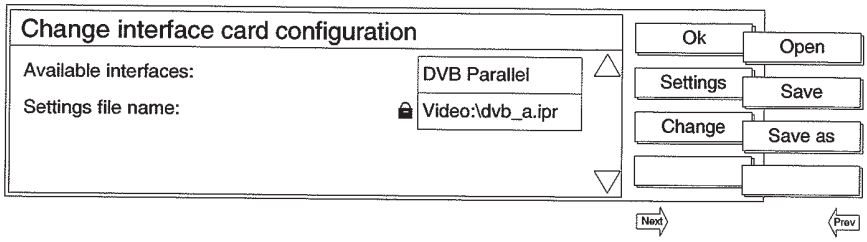
Streams located elsewhere (e.g. CD/DVD) will need to be copied to the Video: drive before they can be opened (see *Copying a File* in the *Streams Operation* section).

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View/Modify Player Interface Settings

The Player can be configured to use any of the installed I/O interfaces. Selecting **I/O Card** allows an interface to be selected and/or the settings to be modified. If a stream is either cued or playing, the interface screens are read only and cannot be modified. The interface currently in use is shown in the dialog. Also the path and name of the current Player Interface Properties file (*.ipp).

(Interface settings can be saved as or opened from a Player Interface Properties file (*.ipp); see Files in this section.)



Interface Selection dialog

Select the required interface from the spin list using the **Change** control. Only the interface cards fitted to the unit are available, viz. DVB plus one interface card.

To enable the interface with the current settings, select **Ok**. Changes made to all interface settings (see below) are confirmed when **Ok** is selected. If the Auto-Save option is enabled, the settings are automatically saved to the current Player Interface Properties file when the Change Interface Card Configuration dialog is closed. If the Auto-Save option is not enabled, the settings will be implemented but will be discarded at the end of the current session (i.e. when the unit is switched off). (See Player Options, page 5-13.)

To view and edit the selected interface settings, select **Settings**. Settings are read-only when a stream is cued or playing.

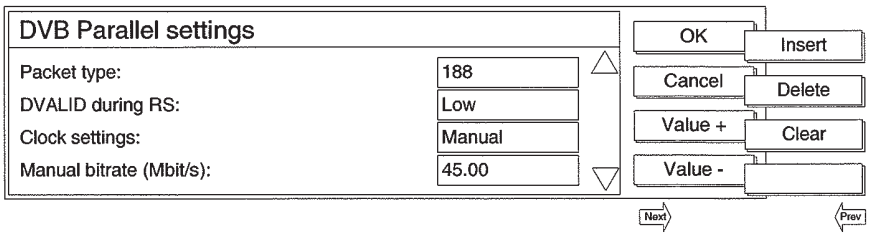
Open, **Save** and **Save as** are applicable to the Player Interface Properties file (see Files in this section).

The following paragraphs detail the P*layout* settings; there is equivalent R*ecord* information (Recorder Interface Properties file *.ipr) in the *Recorder Operation* section.

The physical aspects of the interfaces are dealt with in *Installation* section.

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DVB Parallel Settings



DVB Parallel Settings dialog

The following settings are provided:

Packet type: Values: 188 / 204
This parameter sets the player packet type.
The packet size displayed will default to the size in the source stream, but a stream may be played out in another format; that is streams whose packet size is 188 packets can be played out at 204 packets and vice versa.

DVALID during RS: Values: High / Low
Controls the DVALID signal that is used to indicate whether the last 16 bytes of each packet contain valid data. If **High** is selected, then the DVALID signal on the DVB parallel port will remain high during bytes 189-204 of the packet.
DVALID during RS can be edited when **Packet type** is 188 but has no effect.

Clock settings: Values: External / Manual / From source
Dictates the origin of the playout bitrate.
External selected takes the clock signal from the external clock input (Refer to *Installation* section).
Manual selected allows the **Bit rate** to be set manually.
From source ensures that the playout bitrate is derived from the source file.

Manual bitrate (Mbit/s): Values: 0.25 to 60. Only enabled when Clock Settings are Manual. Enter the value required for the playout; the value is expressed in megabits per second. An error message will be displayed if the value entered is outside the defined limits.

The following settings are not displayed in the idle mode; they are derived from an open stream.

Source packet type: (read-only) The packet size derived from the source stream.

Source bitrate (Mbit/s): (read-only) The bitrate derived from the source stream.

Playout bitrate (Mbit/s): (read-only) The playout bitrate is calculated from the **Packet size** and the bitrate dictated by the **Clock settings** selected.

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The field displays zero (0) if **External** clock setting is selected. Similarly the field displays the **Manual** bitrate entered when selected. If the **From Source** clock setting is displayed, the bitrate is calculated as follows:

$$\text{Playout bitrate} = \text{source bitrate} \times \frac{\text{playout packet size}}{\text{source packet size}}$$

For a description of the *Common Operational Features*, refer to General Operation section.

ASI+ Settings

The layout of the ASI+ Settings dialog is similar to the DVB Parallel Settings dialog.

The following settings are provided:

Packet type: Values: 188 / 204
This parameter sets the player packet type.
The packet size displayed will default to the size in the source stream, but a stream may be played out in another format; that is streams whose packet size is 188 packets can be played out at 204 packets and vice versa.

Clock settings: Values: External / Manual / From Source
Dictates the origin of the playout bitrate.
External selected takes the clock signal from the external clock input (Refer to *Installation* section).
Manual selected allows the **Bit rate** to be set manually.
From Source ensures that the playout bitrate is derived from the source file.

Manual bitrate (Mbit/s): Values: 0.25 to 60. Only enabled when Clock Settings are Manual. Enter the value required for the playout; the value is expressed in megabits per second. An error message will be displayed if the value entered is outside the defined limits.

ASI+ mode: Values: Normal / Burst / ASI Forced Error / M2S
Normal – the operating mode of the standard ASI.
Burst – data is transmitted in bursts of 1, 2, 3 or 4 transport stream packets. The number of packets in each burst is specified in the following Packets field.
Forced Error – causes an error byte to be transmitted in position 15 of each packet.
M2S – selects M2S compatible mode.

Packets: Values: 1 / 2 / 3 / 4
Only enabled when ASI+ Mode is ASI Burst.
Select the number of packets.

The following settings are not available in the idle mode; they are derived from an open stream.

Source packet type: (read-only) The packet size derived from the source stream.

Source bitrate (Mbit/s): (read-only) The bitrate derived from the source stream.

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Playout bitrate (Mbit/s): (read-only) The playout bitrate is calculated from the **Packet size** and the bitrate dictated by the **Clock settings** selected.

The field displays zero (0) if **External** clock setting is selected. Similarly the field displays the **Manual** bitrate entered when selected. If the **From Source** clock setting is displayed, the bitrate is calculated as follows:

$$\text{Playout bitrate} = \text{source bitrate} \times \frac{\text{playout packet size}}{\text{source packet size}}$$

For a description of the *Common Operational Features*, refer to General Operation section.

GPSI-II Settings

The layout of the GPSI-II Settings dialog is similar to the DVB Parallel Settings dialog

The following settings are provided:

Interface: Values: SMPTE/SSI
Allows the player output interface to be selected.

Packet type: Values: 188 / 204 / 208
The packet size displayed will default to the size in the source file, but it may be played out in another format. The playout transformations are:

Source file format	Output Format 188 byte	204 byte	208 byte
188 byte	✔	✔ (dummy RS)	✔ (dummy RS)
204 byte	✔	✔	✕

Clock settings: Values: Fixed 19 / Fixed 38 / External / Manual / From Source
Selecting either **Fixed 19** or **Fixed 38** allows easy selection of the high precision values 19.392658Mbit/s and 38.785317Mbit/s respectively.
Selecting the **Manual** value enables the following value (Bitrate) which allows a specific value to be entered.
Selecting the **From Source** value ensures that the playout bitrate is derived from the source file.

Manual bitrate (Mbit/s): Values: SMPTE/SSI - 1.0 to 44.0

Manual bitrate setting is only enabled when Clock settings are Manual. Enter the value required for the playout; the value is expressed in megabits per second. An error message will be displayed if the value entered is outside the defined limits.

The following settings are not available in the idle mode; they are derived from an open stream.

Source packet type: (read-only) The packet size derived from the source stream.

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Source bitrate (Mbit/s): (read-only) The bitrate derived from the source stream.

Playout bitrate (Mbit/s) (read-only) The playout bitrate is calculated from the **Packet size** and the bitrate dictated by the **Clock settings** selected.

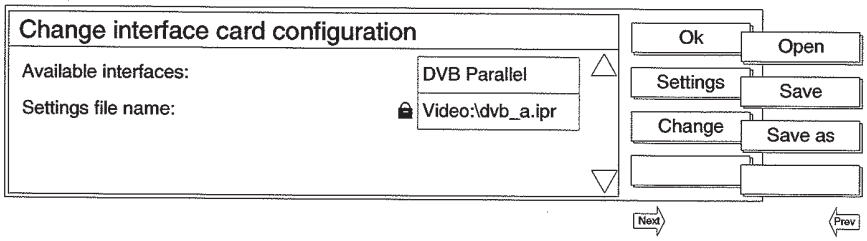
The field displays zero (0) if **External** clock setting is selected. Similarly the field displays the **Manual** bitrate entered when selected. If the **From Source** clock setting is displayed, the bitrate is calculated as follows:

$$\text{Playout bitrate} = \text{source bitrate} \times \frac{\text{playout packet size}}{\text{source packet size}}$$

For a description of the *Common Operational Features*, refer to General Operation section.

Using IPP Files

A Player Interface Properties file (*.ipp) contains a snapshot of the player interface settings (see View/Modify Player Interface Settings in this section). A number of Player Interface Properties files can be saved to cater for different playout requirements. At switch-on the last used Player Interface Properties file is used.



Interface Selection dialog

Player Interface Properties files can be saved at any time; however they cannot be opened if a stream is cued or playing.

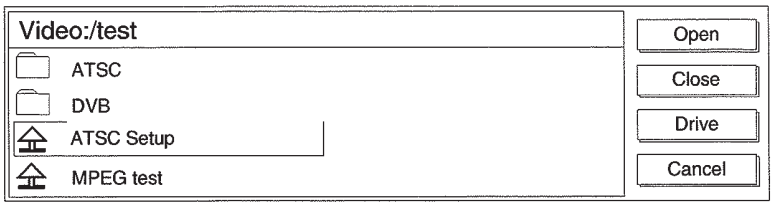
Identifying the Current Player Properties File

The current player properties file is shown in the **Settings file name** field in the opening dialog. If the path/file name extends beyond the end of the field, it can be viewed by moving the cursor to the right of the field.

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Opening a Properties File

To open an existing Player Interface Properties file select **Open** on the **Change Interface Card Configuration** dialog.



Note that only folders and Player Interface Properties files ( ) are shown; other files may be present in the folder, but they are not displayed this view.

Use **Open** and **Close** to navigate among folders; note the path name in the display caption. If available, a different drive can be accessed using the **Drive** item.

Highlight the Player Interface Properties file required and select **Open**. The selected properties file will open and the interface settings will take effect immediately.

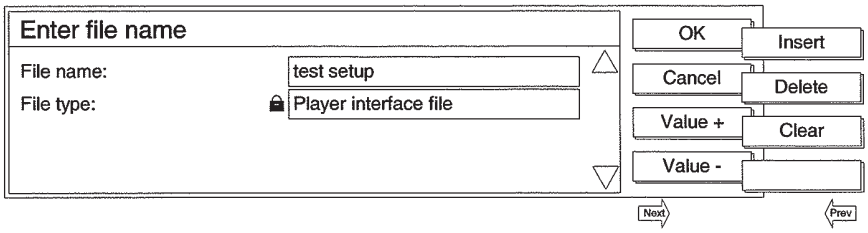
Saving the Current Properties File

If the Auto-Save option is enabled, the settings are automatically saved to the current Player Interface Properties file when the Change Interface Card Configuration dialog is closed. If the Auto-Save option is not enabled, the settings will be implemented but will be discarded at the end of the current session (i.e. when the unit is switched off). (See Player Options, page 5-13.)

If you are unsure of the options setting or wish to save the player properties file anyway, select **Save**. No confirmation is given, but the properties will take effect immediately. The current Player Interface Properties file is overwritten (subject to the auto-save setting described in the previous paragraph). If no properties file is currently loaded, the Save as dialog is opened and the file must be named before it can be saved. Note that the saved file will be loaded by default at the next start-up.

Saving a New Properties File

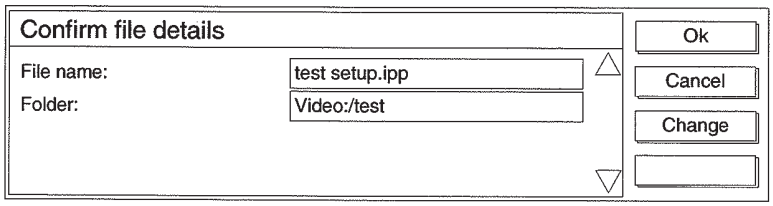
Select **Save as** to save the current interface settings to a new file or to overwrite an existing file; the following dialog is displayed:



Enter SaveAs details

The file name displayed initially is that of the current properties file. The File type field is read-only. Edit the file name as required and select **Ok**.

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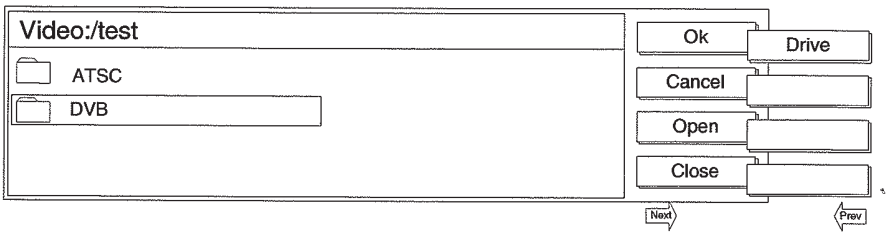


Confirm SaveAs dialog

Select **Ok** to confirm that the file name and the destination folder are correct.

If the file name needs to be amended, highlight the file name field and select **Change**. The previous dialog will be redisplayed and can be amended as required; note that the extension (.ipp) cannot be changed.

If the folder needs to be amended, highlight the folder field and select **Change**.



SaveAs Folder Navigation dialog

Navigate to the correct folder using **Open** and **Close**. If available, a different drive can be accessed using the **Drive** item. Confirm the destination folder by selecting **Ok**.

If the file name selected already exists, a warning message will be displayed.

Note that the newly saved file will be loaded, by default, on restarting AD991 Stream Source.

For a description of the *Common Operational Features*, refer to *General Operation*, section.

Continuous Time Stamping (Stamp)

When looping a transport stream to simulate continuous playout, transport stream errors can be generated at the loop point caused by discontinuities in timing information derived from the stream itself. The Continuous Time Stamping function allows the user to specify which time components in a transport stream should be modified to allow a looped stream to correct these timing errors.

If continuity problems are still apparent at the loop point, it may be beneficial to apply the Make Seamless function to the stream (see Make Seamless Wizard, page 4-10).

The following timing components are available for modification:

Sequence counters

Continuity count: The continuity counter is a 4-bit field which increments with each transport stream packet having the same PID

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Relative time values

PCR (Program Clock Reference): A timestamp in the transport stream from which decoder timing is derived.

PTS (Presentation Time-Stamp): A PES packet header field that indicates the time that a presentation unit is presented in the system target decoder.

DTS (Decoding Time-Stamp): A PES packet header field that indicates the time that an access unit is decoded in the system target decoder.

Absolute time values

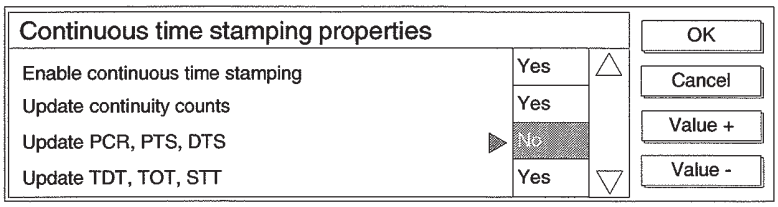
TDT (Time and Date Table): A DVB-specific SI table which carries current date and time of day information.

TOT (Time Offset Table): A DVB-specific SI table which carries current date and time of day offset information.

STT (System Time Table): An ATSC-specific table which carries current date and time of day information.

Note that other transport stream errors may occur at the loop point if the stream has not been pre-processed for seamless looping. These errors are not dealt with by Continuous Time Stamping.

The Continuous Time Stamping (CTS) dialog is displayed when the **Stamp** menu control is selected on the Player menu. Provided that a file is not being played out, the CTS settings can be changed at any time.



If **Enable continuous time stamping** is disabled (No), the other options are disabled and are not editable.

1. Select the option to be changed using the cursor keys.
2. Change the value of the selected option using the **Value+/-** buttons.
3. Implement the changes using the **Ok** button.
4. Discard the changes using the **Cancel** button.

NO CTS is displayed in the Playout Status field when Continuous Time Stamping is enabled but unable to function correctly; this can be due to the length of the stream, i.e. too short.

Continuous Time Stamping is not compatible with BSD streams.

For a description of the *Common Operational Features*, refer to General Operation section.

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Mark end and Mark start

Start and end markers define a portion of a stream that is to be played. If no markers are set, the whole file will be played. If only a start marker is set, the stream will be played from that point to the end of the stream. Similarly, if only an end marker is set, the stream will be played from the beginning of the stream to the end marker. Visually the selected part (or whole) of the stream is shown as the filled portion of the Player Slider bar.

Start and end marker positions are recorded in the stream properties file; consequently, when a stream is closed (and subsequently opened), the start and end markers will be retained for that stream.

To set the start point of the portion of the stream, position the file pointer using the left and right cursor keys, and select **Mark start**. The left-hand end of the shaded portion of the Slider Bar will reposition to indicate the start of the playout.

Similarly, to set the end point of the playout, position the cursor and select **Mark end**.

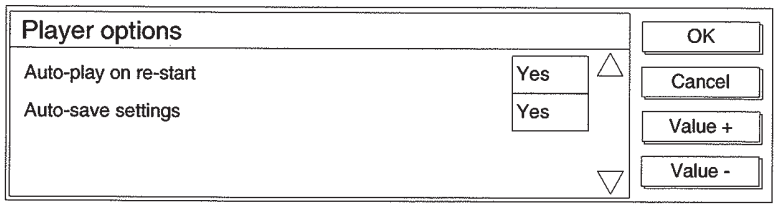
To move a start or end point, simply re-mark the new start and end points.

Start and End markers can also be entered as absolute positions (packet number) in the Stream Properties file (see Stream Properties in this section).

Start and end markers can be deleted using the **Clear marks** menu item, effectively setting the start and end of the stream playout to the beginning and end of the file.

Options

When **Options** is selected, the following dialog is displayed:



Auto-Play on Restart

If this option is enabled (**Yes**), the most recently opened stream is opened and played when the unit is next switched on.

Auto-save settings

If this option is enabled (**Yes**), changes to the Player Interface Properties file settings are automatically saved to the current properties file when the Change Interface Card Configuration dialog is closed.

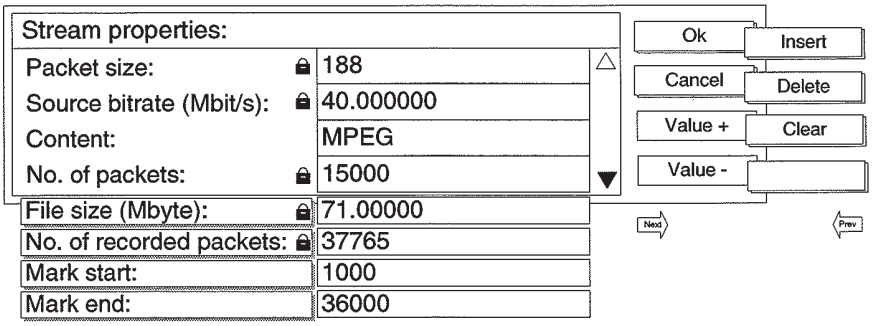
If the option is disabled (**No**), changes to the Player Interface Properties file settings are implemented during the current session. The changes are discarded when the unit is switched off.

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Stream Properties

A Stream comprises a single MPEG-2 transport stream file (MPEG file) and a set of data about the MPEG file; the latter is held in a Stream Properties file. Stream Properties files contain basic stream setup information including file size, content standard (MPEG/DVB/ATSC) and bit rate.

To view the Stream properties, select **Stream** from the Player menu.



Stream Properties dialog

The following parameters are available:

Packet size: (read-only) Packet size (bytes); 188/204 byte packet sizes are available.

Source bitrate (Mbit/s): (read-only) The bitrate derived from the PCRs in the stream. If the bitrate cannot be deduced from the PCRs, a default value is set.

Content: Broadcast standard; MPEG2, DVB, ATSC, BSD SFsynch, BSD Psynch.

The content standard (MPEG, DVB, ATSC or ISDB) of an MPEG file is not currently detected by the software and so must be set by the user. The content standard affects the Continuous Time Stamping process in that it determines whether TDT/TOT table, or STT table updating, or no table updating will be tried.

No. of packets: (read-only) Number of packets in the file.

File size (Mbyte): (read-only) File size (Mbytes).

No. of recorded packets: (read-only) This is dependant on each recording. If the designated file-space is not filled when a recording is made, this property is used to control the playout so that only the recorded section is played.

Mark start: The number of the first packet to be played.

Mark end: The number of the last packet to be played.

For a description of the *Common Operational Features*, refer to General Operation section.

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Player Menu Controls

The diagram below gives an overview of the menu controls available from the main Player display.

The Player menu controls are briefly described (in alphabetical order) in the following paragraphs. The 'Modes' entry indicates in which menus the controls are available. (An ellipsis (...) following the control image indicates that more information is provided elsewhere in this manual.) Note that some controls are available in all modes; although in the Cue and Play modes the data subsequently displayed may be disabled and shown for information only (E.g. **I/O Card** and **Stream**)

About — About Player...displays AD991 Stream Source version information.

Clear marks... — Clear start and end markers.
Modes: Open

Close — Closes the currently open Stream and clears the details from the Player screen.
Modes: Open

Cue — Prepares the Stream currently open for playout and moves the Player into the Cue mode.
Modes: Open

I/O card ... — Allows the interface to be selected and the settings edited.

If this control is selected in the Cue or Play modes, a read-only version of the interface card settings dialog is displayed.
Modes: Idle, Open, Cue, Play

Loop — Toggles loop mode; when loop mode is active, the **Loop** flag is displayed. When active, the playout loops within the positions currently marked by **Mark start** and **Mark end**.
Modes: Idle, Open, Cue, Play

Mark end ... — Sets the current end marker at the current cursor position.
Modes: Open

Mark start ... — Sets the current start marker at the current cursor position.
Modes: Open

Open ... — Allows a Stream file to be opened.
Modes: Idle, Open

Options ... — Opens the Player Options dialog that allows a selection of Player operating parameters to be modified.
Modes: Idle, Open, Cue, Play

Play — Starts the player and plays from the cursor position.
Not allowed if Recorder is currently cued or recording.
Modes: Open, Cue

Stamp ... — Allows the Continuous Time Stamping features to be enabled. To be effective, **Loop** mode must be enabled.
Modes: Idle, Open

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Rewind — Moves the current position pointer to the start of the Stream (either the Start mark or the start of the stream).
Modes: Open

Stop — Stops the player. The cursor remains at the current position in the playout.
Modes: Cue, Play

Stream ... — Allows the user to view/edit the parameters of the currently open Stream Properties file.
Modes: Open, Cue, Play

Time / Pkt — Toggles the count display between packet count and time and date.
Modes: Idle, Open, Cue, Play

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Recorder Operation

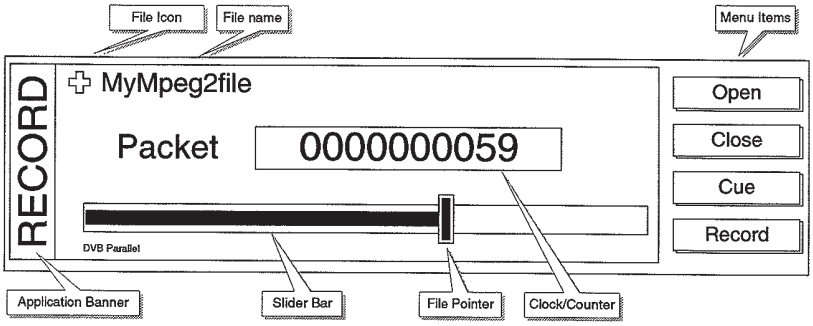
Overview 6-1
Getting Started with Recorder 6-3
Opening a Stream 6-5
Modify Recorder Interface Settings 6-6
Using IPR Files 6-8
Options 6-11
Stream Properties 6-12
Recorder Menu Controls 6-13

Overview

The Recorder is used to manipulate and record Stream files.

Streams can be opened in Recorder either from the Recorder itself or cued from Systems.

The screen illustrated below shows Recorder with the file MyMpeg2file Stream open.



Recorder Screen

The Player Screen comprises the following elements (from left to right):

Application Banner Displays **RECORD**.

File Icon The file icon indicates the file type currently open.

File name Shows the file name of the currently open stream. Blank if no stream is open.

Counter Display Displays the current position of the pointer in the Stream expressed in terms of Packets. The Packet count is shown as a ten-digit number.

Slider Bar The Slider represents the Stream as a bar with a pointer which shows the current recording position in the Stream during recording. The recorded part of the Stream is indicated by the filled portion of the bar within the Slider outline.

Record Status The only status flag to be displayed is **No Sync** during recording when synchronisation to the stream cannot be established. This normally means that either there are no incoming packets or that the packet arrival is discontinuous.

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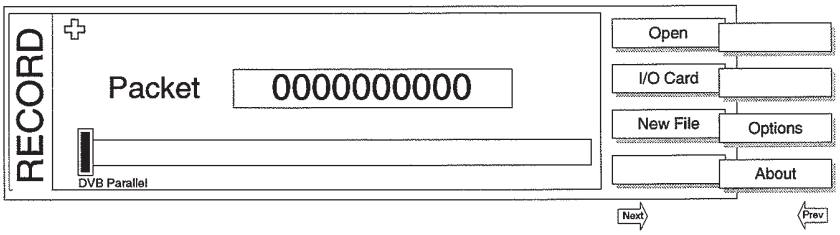
Menu Items Four menu controls are displayed at a time; they are operated via the buttons on the right-hand side of the display. Where further controls are available, they are accessed cyclically using the **Next** and **Prev** buttons immediately below the menu control buttons. The recorder controls are described in the following section.

Recorder Modes

The Recorder application has four operational modes: idle, open, cue and record. Each operational mode displays a different set of menu items.

Idle

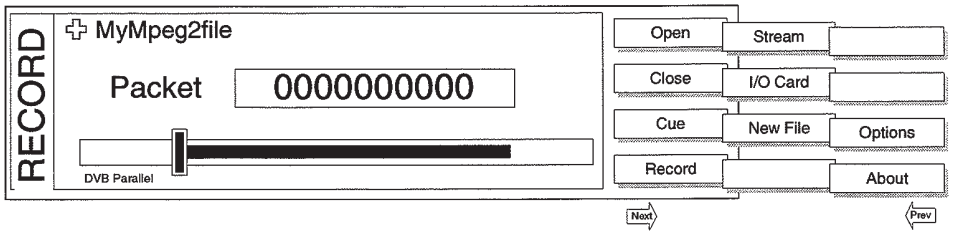
The **Idle** mode is active when the Recorder application is active but no Stream is loaded. In this mode the file name is blank.



Idle Mode Menu Items

Open

The **Open** mode is active when a Stream has been identified and it's name is displayed at the top of the screen (in the file name field). The application performs some preliminary but basic analysis of the Stream in preparation for recording.

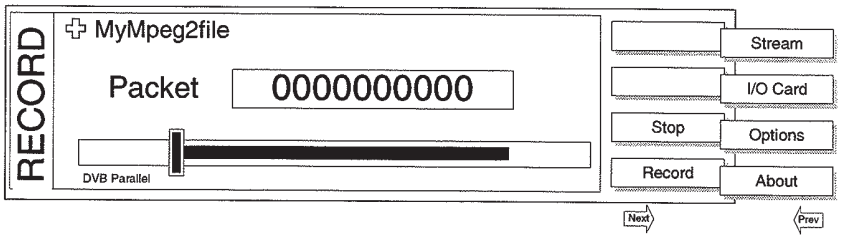


Open Mode Menu Items

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Cue

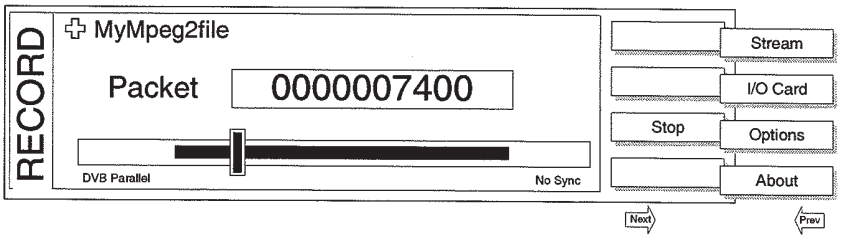
The **Cue** mode becomes active when a Stream is open and the **Cue** button is pressed. This enables the MIC card to prepare the Stream for recording. When the Recorder is cued a red LED illuminates the Recorder application button.



Cue Mode Menu Items

Record

The **Record** mode is active when a Stream is being recorded.



Record Mode Menu Items

Recording is initiated by pressing the **Record** button. If the Recorder is in Cue mode when the **Record** button is pressed, recording will commence immediately, since the preparatory processing has already been done. If the Recorder is in Open mode when the **Record** button is pressed, recording will commence after a short interval. An LED will illuminate the Record application button whilst recording is taking place.

Getting Started with Recorder

This section provides information on basic activities associated with Recorder.

In simple terms the steps for creating a recording are as follows:

a) Create a new stream (see *Creating a New Stream*, this section).

b) Open the stream in Recorder (see *Opening a Stream*, this section).

c) Press **Record**.

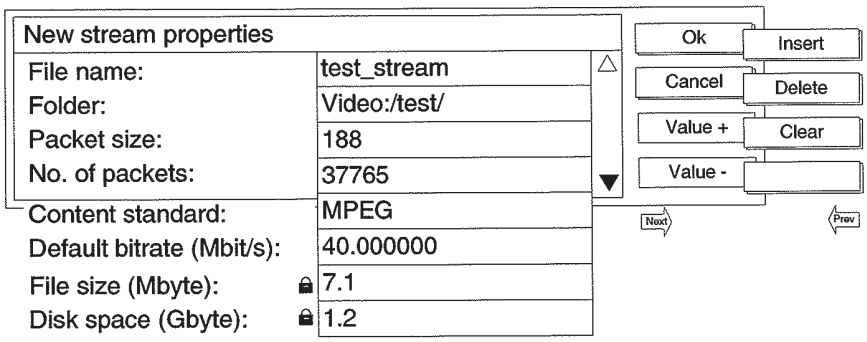
Creating a New Stream

When a new file or Stream is created in order to record into it, both the Stream Properties file and the (empty) MPEG file are generated.

From the Record screen:

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1. Select the folder where the new stream is to be created and press **New File**. The **New stream properties** dialog is displayed:



2. Create the **File name:** that the new stream is to have. (This name will be applied to Stream Properties file and the (empty) MPEG file, with their respective file extensions, .spf and .mpg.)

3. Select the **Folder:** where the stream is to be stored. **Value+** and **Value-** open a second dialog which allows the folder to be identified.

4 Enter the **Packet size** (188/204) and the **No. of packets** that the new stream is to have.

   The **File size:** and **Disk space:**, which are a read-only fields, will be calculated automatically as a product of the packet size and the number of packets. The final file size is only limited by the disk space available; a message will be displayed if disk space is limited. The minimum permissible number of packets is 4600 packets of 188 bytes/packet.

   Note that **File size** field is updated in line with changes made to **Packet size** and/or **No. of packets**.

5. Select the **Content standard** (MPEG/DVB/ATSC/BSD SFsynch/BSD Psynch).

6. Enter the **Default bitrate** in Mbit/s.

7. Select **Ok** to confirm the new file details.

   If the file name already exists in the current folder, a message will be displayed and the **New stream properties** dialog redisplayed.

   The creation of the new stream is indicated by the progress dialog following. When complete the main Record is redisplayed. The new stream name is added to the current folder listing.

   To reject the file name and cancel creation of the new stream, select **Cancel**. The Streams screen will be redisplayed unchanged.



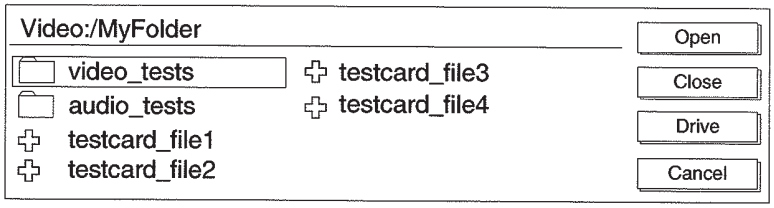
It is not recommended that a new stream is created while a stream is being played in Player since it may result in temporary problems with the playout..

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Opening a Stream

For a stream to be recorded it must first be opened in Recorder. Selecting **Open** displays a navigation screen similar to the Streams screen as shown below.

Highlight a stream and select **Open** to open the stream in Recorder.



Recorder Open Stream dialog

The caption shows the name of the folder that is currently open (e.g. MyFolder). The dialog properties area shows the Streams and folders available.

Open — If a Stream is currently selected (highlighted), it is opened in the Recorder. If a folder is selected, the contents of the folder are displayed.

Close — Closes the current folder and displays the contents of the parent folder.

Drive — Currently allows the Video drive to be selected.

Cancel — Closes the dialog, making no changes to Recorder or it's currently selected stream.

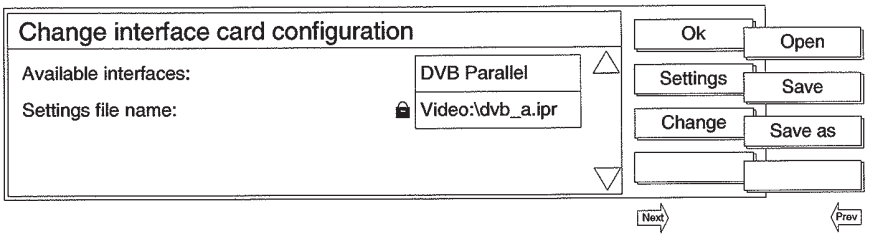
Note that Recorder displays the contents of the Video: drive only. Streams cannot be recorded to external drives (e.g. CD/DVD).

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View/Modify Recorder Interface Settings

(Interface settings can be saved as or opened from a Recorder Interface Properties file; see Using IPR Files in this section.)

The Recorder can be configured to use any of the installed I/O interfaces. Selecting **I/O card** allows an interface to be selected and/or the settings to be modified. Settings are read-only when a stream is cued or recording. The interface currently in use is shown in the dialog.



Interface Selection dialog

Select the required interface from the spin list using the **Change** control. Only the interface cards fitted to the unit are available; viz. DVB plus one interface card.

To enable the interface with the current settings, select **Ok**. Changes made to all interface settings (see below) are confirmed when **Ok** is selected. If the Auto-Save option is enabled, the settings are automatically saved to the current Recorder Interface Properties file when the Change Interface Card Configuration dialog is closed. If the Auto-Save option is not enabled, the settings will be implemented but will be discarded at the end of the current session (i.e. when the unit is switched off). (See Recorder Options, page 6-11.)

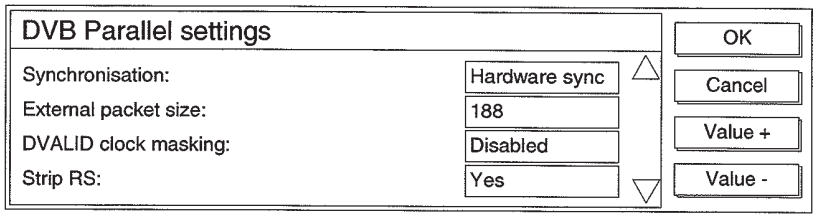
To view and edit the selected interface settings, select **Settings**. Settings are read-only when a stream is cued or recording.

Open, **Save** and **Save as** are applicable to the Recorder Interface Properties file (see Using IPR Files in this section).

The following paragraphs detail the Record settings; there is equivalent *Player* information in *Player Operation* section. The physical aspects of the interfaces are dealt with in *Installation* section.

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DVB Parallel Settings



DVB Parallel Settings dialog

The following settings are provided:

Synchronisation: Values: Hardware sync / 5 sync bytes
Hardware sync: Recording will be synchronised to the hardware PSYNC signal.
5 sync bytes: Recording will not start until five consecutive sync bytes have been identified in the source stream.

External packet size: Values: 188 / 204 Hardware sync only
If **Hardware sync** is chosen, the size of the incoming packets must be specified here as 188 or 204 bytes.

DVALID clock masking: Values: Enabled/Disabled

Some transmitting equipment uses the DVALID signal as a gating signal on the data. This setting accommodates such equipment.

If **DVALID clock masking** is **Enabled**, incoming bytes are discarded when DVALID is inactive.

If **DVALID clock masking** is **Disabled**, all incoming bytes are accepted.

Strip RS: Values: Yes/No
If this option is set to **Yes**, the recorded stream will comprise 188 byte packets. Bytes above 188 will be removed regardless of their content.

For a description of the *Common Operational Features*, refer to General Operation section.

ASI+ Settings

The layout of the ASI+ Settings dialog is similar to the DVB Parallel Settings dialog

The following settings are provided:

Strip RS: Values: Yes/No
If this option is set to **Yes**, the recorded stream will comprise 188 byte packets. Bytes above 188 will be removed regardless of their content.

The ASI+ interface will automatically adjust to receive either DVB or M2S data

For a description of the *Common Operational Features*, refer to General Operation section.

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GPSI-II Settings

The layout of the GPSI-II Settings dialog is similar to the DVB Parallel Settings dialog

The following settings are provided:

Interface: Values: SMPTE/SSI
Allows recorder interface to be selected.

Frequency tracking: Values: Yes/No
When enabled (**Yes**), the SMPTE/SSI interface is able to derive the bitrate from the incoming stream provided that it is between 38.5 and 44.0 Mbit/s.
When disabled (**No**), the **SMPTE bitrate** setting is used.

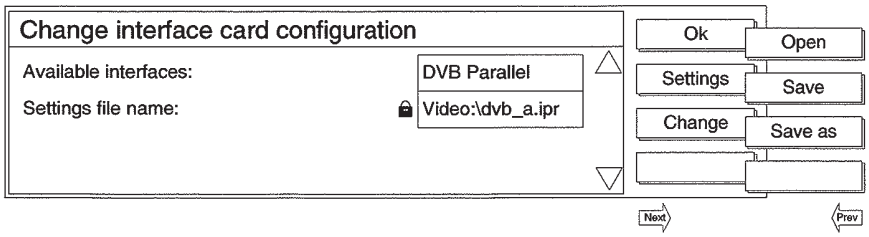
SMPTE bitrate (Mbit/s): Values: 1.0 to 44.0
Only enabled when **Frequency tracking** is disabled. The expected bitrate must be entered here.

Bytes above 188 are removed, regardless of their content, e.g. Reed Solomon data.

For a description of the *Common Operational Features*, refer to General Operation section.

Using IPR Files

A Recorder Interface Properties file (*.ipr) contains a snapshot of the recorder interface settings (see Modify Recorder Interface Settings in this section). A number of Recorder Interface Properties files can be saved to cater for different recording requirements. At switch-on the last used Recorder Interface Properties file is used.



Interface Selection dialog

Recorder Interface Properties files can be saved at any time; however they cannot be opened if a stream is cued or recording.

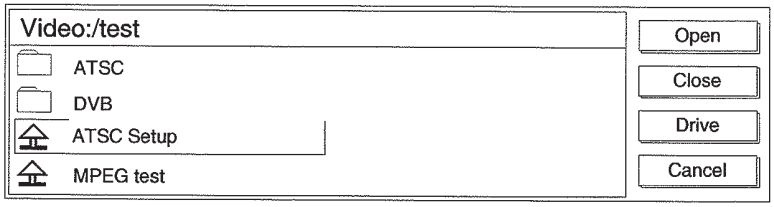
Identifying the Current Recorder Properties File

The current recorder properties file is shown in the **Settings file name** field in the opening dialog. If the path/file name extends beyond the end of the field, it can be viewed by moving the cursor to the right of the field.

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Opening a Properties File

To open a Recorder Interface Properties file select **Open** on the **Change Interface Card Configuration** dialog.



Note that only folders and Recorder Interface Properties files are shown; other files may be present in the folder, but they are not displayed this view.

Use **Open** and **Close** to navigate among folders; note the path name in the display caption. If available, a different drive can be accessed using the **Drive** item.

Highlight the Recorder Interface Properties file required and select **Open**. The selected properties file will open and the interface settings will take effect immediately.

Saving the Current Properties File

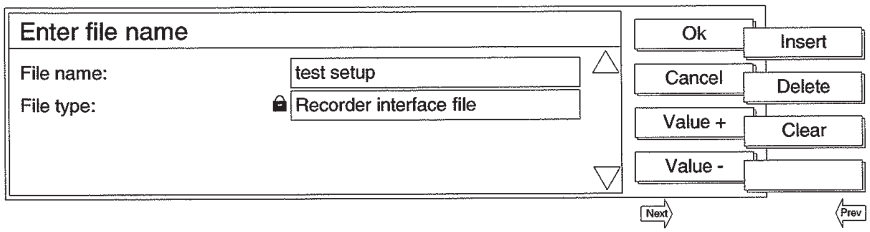
If the Auto-Save option is enabled, the settings are automatically saved to the current Recorder Interface Properties file when the Change Interface Card Configuration dialog is closed. If the Auto-Save option is not enabled, the settings will be implemented but will be discarded at the end of the current session (i.e. when the unit is switched off). (See Recorder Options, page 6-11.)

If you are unsure of the options setting or wish to save the recorder properties file anyway, select **Save**. No confirmation is given, but the properties will take effect immediately. The current Recorder Interface Properties file is overwritten (subject to the auto-save setting described in the previous paragraph). If no properties file is currently loaded, the Save as dialog is opened and the file must be named before it can be saved. Note that the saved file will be loaded by default at the next start-up.

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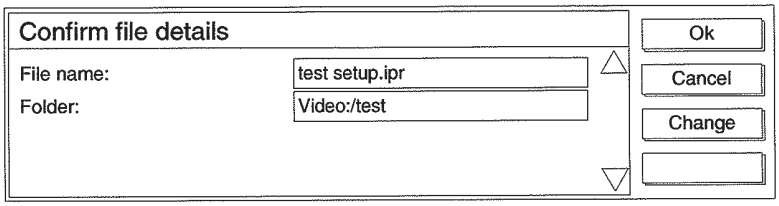
Saving a New Properties File

Select **Save as** to save the current interface settings to a new file or to overwrite an existing file; the following dialog is displayed:



Enter SaveAs details

The file name displayed initially is that of the current properties file. The File type field is read-only. Edit the file name as required and select **Ok**.

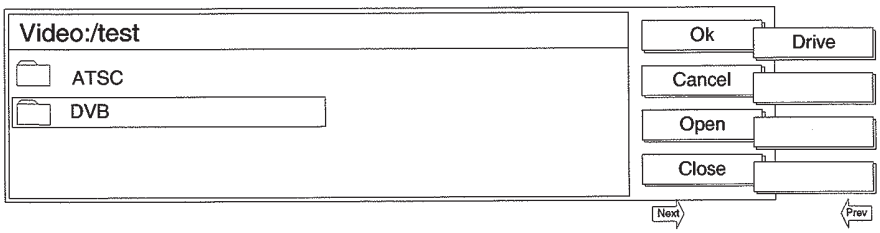


Confirm SaveAs dialog

Select **Ok** to confirm that the file name and the destination directory are correct.

If the file name needs to be amended, highlight the file name field and select **Change**. The previous dialog will be redisplayed and can be amended as required; note that the extension (.ipr) cannot be changed.

If the directory needs to be amended, highlight the directory field and select **Change**. The folder navigation dialog is displayed.



SaveAs Folder Navigation dialog

Navigate to the correct directory using **Open** and **Close**. If available, a different drive can be accessed using the **Drive** item. Confirm the destination directory by selecting **Ok**.

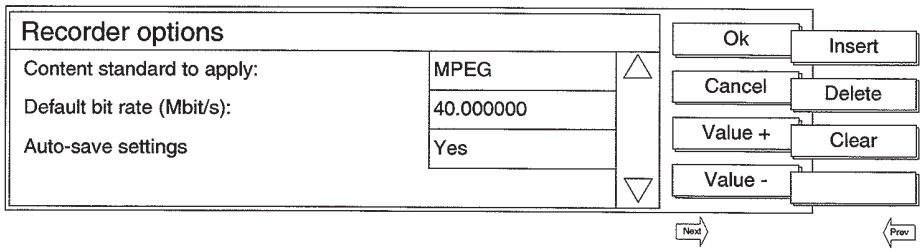
If the file name selected already exists, a warning message will be displayed

For a description of the *Common Operational Features*, refer to *General Operation* section.

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Options

The Options dialog allows the user to set the recorder defaults.



Content standard to apply: Values: MPEG / DVB / ATSC / BSD SFsynch / BSD Psynch

Default bit rate (Mbit/s): Value: 0.25 to 60.

Auto-save settings

If this option is enabled (**Yes**), changes to the Recorder Interface Properties file settings are automatically saved to the current properties file when the Change Interface Card Configuration dialog is closed.

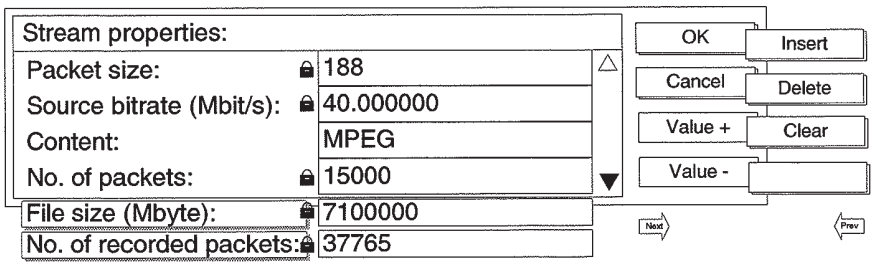
If the option is disabled (**No**), changes to the Recorder Interface Properties file settings are implemented during the current session. The changes are discarded when the unit is switched off.

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Stream Properties

A Stream comprises a single MPEG-2 transport stream file (MPEG file) and a set of data about the MPEG file; the latter is held in a Stream Properties file. Stream Properties files contain basic stream setup information including file size, content standard (MPEG/DVB/ATSC) and bit rate.

To view the Stream properties, select **Stream** from the Recorder menu.



Stream Properties dialog

The following parameters are available:

Packet size: (read-only) Packet size (bytes); 188/204 byte packet sizes are available.

Source bitrate (Mbit/s): (read-only) The bitrate derived from the PCRs in the stream. If the bitrate cannot be deduced from the PCRs, a default value is set from the value in the Options dialog.

Content: Broadcast standard: MPEG2, DVB, ATSC, BSD SFsynch, BSD Psynch.

The content standard of an MPEG file is not currently detected by the software and so must be set by the user. The content standard affects the Continuous Time Stamping process in that it determines whether TDT/TOT table, or STT table updating, or no table updating will be tried.

No. of packets: (read-only) Number of packets in the file.

File size (Mbyte): (read-only) File size (Mbytes).

No. of recorded packets: (read-only) This is dependent on each recording. If the designated file-space is not filled when a recording is made, this property is used to control the playout so that only the recorded section is played.

For a description of the *Common Operational Features*, refer to General Operation section.

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Recorder Menu Controls

The diagram below gives an overview of the menu items available to the Recorder application. Note that some controls are available in all modes; although in the Cue and Record modes the displayed data may be disabled and shown for information only.

The Recorder menu controls are briefly described (in alphabetical order) in the following paragraphs. The 'Modes' entry indicates in which menus the controls are available. (An ellipsis (...) following the control image indicates that more information is provided elsewhere in this manual.) Note that some controls are available in all modes; although in the Cue and Record modes the data subsequently displayed may be disabled and shown for information only (E.g. **I/O Card** and **Stream**)

About — About Recorder...displays AD991 Stream Source version information.

Close — Closes the currently open Stream and clears the details from the Recorder screen.
Modes: Open

Cue — Prepares the Stream currently open for recording and moves the Recorder into the Cue mode.
Modes: Open

I/O Card ... — Allows the settings of either the MIC card and the currently installed daughter-card interface to be edited.

If this control is selected in the Cue or Record modes, a read-only version of the interface card settings dialog is displayed.
Modes: Idle, Open, Cue, Record

New File — Creates a new file and opens a dialog that prompts for file type and file name to be created.

Open — Allows either a Stream file to be opened.
Modes: Idle, Open

Options ... — Opens the Recorder Options dialog which allows a selection of Recorder operating parameters to be modified.
Modes: Idle, Open, Cue, Record

Record — Initiates recording to the currently opened Stream.
Not allowed if the Player is currently cued or playing.
Modes: Open, Cue

Stop — Terminates recording to the currently open Stream. The Recorder will return to the idle mode. The cursor will be returned to the beginning of the Stream. The slider bar will indicate what proportion of the file has been used for recording.
Modes: Cue, Record

Stream ... — Allows the user to modify some parameters of the currently open Stream Properties file.
Modes: Open, Cue, Record (Read only in Cue and Record modes.

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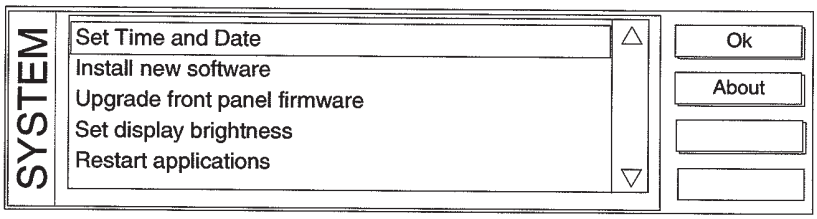
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System Operation

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Overview

The System application enables system options to be set and new software to be installed. At a future date, the System application may also provide access to customised AD991 Stream Source actions.



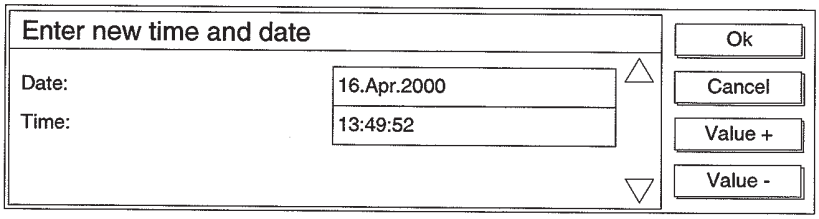
System Screen

Set Time and Date

The AD991 Stream Source system time and date can be set to local time as required.

The date is entered in dd:mmm:yyyy format (i.e. 24 Sep 1999). The time is entered in hh:mm:ss 24-hour format (15:47:59)

From the System screen, select **Set Time and Date**. The following dialog is displayed:



System Time and Date dialog

To edit the date:

In the Date field, there are three discrete elements: day, month and year.

With Date highlighted, use the cursor buttons to place the cursor in the element to be edited.

Use the **Value+** and **Value-** controls to select the value required.

Select **Ok** to confirm the change and close the dialog. Select **Cancel** to discard the change, close the dialog and return to the existing settings.

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To edit the time:

In the Time field, each numeral can be edited.

With time highlighted, use the cursor buttons to place the cursor to the left of the numeral to be edited.

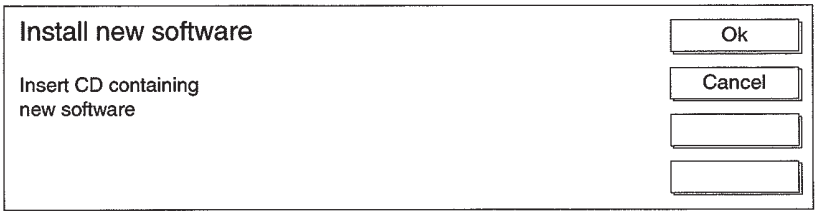
Use the **Value+** and **Value-** controls to select the value required.

Select **Ok** to confirm the change and close the dialog. Select **Cancel** to discard the change, close the dialog and return to the existing settings.

Installing New Software

New software will be supplied for the AD991 Stream Source on CDs. Installation will be automatic, once the process is invoked.

From the System screen, select **Install new software**. The following dialog is displayed:



New Software dialog

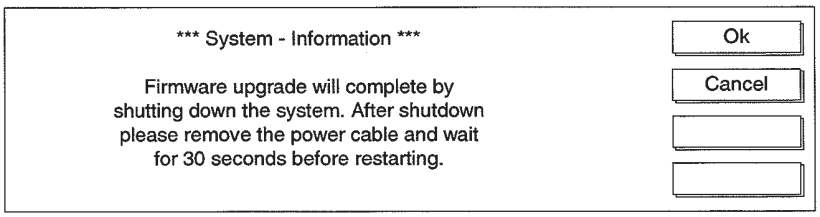
Simply follow the on-screen instructions (using the 'Server Software' CD). Any departure from the on-screen installation procedure will be notified with the CD package.

Upgrade Front Panel Firmware

New firmware will be supplied for the AD991 Stream Source on CD. It must be upgraded at the same time as a software upgrade.

Firmware - Software stored in read-only memory (ROM) or programmable ROM (PROM). Firmware is responsible for the behaviour of the system when it is first switched on.

From the System screen, select **Upgrade front panel firmware**. The following dialog is displayed:



Firmware Upgrade dialog

Note the message and select **Ok**.

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When the upgrade is complete, the unit will shutdown automatically. The power source should be switched off and the power cable removed from the unit for at least 30 seconds. The power cable can then be replaced, power restored and the unit switched on (see Starting AD991 Stream Source, page 3-5).

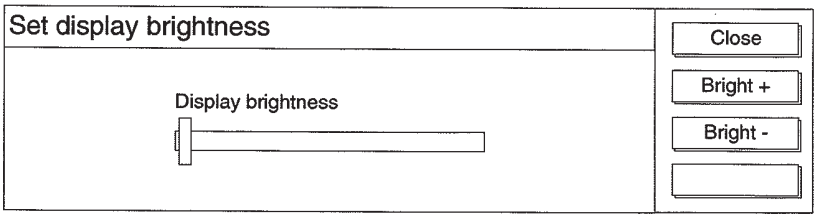
Restart

Restart stops and restarts the AD991 Stream Source applications with out the need to switch the unit off.

To restart the Stream Source applications, select **Restart** and confirm the action. Note that the closedown phase of restarting can take up to two minutes; no further activity, such as manual shutdown, should be undertaken during that time.

Display Brightness

The display brightness can be varied to take account of ambient lighting conditions. Use the **Bright+** and **Bright-** controls to increase and decrease the display brightness.



Display Brightness dialog

About AD991 Stream Source

Selecting the About control will display a dialog that contains software version information. This information will be required in the event of call for support being made.

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Technical Specification

Power Requirements

Input Voltage (via voltage selector switch):	115VAC +6% -10% 230VAC ±10%
Input Current:	115V 0.76A (maximum) 230V 0.38A
Frequency:	45Hz to 63Hz
Power Consumption:	300W (maximum)

Environmental Specification

Operating Temperature:	5°C Minimum 40°C Maximum
Storage Temperature:	-10°C Minimum 60°C Maximum
Humidity:	90% non-condensing
Cooling:	+ve pressure from front to back

Mechanical

Overall Width:	43.5cm (19" rack mount)
Overall Height:	9cm (2U)
Overall Depth:	56cm
Weight:	12.5kg

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