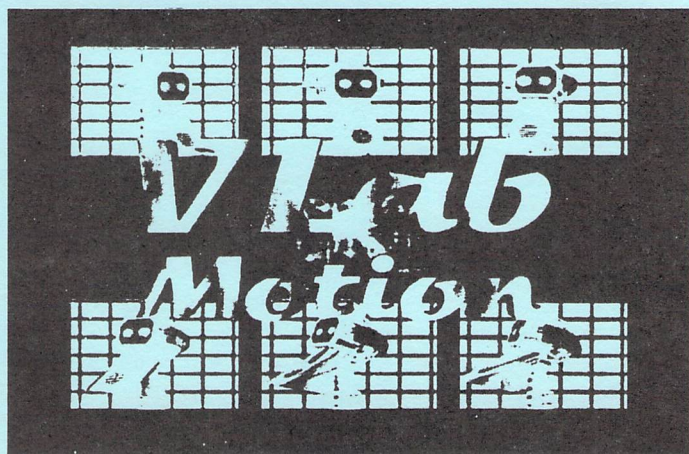


# VLab Motion

Affordable Non-Linear Editing

by MacroSystem



**Real Time JPEG Digitizer and Framebuffer  
for Video Editing, Special Effects, and Animation**

## **A conversation with Jorg Sprave, President of MacroSystem GmbH, Witten Germany:**

### **1. Jorg, tell me, what is VLab Motion?**

VLab Motion is a true single-board video solution for your Amiga. Using VLab Motion, full motion, high quality video can be recorded from any source, edited, and played back. Combined with the Toccata 16 Bit sound card, VLab Motion offers simultaneous non-linear and completely flexible editing of video with audio.

VLab Motion is a real time JPEG hard drive record-playback unit, with full non-linear editing capabilities. It works with all Amiga 2000, 3000, and 4000 computers. It combines a realtime digitizer/framegrabber, fast JPEG compressor/ decompressor, Genlock, chroma keyer, and the powerful Movieshop video editing software into one package. The tremendous advantages of this system are:

- \* NO time base corrector is needed for video sources, including tape
- \* NO dedicated hard drive is needed, as is the case with some systems
- \* Non-linear editing of video (and 16-bit stereo audio, with the addition of the Tocatta 16 card) in "broadcast" (professional) resolution
- \* NO frame-accurate tape recorder or single-frame controller is needed for recording finished material
- \* 4:2:2 digital record and playback quality exceeds that of S-VHS or Hi-8 video editing systems; no loss of quality occurs during editing
- \* Significantly lower cost, compared to the competition, for the above features!

When recording, continuous video and audio is digitized onto your hard disk, where it can be edited as much as necessary without loss of quality. It's worth emphasizing that tape sources do not require processing through a TBC, and output to tape does not require a single-frame controller or frame-accurate tape recorder. When complete, the material can be played back in real time to any recorder, and can be mixed with an external video source during playback. Of course, VLab Motion also has many other uses. The applications for this versatile hardware/software bundle are limited only by your imagination. The VLab Motion card can be purchased with or without the Toccata.

VLab Motion has composite and Y/C inputs and outputs. An expansion socket is also included for add-ons, like the YUV/RGB transcoding output module. There is also an interface allowing output through NewTek's Video Toaster. With these features, VLab Motion is perfectly suited for the semi-professional as a stock package, yet can easily be expanded to provide complete professional solutions. Add the Tocatta 16 to the system, and you have an unbelievable combination of video and audio capabilities; add the Retina Z3 for a superb frame display.

### **2. Pricing**

VLab Motion comes in 3 configurations. Our most popular one, called the System, consists of the VLab Motion board along with the Toccata audio card, and has a suggested retail of \$2150. The VLab Motion card can be purchased alone at a suggested retail price of a remarkable \$1750. We offer a third configuration, called VLab Motion Complete. This is a specially priced bundle of the VLab Motion, Toccata, and the

Retina Z3 24 Bit Display Enhancer. The VLab Motion Complete has a suggested retail price of \$2900 (\$250 less for the Retina Z2 for A2000's). VLab Motion is imported into North America exclusively by NoahJi's.

### **3. What are the Hardware Requirements?**

The VLab Motion card requires an Amiga 2000/3000/4000 utilizing version 2.04 or higher operating system. VLab Motion also requires your computer to have a hard drive. A fast drive and interface (which includes the SCSI adapter and expansion bus), capable of 1.5 MB/s (megabytes/second) or more, is important to maintain the highest video quality, because it allows the use of lower compression ratios. A large drive is necessary for long video sequences, since high quality recording takes up 100 to 150 MB/s of space per minute of video. It is highly recommended that your Amiga have at least a 68030 processor and 8 MB of RAM. A graphics board like the Retina is also extremely useful. Two monitors are needed, one to view the program screen, and one to view the video output. Later in this brochure, we'll discuss in more detail your specific hardware options.

### **4. How Does VLab Motion Work - What Can It Do?**

#### **4.1 The Digitizer**

VLab Motion can digitize from a Y/C or composite video source. The video signal will be grabbed in YUV 4:2:2 (broadcast quality) with a maximum resolution of 640 x 480 pixels in NTSC (remember, these are square pixels, and are equivalent to about 720 x 480 Amiga pixels; the picture is full-size NTSC format).

It also is possible to grab the video in a size less than full-screen. The scaler function can reduce the video, in real time, to any desired size by interpolation. The results are very impressive. For the framegrabber/digitizer chipset, we've used the Phillips SAA 7194, in conjunction with the Wandlern TDA 8708/9A.

#### **4.2 Hardware - JPEG Compression and Decompression**

Since the data rate of digital video is too high to employ live recording at reasonable cost, the data must be compressed. If you have used software JPEG, you know that this process is slow. On the other hand, full-motion video (30 frames/second) would require uncompressed recording at a rate of about 27 MB/s! While it would be possible to record and play back uncompressed video with an elaborate, expensive array of hard drives, hardware-based JPEG now makes this approach obsolete.

The VLab Motion solution employs a specially developed, very high speed JPEG integrated circuit to compress the video datastream in real time. The LSI chip incorporates the JPEG encoder/decoder, DCT converter, and raster-to-block converter, and compresses the video by a ratio adjustable from 100:1 to 2:1. With compression ratios between 20:1 and 10:1, JPEG can process video without noticeable artifacts, and this brings the data rate into the range that a single hard drive can handle. Chip manufacturers give specifications of 200 KB/s (kilobytes/second) for minimum usable results, 500 KB/s for VHS quality, 1 MB/s for laserdisk quality, and 1.5 MB/s for professional quality. We believe such grading is too rigid, since the end quality depends strongly on the type of video. For instance, aerial shots are much cleaner after compression than detail-rich and colorful takes. However, at 1.5 MB/s, quality is so high that one good demonstration will convince even the most particular users.

The JPEG chip processes data in both directions. A 640 KB RAM section buffers a continuous JPEG data stream for record or playback. During record, the video is compressed in the JPEG chip, fed to the buffer, and on to the Amiga bus and hard drive. The reverse happens in playback.

### **4.3 The Framebuffer**

After being stored on the Amiga hard disk in compressed form, video fields and frames are still fully accessible. Individual fields or frames can be viewed on the Amiga, with the graphics quality determined by your display card. The Retina is ideal for this purpose. The fields or frames can be accessed by graphics or paint utilities for modification, then replaced in the video sequence.

In order to play back continuous video, the data must be decompressed through the LSI chip. VLab Motion provides simultaneous Y/C and composite video outputs, which makes it easy to attach both a recorder and monitor at the same time.

For professional use, an optional RGB/YUV transcoder is available. A 50 pin connector on the main board allows easy installation of this module, which then will output either RGB or YUV component signals. The high quality of the VLab Motion video output through this module is appropriate for studio quality equipment requiring a component signal source.

In order to show still fields on the framebuffer (and also to handle the highest densities in the JPEG data stream) VLab Motion uses a RAM buffer size of 640 KB for image memory. Since JPEG images seldom exceed 60 KB/field, the 640 KB provides more than enough display memory. The Amiga hard drive system loads the compressed field into this storage area; it is then decompressed and output by the LSI chip.

The video driver chip is the Phillips SAA 7199; it delivers a studio quality video signal, which can be verified by critical waveform monitor analysis.

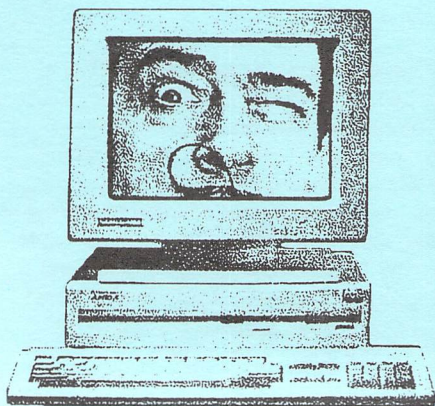
### **4.4 The Genlock and Bluebox**

These features are accomplished by the cooperation of the Phillips SAA 7194 digitizer chip and the SAA 7199 output chip. In genlock mode, the 7199 accepts two video signals, an internal one from the JPEG section, and the other from an external source, fed through the digitizer. Sync is derived from the external, or reference signal, and is used to control the clocking of the internal signal such that they are synchronized.

Thus the mixing is accomplished, with the help of the 7199 chip.

But VLab Motion can do more than synchronize and mix the internal signal with an external video source. When digitized video is played back, the system can detect a specified range of colors (usually blues), and cause them to become transparent to the other video signal.

Let's say you wanted a video of a surfer slicing through waves of flame. First you'd video your surfer. Then you'd define the color blue as transparent in your playback. Everything from the sky (light blue) to the



water (dark blue) would become transparent. Then you could play back the "waves of flame" video you'd created, and your surfer would appear knarling her way through flame. Of course, once you have your surfer with a transparent background, you could have her go through mountains, over streets, or slicing her way through the desert. This is the classical technique of blue boxing, or chroma keying, in digital form.

Worlds of special effects are opened to you, special effects limited only by your imagination. Prior to VLab Motion, these effects were possible in only the most rudimentary form at low cost; broadcast-quality chroma keyers have been quite expensive. No longer!

### 5. Hey Jorg, why JPEG, and not MPEG?

Great question. I'm glad you asked, as discussions in the media have awakened curiosity about these standards. JPEG and MPEG use the same compression technique, but additional steps are taken in MPEG to greatly reduce the data rate. MPEG-1 (generally, the CD movie format) reduces full-motion video to less than 140 KB/s. This is necessary so that the data rate, with audio and overhead added, will be 150 KB/s, the same as an audio CD. But unfortunately, this severe compression forces compromises in video quality. To avoid this, why not go faster, since CD-ROM drives now can transfer data two to four times faster? Because even the 150 KB/s rate only allows 62 minutes on a CD side, which still requires two disks or more for a full-length movie. To retain playing time and increase the data rate would require more tracks on the disk, which is not possible, given the disk diameter and present-day red laser pickup. Many people do not like changing disks during a movie, which is why 12 inch diameter video laser disks are double-sided, and better laser disk players have mechanisms that automatically switch sides. If the industry decides to take a similar approach with CD movie disks, this format would be more operationally acceptable to the public. But will the quality be acceptable? Read on and judge for yourself.

In the MPEG-1 compression process, each frame is first scaled down to a resolution of 352 x 240, about half in each dimension compared to professional digital video. Then, the frame is digitally encoded into 4:2:0 format, as opposed to professional video, which is 4:2:2. This results in less than ideal color resolution, vertical resolution chopped in half, and horizontal resolution similar to VHS tape! Next, JPEG compression is applied. This is done by forming microblocks, 16 pixels on a side, and doing the compression process separately in each of the 330 microblocks, with additional information encoded by comparing adjacent blocks.

The above represents the JPEG part of the process. At this point, MPEG-1 encoding takes on considerable complexity, generating several types of replacement frames for many of the JPEG'ed frames. The original compressed frames are called I frames, which are needed at major scene changes, and at regular intervals during relatively slow-changing scenes. P frames (predictive) are formed using delta compression, meaning they contain only changes from a previous P or I frame. B frames (bidirectional) use information from both previous and future I or P frames. P and B (especially B) frames contain relatively low amounts of data, allowing very significant compression. Exactly how much compression depends on video content, because where scene changes are occurring rapidly, more I frames are needed, to prevent errors from becoming noticeable. Encoding and decoding gets tricky where rapid scene changes occur, sometimes resulting in an effect that looks like short freeze frames, due to frames being dropped.

Reasonably priced decoders have been available for the Commodore CD-32 and

Phillips CD-I machines, and allow you to play about 20 movie and music video titles, at last count. Well and good. However, it should be clear from the above discussion that MPEG-1 video is not even close to professional video in quality! Color values are limited. Vertical resolution is half that of interlaced video, which causes a visible stairstep on diagonal edges. Horizontal resolution is also about half of what is desirable. And motion artifact and framedrop can occur during action scenes. The industry is pushing the notion that this is a great format for home viewing of movies, comparing it to S-VHS. Any alert viewer having a large-screen television would quickly learn it just ain't so.

This is only part of the answer to the original question. Another part is that complex electronics are required to do MPEG-1 encoding. The video stream must be analysed carefully during encoding, to make the optimum decisions to minimize the number of I frames (maximize compression). Incorrect decision process results in poor quality video that is annoying to watch. The cost of such encoders is quite high at present; the C-Cubed encoder is more than \$100,000. Cheaper encoding approaches use software that is quite slow.

A third important reason is that an MPEG-1 video sequence contains many P and B frames in delta form. This would make precise video editing a technological nightmare, since you could not easily examine, delete or rearrange these frames. Editing would require reconstructing the sequence with an encoder, unless it is limited to points where I frames exist. A frame accuracy of about five to twenty frames would be the best possible!

A standard called MPEG-2 has recently been developed, which is intended for professional video, although little or no commercial application of it has yet occurred. As a playback medium, it could not be implemented on existing CD drives without shortening the play time drastically, since the data rate is many times greater. This should soon be addressed by the introduction of a new format CD player that uses a blue laser pickup, with about double the track and bit density capability.

For professional video purposes, MPEG-2 could be recorded on hard drives and played back from them. The only advantage would be fitting more video time on a given hard drive than with JPEG only. This is usually not so important in commercial work; the VLab Motion can record 13 to 20 minutes on a 2 GB (gigabyte) drive, adequate for most jobs. MPEG-2 might triple that; however, the objections of an expensive, complex encoder (not currently available in any case), and of limited editing ability would apply even more here, since the technical requirements would be much greater.

JPEG, as used in the VLab Motion system, has very clear quality advantages, compared to the only MPEG now available:

- \* The resolution of 640 x 480 needed for professional video
- \* The 4:2:2 digital format, assuring accurate, noise-free video
- \* Editing to the exact desired frame

Just as important, it is affordable, easy to use, and reliable!

## **6. The Software Concept of VLab Motion**

VLab Motion is a product with very efficient hardware that offers many possibilities. But such a device requires comprehensive and versatile software. Often good

products are lacking such software. MacroSystem is proud to be known for the high quality of our software and the integrity of our upgrade policies.

VLab Motion has comprehensive and complete software available that naturally leaves much conceptual room for future improvements. For this product, as all others, the 'software upgrade' option is available. For a nominal price, you are ensured the prompt delivery of the newest software versions. Thousands of our customers worldwide have already chosen the automatic software update option for the Retina, VLab, and the Toccata. As a bonus, early buyers of the VLab Motion will receive the first two software upgrades at no cost.

### 6.1 The Editing Software - MovieShop

MovieShop brings extraordinary features to VLab Motion. This package contains superior capabilities that alone are worth much more than the price of the complete system. MovieShop was developed by MacroSystem especially for VLab Motion, and makes full use of the hardware.

We are confident you'll agree that MovieShop is one of the most impressive software packages you've ever used.

MovieShop is a non-linear editing software package which directly controls the VLab Motion card. You can directly digitize and compress live video with MovieShop. The video data can then be edited, special effects added, and manipulated as you please. When your video master has been finished, MovieShop will play back the project in real time, as you marvel at your creation.



MovieShop requires the connection of a video source to the VLab Motion, and a video monitor attached to the video output of the card. The user interface of the software will be displayed on the RGB monitor of the Amiga, or over a graphics card like our amazing Retina display enhancer (us? humble?). The running video will always appear at the video output of the VLab Motion. MovieShop displays stored video clips as reference stamps on the RGB monitor, allowing the user to easily rearrange the playback sequence.

MovieShop is a hierarchically constructed editing system. This means that first you digitize the raw video onto your hard disk. Single pictures, animations, or video sequences can also be imported and stored as data. The video now existing in one piece can be subdivided into clips. The clips - like the sectors of your hard disk - can be segmented and stored in a tree, much like directories on a computer, allowing the user to define levels of clip access.

For example, you could title a video 'Vacation 1994.' The first level could be divided into 'summer' and 'winter' sections. The summer division could then be subdivided into 'departure,' 'the hotel,' and 'at the beach.' You could further subdivide 'at the beach' into 'volleyball spikes' and 'surfing the wall.' The subdivision depth can extend to 256 levels.

The clips can be manipulated in numerous ways. Naturally, they can be divided. clips also can be grouped under one title, and divided yet again, or re-assembled, to combine the scenes back together in their new order. Every clip has a corresponding reference stamp or picture, which will be displayed in a window. This reference picture can be taken from any frame, and allows easy location of a clip. The reference picture can either be a single frame or a three-frame version. This three-frame version displays a smaller version of the beginning, reference, and end pictures.

Your video clips can now be played back from whatever level you desire. You can replay from the top level, which would include the entire video, or at the lowest level, you can replay a single frame. After the fine editing, your clips will be arranged on a playlist. This determines the playback sequence of the clips, and thus lays out the story. Under extreme circumstances, for instance, when extreme changes in the sequence of clips are desired, a new arrangement of the material might be needed, because the sequence is made up from fragments located all over the partition. In this case, the user can initiate a reorganization of the clips on the disk to match the playlist sequence.

Optionally, the video clips can be output onto another disk drive, onto a removable-media drive such as a Syquest or an optical drive, or even onto a DAT tape drive. The clips will be stored according to their playlist organization, insuring that the playback order is never lost or altered. The video can now be played back continuously, without bothersome search time. The work can be digitally backed up at any time, for which a DAT system is especially suitable, although a streaming tape drive, Syquest, or optical drive could be used. If your hard disk is not large enough to play back the entire video at one time, then a subdivision can be useful. Your video could then be output and recorded in pieces.

If the system includes a Tocatta card, MovieShop will also record, edit, and play back stereo audio synchronized with video. An advanced version of MovieShop, called MovieShop Professional, easily allows you to create video special effects, like wipes and soft over-blending. This package is available as an option.

## **6.2 Storing JPEG Data**

VLab Motion does not require a dedicated hard drive, but instead stores the data in special disk partitions, using a custom filing system. This is important, given the enormous data rates required. You can easily end up with many thousands of pictures stored in the VLab Motion partition. The Amiga filing system, however, does not deal well with large quantities of files, not having been optimized for this purpose; there can be long search times for specific frames or pictures. For this reason, VLab Motion writes and reads these independent partitions with a sector-oriented custom filing system, optimized for video frame handling, bypassing the Amiga Fast File System.

There are many graphic utilities that you may wish to use to process your stored video frames. To simplify and speed up such processing, we decided that within VLab Motion, your software should have direct access to the picture files, despite the JPEG compression and custom file system.

When another program requests the picture file directory, the VLab software running in the background senses this request. Transparently to the requesting program, VLab converts the file from JPEG to 24 bit IFF. So any software that is able to load



IFF images can also directly load images that have been stored in a VLab Motion partition.

This also works in reverse, so when other software packages store an IFF picture in the partition, the VLab Motion software sneaks in undetected, and compresses the data using JPEG. In other words, VLab Motion provides you with a super-fast JPEG filing system that transparently replaces the Amiga Fast File System. Pretty nifty, eh?

### **6.3 Utilities**

In addition to MovieShop, there are various other tools and utilities included with VLab Motion. There are information programs, the image format converter referred to above, which handles JPEG, 24 bit IFF, Sun Raster and other formats, and various drivers, such as an ADPro loader and saver module.

## **7. Supplemental Hardware**

VLab Motion requires no additional software or hardware to record, edit and play back video superbly. Yet, there are many useful supplements to both the hardware and software that can be of significant value to users of VLab Motion. Let's discuss a few of these that you may find most useful.

### **7.1 The Toccata Audio Card**

This card is the perfect supplement to VLab Motion. The North American distributor of MacroSystem products, NoahJi's, offers a special bundled price for the Toccata along with the VLab Motion. The name given this bundle is The VLab Motion System, as these two packages complement one another ideally. With both installed in your Amiga, picture and sound can be recorded and played back at the same time. The Professional version of MovieShop (a separately priced option) allows much more extensive audio editing operations. We'll discuss a few examples in section 8, Supplemental Software.

The Toccata can record and play back 16 Bit audio in stereo at sampling rates up to 48 KHz maximum (DAT quality). For use with video, however, the compression modes are often advantageous, in that they combine near-CD quality sound with the use of less storage space. In A-Law compression mode, for instance, a 16 KHz mono track uses a storage space of only 15 KB/second. Therefore, the data rate for video and audio is hardly increased from that of video alone. The Toccata has 3 stereo inputs, a microphone input, and a stereo output. It is a Zorro II card, able to operate in most Amigas. Look for the listing of the hardware and software features of the Toccata at the end of this brochure.

### **7.2 The Retina Graphics Cards**

As part of the VLab Motion Complete, the Retina Z3 offers flicker free 24 bit display capabilities with up to 16.7 million colors. VLab Motion certainly provides outstanding video quality, but it can only be used to display continuous video, or single pictures, on a video monitor. Thanks to the 16/24 bit Workbench emulation, the Retina, under MovieShop, has some interesting advantages.

For example, the screen for the editing program can be much larger than the Amiga-specified limit of 736 x 482. Resolutions of 1280 x 1024 or more are possible with the Retina. Another advantage has to do with the reference pictures. Using the Retina, the reference pictures can be in full color, instead of being limited to 16 colors. You

can be assured that, as a Macro-System product, the Retina is optimally coordinated with VLab Motion. Specs for the Retina Z3 are at the end of this brochure. It should also be noted that the Z2 Retina is the card you will need for an Amiga 2000, because the Z3 requires the Zorro III bus found in the 3000 and 4000 Amigas.

### **7.3 Backup & Storage**

Digital video requires enormous storage capacity. Since VLab Motion stores video on hard disk, disk capacity is needed in abundance. Even the largest disk is quickly filled, so the need for a fast and reliable data backup system will quickly arise. The tape streamer and DAT recorder have both proven themselves. These devices can store data very inexpensively, which is important. Their disadvantages are that they are slow, and can't be used as independent mechanisms, so they are suitable mainly for data storage and security.

Alternatives exist in the optical storage media, which come in either 3.5" (128/256 MB) and 5.25" (660/1300 MB) formats. These media are usable in the same manner as hard disk drives, but are not as fast. They are somewhat expensive, more than tape devices. Optical drives are especially slow during write operations, because they must erase each track during one revolution before writing to it on the next.

The newest of the Syquest cartridge drives has a 270 MB capacity, and is faster than the opticals, being similar to hard drives in speed (13 milliseconds average access time).

### **8. Supplemental Software**

Again, VLab Motion requires no additional software to function in a manner that is truly outstanding. Yet, there are a few useful supplements to the software that can be extremely valuable for users of VLab Motion. Here are some options:

#### **8.1 MovieShop Professional**

The version of MovieShop that ships with VLab Motion offers complete editing, and has all the necessary functions you may ever need. MovieShop Professional goes even further by offering features the experienced pro will want, and the hobbyist may well appreciate:

- \* Integrated audio editing with video editing
- \* Advanced video and audio effects contained in software modules; full documentation for effects module editor
- \* Easy addition of new effects modules
- \* CMX and Grass Valley Edit Decision List support
- \* GPI support for other devices
- \* Cataloging of archived data; prompting tells operator which tape or cartridge to insert for replay of a requested video clip

The Professional version of MovieShop will be available within a few months after the release of VLab Motion.

## 8.2 Image Processing Programs

Third party developers have created a number of powerful image processing packages. These programs allow you to alter images in fascinating ways. Image processors are extremely handy for color correction, special effects, and digital video effects. The most prominent image processors are ADPro, Morph- plus, Image F/X, Imagemaster, and OpalVision (also hardware). The video images from VLab Motion can be loaded into such packages, altered, and sent back to the MovieShop software for editing.

## 9. An Optimal Hardware Package

VLab Motion can deliver very good results with a relatively poorly equipped Amiga. Even so, I'd like to address the subject of the optimal system for VLab Motion. This should serve as a reference point to counsel you for future hardware considerations.

### 9.1 Which Amiga, Jorg?

Above all, VLab Motion requires powerful hard disks. The faster the hard drive is, the better the quality of your video can be made (by decreasing the compression factor). Give this detail the most attention if you're buying a new Amiga.

Amiga computers with a SCSI DMA adapter on the motherboard are ideal, because you don't need to use a Zorro slot for the adapter card, and you won't use time for the Zorro bus cycles. The A3000, the A3000 Tower, and the A4000 Tower have this design. Tower systems are preferred over desktops, because they offer more room for hard disks and data backup drives. The A4000 Tower can certainly be considered the optimum Amiga for VLab Motion. The A4000 Tower boasts 5 slots, along with a super-fast 32 Bit SCSI-II DMA adapter on the motherboard. In addition, this model has plenty of space and power for disks and other devices.

The Amiga 2000 computers can work well, if used with a good accelerator board and integrated SCSI adapter; see below. A stock Amiga 4000 is not as readily suitable for VLab Motion. It offers little internal space for hard disks, and must have a SCSI adapter installed, which uses one of only four available Zorro slots. However, expansion products are available that will bring the A4000 up and beyond other systems.

### 9.2 OK, but What About the Disk Controller?

This question is for those of you with A2000 and A4000 computers.

The A2000 will scream, if equipped with an appropriate accelerator board that has an integrated SCSI-II DMA adapter. The Magnum 040 accelerator from CSA has shown itself to be the best choice for the job, being extremely fast, and capable of maximum VLab Motion performance. The GVP 040 accelerator is also suitable for the A2000.

Far less appropriate for the job are the Zorro II SCSI cards we've tested to date. These slow down the data stream noticeably, to less than 1.5 MB/s, even with very fast hard drives. If you have to use a Zorro II adapter, you need to pay attention to the DMA capacity (CBM A2091, GVP), otherwise the JPEG data-stream will be extremely irregular. Users report problems with Series II GVP adapters, and you should consult GVP about possible firmware upgrades before depending on a Series II for video use. Similar problems may occur with the Commodore 2091.

For A4000 users, the Z3 Fastlane from AS & S has been successfully tested. It's a Zorro III SCSI-II DMA adapter card. Even though there is bus cycle overhead here too, it doesn't noticeably slow the data stream, since Zorro III can run up to five times faster than Zorro II. Fastlane users will need the latest revision 2.3 firmware.

We discourage you from using IDE, because it is really too slow for all but lower quality video.

### **9.3 Great Info, Jorg, but What About That ALL IMPORTANT HARD DISK DRIVE???**

Ah, now we get to the heart of the matter, or rather the lungs. Let's just say, for my sake, that VLab Motion is the heart of this matter!

Here the only thing to understand is: As Big As Possible .. As Fast As Possible. Got that? Consider this: 30 minutes of video at 1.5 MB/s (according to LSI broadcast quality) requires approximately 2.7 GB of storage!

The Quantum Series in sizes of 525 MB, 1 GB, 1.2 GB, and 2 GB were successfully tested with VLab Motion. The new MPire series is also very well suited for VLab Motion, as it's made for digital video, and therefore does not do periodic thermal recalibrations, which may interrupt the video.

At this time, the fastest drive available is the Seagate Barracuda, with up to 2 GB capacity. For absolute speed, this series of drives leaves the others behind. The fast Quantum drives pale in comparison to the Barracuda drives. At 2.5 MB/s, easy for the Barracuda, VLab Motion hardware is completely able to produce its best performance.

### **9.4 Which Video Recorder do You Recommend?**

For VLab Motion you don't need a professional video recorder. In principle, you can use the least expensive unit on the market, although more expensive machines would certainly allow higher quality.

If your computer does not have a large enough hard drive to hold the entire video clip you wish to play to tape, the recorder should have a flying erase head for assemble editing; otherwise, transitions between sections will not be acceptably clean. This is the only method for creating long videos with relatively small hard disk capacity.

If you don't have a Toccata 16 card on hand (shame on you!) for the simultaneous processing of video and audio, then the recorder should at least have the option of audio recording at a later time. Otherwise the video would be silent, and Charlie Chaplin is long gone.

From the resolution aspect, a Hi-8 or S-VHS device is useful, as the video will be much better. The disadvantage is that high resolution requires more storage. With VHS, there is only approximately 300,000 pixels, compared with 480,000 for S-VHS.

## **10. Future Plans for VLab Motion, or Is the Z2 Right for Me?**

Our next major push for VLab Motion is to release the Z3 version of the board. This card will be a pure Zorro III card, for the highest end of the market. We plan on having compression ratios as low as four (requires 7 MB/s), even though

the fastest disk drives can only support around 6 MB/second as of this writing. But remember, at 6 MB/second, a 2 GB hard drive will hold only 340 seconds of video. A long-playing hard disk system for this mode would be far more expensive than the Z3 board. This is why I like to stress that VLab Motion Z2 is truly the perfect solution for probably 90% of the video market.

At a compression rate of 1 MB/s, our experience is that the picture quality is very good. Certainly this is lossy compression, and exacting perfectionists may not be happy (are they ever?), but 1 MB/s is in fact a good rate for the hobbyist, semi-pro, and most professional users. A more important question I'm asked all the time is "how much video can I fit on my hard drive?" A 1 GB hard drive will hold over 17 minutes of video at 1 MB/s. We feel strongly that the Z2 board is the right board at this price point for most everyone.

The Z3 will be at least \$1,000 more expensive. At this time, we plan to have the board contain a video plug, for a one monitor solution. The VLab Motion Z3 will also have component and composite output and input, via an external box, with the necessary 12 connection options. This will be a nice high end system, and we welcome your comments and suggestions regarding the options you'd like to see on the board.

### **11. How Does VLab Motion Compare to the Flyer?**

Truth is, I don't know, since I haven't seen their product. From the literature I've read, here's the best comparison I can give. As I understand the product, the Flyer needs a Toaster, as well as two dedicated hard drives and time base correctors for tape sources. VLab Motion needs none of these. The Flyer is only composite, VLab Motion offers Y/C and component options as well (plus digital RGB and YUV output modules). Both cards are Zorro II type. Both integrate directly with the Video Toaster, and allow control of switching effects from within the editing software. MovieShop is based on timeline editing; the Flyer software is point and click, like the Toaster's interface. Certainly there are things they'll do better than us. Like market their product with great fanfare, and fantastic ads. But we believe VLab Motion is a strong contender for your non-linear needs, at a much better price.

### **12. How about the Personal Animation Recorder?**

There is no non-linear editing package for the PAR, as of the latest word we had. A second drawback is that it requires use of a dedicated IDE hard drive. This limits the size and choices of drive, compared to SCSI-II products which are available in sizes to four GB and beyond.

### **13. Tell Me ... What Is The Meaning of Life?**

Aha, so now we get to the easy question. Listen closely, grasshopper, and I'll speak of the meaning of your life. You were put here to buy every MacroSystem product possible, and to spend countless hours enjoying them on your Amiga!

### Features/Specifications for the Toccata 16 Audio Card

- \* Full 16 bit/48Khz audio digitizer
- \* 3 stereo inputs, 1 microphone input, 1 stereo output
- \* Includes the award winning non-linear software - Samplitude
- \* Offers ADPCM data compression up to 1:2 and 1:4
- \* Supports MAUD 16bit IFF, many 8 bit IFF, and Apple AIFF 16bit
- \* 95 dB signal to noise ratio
- \* Record and playback simultaneously
- \* Reads audio SMPTE timecode with optional module
- \* On board mixer
- \* 64 times oversampling
- \* Frequency range of 10Hz - 20KHz
- \* 16 different sampling rates
- \* Direct connection to Amiga audio
- \* Record simultaneous audio with video from VLab and VLab Motion
- \* Works with all hard drives
- \* OS 2.0 and up compliant

### Features/Specifications for the Retina Z3 Graphics Card

- ▣ Programmable resolutions of up to 2400 x 1200 (1152 x 862 in 24 bit)
- ▣ 32 bit on-board blitter with maximum rate of 180 MB/sec - 10 times the speed of the A4000
- ▣ Pixel frequency of up to 110 MHz (90 MHz - Z2, 7 MHz - Amiga)
- ▣ Flash ROM for software updates of its RTG ROM software
- ▣ 1 MB or 4 MB versions available
- ▣ Drawing assist functions which accelerate GUI operations
- ▣ Full 32 bit Zorro III card
- ▣ Optional external video encoder available with composite and Y/C outputs
- ▣ Programmable frequency generator chip allows precise optimization of the RAM frequency within one MHz.
- ▣ Downward compatible with existing software for the Retina Z2
- ▣ MakeRACE 16/24 bit animation creation and playback software
- ▣ Powerful 24bit XI Paint real time paint program
- ▣ Workbench emulation and software promotion (retargetable graphics)
- ▣ 24 bit deep workbench
- ▣ Toastertm and Opalvisiontm compatible
- ▣ Double frame buffer
- ▣ Requires OS 2.0 and up, compatible with all versions of the Buster chip
- ▣ Installs in any 100 pin slot
- ▣ Drawing assist functions which accelerate GUI operations
- ▣ 1 MB requires eight 256 x 4; 4 MB requires eight 1 x 4 fast page zips

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## A Personal Note to Current Owners of MacroSystem Products:

Hello, you wonderful group of people. In our first two weeks of distributing these products (Retina, V-Lab, and Toccata), we've heard too many stories about the trouble you've had receiving technical support. I want to assure you that we're going to stand behind all of these products. MacroSystem GmbH of Germany, the manufacturer, wants it known that there are no corporate or ownership ties between MacroSystemUS and MacroSystem GmbH. The two companies are totally separate. MacroSystemUS is NOT a division of MacroSystem GmbH of Witten, Germany, and no longer distributes the products of MacroSystem GmbH.

MacroSystem of Germany provides a high level of service and support to their customers. NoahJi's will follow their lead in this aspect of the business. We want your input regarding our manuals, our products, and any other information you think we can use to help serve and inform our users.

We do NOT have a database of installed users of MacroSystem products here in North America. If you're a current owner of any of our products, please drop us a note in the mail and let us know your name, address, phone number, and the product(s) you own, so that we may add you to our database. Software upgrades are available under liberal policies, and we'll keep you abreast of the information you'll need to stay current with our products. The Retina upgrade to version 2.2 software is available for \$24.50. Also, for all Retina Z2 owners, you should be aware that we are offering an upgrade in the form of a trade-in for the Retina Z3, at \$349.

Thanks for your continued patience as we get up to speed. We're excited about the product line, and the upcoming products in the pipeline. Continue to let us know how we can help.

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