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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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Performance

Storage capacity (Video drive):	7, 16 or 34 Gbytes
Maximum data rate:	60Mbit/s†
Minimum data rate:	Internal clock: 250kbit/s† External clock: 250kbit/s†
Minimum stream size:	4600 packets of 188 bytes/packet

† Subject to interface used.

Control Interfaces

Ethernet for remote control and access to streams.

Transport Stream Interfaces

- DVB Synchronous Parallel interface,
- SMPTE 310M Serial interface,
- DVB Asynchronous Serial interface (ASI),
- DVB Synchronous Serial interface (SSI),

Note that only one interface can be supported in addition to the DVB Parallel interface. Alternative interfaces are factory-fitted as ordered.

External Clock

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

Client PC

IBM compatible 300MHz Processor, 64M RAM.

Windows NT4.0, Service Pack 5 (minimum).

Multiplexer (option): Ultra2 SCSI hard drive is recommended.

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Standard Remedial Action

Unless otherwise noted in the following sections, the following course of action should be taken when a problem arises:

1. Note message details.
2. Restart the unit (see *Streams Operation* section).
3. Retry the action.
4. If the action fails again, note the message details if they are different.
5. Switch the unit off (see *General Operation* section), wait one minute and switch on again.
6. Retry the action.
7. If the action fails again, note the message details if they are different.
8. No further local action should be taken, except under the guidance of an Adherent Systems approved support person.
9. Contact your local distributor who will be able to offer technical support.
10. The following information should be available when making a call to Technical Support:
    a. the error message details
    b. a description of the activity leading to the failure of the unit and any streams that were in use,
    c. details of the software version(s); use the **About** button in any application,
    d. details of the unit serial number; on rear of the unit.

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Troubleshooting

What should I do if the VFD (display) is blank on startup?

- Check that the unit is switched on.
- The display normally becomes active within two seconds of the unit being switched on.
- If the display is still inactive, contact technical support.

What should I do if the unit does not power up?

- Check that the mains supply is good.
- Check connections to Stream Source, including mains plug fuse.
  If in doubt, check the mains cable by using it on other known working equipment.
- Press on/off button. The adjacent LED should light immediately, shortly followed by the Adherent logo on the VFD.
- If the unit still does not power up, contact technical support.

What should I do if I have loaded a CD into the drive but the displayed drive still appears to be empty?

When a CD is placed in the DVD/CD ROM drive it can take up to a 15 seconds to be read and loaded; see *Opening a Folder* in the *Streams Operation* section of this User Guide.

I have selected an external clock source, I press Play and nothing happens.

If an external clock source is selected, but no external clock is supplied, the stream will not playout. When selecting an external clock source, ensure that it is present.

The unit powers up and displays the scrolling Adherent banner but no applications start.

Most probably this is caused by the Windows NT(TM) automatic start-up process being prevented from concluding. If the unit has been configured as described in this User Guide then this is unlikely to occur but problems with the network configuration could be causing this. Power down the unit and connect a monitor keyboard and mouse. Switch on the monitor then switch on the AD991 Stream Source. Check the monitor display to determine the cause of the problem.

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Error Messages and Warnings

Stream Source delivers three types of message:

- Information messages provide information about the operation / control of the unit
- Warning messages indicate that some action will not succeed (and ask the user to take appropriate alternative action).
- Error messages indicate that an action has failed.

Generally, error messages are displayed in a three-line format:

- The first line indicates (where possible) the *application* from which the message originates; e.g. Player.
- The second line indicates the immediate *reason for the failure*; e.g. 'The rewind operation failed'.
- The third line is an *error description*, which indicates the underlying process that may have failed; e.g. 'Unable to locate the MPEG file'.

It will assist technical support if a note is made of the activity leading to the error and details of the message.

Reason for Failure messages

Failed to set the looping mode...

Failed to set the CTS mode...

The rewind operation failed...

The play operation failed...

The cue operation failed...

The stop operation failed...

The pause operation failed...

Failed to update the stream properties...

Failed to open the stream file...

Failed to open auto-play stream...

Failed to update the mark start...

Failed to update the mark end...

Failed to update the interface settings...

The record operation failed...

The cue operation failed...

The stop operation failed...

The pause operation failed...

Failed to update the stream properties...

Failed to open the stream file...

Failed to update the interface settings...

Failed to cue file...

The *reason for failure* message will be associated with a specific error description that will indicate the process that may have failed. The *error descriptions* are given in the following table.

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Error Descriptions

Message	Occurs when / cause	Remedial Action
An invalid bitrate has been entered. Please refer to the user manual for the valid range.	The manual bit rate entered is not appropriate for the interface in use.[1]	Refer to the Player/Recorder section of this manual. The range of permissible bit rates is specified in the subsection for each interface.
An invalid playout rate has been specified for the current interface. The play operation has been aborted	With the **Clock settings** set to **From source**, a stream was cued with a source rate out of range for the interface selected.	Use alternative **Clock settings** to play out this stream.
Another stream is cued	Occurs when the Streams application is used to cue streams to Player or Recorder. Only one stream can be cued to each application.	Uncue the currently loaded file (using the Player or Recorder application) and re-cue the desired file.
BSD stream play/record is only supported on the DVB interface		Select DVB interface.
Cannot open Stream Properties file	When viewing / editing Stream Properties file	Check that file is not in use by other programs. If this is not the case then the file may be damaged. The file may be deleted and recreated from the MPEG file.
Cannot open Stream Properties file	Occurs when opening a stream. (a) The stream may be in use by another application (Player / Recorder) (b) The stream properties file may be damaged.	• Check that file is not in use elsewhere. • Check that the contents (stream properties) are sensible (using Open:View stream properties, from within Streams). • If the properties cannot be viewed, delete and recreate the stream properties file.
Cannot paste file on read only drive.	When attempting Paste.	Select an alternative destination or cancel operation.
Cannot paste file. A file with this name already exists within this folder.	When attempting Paste.	Copy the file to another folder. Rename it. Then move it to the original folder.
Cannot paste file. Not enough space on disk.	When attempting Paste.	Error code is NT™ error code. Contact Technical support if help needed.

[1] Note: This only occurs when GPSI-II is selected as the input interface, since this is the only inteface that requires Clock settings to be defined.

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Message	Occurs when / cause	Remedial Action
Cannot rename file. A file with this name already exists within this folder	When attempting Rename	Alter the desired file name
Copying folders is not supported	Self evident	N/A
Continuous time stamping is not compatible with BSD streams		Disable CTS
Erroneous server state	Client / server dialog mismatch	If problem persists, use Restart or Reboot.
Failed to create folder. Error Code =	When using *Folder	Error code is NT™ error code. Contact Technical support if help needed.
Failed to delete file. Error Code =	When using Delete on a file	Error code is NT™ error code. Contact Technical Support if help needed.
Failed to delete folder. Check the folder is empty. Error Code =	When using Delete on a folder	If folder is not empty, delete files within folder before deleting folder. Error code is NT™ error code. Contact Technical Support if help needed.
Failed to open the property file. The specified file is either invalid or corrupt	When loading Player or Recorder interface properties	The file may not be an AD991 file (e.g. it may have been generated by another product loaded from the network). Use another interface properties file.
Failed to paste file. Error Code =	When attempting Paste.	Error code is NT™ error code. Contact Technical Support if help needed.
Failed to paste MPEG file. Error Code =	When attempting Paste.	Error code is NT™ error code. Contact Technical Support if help needed. NB. You should immediately delete the pasted Stream Properties file (if applicable).
Failed to read the hardware configuration…	On start up.	Contact Technical support.
Failed to rename file. Error Code =	When attempting Rename. The operation failed with an NT™ error.	Error code is NT™ error code. Contact Technical Support if help needed.

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Message	Occurs when / cause	Remedial Action
Failed to rename MPEG file. Error Code =	When attempting Rename. The operation failed with an NT™ error.	Error code is NT™ error code. Contact Technical Support if help needed. NB. You should immediately rename any associated Stream Properties file back to its original name.
Failed to save the property file. An error occurred during the save operation	When saving Player or Recorder interface properties.	Try saving to a different file. If problem persists Reboot the machine and retry.
Invalid mark end	On updating properties	Set mark end in the range mark start <= mark end < No. of recorded packets.
Invalid mark start	On updating properties	Set mark start in the range 0 <= mark start < No. of recorded packets.
Invalid stream. No recorded packets	Attempted to cue a stream to Player which contains no recorded data (and hence cannot be played out).	Uncue and Close the stream using the Player application. Select another stream.
Moving folders is not supported.	Selecting Cut on a folder	None
Not enough disk space to create file	Attempted to create a new stream file of size greater than the available disk space.	(a) Reduce **Packets in file** value for the new file. (b) Delete other files to create more disk space.
Not enough disk space to create file	When creating a stream	Delete other files to make more space available
Server error.	Generic server error	Contact Technical support.
The GPSI interface does not support the playout of 204 byte packet streams as 208	A 204 byte packet stream has been opened and cued in Player, when the Play-out packet size is set to 208.	Choose another stream or alter the I/O settings
The interface is in use	Interface in use by another application. E.g. attempting to cue a file in recorder whilst Player is playing out.	Stop other application using interface
The loaded card selection is invalid. Defaulting to DVB Parallel	The interface card that was selected when last powered up, is no longer installed or is not functioning.	Check I /O Card settings and change to desired values. If the interface card is installed but is not being recognised, contact Technical Support.
The MPEG file is in use.	On attempting to Paste (move / copy) a stream.	As above.
The MPEG file is not writeable	The file is either marked as read only or is on read-only media	Copy the stream to another location - which will remove read-only access) - or remove read-only status (network file access or monitor needed).

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Message	Occurs when / cause	Remedial Action
The property file contains invalid settings.	When loading Player or Recorder interface properties	Delete and recreate the Stream Property file for this MPEG file.
The server is unavailable	The server app. is dead	Restart or Reboot.
The Stream Properties file is in use	On attempting to Paste (move / copy) a stream.	Check that the file is not in use. If problem persists, to ensure file is not in use, perform a Reboot.
Unable to access the MPEG file	(a) The MPEG file is locked by another application, e.g. attempting to record to file which is currently loaded in Player. (b) The MPEG file is read-only (e.g. when opened by Recorder).	If (a) either use another stream, or check the other applications and release the stream from the other application. If (b) copy the stream to another location - which will remove read-only access) - or remove read-only status (network file access or monitor needed).
Unable to locate the MPEG file	The MPEG file doesn't exist, e.g. it was deleted via network without deleting the Stream Properties file.	Delete the Stream Properties file.
Unable to save changes	When creating new Stream Properties file or editing Stream Properties file	As above
Unable to save stream file	On updating properties	Check that file is not in use by another application.

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Frequently Asked Questions

The following is a selection of frequently asked questions. The most common FAQs relate to situations not explicitly described in the remainder of the User Guide; direct reference to text in the User Guide is made where possible to avoid duplicating information.

What information should I have available when I contact technical support?

- The error message details,
- A description of the activity leading to the problem with the unit,
- Details of any stream file being played out or recorded,
- Details of the software release; use the **About** button in any application.
- The serial number of the unit; on the rear of the unit.

How do I introduce a new MPEG file to the system?

If the file is to be copied from a CD ROM, use the Copy and Paste activity described in the *Streams Operation* section of this User Guide.

Where the unit is networked, Windows Explorer may be used at a remote terminal to copy the file, but the file must be copied to the Stream Source **Video:** drive.

Remember that a Stream will have to be created based on the imported MPEG file – see *Opening an MPEG File* also in the *Streams Operation* section of this User Guide.

How do I access the DVD/CD ROM drive?

The DVD/CD ROM drive forms part of the folder hierarchy; see *Opening a Folder* in the *Streams Operation* section of this User Guide.

If looping is turned off while a stream is playing, how soon will it take effect?

If looping is turned off whilst a stream is playing, playout will stop at the next end-of-file.

However, if you turn off looping on a *small* stream (approximately 4600 packets of 188 bytes/packet) during play out, the looping may continue for several loops; it will eventually stop.

The minimum stream size is given in *Reference - Technical Specification.*

How do I determine the playout time of a stream?

In the Player application,

a) Open the stream,

b) Use the right cursor button slide the file pointer to the end of the stream,

c) With the Time/Pkt display option set to **Time**, read the playout time of the stream

How do I determine the number of (recorded) packets in a stream?

In the Player application,

a) Open the stream,

b) Use the right cursor button slide the file pointer to the end of the stream,

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c) With the Time/Pkt display option set to **Packet**, read the number of recorded packets in the stream

How do I ensure that I am playing a stream at its intended bitrate?

You need to check the original bitrate of the stream and the intended playout rate.

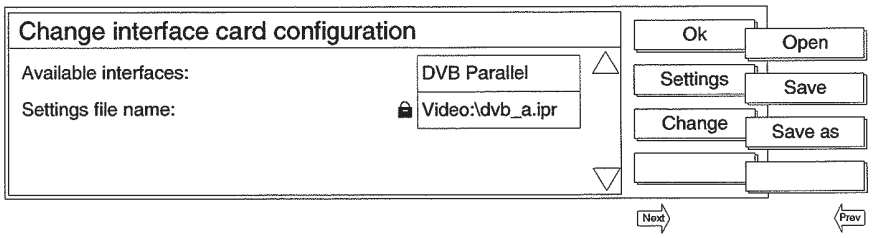
a) Open the stream,

b) The intended Source bitrate and Playout bitrate can be found in the current I/O Interface settings, thus: **Player** => **I/O Card** => **Source bitrate** and **Playout bitrate.**

If the values are the same, the stream will playout at its intended bitrate.

How do I determine the currently loaded settings file?

To identify the active settings file (or Interface Properties file), select **I/O card** in either the Player or Recorder application.



Note the details in the **Settings file name:** field.

Can I connect my Stream Source to a network?

The software and electrical connections are available to make your Stream Source unit function as part of a network. Contact your System Administrator and, if necessary, Technical Support.

How do I power down my Stream Source?

Refer to *Shutting down Stream Source* in the *General Operation* section of this User Guide.

How do I connect an external clock?

The external clock is connected via a BNC connector on the MPEG Interface card (see Rear Panel Connectors in the Physical and Electrical Description section of this User Guide). Electrical interface data is given in the Technical Specifications in this section.

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Glossary

ASI	Asynchronous Serial Interface
BSD	Broadcast Satellite Digital
DTS	Decoding Time Stamp
DVB	Digital Video Broadcasting
EIA	Electronics Industry Association
GPSI	General Purpose Serial Interface
ISDB-S	Integrated Services Digital Broadcasting - Satellite
LVDS	Low Voltage Differential Signalling
PCR	Program Clock Rate
PSI	Program Specific Information
PTS	Presentation Time Stamp
SCSI	Small Computer System Interface
SMPTE	Society of Motion Picture and Television Engineers (time code)
SPI	Synchronous Parallel Interface
SSI	Synchronous Serial Interface
STT	System Time Table (ATSC)
TDT	Time and Date Table (DVB)
TIA	Telecommunications Industry Association
TOT	Time Offset Table (DVB)
VFD	Vacuum Fluorescent Display

References

[1] *Interfaces for CATV/SMATV Headends and similar Professional Equipment* TM1449 Rev 1, 11 July 1995

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Appendix A MPEG-2/DVB Test Streams

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Introduction

This document contains the specification of a CD-ROM containing a collection of six Transport Streams containing a set of conditions designed to aid MPEG/DVB testing.

General Information

These parameters are the default settings for all streams unless specified otherwise:

Duration: 60s

SI: BAT, PAT, PMT, NIT, SDT, TOT, EIT

PSI: PAT,PMT

Video bit rates are raw encoder bit rates and the GOP size is 12

Audio is Layer II MPEG-1

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Test stream 1: Bit rate tests

This test stream contains a collection of video and audio elementary streams at different bitrates. The video has a GOP size of 12 (IBPBPBPBPBPB), the audio is composed of layer 2, MPEG 1 material with a sample frequency of 48kHz.

Service	video bit rate (Mbit/s)	audio 1 bit rate (kbit/s)	audio 2 bit rate (kbit/s)
1	1.98	64	384
2	3.96	128	64
3	4.98	192	128
4	9.96	256	192
5	13.98	384	256

The TS bit rate is 41.471Mbit/s, and the file size approximately 310Mbyte.

Test Stream 2: PCR errors

This test stream contains various PCR errors. Service 1 to 5 contain radio services carrying a PCR, Service 6 contains video at a bit rate of 3Mbit/s. The first service is intended as a reference PCR. The start value of this PCR is 95413.7177s. This value has been chosen in such a way that after 30s the PCR wraps around to zero.

Service	PCR specialities	amplitude
1	reference (+wrap)	-
2	jitter (sinus)	250ns
3	jitter (sinus)	750ns
4	jitter (random)	500ns
5	step in PCR	100s
6	'splice'	100s

The TS bit rate is 8Mbit/s, and the file size: 60Mbyte.

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Test Stream 3: Transport packet layer errors

The transport stream contains two services.

Service 1:

- video 3.0Mbit/s (PID 0x0009)
- 2 audio, PID120 at 384kbit/s PID 130 (scrambled) at 192kbit/s

Service 2:

- video 3.0Mbit/sec (PID 210)
- 2 audio 192kbit/s (PID 220, 230), one of which is scrambled (230)
- private data stream 10kbit/s (PID 260)

The stream will start correctly to enable the analyser to check the (P)SI tables. An error will be inserted only once.

Error name	PID	Packet No	Error specifications
PAT error 1	0x0000	25531 26595 27659	transport_scrambling_control is '11'
PAT error 2	0x0000	50001 51063 52127	table_id is 0x03'
forbidden PID	0x0009	throughout	Video PID is 0x0009 (reserved value)
payload_unit_start_ indicator error	0x1FFF	75001 75002 75005	payload_unit_start_indicator is '1'
AF error 1	0x1FFF	100006 100007 100008	adaptation_field_control is '11'
AF error 2	0x0000	125531 126597 127659	adaptation_field_control is '10'
AF error 3	120	150021 150062 150103	adaptation_field_control is '00'
AF error 4	120	175162	adaptation_field_control is '11', and

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Error name	PID	Packet No	Error specifications
			adaptation_field_length = 183
Continuity counter error	130	200046 200125	the continuity counter is the same for 3 packets in a row, and 2 packets are lost
CAT error	0x0001	throughout	PID 0x0130 has been scrambled but no CAT has been inserted
Length error 1	100	225532	ES_info_length in PMT is incorrect
packet_start_code _prefix error	120	250025	payload_unit_start_indicator = '1' but no PES packet_start_code_prefix
Length error 2	120	300293	PES_packet_length incorrect by 1 byte
Length error 3	0x0000	325531	PAT section length is set to 6
CRC error	0x0010	354616	The CRC in the NIT is wrong
PID error 1	1000	throughout	PMT not listed in PAT (audio ES)
PID error 2	1010	throughout	PAT section on illegal PID
PID Error 3	16	throughout	CAT section on illegal PID (together with NIT, continuity counter corrected)
sync error 1	XXX	350000 350001 350002 350003	sync loss over 4 consecutive packets
sync error 2	XXX	400000 400001 400002 400003 400004	sync loss over 5 consecutive packets

TS bit rate is 16Mbit/s, and the file size is approximately 120Mbyte

Test Stream 4: (P)SI table repetition too slow

In this service all the tables are inserted after the time specified in ETR 211 have been exceeded.

1 service, video 3.0Mbit/s, audio 192kbit/s

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Table	Time between occurrences (s)
BAT	>10
PAT	>0.5
CAT	>10
PMT	>0.5
NIT	>10
SDT	>2
EIT	>2
TOT & TDT	>30

Test Stream 5: (P)SI table repetition too often

In this stream all tables occur too often.

1 service, video 3.0Mbit/s, audio 192kbit/s. All tables occur more than 40 times per second (thus less than 25ms between sections).

TS Bit rate is 8Mbit/s, the file size approximately 60Mbytes.

Test Stream 6: Colour Bar Test Stream

This stream contains the following content:

Transport Stream

bitrate: 6Mbit/s

length: 38.1Mbytes (40,000,008 bytes)

duration: 53.33s

(P)SI: PAT, PMT, NIT, SDT

The PCR is placed upon the video PID

Video

content: 75% Colour bar

refresh rate: 50Hz

bitrate: 3Mbit/s

Audio

content: sine wave at 1kHz

bitrate: 384kbit/s

extra info: layer 2 MPEG-1, stereo, 48kHz

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(P)SI

PAT, PMT, NIT, SDT

CD-ROM usage

The CD-ROM has a maximal capacity of 650Mbytes. The intended usage is shown below:

Test stream	File size (MB)
stream 1	310
stream 2	60
stream 3	120
stream 4	60
stream 5	60
stream 6	38
Total file size (Mbyte)	**648**

The files on this disk are compressed to 315Mbyte to allow fast, simple Auto-run installation (and de-install if required). The disk root directory contains documentation files uncompressed and can easily be read without installation.

These streams have been generated for us by:
The Competence Centre for MPEG/DVB Systems Testing,
Philips DVS, P O Box 80002, 5600 JB Eindhoven, The Netherlands,
email dvb-cc@ce.philips.nl"

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Appendix B Seamless Processing

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Seamless Processing

Several of Adherent's products include the ability to make a transport stream seamless. When a seamless stream is played out in a looped fashion using continuous time stamping, any audio and visual artefacts at the loop point will be minimised.

Input to the seamless process is an MPEG transport stream conforming to ISO/IEC 13818-1, any additional standard it adheres to (DVB or ATSC) and a priority program number. The software uses the priority program number to focus the seamless processing on a particular PID. This is because in general a multi-program transport stream cannot be made seamless. The software chooses the video PID of the priority program as the priority PID or the first audio PID listed in the PMT if there is no video associated with the priority program.

The software can process MPEG-2 video, MPEG audio and AC-3 audio elementary streams.

The following notes specify the attributes of a transport stream will have once it has been processed.

Transport Layer

PCRs are added to the beginning and the end of any stream that carries them to comply with PCR repetition rates.

Extra MPEG sections are inserted at the beginning and end of the transport stream to meet any minimum table repetition rates specified by the standard.

Private table repetition rates can be incorporated using Adherent scripting (See Custom SI Scripting Technical Note, Ref [1]).

PES Layer

The stream will contain a whole number of PES packets. Any packets that, after processing, do not contain the first byte of an access unit will have its time stamps removed.

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Elementary Layer

Video streams will begin with an I-picture preceded by a sequence header and a GOP header. The broken link flag will be set in the GOP header to indicate that the initial B-pictures in the loop which reference previous pictures may not be decoded properly. If a decoder ignores the broken link flag then there may video artefacts (blocking) at the loop point. If the video is interlaced the I-picture will also be the first field. Video streams end with a picture which preceded an I- or P-picture in the original stream. If the video is interlaced the last picture will be the second field.

Audio streams will contain a whole number of audio frames.

Limitations

A transport stream that contains only a whole number of access units and complies with the T-STD buffer model may not comply when played out in a looped fashion. This is because the transport stream duration may not equal the sum of the access unit durations. A symptom of this is a "step" in the PES time stamps at the loop point (see the tech note on continuous time stamping).

In summary, to comply with the T-STD buffer model[2] the following equation must be satisfied:

$$\frac{N_B}{B_r} = \frac{N_F}{F_r}$$

where: (N_B) = bits in looped sequence

(B_r) = average bitrate

(N_F) = frames in looped sequence

(F_r) = frame rate

Only a single PID may be made totally seamless. The output transport stream duration is based on the priority PID's loop end points. It is improbable that all the other elementary stream's loop end points are coincident with the priority PID's. Thus, PIDs other than the priority PID will have a period at the beginning and end of the transport stream where they do not appear.

Only single versions of MPEG sections may appear in the input transport stream. If multiple versions occur then, at the loop point, the section will appear to revert to a previous version.

The software cannot make scrambled streams seamless.

References

[1] Technical Note, Custom SI Scripting, SI185.

[2] Technical Note, T-STD Model description, WI170.



Technical Notes referred to in this user guide can be obtained directly from Adherent Systems Limited.

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Appendix C Networking

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Networking

It is possible to configure the AD991 Stream Source unit to allow its 'Video' drive to be viewed from other workstations in a Microsoft™ network. This allows, for example, MPEG files to be transferred to and from the AD991 Stream Source unit.

You are strongly advised to review the procedure below with your Network Administrator before proceeding further.

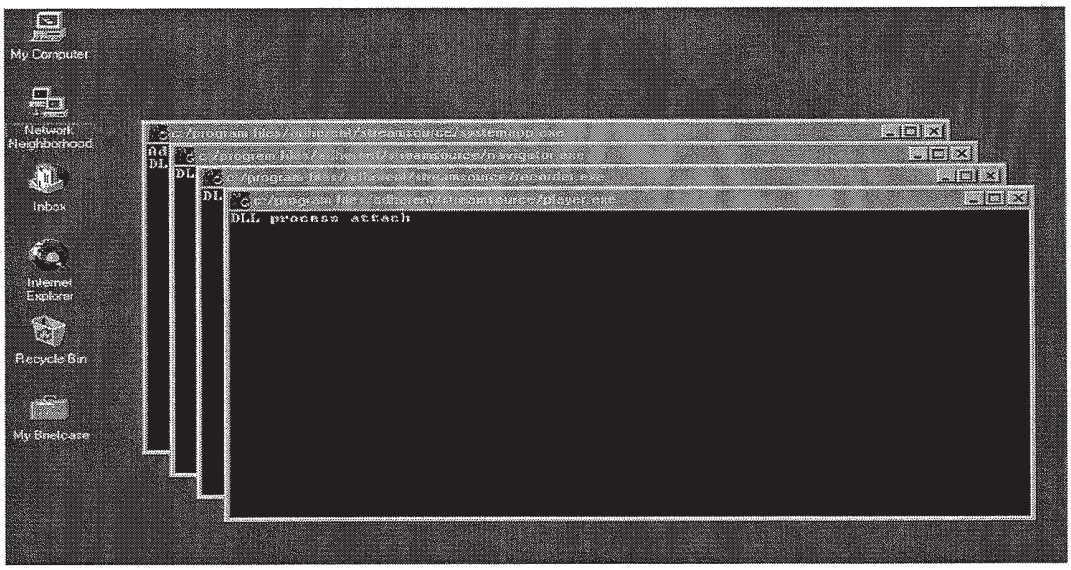
In order to configure the network settings it is necessary to connect a keyboard, monitor and mouse to the unit (refer to Rear Panel Connectors, page 2-5 for keyboard/monitor/mouse connections). Switch off the unit before making these connections.

The AD991 unit should be run with the monitor keyboard and mouse connected only in order to change the network configuration.

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

Switch on the monitor before switching on the AD991 Stream Source unit. The unit will boot up and automatically log in as user **ad991**. This user has Administrator privileges allowing you to make any necessary configuration changes. After a few seconds, a number of console applications will appear on screen. These can be minimised using the minimise button ( ) in the top right corner of each window.

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To configure the unit for access from your network, please follow the instructions below. **No other configuration changes should be made to the unit.**

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Changing the Computer Name, Domain and IP Address

Networked computers each require a unique address for identification. A default address is supplied as part of the standard set up. The details are:

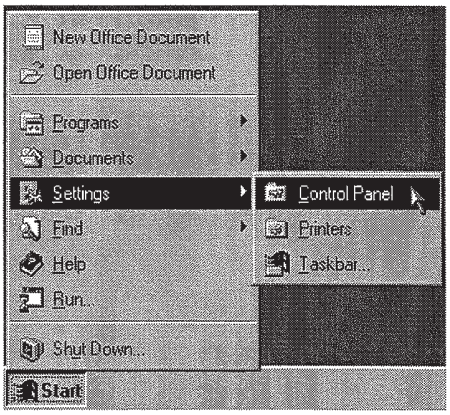
Network address	192.168.1.50
Sub mask	255.255.255.0.

This address should not be used on any network accessible from a public network.

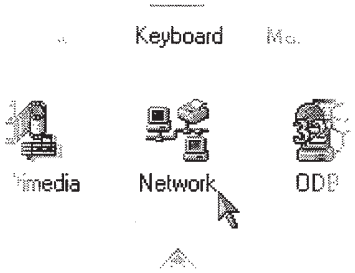
Your Network Administrator will create a computer account on your Network Domain and supply details of the correct computer name, domain name and IP address to use to connect the unit to the network.

The procedure for modifying these is as follows:

1) From the Windows NT Task bar, select **Start ➔ Settings ➔ Control Panel**



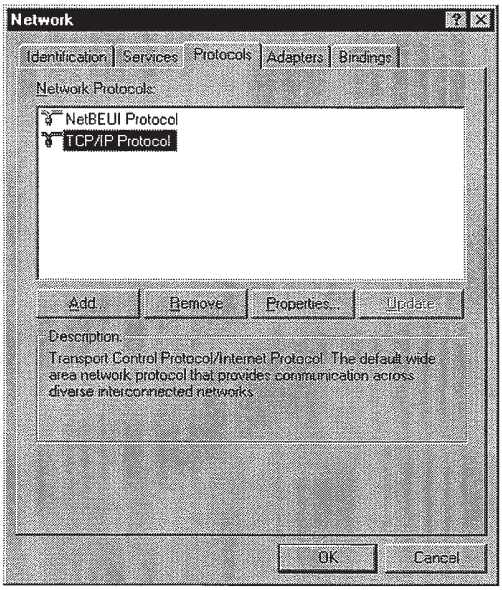
2) From the **Control Panel**, select **Network**



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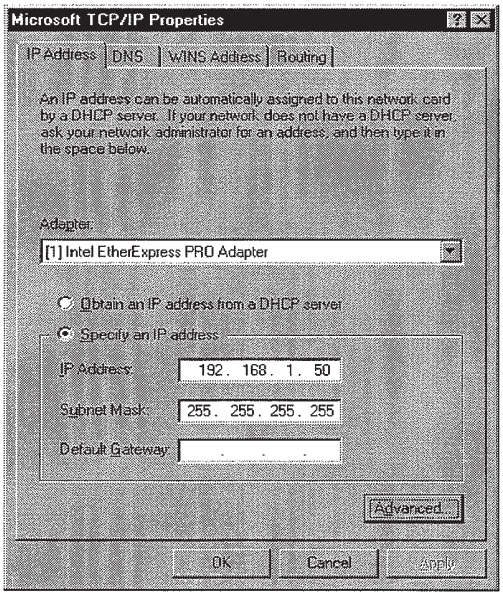
3) The **Network** dialog is displayed. Select the **Protocols** tab.

4) On the Protocols screen, highlight **TCP/IP Protocol** and select **Properties**.

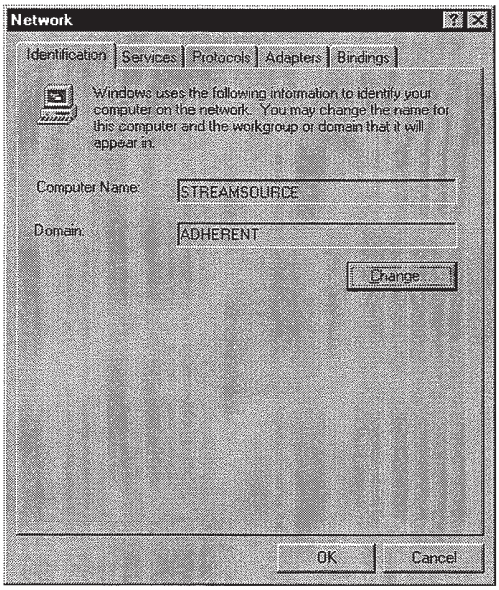


5) On the **IP Address** screen edit the IP address fields as required.

6) Enter **Ok** to implement the changes.



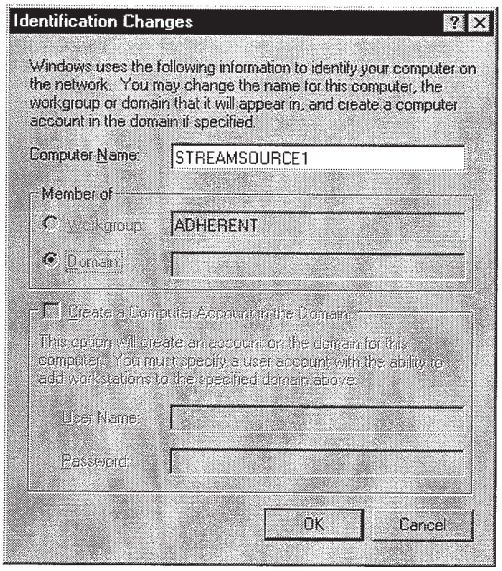
7) Control will return to the **Network** dialog. Select the **Identification** tab.



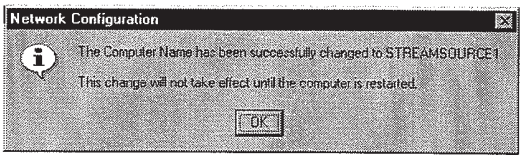
8) On the **Identification** screen, press the **Change** button.

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9)The **Identification Changes** dialog is displayed. Change the **Computer Name** to the desired name.

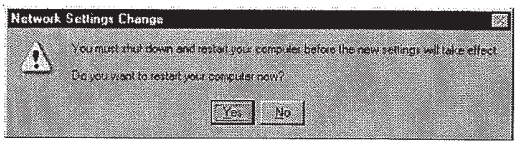


10) Enter **Ok** to implement the changes.



11) Enter **Ok.**

12) Control will return to the **Network** dialog. Press **Close.**

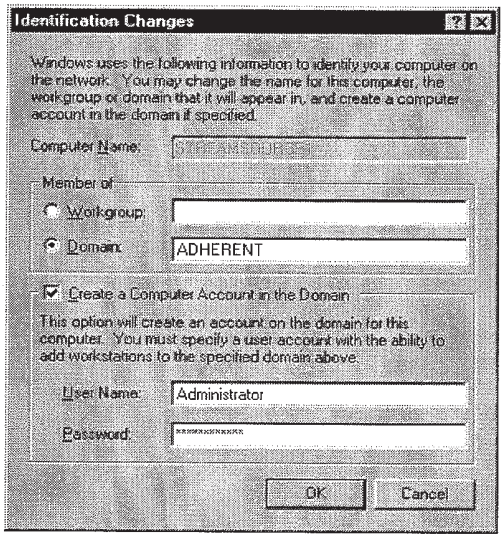


13) Select **Yes.** The machine will reboot.

14) Wait for the re-boot to complete and then connect the machine to the network.

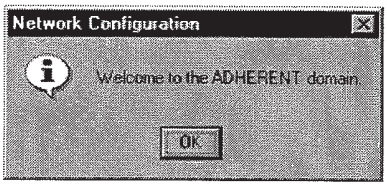
15) Open **Control Panel** and re-enter the **Network** dialog. from the **Identification** tab, press the **Change** button.

16) The **Identification Changes** dialog is displayed. Select **Domain** and enter the correct domain name.



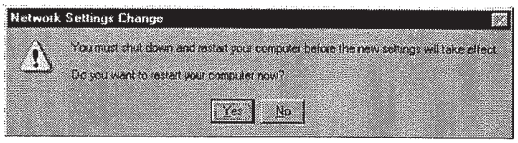
17) Select **Create a Computer Account in the Domain** and enter user details for an account which has Administrator privileges for the domain.

18) If successful, a dialog similar to the one below will be displayed. Enter **Ok.**



19) Enter **Ok.**

20) Control will return to the **Network** dialog. Press **Close.**



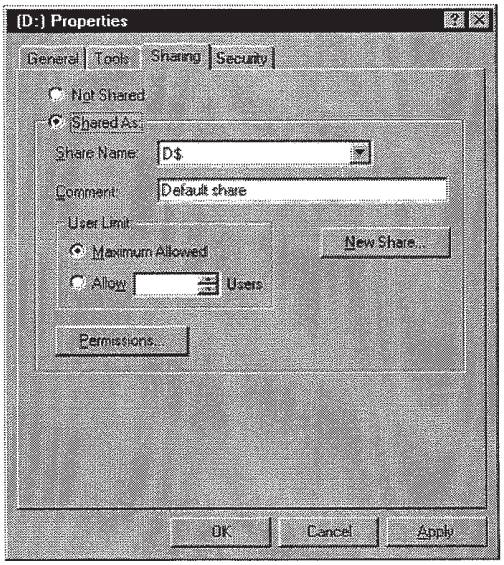
21) Select **Yes.** The machine will reboot.

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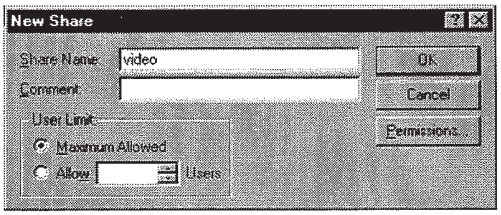
Sharing the Video Drive

Network users having Administrator privileges for the domain will be able to see the AD991 unit but other users will not. To enable other users to see the 'Video' drive, follow the instructions below.

1) Right-click on **MyComputer** and choose **Explore**.
2) Right-click on the **(D:)** drive and choose **Sharing...**
3) The **(D:) Properties** dialog will be displayed.
4) Left-click on the **New Share** button.



5) On the **New Share** dialog, enter the desired share name ('video') is recommended).
6) Enter **Ok**.
7) The **(D:) Properties** dialog will be displayed.
8) Enter **Ok**.



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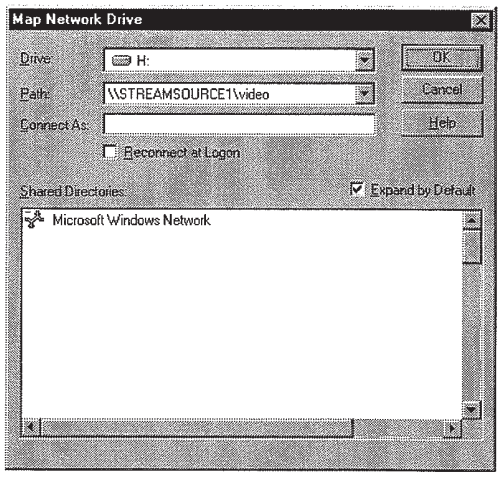
Connecting to the AD991 Video Drive from a Computer on the Network

Users can now map drive letter to the AD991 unit 'video' drive. As follows…

1) Right-click on **MyComputer** and choose **Map Network Drive.**
2) In the Path field, in the dialog, enter the path of the shared drive - this is constructed as follows:

- The first part consists of the computer name, preceded by two backslash characters '\\'.
- The second part is the drive share name preceded by a single backslash character '\'.

3) Enter **Ok.**



Removing the Monitor, Keyboard and Mouse

The AD991 unit should be run with the monitor keyboard and mouse connected only in order to change the network configuration.

Before, disconnecting the monitor, keyboard and mouse…

1) Close all of the windows that you have opened (you need not close the console application windows opened automatically by the AD991 unit).
2) Shut down the unit by holding in the On/Off button for 3 seconds (approximately).
3) Switch on the Stream Source unit and check that the machine boots successfully.
4) Shut down the unit by holding in the On/Off button for 3 seconds.
5) Disconnect the monitor, keyboard and mouse.
6) Switch on the Stream Source unit and check that the machine boots successfully.

Limitations of Use

Do not map network drives onto the AD991 unit. This interferes with the automatic boot up mechanism.

Performance of play-out or recording cannot be guaranteed if file transfers to or from the unit are performed whilst recording /playing out.

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Appendix D Adding an External Drive

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Introduction

When making an external drive available to AD991 Stream Source it is necessary to modify the AD991 resource file. This appendix provides instructions.

In order to configure the external drive settings 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.



The AD991 unit should be run with the monitor keyboard and mouse connected only in order to change the external drive settings.



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

Modifying ad991.resource file

The primary purpose of modifying the AD991.resource file is to ensure that the external drive name (label) is available to the Drive menu item (see Drives, page 3-13).

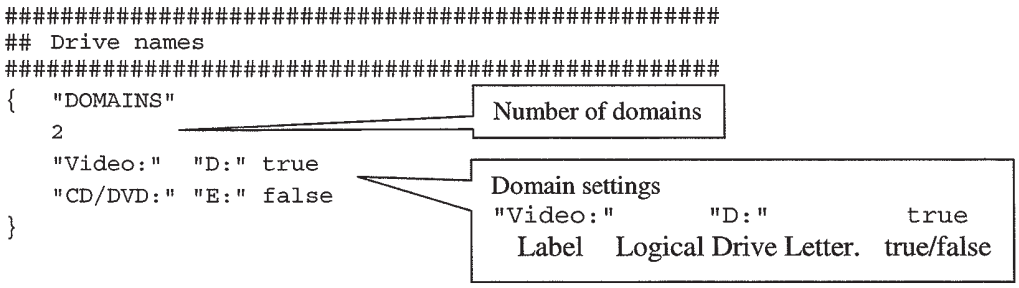
On starting the AD991 Stream Source unit, the external drive (connected via the SCSI connector) should be automatically detected.

1) From the Windows Task Bar, open the administrative tool Disk Administrator and assign a drive letter to the external drive.
If there are any problems with installing the new drive, contact Adherent Systems Ltd or your local distributor.

2) Using a text editor such as Notepad, open the file
`c:\program files\adherent\streamsource\ad991.resource`.

3) Locate the following text in the `ad991.resource` file:

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Only the 'Domains' section of the `ad991.resource` file should be modified. Any attempt to make changes to other parts of the file may result in system failure.

4) Note the 'Number of domains' and the 'Domain settings'.

5) Increment the 'Number of Domains' as required, e.g. from 2 to 3.
Note that if the number of domains does not correspond with the actual number specified, the AD991 Stream Source applications will fail to start.

6) Add a line to the 'Domain settings' as required.
Label – a local name for the drive.
Logical Drive Number – the letter allocated to the drive
true – Read/Write; **false** – Read only
e.g. "Raid:" "G" true

7) Save the file `ad991.resource`.

8) Restart the AD991 Stream Source unit.

9) Verify that the drive is available to the AD991 Stream Source unit using the Drive menu item. (See Drives, page 3-13.)

Network Sharing

It is also necessary to ensure that the external drive is 'visible' over the network where remote operation is to be used.

Refer to Appendix C Networking, Sharing the Video Drive, page C-6 for details of how to share the external drive. For the 'share' name use the local name (label) used in the AD991.resource file.

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Removing the Monitor, Keyboard and Mouse



The AD991 unit should be run with the monitor keyboard and mouse connected only in order to change the network configuration.

Before, disconnecting the monitor, keyboard and mouse…

1) Close all of the windows that you have opened (you need not close the console application windows opened automatically by the AD991 unit).
2) Shut down the unit by holding in the On/Off button for 3 seconds (approximately).
3) Switch on the Stream Source unit and check that the machine boots successfully.
4) Shut down the unit by holding in the On/Off button for 3 seconds.
5) Disconnect the monitor, keyboard and mouse.
6) Switch on the Stream Source unit and check that the machine boots successfully.

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Appendix D Adding an External Drive

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Adherent Stream Source

Source Scheduler

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AD991 Stream Source Product - Source Scheduler

Adherent Document: SI253v20 Issue 2.0f

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Overview

Source Scheduler is an option for the AD991 Stream Source. It is a remote scheduling application that allows lists of streams to be assembled and scheduled at a remote location for subsequent playout. It also provides a playout function so that single files can be selected and played.

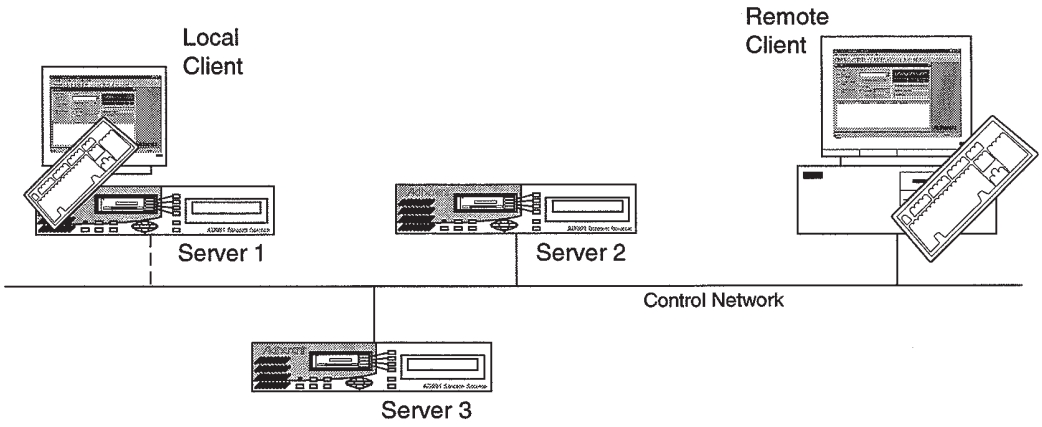
This manual describes the following:

- local interface – AD991 Stream Source,
- remote interface - Source Scheduler,
- scheduling, playout and recording activities

This manual should be read in conjunction with the *AD991 Stream Source User Guide[1]*; it is assumed that the user has read the user guide and is familiar with the Stream Source unit and its operation.

Client/Server Operation

The application is realised as a client-server architecture, where the server is a AD991 Stream Source unit and the client is the Windows™ based application Source Scheduler. The application can be installed on either a remote, networked PC or a Stream Source unit equipped with a monitor, keyboard and mouse.



The minimum system requirements of the client PC are given in the Technical Specification (see Reference section of this manual).

Dongle Protection

Source Scheduler is a purchasable option and as such, a PC requires a dongle to be fitted to the parallel port of the remote client PC for security protection. Please refer to your supplier for further details.

Software Installation

Software installation information (client and server) is given in the *AD991 Stream Source User Guide[1]*.

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Networking

Networking is described in Appendix C of the *AD991 Stream Source User Guide[1].*

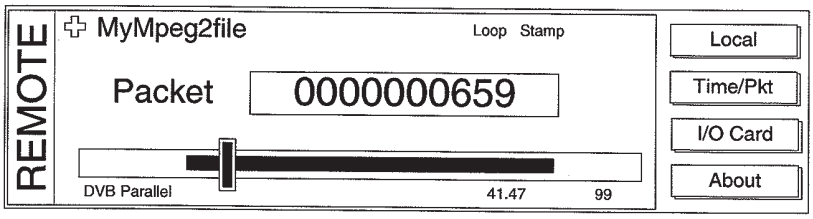
Safety

Normal safety procedures as described in the Stream Source User Guide should be followed. Only warnings specific to Source Scheduler will be given in this user guide.

Local Interface – AD991 Stream Source

When AD991 Stream Source is being controlled remotely,

the REMOTE application is displayed; this is based on the Player application. Similarly the Recorder application is available but with reduced menu options. The Streams application is disabled. The System application remains active so that system-level activities can be carried out, e.g. display brightness.



The main display is identical to the Player main display. When playing, the filename shows the name of the stream being played currently.

Remote Menu Controls

Local	Restarts the Player under local control after confirmation.
Time/Pkt	Toggles the count display between packet count and time and date.
I/O Card	Allows the interface and it's setting to be viewed (but not changed) (see Stream Source User Guide[1].)
About	Displays AD991 Stream Source version information.

'Remote' Operations

Control of scheduling and playout is carried out from the remote interface.

Terminating Remote Control

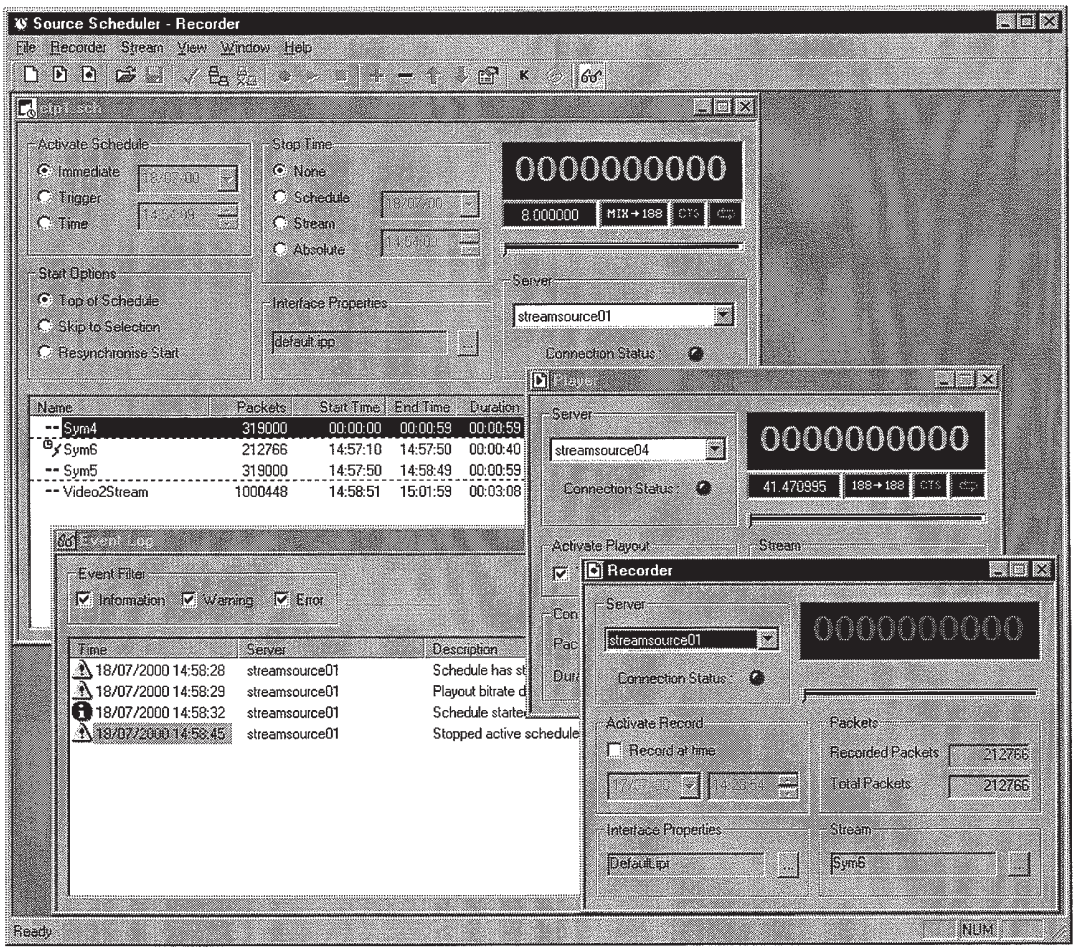
An active connection to a remote AD991 Stream Source may be broken from either end. At the local interface, selecting the **Local** menu control terminates any schedule (or playout) that may be running. The connection between the server and the remote interface is broken and the Player, Recorder and Streams applications are re-started in stand-alone mode (the Systems application is already running).

When the playout of a schedule is complete, the server is left in remote mode. Similarly, after playout from the remote Stream Player, the remote connection is maintained to allow further files to be selected and played out.

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Remote Interface - Source Scheduler

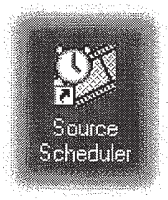
The remote Scheduler (Source Scheduler) runs as an application on any compatible networked PC or suitably equipped Stream Source unit (Refer to Technical Specification, page 49).



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Starting the Program

The program can be started by selecting the **Adherent Source Scheduler** option from the **Start → Programs** menu.



or

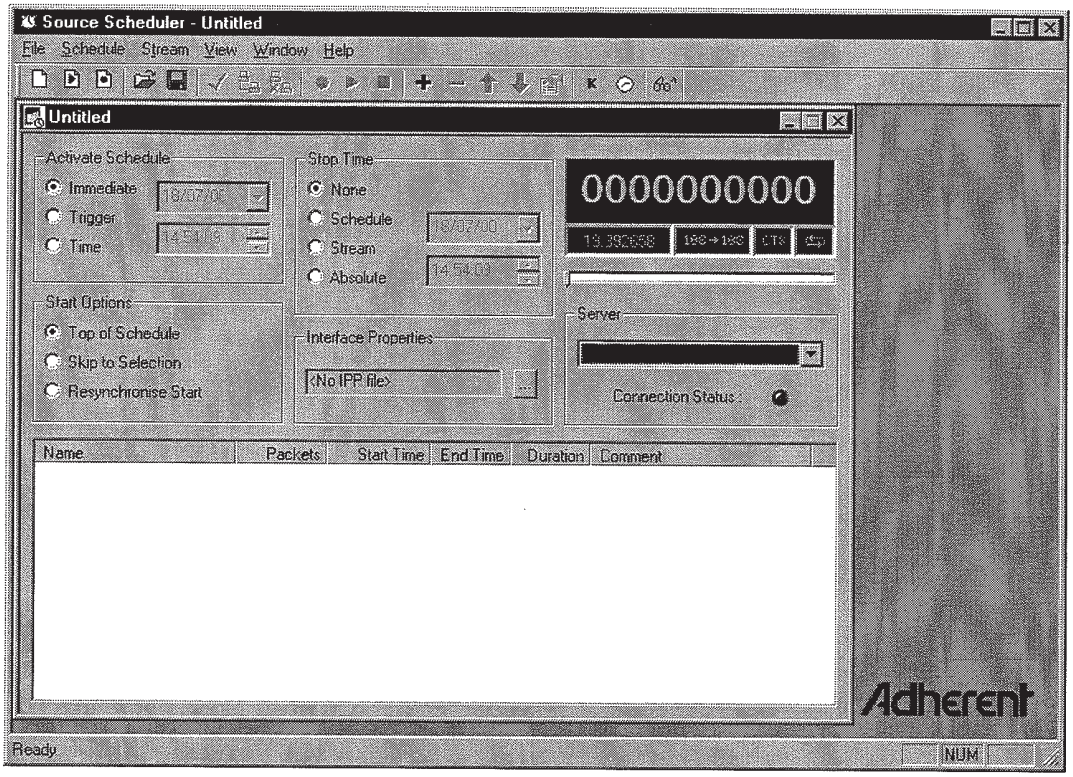
by double clicking the **Adherent Source Scheduler** shortcut on the desktop.

Source Scheduler should not be run while the user is logged on using the 'Guest' or 'AD991' user accounts on the client PC. The 'Administrator' account should also not be used unless it has no password set.

Normally, the user would be expected to log on using his standard account Username.

Using these accounts may prevent the client establishing a connection to the server. 'Access denied' will be reported in the event log.

When the Source Scheduler program has started and is ready for use, it will open the Main Window and an untitled, blank schedule window.



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The Toolbar (underneath the Menu Bar) can be hidden from view, moved to a separate window or moved to any side of the main window.

The Status Bar (at the bottom of the main window) can be hidden from view. It gives a description of any button or menu option over which the pointer is placed; it may also show other non-critical messages.

Main Window

The following paragraphs describe the main features of the Source Scheduler window:

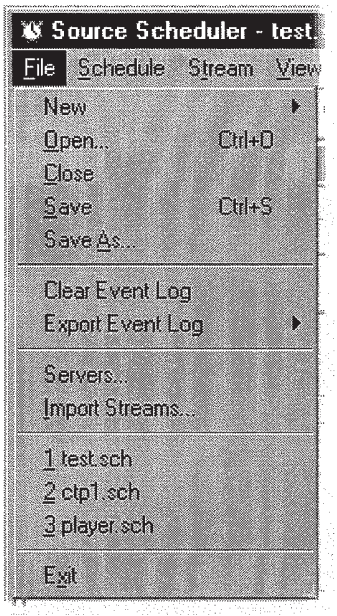
Menus and Options

The following sections list the menus and options available during normal operation. The menus are function dependent; that is, they may change in accord with the currently active function (Scheduler, Player or Recorder); similarities and differences are described below.

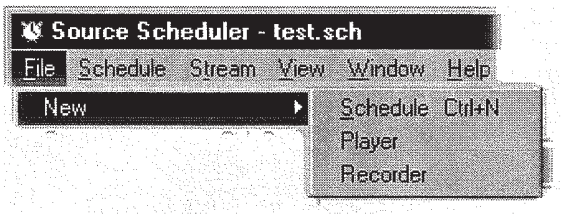


A check mark ✓ next to an option shows that the option is currently active; no ✓ means that it is inactive.

File Menu Options



New — Allows a new Schedule, Player or Recorder window to be opened.



Open... — Opens a dialog, allowing an existing schedule (*.sch) to be selected.

Close — Closes the currently selected window. If the server connection is active, it is also closed.

Save — Saves the currently selected schedule. If the schedule has not been saved before, the **Save As** dialog is opened. (Only active for Schedule window)

Save As... — Opens the **Save As** dialog. (Only active for Schedule window)

Clear Event Log — Clears the Event Log of all entries after confirmation.

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Export Event Log Allows the contents of the Event Log to be copied to either the clipboard or a file.



File copies of the Event Log are stored in ASCII format.

The clipboard version of the Event Log can subsequently be pasted into a Windows based document.

Servers... Allows Servers to be added to, removed from and edited in the current list.

Import Stream... Allows a Stream Properties file to be created (See Importing a Stream, page 41).

1 <filename>
2 <filename>
...
8 <filename>

A list of up to eight of the most recently opened schedules. Selecting a filename opens that schedule.

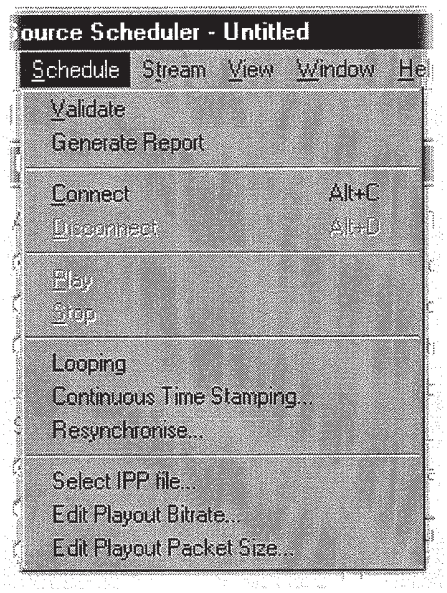
Exit Exits the application.

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Function Menu Options

The Function Menu options available depend upon the active function: Schedule, Player or Recorder.

Schedule Menu Options



Validate In schedules, validates the server and stream choices. Normally, validation is performed automatically when a connection is made. This control allows manual validation prior to connection.

Generate Report A log file or report is generated. An option to read it immediately is offered.

Connect Opens a connection to the server. (Only active when a schedule has been prepared.)

Disconnect Closes the connection to the server.

Play Plays the schedule currently selected in the Schedule window. (Only active when the server connection is active.)

Stop Stops the stream that is currently playing; confirmation is requested. The server connection is broken when a schedule is stopped.

Looping Toggles the loop option in the Scheduler window.

Continuous Time Stamping... Opens the CTS dialog. (See Continuous Time Stamping…, page 35)

Resynchronise... Allows a schedule to be manually resynchronised.

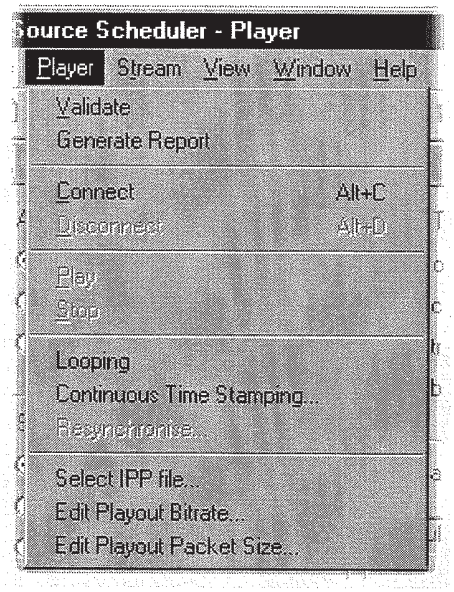
Select IPP file... Allows the Interface Properties Playout file to be selected.

Edit Playout Bitrate... Allows Playout bitrate of currently selected schedule to be changed.

Edit Playout Packet Size... Allows Playout packet size of currently selected schedule to be changed.

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Player Menu Options



Validate Validates the server and stream choice. Normally, validation is performed automatically when a connection is made. This control allows manual validation prior to connection.

Generate Report A log file or report of the playout activity for the current/previous playout session is generated. An option to read it immediately is offered.

Connect Opens a connection to the server.

Disconnect Closes the connection to the server.

Play Plays the stream currently selected in the Player window. (Only active when the server connection is active.)

Stop Stops the stream that is currently playing. The server connection is placed in standby when a Player stream is stopped.

Looping Toggles the loop option in the Player window.

Continuous Time Stamping... Opens the CTS dialog. (See Continuous Time Stamping..., page 35)

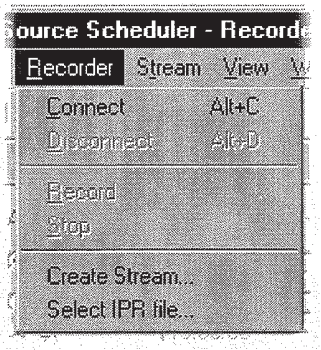
Select IPP file... Allows the Interface Properties Playout file to be selected.

Edit Playout Bitrate... Allows the playout bitrate of the Player to be changed.

Edit Playout Packet Size... Allows the playout packet size of the Player to be changed.

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Recorder Menu Options



Connect Opens a connection to the server.

Disconnect Closes the connection to the server.

Record Initiates recording. (Only active when the server connection is active.)

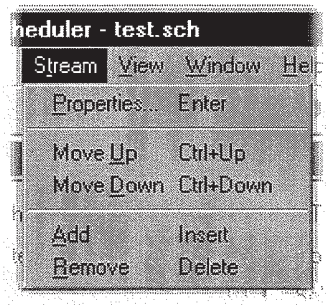
Stop Stops the current recording activity. The Player window is automatically opened and the server connection is kept open.

Create Stream... Opens the Stream Make Wizard (see Transport Stream Maker section in this User Guide).

Note that the stream must be created on one of the server's video drives, e.g. the path should be of the form '\\streamsource\video\stream.mpg'. The file extension must be 'mpg'.

Select IPR file... Allows the Interface Properties Record file to be selected.

Stream Menu Options



Properties Opens the Stream Properties dialog for the currently selected stream (see page 24).

Move Up Moves the currently selected stream one position up in the schedule list. If the stream is currently at the top of the list, then selecting this button has no effect.

Move Down Moves the currently selected stream one position down in the schedule list. If the stream is currently at the bottom of the list, then selecting this button has no effect.

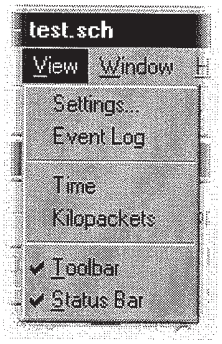
Add Opens a dialog and a link to the

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server, allowing streams (or multiple streams) to be added to the schedule.

Remove Removes the currently selected stream from the schedule.

View Menu Options



Settings Opens the Source Scheduler Settings dialog (see page 37).

Event Log Opens/Closes the Event Log window.

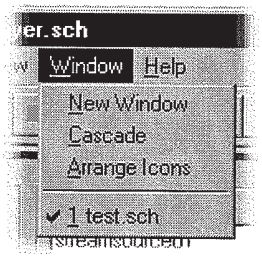
Time Time/Packets: This toggles the counter display in the active window between showing the current position within the file in terms of time or packets (or kilo-packets).

Kilopackets Kilopackets: This toggles the counter display in the active window between showing the current position in the file in packets or kilo-packets. The Kilo-packets button is disabled when the Time display is selected.

Toolbar Toggles the Toolbar.

Status Bar Toggles the Status Bar.

Window Menu Options



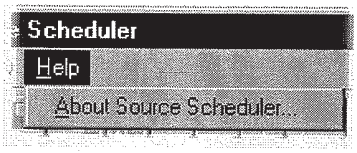
New Window Duplicates the currently selected window.

Cascade Cascades the currently open windows.

Arrange Icons Aligns icons of any minimised windows at the bottom of the program's main window.

✓ 1 test.sch Lists the windows currently open. The active window is indicated with a tick.

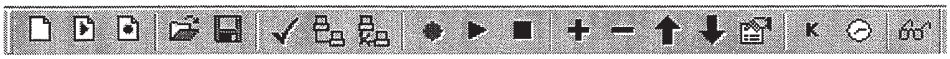
Help Menu Options



About Source Scheduler... Opens a dialog which displays the program registration and version details.

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Toolbar



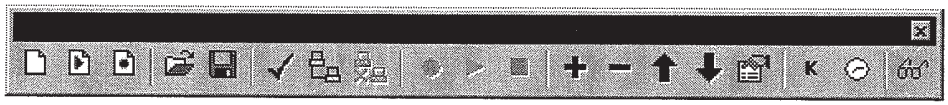
The toolbar provides a set of convenient shortcuts to the more frequently used menu options. The available commands are given below:

- Open a new schedule window.
- Open a new Player window.
- Open a new Recorder window.
- Open an existing schedule.
- Save a schedule.
- Validates the server and stream choices in a schedule.
- Opens a connection to the server from the machine running this program. (Only active when a schedule has been prepared.)
- Closes the connection to the server from the machine running this program.
- Starts the Recorder. (Only active when the server connection is active.)
- Plays the schedule currently selected in the Schedule window or the stream currently selected in the Player window, whichever is active when the button is selected. (Only active when the server connection is active.)
- Stops the active playout (either as part of a schedule or from the Stream Player) or recording; confirmation is requested.

  The server connection is broken when a schedule is stopped, but placed in standby when a Player or Recorder stream is stopped.
- Opens a dialog and a link to the server, allowing streams to be added to the schedule, or opened in the Player.
- Removes the currently selected stream from the schedule or the Player. If no stream is highlighted, then selecting this button has no effect.
- Moves the currently selected stream one position up in the schedule list. If the stream is currently at the top of the list, then selecting this button has no effect.
- Moves the currently selected stream one position down in the schedule list. If the stream is currently at the bottom of the list, then selecting this button has no effect.
- Opens the Stream Properties dialog for the currently selected stream (see page 24).
- Kilo-packets: This toggles the counter display in the active window between showing the current position in the file in packets or kilo-packets. The setting of the Kilo-packets button is disabled when the Time display is selected.
- Time/Packets: This toggles the counter display in the active window between showing the current position within the file in terms of time or packets (or kilo-packets).
- Opens/Closes the Event Log window.

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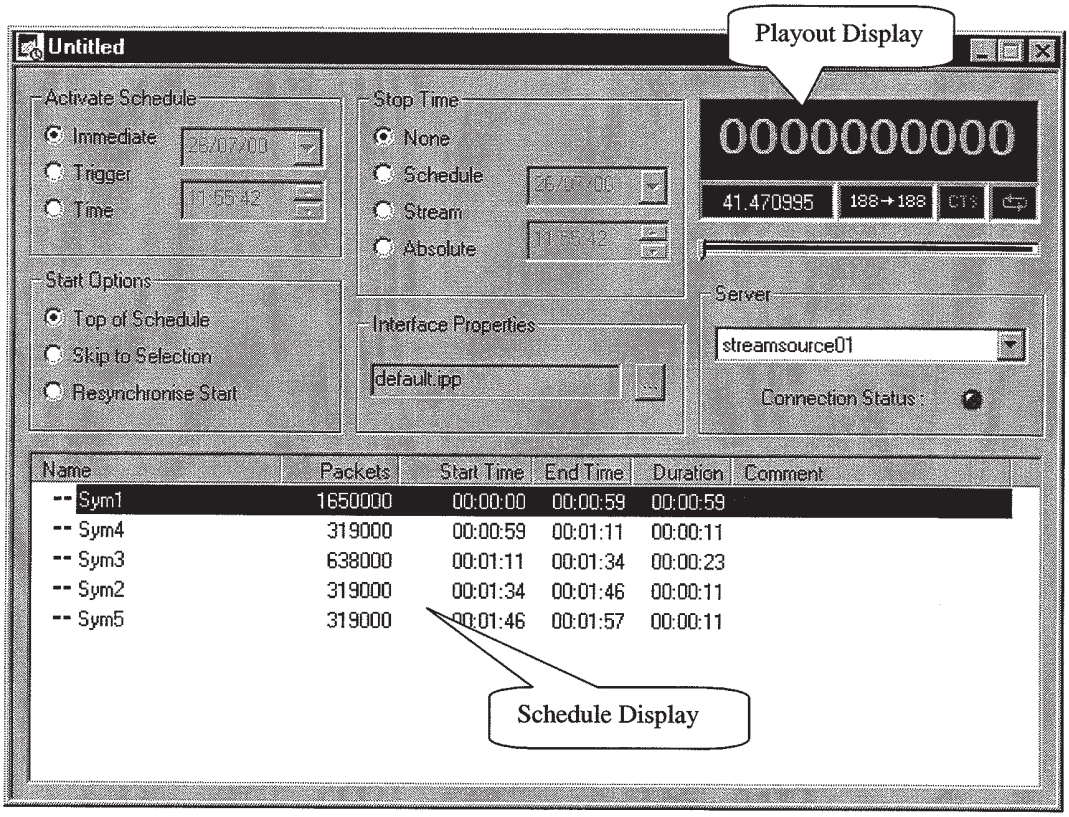
The Toolbar can be dragged off the edge of the main window into a floating pallet. To do this, click on the background within the Toolbar (not on one of the buttons) and drag it away from the edge of the main window. A self-contained window as shown below will be created:



To replace the Toolbar as an integral part of the application window, drag it over any of the borders until the outline changes shape.

Schedule Window

The Schedule window allows playlists to be assembled and controlled. A playlist is a list of streams selected from the AD991 Stream Source server and ordered for playout either immediately or at a specified time.



Each functional area identified is described in the following paragraphs. Schedule timing is described in Schedule Timing, page 45.

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Server

The **Server** field contains the name of the currently selected server. If the server has been used in previous sessions, it may be selected from the drop-down list. Servers can be added to the list using the **File** menu option **Servers...** (see Server Selection, page 42).

Different servers may be selected from the Scheduler, the Player and the Recorder windows respectively.

The **Connection Status** 'LED' indicates the current status of the server connection:

- (red) Inactive: no server connection.
- (amber) Standby: server connection made, but not in use
- (green) Active: server connection made and in use.

Schedule Display

The Schedule Display panel lists the streams currently included in the schedule. Each entry in the schedule shows the following information: stream name, the number of packets, start/end time and duration.

A horizontal dotted line between streams indicates a break (discontinuity) in the playout bitstream. This could be caused either by:

a) a stream having a timed or triggered start specified

b) two adjacent streams having differing playout properties

c) two adjacent streams have differing source packet sizes.

Icons which may be displayed adjacent to the stream name are described below.

Streams are selected (and highlighted) by clicking on the stream name. Only one stream can be selected at a time. All streams can be deselected by clicking on any white-space at the bottom of the Schedule display area.

During playout, a visual indication is given of the stream currently playing; played streams are greyed out; the display of start and stop times is also adjusted as appropriate.

The overall operation of Schedule Timing is described more fully on page 45 et seq.

Schedule Display Icons

The following icons may be displayed adjacent to stream names:

- -	Indicates that no start or trigger time has been specified for the stream. However, actual playout may be affected by settings for previous streams.
	Indicates that a start time has been specified for the stream.
	Indicates that a trigger time has been specified for the stream.
!	Indicates that playout properties of the stream differ from overall schedule properties.

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Start and End Time

At their simplest, start and end times for streams in a schedule are calculated cumulatively from the top of the schedule given that the duration of each stream can be calculated from the playout bitrate and the file size. However, Start Times may be set for each stream in a schedule via the Stream Properties dialog (see page 19). The Start Time is assumed to be 'today' unless a day is specified.

Activate Schedule

Activate Schedule is applicable to the overall schedule. It allows the schedule to be played out when the schedule play option is selected, either

- immediately,
- when an external trigger pulse is received,
- or at a preset time.

The options available are as follows:

Immediate: The schedule will start playing out as soon as the schedule play option is selected.

Trigger: The schedule is to be triggered by an external signal supplied via I/O connector on the MPEG Interface Card on the Stream Source machine (Refer to the *Stream Source User Guide*, *Installation* section). In this case, the time is set only to remind the user and will have no effect on when the stream will start.

When the schedule play option is selected, the Schedule player will be put into **Waiting...** mode until the trigger condition is met.

If the trigger does not take place within a time window, an error message may be entered in the event log and the playout report; the stream name will be displayed in red. (See also Miscellaneous Settings, page 39.)

Time: The Time Start Time requires an absolute starting time for the stream to be played in the schedule to be entered.

The overall operation of Schedule Timing is described more fully on page 45 et seq.

Start Options

The selection made in the Start Options dictates the actual time that the schedule will be initiated.

If Activate Schedule is set to Trigger or Time then the **Skip to Selection** and **Resynchronise Start** options are disabled.

Top of Schedule: When enabled the schedule playout will start with the first stream in the schedule.

Skip to Selection: When enabled the schedule will start at the currently highlighted stream (or at the top of the schedule if no stream is highlighted).

Resynchronise Start: When enabled the start time of the first stream will be adjusted to equal to the current time (the first stream must have an absolute Start Time specified.)

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All other times in the shedule will be adjusted by the same amount. The schedule will then start immediately at the first stream. (See also Manual Resynchronisation, page 25)

The overall operation of Schedule Timing is described more fully on page 45 et seq.

Stop Time

The selection made in the Stop Time section, dictates the way in which the schedule will stop playing.

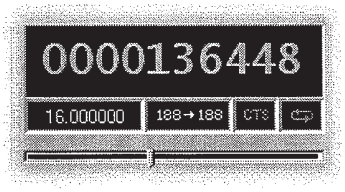
None — The schedule will play through as dictated by the start and stop times of the individual streams. Looped schedules will restart.

Schedule — Playout of the schedule will stop at the time and date specified but not until the current (schedule) pass is completed.

Stream — Playout of the schedule will stop at the time and date specified but not until the current stream is completed.

Absolute — Playout of the schedule will stop immedaitely at the time and date specified.

Playout Display (Schedule)



The Playout display indicates the status of the schedule/stream that is currently being played out. The time/packet display and the slider bar indicate the progress of the currently highlighted stream in the Schedule Data pane. The dark part of the slider bar indicates the extremities of the Mark Start and Mark End points applied to the stream.

The status displays (below the time/packet display) are applicable to the whole schedule.

Clicking an icon will either toggle the mode or open an associated dialogue.



Displays the bitrate of the current schedule. This element is dimmed if a server is not selected.

If an external clock is being used, '**ext**' is appended to the clock value.



Indicates the source → playout packet size.

When the schedule comprises mixed packet sizes, the word **MIX** will be displayed in the 'source' position.. .



Indicates the status of Continuous Time Stamping applied to the schedule/stream.
Note that at schedule level, only a subset of CTS can be applied – see page 33.



Indicates that the current schedule will be looped (restarted) when it reaches the end of the last stream.

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Interface Properties

The Interface Properties file contains a snapshot of the server (player) interface settings.

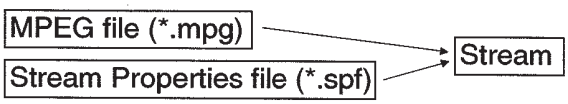
To choose a new properties file, select **Schedule → Select IPP file...** or select the adjacent browse button (...) and select a new file (*.ipp). The file must reside on the Stream Source server. When running as a 'local client', select the *.ipp file from the \\streamsource\ path, not the local drive, e.g. D:.

The only parameters that can be modified from Source Scheduler are the **Playout Bitrate** and the **Packet Size**; it is these values that are used to calculate the playout duration of streams.

Stream Properties

Each stream added to the schedule has unique properties; some are derived from the stream, some are created and modified by the Source Scheduler. These properties are automatically created when a stream is added to a schedule or player or recorder.

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).



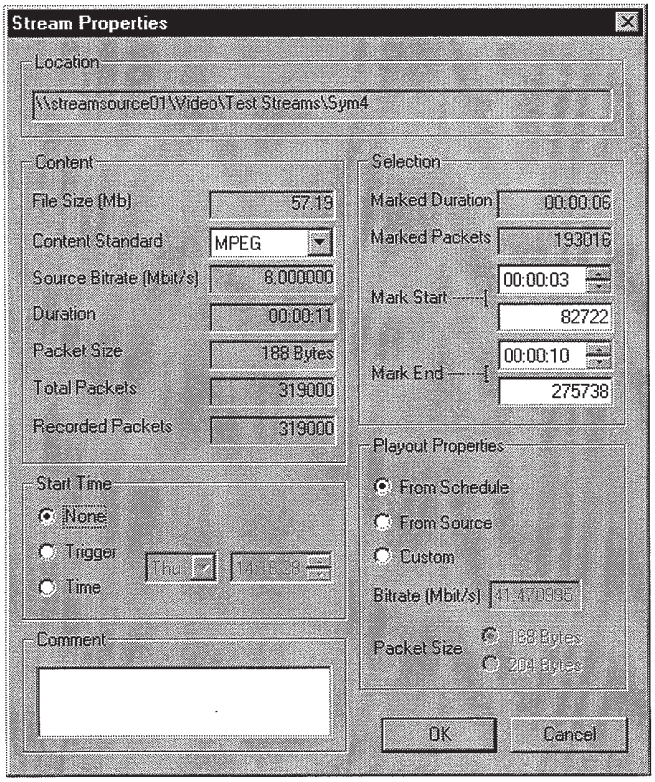
- An *MPEG file* comprises one or more programs with one or more independent time bases in a single stream.
- A *Stream Properties file* can be viewed as an MPEG configuration file. It specifies such parameters as file size, content standard (MPEG/DVB/ATSC/BSD) and bit rate. The parameters are, in part,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

In Source Scheduler the Stream Properties file parameters are displayed as part of the Stream Properties.

(A full explanation of the Stream Properties file can be found in the Stream Source User Guide[1].)

The full contents of the Stream Properties file can be viewed by highlighting a stream and selecting **Properties...** from either the right-click menu or the **Stream** menu or by double-clicking the stream name.

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The Stream Properties dialog comprises the following areas:

- Location
- Content
- Selection
- Start Time
- Playout Properties
- Comment

These are described in the following paragraphs:

Location

The location of the stream: '\\server\pathname…\filename'

Content

File size (Mb): File size (Mbytes).

Content Standard: Broadcast standard; MPEG2/DVB/ATSC/BSD.

The content standard (MPEG, DVB, ATSC or BSD) of an MPEG file, can be changed as required. The content standard selected 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.

(Two choices are available for BSD; BSD-SFSync (BSD stream using super-frame synchronisation) and BSD-Psync (BSD stream using packet synchronisation.

If any stream has one of the BSD content standards, all other streams must also have the same BSD content standard. *It is not permissible to have a schedule containing both PSync and SFSync streams.*

CTS must be disabled.)

The Content Standard is recorded in the Stream Properties file and will therefore affect playout of the file locally at the server Stream Source unit.

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

Duration: The duration of the stream. Calculated as follows:

$$\frac{\text{(Recorded packets * Playout Packet Size)}}{\text{Playout Bitrate}}$$

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

Total Packets: The total number of packets in the stream.
(A stream is prepared for recording by allocating a number of packets, i.e. Total Packets. Subsequent recording into the prepared stream need not use all of the available packets, hence Recorded Packets.)

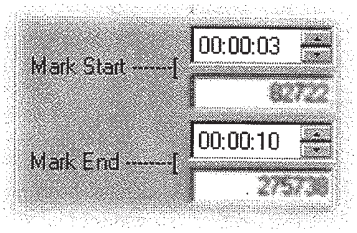
Recorded Packets: This is dependent on each recording. If the entire allocated file-space is not filled when a recording is made, this property is used to control the playout so that only the recorded section is played.

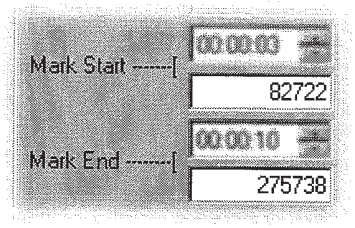
Selection

This section allows a section of a stream to be identified for playout; this also applies to local playout by the Player.

Mark Start and **Mark End** allow the start and end points of the playout to be specified. Each can be specified in terms of time or packet number.

The time element of Mark Start and Mark End is presented in hours, minutes and seconds; hh:mm:ss. Each time sub-division (hh, mm or ss) can be edited by highlighting it and typing a number directly or using the spin controls.





The packet element of Mark Start and Mark End can be edited by highlighting it and typing the required number.

Note that while it is possible to enter start or end values greater than that of existing stream, on leaving the field, the value will revert to the minimum/maximum in the stream.

The duration and the number of packets specified for playout are calculated and displayed in the read-only fields **Marked Duration** and **Marked Packets**.

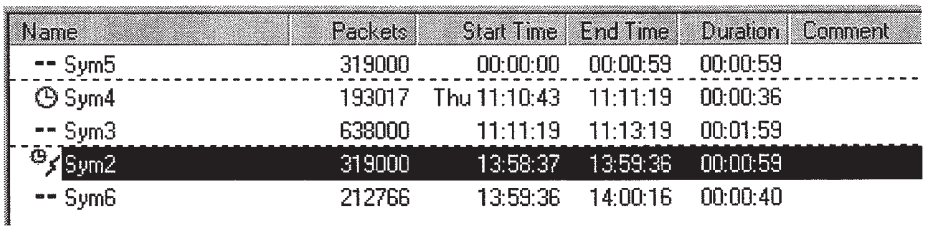
The Marked Duration is calculated as follows:

$$\frac{\text{(Mark End - Mark Start) * Playout Packet Size}}{\text{Playout Bitrate}}$$

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Start Time

Start Time is used to specify the time at which a stream will start to play within a schedule. The following options are offered:



Name	Packets	Start Time	End Time	Duration	Comment
-- Sym5	319000	00:00:00	00:00:59	00:00:59	
Sym4	193017	Thu 11:10:43	11:11:19	00:00:36	
-- Sym3	638000	11:11:19	11:13:19	00:01:59	
Sym2	319000	13:58:37	13:59:36	00:00:59	
-- Sym6	212766	13:59:36	14:00:16	00:00:40	

None: The stream is integrated into the schedule and obeys the overall timing of the schedule. It will follow on from the previous stream without a break in the playout bitstream.

Trigger: The stream is to be triggered by an external signal supplied via I/O connector on the MPEG Interface Card on the Stream Source machine (Refer to the *Stream Source User Guide*, *Installation* section). In this case, the time is set only to remind the user and will have no effect on when the stream will start.

Whilst waiting for a trigger signal, null packets are output from the selected interface.

When Trigger Start Time is enabled, the clock and trigger icons are shown on the schedule display adjacent to the stream name and the Start times are calculated with reference to the time entered.

When the schedule play option is selected, the Schedule player will be put into **Waiting...** mode until the trigger condition is met.

If the trigger does not take place within a time window, an error message may be entered in the event log and the playout report; the stream name will be displayed in red. (See also Miscellaneous Settings, page 39.)

Time: The Time Start Time requires an absolute starting time for the stream to be played in the schedule to be entered. The Start day can also be specified up to a week ahead. If the Time option is enabled, the clock icon is shown on the schedule display adjacent to the stream name and the Start times are recalculated accordingly.

Whilst waiting for a Start Time, nothing is output from the selected interface.

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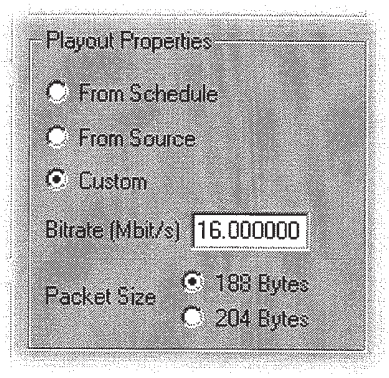
Playout Properties

The setting in the Stream Playout Properties dictate the playout properties in terms of bitrate and packet size of the selected stream.

From Schedule The playout properties of the selected stream are inherited from the Schedule settings made via the Schedule menu options. The inherited setting will override the source properties of the stream.

From Source The playout properties of the stream in the schedule are inherited from the stream, overriding any settings made in the overall schedule.

Custom The playout properties of the stream are specified locally in terms of **Bitrate** and **Packet Size** overriding any settings made in the overall schedule.



Where the playout properties are set to other than **From Schedule**, an exclamation mark ! will be displayed adjacent to the stream name.

Discontinuity

Schedule setting	Stream settings
40Mbit/s; 188 byte	Sym5: **From Schedule** Sym2: **Custom**, Bitrate: **40**Mbit/s, Packet size: 188 bytes --- Sym3: **From Source**, Bitrate: **20**Mbit/s, Packet size: 188 bytes Sym4: **Custom**, Bitrate: 20Mbit/s, Packet size: 188 bytes

Name	Packets	Start Time	End Time	Duration	Comment
-- Sym5	159575	00:00:00	00:00:06	00:00:06	
! -- Sym2	319000	00:00:06	00:00:17	00:00:11	
! -- Sym3	275739	00:00:18	00:00:44	00:00:25	
! -- Sym4	319000	00:00:44	00:01:14	00:00:29	

Note that the dotted schedule discontinuity line is placed where there is a change in playout bitrate (or Packet Size) and not necessarily a change in playout bitrate (or Packet Size) origin.

Any discontinuity may cause a small 'gap' between the affected streams in a schedule during which the **Waiting...** message will be displayed.

Comment

Comments can be added to streams as required.

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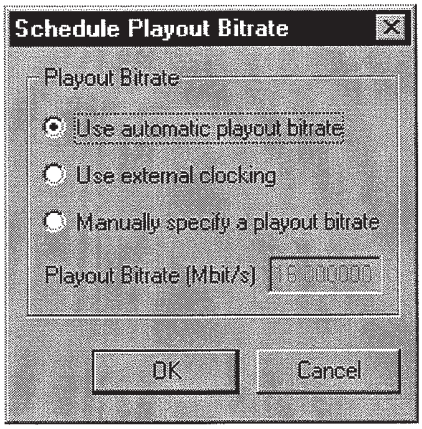


The overall operation of Schedule Timing is described more fully on page 45 et seq.

Edit Playout Bitrate...

To modify the playout bitrate of a schedule either select **Schedule ➔ Edit Playout Bitrate...** or click the bitrate display in the Playout Display.

The bitrate displayed when **Use automatic playout bitrate** is selected is derived (at any time) from the first stream in the schedule. The value will be applied for the whole schedule ➔





➔ When either external clocking or manual is selected, a playout bitrate value (in Mbit/s) can be entered.

Valid ranges of values depend on the interface installed in the Server (see *AD991 Stream Source User Guide*[1])

External Clock Mode

When external clocking is selected, the clock input directly controls the playout bitrate. The duration of a stream, and hence the start and stop time in a schedule, is calculated using the external clock value. However, since Source Scheduler does not is unable to measure the bitrate, it is necessary to manually enter a value in the **Schedule Playout Bitrate** dialog when **Use external clocking** is enabled. A manually entered time which differs from the actual external clock rate will cause the duration and start and end times of streams to be incorrectly calculated and displayed.

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Edit Playout Packet Size...

To modify the playout packet size either select **Schedule ➔ Edit Playout Packet Size...** or click the packet size display in the Playout Display.

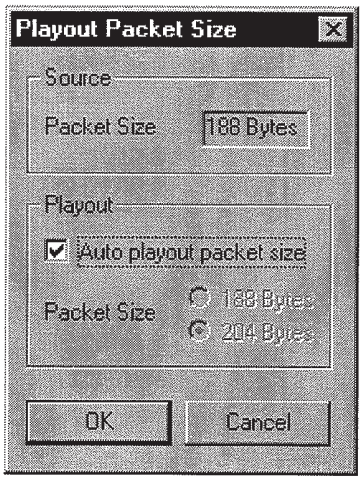
The **Source** packet size displayed is based on all streams in the schedule; **188**, **204** or **MIX**.

When **Auto playout packet size** is enabled, the playout packet size is derived from the first stream in the schedule.

If **Auto**... is disabled, the required packet size can be selected by enabling the appropriate radio button.

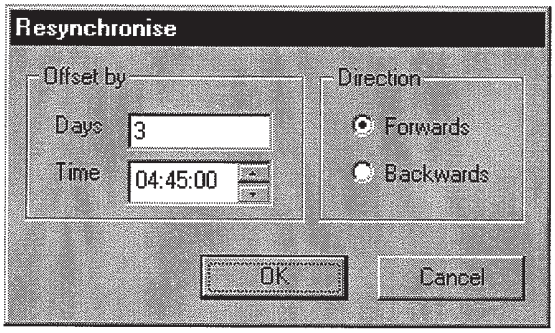
Note that if the playout packet size differs from the source packet size, the playout bitrate may be automatically scaled to allow for the extra/less packets.

The values will be applied to all streams which are using schedule-level properties (**From schedule** in Stream Properties).



Manual Resynchronisation

A schedule can be manually resynchronised using **Schedule ➔ Resynchronise...**. The dialog shown below is opened.

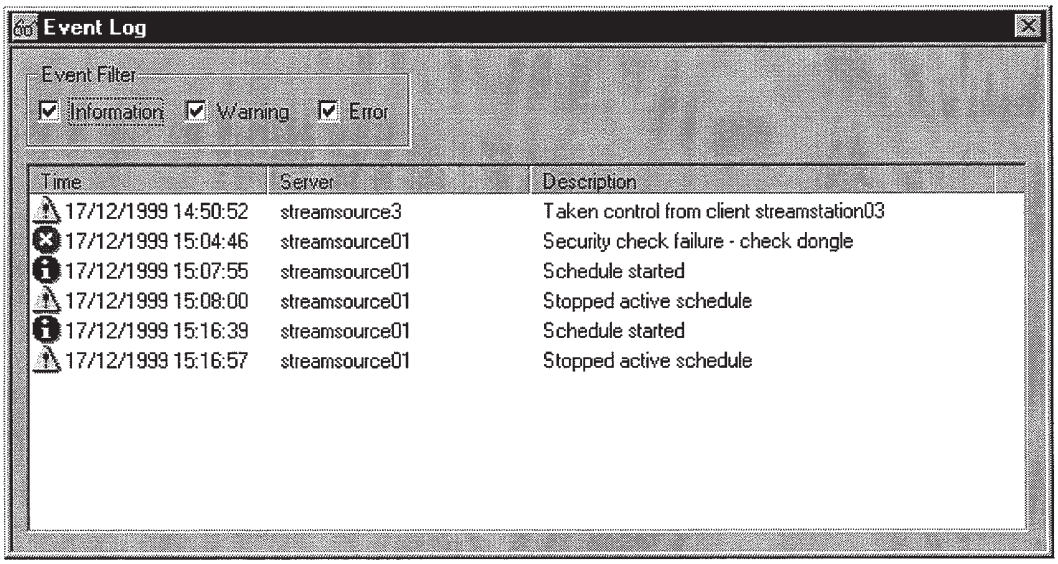


Select an adjustment (in Days and Time) to be applied to the schedule. When OK is selected, the start time of all absolute files in the schedule is modified by the specified adjustment, as is the specified Activate Schedule date/time (if any).

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Event Log Window

The Event Log window displays the errors and events that occur during the scheduler operation. Each entry contains the date and time of the event, the server and a brief description of the event.



Events can be filtered by selecting the appropriate checkbox(es) in the **Event Filter** area. Note that this is only a 'display' filter; the full log will be exported when requested.

Information: indicates processing activity.

Warning: provides information about non-catastrophic events, e.g. events which, whilst not preventing the schedule from operating, may make it operate incorrectly.

Error: provides information about catastrophic events, e.g. events which prevent the scheduler from operating correctly.

Clear Log

The Event Log can be cleared by selecting **Clear Event Log** from either the right-click menu or from the **File** menu. This action will clear all messages, irrespective of the filter settings.

Export Event Log

The Event Log can be exported, in tab-separated value format, either directly to a file (**Export → File**) or via the Windows clipboard (**Export → Copy**). Both actions are available from the right-click menu or from the **File** menu. This action will copy all messages irrespective of the filter settings.

Export → File: When selected, the contents of the Event Log are written to the file 'event.txt'; this is normally stored in the same directory as the Source Scheduler program (SourceScheduler.exe).

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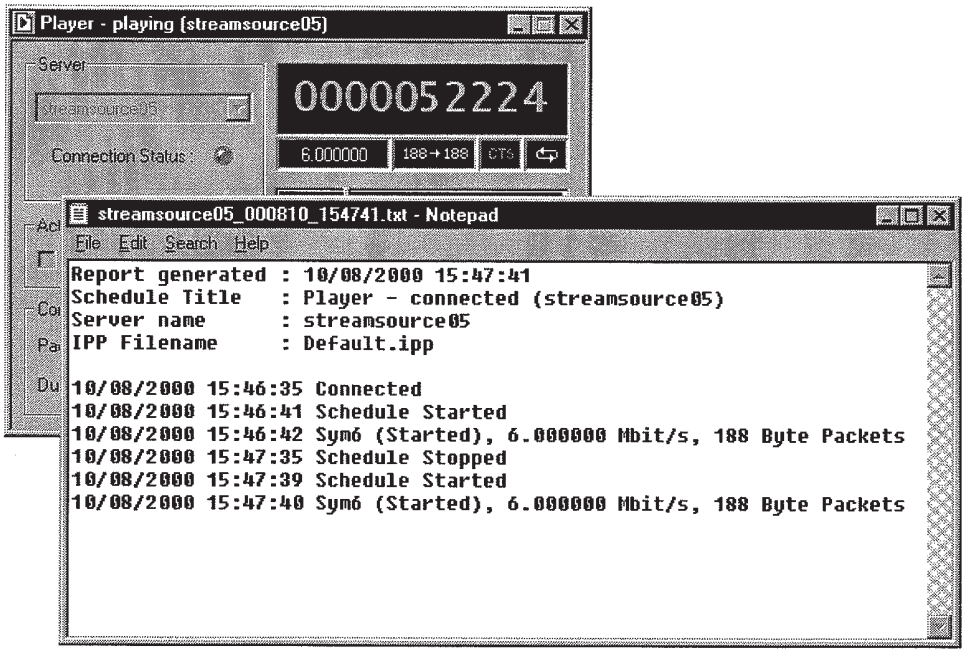
Export → Clipboard: When selected, the contents of the Event Log are copied to the Windows clipboard. From the clipboard, the log can be pasted into any windows text-based document in tab-separated value format.

Reports

In addition to the Event Log, Scheduler and Player activity reports can generated as required. These reports are confined to the current or most recent activity; the report store is cleared each time a new connection is made.

The Schedule and Player report can be saved to an ASCII format file (**Schedule / Player → Generate Report**); an option is offered to view the report immediately.

The screenshot below shows an example of a Player report

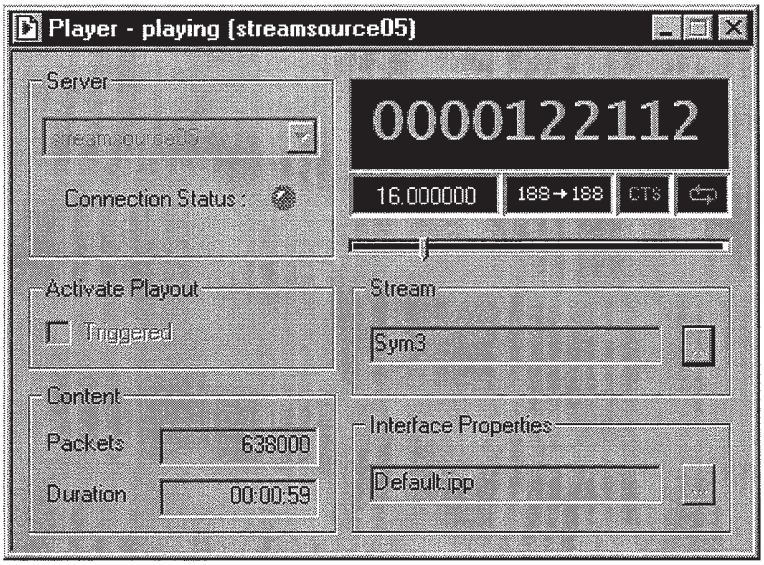


A warning will appear when a Scheduler report is about to be discarded, giving the user the opportunity to save it. This warning can be disabled either in the warning dialog or in the application settings (**View → Settings... → Warnings** tab).

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Stream Player Window

The Stream Player window allows a single stream to be selected and played via the server.



Server

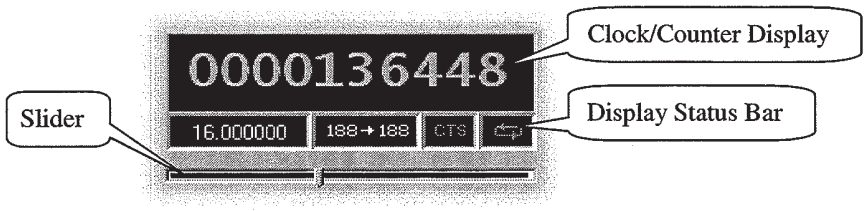
The **Server** field contains the name of the currently selected server. If the server has been used in previous sessions, it may be selected from the drop-down list. Servers can be added to the list using the **File** menu option **Servers...** (see Server Selection, page 42).

Different servers may be selected from the Scheduler, the Player and the Recorder windows respectively.

The **Connection Status** 'LED' indicates the current status of the server connection:

- (red) Inactive: no server connection.
- (amber) Standby: server connection made, but not in use
- (green) Active: server connection made and in use.

Playout Display (Player)



Clock/Counter Display : The Clock/Counter Display shows the current playout position in the file. It can show either elapsed time or number of packets from the start of the file.

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The Time button on the Toolbar (or the menu option **View → Time**) toggles the Counter display between showing the current position within the file in terms of time or packets (or kilopackets).

The Kilopackets button on the Toolbar (or the menu option **View → Kilopackets**) toggles the packet counter display between showing the position within the file in packets or kilopackets.

Display Status Bar : The Display Status Bar provides visual feedback on the following settings. If an icon is dimmed, the associated function is inactive:



Displays the bitrate of the currently selected stream. This element is dimmed if a server is not selected.



Indicates the source → playout packet size.



CTS (Continuous Time Stamping).
Menu option **Schedule → Continuous Time Stamping...**



Loop mode.
Menu option **Schedule → Toggle Looping**

Clicking an icon will either toggle the mode or open an associated dialogue.

Activate Playout

During normal operation (with Trigger disabled), the playout will commence when the **Player → Play** menu option is selected. When the Trigger option is enabled, playout will not start when the **Player → Play** menu option is selected, until an external trigger signal is received via I/O connector on the MPEG Interface Card on the Stream Source machine (Refer to the *Stream Source User Guide*, *Installation* section).



Whilst waiting for a trigger signal, null packets are output from the selected interface.

Content

The values shown in the **Content** pane (**Packets** and **Duration**) are derived from the Stream Properties file.

Stream

Shows the name of the currently selected playout file.



Opens a dialog, allowing a stream file to be selected from one of the Video drives of the selected AD991 Stream Source server.

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Interface Properties

The Interface Properties file contains a snapshot of the server (player) interface settings.

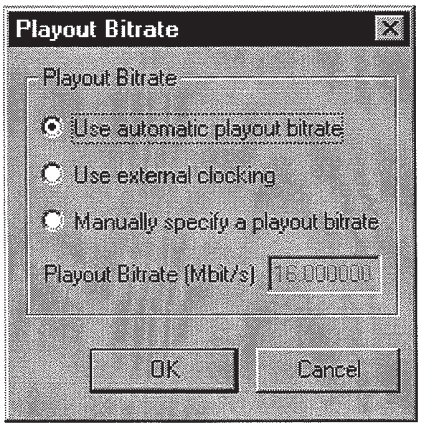
To choose a new properties file, select **Schedule ➔ Select IPP file...** or select the adjacent browse button (...) and select a new file (*.ipp). The file must reside on the Stream Source server. When running as a 'local client', select the *.ipp file from the \\streamsource\ path, not the local drive, e.g. D:.

The only parameters that can be modified from Source Scheduler are the **Playout Bitrate** and the **Packet Size**; it is these values that are used to calculate the playout duration of streams.

Edit Playout Bitrate...

To modify the playout bitrate either select **Player ➔ Edit Playout Bitrate...** or click the bitrate display in the Playout Display.

The bitrate displayed when **Use automatic playout bitrate** is selected is derived (at any time) from the stream ➔





➔ When either external clocking or manual is selected, a playout bitrate value (in Mbit/s) can be entered.

Valid ranges of values depend on the interface installed in the Server (see *AD991 Stream Source User Guide*[1])

External Clock Mode

When external clocking is selected, the clock input directly controls the playout bitrate. The duration of a stream, and hence the start and stop time in a schedule, is calculated using the external clock value. However, since Source Scheduler does not is unable to measure the bitrate, it is necessary to manually enter a value in the **Playout Bitrate** dialog when **Use external clocking** is enabled. A manually entered time which differs from the actual external clock rate will cause the duration and start and end times of streams to be incorrectly calculated and displayed.

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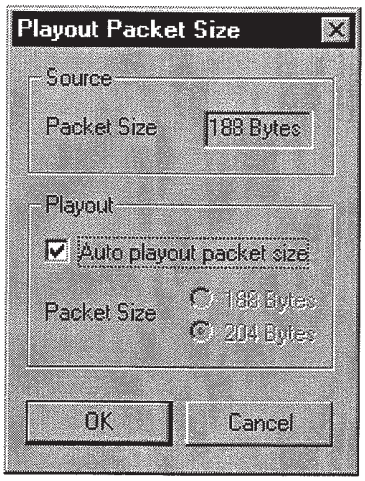
Edit Playout Packet Size...

To modify the playout packet size either select **Player** ➔ **Edit Playout Packet Size...** or click the packet size display in the Playout Display.

The **Source** packet size displayed is derived (at any time) from the selected stream.

When **Auto playout packet size** is enabled, the playout packet size is also derived from the selected stream.

If **Auto**... is disabled, the required packet size can be selected by enabling the appropriate radio button.

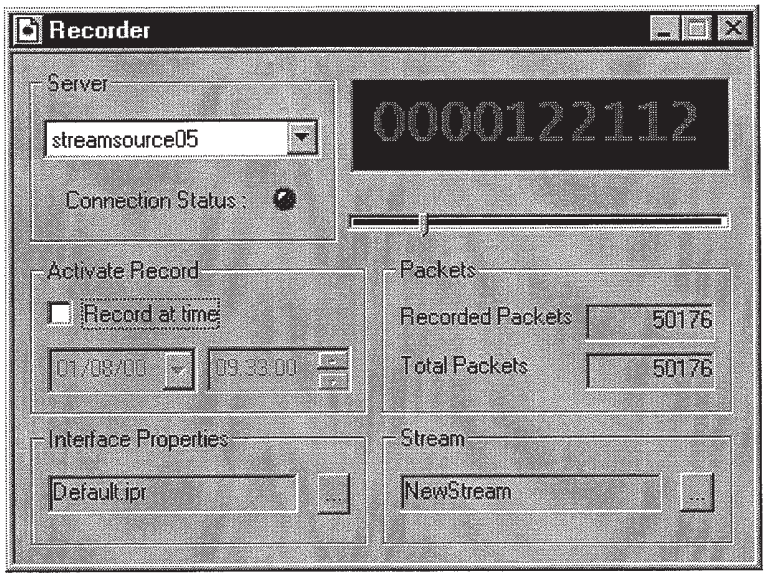


Note that if the playout packet size differs from the source packet size, the playout bitrate may be automatically scaled to allow for the extra/less packets.

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Stream Recorder Window

The Stream Recorder window allows a single stream to be selected and recorded via the server.



Server

The **Server** field contains the name of the currently selected server. If the server has been used in previous sessions, it may be selected from the drop-down list. Servers can be added to the list using the **File** menu option **Servers...** (see Server Selection, page 42).

Different servers may be selected from the Scheduler, the Player and the Recorder windows respectively.

The **Connection Status** 'LED' indicates the current status of the server connection:

- (red) Inactive: no server connection.
- (amber) Standby: server connection made, but not in use
- (green) Active: server connection made and in use.

Playout Display (Recorder)



Counter Display : The Counter Display shows the current playout position in the file. It can shows the number of packets from the start of the file.

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The Kilopackets button K on the Toolbar (or the menu option **File → Kilopackets**) toggles the packet counter display between showing the position within the file in packets or kilopackets.

Activate Record

When the **Record at time** checkbox is not enabled, recording will commence as soon as the connection to the selected server is made; provided of course that a stream is being played into the server.

If the **Record at time** checkbox is enabled, recording will not commence until the date and time specified; until that time **Waiting...** will be displayed in the Recorder window.

If no stream is being played into the selected server, the message **No sync** will be displayed in the Recorder window.

On completing recording, a check will be made for any Players with the same server and stream connected; if any exist, they will be updated with the newly recorded stream; if none exist, a new Player window will be opened. The client-server connection will remain open to allow the stream to be played out or further recordings to be made.

Interface Properties

The Interface Properties file contains a snapshot of the server (recorder) interface settings.

To choose a new properties file, select **Schedule → Select IPR file...** and select a new file (*.ipr).

Packets

Recorded Packets and **Total Packets** are derived from the stream properties file. Note that for a new recording into a pre-recorded stream a warning message will be displayed indicating that the existing stream is abut to be overwritten (Note that this warning can be disabled via the **View → Settings... → Warnings** option).

Stream

Shows the name of the currently selected record file.



Opens a dialog, allowing a stream file to be selected from one of the Video drives of the selected AD991 Stream Source server.

Only preformatted or existing streams can be selected at this point. If an entirely new stream is required, it must first be created using the Stream make Wizard (via **Recorder** menu option **→ Create Stream...**).

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Continuous Time Stamping...

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 *Stream Source User Guide*[1]).

The following timing components are available for modification:

Sequence counters

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

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

Update tables: The following tables are updated:

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.



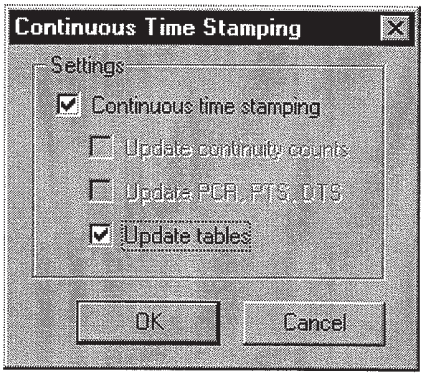
Note that other transport stream errors may occur at the loop point if the stream has not been pre-processed for seamless looping. These errors are not dealt with by Continuous Time Stamping.

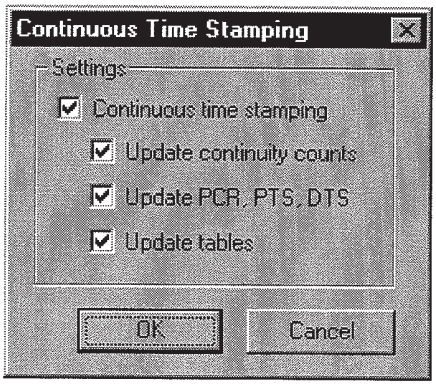
The CTS option is selected from **Schedule/Player → Continuous Time Stamping...** or by clicking **CTS** in the Playout display. The option is read-only when connected to a server.

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Within the Scheduler, only the **Update Tables** option is available when **Continuous time stamping** has been enabled.

This will allow elements such as the time and date to be updated in the SI tables.

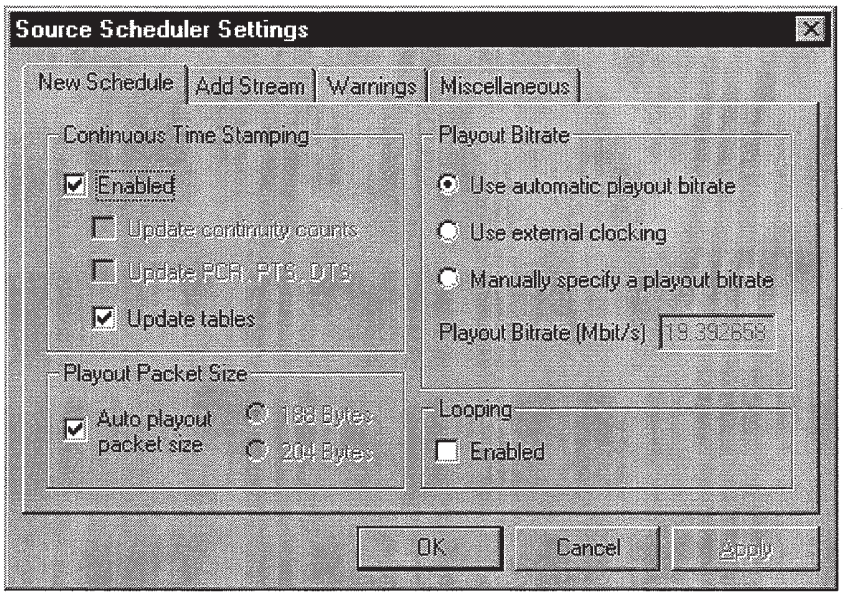




Within Player, all CTS options are available when **Continuous time stamping** has been enabled.

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Settings



New Schedule Settings

The settings on this tab, dictate the defaults that will be applied when a new stream is created; subsequently they may be changed using the equivalent schedule and stream controls.

Continuous Time Stamping

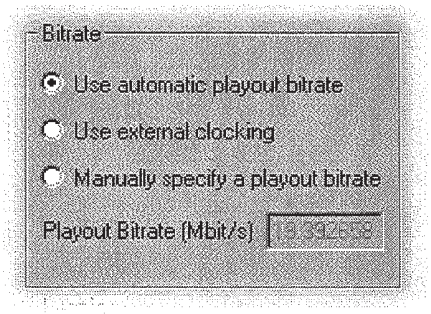
(For details of Continuous Time Stamping, refer to Continuous Time Stamping…, page 35.)

Playout Packet Size When **Auto playout packet size** is enabled, the default packet size displayed is derived from the first stream added to the schedule.

If **Auto**… is disabled, the default packet size can be selected by enabling the appropriate radio button.

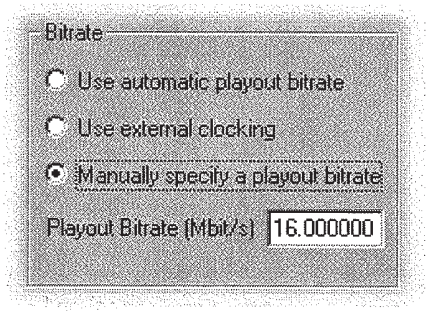
Bitrate

The bitrate displayed in the Schedule window (when the manual selection is disabled) will be derived (at any time) from the first stream in the schedule. The value will be applied for the whole schedule ➔



➔ If the manual selection or the external clock is enabled, a playout bitrate value can be entered.

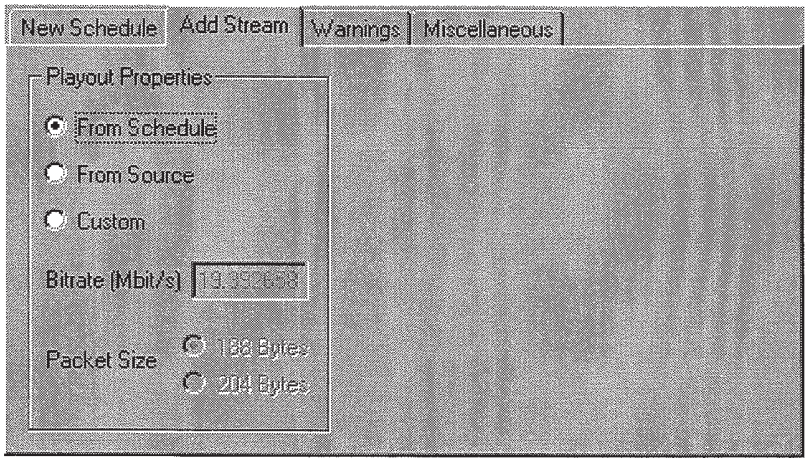
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Valid ranges of values depend on the interface installed in the Server (see *AD991 Stream Source User Guide*[1])

Looping When selected, enables schedule looping as a default.

Add Stream Settings



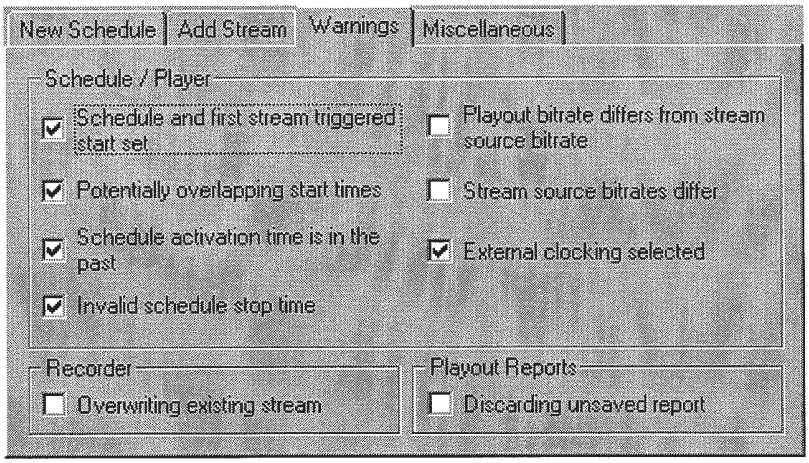
Sets the default playout properties to be used when a stream is added to a schedule.

Any conflict introduced will be indicated on the schedule.

The **Bitrate** and **Packet Size** can only be specified when **Custom** playout is selected.

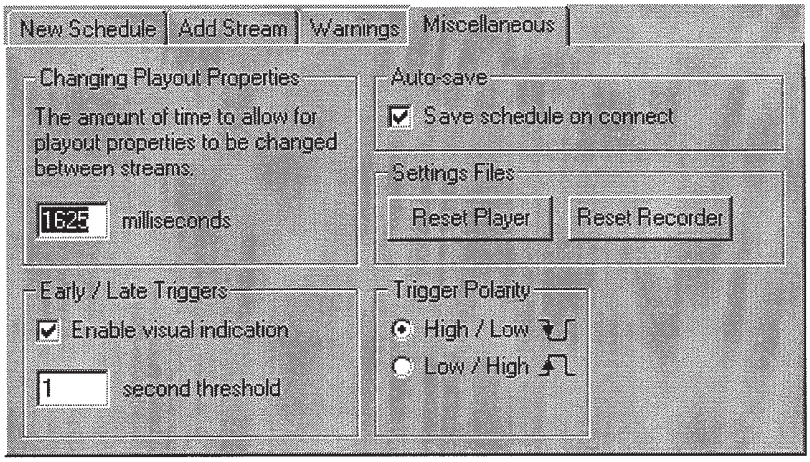
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Warnings Settings



Enables and disables the display of warning dialogs. The dialogs themselves also offer an opportunity to suppress their display; if suppressed, this dialog can be used to redisplay them.

Miscellaneous Settings



Changing Playout Properties

If a schedule with streams of differing playout properties is assembled, this setting gives the time permitted for the server to adjust the playout properties before the schedule should be aborted.



The Changing Playout Properties value should not be adjusted unless problems are being experienced with displayed start times of schedules with different playout properties.

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Early/Late Triggers

This setting allows the user to have a visual indication displayed of the arrival or non-arrival of a trigger pulse (used to initiate the playout of a schedule/stream).

The indication, the stream name being displayed in red, is given as follows:

a) if the trigger pulse arrives either before or after the trigger time plus or minus the trigger threshold,

b) if the trigger pulse fails to arrive after the trigger time plus the trigger threshold.

When enabled, the threshold value entered will be applied and a visual indication given. Note that log entries (Event and Playout) will be made regardless of this setting.

Trigger Polarity

Select the type of trigger pulse expected; rising or falling leading edge.

Auto-save

With Auto-save enabled, the application will attempt to save the schedule whenever a connection is established. If the schedule was previously unsaved the **Save As...** dialog will be displayed. This does not affect the application prompting users to save modified schedules on closing them.

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Importing a Stream

(It is assumed that the user is familiar with the concept of Stream Management as described in the *Stream Source User Guide*[1].)

Briefly, before an MPEG file can be scheduled or used by a Stream Source unit, it must be associated with a Stream Properties File to form a Stream. The MPEG file must also be resident on a Server video drive (If necessary it will need to be copied using the facilities of the Server Stream Source or normal Windows procedures).

Note that when an MPEG file is added to a schedule or loaded into the Player or Recorder, the Stream Properties File is created automatically if it does not already exist. The most common use of the Import Streams option will be where it is required to prepare a batch of new streams for use with Player form the AD991 local control panel.

Note that the user need not be aware of the existence of the Stream Properties File for remote use.

a) From the File menu, select the **Import Streams...** option.

b) Select a server from the **Server** drop-down list. (It may be necessary to add the required Server to the current list, see Server Selection, page 41.)

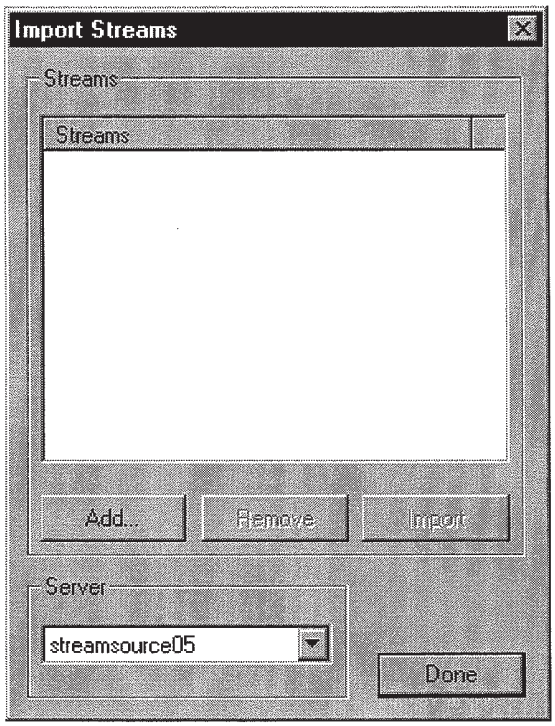
c) Using the **Add...** button, select the required MPEG file from the server's Video drive.

   If a Stream Properties file already exists, a message will be displayed and the selection terminated. If no Stream Properties File is associated with the MPEG file, the Open dialog will close and the MPEG filename will be displayed in the Stream field.

d) Select **Import**.

e) Select Done to close the dialog.

   The Stream is now available for scheduling and local use.



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Server Selection

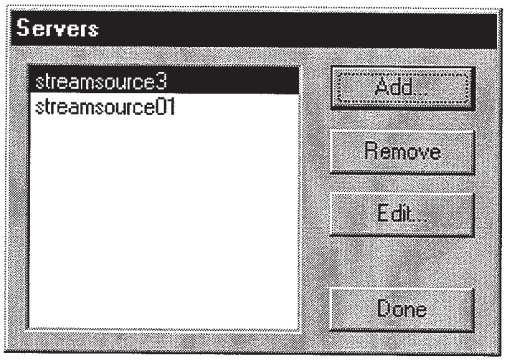
Streams used by the Source Scheduler are resident on servers. All servers available to the client can be held in a list and can be selected as required. Different servers can be used for each activity; schedule, playout, record.

Each server must also associated with playout and record properties files which contain snapshots of the server interface settings. A number of interface properties files may be available on each server to cater for different playout and record requirements.

Consult your System Administrator for the Hostnames of suitable AD991 Stream Source servers.

Open the **Servers** dialog by selecting the **Servers...** option on the **File** menu.

The servers already nominated are listed in the dialog.

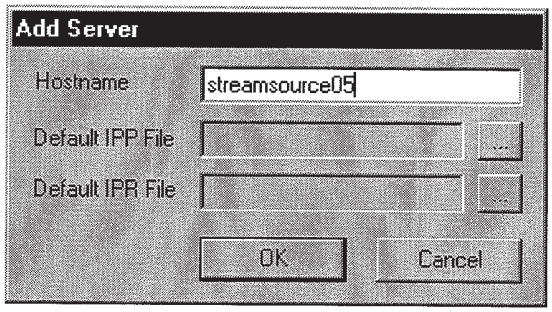


Adding a Server

a) To add a server, from the **Servers** dialog select the **Add...** button.

b) Enter the **Hostname** of the server.

The server cannot be added until play and record interface property files (ipp and ipr respectively) have been selected.



c) Select the browse button. 

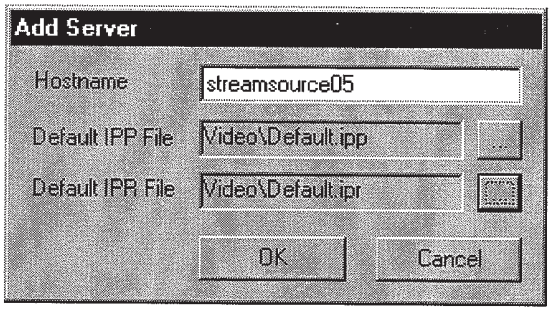
A standard Windows File Open dialog will be displayed.

d) Select an Interface Properties file (from the server) and note that it is displayed in the default field.

e) Select **OK** to close the **Add Server** dialog.

f) Note that the new server name is displayed in the **Servers** dialog.

g) Select **Done** to close the **Servers** dialog.



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Changing the Default IPP/IPR file

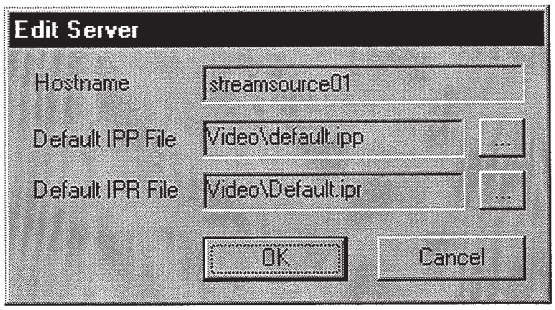
The default interface properties file of a listed server can be changed via the Servers dialog.

a) To change the interface properties file, from the **Servers** dialog select the **Edit...** button.

b) Using the [...] button, select a new interface properties file.

c) Select **OK** to close the dialog.

d) Select **Done** to close the **Servers** dialog.



Note that the appropriate interface properties files (player or recorder) can be changed temporarily via each scheduler function

Deleting a Server

Servers can be deleted from the list via the Servers dialog.

a) To delete a server, from the **Servers** dialog, highlight the server and select the **Delete...** button. Confirm the action.

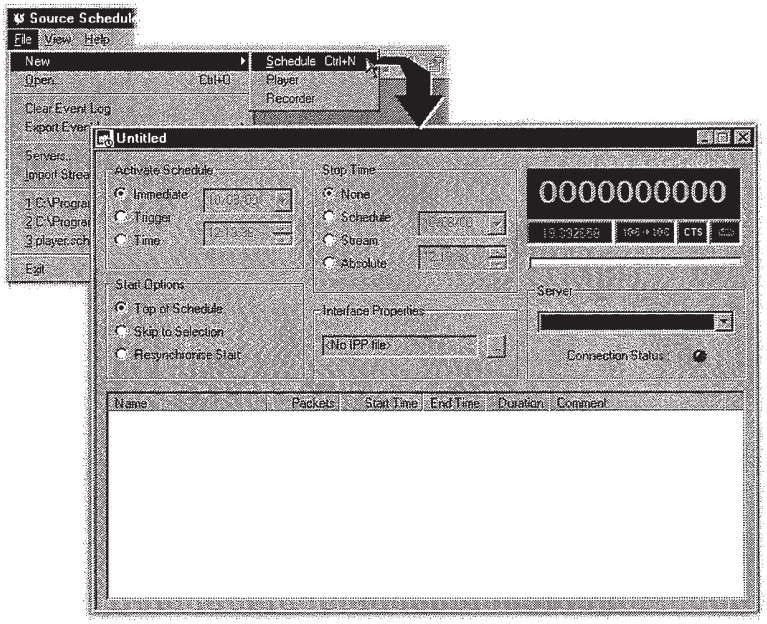
b) Select **Done** to close the **Servers** dialog.

Scheduling Activities

Creating a Simple Schedule

A schedule is a pre-defined list of streams, selected from those resident on a server's Video drive. This example demonstrates the creation of a simple schedule:

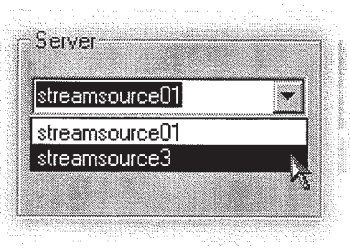
1.) Select **File** ➔ **New**.



At this point, the schedule is unnamed (and unsaved). Whilst not essential if it is to be used only once, it is nevertheless good practice to save it (see below). If it is saved it can also be re-used.

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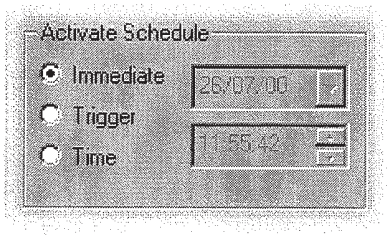
2.) Select a Server.



If the server has been previously used, it will be available in the **Server** drop-down list. If a new server is to be used, it must be added via the Server dialog (see Server Selection).

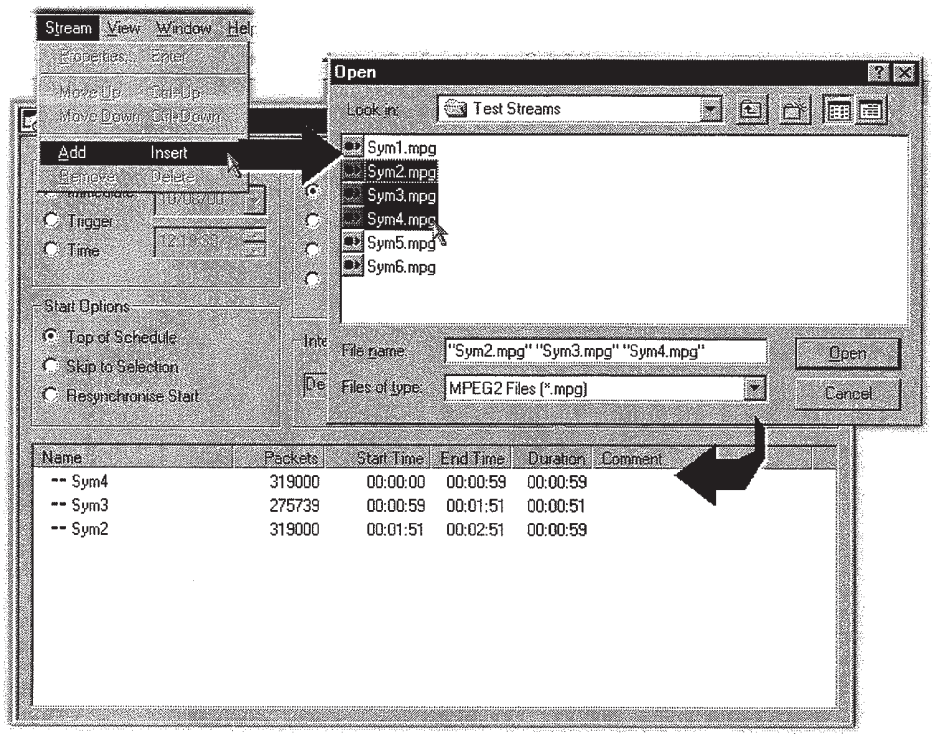
If you wish to check the existence of the server, select **Schedule ➔ Validate**; this will confirm that the server is present and has one or more Video drives.

3.) Select start time.



The start time of the schedule can be the moment it is played on the server (**Immediate**) or at a scheduled time (**Trigger** or **Time**).

4.) Add Stream.



Up to 256 streams can be added to a single schedule (or 128 in schedule that is to be looped).
Select **Stream ➔ Add** to gain access to the server's video drive and locate the required streams. Streams can be added individually or in multiples using standard Windows techniques.

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Adding a stream with no recorded packets will not be allowed.

5.) Set Schedule Options (Loop; Continuous Time Stamping)
If the schedule is to be looped, ensure that the loop icon in the player section of the schedule window is illuminated. Toggle the function by selecting **Schedule ➔ Toggle Looping**.
If the time values in the scheduled streams are to be updated as the schedule plays, select **Schedule ➔ Continuous Time Stamping...** and ensure the **Update tables** box is checked.

The final action in creating a schedule should be to save it as described in the following paragraphs.

Schedule Timing

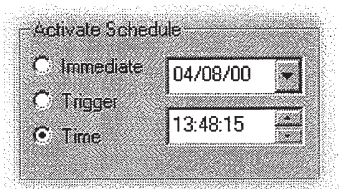
Schedule timing is a result of interaction between stream Start Time and Activate Schedule.

When a single stream is added to a new schedule with no Activate Schedule date/time assigned, the Start Time is assumed to be 'now'.

The start times of streams subsequently added to the schedule are cumulative, thus:

Name	Packets	Start Time	End Time	Duration	Comment
-- Sym1	1650000	00:00:00	00:00:59	00:00:59	
-- Sym5	319000	00:00:59	00:01:11	00:00:11	
-- Sym4	319000	00:01:11	00:01:22	00:00:11	
-- Sym2	319000	00:01:22	00:01:34	00:00:11	
-- Sym3	638000	00:01:34	00:01:57	00:00:23	
-- Sym6	212766	00:01:57	00:02:05	00:00:07	

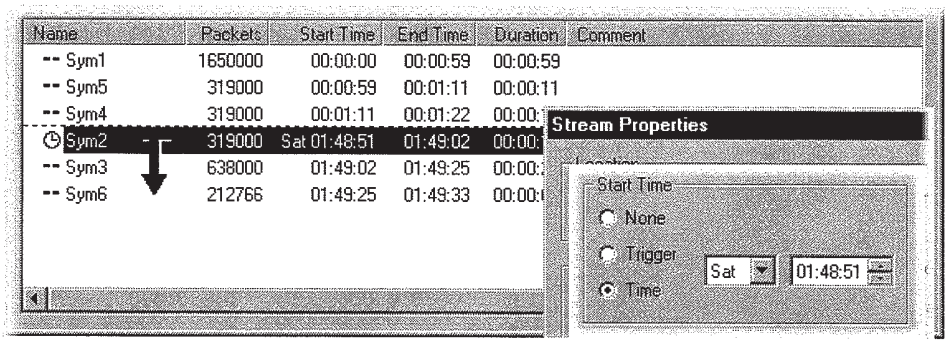
If an Activate Schedule date/ time is set, this will be applied to all streams:



Name	Packets	Start Time	End Time	Duration	Comment
-- Sym1	1650000	13:48:15	13:49:14	00:00:59	
-- Sym5	319000	13:49:14	13:49:26	00:00:11	
-- Sym4	319000	13:49:26	13:49:37	00:00:11	
-- Sym2	319000	13:49:37	13:49:49	00:00:11	
-- Sym3	638000	13:49:49	13:50:12	00:00:23	
-- Sym6	212766	13:50:12	13:50:20	00:00:07	

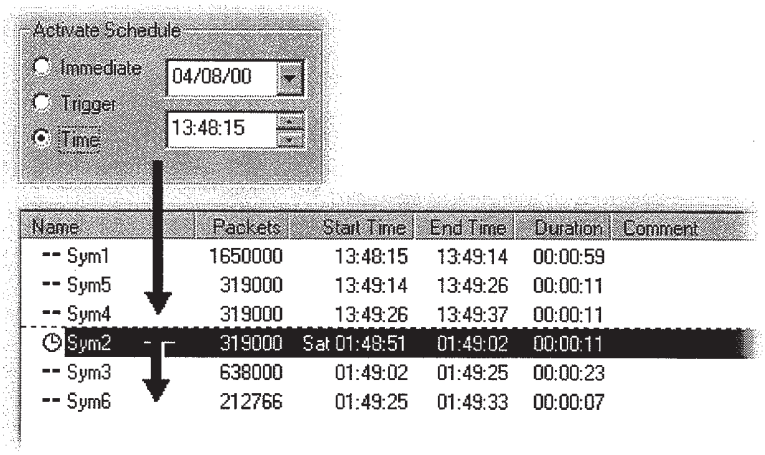
If a Start Time is set for an individual stream, then the start day/time of all subsequent streams will be modified; streams prior will be unaffected:

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The day may be up to a week ahead.

Similarly, an Activate Schedule date/time will provide a specific start time for only those streams without a specific start date/time.



Note that, in the example above, the *streams* 'Sym2, etc' are scheduled to run on a specific day in the future. If the Activate Schedule date were to be set for any day after 'Saturday', the whole *schedule* would be affected and the 'Saturday' in 'Sym2, etc' would then refer to the *next* Saturday.

Saving a Schedule

To save a Schedule for future use:

1.) Select the schedule window to be saved; note that more than one schedule may be displayed.

2.) Select **File → Save** to either save a new schedule or to resave an existing schedule.
Select **File → Save As...** to save a schedule under a different name.

3.) A standard Windows dialog is displayed; simply follow normal Windows procedure to save the schedule. Note that the schedule is stored on the local hard disk, not the server Video drive.

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Retrieving a Schedule

A previously saved schedule can be retrieved using the **File → Open...** command and following normal Windows procedure.

'Playing' a Schedule

Before a schedule can be played, a connection must be established with a server. Note that provided that the streams are similarly named and located at the same point in the directory structure, any server can be used to implement the schedule.

1.) Retrieve and display the required schedule (see *Retrieving a Schedule*).
If a newly created or modified schedule has not previously been saved, an opportunity to save it will be offered when connection is attempted.

2.) Select **Schedule → Connect**.
If the server is operating locally (playing, recording, etc.), an opportunity will be offered to cancel the local activity and proceed with the scheduling activity. Similarly, if the server is under remote control by another remote interface, an opportunity will be offered to cancel that remote activity and proceed with this scheduling activity.

When a connection has been established, the **Connection Status** LED in the Schedule window changes from red (no connection) to orange (standby).

3.) The **Schedule → Play** option becomes active and can be selected while the connection is active. If **Play** is selected, the schedule will start immediately (**No Delay** set) or display **Waiting...** (**Delay** set) until the schedule activates.

When a schedule is running, the **Connection Status** LED in the Schedule window changes from orange (standby) to green (active).

4.) Termination of the schedule can be either normally (when the schedule has completed) or by user intervention at either the server or the Source Scheduler interface. In all cases, the connection is broken and the **Connection Status** LED changes from green (active) to red (no connection).

If a schedule is terminated (either via the local server user interface or by another Source Scheduler), a message will be displayed informing the user that the server has terminated the connection.

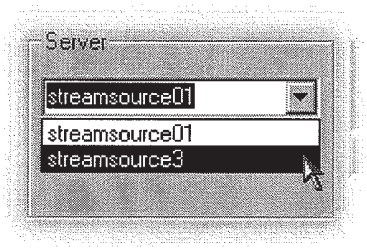
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Player Activities

The Stream Player allows a single stream to be selected and played via the server. Streams are selected

Selecting a Stream

Before a stream can be selected for playout, a server must be identified.



If the server has been previously used, it will be available in the **Server** drop-down list. If a new server is to be used, it must be added via the Server dialog (see page 42).

If you wish to check the existence of the server, select **Schedule → Validate**; this will confirm that the server is present and has a Video drive.

1.) Select the browse button (...) in the **Stream** pane of the Player window and select the required stream.

2.) Set Player Options (Loop; Continuous Time Stamping)
If the stream is to be looped, ensure that the loop icon is illuminated. Toggle the function by selecting **Schedule → Toggle Looping**.
If any of the continuous time stamping options are to be used during playout, select **Schedule → Continuous Time Stamping...** select the required configuration.

The stream is now ready to be played out via the server.

Playing a Stream

Before a stream can be played, a connection must be established with a server. Note that provided that the stream is similarly named and located at the same point in the directory structure, any server can be used to play the stream.

1.) Select **Schedule → Connect**.
If the server is operating locally (playing, recording, etc.), an opportunity will be offered to cancel the local activity and proceed with the playout activity. Similarly, if the server is under remote control by another remote interface, an opportunity will be offered to cancel that remote activity and proceed with this playout activity.

When a connection has been established, the **Connection Status** LED in the Player window changes from red (no connection) to orange (standby).

2.) When a connection is established, the **Schedule → Play** option becomes active and can be selected while the connection is active.

When a stream is playing out, the **Connection Status** LED in the Schedule window changes from orange (standby) to green (active).

3.) Termination of the playout can be either normally (when the playout has completed) or by user intervention at either the server or the Source Scheduler interface.

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If the playout is terminated normally or by user intervention at the Source Scheduler, the connection is not broken but returns to standby; the **Connection Status** LED changes from green (active) to orange (standby).

If the playout is terminated by the server, a message is displayed informing the user that the schedule has been terminated by the server, the connection is broken and the **Connection Status** LED changes from green (active) to red (no connection).

Recorder Activities

The Recorder allows a single stream to be recorded.

Creating a Stream

Streams can be recorded over existing files, but before a new stream can be recorded, a new empty file must created and initialised. Note that the file is not a valid MPEG stream until a complete recording has been made to it via the Recorder.

The Transport Stream Maker wizard facilitates the preparation of an empty file ready for recording.

The wizard is accessed via the **Recorder** menu option **Create Stream....** Use of the wizard is described in the Transport Stream Make section of this User Guide.

Recording a Stream

In order for a stream to be recorded it must be played from an external source into the Server (Refer to the AD991 section of this User Guide).

1.) Select a Server

2.) Specify a Stream

3.) Specify a time at which recording should commence (if required).

4.) Connect

5.) Record

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Technical Specification

Client PC

IBM compatible 300MHz Processor, 64M RAM (minimum).

Windows NT4.0, Service Pack 5 (minimum).

Display resolution: 800 x 600 (minimum)

Multiplexer (option): Ultra2 SCSI hard drive is recommended.

Glossary

ATSC	Advanced Television Systems Committee
BSD	Broadcast Satellite Digital
CTS	continuous time stamping
DVB	Digital Video Broadcasting
ipp	player interface properties
ipr	recorder interface properties
ISDB	Integrated Services Digital Broadcasting
MPEG	Moving Picture Experts Group
PC	Personal computer
spf	stream properties file

References

[1] Stream Source User Guide, Adherent Ref: SI163

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