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15×5¾×2½ inches, with several inches extending past the back of the computer. The green LED located near the front of the enclosure indicates hard-drive activity. Inside the enclosure, I found a single 100-pin, A2000-type expansion slot and the DataFlyer SCSI host adapter, a half-length card. The unit comes with a half-height Quantum 40MB hard drive mounted at the back of the enclosure. The system I reviewed came with a DataFlyer RAM option ($129), a DataFlyer power supply option ($69), and a SCSI pass-through option ($14.95) that provides a 25-pin SCSI connector on the back panel.

You can obtain DataFlyer RAM configured with .5 , 1, or 2MBs by using 256K SIMMs. With 1MB SIMMs, the possible memory configurations are 2, 4, or 8MBs. DataFlyer RAM plugs into a 100-pin header located on the DataFlyer SCSI host adapter.

The DataFlyer 500 power supply installs inside the enclosure and powers the entire system. This switching power supply does not need an on/off switch, as it automatically powers up when the A500 is turned on. The DataFlyer RAM power supply option ($29) is an external supply that you use only to power DataFlyer RAM. In this case, the A500 powers the DataFlyer SCSI host adapter and the associated hard drive.

The DataFlyer 500's set-up software consists of a command-line window presenting a series of questions for response. This setup successfully leads you by the hand through both low- and high-level formatting, partitioning, and Workbench and AmigaDOS installation.

The basic DataFlyer 500 is a low-cost, no-frills hard-drive system that performs most competently. Performance with a Quantum 40MB hard drive was very good, although its speed did drop off somewhat with DMA and CPU contention turned on. Installing additional peripherals will somewhat offset the initial low price of the system.

The Trumpcard Experience

Interactive Video Systems' (IVS) Trumpcard line of products is designed to offer a variety of options. What's more, IVS's hard-drive set-up software, common to all of their hard-drive systems, is the best I have seen. Its point-and-click user interface lets you create and size hard-drive partitions by simply dragging the mouse. It supports all known file systems, including the old file system, the fast-file system and AMax.

Trumpcard 500 AT

The Trumpcard 500 AT ($275.95) has a plastic housing that matches the A500's styling, coloration, and profile. About 5¼ inches in width, the enclosure's sloping front panel sports a red power LED and a green hard drive-activity LED. Its rear panel is fitted with a five-pin DIN connector for an optional external power supply. To disassemble the unit, simply remove the eight screws from the bottom of the case and lift the cover off. You can then pull the main circuit board right out.

The unit's full-length circuit board utilizes all surface mount components, located underneath. Eight SIMM sockets, the hard drive, and the associated connectors are all mounted topside. A half-height, 3½-inch hard drive mounts on four nylon standoffs to the top of the board. The on-board memory expansion uses 1MB SIMMs that can be configured as either 2, 4 or 8MBs of Fast RAM. An autoboot enable/disable jumper is provided if you are still using Kickstart 1.2. You will have to set a RAM-disable jumper if you want to run the included RAM test program.

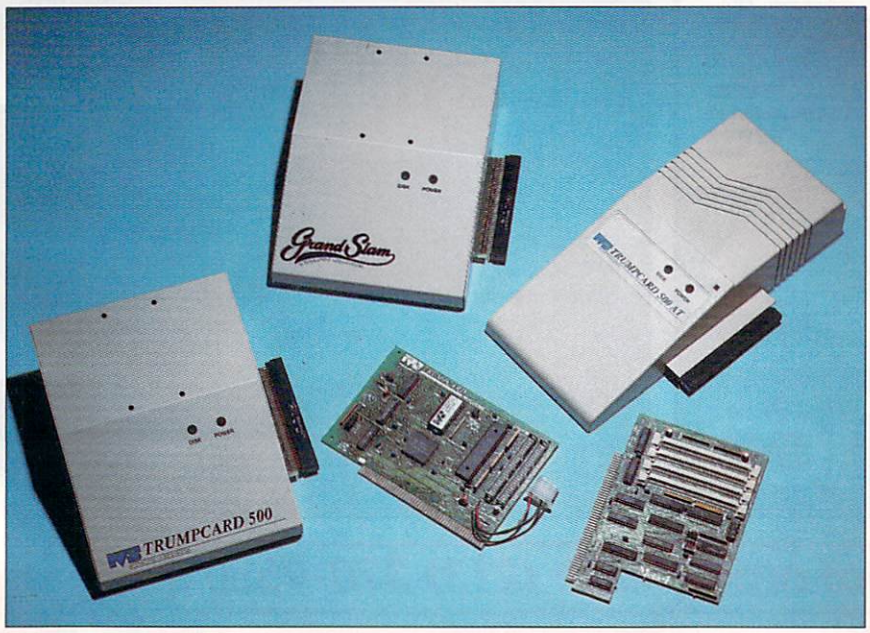
As with all of IVS's hard-drive host adapters, you can disable the autoboot simply by putting a bootable floppy disk into drive DF0:. The system then boots from the floppy, and the hard drive is not mounted, remaining unrecognized by the system. You can also hold down the left mouse button while the system boots from a floppy disk. In this case, your system recognizes the hard drive, and all its partitions will be mounted; however, the system will boot and run from the floppy drive.

Trumpcard 500 AT differs from all the other systems in this report in that it utilizes an IDE (Intelligent Device Electronics) disk drive. Most other Amiga hard-drive host adapters support the SCSI system. Like SCSI drives, IDE drives provide on-board intelligent controllers. While the Trumpcard 500 AT does not provide for an external drive cable, you can modify its enclosure to support a second drive. Additionally, IDE hard drives are inherently slower than SCSI drives, although the Trumpcard 500 AT still puts in a respectable performance on the speed tests with its supplied Quantum LPS 52AT, 52MB hard drive.

Low-cost IDE drives keep the total cost down. I recently found the Quantum Prodrive LPS 52AT advertised for less than $180. You should be able to put together a 50MB hard-drive system based on Trumpcard 500 AT for less than $400. When you consider that the system includes built-in 8MB RAM expansion, comes with excellent support software, and has better-than-average performance, it merits a best-buy rating.

Trumpcard 500

IVS's original hard-drive and memory-expansion system for the A500, the Trumpcard 500 ($189.95), is an all-metal boxy enclosure with sloping front. It measures 9×7×3 inches, making it slightly taller than the computer. The hard drive mounts upside down directly onto the top cover, which comes off easily upon the removal of



The IVS line of hard disks and RAM expansion for the A500.

four screws. Like the 500 AT, the sloping front panel sports a red power LED and a green hard drive-activity LED, and the rear panel has a five-pin DIN connector for an optional external-power supply. It also has a cutout fitted with a plastic insert for an optional 25-pin external SCSI connector.

Trumpcard 500 uses the same hard-drive set-up software as all of IVS's host adapters, with the same booting options. Inside the housing is a two-slot expansion chassis that accepts a pair of half-length, A2000-style, 100-pin expansion boards. One of these boards, IVS's Trumpcard, comes with the system. The second slot is intended for Meta4, IVS's 4MB RAM-expansion board that accepts SIMM modules. Meta4's memory configurations are 512K or 1MB with 256K SIMMs. With 1MB SIMMs, Meta4 comes with 2 or 4MBs of fast RAM. Based on current memory prices, I recommend 1MB SIMMs.

Trumpcard is IVS's bottom-of-the-line SCSI host adapter. Nevertheless, it does a competent job. Trumpcard 500's performance with the A500 and a Quantum 40MB hard drive was quite respectable. The Trumpcard 500 provides for an external, 25-conductor SCSI cable to the enclosure's rear port. Like all SCSI host adapters, you can daisy-chain as many as seven SCSI devices to the system. In addition to fixed SCSI hard drives, Trumpcard 500 also supports removable media drives such as the Syquest system.

Trumpcard 500 is a good do-it-yourself system that maintains upward compatibility with the A2000. With its moderate price tag, good performance and supporting software, Trumpcard 500 is well worth considering.

Trumpcard Professional

Trumpcard Professional 500 ($279.95) utilizes the same metal enclosure as Trumpcard 500, with a built-in, two-slot expansion chassis. It differs from Trumpcard 500 in that it comes with IVS's Trumpcard Professional SCSI host adapter. As a result of its high-speed design, Interactive Video Systems does not recommend the use of the 25-pin external SCSI cable. Instead, Trumpcard Professional makes use of a matched set of on-board, 50-pin SCSI connectors. You can daisy-chain additional SCSI devices via 50-conductor flat-ribbon cable. The board has room for a Meta4 fitted with up to 4MBs of expansion memory. I consider the Trumpcard Professional 500's performance with a Quantum 40MB hard drive to be the best of this group. ►

A500 Hard-Drive Test Results

I used MKSoft's DiskSpeed 3.1 to test these hard-drives. With Workbench 1.3 and its sundry files installed on each drive, I attempted to find out how many kilobytes each host adapter could create, read, and write in one second when using a 256K buffer. In the Table 1 columns, the figure to the left of the slash represents the results with no other disk activity, while the right-hand figure reflects a multitasking environment.

The data in Table 2 shows how many files each of the system's drives was able to create, open and close, scan, delete, and seek/read in one second. As in Table 1, the inital figure listed tells you the results without DMA and CPU contention, and the second figure shows you what happens with these extra demands.

Finally, the results of two "real-world" tests appear in Table 3, the first column showing how long each system takes to autoboot from a cold start, and the second column how long it took to build a new index on one field within a large database file.

Table 1. Kilobytes per second, using a 256K buffer.

System	Create	Read	Write
Comspec SA with 48MB Seagate ST-157N	55/30	152/42	61/41
DataFlyer 500 with 40MB Quantum	148/60	428/167	191/76
Trumpcard 500 with 40MB Quantum	238/99	392/152	393/152
Trumpcard AT with 52MB Quantum	299/194	435/264	464/268
Trumpcard Pro 500 with 40MB Quantum	272/138	559/292	549/261
GrandSlam 500 with 40MB Quantum	273/137	562/300	546/261

Table 2. Number of files per second.

System	Create	Open/ Close	DirScan	Delete	Seek/ Read
Comspec SA	5/1	11/3	52/9	13/2	13/2
DataFlyer 500	8/5	31/14	133/54	30/15	195/77
Trumpcard 500	9/5	32/15	102/41	29/15	196/73
Trumpcard AT	12/8	29/15	111/51	62/29	177/78
Trumpcard Pro	8/5	38/16	132/51	29/17	191/73
GrandSlam	9/5	39/18	132/54	29/18	191/80

Table 3. Time taken to autoboot and build a new index.

System	Cold Boot	New Index
Comspec SA	25 sec.	52 sec.
DataFlyer 500	24 sec.	41 sec.
Trumpcard 500	29 sec.	37 sec.
Trumpcard AT	24 sec.	37 sec.
Trumpcard Pro	29 sec.	41 sec.
GrandSlam	29 sec.	41 sec.

GrandSlam 500

GrandSlam 500 ($369.95) inhabits the same metal enclosure as Trumpcard 500. The difference is that GrandSlam 500's built-in expansion chassis only has one A2000, 100-pin slot, which is equipped with IVS's Grand Slam SCSI host adapter. GrandSlam evolved from three IVS products, Trumpcard Professional, Meta4, and Printerface. It is actually a Trumpcard Professional SCSI host adapter, an 8MB RAM-expansion card, and an auxiliary Amiga parallel port on a single, half-length, A2000-type expansion card.

Since it uses the same high-speed design as the Trumpcard Professional SCSI host adapter, IVS applies the same restriction against the use of a 25-pin SCSI cable, using instead a pair of 50-pin SCSI connectors. GrandSlam 500's performance with the A500 and a Quantum 40MB hard drive was comparable to that of Trumpcard Professional 500, which was the best of this group.

All of GrandSlam's operational features, autobooting, hard-drive installation, support software, and SCSI network support are the same as for Trumpcard Professional. You can install up to 8MBs of Fast RAM, and memory comes in 2, 4, 6, or 8MB increments with 1MB SIMMs.

GrandSlam 500 adds a second parallel port to the A500. Although from an electrical point of view its parallel port could operate bidirectionally, the Amiga's operating-system design limits its operation to output only. With the GrandSlam 500's extra parallel port connected to a printer, the Amiga's original parallel port is available for use by devices such as video digitizers, sound samplers, and scanners.

GrandSlam 500 is a good do-it-yourself, high-performance system that maintains upward compatibility with the A2000.

Teacher's Toolkit

TTR Development

No more pencils, no more books.

By Neil Randall

TEACHERS SPEND A LOT of time on administrative and organizational tasks. There are grades to record, lessons to prepare, lists to keep, reports to compile, and all of these detract from the teacher's main job, which is, after all, to teach. ***TTR Development***'s Teacher's Toolkit ($54.95), a teacher-oriented record-keeping package, lets your Amiga assume some of the burden.

In its favor, Teacher's Toolkit is teacher designed and programmed, and it's clear from the result that the author continually had himself as teacher in mind. The potential problem with a one-person design and development team is that the package may suffer from a kind of personalized tunnel vision, but the author has largely risen above these concerns.

Time Released

Let's begin by concluding. Teacher's Toolkit will unquestionably assist teachers in organization and record keeping. It is flexible, usable, and far from overburdened with marginal features. There are, however, two caveats here. First, the program is slow, even if you have a hard drive. On an A500, some of the reports and graphs take ages to appear, and waiting for new screens to show up is aggravating. Second, and more important, the Toolkit assumes regular and continual use.

As its name suggests, Teacher's Toolkit is more than just a grade-recording program. The grades module (called Gradebook) is certainly the most important part of the package (it can be booted by itself from disk #2), but there is also a text editor, an appointments calendar, a telephone directory, and, most interestingly, a lesson planner. The text editor is a rudimentary word processor (but it works), the calendar is more than sufficient for most needs, and the telephone directory is really a small database with an autodial function.

The Lesson Planner is an extremely good idea, more sophisticated than the smaller utilities, but just as easy to use. Its strength, like the rest of the program, is in forcing you to make concrete decisions about what you're going to do, then helping you stick with those decisions. This utility won't plan lessons on its own, but by the time you've worked your way through it, the lesson should be clear in your mind. It also lets you combine strategies from earlier successful lessons, helping you avoid continually reinventing the wheel.

Toolkit divides each lesson into eight stages: Objective, Equipment, Motivation, Overview, Presentation, Check,

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