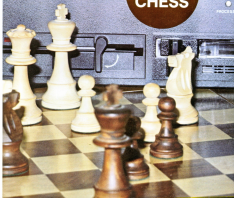


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Inside In Stride

by Verlene Bootham

Our apologies to those who phoned "Sage-Computer" the last few weeks and hung up when hearing "Stride Micro." It was impossible to co-ordinate a name change like this perfectly, and it came as more of a surprise than we had intended to cause folks. (Most of you were smart and called again.) See the article inside on why and how we REALLY changed the name.

The worst of the switch is now over, and we're beginning to feel comfortable with Stride Micro, with SAGE fondly set aside.

Last month's issue had some extra text left in at the end of the LAN article. For those of you left hanging, the sentence was "Same networks require that the drop points be right at the computer." The reprint of the issue did not have the error.

This month's issue is again larger as we address many of the questions about our 400 Series products and software. We intend to keep the format open and varied with more space for user letters and comments. Let us know what type of articles you'd like to see, more software reviews, more hardware hints, etc. If you're interested in all space, we can send you a price list.

Note also that this month's issue is labeled October/November. Yes, we're going to miss a month. Delivered on the issues in the past were arriving almost into the next month, especially outside of the U.S. As editor, I like to have users receive their issues at the first of the correct month. This first issue seemed an appropriate time, therefore, we simply changed the label.

A few last minute notes as this goes to press: Yes, Stride will be also shipping IV.13 with every system until the software vendors get their products converted. A IV.2 release for Sage B/TV machines will be out soon. Some differences in the versions are discussed on this page.



Converting Programs For p-System Version IV.2

In the back of the new p-System manual is a section which describes the differences between Version IV.11 and IV.2. However, the real impact of some of these changes may not be clear.

For example, page 120 of this section talks about units and interface sections. This sounds like something only programmers would have to worry about. Normally, this is true. However, if you have been using a program on the Sage II or IV, and want to try it on the new 400 Series, knowing how to juggle the units around may make the difference between the program working or not.

Before running the program, take a look at how units are used. This is done with LIBRARY:

```
LIBRARY <CR>
Output file? yourprog.code
Input file? yourprog
```

The screen will show a list of all the units inside. If the screen is full, there may be more units. Type "Y" to see the rest of them. If any of the units have the following names, they will have to be removed:

```
ERRORHANDLER
FILED
DIRINFO
SYNINFO
FILEINFO
```

Removing the units from the program will force it to use the newer version of the unit which is in SYSTEM/PASCAL. The program will also be smaller. To remove, use the format option of LIBRARY. This will ask if you want to copy the units, one by one. Type "N" for any unit with the names above or "Y" for anything else. When done, type "Q" to quit. Type <CR> at the "Notice".

Before executing the program, if it still has problems, it may need to be recompiled. If you happen to know that the program uses the KERNEL, it must be re-compiled. Also note that the SCREENOPS unit has new additional calls in the interface section, but these should not generally force you to re-compile.

MBM Development Packages

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It's All In The Name

by Randy Frank

Last month we announced the new Stride 400 Series and said, "We struggle to find a new name which would not only mark this occasion, but one which would better describe our products and our unique philosophy."

This month I received dozens of inquiries that eventually asked, "... but why did you **REALLY** change your name?" Actually, that original quote from Red Coleman cited above is a fair summary, but there was more to it. Here's a brief summary of how the process of changing from Sage to Stride evolved.

When we first started exploring the possibility of creating a second generation of 68000-based microcomputers over a year ago, we realized that to include some of the latest technologies such as floating point, LANs, C4005, etc., we virtually had to start with a clean sheet. Only one item made it over to the new design philosophy: compatibility with the Sage family of products.

We also looked for a name for the new products. "Sage" (if we could count the proposed high-mid-range line, but we had to also find new titles for the smaller systems (Sage Ix)) When we brought our lawyers in on the discussion last February, we realized there were bigger issues to be addressed.

"Sage" had a lot going for it. It meant a wise person, an exotic spice and was, coincidentally, the state flower (Sagebrush) of our home, Nevada. It also had made us many good friends over the last few years.

On the negative side, it didn't really say too much about the character of our machines. We are largely a performance company, and "Sage" did not reflect that quality. But the biggest disappointment was that we found out that we weren't the only "Sage" out there! In fact, there are literally dozens of other companies in the electronics, software, computer, or peripheral markets that had the same name.

Our trademark attorneys (which we didn't have when we formed Sage Computer in January of 1982) advised us that we would have to defend ourselves from one of these other companies sometime in the future, AND that we had to begin to attack all the others with our name in order to protect it. The bottom line was that it would be difficult to even get the mark registered locally. For such an item was clear, instead of putting our resources into the courtroom, we'd rather find a new name. This had to be one which was unique, easy-to-remember and (importantly) said something about our microcomputers and their performance.

It wasn't easy. Beginning in March, we examined literally thousands and thousands of names. We even wrote a random character generator program on the Sage II and let it crank out letter combinations for a few weeks. Many of the names which might have been considered, already had some form of trademark restriction, names like "IBM killer" were thus rejected.

Finally, we came to internal agreement on "Stride." It was free of legal restrictions and said something about movement, forward motion, aggressiveness and performance. We could make all kinds of silly phrases ("Stride into the future!"), and it had very few negative connotations. The final decision was made in early July.

We've been using the new name internally for several months now. We had to review (and redo) every piece of paper, every part, and every component that carried the old name. On the plus side, we have much better consistency of design on our materials now since everything was examined as a whole. We will miss "Sage," but have found that "Stride" seems to sound better each day.

The addition of the word "Micro" was made to represent our strong feelings about Stride's (and Sage's) basic philosophy. We think that in a few years when someone

(Name Continued)

sage "computer," they will mean a microcomputer. Also, we are still an "open company."

We've always tried to maintain that attitude by doing such things as publishing schematics in the documentation, selling our IBM® sources inexpensively, answering the phone when techies call, working with developers and customers on special problems, and so on. This is the same "grass roots" attitude that started the whole micro-computer revolution in the first place. While the industry is becoming big business today, we think it will appropriate to remember just why the micros made so many inroads into the world of main and mainframes.

Our biggest fear about making this name change was that our customer base might think we were not the same company or that policies might change. We've tried to alleviate those worries by including the "formerly Sage Computer" tag on most material.

From our point of view, we are still Sage at heart, but operating with a stronger name and some much better products. We've had no change in ownership, management or staff and, therefore, we're confident that you'll soon realize that the strength of Stride will be the same as that of Sage: performance.

Stride Faire Set For February

On February 8, 9, and 10, 1985, Stride Micro, formerly Sage Computer, will host its second annual technical trade fair:

Stride Faire '85

Reservations for attendance, accommodations, entertainment and faire display space are now being accepted.

This event will again be held at the MACM Grand Hotel/Casino in Reno. A special travel and accommodations package will be available to attendees. Please contact Laura Smith, Trade Show Manager at (702) 333-6888.

Free Subscription To *In Stride*

In Stride is being sent free of charge for one year to all Stride/Sage computer owners who completed and returned their warranty card. In the past, we did not enforce this policy strictly. Now, due to the increased costs of the larger format, we must close it.

For those of you who have not sent in the warranty card or perhaps did not receive one, the coupon below will serve instead. Please complete it in full, especially the Serial #, and return it for the warranty card by Dec. 1,

In Stride is also available independently by subscription for the price of \$24/year. Simply check the "New subscription" box and submit the coupon with a check or money order made out to Stride Micro.

This free 12-month subscription is also offered to past Sage customers. All such subscriptions will begin with this issue, Oct./Nov, regardless of when the Sage was purchased.

cut here

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EMACS



By Bruce Robertson

EMACS is an editor commonly used in the DEC and Unix world. The feature that distinguishes EMACS from most other editors is its extensibility, that is, a user of EMACS can dynamically change EMACS to suit his own needs. It supports a modest type of windowing by splitting the screen horizontally into sections. Commands are generally FNC (escape key) and CTRL (control) key functions, although these can be re-assigned to function keys.

EMACS has its roots in MIT TECO, an editor on RI-10s and DEC systems. Oh, since TECO was cumbersome, users began to write TECO macros to do small tasks. The name EMACS actually came from "Editor Macros." The MIT EMACS was the father of all the EMACS-like editors; its principal author was Richard Stallman. Another major version was also written at MIT in MacRS by Bernie Greenberg and included many extension facilities.

The Stride version of EMACS is a remote relative of the originals, being totally rewritten in "C." It is available on both Iliac and CPY-4-485 and will run on the Sage II and IV. EMACS is rather large, about 207K, so it isn't very suitable for floppy systems. The total set of release files, database, MAKEP, etc., takes two floppies.

You mention many software and hardware products in the newsletter, but I rarely see part numbers or prices mentioned. How come?

Our Dealers receive pricing and update information every week. This newsletter is printed once a month and may take as long as 2 weeks to get through the mail. Pricing and part #'s may not have been set by press time, but generally are available by the time you receive your copy.

Also, our international distributors face rapidly fluctuating monetary exchange rates, some distribute slightly different products. Therefore, the US prices and part #'s don't apply to 80% of those who read this newsletter.

Q & A

How much faster is the 440 Series hard disk than the Sage III?

About twice as fast. A simple benchmark that's easy to run is the **BadBlock** scan under the Filter. This is an indication of how fast the disk is read. For example, a BadBlock scan of 2000 blocks on the Sage IV took 18.29 seconds. On the 440 it took only 10.66 seconds. This is an increase from 1596 bytes/sec to 2544 bytes/sec. Note that some disks are faster than others. (Makeup is fastest to date.)

What is happening with the SAGE user's group?

Lots of users have written asking to join the user's group. Right now the group exists very informally, there are no officers or charter. Users are welcome to communicate via the Sage Bulletin Board on Telemail. USUS has a Sage SAC (special interest group) which is perhaps more active and has been the push behind getting a Stride/Sage group started. Stride would welcome the formation of a chartered group, if someone will step forward and start the ball rolling. Note that the group needs a new name — any suggestions?

cut Here

Bob Bell
1701 Whiting
Palo Alto
Calif. 94301

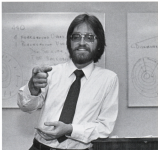
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New 400 Series Training Program Offered



Bob Marzocchi, IBM, involved in new training program for the 400 Series. Behind the Training Manager at IBM.

What is the purpose of the new training program?

The main idea is to show dealers how to place the new 400 Series product. However, any interested user may attend. The course costs \$325 per person. There is one scheduled about every other week. Each course lasts 20 days. By the way, the course is free to new dealers if they sign up within 90 days after their dealer application is accepted.

What topics do you cover?

The course outline covers 400 Series product configuration, p-systems operation, multiuser configuration, LANs, networking, some applications, how to sell single microcomputers, system diagnostics and sub-assembly replacement.

Do I need to bring anything to class with me?

IBM provides all computer and peripheral equipment. The system manuals are used as textbooks for the course. It is my experience that the students need to make notes, so we advise bringing your own copy or buying another set on the first day of class.

For a user, not a dealer. Can the curriculum be changed to meet my needs?

Classes can be arranged to deal with special requirements. However, a minimum of four students is required.

Do I have to pay in advance?

Yes. Payment must be received one week in advance of the class.

I am already a computer dealer, why should I attend this class?

The number one reason is to become familiar with the new 400 Series. It will also give you the opportunity to talk with "home base" on a person-to-person level.

What accommodations are there in Boston?

Kennedy hotels offer excellent accommodations at very reasonable rates. Best buys are in the winter when rates are lower. We will be happy to recommend a few to you.

Will I have any free time in Boston?

Classes are from 8 am to 5 pm; your time is your own after that.

Are classes being offered at locations other than White House?

Jim Kitchley at our Boston office had a class the week of October 15. Other regional classes will be presented as requested by our sales staff. Also, if customers would like on-site training, this can be discussed.



An Harvard member of Mantri shows off his chess program to the local chess and computer communities.

Mantri Chess Uses Machine Muscle

For Maynard it is not a great chess player. In fact, he describes his ability as "several ranks below Novice." Nonetheless, he has created a chess program known as Mantri for Intel and Sage microcomputers that borders on Grandmaster status.

That may seem somewhat impossible, but Maynard has an explanation. "It's simple to design a good chess program; all you have to do is understand the rudiments, and write blinding fast code."

However, that basic equation took Maynard three-plus years and some 3000 lines of cryptic Assembly code. That's far from what most people would call "simple." But for Maynard, it was a labor of love.

His fascination with computers matured as an associate physics professor at Penn. State University where he specializes in acoustics and low temperature physics. May-

hard's first contact with data processing came in high school, and led to designing and building his own hardware during undergraduate studies at the University of Virginia.

His first look at chess on the computer also came at Penn State where he looked for a weekend of getting physics students interested in computers, without having them become computer scientists. When he brought a copy of the Sargon II code (the first popular mainframe computer chess program from Haxby's that was written by Kathie Haxby), Maynard was hooked. "As great as I began translating the Haxby's 2,400 code into the university's RDP 11-36 running RT-11, I did most of this work while accompanying my girlfriend to analog sections. While she had, I wrote."

Version One ran, but not very well. "It was really kind of a mess," Maynard admits. "I began finding basic flaws as I went and slowly began making corrections. Most of these had already been done by the Haxby's with their revision to Sargon II, but I didn't know that. It wasn't a matter though, since I learned quite a bit about the machine. Also about this time, I read an article by David Marr, who had developed the three-world Champion Computer Chess program called Northwestern 4.1. I managed to incorporate many of his concepts into my basic chess."

About this same time, Maynard began looking at microcomputers for personal and professional use. He had strong ideas about what a desktop machine should look like, but had found nothing on the market. When he attended the COMDEX show held in Atlantic City in July of 1982, he noticed one new company marketing a micro called the Sage II. "As I looked at this machine, it was built exactly the way I would have built one: a single board, a 68000 processor and, most importantly, no wait states to slow it down. I ordered one on the spot, even though the company had only been building machines for a month."

He once again translated his chess efforts, this time from the RDP 11 to 68000 assemblies. Since the project had a few priority behind his regular lab work, it took about 30 months. "I did most of the major design work over the '83 Christmas break. Finally, last spring I called Sage and mentioned that I had a chess program running on their system. I was surprised when they expressed total excitement and even made some suggestions for improvements. That encouragement spurred me to add even more technical features for advanced play."

The end result is one of the fastest and most powerful microcomputer chess programs anywhere. Maynard told that the newest revision of Sargon III is a micro-mainframe program, but said that "since Atari is running on the Stride and Sage, it gives me a huge advantage. Overall, I think a battle between two well-designed programs would come down to speed and if that were equal, it would just be luck."

Perhaps Maynard is being modest, because Atari does have some impressive features. Of the millions of people who play chess, only a handful are registered with the United States Chess Federation. Of those the average rating is between 1,300 and 1,400. Atari plays between 1,800 and 2,000 on a Stride 600 series machine.

"I used a full-width, two-search method that really takes advantage of the processor's speed." This means that Atari actually looks at every possible move before it selects the best one. Some programs cannot afford the

time required to perform such searches, Maynard says. "What works best is pure brute force, and the Sage and Stride have plenty of muscle."

Another key to performance is how many moves ahead a machine can search. At level 5, which is tournament speed, Atari will search to 8-9 plies on a Sage, more on a Stride. This means it completely evaluates at least 3 or 4 moves ahead at all times.

Like many computers, Atari places a premium on material gains. "If you're a rook ahead, that's usually the best game!" Maynard explains. But Atari does not completely overlook position, where material is even if always reviews position, pawn structure, connecting rooks, checks, and pays particular attention to knight and bishop development in the opening game.

Moves on Atari are accomplished in standard chess notation (i.e., algebra) with the computer keeping track of the pieces and the captures. Many extras include a self-play mode and the ability to set up problems such as "mate in two" games. Game and board printouts are supported for either serial or parallel printers.

While chess programs on computers are handily defeated by expert players, most folks will find Atari to be more of a challenge than they expected. The program has been in development form here at Stride Micro for months, and it has yet to lose a game. Maynard has posted a similar record around the classrooms at Penn State. Defeat is not always an easy thing to take, and Maynard may be one of the few who can truly say, "I got a real charge when the program makes a brilliant move and usually defeats me."

We aren't as glib as we have at Stride. While we delight in knowing that we built the hardware that Atari needs to improve, it's still rather exciting to have your own system boldly state "Mate in Three" when you still thought you were winning.

Atari is available for all Stride and Sage computers directly from Stride Micro or authorized dealers for all Stride and Sage Computers. It retails in the U.S. for \$89.

Communications Program Updated

A new version of the TELETYPE Communications program has been released with the 400 Series. This version fixes a couple of bugs, in particular that nasty one where job runs out of disk space. It also incorporates a phone directory and dialing for the Hayes Modem version. The directory is created in a file called Phone.dir.txt. The new "Dial" command allows you to select from the directory and will automatically dial the number for you.

A new program called ASCII has been released along with TELETYPE. This program takes a code or data file, and converts it to an ASCII text file. This allows a code file to be positioned in a "message" in an electronic mail system, which typically deals mainly with text. The person receiving the message would also have a copy of ASCII in order to convert the text back to a code file. The program incorporates some error checking to help insure your code file was not corrupted in transit.

Both ASCII and TELETYPE are distributed with each 400 Series computer.

by Steve Auer, Microfinancial Corp.

When you use Personal Computers, you are limited to PC software. However, with a micro like the Sage or a Sissie 486/486, you can look to mainframe-type solutions.

Alvareo is an advanced product that runs on micros, yet it has the features and flexibility of much larger systems. While many small and medium-sized businesses use Alvareo, it is especially well-suited for the larger company where quality is more important than a few dollars difference in cost. Recent price restructuring (effective November 1) no longer requires that a dealer buy a full development system.

Alvareo is really two separate product lines. One is a high-powered, custom application development package. There is also complete integrated **small-business applications**: inventory, order processing, receivables, payables, general ledger, job costing, and payroll. These can be purchased separately, and were actually written with the Alvareo Development System. The packages can be used as a package or individually tailored for special needs.

Both product lines offer powerful features. They are **true multiuser** products. Files can be safely accessed by more than one user at the same time. Users can be part of a network. (Support for networks has been provided even in many earlier versions). Multiple levels of security can protect sensitive information, security can be selective, so that some information can be read by anyone, but only changed by authorized users. More than one company can share databases, with some files marked public and others private to the individual company. International businesses with non-English languages and varying accounting practices find their special problems can be solved with the Development System.

In the past, vertical market suppliers were forced to re-invent parts of the usual accounting software, which is time-consuming and seldom profitable for small markets. Now, a non-programmer can quickly create powerful, unique packages to meet virtually any vertical market need.

Dealers find this a great advantage over the competitors who try instead to charge the customer to fit a canned package. They generally create one or two specialized products and then simply modify the rest of the ready-to-go packages. The developer can even implement his own instructions. However, out of several hundred dealers, only two are known to have done so. One command was used to interface to a barcode reader; the other was for a high-powered math application.

An important part of the system is that it is self-documenting. The documentation generated is high-quality instructional material that features complete and exact screen examples. This is most helpful for those generating new applications, or for documenting changes to existing systems.

On-line help information is available on any field by simply typing a question mark. The same information given in the documentation is shown immediately on the screen. Additional information, such as the acceptable values for a field, may also be given.

The strength of the new Alvareo is its database. Earlier versions of Alvareo applications performed somewhat slowly as that database was designed with an ISAM structure. Now, the faster B-tree technique is used. Critical

parts of the package were also rewritten in native code. Flexware is now shipping "snaps." Worst case single user access to a Model with a 70,000 record database is 1.75 seconds.

Flexware includes some very useful features for business such as Mail Merge and Label printing. Form letters can be created with a standard Editor and combined with information from the database.

Once learned, the Development System is so easy to use that dealers can even create quick special-purpose demos. Many Flexware dealers actually install just a bare bones system. Then they provide maintenance service to change the system as the customer learns to relate to a computer system and define his own needs. Clients with expanding needs are quick to realize that these maintenance costs are minor compared to the cost (and expense) of re-installing complete new packages periodically.

Such a powerful system wasn't built overnight. The team at Flexware has been working on it for nine years, marketing the product for more than seven. There are currently more than 300 dealers in 12 different countries.

Before the new release, all dealers were polled to determine what improvements were needed. All that experience has resulted in a mature and thoroughly tested product.

Flexware is committed to the support of its products. They offer an extensive training program to all their development dealers free of charge. Training on the ready-to-go packages is also available. A communication package allows dealers to send information directly to Flexware using a modem over the phone lines.

Flexware, with a base of a dozen standard applications and the Development System to allow complete customization, will be one of the most popular applications for the more powerful Model 400 Series. The combination of an expandable machine with expandable software is almost assured of success.

IBM's name does not constitute an endorsement or the approval of the Flexware system. For complete information on IBM and logo information, call (800) 541-5277 or writing to International Business Machines Corporation, Dept. 55, Armonk, NY 10504.

A Quick Walk Through Flexware

Using the Flexware Development System is fairly simple. The first step is to define the database entries. For example, this is a typical Accounts Receivable Record for a client:

ACID	CEMDE	RECEIVABLE ID
ACNAME	CEMDE	NAME
ACAGE	CEMDE	AGE
ACBS	CEMDE	ADDRESS
ACSTP	CEMDE	STREET DATE

Each line describes an item, or field, in the record. Information such as the field name, type (such as character), field length and a phrase to display on the screen are all given. From this information, a Flexware program is generated automatically. Below is shown the inquiry portion of this program.

ACID	ACID	1	C
ACID	ACID	10	BP
ACNAME	ACNAME	10	UP
ACAGE	ACAGE	10	UP
ACBS	ACBS	10	UP
ACSTP	ACSTP	10	UP

The columns to the right indicate the processes that are performed on the field. The "R" in "BP," for example, means that the ID is required. The "P" means to print the phrase associated with ACID on the screen. We show fairly simple examples here, but an extensive command set is available to provide all the functions needed for complex applications.

As Flexware works down each column in the program example, it first finds an "R" indicating a required field, which is shown blank, then it finds "U's," indicating unknown (at the moment), so these fields are shown with "??."

The screen that appears to the user is then:

CUSTOMER ID	_____	1	C
NAME	_____	10	UP
AGE	_____	10	UP
ADDRESS	_____	10	UP
STREET DATE	_____	10	UP

The user must type in the customer ID for the required field, before the second column is executed. The "C" is found which does a lookup on the customer file, then the "P" codes print the contents of the rest of the fields. The "E" indicates the end of this process.

To change the order in which the fields are presented on the screen, just change their order in the definition. The program that is generated can also be modified if necessary.

Terminal Troubles



To setup your terminal, read this page first or do better.

If you don't buy your terminal from Stride, how do you set it up? The very first part of the Owner's manual describes this, but you'd be surprised at how many calls are received on this question.

It's surprisingly easy. The key is: **RESET** and start typing again. Garbage characters will show up, then a request to type "A". Once you do this, the terminal should work. You may have to try it two or three times.

This feature is called **AUTOBAUD**. (See the Stride Owner's Manual page 621.) Instead of trying to match your terminal to the computer, this program matches the computer, automatically, to your terminal.

Once you have the new machine working, then try setting your terminal to its highest baud rate and try **AUTOBAUD** again. Stride recommends using the values set up by the factory:

19200 BAUD (or 38400 if available)
8 data bits
no parity
one stop bit
flow/soft

Cables are another big problem. Lots of folks who try to build their own cable to save a few dollars wind up with a big phone bill calling Stride to find out what they did wrong. The Owner's manual does describe cables, see page 83. The best advice is to buy the right cable, especially if you are in a hurry to set up your machine.

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Dave Erikson
Sales Manager, Sales Engineer



Christine Blankert
Editorial Staff Secretary

People

Dave Erikson is the Midwest Sales Engineer. He covers one of the largest sales areas. He is manager of our Strider's softball team and loves Reno, Quora: "Where else can you live that has 27 ski areas within an hour and a half drive?" Dave is also a music man...at one time leading his own band. (He plays bass and rhythm guitar.)

As in *Stride* magazine expands, so will the staff. Christine Blankert is the new Editorial Staff Secretary. She has been in Reno almost three years, moving here from Southern California. Chris likes to ski and is active in the Reno Ski and Recreation Club. Her other interests include camping, bicycling, belly dancing (just learning) and painting.

CP/M-68K

Yes, there's a new version of CP/M-68K. Both an update for the Type II and IV and a new release for the 486 series are available. This version is more than just a bag of bits release.

The "C" compiler finally has a floating point package. The Operating System now supports TypeAhead. The DDD debugger has symbolic capabilities. Two UNIX-like utilities, MORE (to scroll text files) and IPED (to scan text) have been added. There is a new OVERLAP LINKER in addition to the standard linker.

The update includes 4 disks and release notes. A new Digital Research manual is also available separately. New orders contain the 4 disks, release notes, Stride CP/M User's guide, and the DDD manual.

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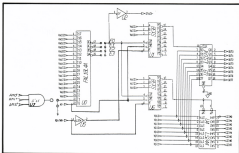
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The circuit provides 8 M of input and output through the VMEbus interface.

Building A VMEbus Interface

by Millar Haney

The VMEbus now makes it easy to interface extra devices to the 486 Series machines. Complete details about the VMEbus are given in the "VMEbus Specification Manual" published by Motorola Inc. Part # MEM585/DL. At first glance, this 188 page manual is rather intimidating. However, we have designed a simple circuit which provides eight bits of input and eight bits of output with a total of eight chips! The keys to the use of the PAL (Programmable Array Logic) chips to do the address decoding. The PAL is available from Stride Systems.

Of the 86 signals available on the VMEbus, we need only to connect to a few.

The Address Lines. The PAL16C45₁ decodes the address lines to give one of four outputs as a range of port addresses. (The Upper and Lower Data Strobe signals are not used.) Jumpers banks B0-B3 allow you to select which address range the card will use. Each of the four outputs corresponds to one of the four 1/2 squares reserved for user boards (slots 13-16). Refer to page 183 of the Owner's Manual for more information.

Address Strobe (AS). This signal, when low, indicates that the address signals are valid for decoding the port address. **Address Masking (AM0, AM1, AM2).** L2 generates the interrupt acknowledge, so no decode occurs during that time. This can be tied low and ignored if the board is not in the last address range.

The Data Lines. The VMEbus has 86 bi-directional data lines. The upper eight are not used. U3, the U3ens, is used to latch the data from the bus to the output port lines. If higher drive is required, a buffering version may be used. If full-to-full voltage swings are required, then an HC (CMOS) version could be used. If 86 bits of output were required, then another port could be added to the upper 8 bits of the data bus with its clock input tied to the clock input of U3. U4, the U4ens octal buffer, is used to gate data from the input port onto the bus whenever the port address is read.

Data Transfer Acknowledge (DTACK-). U2 is used to generate the DTACK-signal. Whenever any access into the board space is made, the DTACK-line is pulled low telling the CPU that write data has been received, or that read data is ready. There are no wait states inserted.

WRITE. This signal (also known as RD+/WR-) is used to indicate whether the current bus cycle is a read or write cycle. U5, and U6, the 74181, generate two separate chip selects, one to read and one to write. The data on the bus

Continued on facing page

#10 87908-1127
 #14 87908-1127
 #15 87908-1181
 #16 87135-0110

VMEbus Interface (continued)

is guaranteed to remain valid for 20ns after address strobe goes high (inactive). The worst case propagation delay of the Status bus. This means that the Data on the bus will be valid for 3ns after the rising edge of the bus select output.

+5v, +12v, -5v, and GND These are used to power the devices on our board.

Bus Grant In (BGxIN-) 0 through 3, Bus Grant Out (BGxOUT-), Interrupt Acknowledge In (IACKIN-), and Interrupt Acknowledge Out (IACKOUT-). These signals are not used by our board, but they must be passed through so that other boards further down the bus can use these signals.

We have used the following prototyping boards from Robinson Nugent, Inc. with good results:

EQC-074-1A-FCB Single width mounted with VMEbus connector

EQC-074-1-FCB Single width mounted without VMEbus connector

EQC-074-2A-FCB Double width mounted with 2 VMEbus connectors

EQC-074-2-FCB Double width mounted without VMEbus connector

QCL-1 Wire application pencil — required for these boards.

QCN-0 (color) Wire, this is yellow wire, don't try to use regular wire wrap wire.

These boards, although relatively expensive, are very fast to wire. Their mounting holes line up with the mounting holes provided on the Single 400 Series boards. Contact Robinson Nugent, Inc. (802) 945-0271.

The PAI, back plane, and connector are available direct from Seale-Matrix.

92888 PAI (Shown in schematic as PAI92844).

80881 Three-high back plane.

CN059 80-pin VME connector.

This circuit shows how easy it is to interface to the VMEbus. Using the PAI supplied by Seale, the typical time necessary to prototype the circuit is 30 minutes. Here at Seale we commonly use this circuit to interface to A/D's, D/A's, and general bit I/O.

VMEbus Bug Fix

An error exists in the generation of the "float addressing" mode on CPU boards. (p/n CB080) Revision A. Those using this special VME mode should contact our customer service for notes on how to fix it.



The VMEbus pins may appear out of order here as this is a single board design.



New Literature Has Uniform Look

As part of our new image, our marketing department has created a new set of literature. New manuals, product catalog, flyers, newsletters, folders, address cards, business cards, pamphlets, and more have all been redone with the new Stride format.

There are two places in the literature which incorrectly have logo instead of Stride or the 400 letters. If you can find either of these places (or any other we missed), and be the first to report it via phone, FAX, or letter, you will receive a free copy of the Marat Chavi program. See related article inside. Note that this newsletter and material

is the
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fly, with

material.

Subscription rate \$20 for one year. All correspondence should be addressed to Stride, 4000 Empire Pkwy., Reno, NV 89502. Attention: Virginia Buchanan.

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