



24i16
Multimedia System for RISC OS
computers

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Welcome!

This manual contains information to assist you in using the **24i16** colour digitising and sound sampling package for RISC OS machines. Within its pages are installation instructions, specifications, hints/tips and descriptions of how to use the software and hardware. A glossary near the back of the manual may help you with unfamiliar buzzwords or expressions.

Acknowledgements

The following deserve thanks for all their work, help, advice and useful information which have put the hardware and software together; Simon Middleton, Chris Honey, Steve Hobbs and Dave Probert.

A RISC OS computer was used to prepare the entire manual. All scanned images were grabbed using **Prol-Mage**.

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Conventions used in this manual

Throughout the manual we have used the following conventions:

Files, application names and directories are shown in ultrabold type, e.g:

!ReplayDIY

Menu names and options are shown in bold, e.g:

Save

Key presses are shown in a typewriter font, e.g:

`return`

Introduction

What you should know now

We assume that you are familiar with the RISC OS desktop, and standard RISC OS applications.

If you are a new user or you do not know how to use the desktop then you should read the Welcome and User Guides which came with your computer. You should also try using some standard applications for a while e.g. **Paint** and **Draw**.

Read the manuals!

You should familiarise yourself with this manual and those supplied by the manufacturers of your video and audio equipment.

Don't forget the ReadMe



A file called **ReadMe** may be found on the floppy disc. This details any last minute changes or additional features made to the software since this manual was written. You should read this text file using **Edit** before Installation. If there is no **ReadMe** file present then you can carry straight on with the Instructions in this manual.

You are probably impatient to get 24116 working as soon as possible. Before you try please read the sections about hardware requirements and installation carefully. Then you should have no problems in getting the hardware and software to work.

General requirements of your computer

You need a machine running version 3.1 (or later) of the RISC OS operating system, a hard disc with several Mb of free space, a minimum of 4Mb of RAM and a backplane with a free expansion slot.

About Digitising and Sampling

How the digitiser works

The analogue TV signal is first separated into brightness and colour components (with S-Video this is already done). Then the components are converted into digital data and stored in a memory on the digitiser. This memory is known as a framestore and is a temporary local storage area. When the computer needs the video data it must read it out of the framestore.

Pixels

You can imagine the digitiser dividing up the TV image into a rectangular grid and measuring the brightness and colour at each square on the grid.

256 grey levels

The squares are known as pixel elements or pixels for short. For the brightness information each pixel can have a value between 0 (darkest) and 255 (lightest).

Bit Images

The TV image is transmitted as a series of lines (called rasters). The block of data created from these lines is called a raster image, bitmap or bit image (strictly the latter two types refer to monochrome i.e. bit per pixel images). Sprites are examples of raster images.

Colour Sub-Sampling

In a TV signal the colour information is sent at a lower resolution than the brightness. This exploits the fact that our eyes are not as sensitive to colour detail. Similarly **24i16** does not store the colour data as frequently as the brightness.

24 Bit Colour

There are two colour components each with values ranging from zero to 255. Together with the brightness these give a total possible range of 16.7 million colours.

About Digitising and Sampling

How the Sampler works

Analogue audio signals are first turned into digital data. **24i16** uses state-of-the-art analog-to-digital converters based upon delta-sigma technology. This allows a wide range of sampling frequencies without having to use external costly and complex anti-alias filters.

Direct-to-Disc Sampling

24i16 allows high quality samples to be captured direct to disc. It gets around requiring large amount of free memory *by* buffering the audio data on the card. Whilst the buffers are being filled data can be transferred to hard disc, allowing a continuous stream of data to be captured. Sample length is limited only by free disc space. Stereo 16 bit samples can be captured at up to 48 KHz sample rates on standard machines.

16 bit output

A 16 bit output from the card allows samples to be played back via external amplifiers and speakers. This gives a much higher quality result than using the built-in sound system. In fact using playback from **24i16** it is hard to tell the difference between sampled and original audio even if the source was from CD or DAT.

Integrating with existing sound system

24i16 can also be integrated into the built-in sound system on A5000 and similar machines *by* connecting to the auxiliary audio plug. This allows the 16 bit output to be mixed in with the computer output, so you can listen to samples via the built in speaker. Also this may be used to sample the output from the computer.

Installation

Software Installation

All the software necessary to operate **24i16** is supplied on the floppy disc(s) provided.

Installing the software is a very simple process, as with most RISC OS applications.

Install the software on your hard disc

Open a directory on your hard disc drive where you want to install the application software. Insert the program disc into drive 0 and click on the floppy drive 0 icon on the icon bar. A directory will appear showing the files on the floppy disc. Select all the applications on the disc and copy them into the directory on your hard disc. You must install the software onto your hard disc, no other media has the speed to keep up with the video and audio recording process.

Hardware installation

Keep the original program disc(s) in a safe place.

Note: when installing hardware, your computer and all its peripherals should be disconnected from the mains supply. To be safe unplug all the mains plugs from the supply.

Expansion card use

To fit **24i16**, follow the expansion card fitting instructions that came *with* it. These also tell you how to dismantle your machine.

Connecting to the built-in sound system

Whilst the lid of your computer is off you should connect the audio expansion lead from **24i16** to the auxiliary audio connector on the main PCB of your computer. See separate sheet for details.

Installation

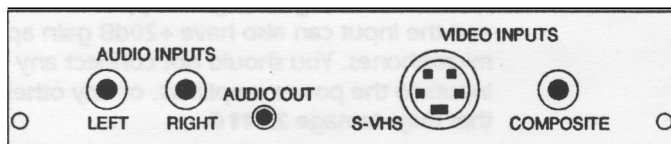
Check list



Make sure that you have correctly installed the expansion card and the cover of your computer has been replaced and screwed in place.

Power up!

You are now ready to power up your computer. If the computer does not power up properly, for example If It does not beep or the desktop does not appear on the monitor then turn off and check the hardware Installation thoroughly.



Rear of 24116 showing connectors for Input video and audio.

Connections

Appropriate leads are required to connect your video and audio sources to **24i16**. There are five sockets on the rear panel of the card - two phono sockets for left and right audio channel Inputs, one phono socket for composite video input, one 3.5mm Jack for audio output and a mini-din for S-video Input.

You can use any domestic or professional composite or S-Video source with **24i16** including: video cameras, video cassette recorders, camcorders, videodisc players and still video equipment.

Video Inputs

Many modern domestic video sources have SCART connections, and SCART leads are readily available which have phono plugs fitted at the end of the lead.

Installation

S-Video

If you have S-VHS or S-Video equipment then use the 4-pin mini-DIN socket for separate chrominance and luminance signals.

Audio inputs

Often the audio output from the video source will be used. However, tape players, compact discs, mixers etc can also be connected to **24i16**. The inputs and outputs are at line level (nominally 1 volt peak-peak). You can adjust these levels if necessary over quite a wide range using the application software and the input can also have +20dB gain applied for microphones. You should not connect any of the inputs to the power amplifiers, or *any* other source that may damage **24i16**.

Audio Output

Most modern domestic audio sources have phono/ 3.5mm Jack connections, and leads are readily available to connect them to the **24i16**'s output. Note that the output requires an amplifier to drive speakers or headphones.

Internal Speaker

Audio can be monitored using the internal speaker providing you have fitted the expansion lead.

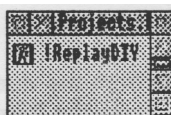
Typically you would connect an audio source to the inputs and an amplifier and pair of speakers to the output of **24i16**. Then when the application is being used you will be able to monitor recorded samples, play them back and set levels etc.

If you have difficulty locating suitable leads then please contact us.

Brief guide to 24116's Application software

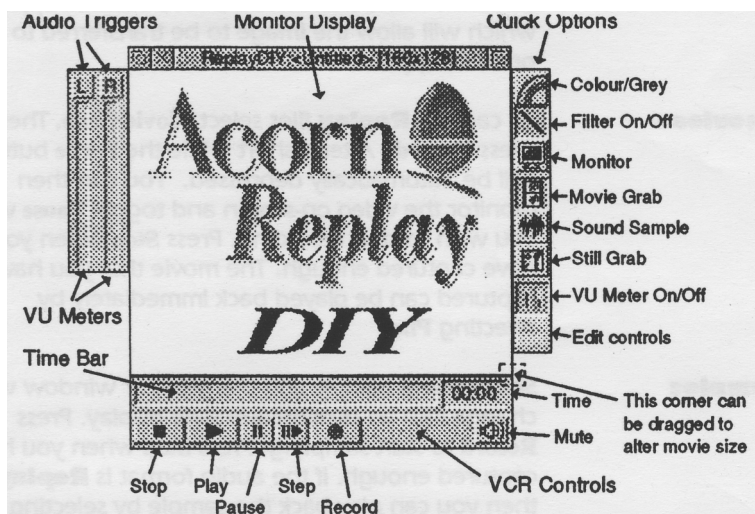
This section gives a basic outline of how to use **24i16**. The user guide which follows explains the use of each function in more detail.

Starting the software



Open the directory where you installed **24i16**'s software and double click on the **!ReplayDIY** icon. The software will install itself on the Icon bar.

Click on **ReplayDIY** on the Icon bar. The main window will appear as shown below.



Video Monitoring

If a video source is connected and the Monitor button is pressed you will obtain a live window of video (you may have to select the S-Video input from the video hardware controls - see later).
Connecting

Brief guide to 24116's Application software

Audio Monitoring

an audio source to the phono inputs, and speakers to the 3.5mm audio output will also allow you to monitor the audio as well.

Capture Modes

On the Quick Options tool bar are the Movie Grab, Sound Sample and Still Grab buttons. These determine the capture mode for **24i16**.

Still Images

For example, to obtain a still image from the video press the Still Grab button. Then, press the Record button. After a short while a save box will appear which will allow the image to be transferred to disc or other applications.

Replay movies

To capture **Replay** files select Movie Grab. Then press Record. After a short while the Pause button will be automatically depressed. You can then monitor the video on-screen and toggle Pause when you wish to start recording. Press Stop when you have captured enough. The movie that you have just captured can be played back immediately by selecting Play.

Audio Samples

Select Sound Sample and the monitor window will change into an oscilloscope style display. Press Record to start sampling. Press Stop when you have captured enough. If the audio format is **Replay** then you can play back the sample by selecting Play.

Further details

The following pages detail the operation of the rest of the application such as changing audio format, adjusting image size and Image format etc.

User Guide - Icon Bar menu

Icon Bar Menu

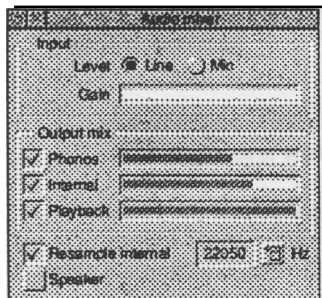
Select this menu by clicking with the middle mouse button over **ReplayDIY** on the icon bar.

Info

Info displays the software version number. if you contact us for support please quote this number.

Audio Mixer

Clicking on this menu item will display the mixer Control panel.



Line and Mic select the input level for the phono inputs. Mic adds +20dB of gain. The slider bar beneath these options allows gain adjustment.

Phonos, Internal and Playback options determine which audio sources are mixed to the 3.5mm jack output. The slider bars alongside each option adjust their respective volumes.

Filtering built-in audio

The unfiltered audio signals from the computer can be filtered using Resample Internal. The cut-off frequency of the low-pass filter can be selected from the menu alongside this option.

Internal Speaker

The internal speaker can be used to monitor audio by selecting Speaker.

Save Choices

This option allows your favourite settings to be saved for future usage.

Quit

Quit will remove the application from memory and free the disc space taken up by temporary files. You will be given the chance to save work in progress.

User Guide - Main Menu

Main Menu



This menu is selected from the monitor window.

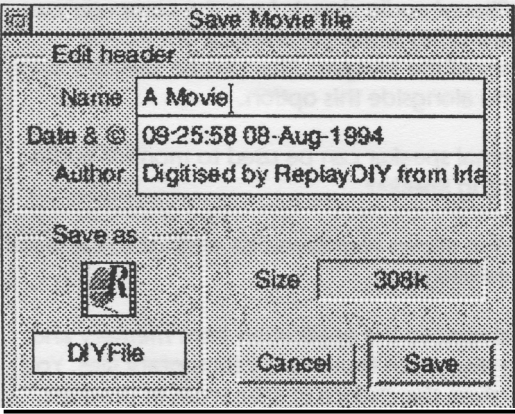
File leads to Save Movie..., Save Audio and Save Frame options.

Selecting Save Movie... will open the dialogue box for this option providing that you have recorded a movie first (see later).



Save Audio will allow the sound sample to be dragged to other applications and directories.

Save Frame will save the contents of the monitor window. This option is to allow single frames of movies to be exported. Note: much better still video images are obtained by using still grab mode.



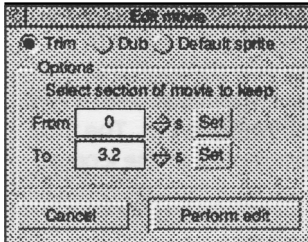
From the Save Movie... dialogue you can edit the **Replay** movie header information. Some details are filled in for you automatically. However, you may edit these as you wish. The movie size is also shown.

To save the movie drag the **Replay** icon out of this panel to the desired destination.

User Guide - Main Menu

Edit Movie

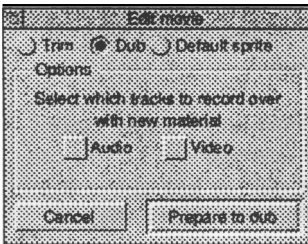
Trim



Once you have recorded a movie it is possible to perform some simple editing operations on it. These operations can also be carried out on other movies by dragging them into the main window. The three editing options are Trim, Dub and selecting the Default sprite. To carry out more sophisticated editing requires a dedicated package like **Empire from Uniqueway**.

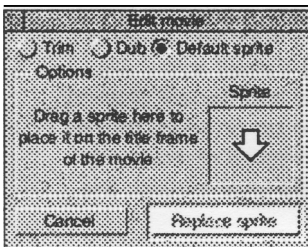
Trim enables a portion of the recorded movie to be cut out of the total duration. The start (From) and end (To) times are filled in automatically from the movie length. These values can be adjusted by editing the values. Or you can move the time bar slider (see later) and press either of the Set buttons. The latter method allows the start and end points to be determined interactively.

Dub



Once you have recorded a movie its audio or video tracks may be recorded over (or dubbed). To do this select which track(s) is to be altered. Then select Prepare to dub, you can then record again and just the track you selected will be overwritten. By adjusting the time bar slider (or playing through part way) and then selecting Prepare to dub you are able to insert new data in the middle of a movie.

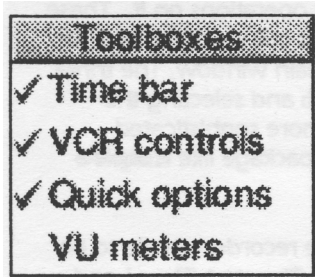
Default Sprite



The helpful sprite is displayed by applications such as !ARPlayer when you drop a movie in. By default the helpful sprite is generated from the first image in the movie. But you can alter this by selecting Default sprite and then dropping in a

User Guide - Main Menu

Tools



This menu allows you to select which tool boxes will be displayed. You can use this feature to reduce the area of the desktop taken up by the application.

During playback the Time bar indicates the current position in the movie. By dragging the bar it is possible to start playback part way through the movie. It can also be used in conjunction with Trim (see above) to set crop points interactively. The time in minutes and seconds is also shown in the icon at the end of the time bar.

VCR Controls include the Stop, Play, Pause, Step, Record and Mute buttons.

Quick options is the vertical tool bar on the right hand side of the main window.

VU meters

The VU meters monitor the level of the audio inputs. They are damped and show average levels. You can use these to set up the input gain or just to monitor the audio visually whilst muted or without any speakers connected.

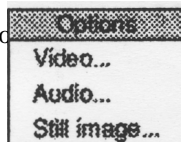
Using audio level to trigger recording

The L and R options above the VU meters select trigger points on the left and right audio inputs respectively. When selected a small arrow will appear pointing towards the appropriate channel. The arrow(s) can be dragged up or down the VU bars. Then, after Record is pressed capture will automatically start if the audio level exceeds the trigger point(s).

Main Menu - Record Options

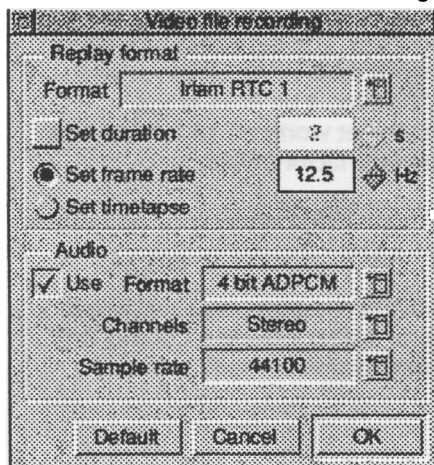
Record Options

These select options for the three capture modes; *Movie Grab* (Video...), *Sound Sampling* (Audio...) and *Still Grab* (Still image...).



Video...

This control panel configures the options for movie grabbing.



Format determines the type of Replay video that is used.

Type 3: YUV 2:1:1 - 25600 bytes per frame

Type 4: 8 bit monochrome - 20480 bytes per frame

Type 5: YUV 4:1:1 - 20480 bytes per frame

Type 6: YUV 16:1:1 - 15360 bytes per frame

Frame sizes are for 160 by 128 sized movies.

Types 3,5,6 contain 15 bit data (5 bits each of luminance, U & V chrominance) at differing levels of sub-sampling. Type 4 is straight 8 bit monochrome data.

When Set Duration is selected the movie duration to be recorded can be entered in seconds.

The rate of image capture can be set in terms of Images per second (with Set frame rate) or as a specified time between images (with Set timelapse). The time lapse option allows movies to be made of slow events e.g flowers opening and clouds forming.

Main Menu - Record Options: Video

Video...

You can disable audio capture *by* turning off Use in the lower part of the Record options control panel.

The audio format, number of channels and sample rate can all be set up in the lower part of this control panel.

Formats

8 bit linear, 8 bit logarithmic, 16 bit linear and 4 bit ADPCM are supported. The logarithmic format is compatible with that used in the built-in sound system (i.e VIDC format). 4 bit ADPCM is a compressed format that works on 16 bit data and reduces data rate *by* a factor of four.

Channels

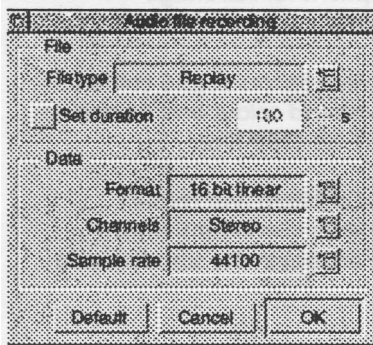
Select between mono (left channel only) and stereo (two channels).

Sample rate

There is a wide range of sample rates supported from 5510Hz up to 48KHz including CD and DAT rates and common fractions thereof.

Main Menu - Record Options: Audio

Audio...



This panel sets options for Sound sampling.

Filetype sets the audio format which can be chosen from Replay, Armadeus, Microsoft Wave and Creative VOC.

The duration can either be controlled using the Record and Stop buttons or by selecting a fixed sample length in seconds.

Formats

8 bit linear, 8 bit logarithmic, 16 bit linear and 4 bit ADPCM are supported. The logarithmic format is compatible with that used in the built-in sound system (i.e VIDC format). 4 bit ADPCM is a compressed format that works on 16 bit data and reduces data rate by a factor of four.

Channels

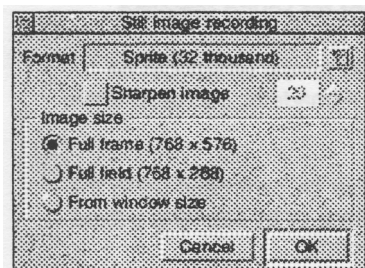
Select between mono (left channel only) and stereo (two channels).

Sample rate

There is a wide range of sample rates supported from 5510Hz up to 48KHz including CD and DAT rates and common fractions thereof.

Main Menu - Record Options: Still Image...

Still image...



This panel controls options for still image grabbing.

You can choose between Sprites In 256 colour, 256 greyscale, 32 thousand colour and 16 million colour flavours and 24 bit Clear files.

256 colour sprites are dithered and colour matched using proprietary algorithms which produce high quality images in the standard 256 colour desktop.

Sharpening

Images may be sharpened *by* turning on the Sharpen Image option. The amount of sharpening is determined *by* the numeric value alongside. The sharpening value ranges from 8 to 32 with smaller values giving sharper images. 8 is very severe and will perform edge detection.

Image size

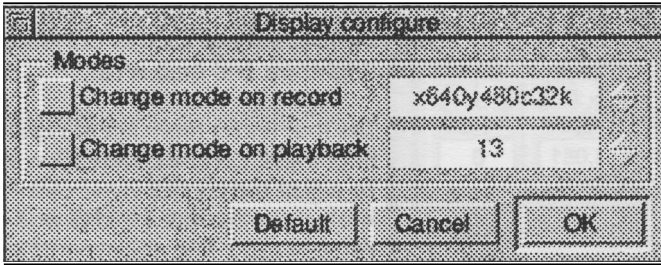
Providing you have the 1 megabyte VRAM option, full PAL TV frames may be captured up to 768 pixels by 576 lines. A full field is 768 pixels by 288 lines.

Note: field and frame capture will grab the entire video area which may include some black borders and teletext lines (timecode etc).

You can select between Full frame, Full field and window size capture. The latter option will capture a scaled still image of the size that is used to generate the monitor window display.

User Guide - Main Menu

Display...



During record and/or playback it is possible to configure the application to use specified screen modes. You enable these features and specify screen mode (as a number or mode string) from the Display... control panel. This facility is used outside of the desktop i.e all of the normal control buttons and tool windows will not appear. So you can use the card in graphics enhancer modes that are not desktop compatible. The keyboard and mouse buttons are then used to control recording and playback:

Escape, Space, MENU: stop or abort recording

M: toggle mute

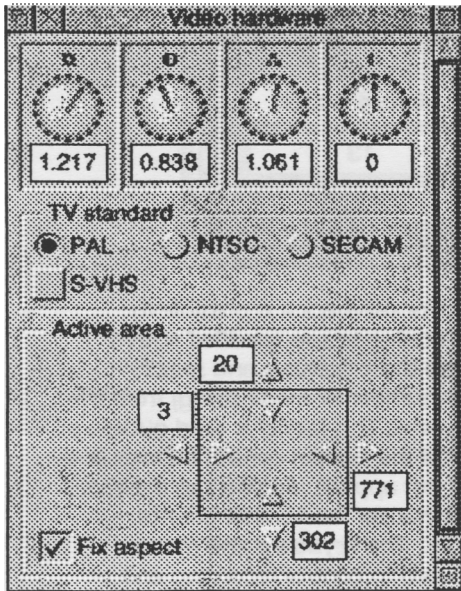
R: start recording

SELECT: toggles pause mode

MENU, Escape: exits playback

ADJUST: pause whilst held down

Video Hardware...



Select this option to adjust the video digitiser settings such as Contrast, Brightness and grab area.

The four knobs (from left to right) control Brightness, Contrast, Saturation and Hue. To adjust the control value click inside the knob circumference (or click and drag). You can make fine adjustments by clicking adjust either side of the knob pointer which will change the value by its smallest step. The icon beneath each knob displays the control value numerically. These can be edited manually. The monitor window will show the effect of any changes made to these controls, so you can set up the optimum display interactively.

Three TV standards can be selected as well as the S-VHS input.

Active area

Active area defines the part of the input video field that is used by the digitiser. By adjusting these values you are able to pan around the video input to a certain extent. The control at the top is the first line to be digitised. The control on the left is the first pixel along a line. The rightmost control is the last pixel along a line digitised, and the bottom control is the last line of the field to be grabbed. There are some constraints on these numbers. The first pixel must be greater than 2. The number of pixels along

Active area limits

User Guide - Main Menu & Main Window

Active area limits

a line (last pixel - first) must be less than 768. And the number of lines (last line - first line) must be less than 288. The application will attempt to ensure that these numbers are sensible and will adjust them if they are outside normal values. Also note: the input video is scaled down so if the monitor window has 288 lines then the software will not allow fewer than this number to be selected.

Fix aspect

When this option is selected the input video will be scaled to TV aspect ratios, so that objects will not be distorted. Then when the monitor window is resized the nearest scale (consistent with TV aspect ratios) will be selected and the picture cropped to fit.

Scale to fit

When this option is turned off the input video will be scaled to fit entirely within the monitor window and objects may appear distorted.

Main Window

Resizing

The main window monitors the input video (and audio in Sound Sample mode). If you move the pointer near to the bottom right hand corner of the window (ignoring the toolbars) it will change shape indicating that the corner may be dragged (using either Select or Adjust). As the size is changed the title bar will indicate the new size.

Toggle Size

If you click on the toggle size icon the monitor window can be toggled between full size (dithered) and half size (undithered). Note that the undithered display will only show a good range of colours in 16 and 32 bit screen modes.

User Guide - Quick Options & VCR Controls

Quick Options

On the right hand side of the main window is the Quick Options tool bar.

Colour/Greyscale

This toggles between colour and greyscale monitor display. Only the monitor is affected by this control. Clicking with adjust opens the Display control.

Video Filter

24i16 always has the video filter enabled so this option is normally greyed out.

Monitor

This turns the monitor window on or off.

Movie Grab

Click on this to enable Movie Grab mode.

Sound Sample

This enables Sound Sample mode.

Still image Grab

Click on this to enable Still image Grab mode.

You can also click using Adjust on the three items above to open their respective control panels.

VU Meters

This toggles the VU Meters on or off.

Edit

This selects the Edit Movie control panel. See previous section for details of how this is used.

VCR Controls

This is the toolbar at the bottom of the main window. From left to right the button functions are Stop, Play, Pause, Record and Mute.

Stop

This stops playback & recording of movies and noun samples.

User Guide - VCR Controls & Time Bar

| | |
|--------------------------|---|
| Play | Starts playback of movies. |
| Pause | Stops playback, but allows it to be resumed later from the point where you left off. Press Pause again to restart. |
| Step | After a Pause it is possible to step through a movie frame by frame using this button. Click each time you wish to advance by a frame. |
| Record | Starts recording movies, samples and initiates still grabs depending on the capture mode. |
| Mute | When pressed this turns off the audio during playback. Press it again to hear the audio track. |
| <u>Time Bar</u> | This is just above the VCR Controls and consists of a slider bar and the elapsed time icon. |
| Scrolling through | After a movie has been captured the slider bar can be adjusted to any point within the movie. Pressing Play will then start playback from that point. During playback the slider bar updates in real-time to indicate the position within the movie. The slider can be used to set start and end edit points in conjunction with the Trim control panel. It can also be used to move to a position part way through a movie for dubbing. |
| Time Counter | As the time bar is adjusted the elapsed time icon indicates the movie position in minutes and seconds |

File Formats

Sprites



24i16 supports several file formats including sprites, Clear files, Replay, Microsoft Wave, Creative VOC and Armadeus.

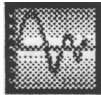
Sprites are used for still Images. Sprites can be 256 grey level, 256 colour or 16 and 32 bit deep sprites. These can be dragged and dropped into any RISC OS application that supports them. Deep sprites are for use on Risc PC.

Acorn only 24 bit formats



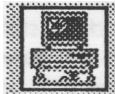
Clear files are a 24 bit format devised by the author of **Translator** (a package similar to **ChangeFS!**). Clear files are simple and are supported by several applications on RISC OS computers.

Armadeus



Armadeus files are mono 8 bit linear sound samples.

Microsoft WAVE



Wave files are audio samples in an Industry standard format which is chunk based and copes with virtually any format, resolution, sample rate etc.

VOC files



VOC files are commonly used by SoundBlaster cards on PC's etc. They are another type of flexible audio file format like Wave files.

Replay files



The Replay file format was devised by Acorn and is very flexible. The types of audio and video which Replay can cope with can be expanded by adding new players to the !ARMovie resource directory. This is the preferred file format on Acorn machines. More information can be found in AE7doc within the !ARMovie documents directory.

Hints and Tips

This section collects together some notes which you may find useful.

Full frame images

Each TV frame is transmitted in two fields; first the even lines are sent followed by the the odd lines. This is known as interlacing. You will only obtain good quality still frames providing there is little movement of objects between the two fields. Parts of the scene that move will have noticeable 'feathered' edges. If capturing from moving material you may be better off using field capture instead.

For moving video use field capture

Still video cameras

Really good quality still frames can be obtained from special still video cameras such as Canon Ion RC260 & RC560, Canon Visualiser, Sharp Visualiser & Sony Mavica. Video material that has been converted from film may also give good quality still frames even with movement.

Capturing small images

You will obtain better quality in general by capturing a large still and then scaling it down (e.g by using ChangeFSI) than by capturing small in the first place.

Not enough System bandwidth

This message will occur if there is not enough processor power for the chosen size or frame rate. You will need to reduce size and/or rate.

Not enough Disc bandwidth

This message occurs when the combination of Image size and frame rate creates data at a rate that the disc/expansion bus cannot handle. You will need to reduce size and/or rate.

Glossary

Aliasing

When an image is captured digitally It will be turned Into an array of pixels on a rectangular grid. Unless the grid Is very fine, noticeable steps will be seen on edges of objects and particularly lines that are not quite horizontal or vertical. This effect is sometimes known as aliasing.

Anti-aliasing

This Is a process where the image Is low-pass filtered by averaging neighbouring pixels to ensure that the jagged edges on lines are reduced.

Aspect ratio

The relationship between the horizontal and vertical size of an image is known as Its aspect ratio. If the aspect ratio Is changed the image will look distorted.

Bandwidth

A measurement of how much data can be transferred per unit time. As an example a Quantum LPS240AT drive In an A5000 has a minimum bandwidth of 700K bytes per second i.e it can save/load more than 700K bytes in one second.

BI-Level

A bi-level Image is composed of pixels which only have one of two values (black or white).

Bit

The smallest unit of Information that can be stored In a digital computer is the bit. Each bit can have one of two values 0 or 1. There are 8 bits in a byte.

Bits per pixel

Each pixel In an Image uses a certain number of bits to represent the brightness

Glossary

and colour. This is the bits per pixel which may be abbreviated to bpp.

Brightness

Brightness is related to the amount of light reflected from or transmitted through an image. This quantity is independent of the image colour.

Byte

A byte is a unit of information used in digital computers that can represent 256 numbers. In each byte there are 8 bits.

Chrominance

This is the colour component of the video signal. In television the colour information is transmitted at a lower bandwidth than the brightness component since the human eye is not as sensitive to colour detail.

CMYK

This is the colour model commonly used in the printing industry. It stands for Cyan (blue-green), Magenta (blue-red), Yellow and Key (Black). These are the colours of the four inks used in full colour printing.

Colour fidelity

The accuracy to which colour is represented.

Colour model

There are several ways (models) to use numbers to represent the colour in an image for example, RGB, YUV, HSV and CMYK.

Colour separation

The process used to split an image into CMYK components for colour printing.

Glossary

Colour space

This is a phrase which means Colour model.

Composite Video

This form of video carries brightness and colour information on the same wire. Televisions and video digitisers etc have to separate the colour and brightness from the video signal. Sometimes fine patterns of brightness get confused with colours leading to some strange effects and poor picture quality. This does not occur with S-Video where the two signals are carried on separate wires and therefore cannot get confused.

Compression

A process where the data required to represent some information is reduced, either by throwing away data that is not significant (lossy compression) or by representing redundant data by fewer bits (lossless compression).

Compression ratio

This is the ratio between original and compressed file sizes. A 10:1 compression means that the compressed file is one tenth of the size of the original.

Contrast

Contrast is the difference in brightness between the light and dark areas of an image. A low contrast image is one in which these areas are similar in brightness.

CVBS

Stands for Composite Video, Blanking and Synchronization. This is an acronym for composite video.

Glossary

Data Rate

The data rate required for the Replay DIY recording process is 345600 bytes per second (10bit YYUV at 160x128 size). So, your hard disc needs to be able to save at least this number of bytes every second to keep up.

Digitizing

The process where an analog signal is converted into binary form so that it is suitable for processing by a digital computer.

Dither

Dithering is a technique which allows images with many colours and brightness levels to be represented on devices with fewer colours and still retain much of the quality of the original. It relies on the fact that our eyes find it hard to distinguish single pixels amongst many others in a complex scene. Dithering chooses the colour of adjacent pixels carefully so that when our eyes average them together we see a better approximation to the original image.

DPI

This is a unit of resolution. It stands for Dots Per Inch and refers to how finely an image is divided up into pixels for digitizing. Along an inch in the image there will be DPI pixels.

EPS

Stands for Encapsulated PostScript ®. This is a PostScript document that is self contained and describes the content of a single page. EPS files can be embedded into other pages of PostScript documents or files.

Error diffusion

Error diffusion is a method of dithering.

Glossary

Field

In the UK we use the PAL television system which *has a* resolution of 625 lines vertically. Each picture is transmitted in two fields comprising the odd lines first followed by the even lines. The field rate is 50Hz i.e each field takes 20 milliseconds to transmit.

File format

Describes how an image is stored for transport to other machines or archival and retrieval.

Filter

When applied to an image a filter modifies the pixel values either on their own or using some combination of the neighbouring pixels to achieve some effect like sharpening, noise reduction etc.

Frame

A frame is a complete television Image composed of the odd and even fields. It takes 40 mS to transmit one frame i.e the frame rate is 25 Hz.

Framestore

The memory used to hold video Images *is* commonly known as a framestore even it can only capture a field **24i16** with the 1 MB option can capture a full frame.

Grey scale

Images with only 1 bit per pixel have two shades only; black or white. Images with more than 1 bpp have shades of brightness (or a grey scale) between black and white.

Glossary

Grey value

This is the brightness value of a pixel.

Halftone

The process of simulating colours or grey shades with tiny dots is known as halftoning. When viewed from a normal distance the eye cannot distinguish the single dots and you perceive a continuous colour or shade.

Hi8 video

This is a domestic video standard which uses 8mm tape and is higher quality than VHS. The tape stores the video information separately in luminance and chrominance channels which enable S-VHS to be produced readily.

Interlacing

A television frame is transmitted in two fields, the first carries the information from the odd lines and the second carries the even lines.

JFIF

JPEG File Interchange Format is a universal file format devised so that JPEG compressed images could be transferred between different platforms. JFIF specifies that the image should be in YUV colour space with 2:1:1 sub-sampling.

JPEG

Strictly Joint Photographics Experts Group is a compression technique and not a file format. JPEG is a lossy compression method that actually throws away information to which the eye is not sensitive. Impressive compression ratios result. The original and decompressed files are indistinguishable at normal viewing distances and magnifications.

Glossary

Landscape

The orientation of an image is landscape if its horizontal dimension is greater than the vertical. Landscape printing makes the longer side vertical on the paper.

Line art

This is a graphic image with only black or white pixels.

LPI

Stands for Lines Per Inch. This is the measure of resolution used In the printing Industry, It is the number of halftone cells per Inch which is quite different to DPI.

LAW Compression

Lempel-Ziv-Welch compression is a compression technique used in TIFF and archival programs. It Is a lossless technique, i.e the decompressed file is identical to the original. This is great for programs and data but unfortunately lossless techniques rarely do better than halve the size of a real (i.e digitised) image.

Luminance

This is another name for the brightness or greyscale information in a picture.

Moire pattern

Moire patterns are the undesirable banding that sometimes occurs when printing a digital image or scanning printed material. It occurs because the scanned resolution is less than the printed resolution (it is classic aliasing from sampling theory).

Glossary

NTSC

This is the American television standard, NTSC stands for National Television System Committee. The frame rate is 30Hz and has fewer lines (525 per frame) than the PAL standard, also the colour information is transmitted differently.

PAL

Stands for Phase Alternation Line. PAL is the television standard used to transmit colour pictures in the UK and many other countries. PAL displays frames at 25Hz with 625 lines per frame.

Pixel

Short for pixel element, this is the smallest element in an image.

Pixel depth

Depth refers to how many bits are used to represent each pixel.

Portrait mode

The orientation of an image is portrait if its vertical dimension is greater than the horizontal. Portrait printing makes the longer side vertical on the paper.

Postscript®

This is a powerful graphics programming language created by Adobe Systems. It is used to describe pages of text, graphics and images.

Realtime

Term used to describe a system which responds within a guaranteed time period

Glossary

Rendering

Rendering is the process where an image is painted to the screen or a printer. Rendering techniques are very important when the display or device can not support the full range of grey levels or colours in an image.

Resolution

A unit of image detail. When the resolution is increased finer detail is seen.

RGB

Red, Green and Blue is the colour model commonly used in computer displays. The colour and brightness are represented by three numbers referring to the amount of each of these primary colours.

Saturation

This is the intensity or purity of a colour.

SCART

The SCART standard, also known as Peritelevision, was developed by European Committee for Electrotechnical Standardisation (CENELEC), as a means of interfacing a wide range of audio-visual equipment including TV, satellite decoders, video recorders, videodisc players, video cameras and domestic computer equipment etc.

Secam

This is the French television standard. SECAM stands for Sequential Colour with Memory.

Glossary

S-Video

Also known as Super-VHS or S-VHS. This gets round the cross-colour effects sometimes seen with composite video by separating the brightness and colour information onto two wires. In general higher quality pictures result from using S- Video sources, but you need S-VHS compatible equipment to get the benefit.

Seek time

The time taken to move the read/write head of the disk drive to the data position and start transfer.

Sharpen

A filter used to increase the contrast of edges and detail in an image.

Smooth

A filter used to decrease the contrast of edges and detail in an image.

Sync

The sync signals in video are used by circuitry on **24i16** to determine when the start of a new frame/field/line occurs 1.e to tell where in the video frame we are.

TIFF

Tagged Image File Format, an industry standard format devised and popularised by several major computer companies.

Transparency

How transparent an object is means how easily it is seen through. Transparency also refers to a photograph taken on slide material.

Glossary

True colour Image

Generally taken to mean a 24 bit digitised image, which we perceive as photographic on a 24 bit display or other output device.

VCR

Video cassette recorder.

VHS

VHS (Video Home Standard) is the most popular domestic standard for video cassette recorders.

VHS-C

This is compact VHS which uses the same format as VHS but with a cassette that is much smaller and is therefore more suitable for camcorders. VHS-C can also support S-VHS. The advantage of VHS-C over Hi8 is that adaptors are available which allow the compact tape to be played by standard VHS video recorders.

Video 8

Used in camcorders, this standard uses 8mm tape and offers higher quality than VHS.

VRAM

Stands for Video Random Access Memory. This is like DRAM except it also has a special serial port which can be operated at video speeds. In a digitiser video data is written into the serial port and transferred into the DRAM section. The host reads the video information via the DRAM port.

Y

This letter is used to denote the brightness or greyscale information in a picture.

