****

WRITING GOOD PROGRAMS (PART 1)

by Burks A. Smith of DATASMITH
Box 8036, Shawnee Mission, KS 66208

Trying to define what constitutes a good program is like trying to identify "good" art. Not everyone will agree. Since writing good programs is primarily a matter of style, every programmer will do it slightly differently and there are legitimate differences of opinion as to what constitutes "good" programming style. Therefore, what appears here is my personal opinion and is by no means intended to be a set of absolute rules. I hope it will serve as a means of stimulating thought on the subject and, hopefully, improve someone's programming style.

There are three perspecitves by which to judge programs, and a really well-written program will get high marks in all three. They are:

1. The program must perform the desired task.
2. The program must get along with people.
3. The program must be maintainable.

The first perspective is most obvious, but is generally the most difficult to achieve, even for an experienced programmer. Performing the desired task doesn't mean just working with test data, it implies reliability of operation with real data and absolutely NO bugs. The infamous "computer error" that often gets newspaper coverage is usually due to software and one needs look no farther than the letters section of any computer magazine to see that most of the programs they publish have bugs. Writing programs that work reliably requires careful planning and a consistent style.

Most programs written in BASIC are of an interactive nature and require some input from the computer operator. Therefore, the program must be designed so that the operator is clearly prompted for the desired response and the program will not crash no matter what the operator enters. Those of us who write programs for a living try to write them for the hypothetical "naive user" who can not be trusted to follow the rules and might do the unexpected at any time. Getting along with the human operator also requires that programs convey an air of polite efficiency like a trusted servant instead of an impersonal machine.

Finally comes the part that is invisible to the user: maintainability. Have you ever written a program and then examined it weeks or months later only to find that you can't remember how it works? Oh, sure, you can figure it out again in time, but that is time wasted. How about a third person? Could any programmer figure out your program if it needed to be changed or fixed? Even if you write programs only for your own use, it will save you time in the long run to write them as if they were for sale to the man on the street with a lifetime warranty.

Programs should be designed to conform to all of the above requirements starting in the planning stage, and code should be written that works the first time. It is possible to approach these goals, if not attain them, by careful advance planning and adherence to a structured programming style. "Structured Programming" seems to be the popular buzzword these days, but I am not jumping on the bandwagon. I have seen whole articles on how superior programs are written by never using a GOTO and why PASCAL is the best language because it is "structured". Well, it is true that certain logical structures offer more efficiency and relia-

BASIC/S COMPILER REVIEW, PART 2

I wouldn't want to kid you by telling you that this system worked fine on delivery. It had a few bugs. Bob Zale has been most cooperative in passing me the patches. I also wouldn't want to see his phone bill for the month. Not to worry - anyone who got an "original" system will get a new disk with all the corrections.

Actually, the first thing I tried worked fairly well. I converted the DISKMENU program of Ed Burkhardt's that was in last month's newsletter.

The first step in conversion of an old program is to run TR/I, a program that translates a Micropolis BASIC program to the BASIC/S format. BASIC/S files are pure ASCII. That makes them CP/M compatible, by the way, and allows them to be created by any editor. If you are writing a program from scratch, you don't need to worry about TR/I. TR/I is supposed to do more than just convert to ASCII. It should insert spaces between the GOTO and GOSUBs and the line number. Because of a bug, it didn't, and I got 19 illegal lines. This bug is now fixed, but at the time I corrected the lines using BASIC/S's global search and replace function.

It took about 15 minutes to finish the conversion, 16 seconds of which were TR/I's job. Remember, this was the first time I opened the book - and all the unnecessary insertion of blanks. I was pretty pleased.

Compiling the program took one minute 13 seconds. There are lots of options on the compile. You can get a source listing, a source listing with the generated assembly language (object) code, and a variable symbol table. You can specify inclusion of the DEBUG option. DEBUG has two sub-options, Trace, and Single-step. Trace will display, as the compiled version is run, the line number of the source code statement being executed. It's the same as FLOW.

The Single-step option is neat. As you'd expect, it causes the program to pause after each line and displays the line number. Pressing any key causes the program to proceed to the next line. In addition, you can specify the display of up to four simple (non-array) variables. This is nice for seeing what's happening to variables in a loop, what values are being considered at program decision points - things like that.

To run a compiled program you can either EXECute it from BASIC/S or RUN/S it from MDOS. RUN/S, as I said last month, is the run-time module, and may be purchased separately.

Now our first Benchmark - Running in Micropolis BASIC, the DISKMENU program executes in 51.3 seconds. Under BASIC/S, 10.1 seconds. That's about 5.1 times faster. Not bad. This is without any attempt at optimization, such as using IF THEN ELSE or integer variables.

I don't want you to get too hung-up on benchmarks. My "gut" feeling is that BASIC/S will run from 3 to 20 times as fast as Micropolis BASIC, depending on what you are doing. We'll document more timing comparisons as the months go on. There are more things to consider than speed, however. Memory utilization, increased (or decreased) power of the language, and code security should also be considered.

I still think BASIC/S is a pretty good investment. For the business environment I believe it will pay for itself many times over and is therefore money well spent. You always have the option of just getting RUN/S and can still receive the rewards of the product. For the hobbiest - gosh, only you can decide where you want to spend your money. Too much to say - need to stop for this newsletter, MUG will continue to report on and support the development of BASIC/S.

. . . .

CP/M TECHNICAL TIPS

by S. Tattersall, ITT
London Road, Harlow, Essex, England CM179NA

THE MICROPOLIS DISK CONTROLLER

CP/M 1.4X implemented on the Sorcerer by Lifeboat
Associates has completely implemented the I/O disk
driver. The addresses below are the locations of
the various elements concerned.

Track Calibration - the current track position of
each drive connected to the controller. Each entry
is initialized to FFH to cause the track position of
each drive to be re-calibrated the first time it is
accessed.

```
BIOS+5F6H    TRACK (DRIVE A)
BIOS+5F7H    TRACK (DRIVE B)
BIOS+5F8H    TRACK (DRIVE C)
BIOS+5F9H    TRACK (DRIVE D)
```

Track max - set to the highest track address for
each disk drive (76(4CH) for MOD II).

```
BIOS+5FAH    TRKMX (DRIVE A)
BIOS+5FBH    TRKMX (DRIVE B)
BIOS+5FCH    TRKMX (DRIVE C)
BIOS+5FDH    TRKMX (DRIVE D)
```

Disk controller - set to the address of the disk
controller which is BOOT PROM + 200H.

```
BIOS+800-801H    DADR
```

Users disk control block - used by BIOS for disk
I/O control.

```
BIOS+802H    UDCBFN function code
  Code    Function
   0      Seek track only
   1      Seek and read sector
   2      Seek and write sector -
            verifies track and sector ID in
            preceding sector header then
            writes data followed by verified
            read after write checksum read
   3      Seek and verify sector

BIOS+803H    UDCBUN   Control flagg/unit select
  Bit     Function
  0-1     unit address (0-3)
   6      read after write check (0 perform, 1
            inhibit)
   7      pre-write header check (0 perform, 1
            inhibit)

BIOS+804H    UDCBSC   Sector address (0-15)
BIOS+805H    UDBTK    Track address (0-76)
BIOS+806-7H  UDCBAD   Buffer address - start of
                        read/write buffer to be
                        used in all operations
BIOS+808-9H  BUFADR   Current buffer address
BIOS+80AH    L1RTRY   Disk I/O error reetry levels
BIOS+80BH    L2RTRY     "    "    "    "     "
BIOS+80CH    L3RTRY     "    "    "    "     "
BIOS+80DH    DIRCTN
BIOS+80E-FH  STACK    Saved stack pointer
```

Disk I/O buffer - 268 bytes

```
BIOS+8C8H    Track address (0)
BIOS+8C9H    Sector address (1)
BIOS+8CAH-   Data (2-267)
```

Error messages - the disk I/O driver returns a
condition code if an error occurs:

1   Permanent I/O error - an unrecoverable disk
      error occurred
2   Parameter error - one of the parameters in
      the disk control block is invalid
3   Drive not up - the selected drive is not ready
4   Write protect - the selected drive is write
      protected and a write operation was specified.

....

FORTH INTEREST GROUP OVER 2500 MEMBERS

The FORTH Interest Group now has over 2500 members,
worldwide (all 50 states and 34 foreign countries).
Fifteen chapters are meeting or in the process of
forming.

All members receive the bi-monthly publication,
FORTH DIMENSIONS. The list of publications from
FIG (FORTH Interest Group) has expanded greatly
over the past year. There are now seven different
source listings for specific CPU's with several
more being developed. A number of user's manuals
can be obtained.

The popular micro computers can now be programmed
in the FORTH language. Various FORTH programmers
and vendors have implemented the language and
applications on mini and mainframe computers.

1981 looks like the year of FORTH. A number of
manuals and books are in the works. More and more
vendors are selling FORTH implementations and
programs. The utilization of FORTH is spreading
from micros to robotics, business applications,
product development and many control applications.
FORTH DIMENSIONS will keep members abreast of these
activities.

Memberships are $12.00 per year ($24.00 foreign)
and include six issues of FORTH DIMENSIONS.

For a list of publications and to become a member,
contact: FORTH Interest Group, PO Box 1105, San
Carlos, CA 94070 (415) 962-8653

....

MOD II TO I CONVERSION

Several people have mentioned the problem of
getting software for the MOD I drives. Programs
tend to be available only in MOD II format.

If it will help you any, I can convert from MOD II
to MOD I. If you MOD I'ers want to buy the MOD II
disk and send it to me, along with $5 ($7 over-
seas), I will reformat the files to MOD I and
return the disk to you.

....

MICROPOLIS INFORMATION

By Bob Wytovich
MICROPOLIS CORPORATION
21329 Nordhoff St, Chatsworth CA 91311

QUANTITY OF DRIVES

In reference to your letter of 3/29/81, we have
produced the following quantities of drives:

```
MOD I - 10K
MOD II - 125K
MOD IV - 5K
MOD VI - 5K
Rigid Drive - 2K
```

Approximately 50-60K of the drives produced were
for S-100 based systems with 10K sold with MDOS.

MAINTENANCE MANUALS

Subsystem Maintenance Manuals are available at a
cost of $50 each (p/n 1084-02) and can be ordered
by calling Micropolis Order Entry Dept. at (213)
709-3333.

FACTORY MAINTENANCE

If a drive becomes non-functional, please contact
Micropolis for a Return Goods Authorization Number
(RGA) and the drive will be repaired in a 3-4 week
period. We do not have regional repair facilities.

MAINTENANCE TRAINING

Training classes are available approximately every 3 months at different locations throughout the U.S. at a cost of $200 for the first person and $175 for each additional person. This 2 day course includes Maintenance Manuals and diagnostic diskettes as well as lunch on each day. The entire training consists of two full days.

If you have any further questions, please feel free to contact my office.

ED NOTE: Micropolis will let me know when and where the maintenance classes will be held. I'll let you know.

....

TIMIN ENGINEERING SOFTWARE

FORTH

Timin FORTH release 2 is available on a Micropolis Mod I or Mod II diskette. The price is $110. CP/M is required, version 1.4 or higher. RAM can be as little as 24K for a CP/M 1.4 system, a little higher for 2.0 or 2.2.

Presently our other FORTH products are only available on 8" standard diskettes. They will be made available on Micropolis diskettes if there is some demand.

Release 2 is a complete FORTH system based on the FIG (FORTH Interest Group) model. It is the closest available to a standard FORTH. A user manual/tutorial is included.

For purchase or further information, contact Mitchell E. Timin, President of TIMIN ENGINEERING CO, at 9575 Genesee Avenue, San Diego CA 92121. (714) 455-9008

....

NEGATIVE FEELINGS ABOUT CURSORS

by Jerry Factor
709 No. Palm Dr., Beverly Hills, CA 90210

I might feel more kindly toward the cursor if it were a cute little dimple on the screen, or maybe a dainty heart. But, it isn't. Any time a program asks for a response from me, or takes so much time that my eye isn't fooled by its agility, IT appears. That intrusive white rectangle stands out on an otherwise graceful screen like a gravy stain on a new tie.

On my COMPAL 8200, the cursor's location is stored in bytes #00077 and #00078, the screen display starts in #63488, and input is through #00079. CHAR$(6) blanks the screen.

These instructions allow blanking the cursor:

```
 10 DEF FNC=63488+PEEK(78)*256+PEEK(77)
 15 B%=ASC(" ")
252 POKE(FNC)=B%:! BLANKS the pesky thing.
```

Adding the following will blank the screen and report that a program is loading. The operator sits calmly. No longer does he have to suppress feelings of persecution, like when he finds a fly in his soup:

```
250 PRINT CHAR$(6)
251 PRINT "Advancing To 'UPDATE' Section";
252 POKE(FNC)=B%
253 PLOADG "UPDATE"
```

And, about those single-character entries: The INPUT command not only leaves one of those THINGS, it also drops in a question mark. You get TWO characters splattered on the screen (without your having any say in the matter), just so you can enter ONE. And, the screen sits there, staring, as if it's satisfied with what it's done. Not even a gentle tug on your sleeve to let you know you have another one of those "things" to clean up.

Adding the following lets us request an entry, blank the cursor, and receive and edit a single keyed input without even having to press "RETURN":

```
 20 I%=00079
 25 DEF FNI=PEEK(I%)
135 GOSUB 500:!  Display Menu
140 PRINT "ENTER Menu Selection (1-3):";
145 POKE(FNC)=B%
150 POKE(I%)=0:!  Clear Input Byte
155 IF FNI=0 GOTO 155:!  Wait For Input
160 I%=CHAR$(FNI):!  Convert To Char
165 POKE(I%)=0
170 ON INDEX("123",I$) GOTO 200,250,300
175 GOTO 150:!  Rejected Input
```

We can even add a sub-routine to provide a winking asterisk, to prompt the operator warmly, like the smell of coffee on a Sunday morning: (Note that line 155 has been deleted)

```
 30 A%=ASC("*")

135 GOSUB 500
140 PRINT "ENTER Menu Selection (1-3): ";
150 GOSUB 600:!  Winking Input
160 I$=CHAR$(FNI)
165 POKE(I%)=0
170 ON INDEX("123",I$) GOTO 200,250,300
175 GOTO 150

600 POKE(I%)=0
601 POKE(FNC)=A%
602 FOR Z=1 TO 20
603  IF PEEK(I%)>0 RETURN
604 NEXT Z
605 POKE(FNC)=B%
606 FOR Z=1 TO 15
607 IF PEEK(I%)>0 RETURN
608 NEXT Z: GOTO 601
```

Now we'll feel better, but not completely free of the problem. Maybe, together, we can build a BASIC routine to allow multiple character input, without some of those little varmints ruining our day.

....

MODERN MICROCOMPUTERS SOFTWARE

GENERAL LEDGER

Modern Microcomputers has developed what they consider to be the best GENERAL LEDGER PACKAGE in their area and have sold it to many accountants in the New York and New Jersey areas. It is designed by a CPA to do the complete write-up for the small to medium size accountant. It produces actual journal pages and does all financial statements. It allows the accountant to customize the Chart of Accounts for each client and requires single entries for each transaction but will create the corresponding Debit or Credit automatically. In this way the system always STAYS IN BALANCE. As far as they know, no other system has this capability. The system also saves data for a full year so that it can print out a comparative P/L and Balance sheet at any time. Payroll is Post-Fact but keeps records for Quarterly reports and year-end W-2's. It also does a Year-Long General Ledger for auditing purposes.

Modern Microcomputers would be interested in selling the package to individuals who might be interested in marketing it in areas other than New York and New Jersey. They presently sell it as part of a package which includes a VECTOR GRAPHIC along with either a Texas Instrument 810 or Xerox Diablo printer. The software sells to the end-user for $1000 and they sell it to O.E.M.'S FOR $450. They could make this same deal with members of the Users Group.

The programs are produced both in Micropolis BASIC and in CP/M. There is complete documentation to go along with the software and they will send samples of print-outs to anyone who contacts them. This may be a good opportunity for some of the Users Group to make some money.

STATISTICS

Modern Microcomputers also have a number of statistical programs written in CP/M as well as both Micropolis BASIC and Northstar BASIC. They've been selling these to both Universities and Colleges around the United States since they are as powerful as the programs found in most University Computer Centers. Modern Microcomputers also will do consulting for Doctoral Canditates who may have problems in setting up their statistical testing.

For further information, contact Dr. Robert Knodt at Modern Microcomputers, 63 Sudbury Lane, Westbury NY 11590 516/333-9178

. . . .

WRITING (Continued from Page 1)

bility, but it is impossible to write a complex program in BASIC without using a GOTO. Structured programming is a state of mind and should not be degenerated into a rigid set of rules.

Assuming that the problem to be solved will require more than a few lines of code, the first step is to plan the solution. Don't write any code until you know exactly what you need to do. One useful technique is decide first on what the program's output will be and then work backwards to determine what input is necessary to produce the desired result. After all, it is results you are looking for and your program must be provided with data that will make that result possible. Make a list of the required input data and the output the program will produce before you start working on the actual mechanism to obtain the output. With this firmly in mind, you can start working on a logical solution.

Complex problems absolutely require some sort of written plan before any coding is done. Flowcharts provide a formal means of defining a logical plan, but use any method that you are comfortable using. A simple outline is far superior to a hazy mental image. Start by breaking down the problem into a few logical functions that can be easily understood. For instance, a program that figures income tax might perform only three major functions:

1. Get input on income, deductions, and filing status.
2. Calculate the tax
3. Output the tax information.

Without worrying about details, this is all the program really does, and it may do it over and over again if the input data is in a disk file. These three major functions are the highest logical level of the program. We can now attack each function as if it were a separate problem, breaking it down into sucessively smaller functions until we reach a level where a single BASIC statement performs a function. As you probably guessed, this is called "top-down programming" and is characterized by the technique of attacking the problem in manageable chunks starting with the most important functions and working toward the small details. The logic of the program can be checked and re-checked every step of the way so that, by the time you write any code, you know exactly which statements are needed. It is during this design stage where you become familiar with the program and bugs can be avoided before they have a chance to get into your code.

Top-down program design lends itself to the production of modular, subroutine-oriented programs that operate efficiently, perform reliably, and are easy to maintain. NEXT MONTH we'll cover good coding practice.

. . . .

COPYING PUBLISHED SOFTWARE

We have discussed the possibility of converting software which is published in books and magazines, and placing that on a MUG Library disk. I wrote a few of the publishers. Their responses follow.

INTERFACE AGE

Dear Mr. Rudow:
We appreciate your interest in INTERFACE AGE and your desire to adapt the programs to the Micropolis system to distribute on a library disk. Unfortunately, due to the copyright problems, some of which are held not by us but by the original author, as well as our license agreement with dilithium Press to publish "The Best of INTERFACE AGE", it is impossible for us to grant your request.

Our legal position is that if something such as this is done, obvious legal recourse must be pursued in order to protect our copyright.

Robert S. Jones, President
Interface Age
16704 Marquardt Ave, Cerritos CA 90701

BYTE

Dear Mr. Rudow:
Thank you for your letter of April 27th. Regarding your question to adapt programs published in BYTE to your Micropolis system, permission is granted with the understanding that the programs will not be used as a commercial venture. Media charges do not fall into this category, so for your members not supplying their own disks you may charge them.

Credit must be given to BYTE as the source of the program, indicating the issue it was published as well. Any copyright notices in the program listing must also be included.

I hope I have helped you. If you have any further questions, please do not hesitate to call.

Mark Haas, Managing Editor
BYTE, 70 Main St, Peterborough NH 03458

CREATIVE COMPUTING

Dear Mr. Rudow:
Thank you for writing to ask our position on reproducing software from our publication for distribution. As you are aware this is copywritten material, and we appreciate your writing for clarification. Essentially, your inquiry falls into two classifications.

The first category is where someone submits a program, and essentially provides the disk and other materials, with no money changing hands. Here we can probably work something out.

The second category is where you not only charge for materials and postage, but also make a personal profit on the materials. I am afraid this is a violation of our agreement with our authors.

In most cases, we are happy to work with clubs under the following specifications.

First, work is volunteer, with no individual receiving a profit.

Second, in the case of copywritten work, a copy of the original source is sold along with the program. For example, if you wanted to translate all the programs in our Basic Games books to the Micropolis format, we would be happy to offer your club a discount on a quantity order for the books. We do not mind if a non-profit club makes a modest profit on the books and the cost of the diskettes, or even if an individual buys the books wholesale and sells them retail. However, the publication of the programs on media can only be done on a totally non-profit basis and in conjunction with the sale of the book or back issue of the magazine.

Please write to our retail sales division, care of
the magazine, for a quote on quantity sales of the
magazines and books you require.

George Blank, Editorial Director
Creative Computing
39 E Hanover Ave, Morris Plains NJ 07950
....

MICROSYSTEMS

Buzz,
At $15/disk it appears that you are making a very
substantial profit on the sale of your disks,
especially when you consider that the CP/M and
SIG/M software libraries are available at a copying
charge of $1/disk or $4/disk (disk supplied).

Sol Libes
MICROSYSTEMS
PO Box 789-M, Morristown NJ 07960

ED NOTE: To clear up this misconception that may be
shared by some of you, the following paragraph is a
reproduction of a section of my response to Mr.
Libes.
....

While I can't disagree with the disparity of prices
between the MUG library disks and the CP/M disks, I
take issue with the theory of a "very substantial
profit." Yes, I am receiving a profit over base
material cost, but consider the purchase of two
unneeded-except-for-MUG MOD-I drives and the time
involved. I'm not really doing this as a hobby.
My purpose in starting the group was to learn about
what others had in the areas of software and
hardware which related to the Micropolis Operating
System. For better or worse, my primary job
requires writing and maintaining Micropolis
programs for a NASA contract and my after-hours job
is a Micropolis S/W based service bureau type of
business. Time is precious. From my point of
view, I give more than I take, and if the members
want the product, then the cost of my time must be
compensated.

KILOBAUD

KILOBAUD hasn't answered my letter.

CONCLUSIONS

It looks like we can do something with this idea.
These disks have to be in a special category. No
charge. Let me know what books you people have
that you think the members would like on disk.
....

MUG DOESN'T RESPOND

Some of you may believe that I don't appreciate
your letters, or ignore them. You haven't received
any response, either directly or by way of the
newsletter. Well, I do appreciate them and I
apologize for not getting back to you. My "excuse"
is simple - not enough time. If you haven't tried
running something like MUG, you can't conceive of
the work involved. As I've mentioned, MUG shares
priorities with a full-time job and a home-based
service bureau type of business.

We're here to stay, however, as long as you members
get value from the MUG. I am trying to rid myself
of the habit of doing everything personally. I'm
very bad at delegating responsibility and
authority. However, from this point on, Lynn, my
wife, will do the composition of the newsletter,
handle the membership file, and probably a lot
more. We should be able to service you better.

There's a second category of non-response. My
ignorance of what you're discussing. I try to
understand what I publish. But some of your
questions and articles are too deep for me.
Therefore, I'm still in the research stage - even
though I've received the correspondence six months
ago.
....

LETTERS

Buzz,
The two disks from the Users Group have really been
an education! I've really enjoyed using (and
converting) them. Most were very usable - those
requiring changes were fairly easy. However, there
are lots I still haven't used. I still see the
Group as a very useful and necessary learning aid
for me. At twice the price the subscription would
be a bargin; same for the disks.

I noticed the following article in a trade
magazine. Thought the Group would be interested.

NEW DRIVE TO BE AVAILABLE

Micropolis Corp. has introduced a family of 5 1/4
inch floppy disk drives offering up to two
megabytes of storage, doubling the capacity of the
company's earlier series of 5 1/4 inch floppies.

The new Megafloppy 1117 family includes two single
and two double sided drives using 96 or 100 tracks
per inch double-track recording technologies.
Single sided versions, priced at $315 in quantities
of 1,000, are said to offer 1.1125 and 1.2 mega-
bytes of formatted storage at 96 and 100 tpi,
respectively. The double-sided models, price at
$395 in the same quantities, provide 2.2025 and
2.175 megabytes at 96 and 100 tpi respectively.
The company said it increased the storage capacity
over its earlier drives by increasing data
recording density from 6,000 bits per inch to
12,000 bpi, using MFM recording techniques.

All four models provide 6 ms track-to-track posi-
tioning speed with 600,000 bit per second data
transfer rates, full compatibility with industry
standard interfaces, mounting dimensions and
bezels, and enhanced electromagnetic shielding, the
company said.

Limited quantities of the drives will be available
in the late third or early fourth quarter of 1981,
and volume delivers are expected to begin in
January, 1982.

Martin Weston
4060 South Garfield, Loveland CO 80537

ED Note: Impressive speed and data capacity.
However, I checked with Micropolis. These drives
are not presently scheduled for production as an
S-100 add-on. If you are an EOM, build away.
....

Buzz,
I've been looking at Vector Graphic systems, but
have been told their systems will include a Tan-
dem floppy disk subsystem in lieu of Micropolis.
If so, these drives must be good; but I've never
heard of them.

Kevin Carlyle
1968 Kathleen Ave, Brights Grove, Ont Canada

Kevin: The statement is true, in part. Some
Vector Graphic systems now come with Tandem drives.
Those that have the 5Mb hard disk certainly do. A
new controller board that services both the
floppies and the hard disk is the main reason.

As far as the System B is concerned, I believe you
can still get it with either Micropolis or Tandem.
Vector Graphic hasn't been giving customers MDOS
for some months. CP/M is the supplied operating
system. You can still specify you want MDOS if you
buy a VG with Micropolis drives.

It would seem that VG is phasing Micropolis out.
The reasoning pertains to speed, price, avail-
ability and durability. Tandem wins on speed and
price; Micropolis on availability. The jury is
still out, as far as durability is concerned.
....

CLASSIFIED

WANTED: I'm in the market for a MOD II dual add-on unit (630K - 2 drives). If you know of someone selling one, a call or a short note would be greatly appreciated.

Tim Cannon
1455 Winslowe Dr, Palatine IL 60067 312/359-2553
....

WANTED: I need a good Legal Billing program which will run along with a good word processing package. I can make a number of very easy sales if I can find this combination. Is it possible that some of the MUG members can help me out?

Bob Knodt
MODERN MICROCOMPUTERS
63 Sudbury Lane, Westbury NY 11590, 516/333-9178
....

FOR SALE: I reload multistrike film ribbon cartridges for letter quality printers (NEC, Diablo, Qume, Radio Shack Daisy Wheel, etc.).

The cost is $2.50 each, exchange used cartridges, plus .35 each or $3 per dozen return shipping (California orders, add 6% sales tax).

I would appreciate my service being called to the attention of your members. Some members may own letter-quality printers and others may work at a firm where a cost-saving suggestion may be turned in.

I have 24-hour turn-around on orders, thoroughly clean and check all parts, and repair without cost (except shipping) broken ribbons (with substantial use remaining) submitted as part of an overall order.

Ben Torres
358 Campbell, Redlands CA 92373, 714/792-0831

Editors Note:
Ben's original letter was printed using a reloaded NEC cartridge. The quality of the reloaded product was indistinguishable from a new ribbon.
....

WANTED: I'm looking for a bowling-secretaries program to keep track of all the data a bowling secretary needs for his duties. If any of our members have one, I'd be glad to trade or buy it.

Ted Schoenke
3014 S 10th St, Manitowoc WI 54220, 414/682-8363
....

WANTED: A driver for a COPE terminal. It is IBM SELECTRIC mechanism using Correspondence code and has it's own modem card - which can be by-passed.

Murray MacKenzie
38 Inniswood Drive, Scarborough, Ont. Canada
....

FOR SALE: Micropolis Mod I Subsystem. Two drives, software, cables, controller. New, used only in prototype system for photos. Drives require power supply. List price $1140. First $600 takes all. Micropolis manual $40 extra. CP/M 1.4 and CBASIC for MOD I new, sealed, $50 for both.

Micropolis Controllers, Model 1071, new $290 each.

VISA or M/C ok.

iPEX International Inc.
16140 Valerio St., Van Nuys, CA 91406 213/781-0020
....

FIRST CLASS MAIL
===== ===== ====

FIRST CLASS MAIL
===== ===== ====

==

FIRST CLASS MAIL
===== ===== ====