

PROTEUS / NEWS

AN INDEPENDENT NEWSLETTER FOR OWNERS AND USERS OF PROCESSOR TECHNOLOGY CORPORATION COMPUTERS

FORMERLY SOLUS NEWS

VOL. 2, BULLETIN

PUBLISHED BIMONTHLY BY PROTEUS, 1690 WOODSIDE ROAD, SUITE 219, REDWOOD CITY, CA 94061, USA

JANUARY 13, 1978

LIMITED TIME TO TRADE-IN OLD MEMORY

Until January 30, 1979, Processor Technology Corporation is offering a special program which allows a customer to trade-in their present (PTC) memory board(s) for credit toward the purchase of one of the new 32KRA-1, 48KRA-1, or 64KRA-1 modules. Reportedly, the trade-in values are high, so that customers can upgrade their systems at minimal cost. The nKRA family of memory modules offers up to 64K on a single board, lower power consumption, extended memory through Bank Select, no wait states.

We don't have any further details, but we've heard that dealers have the whole story. Contact your nearest PTC dealer in a hurry if you are interested in this unusual offer. It is good through January 30, 1979, only.

PRIOR AUTHORIZATION IS NOW REQUIRED FOR RETURNS TO PTC SERVICE DEPT

Individuals as well as dealers must now obtain written Return Authorization slip before sending anything to PTC for repair. Returns without authorization apparently will be refused. This new procedure is to help PTC schedule technicians and order parts, so that the in-shop time will be minimized. If you purchased your equipment from a dealer, contact the dealer for service. If you bought direct from the factory, contact Customer Service by phone or mail, telling them what equipment needs repair, and giving the serial number and symptoms of the problem. Wait for an "RA" number.

SOL PRINTERS DEBUT

Processor Tech has introduced three printers in their line of accessories for Sol computers. The SolPrinter 2 and 2E are Diablo daisy-wheel printers and the SolPrinter 3 is a Diablo high-speed (200 cps) printer intended for drafts and reports. The difference between the 2 and 2E models is that the former uses longer-lasting, metal-plated printwheels, whereas the latter uses all plastic wheels. Apparently, delivery will be slow this quarter, but will pick-up.

An interesting note: PTC recommends that purchasers buy the Diablo extended warranty because it is a bargain at \$135 (\$110 for the SolPrinter 3). Diablo service out-of-warranty now costs \$80/hr for the first hour and \$40/hr thereafter.

SPECIAL BULLETIN ISSUE

This special edition of the newsletter has been sent because of the deadline on the Processor Technology memory-trade-up program. We just learned about this, and wanted to inform all of our readers before the deadline passes. See the story at the left. The regular Vol. 2, No. 1 issue is in final preparation and will be printed soon.

Please notice that the newsletter's name has been changed to reflect its enlarged scope, as we explained in the last issues of 1978 Solus News. Subscription rates have been raised as shown below to allow us to rely less upon volunteered help, and to enable us to achieve more. All 1978 subscriptions have expired and should be renewed now. Thanks.

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IN THE COMING ISSUES

--Review of PTDOS 1.5--An Introduction to Programming in PASCAL--
Book Review: 45 BASIC PROGRAMS by Didactic--Software Review:
WordWizard, PTC's word processor--New Products: Content-addressable
memory, magic wand, accounting software, Touch-tone transceiver,
data base manager, etc.--A short note on the development of the
S.L.A.C. PASCAL compiler--Description of S.L.A.C. PASCAL--
Hardware Review: Speechlab speech recognition board--More
Solos/Cuter utilities--More on MSA BASIC--Improvements to
Micropolis disk software for Sol--A BAUDOT printer driver for
Sol--Tutorial: Understanding PTDOS.



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SINGLE ISSUE \$2 (US)

A NEW NAME

As you see, we've taken a new name for our organization and our newsletter. There are many reasons for the change, but the major ones are (1) to better express the full scope of the organization, and (2) to demarcate our transition from an all volunteer staff to a paid (part-time) staff. Our scope has enlarged because we have given up hope that HELIUM and the ALS-8 users groups will ever function. Indeed, it is better for us all to have a single users group than several factions. Secondly, our size has grown in the past year to the point where there is too much work for volunteers to enjoy doing, so we now have a part-time secretary. As the number of Sol systems increases, so will our membership, and we felt that the organization was on the way to oblivion unless we took the burden off of the volunteers. With the reorganization, we can actually seek an increase in membership, to the greater benefit of us all.

REQUEST FOR COMMENTS

In this issue we have reduced our type-size to a slightly more dense factor. Please let me know if you feel the type has become too difficult to read. One article in particular, the Introduction to Pascal, may be a problem because it was somewhat reduced in the original already. If it is unreadable in this issue I will print it again in the next issue, with larger type.

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UPDATE ON PROTEUS PROJECTS

The S.L.A.C. Pascal Compiler is available among other programs on Helios library diskette #1. (See Solus News, Vol. 1, No. 6 & 7 and this issue.) We are in the process of adapting it to Solos/Cuter as a two cassette system. We've had requests for Northstar and CP/M versions as well. Actually, the planned adaptation to Solos/Cuter is going to be done in a very general way, so that the system will be device independent. That is, the device drivers will all have a standard interface between the Pascal monitor and the host operating system. Adaptation to another operating system such as Northstar DOS, Micropolis MDOS, or CP/M will only require writing a new interface for the disk devices. We have been contacted by several people interested in working on the CP/M adaptation.

Our conversion project for bringing CP/M users library programs onto the Helios under PTDOS is slowly making headway. Hardware problems slowed us down, but they should be resolved soon.

We have someone to work on passing programs to and from the Micropolis disk system. No one yet for Northstar. (Anyone interested in running the Northstar arm of the PROTEUS library should let us know.)

One set of tools that we will soon need is a collection of programs to copy a Solos data file (byte mode) into a disk file (and vice versa) for each of the disk systems (PTDOS, Northstar, Micropolis, and CP/M). We will all then be able to pass files such as assembly language source code, Pascal source or p-code, etc., among each other's systems. In CP/M, the ideal way to do this would be with a driver to implement the so-called "reader" and "punch" devices as cassette tape read and write. Then in CP/M, "PIP" (peripheral interchange program) could be used to move the files to and from cassette. If anyone out there has already done this sort of thing, please send us the program for publication. The obvious way to do this is to load the file into RAM with Solos and then write it out with the host DOS's file saving command, but this won't work for very large files. (The Pascal compiler is about 4000 lines of source code in Pascal, for instance.)

With the retirement of our only successful cassette librarian, we have no mechanism yet for distribution of programs on cassette, but we have begun investigation of copying services. The loaner library of cassettes will be available to people who can't get to a local meeting as soon as we figure out the administrative details. We'll let you know through the newsletter.

The original release of PTDOS (version 1.4) has been improved and released as version 1.5. The new manual describes the following changes in addition to correction of known bugs in 1.4.

Three new commands have been added: HELP, DCHECK, and XREF. The HELP command takes as arguments a list of command names and it gives a brief display of the syntax and usage of each command named. With no argument it gives info about the HELP command itself. This command is essentially an abbreviated manual of PTDOS, so you don't have to leaf through the printed one so often.

DCHECK one-by-one attempts to open, space through to the end-of-file, and close each file in the directory on the named unit. Errors encountered are reported on the console and the program goes on to the next file. This is useful to check the integrity of files. A hardware or software error can "break" a file by writing over the data in the block header of a data block in the file. Since the continuity of a file is established by pointers in the headers, a bad header can make it impossible for PTDOS to read beyond the bad block. DCHECK will detect this type of error in the file structure. There still is no PTDOS command to repair "broken" files for data recovery. The RECOVER command doesn't repair files; it just recovers orphaned sectors for free space.

The XREF command generates a cross-reference listing of an assembly language program. It works faster than the XREF option of the assembler.

The PTDOS 1.5 system disk also contains Extended Disk BASIC instead of the BASIC/5 interpreter which 1.4 had.

The DISKCOPY, FREE?, and \$PR commands have additional capabilities. DISKCOPY now has options to allow "conditioning" a diskette (erasing it and writing the primitive format necessary for the controller), "formatting" a diskette (conditioning and creating the system files necessary for PTDOS to use it as a data disk), copying a diskette onto a conditioned diskette, verifying a copy by reading it and the original diskette and comparing, and testing the readability of a diskette (verifying it against itself by reading twice and comparing). Removal of the conditioning step from the copying process speeds it up compared with the DISKCOPY in version 1.4, provided the destination diskette has been used before (conditioned). The FREE? command now has a blocksize argument as well as the unit. If no blocksize is given, the command works as in version 1.4. If blocksize is given, the command counts only the number of available blocks of the specified blocksize. This is useful because PTDOS doesn't repack a diskette after a file is killed. It just returns the sectors to free space. Although many small blocks may be free, they may be scattered and it may thus be hard to find large blocks. The new option lets you see how much free space is available to files of a certain blocksize. (A diskette can be repacked easily using the GET command to copy all of its files to an empty diskette just by specifying the units. The new diskette will have all of its free space in one contiguous area at the end.) \$PR now allows control characters in the print string, so within command files you can clear the screen, set tabs, sound the bell, etc. (if supported by the console device).

The system can be configured now to have a permanently open "log file" to which all commands (not their output) are echoed. If a flag in the system Global area is set, the bootloader will open file "SYST.LOG" as the echo file #3, and will make it permanently open. This creates an audit trail of commands from the log file. It is especially useful when the system is taking commands from a file rather than from the console.

The Console device now initializes itself according to the setting of the SOLOS/CUTER pseudo-port previously selected (by default or the SET I= or SET O= commands in SOLOS/CUTER. This lets PTDOS come right up talking to the same console as SOLOS/CUTER when bootload occurs.

Device drivers are explained somewhat more clearly in the new manual, although the explanation is still by no means on the tutorial level. Several new device CONTROL/STATUS operations have been added and their action is specified, but their purpose is not. They seem to be the calls necessary to allow asynchronous use of a device, like the way the WordWizard uses the printer to print in the background while the system continues editing another file. (I've been told an explanation of how to write a custom printer driver for WordWizard is in preparation. I'll bet it sheds light upon these calls.)

Some error messages have been reworded, and the manual now has an entire section explaining each PTDOS error message in some detail. Suggestions are made to help in recovering from the error.

The screen editor (EDIT) now supports tab stops on the screen. The TAB key acts as a tabulation key rather than as a search-continue key. The LOAD key now does what TAB used to do. A command has been added to allow tab set and clear. Pattern deletion has been added. An "insert file" command allows another file to be copied into the file being edited, at any desired location.

The assembler supports Title and Page-ejection pseudo-ops to control the listing, and it has a pseudo-op "ASCZ" which works like "ASC" to define an ASCII string, except it appends a NUL (00H) character as delimiter in the PTDOS-conventional manner. Labels may have lower case letters, and a few other small changes have been made. The chapter on ASSM now explains the error flags, gives some useful tables, and explains a sample listing.

The debugger (DEBUG) now talks to the PTDOS console as its default device, rather than using its internal VDM driver as default. The chapter on DEBUG has been greatly expanded and includes a "walk-through" example.

The entire PTDOS manual has been rewritten for clarity and completeness. It seems that there isn't a chapter that hasn't been expanded. The file structure is more fully explained. The directory and block header formats are given. (Archive file formats are still a mystery.) A more complete command summary is given. The style is more consistent throughout. The manual is now bound (not loose-leaf) in soft-cover, 8 1/2" by 11" form with standard 3-hole drill. It is still typewritten (not typeset) and could use a few font changes to make headings easier to find, especially command names. It would also benefit from a topic index. Chapters are easily located by thumbing to a distinctive block number on the edge of the page.

In conclusion, PTDOS 1.5 is the next evolutionary step in Processor Tech's disk operating system. The most significant change is the improved DISKCOPY command. The most significant change in the manual is the new chapter on error messages.

I don't yet know how PT intends to handle upgrading for users of PTDOS 1.4. That is, what price will existing users have to pay for the new version? I suspect it will be the same as one would pay to get an additional manual and diskette. When I find out, I'll pass the info along.

B I T S A N D P I E C E S

The memory-board trade-up offer reported in the special Proteus bulletin in January does NOT end January 30 as we incorrectly reported. That was the deadline for dealers to commit themselves to trade-up orders from PTC. Customers reportedly can still trade-up old PTC memory boards, either through your dealer, or direct from PTC if it is not possible to work through a dealer.

A high-ranking official of PTC has hinted that they will soon have available a "high performance mini-disk". We've heard that it will utilize a subset of PTDOS, so that programs will be interchangeable between HELIOS and the new mini-disk.

As of December 28, 1978, PTDOS 1.5 was at revision level E, WordWizard was at Rev. D, WordWizard Document Disk was at Rev. C. We've heard that dealers will upgrade their customers' diskettes to current revision levels, free of charge. The second edition of the PTDOS User's Manual has been updated by PTC document 731072.

The Sol computer has been modified to simplify manufacture and repair. The Sol-PC is now at Revision R. Some of the changes eliminate problems encountered in the use of the ParaSol Debugger (a diagnostic test device which lets a "healthy" Sol check a "sick" Sol). The top 100-pin socket on the backplane has been dropped.

Extended Cassette BASIC is now shipped with the Sol 20 and Sol cassette-based systems, instead of BASIC/5. Likewise, BASIC/5 on Helios and Sol disk-based systems has been replaced by Extended Disk BASIC.

INTRODUCTION TO PASCAL
by Chip Weems

AN INTRODUCTION TO PROGRAMMING IN PASCAL

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Abstract:

This paper will concentrate heavily on the use of the Pascal language at the beginner's level. A minimal knowledge of some other programming language such as FORTRAN, BASIC or ALGOL is assumed.

The areas which will be covered are simple and structured statements in Pascal, simple and structured data types, plus procedures and functions. Emphasis will be placed on using Pascal statements, although some discussion of the power of user defined data types will also be included.

A list of machine models for which implementations of Pascal are known to exist, is provided as an appendix.

Part One: What is Pascal?

Historical Introduction:

Pascal is not an acronym, unlike many languages the letters which make up its name do not stand for anything. This is perhaps a first indication that Pascal is something different and a little special.

Pascal was named after the famous mathematician Blaise Pascal (1623 - 1662) who, among other things, invented an eight digit calculating machine which could perform addition and subtraction. Multiplication and division were performed by repeated addition or subtraction, respectively. He completed the first operating model at the age of 19, and built 50 more during the next 10 years.

The Pascal language was originally specified in 1968 by Niklaus Wirth at the Institut für Informatik, Zurich. This makes it a relative newcomer to world of programming languages. The first Pascal compiler became operational in 1970 and was published in 1971.

The following table shows just how new Pascal really is. Remember that

most compilers are not introduced until three to five years after their initial specification. (For example, APL was initially specified in 1962.)

<u>Language</u>	<u>Introduction Date</u>
FORTRAN	1957
COBOL	1960
ALGOL	1960
LISP	1961
SNOBOL	1962
BASIC	1965
PL/1	1965
APL	1967
Pascal	1971

After two years of experience, the language was revised and re-released in 1973. This version of the language is now generally referred to as standard Pascal. The important thing to note here is that Pascal was the first major new language to be developed after the concept of structured programming was introduced.

Structured Programming and Pascal:

There exists no exact definition of structured programming, although it has been termed "A collection of all good and wonderful programming practices." One fact becomes obvious in discussing it with groups of programmers: Some people love it, and some people hate it. However, those who hate structured programming are now finding themselves more often in the minority.

Some features to be found in a structured program are that it is generally more readable and more easily shown to be correct. The design of a structured program usually involves stepwise refinement, or top-down programming. Languages designed with

structured programming in mind will usually include a large group of program-flow control structures, which are entered at only one point and from which there is only one exit. Another notable point about such languages is that they often require explicit definition of all variables and data structures in the code. What does all of this mean? How does it relate to Pascal?

Readability:

One of the outstanding features of Pascal is that well written Pascal code is very readable; more so than most other programming languages. Probably the greatest single factor which makes this language so easy to follow, is the construction of data names. In Pascal there is no limit to the acceptable length of names. Generally, the compiler only uses the first eight characters of a name to distinguish it from all others, with the remainder of the name simply being ignored. This lack of constraints usually leads to very meaningful names in Pascal. Note that I have specifically avoided writing 'variable names'. Pascal permits not only variables to be named, but also constants, files, records, complex data structures, procedures and functions; all with the same naming conventions in effect. Compare this to other languages such as BASIC or FORTRAN!

Pascal's readability is also enhanced by the wording of its statements. When meaningful names are used, almost always the coded statements will make sense as English phrases. This would almost seem to take the place of program comments, but even so, Pascal provides one of the most flexible commenting schemes possible. Comments may appear anywhere in a Pascal program except in the middle of words!

Stepwise Refinement:

In writing a Pascal program it becomes very easy to use top-down programming style. This is mainly due to the flexibility and ease of writing procedures and functions. It is not unusual to see incredibly complex Pascal programs, several hundred lines long, in which the main program accounts for less than one hundred lines. Such a main program will usually consist of the overall program flow-logic with dozens of calls to well-named procedures and functions.

Procedures and functions correspond roughly to subroutines and functions in FORTRAN, but are actually part of the Pascal program. This means that procedures and functions inherit all variables defined in the main program, similar to subroutines in BASIC, but they can also include declarations of variables and constants which are only valid within themselves.

It should also be noted that procedures and functions are fully recursive in Pascal, that is they may in turn call themselves.

Simply using the name of a procedure or function will invoke it; thus it becomes very easy to write code with procedure names and worry about all of the messy details at a later date. This is, of course, the basis of top-down programming.

Explicit Definitions:

Another level of stepwise refinement is careful pre-planning of a program. Usually, Pascal programs are most easily planned-out by using a form of loose, English-like pidgin ALGOL.

One thing should be noted here: Pascal is probably best classified as a descendant of ALGOL. People who know ALGOL seldom have any difficulty in learning Pascal. In fact, ALGOL-60 is generally considered to be a subset of Pascal.

Careful pre-planning is encouraged by the fact that Pascal has very rigid rules requiring virtually all data structures to be defined at the start of a program. Unlike many languages, you can't just throw in an extra variable, in the code, when you discover that you need it. Because Pascal also requires such things to be defined, careless pre-planning often becomes quite self-evident just by looking at the declarations. This feature is something which BASIC programmers typically have a hard time getting used to, but it often makes Assembly Language hackers feel right at home.

Probably the greatest single new idea to come out of Pascal is the user definable data type. This construct, which appears in the declarations, permits the programmer to specify new types of data beyond the standard Real, Integer, Character and Boolean types. Data types of arbitrary complexity may be constructed; in fact adding complex numbers to a Pascal program is generally considered to be a trivial case!



Users may define data types as outrageously complex as say, a five dimensional array of records of arrays, scalars, records with variant parts, pointers and complex numbers. The programming power added by this concept is almost difficult to imagine; it provides us with the ability to create structured data as well as structured processes.

Single-Entry / Single-Exit Control

Structures:

One of the requisites for being able to show that a program will work correctly is that it must be possible to trace out all of the possible execution paths, through the program, for given sets of inputs. Usually, this is done by first breaking the program down into small units, showing that each unit works correctly, and then showing that combinations of units work correctly and so on.

This all sounds very simple, except for one item -- the GOTO statement throws a monkey wrench into the whole thing. The problem is that it doesn't take too many GOTO's combined with conditional branches, before an almost infinite number of possible execution paths appear in a program. How can you prove that a block of code will perform correctly, when you can't even be sure where it will be entered from, or where control will exit to, once it has completed?

As an example, consider a section of a BASIC program, possibly a scoring routine for a game, which is invoked by GOTO's from 20 different locations. In addition, these GOTO statements jump into the scoring routine code at six different points, depending on flags set by previous passes through the routine, and upon other outside events. Depending on the data present and the entry point, the routine may branch to several places in itself, loop in two places, or fall straight through. Also, when it completes, depending on outside conditions and also upon previous passes through it, the routine may branch to any one of eight other program sections. Stop and think about how much effort it would take to trace all possible paths through such a mess! This code might be clever and efficient, but is it worth all of the headaches which it will cause in the long run?

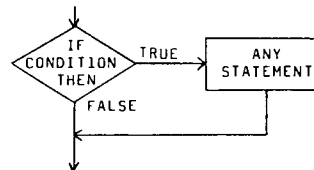
Not only is such convoluted logic difficult to follow and understand, but it is also a major chore to get all of the bugs out of it; and you can never be sure that all of them ARE out. As if that isn't enough, just try to make a major change to such a piece of code -- it would probably be easier to discard the whole thing, rather than try to patch it.

Now that we've raked the GOTO statement over the coals, what is there which will take its place? The answer is: single-entry / single-exit control structures. Flow of control, in a program, always enters the top of such a structure, and will only exit out through the bottom. This means that, if the program unit inside of the structure is correct, we can trace an effective straight line through the whole thing. A familiar example of a single-entry / single-exit structure is the FOR-NEXT loop in BASIC, but without any GOTO's which enter or leave the middle: Flow will enter at the top, looping will occur, but eventually flow will continue through the bottom of the FOR-NEXT.

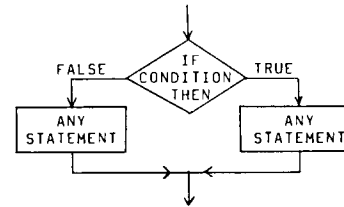
As it turns out, there are only three structures required to replace the GOTO statement. They are: The WHILE statement, the IF-THEN statement, and Compound statements. In Pascal, anyplace a statement can go, may be placed a Compound statement. Compound statements consist of the word BEGIN, followed by any group of statements (Which may include more Compound statements.), followed by the word END. Pascal also includes WHILE and IF-THEN statements, plus several other single-entry / single-exit structures which add to the convenience of GOTO-less programming.

The following is a list of all of the structured statements in Pascal along with flowchart segments to indicate how they function:

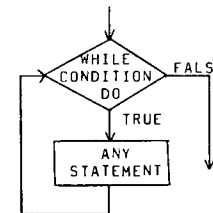
This is, of course, the well known IF-THEN statement:



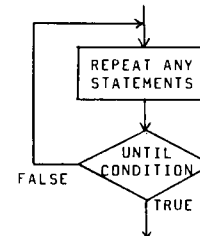
A convenient form of the IF-THEN statement is the IF-THEN-ELSE:



The WHILE statement has the form:



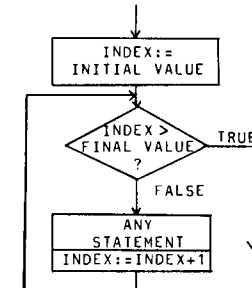
This next one is the REPEAT-UNTIL statement. There is an important difference between this and the WHILE statement which should be noted: If the condition is false, when a WHILE statement is entered, no action takes place -- control skips around the ANY STATEMENT part. In a REPEAT-UNTIL however, the ANY STATEMENT part always gets executed at least once, regardless of the conditional part.



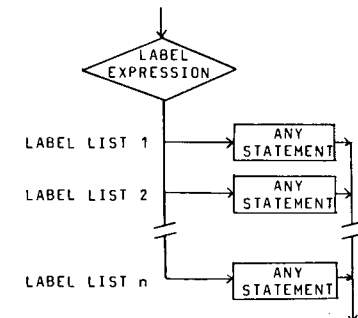
The FOR-UPTO statement is very similar to the FOR-NEXT statement in BASIC, except that it is restricted to an increment of 1. This is intended to add to the reliability of the construct,

since most digital computers can not exactly represent fractional numbers. If other increments were permitted, it might be possible for the increment to not exactly match the terminator when it reached the desired value, and so perhaps the loop would continue for an extra pass. This is a very frustrating problem, because it is usually highly machine dependent, and will typically only show up in a very few specific instances. All of this is eliminated by Pascal's restriction of the increment value to 1. One positive side effect which results from this is that the speed of the statement is often greatly increased, since many machines have single instructions for incrementing and testing memory locations, or registers.

The FOR-DOWNTWO statement is identical to this, except that the index is decremented by one, each time through the loop:



This last one is the CASE statement, which is somewhat like the ON-GOTO statement in BASIC:



All of this should not be taken to imply that Pascal is a GOTO-less language; it does have labels and GOTO's. The important point is that the experienced Pascal programmer will almost never use them, since they are never needed and only rarely of any value.

Part Two: A summary of Pascal statements, with examples.

Character Set:

The standard Pascal character set includes: Letters A - Z (and depending on the implementation, a - z), numbers 0 - 9, special characters + - * / = < > () [] . , ; : ' ^ (and the space or blank character).

Names:

Names in Pascal consist of letters and/or digits, and may be any number of characters in length. The first character must be a letter, and the first 8 characters must be different than the first 8 characters of any other name.

Examples:

```
ENDOFDATA TYPES AVERAGE SN7473A
TOTAL SCORES PAYRATE CARDCOUNT
```

Numbers:

Numbers in Pascal are either real or integer. They may be signed or unsigned.

Integers are a string of digits.

Examples:

```
+7 43 365 -18 8388607 4092 0
```

Reals have three forms:

```
digits.digits
digits.digitsEscale factor
digitsEscale factor
```

The E notation indicates multiplication by 10 raised to the scale factor power.

Examples:

```
3.1415 6.02E23 9.11E-31 -1E9
```

Note that the scale factor is always an integer.

Comments:

Anything typed between the symbols (* and *) will be ignored by the compiler as comments. On systems which

have them, curly brackets { } are used instead.

Operations:

Integer operations

```
* Multiplication
DIV Division (Integer part only,
remainder discarded.)
+ Addition
- Subtraction
MOD Modulo (A MOD B =
A-((A DIV B)*B))
```

Real operations

```
* Multiplication
/ Division
+ Addition
- Subtraction
```

Boolean operations

```
AND Logical AND
OR Logical OR
NOT Logical NOT
```

Relational Operations (give boolean results)

```
< Less than
> Greater than
= Equal to
<= Less than or equal to
>= Greater than or equal to
<> Not equal to
IN Used with data type SET, to
determine membership of an
element
```

Examples:

```
A * B A times B
X DIV Y X divided by Y
TOP <= BOTTOM Numerical comparison
ABOVE AND BEYOND True if both (ABOVE
and BEYOND) are true
boolean variables.
```

Functions:

Name	Action
ABS	Absolute value
SQR	Square
TRUNC	Truncate to integer part
ROUND	Rounded-up integer form
SUCC	Next highest (Integer or Char)
PRED	Next lowest (Integer or Char)
SIN	Trigonometric sine
COS	Trigonometric cosine
ARCTAN	Trigonometric arctangent
LN	Natural (Base e) logarithm
EXP	e raised to the power
SQRT	Square root
ORD	Numeric value associated with the character

Name	Action	Variable Definition:
CHR	Character associated with the numeric value	VAR varname, varname,...:type; varname, varname,...:type;...
ODD	True if the integer argument is odd	Example:
EOLN	True when end-of-line is reached	VAR SCORE,MAX,MIN,TOTAL: INTEGER;
EOF	True when end-of-file is reached	RADIUS,DIAMETER,CIRCUMFERENCE: REAL;

Name	Integer	Real	Character
ABS	Integer	Real	
SQR	Integer	Real	
TRUNC	Integer	Integer	
ROUND	Integer	Integer	
SUCC	Integer		Character
PRED	Integer		Character
SIN	Real	Real	
COS	Real	Real	
ARCTAN	Real	Real	
LN	Real	Real	
EXP	Real	Real	
SQRT	Real	Real	
ORD			Integer
CHR	Character		
ODD	Boolean		
EOLN	Argument is always a file name, result is always boolean.		
EOF	Argument is always a file name, result is always boolean.		

Statements:

Program Heading:
PROGRAM programname (filename, filename,...);

Example:

```
PROGRAM TESTSCORES (INPUT,OUTPUT);
```

Constant Definition:
CONST constname = value; constname = value;...

Example:

```
CONST ENDOFDATA = -1.0; PI=3.141592;
MAXSCORE = 100; MINSORE = 0;
```

Note that the constant definitions can continue onto more than one card, but the CONST is only typed once. There are some predefined values which do not need to be declared as constants in Pascal programs. These are:

TRUE	Boolean true value
FALSE	Boolean false value
MAXINT	Largest integer the computer can work with
NIL	Null pointer

Procedure Definition:
PROCEDURE procname (value parameters; VAR variable parameters);
body of procedure

Example:

```
PROCEDURE INCREMENTBY (INCREMENT:REAL;
VAR VARIABLETOBEINCREMENTED:REAL);
BEGIN
VARIABLETOBEINCREMENTED :=
VARIABLETOBEINCREMENTED +
INCREMENT
END;
```

Function Definition:

FUNCTION funcname (value parameters): result-type;
body of function

Example:

```
FUNCTION RADIUS (CIRCUMFERENCE:REAL):
REAL;
CONST TWOPI = 6.2831;
BEGIN
RADIUS:=CIRCUMFERENCE/TWOPI
END;
```

Assignment Statements:
varname := expression

Examples:

```
WEEKSPAY := PAYRATE * HOURSWORKED;
VOLTS:=AMPS*OHMS;
CONEVOLUME:= (PI*SQR(RADIUS)*HEIGHT)
/3.0;
ARRAYLOCATION :=ARRAYLOCATION + 1;
```

Note that the assignment statement is very free-form: Spaces may be inserted as needed, the assignment may continue onto more than one line, etc. The only restriction is that words can not be broken in the middle.

5

The Compound Statement:

In Pascal, any place where a statement can be used, a compound statement may also be used. A compound statement is formed by the word BEGIN, a group of any statements, followed by the word END.

Examples:

```
BEGIN
  SCORESUM:=SCORESUM+SCORE;
  SCORECOUNT:=SCORECOUNT+1
END
```

```
BEGIN
  X:=(Y+Z)/100;
  BEGIN
    T:=(Q/75)+15;
    F:=N-18
  END
END
```

Placement of Semicolons:

The simplest rule for the placement of semicolons, in a Pascal program, is: Place a semicolon between any two Pascal statements.

Note: BEGIN and END are not Pascal statements, they are simply delimiters. A compound statement is a statement, and must be separated from other statements. Also note one exception in the rule -- The ELSE in the IF-THEN-ELSE takes the place of a semicolon in separating the two statements.

Conditional Statements:

The IF-THEN Statement:

```
IF expression THEN statement
```

Example:

```
IF MAXSCORE < SCORE THEN MAXSCORE:=
  SCORE
```

The IF-THEN-ELSE Statement:

```
IF expression THEN statement ELSE
  statement
```

Example:

```
IF TIME < 0 THEN TIME:=0 ELSE TIME:=1
```

The CASE statement:

```
CASE expression OF
  case-label-list:statement;
  case-label-list:statement;
  .
  .
  case-label-list:statement
END
```

Example: (* Determine command group from a command number *)

```
CASE COMMANDNUMBER OF
  0,1,3 : GROUP:=1;
  2,4   : GROUP:=2;
  5,9,11 : GROUP:=3;
  6,7,8  : GROUP:=4;
  10    : GROUP:=5
END
```

Repetitive Statements:

The WHILE-DO Statement:

```
WHILE expression DO statement
```

Example:

```
WHILE NOT EOF(INPUT) DO
  BEGIN
    READ(SCORE);
    SCORESUM:=SCORESUM+SCORE;
    SCORECOUNT:=SCORECOUNT+1
  END
```

The REPEAT-UNTIL Statement:

```
REPEAT group-of-statements UNTIL
  expression
```

Example:

```
REPEAT
  X:=X-1;
  Y:=Y+1
UNTIL (X < 0) OR (Y > 0)
```

The FOR Statement: (Two forms.)

```
FOR control-variable := initial-
  value TO final-value DO statement
FOR control-variable := initial-
  value DOWNTO final-value DO statement
```

Examples:

```
FOR INDEX := 1 TO ARRAYTOP DO
  ARRAY[INDEX] := 0
FOR INDEX := 100 DOWNTO ARRAYBOTTOM
  DO IF ARRAY[INDEX] < 0 THEN
    ARRAY[INDEX] := 0
```

Transfer of Control Statements:

The conditional and repetitive statements previously described are sufficient control structures to perform any required computation. Remember that although labels and GOTO's are provided in Pascal, they are unnecessary and will often only create confusion in program logic. Therefore it is recommended that they be avoided except in those rare extreme cases where they actually have some value.

6

Label Definition:

The label definition is placed after the CONST declarations in the program.

LABEL integer, integer, ...;

Example:

```
LABEL 10, 20, 25, 100, 9999;
```

GOTO Statement:

```
GOTO label
```

Example:

```
GOTO 9999
```

Input and Output in Pascal:

Pascal I/O statements are not really statements, but are actually calls to predefined procedures. None the less, they are often referred to as statements.

Input Procedures:

```
READ(variable-list)
READLN(variable-list)
READ(filename, variable-list)
READLN(filename, variable-list)
```

Examples:

```
READ(X,Y,Z,MAXVAL)
READLN(HIGHSCORE,LOWSCORE,AVGSCORE)
READ(WEATHERFILE,TEMP,HUMIDITY,PRESSURE)
READLN(CUSTOMERFILE,NAME,NUMBER,BALANCE)
```

The filename must have been declared in the program heading.

The difference between READ and READLN is that successive READ statements will continue to input successive values from the same record, only going to a new record when all values on the current one have been exhausted. A READLN, on the other hand, will skip any additional values on the current record, and go to the next record to begin reading values.

Example:

Two records:

```
0.0 1.0 2.0
```

```
3.0 4.0 5.0
```

```
READ(A,B);
READ(C,D)
```

The result of this would be A=0.0, B=1.0, C=2.0, D=3.0.

```
READLN(A,B);
READLN(C,D)
```

Would result in A=0.0, B=1.0, C=3.0, D=4.0.

Output Procedures:

```
WRITE(expression-list)
Writeln(expression-list)
WRITE(filename, expression-list)
Writeln(filename, expression-list)
```

Examples:

```
WRITE(A,B,C)
Writeln(X*Y/2,MAX,SQRT(Q),'*****')
WRITE(NEWFILE,NAME,ADDRESS,PHONE,
  AMT+1.0)
Writeln(PLOTFILE,XCOORD,YCOORD,PENPOS,
  MARK)
```

Successive WRITE statements cause the values to be written, all as one record. Each time a Writeln is executed, however, a new record is output.

Examples:

```
WRITE('A','B');
WRITE('C','D')
Would output ABCD.
Writeln('A','B');
Writeln('C','D')
Would output AB
  CO.
```

Formatting numeric output is very easy in Pascal. Each expression in a WRITE or Writeln can actually have one of the following three forms:

```
expression
expression:width-expression
expression:width-expression:fraction-
  width-expression
```

The expression gives the value which is to be output. The width-expression gives the minimum number of character positions to be included in the output. If the expression value doesn't require all of the positions, extras will be filled with blanks. If the number is too big to fit in the area, the area size is expanded to accommodate the number.

The fraction-width-expression specifies how many digits will be printed to the right of the decimal point for a real number.

Examples:

A=100, B=1.5, C=137875.3217,
D=128.34152

WRITE(A:5,B:5,C:5,D:9:3) would output

100 1.5137875.3217 128.341

WRITE(A:3,B:5:2,C:9:1) would output

100 1.50 137875.3

Carriage Control:

Although this is machine and implementation dependent, most Pascal systems will destroy the first character of each record output to a printing device. Thus, an extra character must be provided at the start of each output line, usually a space.

In reality, this character acts as a carriage control command, which is either directly implemented in the hardware of the printer, or which is simulated by the monitor or operating system, in software.

The following are the standard carriage control command characters used in Pascal:

Character	Action
Space	Normal, single spacing
0 (Zero)	Double space, skip 1 line
1	Page eject

Depending upon how the carriage control is implemented, using other characters may have different effects, which may, or may not be desirable.

Data Types:

All data type definitions are placed between the CONST and VAR declarations at the start of the program.

Scalar Types:

TYPE typename = (identifier, identifier,...);

Example:

TYPE MONTH = (JAN,FEB,MAR,APR,MAY,JUN,
JUL,AUG,SEP,OCT,NOV,DEC);

Subrange Types:

TYPE typename = constant..constant;
VAR varname-list : constant..constant;

Examples:

TYPE LETTER = A..Z;
TYPE WINTERTERM = JAN..MAR;
VAR SCORE:0..100;

Array Types:

TYPE typename = ARRAY[index-type]
OF element-type;
VAR varname-list : ARRAY[index-
type] OF element-type;

Examples:

TYPE COEFFICIENTS = ARRAY[0..4] OF REAL;
VAR SAMPLELIST = ARRAY[0..100] OF REAL;

Note: INTEGER and REAL are not permitted as index types.

Multidimensional arrays are defined by specifying multiple index-types.

TYPE typename = ARRAY[index-type,
index-type,...] OF element-type;
VAR varname-list : ARRAY[index-
type,index-type,...] OF element-type;

Examples:

TYPE SIMLINEQS = ARRAY[0..5,0..6] OF
REAL;
VAR FOURSSPACE : ARRAY[0..10,0..10,
0..10,0..10] OF INTEGER;
VAR NAMELIST : ARRAY[1..100,1..30] OF
CHAR;

Packed arrays are almost identical to normal arrays, except that by declaring an array to be packed, it may be possible to reduce the size of the memory space used by it. The amount of reduction depends upon the machine and the implementation, and may in fact be nil. This may also reduce the running speed of the program.

TYPE typename = PACKED ARRAY
[index-type-list] OF element-type;
VAR varname-list = PACKED ARRAY
[index-type-list] OF element-type;

Example:

VAR FOURSSPACE : PACKED ARRAY[0..10,
0..10,0..10,0..10] OF INTEGER;

Elements in arrays are referenced by placing the index expression(s) between square brackets associated with the array name.

array-name[index-expression-list]

Examples:

A[1,5] FOURSSPACE[X,Y,Z,T] LIST[N+1]

Record Types:

TYPE typename = RECORD field-list
END;
VAR varname-list = RECORD field-
list END;

Examples

TYPE COMPLEX = RECORD REAL,IMAGINARY:
REAL END;
TYPE CUSTOMER = RECORD
NAME, STREET:ARRAY[1..30] OF
CHAR;
CITY:ARRAY[1..20] OF CHAR;
STATE:ARRAY[1..2] OF CHAR;
ZIP: 0..99999
END;

In addition to fixed format records, a case construct can be added to the record description to permit variable structure.

Example:

TYPE
THIRTYCHARS=PACKED ARRAY[1..30] OF
CHAR;
EMPLOYER=(GOVT,PRIV,SELF,OTHE);
TWENTYCHARS=PACKED ARRAY[1..20] OF
CHAR;
TWOCHARS=PACKED ARRAY[1..2] OF CHAR;
EMPLOYMENT=RECORD
NAME:THIRTYCHARS;
ADDRESS:RECORD
STREET:THIRTYCHARS;
CITY :TWENTYCHARS;
STATE :TWOCHARS;
ZIP :0..99999
END;
SEX:(MALE,FEMALE);
SOCSEC:INTEGER;
CASE TIMEEMPLOYED : EMPLOYER OF
GOVT:(YEARS :INTEGER;
BRANCH:TWENTYCHARS);
PRIV:(YEARS :INTEGER);
SELF:();
OTHE:(DESCRIPTION:THIRTYCHARS)
END; (*EMPLOYMENT*)

There are two different ways to reference fields in records. The first is a format for writing the variable name, the other is a statement which selects a particular group of records and allows reference to fields directly, within the confines of the statement.

recordname.fieldname

Examples:

EMPL.NAME CUST.ZIP EMPL.ADDRESS.STATE

The WITH statement restricts the program to only those records which it specifies. This permits the programmer to directly reference fields within those records. Typically, this statement is used in conjunction with a compound statement which performs all of the desired functions on the restricted record set.

WITH recordname-list DO statement

Example:

WITH EMPL,COMP DO BEGIN
A:= NAME;
B:= ADDRESS;
C:= REAL;
D:= IMAGINARY
END

Set Types:

TYPE typename = SET OF base-type;
VAR varname-list = SET OF base-type;

Examples:

TYPE LETTER = SET OF 'A'..'Z';
VAR DIGITS : SET OF 0..9;
VAR SIZE : SET OF (SMALL,MEDIUM,LARGE);

Note that the base-type must be a scalar or subrange type.

Set Operations:

+ Union
* Intersection
- Difference
= Set equality
< > Set inequality
<= >= Set inclusion
IN Left operand is a scalar, right operand is a set. Evaluates to TRUE if the scalar is an element of the set. In other words, if the scalar is IN the set.

File Types:

TYPE filename = FILE OF type;
VAR varname-list = FILE OF type;

Examples:

TYPE DATA = FILE OF INTEGER;
VAR CUSTFILE : FILE OF CUSTOMER;

References to files are made through a set of predefined procedures which are listed below. When a file is declared, (All I/O files must also be declared in the program heading, as was noted earlier.) a buffer with the same name, followed by an f symbol is created. This buffer variable is like a window



on the current position of the file.

Examples:

```
B := CUSTFILE↑
CUSTFILE↑ := XYZ
```

The standard I/O procedures for use with files are:

RESET(filename) Returns the file window to the beginning of the file.

REWRITE(filename) The file is replaced by an empty file, the window is set to the beginning of the file, and the file becomes writable.

GET(filename) Advances the window to the next position in the file.

PUT(filename) Appends the current value of filename↑ to the file. Will only work if the window is at end-of-file. filename↑ becomes undefined after a PUT.

EOF(filename) Evaluates to TRUE if the window is at end-of-file.

See the section on input and output in Pascal for more information on the following:

```
READ(filename, varname-list)
WRITE(filename, varname-list)
READLN(filename, varname-list)
WRITELN(filename, varname-list)
```

Pointer Types:

```
TYPE typename = ↑type;
VAR varname-list : ↑type;
```

Examples: (A linked list)

```
TYPE LINK = ↑PART
:
:
PART = RECORD
:
NEXT: LINK;
:
END;
```

Pointer variables are only prototypically defined by their definition.

Actual storage must be allocated for them, at run time, by the standard procedure NEW(pointer-variable). For record types with variable field lists, NEW(pointer-variable, case-tag, case-tag,...) is used, where each case-tag specified must be listed in the same order as in the record description.

Conclusions:

Pascal is a relatively new and powerful general purpose programming language. It is also one of the first languages to employ many of the principles of structured programming.

As a result of this, programs written in Pascal are usually more straightforward and considerably more readable than those written in most other contemporary languages.

Since its introduction, Pascal has seen an amazing rise in popularity throughout the world. This fact is well evidenced by the number of colleges and universities whose computer science departments have switched their emphasis from FORTRAN or BASIC to Pascal, in the past few years. Educators are discovering that Pascal is an excellent introductory language, since it is not only easy to learn, but also teaches good programming habits right from the beginning.

Pascal is certainly not the utopia of programming languages -- it is far from perfect. However, it provides a significant improvement, in general purpose computing, over most of those older languages listed earlier, thus it would seem to be the next logical rung on an endless ladder reaching towards a perfect language.

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Mickel, Andy (ed.) Pascal News #9/10 Minneapolis, MN: Pascal User's Group, 1977.

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Appendix 1: List of Machines with Known Implementations of Pascal

The greatest proliferation of Pascal implementations appears to have occurred on Burroughs B6700, CDC-6000/Cyber series, IBM 360/370 series and DEC PDP-11 series machines. Pascal is available in forms which will run on most configurations of these machines.

The following is a list of machines for which an implementation of Pascal is known to exist. (*) indicates that the implementation was still under development at the time of this writing. For detailed information, see Pascal News #9/10 September, 1977.

Amdahl 470
 Burroughs B1700, B3700, B4700, B5700, B6700, B7700
 Control Data Corp. Cyber 18 and 2550, 3200(*), 3300, 3600, 6000 series, Cyber 70 series, Cyber 170 series, Omega 480, Star 100
 CII IRIS 50, IRIS 80, 10070
 Computer Automation LSI-2
 Cray-1
 Data General Eclipse, Nova
 Digital Equipment Corp. PDP-8 series, PDP-10 series, PDP-11 series
 Dietz MINCAL 621
 Foxboro Fox-1
 Fujitsu FACOM 230
 Harris/4
 Hewlett-Packard HP-21MX, HP-2100, HP-3000(*)
 Hitachi Hitac 8800/8700
 Honeywell H316, 6000
 IBM Series 1(*), 360/370 series, 1130
 ICL 1900 MK2, 2970, 2980
 Intel Intellex 8080A
 Interdata 7/16, 7/32, 8/32
 Itel AS/4, AS/5
 Kardios Duo 70

Mitsubishi MELCOM 7700
 MITS Altair 680b
 MOS Technology 6502 (*)
 Motorola 6800 (*)
 Nanodata QM-1
 NCR Century 200 (*)
 Norsk Data NORD-10
 Prime P-400
 Sems 11600
 Siemens 330, 4004, 7000
 Solar 16/05/40/65
 Telefunken TR-440
 Terak 8510A
 Texas Instruments ASC, 9900/4
 Univac 90/30(*), 90/70, 1100
 Varian V-70
 Xerox Sigma 6, Sigma 7, Sigma 9
 Zilog Z-80 (*)

Appendix 2: Pascal User's Group

The Pascal User's Group is in its third year, and already boasts a world wide membership with branch offices in Europe and Australia. The Group is based at the University of Minnesota, under the direction of Andy Mickel. The main function of the User's Group is to promote the use of Pascal, by providing an open forum for members, in the form of the quarterly published Pascal News. The content of Pascal News is determined by the motto "All the news that fits, we print."

Membership/subscription dues are \$6.00 per academic year. To join, or get more information (Your letters may or may not be answered -- these people are extremely busy. If you just want information, it's best to just join, and then send in a letter for publication.) write to:

Pascal User's Group, c/o Andy Mickel
 University Computer Center: 227 EX
 208 SE Union Street
 University of Minnesota
 Minneapolis, MN 55455 USA

If you are joining, you should send along \$6.00, your name, address, phone number, type(s) of computers you are using (Especially if you have a Pascal implementation on any of them), and be sure to date your letter. Better yet, if you know someone who already gets Pascal News, just copy the All Purpose Coupon from one of the issues, and send that in.

(ED. NOTE: A Pascal compiler is available now for the PTDOS operating system through Proteus. See Solus News Vol 1, No. 6 for details. Also see page 1 of this issue.)

WORDWIZARD

A Software Review
by Stan Sokolow

In December, 1978, Processor Technology Corp. released its first major software package directed at the "end-user", the person who wants ready-to-use programs for specific applications. This first application program is for word processing, as the name implies. In this article we describe the WordWizard based upon the WordWizard User's Manual (Nov. 1978 edition). In a future article we plan to compare it with competitive programs, such as the Electric Pencil II by Michael Shrayer (see software directory in Solus News, vol. 1, no. 6). In the comparative article, we will also describe our "hands-on" experiences with WordWizard.

Before we look at the WordWizard, we should have a brief overview. What is a word processor? There is quite a range of products that are called word processors, from typewriters with some sort of recording medium to multi-terminal computers costing in the 6 figure area. Basically it is a system for composing and editing documents into the machine's memory and then "playing back" the final version for typing on paper. Since the documents are stored on a machine readable medium, they can be read back into the machine for further editing, without retyping. How does a word processor differ from the general text editors used for composing computer programs? Typically, general purpose text editors don't know anything about natural language syntax, whereas word processors know what a word is, what a paragraph is, and in some cases how to correct spelling errors, how to hyphenate words, how to make a table of contents or index, and so on.

Now let's look at the computer hardware required to run the WordWizard. First, of course, is the computer. Unlike Processor Tech's previous software, WordWizard is designed to run specifically on a Sol with Helios disk. Because of the versatility of PTDOS, the disk operating system for Helios, it is probably possible to run it on any 8080 or Z-80 that can operate a Helios disk, but PTC isn't marketing the system as an add-on for other computers, just for the Sol. The marketing brochures treat the hardware and software as a complete system for word processing, although it does point out that it is a general purpose computer and can be programmed for other applications. The system requires 48K of add-in RAM and uses only two Helios diskettes at a time, so the 4-disk model of Helios isn't of any advantage. The system disk contains software (drivers) to operate Processor Technology's line of printers (2 daisy-wheel printers and one dot-matrix printer) or the Xerox/Diablo 1610/1620 terminal. But provision is made for a custom driver to operate other printers. The WordWizard package also contains two self-adhesive plastic labels that are to be placed above the Sol's keyboard, aligned with the top row of keys. These labels identify the functions of these keys in the various modes of operation.

And now let's see what the Wiz can do. When the system is running, two disks are in the Helios. The programs are on the System disk and the documents are stored on the Document disk. When the typist turns on the system, she/he inserts the disks, types "BOON" and the word processor comes right on the screen without any further computer talk. The screen identifies itself as the WordWizard, lists the names of the documents on the document disk, shows the list of possible activities (menu) for the operator to select one, and gives an estimate of the number of empty pages left on the disk. Document names can be up to 15 characters long. There is space for up to 20 documents on a disk. An empty document disk has space for about 110 letter-size pages.

At this point the typist can select one of the following activities: create a new document, remove an existing document, edit a document, select a document for use as a merge library (to be explained), start printing a document, stop printing, eject a page on the printer, print the list of documents on the

disk, copy a document into a file on the system disk (the "archive") for use by other programs or for retrieval later, retrieve (copy) a document from the archive. In addition to these selections, the typist can press the escape key and get a different menu of activities which are: copy a system disk, format a new document disk, copy a document disk, select a printer, or return to the word processing activity menu.

The printer selection function is provided because several printers (usually no more than two) can be connected to the Sol at the same time, although only one can be active at any one time. This allows use of a high-speed dot-matrix printer for rough drafts and internal documents, and the slower-speed letter-quality printer for final documents.

One feature that I didn't expect to see may be a crucial one which separates the WordWizard from its competitors: When the Sol starts printing a document, the activity menu returns to the screen and the typist can continue using the system while the document prints. Any activity in the word processing mode can be done as long as it doesn't involve the printer or the document being printed. For example, the typist can edit another document or even edit another copy of the document being printed. This feature allows the Sol to do the work of two less-sophisticated systems--a factor which may be very influential in the decision to buy. (Technically, the foreground/background activity is done without interrupt hardware. The system rapidly polls the printer driver to see if it can accept another character. A special control/status protocol has been established for this.)

Now let's look at how documents are created and edited on the video screen. The typist views the document through a 16 line by 63 character window. (The 64th column is used for a break character which indicates end of paragraph.) Using the cursor control (arrow) keys, the cursor can be moved around within the window. When the typist moves the cursor beyond the edge of the window (either with the arrow keys or by entering text) the window moves (scrolls) in the appropriate direction so that the cursor remains in view. Documents can be up to 128 characters wide. Horizontal moves of the window are made in 32 character leaps so that the typist isn't given a headache from character-by-character horizontal scrolling. Several ways are provided for rapid scrolling in any direction to find a desired place in the document. Special function keys can be used to jump directly to the beginning or the end of the document.

Once the desired place is found, the typist moves the cursor to the spot where typing is to be done and freely types onto the document without regard for the right margin. When the end of a line is reached, the WordWizard removes any word fragment at the end of the line, justifies the line by inserting extra spaces between words if justification mode is turned on, begins a new line, places the word fragment at the left margin of the new line, and resumes the the typing where it left off. All of this occurs practically instantaneously and without interrupting the typist. The only time the typist uses the cursor return key is at the end of a paragraph or to create blank lines between paragraphs. As the document grows in size and the internal buffer fills (capacity about 7000 characters), a portion of the document is written out to the disk automatically to create free space in the buffer. At any time, only the part of the document stored in the internal buffer is in jeopardy of being lost by a system failure. Unfortunately, this is even true when editing an existing document on the disk, since the program removes the part of the document in the buffer from the file structure as it reads from the disk and restores it as it writes out again.

At any time during the typing, the typist can change margin settings, turn justification on or off, or change tab settings, and the changes will take effect for any typing done subsequently, but not for what was already done. Existing portions of the document can be reformatted, but explicit action from the typist is needed. The changes are done on the screen as the document is typed so that the typist can see virtually the finished body of the document before it is printed. Pagination, headings, footers, line spacing, and the like are deferred until printing, so they can't be seen on the screen in final form.

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To alter a portion of a document, the cursor is first positioned where the alteration is needed. Then the DEL key can be used to delete, or the typist can type over an error. As characters are deleted, the remainder of the line moves to the left to fill in, but words are not pulled up from the rest of the paragraph. To insert text, the INSERT SPLIT function key is used. This splits a line into two lines, with everything to the left of the cursor moved up onto the first line and everything else staying where it was on the second line. Then the insertion can be typed into the gap thus created. To close the gaps created by insertion and deletion, the CLOSE PARAGRAPH function key is used. This reformats the paragraph: closing gaps, filling lines to the current margins, and justifying if the justification mode is turned on. This key can also be used to reformat paragraphs: new margins, unjustify, etc..

Commands are provided to search for a string of characters (up to 40) within the current margins throughout the document, or to search for and replace with another string (and then CLOSE PARAGRAPH automatically). Blocks of text can be deleted, moved, or copied anywhere in groups of up to 16 lines per block. Any number of tab stops can be set for use with the TAB key. Non-printing comment lines can be inserted to identify portions of the document to the typist, to remind the typist of tab and margin settings, or to provide a visual ruler of column numbers. A special non-printing character, visible only on the video screen, can be used in place of a space where a group of words is to be treated as a unit and not split onto separate lines nor separated further by justification. No special features are provided to aid centering or hyphenation.

Pieces of text from one document can be extracted and inserted into another one using the Merge feature. The passage in the merge library (source) document must be marked a certain way and given a name up to 40 characters long. While editing a document, the typist can insert one of these pre-typed passages simply by using the CALL MERGE key and giving the desired passage's name. The WordWizard searches the currently selected Merge document and copies the named passage into new lines above the cursor. This feature makes it easy to assemble documents from pre-written clauses, or to pull addresses from a mailing list.

All of the above features have been accomplished without the use of command lines inserted in the text. They were done immediately by the typist using function keys. In some text processors, very little is done immediately in the editing phase like this. In these programs, heavy use is made of command lines inserted in the text because the formatting is done in the non-interactive phase prior to printing. The design of the WordWizard emphasizes doing most of the formatting in the interactive editing phase, so that the system acts much like a very capable electronic typewriter. I suspect that the majority of typists would prefer this because they can immediately see the results of their actions. The other sort of text processing requires more abstraction and may be more difficult for the typist. We'll have more to say about this in the next article.

WordWizard does use command lines in the document to specify how the printed page is to be organized: header lines, footer lines, page numbering, lines per page, vertical spacing (for printers with variable line spacing), pitch (for printers with adjustable horizontal spacing), form length, page ejections, overstrike and underscoring, and widow prevention (keeping lines together on one page). Command lines begin with a period (no option to alter this) and contain key words to set these parameters. They take effect when encountered in the document and then remain in effect until changed in subsequent lines.

According to the manual, underscoring and overstriking are done by printing two adjacent lines on top of each other. The manual doesn't explain if this is done by a carriage return without a line feed, by absolute tabbing, or by backspacing, but the impression I get is that it is done by the first of these methods. If so, it may be impossible to have the WordWizard underline with a selectric printer, because selectric's always line feed when they carriage

return. Some text formatters provide several modes for underscoring to get around the problem. It may be possible to enter backspace characters (control-H) into the document and thus do underlining as you would on a conventional typewriter. (The margins may have to be reset temporarily to allow for the extra line length.) I'll investigate this and report in the next article.

Superscripts and subscripts can be placed using the variable line spacing (if supported on the printer).

The manual makes no mention of different modes for justification. Some text formatters provide several ways of expanding lines to the right margin: (1) add additional spaces between several words, (2) enlarge all spaces proportionately between all words, or (3) enlarge the pitch of all characters on the line (providing more space between letters as well as between words). The last two methods require variable horizontal increment printers, so ordinary typewriters and printers can't support them. Daisy-wheel printers and some dot matrix printers have variable pitch (including the SolPrinters 2 and 2E). WordWizard lets you assign any pitch from 1 character per inch to 120 per inch, so it does use variable pitch to some extent. But apparently it only uses method (1) for justification, even though some Sol hardware will support all three methods.

A few final words about the users manual itself are appropriate: profession appearance, well-written, typeset (not typewritten), lots of examples, frequent "hands-on" exercises, easy reading, well-thought-out, well-proofread, unfortunately no index, good summary of functions in the appendix, good error message explanation in the appendix, written for the end-user with only a small technical section in the appendix, feedback questionnaire for readers comments (post-paid self-mailer). It also mentions that the manual was written using WordWizard (a good way to user-test the program) and the final text was transmitted from the Sol direct to a computerized typesetting service for final composition. (The manual uses bold-face type, multiple fonts, and variable spacing justification not available in WordWizard itself.)

In the next article on Word Wizard, we'll report on our impressions of the system after actual use. We also hope to have several other systems for comparison. One thing we will try is testing the software for it "bullet-proofing", that is, its security against human errors.

CLARIFICATION OF INTENT

A remark made in the last issue prompted Bob Stek to write: "I applaud the expansion of Solus News to Proteus and your willingness to serve as a clearinghouse for Sol software. Compared to Access and the NorthStar Newsletter, Solus News has published more useful information more often.

"One of your comments in the December issue bothered me. While it is true that the end-user may not be interested in 'the details of patching so-and-so's Basic to run on a Sol with whose-it's disk,' the hobbyist is. Most of the value I have gotten from Solus News has been from articles of this type. By all means, expand the types of articles you publish, but not at the expense of hobbyist articles. ...please don't discriminate against hobbyist articles.

Bob, Proteus News will continue to print all of the hobbyist articles I can get my hands on. The intent is to provide a broader variety of articles so that both the end-user and the hobbyist can find something of value in Proteus News. Frankly, I'm not sure what the end-users really finds valuable, but I'm going to try. We need to attract more subscribers to Proteus News to be able to accomplish as much as I'd like. But I'll never neglect the hobbyist. Thanks for your concern, Bob.

Stek

MODIFICATION OF PTC MUSIC SYSTEM FOR THE NORTH*STAR
by N. C. PATE

Here is a quick and dirty modification that will adapt your Processor Technology Corp. Music System to use with your North*Star Disk Operating System (DOS). The obvious advantage of this adaptation is the speed of the disk when storing and loading music files.

The following is a step by step description of the modification. I have assumed that you are operating in the SOL Operating System (SOLOS) or CUTER to begin with.

1. If you can, zero memory from 0 to 900H. (This is not necessary; it just makes things a little neater if you can do it.)
2. Get and execute the program MUSIC from your PTC tape. (Do this either by "XEQ MUSIC" or by "GET MUSIC" followed with "EX 0".)
3. Reserve memory above the N*S DOS to be used by the Music System. (Do this with the Reserve command, e.g. "R 7FFF" for a high memory address of 32K.)
4. Leave MUSIC. (Execute the Return command, "R", and you will be back in SOLOS or CUTER.)
5. Change the following memory locations.

	FROM		TO
0000-0002H	31 FD CB (LXI SP,OCBFDH*)	C3 E0 08	(JMP 08E0H)
0089-008AH	04 C0 (C004H*,SOLOS entry)	28 20	(2028H,DOS entry)
018C-018DH	D3 08 (08D3H,MUSIC file beginning)	04 2A	(2A04H, new MUSIC file beginning)
08E0-08E2H	- - -	21 00 2A	(LXI 2A00H)
08E3-08E4H	- -	36 00	(MVI M,0)
08E5H	-	23	(INX H)
08E6-08E7H	- -	36 C3	(MVI M,OC3H)
08E8H	-	23	(INX H)
08E9-08EAH	- -	36 00	(MVI M,0)
08EBH	-	23	(INX H)
08EC-08EDH	- -	36 00	(MVI M,0)
08EE-08FOH	- - -	31 FD CB	(LXI SP,OCBFDH*)
08F1-08F3H	- - -	C3 03 00	(JMP 3)

*CUTER may have a different value.

6. Execute MUSIC again. (Do this with "EX 0".)
7. Initialize MUSIC (Use the New command, "N". You should receive the message "2A04 2A04".)
8. Leave MUSIC.. (Execute the Return command, "R". This time you should return to the N*S DOS.)
9. Save the new program, MUSIC, which is 9 blocks long on disk. (Do this the usual way, "CR MUSIC 9", then "TY MUSIC 1 0", and "SF MUSIC 0".)

You are now ready to use your modified program.

CAUTION: You will crash if you try to list a file immediately after the "GO MUSIC" command from the N*S DOS and before a music file is created. To be on the safe side, always execute the New command, "N", immediately after executing MUSIC from disk. Now you won't crash if you try to list a file, even though none exists.

. Those music files you have stored on tape are not useless. Just load them beginning at address 2A04H (e.g. "GET PRELD 2A04" and, execute MUSIC with "EX 0" from SOLOS).

To save a music file first determine its length with the File command, "F" and HEX subtraction; sorry about that. (Remember that since 100H equals 256D, after HEX subtraction, whatever is to the left of the "tens column", rounded up if necessary and converted to decimal is the number of blocks required.) Use 2A01H as the smaller address for this subtraction (not 2A04H) since you will save the music file beginning at 2A01H.

Next leave MUSIC with the Return, "R", command. You will now be in the N*S DOS. Create, type, and save the music file in the normal manner (e.g. "CR PRELD 10", "TY PRELD 1 2A01", and "SF PRELD 2A01"). Note, 2A01 was used so that a music file could be distinguished from other programs when listed from your disk.

To use a music file stored on disk just execute it with the "GO" command (e.g. "GO PRELD"). This command will automatically jump to the program MUSIC after the music file is loaded.

CAUTION: You must have previously loaded MUSIC before you load a music file. Failure to do so will crash your system.

CAUTION: As with music files loaded from tape, the first thing that must be done with a file loaded from disk is to verify it with the File, "F", command. Failure to do so could crash your system.

(ED. NOTE: The Music System referred to in this article was produced jointly by Processor Technology Corporation and Software Technology Corporation. Since Software Technology Corporation is no longer viable, the product was removed from the market. Unfortunately, the original author of the software is in some kind of "catch 22" trap, so the product may never be produced again.)

ASSOCIATIVE MEMORY AVAILABLE

Associative memory, also known as content-addressable memory, is now available at a reasonable cost for the S-100 bus. The product is known as REM S-100 made by Semionics, 41 Tunnel Road, Berkeley, California. Rather than accessing the data by address, the REM board accesses its data by a hardware table-lookup method. The on-board comparisons are done so rapidly that to the microprocessor it appears to be done across all of the entries in the REM memory simultaneously. Software is still required to scan across the columns of the entries, but a ROM is available to perform many complex recognition functions. The board can recognize a byte in any of the 16 superwords (256-byte strings) on the board within 4 microseconds. The REM S-100 uses static memory and has a capacity of 4096 bytes. Many REM boards can be in the same system since all are accessed in parallel. The REM S-100 sells for \$325, the 2708 PROMS with the firmware sell for \$80. Manuals are available without the board for \$3.

This is a continuing series of articles on Processor Technology's operating system "PTDOS". We will have information in this series that is of use to everyone with PTDOS; not just the programmers, but also the end-users who only want to know how to handle their application system better. Readers are invited to submit tutorial-type articles for this column in the style of this one.

USE CAUTION WHEN PROGRAMS END ABNORMALLY

PTDOS was designed to minimize the risk of destroying data accidentally, but there are still ways to foul up the safety features. One serious error is produced by closing a file after its diskette has been replaced by another one in the drive.

Files that are being used are kept track of in a set of tables within PTDOS's buffer area. Each file has an entry known as a file control block (FCB) where PTDOS records the position of the file on the diskette, the location of the cursor within the file, and so on. After a program is done with a file that it was writing onto, PTDOS must write the last block of data onto the file, reclaim any extra sectors beyond that point for free space, and rewrite the directory entry for the file. If you stop a program before its normal end (or in some cases if the program reaches an abnormal end due to a serious error), files may still be open. Then if you remove the diskette, put another one in the same slot and allow PTDOS to close the open files, it will write onto the diskette it still thinks was there. PTDOS could check the name recorded on the diskette, but it doesn't because it takes too much time to do this before each write operation. Since the wrong diskette is written onto, part of a file there may be destroyed. Files that are being read rather than written will present no problems.

How do you avoid this? First, if in doubt whether files are still open, you can have open files listed with the "OPEN?" command. The CTRL-C key given at the beginning of a command line (after PTDOS's asterisk prompt) will tell PTDOS to close all open files. Individual files can be closed by the "CLOSE" command. Second, if you reboot ("BOOTLOAD") after switching diskettes, the system will ignore all of the previous file operations. This won't harm the new diskette, but the old output files that were never closed may lose data that stayed behind in the buffer.

In summary, when a program ends abnormally be sure you close the open files before you switch diskettes, or be sure to bootload again before using the new diskette.

Another puzzling problem can arise when you retry a program that has ended abnormally without closing all open files first. For example, suppose you run a program that reads file "A" and writes onto file "B". During the execution a serious error occurs that causes PTDOS to abort the program and give an error message. You realize it was due to your mistake, so you execute the program again from the beginning. Now the program runs a while and PTDOS refuses to do a file operation because the file is protected. You look at the file attributes of both files and find that neither are protected. "System program bug," you say to yourself. But no, it's your error. Think about it before you read on....

Here's what happened. The program was interrupted in the middle of execution and not allowed to close open files. When you restarted it, the program again asked PTDOS to open these files, which it did even though the files were already open. But the second opening of the file does not destroy the other FCB's from the previous openings. This is a useful feature designed into PTDOS to allow files to be "multiply-open." Each instance of the opening creates its own FCB so it is independent of the others. One of the rules about multiply-open files is that only the first opening can add new blocks by writing beyond the existing end-of-file. When your program got to the point where file B needed to be extended, PTDOS

refused because of this rule. Apparently PTDOS keeps track of the rule by marking the second and subsequent openings as though they had the "E" attribute, which protects against extending the file. Hence you get this puzzling but correct error message.

How do you avoid this? Simply by closing the open files after the program ends abnormally. CTRL-C given as the first entry after PTDOS's prompt will do it.

When is it wrong to close the files after an abnormal end? Only when you want to keep the cursor pointing to the current place in the file. If you can have the program resume execution where it left off, you shouldn't close the file because that will interfere with the program's operation on the file. For example, if the program is interrupted by the "DRIVE NOT READY" message, you can simply ready the disk drive and press the space bar to resume where the program stopped. Don't try close the file; it makes no sense.

Under normal circumstances you don't have to worry about closing files; it's done automatically by normal program termination. But when you get an error message from PTDOS, be careful and you can stay out of trouble.

HOW TO PRINT ONLY PART OF A FILE

Has this ever happened to you? You are printing a large file that takes over an hour to print. You set it going and after being sure its running okay and there's enough paper in the stack, you go off to do something else. From time to time you check back and find everything is still okay. But when the printer finally stops and you come in, you are horrified to see the last few pages are messed up and are unreadable. What do you do now? Print the whole thing over? You would be happy if you could just back the file up to the approximate vicinity of the error and print the end of the file again. But how?

It's easy with PTDOS. Since the program has ended normally the file is closed. You can reopen the file and run the cursor out to the desired place by giving the command

*COPY filename,#1

This will open the file and copy it onto the console. When you get near the last good lines printed, interrupt the copying with the MODE SELECT key on the Sol (or CTRL-3). The COPY program will finish the current buffer and then quit, leaving the file open. It will also tell you the file number assigned to the open file. Now you give the command

*COPY #n,device

where "#n" is the file number and "device" is the printer's file name. This will resume copying from the desired file, but now onto the printer.

Since the PRINT program has no provision for starting the page numbering other than at 1, you can't really duplicate the exact page printing that you would have gotten if the error had not occurred. I haven't tried using PRINT rather than COPY for error recovery, but you may be able to do it if you need the features of PRINT which COPY doesn't have. By the way, COPY is a much faster way to view a file than PRINTING it on the screen. COPY really lets it fly by when you set the speed to 1 with the numeric keys. It's great when you want to get to something way out near the end of a file.

This article has been based upon my experience with PTDOS version 1.4. Some of the observations may not apply to later revisions of PTDOS. However, most of the content relates to fundamental features of PTDOS and will most likely remain unchanged in later versions.

IF YOU HAVE SOME HANDY HINTS OR TUTORIAL REMARKS FOR USERS OF PTDOS, PLEASE WRITE TO PROTEUS. WE ALSO WOULD LIKE TO RUN SIMILAR ARTICLES ON CP/M, NORTHSTAR, MICROPOLIS, AND OTHER DISK OPERATING SYSTEMS. ARTICLES ON THESE SYSTEMS ARE WELCOME.

S P L E C H L A B R E V I E W E D
by Bruce Barron

SpeechLab 50 is just that--a speech lab. It teaches the user the basics of speech recognition and to some extent speech generation. The SpeechLab 50 by Neuristics Inc. sells for \$299 assembled and includes a single S-100 board, a microphone, a 95 page hardware manual, a 275 page lab manual and three paper tapes. To use the board in a Sol requires the change of one jumper on the board and is explained in the hardware manual. The lab uses an input port and an output port, both at the same address--nominally AF, but jumper changable to BF or LF.

The Speechlab cues the user by generating a tone and playing it through the microphone. Unfortunately when the system is first turned on, this circuit is activated and it is necessary to send a turn-off command out via the port. This can also be fixed in hardware by cutting the foil to bus pin 75 from IC 16-1 and connecting it to pin 67. The board contains test circuitry and one of the paper tapes is a machine language to test the board. Source listings are provided and the test program is short enough to load by hand. The other two programs are quite lengthy and should be read from the tapes. If necessary, borrow a tape reader for a short time, write the paper tape into memory then save it on cassette. The manual says all three tapes are in Intel format and they include a loader.

The hardware manual explains the testing and also gives the theory of operation, although knowledge of the hardware is not necessary to the use of the lab. The lab manual is quite comprehensive. It starts off with an explanation of how speech is generated and discusses phonics and the phonetic alphabet for "standard American English". The first two experiments use a machine language demo program in which the software is treated as a black box. In this program the user "trains" the machine with words or phrases up to 1.5 seconds long. The second half of the program then types out a word in response to the users vocal input. Very impressive. Using 5 fold redundant inputs it would recognize inputs from both me and my wife and differentiate between voices of the same word. It could also be set to provide the same response for both voices. There is one software change required when using the Sol with video alone or a VDM with CUTTER or most other drivers. The CRLF subroutine writes a CR and then the LF. This erases what was just written. A LF should always come first.

The rest of the experiments use a modified Tiny Basic which is included. There are experiments which plot the outputs of the three filters and the zero crossing detector as a function of time and numerous experiments on different recognition algorithms. Considering that the BASIC is integer only with no functions, they do a quite good job. I do suggest two additions to the BASIC interpreter, both of which are easy to fit in. First a "BYE" to return to the monitor and second a "CLEAR" since this function is not automatic with RUN as it is in most BASICS. I have sent source code for these additions to Neuristics. Also the BASIC does not have provisions for saving a program but the interpreter is short enough to record it and the program intact.

Throughout the manuals, Neuristics asks (almost begs) the user to keep them informed of hardware and software mods and interesting experiments. A second lab manual is in the works and maybe a newsletter. It is refreshing to find such a company after dealing with poor performing ones for so long. I highly recommend this product to anyone wanting to get involved in speech recognition.

S O L / N O R T H S T A R D E M O N S T R A T I O N P R O G R A M

by Bob Stek

```
10 REM * SOL/NORTHESTAR DEMONSTRATION PROGRAM
20 REM * BY BOB STEK     JAN. 1979
30 REM * MODIFIED FROM DIGATE'S BASIC5 PROGRAM
40 REM * IN ACCESS, VOL 2,#1
50 N=51968 :REM 51968 = CB00 IN HEX
60 FOR I=0 TO 4
70 READ J
80 FILL N+I,J
90 NEXT
100 DATA 67,205,152,192,201 : REM HEX - 43 CD 98 C0 C9
110 DIM M$(80) : REM RESERVE SPACE FOR MESSAGE
120 PRINT CHR$(11) : REM CLEAR SCREEN
130 PRINT "This is a demonstration of the capabilities of the"
140 PRINT "SOL using NorthStar BASIC."
150 PRINT:PRINT
160 PRINT "The SOL can print in upper and lower case and"
170 FILL 51211,37 : REM SLOW DOWN DISPLAY SPEED
180 PRINT "can even print",
190 M$=" in inverse video"
200 GOSUB 600
210 PRINT " "
220 PRINT:PRINT
230 PRINT "The SOL can even change",
240 FILL 51211,50
250 PRINT " display speeds ",
260 FILL 51211,150
270 PRINT "dynamically!"
280 FILL 51211,0
290 PRINT:PRINT
300 PRINT "Pretty neat, huh?"
310 FILL 51211,15
320 PRINT:PRINT:PRINT
330 PRINT "The SOL also has a special set of limited graphics"
340 PRINT "characters. They are shown below in both regular"
350 PRINT "and inverted video. This gives a BASIC programmer"
360 PRINT "very good flexibility when designing display formats."
370 PRINT:PRINT
380 FILL 51211,0
390 FOR C=0 TO 31
400 A=CALL(N,C)
410 NEXT
420 FOR C=0 TO 31
430 A=CALL(N,C+128)
440 NEXT
450 PRINT:PRINT
460 FILL 51211,20
470 PRINT:PRINT
480 PRINT "This concludes my demonstration of special display"
490 PRINT "features available on the SOL in NorthStar BASIC."
500 PRINT:PRINT
510 M$=" HAPPY COMPUTING!"
520 PRINT " "
530 GOSUB 600
540 FILL 51211,0
550 END
600 FOR I=1 TO LEN(M$)
610 C=128+ASC(M$(I,I))
620 A=CALL(N,C)
630 NEXT
640 RETURN
```

IMPROVEMENTS TO MICROPOLIS SOFTWARE

by Richard Greenlaw

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SINCE MICROPOLIS DISKS SEEM POPULAR WITH SOLUS MEMBERS I BELIEVE THE LISTING ATTACHED WILL BE OF CONSIDERABLE USE. IT FIXES SEVERAL WEAKNESSES IN MICROPOLIS MOOS/RES/BASIC VERSIONS 3.0.

1. PROVIDES EDITTING OF EXISTING BASIC LINES!
2. PREVENTS EARLY CARRIAGE RETURNS DUE TO COUNTING BACKSPACES AS FORWARD CURSOR MOTIONS.
3. PROVIDES SPACE BAR PAUSE/RESUME OF OUTPUT, INSTEAD OF CONTROL-S/OTHER.
4. SUBSTITUTES MODE/CONTROL-# FOR CONTROL-C AS THE BREAK CHARACTER.
5. CORRECTS ERRATUM NUMBER 7.
6. FIXES A BUG IN THE PAUSE ROUTINE OF RES WHICH LUCKED OUT UNTIL I KEYPOTE CDIN, BUT DIDN'T MEET THE REQUIREMENTS OF SECTION 2.2.4.3.3.

THE EDIT FEATURE IS NOT UNIQUE TO BASIC, BUT BASIC IS ITS PRIMARY USE. TO USE IT, JUST TYPE A LIST COMMAND FOR THE LINE YOU WANT TO EDIT, BUT USE CONTROL-E INSTEAD OF CARRIAGE RETURN. THIS WILL INITIALIZE A BUFFER TO CAPTURE A COPY OF EVERYTHING GOING THROUGH THE CONSOLE OUTPUT DRIVER EXCEPT CONTROL CHARACTERS UNTIL THE BUFFER IS FULL OR YOU USE CONTROL-L.

THE FIRST TIME YOU TYPE CONTROL-L (OR THE SOL'S LOAD KEY) THE OUTPUT CAPTURE FLAG IS RESET AND THE POINTER IS RESET TO THE BEGINNING OF THE BUFFER. THE FIRST CHARACTER IN THE BUFFER WILL BE RECEIVED AS IF YOU HAD TYPED IT. AFTER THAT, EACH CONTROL-L WILL BRING IN SUBSEQUENT CHARACTERS FROM THE BUFFER AS IF YOU HAD TYPED THEM. THE REPEAT KEY IS USEFUL IN BRINGING IN THE BASIC LINE UP TO THE POINT WHERE CHANGE IS REQUIRED. YOU CAN TYPE NEW CHARACTERS OR BACKSPACE OVER CHARACTERS BROUGHT IN BY CONTROL-L AT ANY TIME. WHEN YOU HAVE THE DESIRED NEW LINE JUST HIT THE CARRIAGE RETURN AS USUAL.

THIS OBJECT FILE MUST BE IMPLICITLY LOADED BECAUSE IT OVERLAYS "RES". AFTER ASSEMBLY TO FILE "RESFIX" USE:

- >TYPE "RESFIX" C
- >RESFIX
- >SAVE "RES" 2B8 146B 3

KEEP A BACKUP OF THE ORIGINAL**

BEST WISHES,

Richard Greenlaw

RICHARD GREENLAW

251 COLONY CI.
GAHANNA, OHIO 43230

```

0000      TAB 8,13,25
0000      LINK 'SYS01'
0000      ORG @C10TABLE+6
04F6      *ADDRESSES OF SUBSTITUTE CONSOLE DRIVERS
04F6 1B 06      DW CDIN
04F8 60 06      DW CDOUT
04FA 80 06      DW CDBRK
04FC 8C 06      DW CDINIT
04FE      ORG @L10TABLE+8
050A      *ADDRESSES AND PARAMETERS FOR LIST DEVICE DRIVERS
050A 95 06      DW LDOUT
050C 9C 06      DW LDATN
050E 9C 06      DW LDINIT
0510 00      DB 0      ;WRAP FLAG OFF
0511 03      DB 3      ;NULL COUNT
0512 47      DB 71     ;WIDTH (MY ITY HAS AUTO CRLF 1
N COL 72)
    
```

```

0513
0513
0513
051C 00      DB 0
051D      ORG 58DH
058D 00      DB 0
058E
058E
058E
058E
0549 C3 91 05      JMP BSPCUR
054C      ORG 591H
0591 25      BSPCUR DCR H
52E)
0592 25      DCR H
0593 06 5F      MVI B,5FH
0595 C3 4C 05      JMP 54CH
0598
0598 CD 8D 07      INPTOA CALL 78DH
059B 78      MOV A,B
059C C3 85 05      JMP 585H
059F
059F
05F4 CD E5 07      *BUG FIX (ERRATA ITEM 7 WAS WRONG!)
05F7      ORG 5F4H
05F7      CALL 7E5H
*
*BUG FIX I DISCOVERED
05F7      ORG 582H
0582 C3 98 05      JMP INPTOA
*USE SPACE BAR TO PAUSE/RESUME OUTPUT
0585      ORG 57EH
057E 20      DB ' '
057F      ORG @PCON
*
*CONSOLE DEVICE DRIVERS WITH EDIT FEATURE
*INPUT TO B. CHANGES A. CLEARS CY FLAG.
061B CD 1F C0      CDIN CALL 0C01FH
CE)
061E CA 1B 06      JZ CDIN
0621 47      MOV B,A
0622 E5      PUSH H
0623 E6 7F      ANI 7FH
0625 FE 05      CPI 05H
0627 C2 37 06      JNZ CDIN2
062A
062A 06 0D      *SET CAPTURE FLAG AND POINTER
062C 3E 01      MVI B,0DH
062E 32 9E 06      MVI A,1
0631 21 A1 06      STA CAPFG
0634 22 9F 06      LXI H,CAPBUFF
0637 FE 0C      SHLD CAPBPTR
0639 C2 5D 06      CDIN2 CPI 0CH
063C      JNZ CDINX
*WANTS INPUT FROM BUFFER
063C 3A 9E 06      LDA CAPFG
063F B7      ORA A
0640 CA 4D 06      JZ BUFFIN
*1ST TIME - RESET CAPTURE FLAG AND POINTER
0643
0643 AF      XRA A
0644 32 9E 06      STA CAPFG
0647 21 A1 06      LXI H,CAPBUFF
064A 22 9F 06      SHLD CAPBPTR
064D 2A 9F 06      LHL CAPBPTR
0650 3E 1F      MVI A,0FFH&CAPBEND ;LOW BYTE OF BUFFER END ADDR
R
0652 BD      CMP L
0653 06 07      MVI B,7
0655 CA 5D 06      JZ CDINX
0658 46      MOV B,M
0659 23      INX H
065A 22 9F 06      SHLD CAPBPTR
065D E1      CDINX POP H
065E AF      XRA A
*
*USE MODE OK CNTL-# INSTEAD OF CNTL-C FOR BREAK
ORG 51CH
DB 0
ORG 58DH
DB 0
* CORRECT CURSOR POSITION DURING BACKSPACING.
* FOR TERMINALS WHICH CAN MOVE CURSOR/HEAD BACK.
* LIST OUT ROUTINE WOULD NEED SIMILAR CHANGE IF
* PRINTER COULD BACKSPACE.
ORG 549H
JMP BSPCUR
ORG 591H
;FREE AREA
BSPCUR DCR H ;BACKUP CURSOR (BAD COMMENT AT
;TO BALANCE INR LATER
;ORIGINAL INSTRUCTION AT 549H
;TO COUTI
*PART OF MY BUG FIX
INPTOA CALL 78DH ;#CDIN - INPUT TO B
MOV A,B
JMP 585H
*BUG FIX (ERRATA ITEM 7 WAS WRONG!)
ORG 5F4H
CALL 7E5H ;(WAS OK ON MY DISK)
*
*BUG FIX I DISCOVERED
ORG 582H
JMP INPTOA
*USE SPACE BAR TO PAUSE/RESUME OUTPUT
ORG 57EH
DB ' ' ;REPLACE ONLY 1ST CNTS
ORG @PCON
*
*CONSOLE DEVICE DRIVERS WITH EDIT FEATURE
*INPUT TO B. CHANGES A. CLEARS CY FLAG.
CDIN CALL 0C01FH ;SINP (USES CURRENT INPUT DEVI
)
JZ CDIN ;UNTIL INPUT OCCURS
MOV B,A ;THE INPUT
PUSH H
ANI 7FH
CPI 05H ;CNTL-E
JNZ CDIN2
*SET CAPTURE FLAG AND POINTER
MVI B,0DH ;CONVERT TO CR
MVI A,1
STA CAPFG
LXI H,CAPBUFF
SHLD CAPBPTR
CDIN2 CPI 0CH ;CNTL-L/LOAD
JNZ CDINX
*WANTS INPUT FROM BUFFER
LDA CAPFG
ORA A
JZ BUFFIN
*1ST TIME - RESET CAPTURE FLAG AND POINTER
XRA A
STA CAPFG
LXI H,CAPBUFF
SHLD CAPBPTR
BUFFIN LHL CAPBPTR ;POINTER
MVI A,0FFH&CAPBEND ;LOW BYTE OF BUFFER END ADDR
CMP L
MVI B,7 ;BELL TENTATIVE
JZ CDINX ;IF NO MORE INPUT BELL
MOV B,M ;INPUT FROM BUFFER
INX H
SHLD CAPBPTR
CDINX POP H
XRA A
    
```


SOL UTILITY COMMAND: 16-BIT INTEGER MATH

by Lewis Moseley, Jr.

```

065F C9          RET
0660            *
0660            *OUTPUT FROM B. CHANGES A. CLEARS CY FLAG.
0660 CD 19 C0    CDOUT  CALL 0C019H      ;SOUT (USES CURRENT OUT DEVICE
)
0663 3A 9E 06      LDA  CAPFG      ;CAPTURE FLAG
0666 B7            ORA  A
0667 C8            RZ                ;IF NO CAPTURE REQUEST
0668            *CAPTURE UNLESS CNTL CHAR
0668 E5            PUSH H
0669 3E 1F         MVI  A,1FH
066B B8            CMP  B
066C F2 7D 06     JP   CDOUTX      ;IF <SPACE
066F 2A 9F 06     LHLD CAPBPTR
0672 3E 1F         MVI  A,0FFH;CAPBEND ;LOW BYTE OF BUFFER END ADDR
R
0674 BD            CMP  L
0675 CA 7D 06     JZ   CDOUTX      ;IF BUFFER FULL
0678 70            MOV  M,B        ;LOAD BUFFER
0679 23            INX  H
067A 22 9F 06     SHLD CAPBPTR
067D E1            CDOUTX POP  H
067E AF            XRA  A
067F C9            RET
0680            *
0680            *BREAK CHECK: NZ IF NO INPUT OR INPUT IN B. USES A.
0680 CD 1F C0     CDBRK  CALL 0C01FH      ;INPUT TO A OR Z SET. CURRENT
DEVICE.
0683 CA B9 06     JZ   NOINP
0686 47            MOV  B,A
0687 AF            XRA  A
0688 C9            RET
0689 AF            NOINP  XRA  A
068A 3C            INR  A
068B C9            RET
068C            *
068C            *CONSOLE INITIALIZATION USES A, CLEARS CY.
068C CDINIT  XRA  A
068D 32 9E 06     STA  CAPFG      ;CAPTURE FLAG OFF
0690 3E 0B         MVI  A,0BH      ;CLEAR SCREEN (FOR VIDE0)
0692 C3 60 06     JMP  CDOUT
0695            *
0695            *LIST DEVICE OUT FROM B. USES A. CLEARS CY (NO ATTN)
0695 3E 01         LDOUT MVI  A,1        ;SOLOS/CUTER SERIAL PSEUDOPORT
0697 CD 1C C0     CALL 0C01CH      ;AOUT. OUTPUT FROM B
069A AF            XRA  A
069B C9            RET
069C            *
069C            *NO PRINTER ATTENTION NOR INITIALIZATION
069C 069C  LDATN EQU $
069C 069C  LDINIT EQU $
069C AF            XRA  A
069D C9            RET
069E            *SPACE FOR EDIT FEATURE BUFFER
069E CAPFG  DS  1        ;CAPTURE FLAG
069F CAPBPTR DS  2        ;POINTER INTO BUFFER
06A1 CAPBUFF DS  720H-$ ;CAPTURE BUFFER
0720 071F  CAPBEND EQU $-1
0720            END  @WARMSTART

```

```

0000            1000 *UTILITY PROGRAM TO DO 16-BIT
0000            1010 *INTEGER ARITHMETIC
0000            1020 *
0000            1030 *COURTESY OF LEWIS MOSELEY, JR.
0000            1040 *2514 GLENDALE CT NE
0000            1050 *CONYERS, GA. 30207
0000            1060 *THIS VERSION DATED 12/01/78
0000            1070 *
0000            1080 *COMMAND TAKES THE FORM:
0000            1090 * MATH <P1> <P2>
0000            1100 * WHERE P1 AND P2 ARE HEX NUMBERS
0000            1110 *
0000            1120 *THE RESULT IS DISPLAYED AS FIVE
0000            1130 *HEX NUMBERS, AS FOLLOWS:
0000            1140 *P1+P2 P1-P2 P1*P2 P1/P2 P1.MOD.P2
0000            1150 *WHERE P1/P2 MEANS INTEGER DIVISION
0000            1160 *AND P1.MOD.P2 MEANS THE REMAINDER
0000            1170 *OVERFLOWS ARE IGNORED.
0000            1180 *
0000            1190 *THANKS TO ATLANTA COMPUTER MART,
0000            1200 *5091 BUFORD HWY, ATLANTA, GA. 30340
0000            1210 *FOR THE USE OF A DECWRITER FOR THIS
0000            1220 *LISTING.
0000            1230 *
0000            1240 *THIS PROGRAM RESIDES IN THE SOLOS
0000            1250 *SYSTEM RAM AREA. WHEN SAVING TO
0000            1260 *TAPE, SET XEQ CB00. THUS, WHEN
0000            1270 *LATER LOADED BY THE XEQ COMMAND,
0000            1280 *THE PROGRAM SETS ITSELF UP AS A
0000            1290 *CUSTOM COMMAND FOR EASE OF USE.
0000            1300 *INTERNAL SOLOS/CUTER ROUTINES ARE
0000            1310 *USED TO EXTRACT THE TWO PARAMETERS
0000            1320 *AND TO PRINT OUT THE RESULTS.
0000            1330 *THIS COULD BE CHANGED IF NECESSARY.
0000            1340 *
0000            1350 *EQUATES TO CUTER-IN-ROM, VER 1.3
0000            1360 *OTHERS CHANGE AS NECESSARY
0000            1370 CRLF EQU 0C342H
0000            1380 PSCAN EQU 0C3A5H
0000            1390 ADOUT EQU 0C3D9H
0000            1400 *
0000            1410 SOUT EQU 0C019H
0000            1420 CUTAB EQU 0C83CH
0000            1430 RETRN EQU 0C004H
0000            1440 *
0000            1450 *
0000            1460 ORG 0C800H
0000            1470 INIT EQU $ SET UP AS CU COMMAND
0000            1480 LXI H,'AM' 'MA' REVERSED
0000            1490 SHLD CUTAB PUT IN SOLOS RAM
0000            1500 LXI H,START ROUTINE ADDR
0000            1510 SHLD CUTAB+2 PUT IT IN
0000            1520 XRA A
0000            1530 STA CUTAB+4 MARK TABLE END
0000            1540 CALL CRLF
0000            1550 LXI H,IMES POINT TO MSG
0000            1560 CALL SCRN SEND IT OUT
0000            1570 JMP RETRN THRU W/INITIALIZATION
0000            1580 *
0000            1590 *STORAGE AREA FOR THE TWO PARAMS
0000            1600 P1 DS 2
0000            1610 P2 DS 2
0000            1620 *
CB00 21 4D 41
CB03 22 3C C8
CB06 21 20 C8
CB09 27 3E C8
CB0C AF
CB0D 32 40 C8
CB10 CD 42 C3
CB13 21 B6 CB
CB16 CD 9C CB
CB19 C3 04 C0
CB1C
CB1C
CB1C
CB1E
CB20

```

CB20 1630 *
 CB20 1640 START EQU \$ MATH ROUTINES
 CB20 CD A5 C3 1650 CALL PSCAN GET FIRST PARAMETER
 CB23 22 1C CB 1660 SHLD P1 SAVE
 CB26 CD A5 C3 1670 CALL PSCAN MUST HAVE TWO
 CB29 22 1E CB 1680 SHLD P2 SAVE IT, TOO
 CB2C CD 42 C3 1690 CALL CRLF
 CB2F 1700 *
 CB2F 1710 *ADDITION ROUTINE
 CB2F CD 94 CB 1720 CALL RESET GET PARAMS BACK
 CB32 19 1730 DAD D DO ADDITION
 CB33 CD D9 C3 1740 CALL ADOUT SEND OUT RESULTS
 CB36 1750 *
 CB36 1760 *SUBTRACTION ROUTINE
 CB36 CD 94 CB 1770 CALL RESET GET PARAMS BACK
 CB39 CD 8D CB 1780 CALL DSUB
 CB3C CD D9 C3 1790 CALL ADOUT SEND OUT RESULTS
 CB3F 1800 *
 CB3F 1810 *MULTIPLICATION ROUTINE
 CB3F 1820 *WORKS BY REPETITIVE ADDITION
 CB3F CD 94 CB 1830 CALL RESET
 CB42 E5 1840 PUSH H COPY HL...
 CB43 C1 1850 POP B ...TO BC
 CB44 21 00 00 1860 LXI H,0 GET 16-BIT ZERO
 CB47 7A 1870 M1 MOV A,D
 CB48 B3 1880 ORA E FINISHED YET?
 CB49 CA 51 CB 1890 JZ M2 YES
 CB4C 09 1900 DAD B NO, ADD AGAIN
 CB4D 1B 1910 DCX D AND DROP COUNTER
 CB4E C3 47 CB 1920 JMP M1 GO BACK FOR MORE
 CB51 CD D9 C3 1930 M2 CALL ADOUT
 CB54 1940 *
 CB54 1950 *DIV AND MOD ROUTINE, ADAPTED
 CB54 1960 *FROM 10/78 ISSUE OF DR DOBBS
 CB54 1970 *JOURNAL, BOX E, MENLO PK, CA 94025
 CB54 1980 *ENTER WITH: H-L = DIVIDEND
 CB54 1990 * D-E = DIVISOR
 CB54 2000 *RETURNS: B-C = H-L DIV D-E
 CB54 2010 * H-L = H-L MOD D-E
 CB54 2020 *
 CB54 CD 94 CB 2030 CALL RESET
 CB57 7A 2040 MOV A,D CHECK FOR DIV-BY-0
 CB58 B3 2050 ORA E
 CB59 CA 78 CB 2060 JZ DVERR YES - ERROR
 CB5C E5 2070 PUSH H
 CB5D 6C 2080 MOV L,H DIVIDE H BY DE
 CB5E 26 00 2090 MVI H,0
 CB60 CD 82 CB 2100 CALL DIV1
 CB63 41 2110 MOV B,C SAVE RESULT IN B
 CB64 7D 2120 MOV A,L (REMAINDER+L)/DE
 CB65 E1 2130 POP H
 CB66 67 2140 MOV H,A
 CB67 CD 82 CB 2150 CALL DIV1
 CB6A EB 2160 XCHG SAVE HL
 CB6B C5 2170 PUSH B COPY BC...
 CB6C E1 2180 POP H ...TO HL
 CB6D CD D9 C3 2190 CALL ADOUT SEND OUT DIV RESULT
 CB70 EB 2200 XCHG GET BACK MOD RESULT
 CB71 CD D9 C3 2210 CALL ADOUT AND SEND IT OUT
 CB74 CD 42 C3 2220 CALL CRLF
 CB77 C9 2230 RET ALL FINISHED
 CB78 2240 *
 CB78 2250 *DIVIDE-BY-ZERO ERROR
 CB78 2260 DVERR EQU \$
 CB78 21 AB CB 2270 LXI H,EMES POINT TO MESSAGE
 CB78 CD 9C CB 2280 CALL SCRNM SEND IT OUT
 CB7E CD 42 C3 2290 CALL CRLF MAKE IT PRETTY
 CB81 C9 2300 RET TERMINAL ERROR
 CB82 2310 *
 CB82 2320 *DIVIDE ROUTINE
 CB82 0E FF 2330 DIV1 MVI C,-1 RESULT ENDS UP IN C
 CB84 0C 2340 DIV2 INR C ROUTINE DIVIDES BY..

CB85 CD 8D CB 2350 CALL DSUB (HL=HL-DE)
 CB88 D2 84 CB 2360 JNC DIV2 ...REPT. SUBTRACTION
 CB8B 19 2370 DAD D
 CB8C C9 2380 RET
 CB8D 2390 *
 CB8D 2400 *16-BIT SUBTRACTION ROUTINE
 CB8D 7D 2410 DSUB MOV A,L HL=HL-DE
 CB8E 93 2420 SUB E
 CB8F 6F 2430 MOV L,A
 CB90 7C 2440 MOV A,H
 CB91 9A 2450 SBB D
 CB92 67 2460 MOV H,A
 CB93 C9 2470 RET
 CB94 2480 *
 CB94 2490 *USED TO RESET PARAMETERS AFTER
 CB94 2500 *EACH OPERATION, TO GET READY
 CB94 2510 *FOR THE NEXT ONE
 CB94 2520 RESET EQU \$
 CB94 2A 1E CB 2530 LHLD P2 SECOND PARAM...
 CB97 EB 2540 XCHG TO D-E
 CB98 2A 1C CB 2550 LHLD P1 FIRST TO H-L
 CB9B C9 2560 RET
 CB9C 2570 *
 CB9C 2580 *OUTPUT MESSAGE POINTED TO BY HL
 CB9C 2590 SCRNM EQU \$ SEND OUT MESSAGE
 CB9C 7E 2600 MOV A,M 'GET CHAR
 CB9D FE 0D 2610 CPI 0DH TERM CHAR?
 CB9F C8 2620 RZ YES - THRU
 CBA0 47 2630 MOV B,A NO - SET UP,
 CBA1 CD 19 C0 2640 CALL SOUT SEND IT OUT,
 CBA4 23 2650 INX H BUMP POINTER,
 CBA5 C3 9C CB 2660 JMP SCRNM AND GO BACK FOR MORE
 CBA8 2670 *
 CBA8 20 20 44 2680 EMES ASC ' DIV-BY-ZERO'
 CB85 0D 2690 DB 0DH
 CB86 48 45 58 2700 IMES ASC 'HEX MATH PACKAGE'
 CB8C 0D 2710 DB 0DH

FIXING MSA BASIC

by Lewis Moseley, Jr.

NOVEMBER 22, 1978

SOLUS NEWS
REDWOOD CITY, CA.

DEAR STAN,

MARVIN DALTON'S LETTER AND PATCHES IN THE LAST ISSUE PROMPTED ME TO DRAG OUT MY COPY OF MSA 8K BASIC, SOLOS/CUTER VERSION. I HAVE NOT DONE MUCH WITH IT LATELY, MAINLY BECAUSE OF THE TAPE PROBLEMS. HOWEVER, NOW I HAVE COME UP WITH ANOTHER SET OF REVISED TAPE ROUTINES. IN MY OPINION, THEY HAVE TWO ADVANTAGES OVER MARVIN'S: THEY FIT ENTIRELY WITHIN MSA BASIC, AND SO ARE LOADED WITH IT RATHER THAN REQUIRING A SEPARATE TAPE LOAD FOR THE PATCHES, AND THEY USE THE TAPE BLOCK ROUTINES RATHER THAN THE TAPE BYTE ROUTINES, AND SO ARE PROBABLY A GOOD BIT FASTER. A LISTING OF MY PROGRAM IS ENCLOSED. IF YOU ALREADY HAVE SOME MSA PROGRAMS ON TAPE, AND CAN MANAGE TO READ THEM, YOU CAN CHANGE THEM OVER TO THE NEW FORMAT BY: 1. ASSEMBLE THE PATCH AND RECORD IT TO TAPE (1140-11FB HEX), 2. LOAD THE OLD MSA BASIC, AND THEN THE OLD BASIC PROGRAM. 3. LEAVE BASIC TO SOLOS/CUTER AND TAPE-LOAD THE PATCH, OVERWRITING THE ORIGINAL MSA TAPE ROUTINES. 4. MAKE THE NECESSARY CHANGES IN THE MSA BASIC JUMP TABLE. 5. PUT IN A FRESH TAPE AND USE THE SAVE COMMAND TO SAVE THE PROGRAM IN CUTS FORMAT (NOTE THAT THE FILE NAME CAN BE 1-5 CHARS, NOT JUST 1). 6. FOR EACH OLD PROGRAM, START AGAIN AT STEP 1.

NOW A FEW COMMENTS ON MSA BASIC IN GENERAL. IT'S ALWAYS AN INTERESTING EXPERIMENT TO DO A ASCII SCAN OF A NEW PROGRAM. IF YOU DO SO ON THE FULL BASIC PROGRAM, YOU WILL SEE THAT IT IS ALSO 'BYTE SHOP BASIC'! ON LOOKING MORE CLOSELY AT THE CODE, YOU WILL SEE THAT IT SEEMS TO BE A COPY OF MITS 8K BASIC, PATCHED (RATHER POORLY) TO OPERATE UNDER SOLOS/CUTER. HERE ARE SOME FACTS I NOTED AND SOME FIXES I MADE:

1. EVEN THOUGH THE DOCUMENTATION SUPPLIED DOES NOT REVEAL IT, THE PROGRAM FULLY IMPLEMENTS 'AND', 'OR', AND 'NOT' ON BOTH A LOGICAL AND BITWISE BASIS, A LA MITS BASIC.
2. THE CODE PATCHERS IMPROPERLY USED THE 'CURSOR-LEFT' CHARACTER INSTEAD OF THE 'BACK-SPACE' CHARACTER IN THE KEYBOARD DELETE ROUTINE. THIS CAN BE FIXED BY CHANGING THE BYTE AT 4B3 HEX FROM 81 (WHY 81???) TO 5F HEX.
3. I LIKE MY PROGRAMS TO BE CONSISTANT IN THE USE OF CONTROL CHARACTERS, SO I MADE THE <MODE> KEY REPLACE '@' AS THE LINE-DELETE CHAR, AND REPLACE <CTRL-C> FOR THE 'BREAK' FUNCTION. DO THIS BY CHANGING THE BYTES AT 4FB AND 507 HEX TO 00.
4. THE PROGRAM LOGIC FLOW IS MOST DIFFICULT TO FOLLOW. IF YOU CARE TO TRY IT IS POSSIBLE TO LOCATE THE MAJOR ROUTINES. STARTING AT 73 HEX IS A LIST OF THE RESERVED WORDS. NOTE THAT THE FIRST CHAR OF EACH WORD HAS THE MSB HIGH TO SEPARATE THE WORDS. A JUMP TABLE WITH THE ADDRESSES OF THE ROUTINES, STARTING WITH 'END' AND GOING THROUGH 'NEW', IS LOCATED AT 15B-194 HEX, TWO BYTES PER ROUTINE, STORED IN NORMAL LOW-HIGH ORDER. ANOTHER JUMP TABLE ELSEWHERE COVERS THE FUNCTIONS, WHOSE NAMES IMMEDIATELY FOLLOW THE STATEMENT NAMES IN THE LIST.
5. THE AUGUST 1978 ISSUE OF DR DOBBS JOURNAL FEATURED AN ARTICLE ON HOW TO RENUMBER MICROSOFT BASIC PROGRAMS. THE ARTICLE DESCRIBED IN DETAIL THE OPERATION OF THE 'NEW' ROUTINE. BY COMPARING THEIR DESCRIPTION WITH THE MSA 'NEW' ROUTINE AT 3B0 HEX, YOU CAN LEARN THE LOCATION OF A NUMBER OF IMPORTANT DATA STORAGE LOCATIONS, INCLUDING 'TEXT' AND 'SCALR', WHICH I USED IN MY TAPE ROUTINES.

I HOPE THAT MY COMMENTS AND MY TAPE I/O ROUTINES WILL PROVE USEFUL TO THE MEMBERS.

BEST REGARDS,

Lewis Moseley, Jr.
LEWIS MOSELEY, JR.
2514 GLENDALE COURT NE
CONYERS GEORGIA 30207

(4A.
* EX d TO RE-ENTER MSA BASIC)

```

1140      1000 *REVISED AND IMPROVED TAPE SAVE
1140      1010 *AND LOAD ROUTINES FOR MSA 8K
1140      1020 *BASIC, USING THE SOLOS/CUTER
1140      1030 *BLOCK SAVE/LOAD ROUTINES.
1140      1040 *THESE NEW ROUTINES ARE SMALLER
1140      1050 *THAN THE ORIGINAL MSA ROUTINES,
1140      1060 *AND CAN FIT EASILY IN THEIR
1140      1070 *PLACE WITHIN BASIC.
1140      1080 *
1140      1090 *THIS VERSION 11/18/78
1140      1100 *COURTESY OF
1140      1110 *LEWIS MOSELEY, JR
1140      1120 *2514 GLENDALE COURT NE
1140      1130 *CONYERS, GA. 30207
1140      1140 *

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17

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1140      1150 *THANKS TO ATLANTA COMPUTER MART,
1140      1160 *5091 BUFORD HWY, ATLANTA, GA. 30340,
1140      1170 *FOR THE USE OF A DECWRITER FOR THIS
1140      1180 *LISTING
1140      1190 *
1140      1200 *INSTRUCTIONS FOR USE!
1140      1210 *FOLLOWING THESE MODIFICATIONS,
1140      1220 *THE TAPE COMMANDS ARE:
1140      1230 *
1140      1240 * SAVE "NAME"
1140      1250 * LOAD "NAME"
1140      1260 *
1140      1270 *WHERE "NAME" IS AN ALPHANUMERIC
1140      1280 *STRING ENCLOSED IN DOUBLE-QUOTES
1140      1290 *WHICH IS USED AS THE NAME IN THE
1140      1300 *SOLOS/CUTER TAPE HEADER, AND
1140      1310 *WHICH IS SUBJECT TO THE FOLLOWING
1140      1320 *LENGTH RESTRICTIONS:
1140      1330 * 1. IF 5 CHARACTERS OR LESS,
1140      1340 * THE NAME IS USED AS-IS.
1140      1350 * 2. IF MORE THAN 5 CHARS, ONLY
1140      1360 * THE FIRST 5 ARE SIGNIFICANT.
1140      1370 * 3. THE FIRST CHARACTER CANNOT
1140      1380 * BE A SPACE (BLANK).
1140      1390 * 4. AN EMPTY STRING (**) IS NOT
1140      1400 * ALLOWED.
1140      1410 *
1140      1420 *RESTRICTIONS:
1140      1430 *THE NEW ROUTINES DO NOT SUPPORT
1140      1440 *ARRAY SAVE/LOAD, WHICH NEVER
1140      1450 *WORKED FOR ME ANYWAY, NOR CAN
1140      1460 *YOU DO A 'LOAD ?"NAME"'.
1140      1470 *
1140      1480 *IN ADDITION TO REPLACING THE
1140      1490 *BLOCK OF CODE FROM 1140-11F8
1140      1500 *WITH THE NEW ROUTINES, YOU MUST
1140      1510 *ALSO CHANGE THE ADDRESSES IN THE
1140      1520 *COMMAND JUMP TABLE. DO THIS BY:
1140      1530 *
1140      1540 * ENTR 18F <CR>
1140      1550 * 9B 11 40 11 / <CR>
1140      1560 *
1140      1570 *
1140      1580 *EQUATES TO MSA BASIC POINTERS
1140      1590 TEXT EQU 01D6H BEGINNING OF...
1140      1600 *...BASIC PROGRAM SPACE.
1140      1610 *
1140      1620 SCALR EQU 024BH POINTER TO END..
1140      1630 *OF CURRENT PROGRAM, AND THERE-
1140      1640 *FORE, BEGINNING OF STORAGE AREA
1140      1650 *FOR NON-ARRAY VARIABLES.
1140      1660 *
1140      1670 *EQUATES TO SOLOS/CUTER ENTRY PTS
1140      1680 WRBLK EQU 0C016H BLOCK WRITE
1140      1690 RDBLK EQU 0C013H BLOCK READ
1140      1700 *
1140      1710 *WHEN ASSEMBLING, MAKE THE ORIGIN
1140      1720 *AT 1140 (HEX).
1140      1730 *
1140      1740 *
1140      2000 SAVE EQU $ TAPE SAVE ROUTINE
1140      2010 *THE FOLLOWING STEPS ARE COPIED
1140      2020 *DIRECT FROM THE ORIG 'SAVE'
1140      2030 *ROUTINE. THEY APPEAR NECESSARY.
1140      2040 *THE END RESULT IS THAT RP D-E
1140      2050 *POINTS TO THE FIRST CHAR WITHIN
1140      2060 *THE DBL-QUOTES IN THE 'SAVE'
1140      2070 *COMMAND. ADDITIONAL CHARS CAN
1140      2080 *BE OBTAINED BY INX D.
1140      2090 MVI B,1
1140 06 01

```


B O O K R E V I E W

"FORTY-FIVE BASIC PROGRAMS" by Didactix

(From advertising flyer for "45 BASIC PROGRAMS".)

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In our quest for application software, we ran across an ad for this book and wrote for information. We received the table of contents reprinted here. We then wrote for and received a copy for review. The book sells for \$10 and is 65 letter-size pages of rapid-photo-offset printing like that from the instant-printing places. The listings were made on various time-sharing systems with assorted terminals, so it looks like someone's accumulation of programs over a number of years. Some pages are speckled and hard to read, but almost all are legible. Many of the programs include sample output.

Some of the programs are only 10 or 20 lines long. Others are several pages. In some, the input data comes from DATA statements inside the program rather than from the terminal with INPUT statements, so it will be necessary to alter these statements before each use. Some will need modification to run under PTC BASIC because they use features not available in PTC's dialect. For example, several use PRINT USING statements, program 6b uses MAT READ to read a matrix, 4b uses a MARGIN statement, and 5d uses an array of string variables (Microsoft BASIC style). Some of the listings have minor typographical errors. For example, the "EXPECTED VALUE CALCULATOR" has a statement

PRINTT "EXPECTED VALUE IS" E

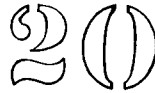
The extra "T" in PRINTT is taken as a variable T to be printed, so the output shows an unnecessary zero at the beginning of that line.

Some of the programs are not what one might expect from the table of contents sent to those who inquire by mail. For example, the "WEEKLY DEMAND FORECASTER" isn't the general purpose program one might think. In actuality, it is for helping a petroleum product vendor estimate the demand for regular, unleaded, and premium gasoline, fuel oil and jet fuel by simple averaging the sales over the prior three weeks. Not of much use to most people, I'd say. On the other hand, the "NAIVE FORECASTING MODEL" computes expected value of a variable "sales" based upon data from up to 50 prior periods, using one of four extrapolation methods. The "MONTHLY BANK STATEMENTS" program doesn't help one reconcile a bank statement; rather it lets one print bank statements. If you happen to run a bank and are dumb enough to want to enter all of your accounting thru DATA statements, you'll love this one. The "WEEKLY PAYROLL" program just computes gross salary. The "DISCOUNTED CASH FLOW" is specific to a manufacturing situation involving "sales tonnage", "unit price", "design capacity", etc.. The "ENERGY CONSERVATION" program is for a chemical production complex.

The other programs are of a general nature and seem to be usable with little modification (although you may want to change some things for convenience). The statistical programs can be applied to any problem area. The price is reasonable even if you only want a few of the programs in this book. No explanation of the programs or the background theory comes in the text, so you had better understand the problem pretty well.

You can order this book from Didactix, 45 Wenley Road, Buffalo, NY 14216. The price is \$10.

NEW PRODUCT ANNOUNCEMENT
TOUCH-TONE-COMPATIBLE TELEPHONE
TRANSCIVER



GENERAL DESCRIPTION

The MK-II DTMF transceiver was developed as an S100 interface for Touch-Tone® telephones. The 5" x 10" board converts Bell System's Dual Tone Multi-Frequency (DTMF) signaling into binary and binary into DTMF. Advances in LSI circuitry make possible central office quality detection and transmission at a reasonable cost and a minimal size, providing a communications capability never offered before to microcomputer users.

In operation, the MK-II is inserted into any

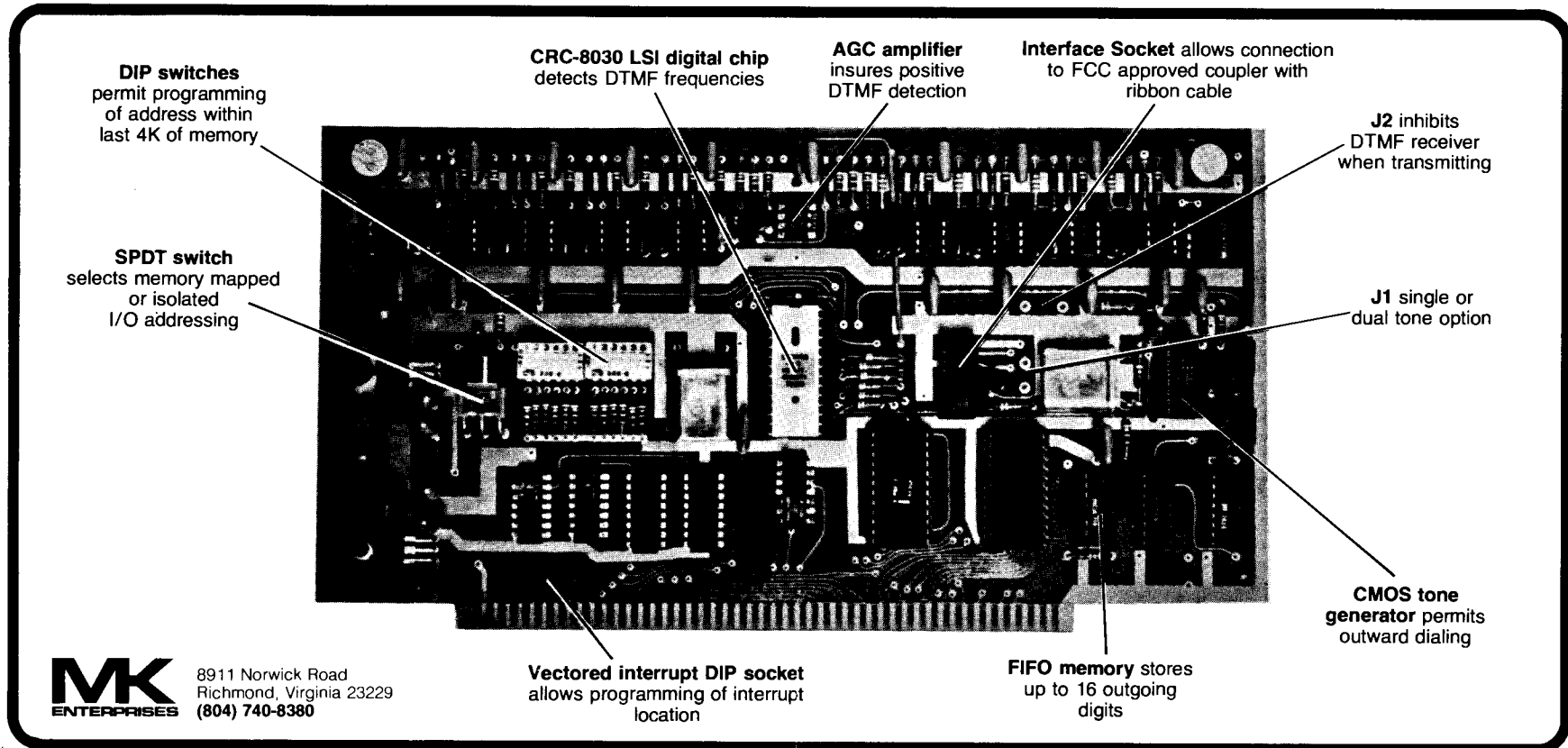
S100 bus microcomputer and connected to the phone's lines via a Data Access Arrangement. Decoding DTMF is accomplished by a front-end band-split filter/limiter used in conjunction with the Collins CRC-8030 DTMF detector. This provides the optimum technological benefits of analog and digital design techniques without the problems plaguing phase-locked-loop designs. Valid DTMF and ring detection alert the CPU of decoded data by generating interrupts, or in less time critical

applications, by setting a status flag. Such a capability permits phoning into the computer and executing programs by punching the correct tone pad sequence on the remote phone. A 4-bit input port allows additional data to be transferred when DTMF is detected. The MK-II can service up to 8 incoming telephone trunks by multiplexing data through this port.

Outgoing calls are made by loading an on-board First In-First Out (FIFO) memory with the

binary encoded digits to be dialed. A CMOS tone generator converts the binary data to DTMF tones. Software is kept to a minimum, as the CPU may unload data to the MK-II without waiting for tone transmission. A 4-bit output port can be used for the supervision of DAA equipment or the control of any other communication facility. Programmable features include variable tone length and single or dual-tone generation.

® Registered trademark of AT&T.



8911 Norwick Road
Richmond, Virginia 23229
(804) 740-8380

Transceiver...continued from previous page

APPLICATIONS



MK
ENTERPRISES

8911 Norwick Road
Richmond, Virginia 23229
(804) 740-8380

MK-II DTMF TRANCEIVER PRICING INFORMATION

LIST PRICE: \$425 Assembled and Tested
Manual Included

ELECTRONIC FUNDS TRANSFER

The MK-II is the heart of an electronic funds transfer system. Interfaced to the bank's main data storage, the MK-II scans telephone lines for DTMF data while the microcomputer time-shares users into the host machine. Customers call in, punch in their account number, access code, and desired transactions, all from their home telephone...and they don't even have to buy Touch-Tone® service from Ma Bell.

SECURITY SYSTEMS

Using a data multiplexer to scan fire and entry sensors, the MK-II adds dial-up security to your S100 system at home or at your business location. When an alarm condition is detected, several numbers are called and an audible message is given. The message may originate from a vocal recording on a cassette data tape, a voice synthesizer board, or simply an audible tone. This makes your S100 computer a more cost effective investment by supplying you with services that are available normally through specialized security contractors.

PABX FEATURES

You can update your present phone system with features that most PABX systems offer without even modifying your telephone system. Simply couple the MK-II into an extension jack and monitor all out-going traffic. Features such as business cost accounting, toll restricting, automatic call-back, and call-forwarding are easily implemented.

• Business Cost Accounting

The MK-II can be used to assist business management in the control over rising tele-

phone costs by providing daily reports on originating extension numbers, digits dialed, and duration of the calls. By analyzing this data with existing tariff rates, a company can determine quickly where its costs are.

• Toll Restricting

By requiring a special access code following the dialing of all long distance calls, the MK-II will supervise outgoing calls and disconnect calls without the proper access code. This also helps management in keeping telephone costs low.

• Automatic Call-Back

It's Saturday morning and you're trying to get a golf time at the pro-shop, but everyone else has the same idea...the line is busy. Press the star * key on your phone. The MK-II will redial your number until it gets through, and when it does, your computer can buzz you to pick up the phone.

• Call Forwarding

Your telephone calls can be transferred to any other number when you program the MK-II to call out on another telephone line whenever the incoming line rings.

AC REMOTE CONTROLLER

With the AC controller boards available, the MK-II extends your command over these devices by allowing them to be switched ON or OFF from a remote telephone. Applications include such possibilities as turning on the air conditioner from work before arriving at home by phoning your computer and punching the correct tone sequence that "addresses" the air conditioner. Security systems may be activated or deactivated, the lawn sprinkler controlled, or lights turned on at night, all from a remote telephone.

QUANTITY	DISCOUNT	PRICE
5 - 10	25%	\$318.75
11 - 25	30%	\$297.50
26 - 100	35%	\$276.50
100 up	consult factory	

*FCC registered DAA coupler (Morey Corp.) \$35.00

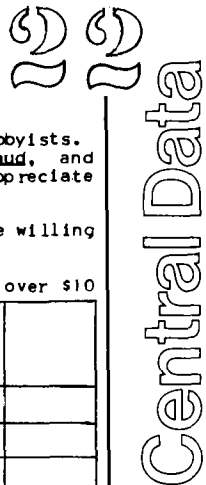
TERMS AND CONDITIONS

The MK-II is burned in for 48 hrs. and has a 90 day warranty. Net 30 day terms are given to rated firms. Full payment must accompany all other orders, or shipment will be C.O.D. For orders outside of the U.S., a certified check is accepted.

Shipments are normally sent via UPS. Above prices do not include shipping and insurance charges, and are subject to change without notice.

Virginia residents add 4% sales tax.

LETTERS



Central Data

...ON A SERVICE BUREAU FOR HOBBYISTS

We are considering starting a service bureau oriented toward hobbyists. Such a service bureau is described in the January 1979 issue of *Kilobaud*, and would provide computer services such as those listed below. We would appreciate your taking a few minutes to fill out this survey.

Which of the following services would you use, and how much would you be willing to pay for each of them?

	often	occasionally	seldom	never	\$1-2	\$2-5	\$5-10	over \$10
Media transfer (such as paper tape to cassette)								
Copying (same medium)								
Program listing								
PROM programming								
Assemblies								
Dis-assemblies								
Cross reference list for BASIC programs								
Other _____								

To help us determine which media and formats to support, please list what computer(s) and peripherals you have. For cassettes, please list recording format (Kansas City, Tarbell, etc.). For diskettes, please list brand (North Star, etc.) and disk size.

What kind of PROMs do you use, if any?

We would appreciate any comments or suggestions. Thank you for your time.

Jim and Shelley Howell
5472 Playa Del Rey
San Jose, CA 95123

(408) 226-0199

...A PRICE BREAK ON DYNAMIC MEMORY

Central Data Corporation
PO Box 2484, Station A
Champaign, IL 61820
(217) 359-8010

Dear Computer Club Members:

Central Data is glad to announce a new policy concerning the pricing of our memory boards to computer clubs.

Under the new pricing, members of a club can team together to get discounts of up to 25% below our all-ready low prices. The quantities required for discounts are listed below:

Quantity	Discount
1-2	none
3-4	10%
5-7	15%
8-11	20%
12 and up	25%

Note that you can mix between different sizes of boards to get the higher quantity discount. The prices for our memory boards are as follows:

Size of Board	Price
16K	\$249.00
32K	425.00
48K	599.00
64K	775.00

If you need more information about our memory boards, you can call or write us or look for our ads in back issues of *BYTE*, *Kilobaud*, and *Interface Age*.

We hope that this offer will allow more of you to expand your systems and enjoy your system even more.

(EDITOR'S NOTE: SOME DYNAMIC MEMORIES GIVE TROUBLE WITH DISK CONTROLLERS AND OTHER DEVICES USING DMA--direct memory access-- SO BE SURE TO TEST THEM IN THE EXACT SYSTEM CONFIGURATION YOU INTEND TO USE. ADDING DMA DEVICES SUCH AS THE HELIOS DISK SYSTEM MAY BE DIFFICULT UNLESS THE MEMORY IS COMPATIBLE.)

...QUESTIONS: HEATING PROBLEMS, IBM-TO-MICROPOLIS TRANSFERS

THE UNIVERSITY OF NORTH CAROLINA
AT GREENSBORO



School of Education

November 22, 1978

Mr. Stan Sokolow, Editor
SOLUS NEWS
1690 Woodside Road # 219
Redwood City, CA 94061

Dear Mr. Sokolow:

We just received our back issues of SOLUS NEWS and are finding them very useful and informative. Would appreciate more information on heating problems.

We have three SOLs - one of my own and two belonging to the school - and a Micropolis Metafloppy dual drive. We want to be able to transfer data from our 370/165's to Micropolis disk. Do you - or does anyone out there - have a cookbook procedure for this? Is anyone interfacing in not just using the SOL as a terminal) with other computers (or among SOLs)?

Keep up the good work. How is the software library coming? We'd like both to use and to contribute.

Sincerely,

Ted Hines

Theodore C. Hines Ph.D., ALA, Professor
Library Science/Educational Technology
Phone: 919 379-5710

GREENSBORO, NORTH CAROLINA / 27412

THE UNIVERSITY OF NORTH CAROLINA is composed of the sixteen public senior institutions in North Carolina
an equal opportunity employer

(ED. NOTE: Does anyone have a simple way to copy from the serial port to a file under the Micropolis disk system? Regarding heating problems, some people have added a second fan to the back of the Sol, some have changed the existing fan to one of the same size which runs faster. I'll try to get the number of the fan. See the progress report on first page for update on software library.)

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...ON SOL IN SMALL BUSINESS SERVICE BUREAU



TONY'S DATA SERVICE

131 Highland Ave.
Vacaville, CA 95688
707-446-0417

Solus News
San Jose, Calif. 95153

Dear Editor,

What has happened to the Solus Users Group and the Solus News? I joined at the September group meeting and except for receiving all the back issues of Solus News (which I prize) I haven't heard from anyone. When are the meetings to be held? I remember something at the Sept. meeting that indicated that a new place was needed. I am very interested in keeping Sol Users Group going and will do all that I can to keep it in existence. If there is anything I can do please don't hesitate to ask.

Something about me: My name is Tony Severa and I have been into computers for approximately 2 and a half years now. My first computer was a Sol20 (rev E) which I bought as a kit. At that time I was working as a Drug and Alcohol Counselor for Solano County and as of September of 1978 I have quit my job and gone into providing computer services for small businesses for a profit.

I currently have two Sol-20's..two dual disk Helios's..one North Star Disk..one Okidata 110 printer..one HiTypeII daisywheel printer and gobs of software.

For word processing I have the WordWizard and am getting more and more used to it and find it very helpful for letter writing and report generation. Recently I printed four first copy 55 page reports using the new system. It took me two weeks to provide what would take 5 typists and 3 weeks to provide. Obviously I am very pleased with my system.

For complaints I have only one. I cannot keep my Processor Tech. 16k memory boards running. I bought my last System Three in October 1978 (I had asked for a 48k board and received 3 16k boards instead) and have had to have all three boards repaired.

For recommendations I would like to express my satisfaction for the service and support I have received from Charlie Babbs at the Walnut Creek Byte Shop. These people have been assisting me since I started buying magazines from their shop in 1976. They worked hard correcting my soldering mistakes when I built my first Sol and never charged me a thing. They always seem to be there (at least by phone) when I dont understand something in the manual or when I have a problem occur. These are good people and they come highly recommended.

On a final note I am currently working on possibly setting up a "community memory" project in the Fairfield/Vacaville area. Obviously money is a concern but I believe in public access to computers and will do what I can to assist others in turning on to the use of computers rather than being used by computers. There are approximately 20 others in the area who share my interest and involvement and we will keep you in touch with our project.

Here's hoping to hear from you as soon as you get the chance.

Tony Severa
Tony Severa
131 Highland Ave.
Vacaville, CA 95688

(ED. NOTE: Sorry for the delays, Tony. I hope the reorganization of Solus into Proteus will help. The San Francisco Bay Area chapter has not met for the past few months due to the lack of a coordinator. One meeting was held but announced only by word-of-mouth. Your problems with 16KRA boards are not unique, but they seem to be most common in systems with HELIOS disks. That is why I went to the extra effort of the January bulletin to announce the memory upgrade program offered by PTC. They are encouraging people with small memory boards to upgrade to the newer high density boards. If you happen to have problem boards, now is your chance.)

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P R O T E U S O R D E R I N G I N F O R M A T I O N

1. Helios library volume 1 @ \$10 with donated program
 or data file or \$25 without acceptable donation. \$ _____
 California residents add 6% sales tax on item 1. \$ _____
 2. Back-issues of Solus News (1977) Vol. 0 @ \$2
 (1978) Vol. 1 @ \$10 \$ _____
 3. Current subscription of Proteus News (1979) @ \$12 \$ _____
- TOTAL PURCHASE (US FUNDS ONLY) \$ _____

Ship to: Name
 Address

If you are donating a program to the library for reduced price
 of a library diskette, please complete the following statement:
 COPYRIGHT STATEMENT

As donor of the computer program(s) or file(s) named below,
 I certify that no copyrighted work is contained therein, other
 than my own. Furthermore, if my submission is published, in
 whole or part, by PROTEUS, I hereby transfer, assign, or otherwise
 convey all copyright ownership to PROTEUS.
 NAME(S) OF FILES OR PROGRAMS:

DONOR'S SIGNATURE _____ DATE _____

MAIL COMPLETED FORM TO: PROTEUS
 Attn: S. M. Sokolow
 1690 Woodside Road, #219
 Redwood City, CA 94061

PROTEUS/NEWS
 S. M. SOKOLOW, EDITOR
 1690 WOODSIDE ROAD, SUITE 219
 REDWOOD CITY, CALIFORNIA 94061
 U. S. A.

James D. McElroy
 2826 Crest Ave. N.
 Allentown, PA 18104

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 Redwood City, Calif.

PROTEUS / NEWS

AN INDEPENDENT NEWSLETTER FOR OWNERS AND USERS OF PROCESSOR TECHNOLOGY CORPORATION COMPUTERS

FORMERLY SOLUS NEWS

VOLUME 2, NUMBER 2 PUBLISHED BIMONTHLY BY PROTEUS, 1690 WOODSIDE ROAD, SUITE 219, REDWOOD CITY, CA 94061, USA SINGLE ISSUE \$2 (U.S.)

PROTEUS CASSETTE LIBRARY IS READY!

About a year late, the public domain cassette library is finally real and ready to send tapes. After the retirement of Solus's third and most successful librarian, we here at Proteus took the bull by the horns and spent several days editing and reorganizing tapes so that we could have a manageable library on tape. We are ready to make copies and send them out to any Proteus member. We have tried to organize the tapes in a way that will make them useful even to people who have disk systems and no longer use their tape recorder.

(Continued on page 2)

PROTEUS -- The Processor Technology Users' Society

Since August 1977, Processor Technology computer owners have had their own independent organization working on their behalf. Originally known as SOLUS (Sol Users' Society), the name was changed in 1979 to reflect a wider scope, and we are now known as PROTEUS. Although we were originally founded by hobbyists, we are now trying to achieve a balance between projects of interest to the hobbyist and to the end-user. In 1979 we want to greatly increase our membership so that we can accomplish more. The purpose of this article is to acquaint you with what we have done and hopefully enlist your participation.

The goals of Proteus are (1) to facilitate communication among Processor Technology computer users, (2) to provide a mechanism for exchanging software, (3) to give feedback from users to Processor Technology Corporation, and (4) to encourage the

(continued on page 13)

PROTEUS DISCOUNTS SOFTWARE

Proteus has added another service to our repertoire. We are becoming a source for commercially-produced software at discount prices for members. The first offerings are the G/2 programs for Sol, produced by GRT Corporation. You have probably seen the ads in popular computer hobbyist magazines for "A better BASIC for the Sol." This is the G/2 Extended BASIC for Sol, written by Microsoft and customized by G/2. A story on this BASIC appears to the right. G/2 also has 3 tapes of programs written in G/2 Extended BASIC, which we also carry.

We are being selective in what we sell, and as we review various programs they may be added to our catalog. If you have any specific requests, let me know. Also, if you have a program which you feel has been really worth the money you paid, please send me the recommendation.

Our discount structure will vary, depending upon what discounts we get from the manufacturers of the software. The G/2 programs are discounted 15% below list price, and we pay postage if payment accompanies your order.

PROTEUS TO MEET AT COMPUTER FAIR

At the 4th West Coast Computer Faire, Proteus will have a booth and a meeting room. The agenda of the meeting will be determined by the responses to the Questionnaire #1 sent in the last Proteus/News, so please send in yours if you plan to attend the Faire. While too few have arrived as of the time I'm writing this, it seems that a presentation by Processor Tech on their new product plans is popular. (PTC does not intend to have an exhibit at the Faire, but will support their dealers to exhibit there.)

At the booth we plan to conduct a software-swap. The details are explained in the article in this issue entitled "Software-Swap at the Faire." Those who cannot attend the Faire may participate by mail. See the article.

Our meeting is to be Saturday, May 5, at approximately 5-6 p.m. after the other sessions have concluded. Check the Faire program for the specific time and place. Our booth will be in the left, rear area of the Brooks Hall exhibition area, near the food and relaxation area. It is booth #1127 and will have our name "Proteus".

MICROSOFT BASIC FOR SOL

An enhanced version of the famous Microsoft Extended BASIC is now available at reasonable cost for Sol (and CUTER systems). Microsoft BASIC is virtually the "industry standard" since it was the first and most widespread major BASIC interpreter in the microcomputer marketplace. Most of the programs you see in computer magazines are in Microsoft BASIC. It is the BASIC used by the Apple, Pet, TRS-80 (Radio Shack), Sorcerer, Ohio Scientific, Imsai, Cromemco, and other computers. NOW, for less than \$50 you can have Microsoft BASIC.

(Continued on page 3)

SOFTWARE SWAP AT THE FAIRE

At the Fourth West Coast Computer Faire, Proteus will conduct a software swap at our booth in the exhibit hall. Here's how it will work.

WE WANT TO EMPHASIZE THIS: THE LIBRARY IS NOT LIMITED TO PROGRAMS WHICH RUN ON CASSETTE SYSTEMS. DISK PROGRAMS MAY BE SUBMITTED, but you must copy them onto a Sol/CUTS cassette as either a block image file (SAVE command) or as a text file (byte-transfer thru Solos/Cuter). WE ARE JUST USING THE CASSETTE AS A UNIVERSAL INTERCHANGE MEDIUM. In particular, CP/M comes in so many hardware media now that the only universal medium among Proteus members is the cassette. By passing programs and files on cassette, people with CP/M on a Northstar can read programs donated by someone with CP/M on a Helios, or a Micropolis, or a standard 8" drive, and so on. Whenever possible, submit programs in text or source form, so that they will have the maximum usefulness.

(Continued on page 3)

For a long time it has been obvious that cassette tapes, while inexpensive, are too slow for many serious applications. However, all Sol's can read them, regardless of whatever type of disk they have. We consider the cassette a convenient interchange medium among dissimilar systems, and a useful back-up in case of disk malfunction (say in a commercial system where you can continue collecting data for processing later when the disk is repaired). To maximize the interchange quality of our library, we have recorded all programs where ever possible, in simple text form as well as internal ("compiled") form. This will let you copy the source programs into files on your disk and make any necessary changes, and then run them under you own variety of disk BASIC or other language. We will try to do this with assembly language source programs too, so that they can be read in so-called ALS-8 format, or in straight text (without character counts in each line). Even if you don't have a disk now, you will appreciate this upward compatability later when you get one. Also, even if you don't have Extended Cassette BASIC, you will be able to use the tapes. NorthStar BASIC is very similar to ECBASIC, and G/2 Extended BASIC is a modified Microsoft BASIC for Sol. (Microsoft BASIC is the most common dialect for microcomputers.)

The catalog of each of the tapes ready for release is shown below. We have tried each program to be sure it works, and in some cases have made changes to improve the usefulness of the program (removed references to sense switches, etc.). We will keep you informed through the newsletter if any bugs are found in the programs. The Extended Cassette BASIC programs are all recorded twice in "compiled" form on side 1, and once in "text" form on side 2. All of our tapes will have the programs recorded more than once, so that you will still have a good copy even if one happens to have a defect. We are using a good quality of tape and haven't had a single read error yet, but it's always possible.

In determining the price of the tapes, we have carefully evaluated our material and labor costs to keep the price as low as possible, but still make it viable. As with our Helios disk library, we have two prices: a low price for those who donate an acceptable program to the library, and a somewhat higher but still reasonable price for those who have no acceptable program to donate. Those who previously donated the programs presently in the library should just mention this fact and give their program names so they can receive tapes at the lower price. One donated program is required for each discounted cassette.

Each cassette costs \$8 plus a donated program, or \$18 without an acceptable program donation.

As we mentioned in a previous issue, we cannot accept for inclusion in the library any program which is copyrighted by someone other than the donor, unless the copyright owner gives Proteus explicit permission to distribute it (in writing). We have obtained permission from People's Computer Company to reprint computer programs published in their magazines, such as Dr. Dobb's Journal, as long as credit-lines are included in the program to identify the source. Donors are responsible for submitting written permission from copyright owners for inclusion in the library.

The extra surcharge paid by those without donated programs will help us to acquire more public programs from other sources. However, we really want to encourage people to submit programs they have written rather than pay the extra charge. The only way the library will continue to work is if everyone tries to make it grow.

As time goes on, we expect to be distributing programs on NorthStar and Micropolis diskettes, too. If you would like to wait for other media to be available or wait for other programs to become available, you may submit a program now on one of the presently acceptable media (Sol/CUTS tape or Helios diskette) and ask for a credit slip toward a future purchase from the library.

22

Contents of Proteus Cassette #1 -- Extended Cassette BASIC

PLOTS C 3C20 00D1 Plots sine & cosine.
 XYPTO C 3C20 0167 An aid for decoding cryptograms.
 MTCHS C 3C20 0357 The game of Nim; you against computer.
 LUNAR C 3C20 097A Lunar lander simulation; you are pilot.
 HXDEC C 3C20 022F Converts hexadecimal numbers to decimal.
 MATH C 3C20 06CF Arithmetic practice for children.
 FINAN C 3C20 15E9 A home financial accounting program.
 VDMFB C 3C20 1BA5 video football.
 PNUTS C 3C20 0F95 Draws Peanuts cartoon characters.
 SLOTS C 3C20 0461 Simulates a slot machine.
 SORTS C 3C20 0B61 Compares the speed of 3 sorting methods.
 ALFA C 3C20 0486 Alphabetizes words.
 DAYS C 3C20 03C2 Computes number of days between any 2 dates.
 NAMES C 3C20 081E Alphabetizes names.
 SLOTM C 3C20 0A11 Another slot machine.
 END C 3C20 0026 End-of-files

Contents of Proteus Cassette #2 -- Extended Cassette BASIC

KENO C 3C20 1404 Keno gambling game.
 KING C 3C20 1840 You are king; manage your kingdom wisely.
 BIOCH C 3C20 077C Your own biorhythm chart.
 MONOP C 3C20 35BB A "Monopoly"-like game.
 BLKJK C 3C20 141F Blackjack card game, with graphic display.
 STORY C 3C20 0B11 Create a children's story.
 SILLY C 3C20 0BF2 Create a silly children's story.
 WMPUS C 3C20 0E79 Hunt the "wumpus" in his caves.
 END C 3C20 0026 End-of-files

Contents of Proteus Cassette #3 -- Extended Cassette BASIC

LIM C 3C20 0D59 Create a silly limerick.
 BAGEL C 3C20 082B A skill-guessing game.
 GUESS C 3C20 01FF Number guessing.
 MGWMP C 3C20 09EF Find the mugwump; practice in coordinates.
 MATCH C 3C20 1006 A word game.
 TACTO C 3C20 08AB Tic-tac-toe.
 DCODE C 3C20 017B Helps decode cryptograms.
 XAGON C 3C20 0A69 A letter capture game; figure out the rules.
 MMIND C 3C20 05CF The Mastermind logical guessing game.
 UCAL C 3C20 039A Universal calendar; gives day-of-week for any date.
 FSCBA C 3C20 0949 Cost-benefit analysis of fuel-saving investment.
 LEASE C 3C20 0609 Computes lease payments, costs, etc.
 C2C C 3C20 00A8 Converts Fahrenheit to Celsius.
 F2F C 3C20 009A Converts Celsius to Fahrenheit.
 END C 3C20 0026 End-of-files

Note: Tapes 1, 2, and 3 have each program recorded "compiled" on side 1 (two copies each) and in "text" once on side 2. The "text" form can be read into any system using the Solos/Cuter byte-oriented file operations and they will look like they should in source code of BASIC. The "compiled" files will only make sense if read by Processor Technology Extended Cassette BASIC.

Contents of Proteus Cassette #4 -- Software Tech Music Selections

CNTRY	08D3	04BE	GIGUE	08D3	099C
COKE	08D3	0436	COTYR	08D3	0976
SCARB	08D3	0804	SONAT	08D3	0E43
AQUAR	08D3	093A	RAIN	08D3	0964
ORNGB	08D3	0486	LIGHT	08D3	038A
STLIF	08D3	05F8	HEART	08D3	0484
SONGS	08D3	0677	LSTRY	08D3	0377
THING	08D3	037A	CLOSE	08D3	0490
GREEN	08D3	0439	TANGO	08D3	08A9
SILVR	08D3	03DD	GRENE	08D3	0439
NOSUN	08D3	038D	LAURA	08D3	06BC
YANKE	08D3	04FB	PURPL	08D3	06F2
BACH	08D3	1325	YAKY	08D3	0857
WEEKD	08D3	087A	WORLD	08D3	03F0
MICHL	08D3	05D0	MOZRT	08D3	0C43
HERE	08D3	0444	WACHT	08D3	11DF
RINGO	08D3	04E9	GDAN1	08D3	0583
PRCEL	08D3	055F	GDAN2	08D3	0583
2PII2	08D3	07AD	GDAN3	08D3	04F7
			MAREF	08D3	0557

(continued at right)

Tape 4 has each music selection recorded once on each side. These require the Software Technology/Processor Technology music system (no longer manufactured).

Contents of Proteus Cassette #5 -- BASIC/5 programs and P.A. tiny Basic

Side 1 -- BASIC/5 programs

SLOTS	LAD9	128E	Slot machine simulation.
GSTAR	LAD9	04BE	Guessing game.
BLKJK	LAD9	1784	Blackjack.
CRAPS	LAD9	07BD	Craps.
ACDUC	LAD9	07BF	Acey-Ducey.
MMIND	LAD9	1945	Mastermind game.
KING	LAD9	1E18	You are King; manage your kingdom.
SQUIZ	LAD9	11D8	Children's literature quiz.
STARS	LAD9	0A15	Shooting stars game.
TRAP	LAD9	0587	A number guessing game.
TAXMN	LAD9	0DCC	A number factoring game.
REVRS	LAD9	0880	Number manipulation game.
HURKL	LAD9	0A33	Find the Hurkle in the coordinate plane.
TTTTT	LAD9	0EAE	3-dimensional Tic-Tac-Toe; challenging!

Side 2 -- Palo Alto Tiny BASIC programs

BLKJK O 0000 2000 Blackjack in Palo Alto Tiny Basic, includes BASIC.
BTREK O 0000 2000 Tiny Star-Trek game in P.A. Tiny Basic, with BASIC.

Note: Palo Alto Tiny BASIC has been documented in the old SCCS INTER-FACE magazine (with source listing) and probably in Dr. Dobbs Journal, too; but we don't recall the particular issue. You can see the statements it recognizes by doing an ASCII dump of it. It resides in the first 2K. It supports only integers. No "BYE" command--reset to get back to SOLOS/CUTER.

Tape 5 has each program recorded twice.

SOFTWARE SWAP (continued from bottom right)

The reason for this is that we don't want to steal programs from the various magazines and books that have copyrighted them. We also don't want to be caught in any hassles with people who donate programs. If you mail your cassette ahead of time, be sure to send a signed copy of the copyright statement, too, or we can't accept the program. We reserve the right to reject any program we feel is inappropriate to the library, but generally every useful or amusing program will be accepted.

MICROSOFT BASIC (continued from page 1)

The features of Microsoft BASIC include: 16-digit precision, descriptive error messages, automatic line numbering, selective renumbering, long variable names, trace function for debugging the program flow, PRINT USING command for "picture"-type formatting, compatibility with other Microsoft BASICs, etc.. This new extended Microsoft BASIC has been produced by G/2 corporation specifically for compatibility with SOLOS/CUTER and Processor Technology's BASICs (BASIC/5 and Extended Cassette BASIC). G/2 Extended BASIC can read tapes created by Processor Tech's BASICs and it can interchange tapes with G/2 BASIC for the SWTPC 6800 computer.

G/2, a division of GRT Corporation (a 13-year-old corporation in the tape-recorded-music business with annual sales exceeding \$55 million per year), is now producing numerous programs for the Apple, Pet, Sorcerer, TRS-80, SWTPC, and Sol. Their Sol series includes Sol Extended BASIC and tapes to run under their BASIC: Beat the House, Clinic, and Outwit. "Beat the House" is a set of 4 casino games (Blackjack, Craps, Poulette, and Slot machine) which simulate Las Vegas rules and payoffs. "Clinic" has 3 programs relating to biorhythms, diet, and personal health. "Outwit" has 3 games which pit you against the computer: Nines (a number addition game), Towers of Tibet (a strategy game), and Line-of-Five (a game of increasing difficulty).

Proteus has arranged to be a dealer of G/2 programs for Solos/Cuter systems. We have all of the tapes mentioned above on order from G/2 and by the time you read this should have them in stock. We are selling them to Proteus members at a 15% discount off of the regular price. See the order form inserted in this issue for details. The Proteus library will carry programs written in G/2 BASIC in the public-domain. G/2 has said that they are testing the demand for Sol programs with this first release, and plan to produce many more releases if they have an adequate response.

SOFTWARE SWAP (continued from page 1)

We are going to rent a high speed cassette copier for the weekend of the Faire. We've tried the copier before and know it reproduces Sol tapes with no apparent degradation of reliability. (We've even copied a tape made on a CUTS board and read the copy perfectly with a Sol using a different tape recorder.) On Saturday and Sunday we will be at the booth with a Sol having two tape recorders and the high speed copier. Members can bring tapes to us and we will copy the file(s) being donated to the library using the Sol. We will arrange the files into additional cassettes for the library. We will make copies of the cassettes for you, or you can get a credit slip for a future tape if you want to wait to see what else comes in.

Obviously this could be very time consuming if we have a lot of donated cassettes to edit into library tapes. So, we encourage you to send your donated files to Proteus in advance of the Faire. We'll do as many complete tapes as we can ahead of time, so everyone will have the greatest selection at the booth. You can pick up your original cassette at the booth. This will also give us a better idea of the demand, so that we can be sure to have enough blank cassettes on hand.

To pay for the rental of the copier, the blank cassettes, the labor, etc., we will charge a fee, but it will be reduced because we don't have to mail the copies back to you. The discount will be \$1 per cassette. We'll also sell copies of the cassettes without a donated program, at the usual price less \$1 per cassette. (This only applies to library cassettes; the commercial cassettes won't be at the Faire--our hands will be full with the library.)

The price will be \$7 per cassette plus one donated program per cassette at this price, or \$17 per cassette without a corresponding donation. Once again, the reason for the price difference is obvious: to encourage people to add to the library.

We will require that you submit the copyright statement shown on the back of the order form enclosed in this issue.

(continued at bottom left)

HARDWARE DIRECTORY BEGINS

Something we've been planning to do for a long time is compile a directory of hardware accessories for Sol systems. One of our members has expressed interest in starting such a listing, with comments from readers on problems they have encountered. Jordan Torgerson's letter explains the problems he had with an S.D. Sales Expandoram board. He has offered to accept letters from Proteus members and send us a report every couple of months for publication. His letter is in the Letters section of this issue.

Enclosed in this issue is a report form which you may use (or copy and save the original for future use). Please be sure to identify the model number, revision number, and/or serial number of the product you are commenting on, so that later improved versions will not be unjustly criticized.

Your are also encouraged to send in favorable reports so that the balance between favorable and unfavorable replies may be seen.

Send your reports to Jordan Torgerson, 5280 Leesway Blvd., Pensacola, FL 32504.

CORRECTION TO ALS-8 RELOCATOR

Joe Maguire has written that his ALS-8 relocation article has an error in it which affects the EDIT function. Location FA64 should not be changed. It should contain E9. If you made a change to that location, set it back to E9. Even if you have not used the article, please make a note of the change so that you won't make the mistake in the future. The article was in Volume 1, No. 6, page 10.

ADDRESS CHANGE FOR KEYBOARD MOD

In Vol. 1, No. 6, we announced a keyboard modification kit for the Sol-20 numeric keypad that allows the Sol to distinguish between those keys and the keys on the main keyboard. Barry Watzman, the manufacturer of the kit, has moved and would like future orders to go to his new address. Please make a note of it on the original announcement.

New address: Barry A. Watzman, 560 Benton Harbor, Mich. 49022, U.S.A..

The kit allows the keys to be used as special function keys and comes with replacement keytops having text-editing/word processing legends.

NOT ALL WORDPROCESSORS ARE EQUAL

We recently received a reply from Computerm Corporation of Huntington Beach, California, to our inquiry regarding their ad in "The Office" magazine. They advertized the wordprocessing capabilities of their microcomputer system. The reply was obviously typed on a wordprocessor, and we must assume it was their own equipment. While it was a neat, justified letter, to the careful eye it is apparent that their wordprocessor handles space distribution incorrectly when justifying. All of the extra spaces needed to expand a line to the right margin are always added between words starting at the left end of the line. This produces "white rivers" of extra space at the left side of the page, and dense typing at the right. The correct way to do this is to alternate between left-to-right padding and right-to-left padding, so that the extra white space is more uniformly distributed.

In the last issue we reviewed the WordWizard. We mentioned that the manual didn't speak about modes of justification and we

assumed that it filled lines by adding whole spaces as we just described, rather than using the variable spacing capability of the Diablo daisy-wheel printers. We have subsequently learned that the printer drivers know how to do variable spacing, and that they automatically average the spacing between words within each line. Thus, the user doesn't have to be aware of the mode when changing from the dot-matrix draft printer to the final copy daisy-wheel printer.

CALL FOR PROTEUS CHAPTER UPDATE

It has been a while since we took stock of where we have local chapters. A local chapter is 2 or more Proteus members who want to meet regularly. Each chapter must have someone acting as coordinator. Please, coordinators, let us know where you are and when you meet. Give us a mailing address (and phone number if you desire) for publication in the next issue. We have had inquiries from a number of new members.

BITS AND PIECES: RUMORS OF PTC

We have heard the following unconfirmed rumors leaking out of PTC from sources of unknown reliability, but they may be true in spite of that.

PTC has a high-performance mini-diskette drive underdevelopment. Also hidden in the top-secret R&D wing of their building in Pleasanton is a 70 megabyte hard disk drive attached to a Sol. (This is not surprising, because PTDOS is really designed to perform well with very large capacity disks. They designed PTDOS to allow a variety of devices to be easily interfaced to PTDOS software.)

There are about 10,000 Sols in the field and the number of Helios units is in the low 4 figures area. An aggressive marketing plan for the WordWizard system is under way, including ads in the Wall Street Journal. Prospects have been impressed by the capabilities of WordWizard compared with more expensive systems. PTC has been giving dealers extra incentives to sell Sols, such as sales contests. Dealers have commented that PTC's advertising program for WordWizard has been the best they've seen in the small systems business.

The Corona color graphics display module is "still undergoing refinement". (Translation: It has been put on a back-burner or perhaps shelved. The reason is rumored to be a recently-discovered, potential patent-infringement problem.)

PTC is working toward having Authorized Service Centers for their products all around the country. They have been giving technical seminars for hardware technicians and software technicians from dealerships. They have set minimum standards for factory-trained technicians, e.g., minimum of an AA degree in electronics.

VDM and CUTS boards have been dropped. GPM-Sol and ALS-8 ROMs are still available. The higher density memory boards have put off the need for an expansion kit to provide more slots. The Parallel Port Prosthetic device was eventually produced. (It swapped the parallel port pinouts to make the old Rev. D Sols have the same pin assignments as the Rev. E and later Sols.) There is a "Sol Service and Maintenance Manual".

UNDERSTANDING CP/M
by Stan Sokolow

Preface

Due to popular demand and its widespread availability, we are starting a series of articles on the CP/M operating system. Readers are encouraged to send us tutorial-type articles on CP/M (or anything else of interest to Proteus members).

Introduction to CP/M

By now this may be too elementary for most readers, but for the newcomer we should begin at the beginning.

CP/M is the first and most widespread operating system for personal microcomputers with floppy disks. It was written by Professor Gary Kildall of the U.S. Naval Postgraduate School in Monterey, California, doing business as Digital Research, an independent company. While it was originally designed and implemented for hardware that employs the so-called "IBM format" for recording data on floppy disks, it has been implemented now on a variety of systems using non-standard formats, including the Northstar, Micropolis, Helios, and in a modified form on the RadioShack TRS-80. What CP/M does for all of these systems is provide the software which enables the user's application program to communicate with the devices attached to the system, such as the console terminal, the printer, and the floppy disk drive(s). In addition to the basic communication functions, CP/M does all of the bookkeeping to maintain a collection of files on the disks, it provides a "Console Command Processor" which is the primary interface between the human at the console and the rest of the system, and it comes along with a collection of programs to facilitate creation and debugging of programs. What gives CP/M its greatest strength is the fact that it was cheap and was written by an independent software vendor in a way that made it relatively easy to adapt to a wide variety of hardware. Because of this it has a larger user base than any other piece of software in the microcomputer field, and therefore a great deal of software is available to run with it.

At the heart of the CP/M system is the operating system proper, which processes requests for input/output. This "FDOS" (floppy disk operating system) is divided into a BIOS (basic input/output system) which is the hardware-dependent portion of the system, and a BDOS (basic disk operating system) which is the machine-independent portion for managing the disk files. When CP/M is customized for a particular disk controller (hardware), the BIOS is the part which is altered to contain the proper "driver" instructions, but the BDOS remains unchanged. The customized BIOS (or "CBIOS") is usually provided by the manufacturer for their particular machine. There is a software vendor (Lifeboat Associates) which is now providing CP/M with CBIOS's for disks made by maverick manufacturers. Understanding the details of the CBIOS or the internal workings of the BDOS is unnecessary for the programmer unless he wants to change the drivers for the console terminal, the printer, etc., or do unusual things with the disk.

The person who only uses pre-programmed application packages on his computer is sheltered from virtually all of the details of the operating system. The higher-level language programmer (BASIC, FORTRAN, COBOL, etc.) needs to know a little about what CP/M does. The assembly level programmer must know how to live with CP/M. We will assume that the reader wants to know all there is to know about CP/M, but we'll try to build up to it gradually. If we get too technical for you at certain points, please keep ploughing through because we will keep going up and down in depth.

Overview

CP/M primarily provides the facilities to maintain a set of "files" on diskettes. The files may contain anything at all: data, source programs, object programs, etc.. Each file has a name, which consists of a prefix up to 8 characters long and a suffix up to 3 characters long. By convention, the prefix is the name of the subject matter in the file, and the suffix indicates the type of data it is (BASIC source program, machine code, etc.). For example, "MYPROG.ASM" is the assembly language source file for the program you call "MYPROG", and "MYPROG.PRN" is the printer listing file produced by the assembler when it assembled "MYPROG.ASM".

To load a program and run it, it must exist in a file as an exact memory image of the machine code. A file of this type is known as a command file and has the suffix ".COM". The part of CP/M which processes your requests to load command files is known as the Console Command Processor (or CCP). When CP/M is initially bootloaded into your system, control will go to CCP. CCP indicates it is ready for your commands by telling you what disk drive unit is currently selected. This is known as the "prompt" and it consists of a letter (A for the first drive, B for the second, etc.) and the greater-than symbol. When the CCP prompt shows on your console, you can simply give the name of a command file without its suffix, and CCP will load the file and execute it. Commands can also receive arguments, such as the name of a file to act upon in some way. Most commands in CP/M exist as command files on the system disk, although a few primitive commands are built into CCP itself and don't have a corresponding file. Because any assembled program can be a command, the user can create any command he wants.

Memory Layout

This section will be quite technical, for the assembly language programmer. If you aren't going to use CP/M in assembly language, you can skip ahead.

Before we go into the functions of the FDOS, we should draw a map of the system memory so we understand where things are. The FDOS itself always lies at the top (high address) end of available memory, so that memory from address 0 to the last address before the FDOS is all available. When the system bootloads itself into memory from the disk, it also places the Console Command Processor (CCP) in memory, just before the FDOS, but application programs can overlay and destroy the CCP if the space is needed. When the application program returns control to the system upon its completion, the CCP is automatically reloaded.

The bottom end of memory is used for certain communication data to let application programs refer to a standard location regardless of the memory size and placement of CP/M. Specifically, locations 0,1,2 have a jump to the warm-start which terminates execution of the application program, reloads part of the system, and turns control back to the CCP for further instructions from the operator. Location 3 has a byte known as the "IOBYTE", which contains the currently assigned device numbers for the console, reader, punch, and list devices, much like SOLOS/CUTER assigns pseudo-port numbers to select devices. (Implementation of the IOBYTE feature is optional, and in many CP/M systems it remains unimplemented because there is no need to select among several printers, etc.) Location 4 is unused, but is reserved for use by CP/M.

Locations 5,6,7 have a jump to the main entry point of the FDOS so that application programs do not need to be rewritten when CP/M is moved to a different location in the memory. Also, since the main entry into FDOS is at its first byte, the address in location 6,7 indicates one beyond the last usable memory byte

(continued on page 7 left)

UNDERSTANDING PTDOS
by Stan Sokolov

Preface

After the last issues I received a number of letters from members who were concerned that we were going too heavily into PTDOS at the expense of other operating systems, such as CP/M. I feel that someone has to go heavily into PTDOS because no one else is--it's only available on the Helios at the moment. CP/M has been around a long time and articles on it have appeared in national magazines. It is supported by a CP/M newsletter from Digital Research, and it has a voluminous user's library in New York.

However, that doesn't mean that I am excluding other operating systems from Proteus News. In fact I would be delighted to publish articles on these systems if someone would send some to me (articles, that is). So let us have it.

Getting Started with Assembly Language

We have received a query from a novice assembly language programmer who wanted to know how you get the blankity-blank thing to execute a program once you have managed to assemble it. The answer is that you simply use the object file name as a PTDOS command, and the command interpreter of PTDOS will load the file and turn over control to the entry point specified in the XEQ pseudo-operation of the assembly source program. (This is virtually the same in CP/M, except that CP/M programs have no XEQ entry because they always load at 100H and begin there. That is, all except TRS-80 CP/M which loads higher because ROM resides at the bottom of memory in the TRS-80.) Your program can read the remainder of the command line to pick up parameters that follow the command name. This is done by reading the command interpreter (CI) input file directly, or through the PTDOS parameter scanner entry point.

The sequence of events is this. First, EDIT your assembly language source program into a new file. Then ASSEMBL the source file into an object file, a listing file, an error message file, and a symbol table file. (All of these files except the source file can be suppressed by giving no file name for them.) The object file can be run just as it is, or you can compress it into a more compact form with the Scrunch option of the EXTRACT command. As we said, to run any object file all you do is give its name after the PTDOS prompting asterisk. If the file is not on the default unit (usually 0), you can give the unit number after the file name using a slash and the unit number, in the usual fashion, with no intervening spaces. (For example, *OBJECT/1). The named file can be a disk file, a device file (typically your printer), or a numbered file. If you only want to make a dry run assembly to see the listing on the screen but create no object file, you can use file #1 as the listing file:

*ASSM PROGNAME,#1

If assembly errors are encountered, you should re-EDIT the source file to make the corrections. When you finally have the error-free assembly, you can load the object file and the debug program with this command:

*YOUROBJ,DEBUG parameters,for,your,program,if,any

What this does is load YOUROBJ and DEBUG and then turn over control to the DEBUG program entry point, since it is the last executable file in the list of command names you gave.

Using the DEBUGger, you can set up registers and stopping points (breakpoints) so that the program can be run a little at a time under your control. You can examine the action of the program with the debugger commands. When you discover a mistake in your program, you have three choices. You can use the debug

commands to alter the copy of the object program in the memory and make a note of it for later correction of the source program file. You can leave the debugger and re-EDIT the source file, reassemble it, and load the new object file and debugger again. Or you can create an assembly source program which contains just the corrections as "patches" to the untouched original object file. The advantage of this last method is that you can get more done with the original listing since none of the addresses will be changed. If the program is short, just reassembling and listing it again is best. But if the listing took you an hour, you might think twice about relisting it each time you make a correction.

Since the first two methods are straightforward, I'll just explain the patch program method a little more. This method is possible in PTDOS but not to my knowledge in CP/M. The reason is that PTDOS's loader can load "image segments" anywhere in memory, whereas CP/M's loader only loads object files beginning at address 100H. This difference will become clear in a moment. Here's how it works. The basic idea of a patch is simple. If you want to replace a sequence of instructions with a correct sequence and the new instructions occupy the same or less space as the old ones, there is no problem. You just make the change and fill in the extra bytes, if any, with NOP instructions or a JMP to the next correct instruction. But if the new instructions occupy more bytes than the ones they replace, you must place a JMP instruction at the error and the correct sequence at some remote area, usually just beyond the end of your program area. At the end of the correct sequence, you place a JMP back to the proper place to resume the program flow. In this way you correct the program without moving everything.

To place the patch, you can enter the instructions with the debugger as we said. But if you are going to make many patches to a rather large program, it may be better to make a program that contains the patches. To do this you set the program origin at the location to be patched and give the replacement instructions to be overlaid there. Then reset the origin to a remote location and give the patch instructions. You can do this over and over for as many patches as necessary. If you want to use symbols from your source program, you will have to define them for the patches program using EQU statements. For example,

```
ORG 1234H ;FIRST LOCATION TO PATCH
MVI A,H ;THIS INSTRUCTION FITS IN PLACE OF ERROR
ORG 2345H ;SECOND PATCH
JMP P1 ;JUMP TO PATCH IN REMOTE AREA
ORG 2456H ;THIRD PATCH
JMP P2 ;JUMP TO PATCH IN REMOTE AREA
ORG 3555H ;REMOTE AREA BEYOND END OF PROGRAM
P1 *** **** ;CORRECT INSTRUCTIONS
*** ****
*** ****
P2 JMP 2348H ;RETURN TO CORRECT PLACE IN PROGRAM
*** **** ;CORRECT INSTRUCTIONS
*** ****
*** ****
JMP 2459H ;RETURN TO CORRECT PLACE IN PROGRAM
END
```

When this program is assembled, the object file should be loaded after the original object file, along with the debugger:

*YOUROBJ,PATCHES,DEBUG

Now you can debug the corrected program. You can continue to add to the patches file and debug. The original long listing still shows the correct addresses where the program hasn't been

(continued on page 7 right)

UNDERSTANDING CP/M (continued from page 5)

below the FDOS. When CP/M loads itself, it automatically sets up these addresses at the bottom of memory. A user's application program can have the FDOS do I/O simply by setting up the arguments in certain registers and doing a CALL 0005H, regardless of whether this is a 16K, 32K,... system.

So far these special addresses have used all of the RST 0 area (locations 0-7). Notice that a RST 0 or JMP 0 will act like a CP/M reset, initiating a warm (partial) start. The other restart instruction areas are not used, so that systems which generate interrupts can use them. There is one exception: the area for RST 7 (locations 38H,39H,3AH) will contain a JMP to the debugger (DDT) when it is loaded. This location was chosen because an address where no memory is installed will return a hex value of FF when the processor tries to read it, hence a wild jump to an unimplemented area of memory will cause the processor to try to execute an FF instruction, which is a RST 7. Thus the debugger will regain control when such a wild jump occurs in a program being debugged. (DDT also places RST 7 instructions where it wants to set a breakpoint.) The RST 6 area, while not standardly used by CP/M system programs, is designated as reserved for future use by CP/M.

Locations 40H-4FH are reserved for possible use as a scratchpad area by the CBIOS. Some CBIOS's don't use these bytes at all. Some place data there that must not be altered by the user, such as status of the disk drive. Locations 50H-5BH are reserved for future use.

Locations 5CH-7CH are used as a default file control block and locations 80H-FFH are used as a default file buffer. More will be said about this later. Locations 7DH-7FH are also reserved.

MEMORY MAP OF CP/M SYSTEM

0000 - 0002	JUMP TO WARM START
0003	IOBYTE
0005 - 0007	JUMP TO CP/M'S MAIN ENTRY (BDOS)
0040 - 004F	CBIOS SCRATCH PAD
005C - 007C	DEFAULT FILE CONTROL BLOCK (FCB)
0080 - 00FF	DEFAULT FILE BUFFER
0100 -	PROGRAM AREA (TPA); STANDARD ENTRY POINT
....	DEBUGGER (DDT) IF LOADED
....	CONSOLE COMMAND PROCESSOR (CCP)
....	BASIC DISK OPEATING SYSTEM (BDOS)
....	CUSTOMIZED BASIC I/O SYSTEM (CBIOS)

Thus we see that CP/M has defined or reserved all of the first page (256 bytes) of memory. However, with just a few caveats, the user can completely destroy the information in this area, as long as he retains the addresses needed to return control to CP/M. Even this can be ignored if the program relies upon the operator to do a cold-start (usually a general system reset button) to reload all of the system. For example, if you want to load and run Extended Cassette BASIC from disk, you can do this even though it resides from location 0 on up. ECBASIC won't need CP/M at all, so it can even destroy the FDOS once it is loaded. You can also run programs that reside at location 0 and use the FDOS, as long as you save the address given at loc. 6 and 7 for making your calls to the system, provided that you only run the program in a CP/M system that doesn't use the CBIOS scratchpad area or the IOBYTE. (Of course, you might even be able to patch the program so it leaves those areas alone for CP/M to use.) Getting the program to load down at location 0 is not automatic, because CP/M normally loads programs at location 100H. But you can write a short routine to move the program down there.

In the next article

We'll continue this series with an explanation of the file system and the system calls to perform I/O.

UNDERSTANDING PTDOS (continued from page 6)

patched. When you are satisfied, you can incorporate the corrections into the original source file.

When the loader places the object file from the patches into memory, it only overlays the parts of memory specified in the patches program by the ORG's. It can do this because the object files produced by the assembler are divided into segments which contain their load address, their byte-count, and the actual bytes to load. The loader can scatter segments all over. This scatter loading is not provided by CP/M's loader. In CP/M the patches are made in the debugger and the memory image is saved. Of course this can be done in PTDOS, too.

COPYING TAPE FILES WITHOUT DOING HEX ARITHMETIC

by Stan Sokolow

When you GET a tape file, SOLOS gives you the starting location and the length in Hex. When you SAVE a file, you must give the starting and ending addresses in hex. Doing the hex addition was driving me nuts until I realized there is an easier way:

```
GET /1 1
SAVE name/2 1 cccc ssss
```

This sequence of commands to Solos/Cuter will first GET the next file on tape unit 1 and load it into RAM beginning at 0001 regardless of the normal load address specified in the file. Solos/Cuter will respond with the file name, its usual load address (ssss=starting address) and the count (cccc=count or file length). This will appear to the right of the GET command:

```
GET /1 1 name t ssss cccc (t=type).
```

Then the SAVE command will write the file onto unit 2 with the name you copied from the Solos response, beginning at location 1 and going thru location cccc, and will mark the header to specify that the usual load address is ssss. (Where I have used the lower case letters you should substitute the corresponding hex numbers that show on your screen.) This will complete the copying of the file from unit 1 to unit 2 without doing any arithmetic in your head. You may write the file onto unit 1 again, of course, if you want to do so, but you must specify "/1" instead of "/2" in the SAVE command. The reason this works is that when you load the file into location 0001, the last byte happens to have an address that is the same numerically as the count.

CORRECTION TO MICROPOLIS MODIFICATION ARTICLE

In the last issue we published Richard Greenlaw's article on customizing the Micropolis disk operating system and BASIC for the Sol. Richard wrote that the following should be deleted from the published listing:

```
ORG 51CH
DB 0
```

and a note should be added that only control-C will cause a break when BASIC expects input. Richard has submitted a revised version which converts the MODE or control-@ to a control-C, for consistency with PTC conventions. The revision also explains the installation procedure better. It will be published in a future issue.

SLAC PASCAL FOR THE 8080/280

by S. Hazeghi and L. Wang

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The STANFORD Micro PASCAL system consists of a PASCAL [1] compiler, a Post_Processor and (currently) an 8080/280 interpreter for the intermediate code, the so called P_Code, generated by the combined Compiler/Post_Processor. The current version of the P_Code Interpreter, intended for the 8080/280 family of micro processors, is written in 8080 assembly language and could be (easily) rewritten for other processors, the rest of the system however is written in PASCAL, and thus is machine independent.

The Compiler, a 4200 line PASCAL program, is a modified version of the PASCAL_P [2] compiler and has been used on the IBM 360/370 computers for some time now. With a few (minor) extensions and restrictions, the Compiler adheres to the standard PASCAL, as defined in [1], the main omissions being in the area of generalized FILE declaration and passing FUNCTIONS/PROCEDURES as parameters to other procedures (see appendix A for more details). The Post_Processor is a 1000-line PASCAL program which converts the symbolic code generated by the Compiler into a compressed object module intended for target machines with small memory or inherent address space limitation.

The (compressed) object code defines a simple minded STACK computer which could be implemented in hardware, micro-coded on a suitable microprogrammable processor, or interpreted on an existing computer with various degrees of run time efficiency. The first two schemes are mainly in the domain of hardware and firmware experts, but the interpretive approach is probably the easiest, though naturally the least efficient, solution. The complexity of the interpreter depends heavily on how closely the target machine approximates a true STACK computer, but even a crude and primitive machine such as the 8080 does not pose any serious problem.

The current 8080/280 interpreter (which does not implement the REAL arithmetic operations) is about 2.5K bytes long and needs an additional 1K byte area for various tables and its internal stack space. Implementation of the floating point instructions can add another 2-3K bytes to the size of the interpreter.

In order to make the interpreter independent of the environment in which it is running (i.e. not geared to the file system or the I/O configuration of the host system) its I/O interface is reduced to four basic operations. These include reading a character (byte) from an specified file, writing a character (byte) into a given file, (re)opening a file for subsequent input (read) operations, and opening a file for output (write) operations. In other words, the host system is supposed to provide four entry points for performing these functions, otherwise the interpreter does not make any assumption about its host system and, in particular, it may be freely relocated in the host computer's address space. Note that the Compiler/Post_Processor are just ordinary PASCAL programs and the same interpreter used in running user programs is used in conjunction with the Compiler/Post_Processor to compile the user program.



The Compiler in the current version translates into about 21K bytes of compressed P_Code, thus a 30K byte area would be sufficient for the compiler and the interpreter, leaving enough stack space for compilation of small user programs (This does NOT include the area needed by the system to provide the above mentioned services). A somewhat larger area would be needed for compiling moderate sized (i.e. 500-1000 lines) programs and a 43K region is sufficient to compile a program the size of the Compiler (or larger if well structured).

The compilation speed of this version of the system, running on the 8080 based Processor Technology's SOL micro computer is about 200 lines per minute and the execution times of our benchmark programs seem to be about 20 times faster than the BASIC versions of the same programs running under a relatively fast integer BASIC interpreter.

For a more detailed description of the P_Code as well as measurement results refer to [3]. The details of the interpreter and the run time environment of the Stack computer are mainly documented in the source code for the Interpreter.

These programs are available to the public for non commercial use (without any explicit or implied warranty) and may be obtained from:

ARGONNE CODE CENTER,
ARGONNE NATIONAL LAB.
9700 S. CASS AVE.
ARGONNE, IL 60439

or through various computer clubs.

- [1] JENSEN, K., WIRTH, N. PASCAL User Manual and Report, Lecture Notes in Computer Science, Vol 18, Springer-Verlag, Berlin, Heidelberg, New York., 1974.
- [2] NORI, K., AMMAN, U., JENSEN, K. and NAGEL, H. The Pascal P Compiler, Implementation Notes., Berichte des Instituts fur Informatik 10, Eidgenossische Technische Hochschule, Zurich, Dec. 1976.
- [3] HAZEGHI, S., WANG, L. A Short Note on High Level Languages and Microprocessors, Conference Proceedings of the 2nd West Coast Computer Fair, San Jose, CA., March 1978.

Appendix A: Restrictions and Extensions.

- 1) Files are limited to TEXT (i.e. FILE OF CHAR) files.
- 2) Procedures/Functions cannot be passed as parameters to other Procedures or Functions.
- 3) A GOTO to a destination outside the procedure containing the originating statement is not allowed.
- 4) The names EXIT"(i: INTEGER)", TRAP"(i: INTEGER; VAR r: ANY-TYPE)" and CLOCK"(i: INTEGER)" have been added to the set of predeclared procedures. EXIT is to simplify terminating the user program and retruning a Return Code, the value of its integer argument, to the outside environment. TRAP provides a means of calling user defined external

(continued on page 9)

SLAC PASCAL (continued from page 8)

routines which can use the first parameter as a function code and modify the value of the second parameter (this one may be of any PASCAL type, including Array or Record) before returning to the calling routine. CLOCK is intended to make the real time and or the elapsed CPU time available to the user program (note that the underlying function should be supported by the operating system).

- 5) The constant subrange designator A..B may be used instead of enumerating all the values A, A+1, ... B-1, B in a set constructor (e.g. ['A'..'Z','0'..'9','\$'] is a valid constant).
- 6) The tag field of a case variant record may be omitted in which case no space will be allocated for such a field.

```
(e.g RECORD ....
      CASE BOOLEAN OF
        TRUE : .... ;
        FALSE: .... ;
      END; )
```

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PASCAL RELATED FILES:

- 1) PAS.DOC : This text.
- 2) PAS.S : PASCAL Compiler, source form.
- 3) PASH.S : PASCAL Post_Processor, source form.
- 4) PINTERP.S : P_Code Interpreter, source form.
- 5) PASCAL : PASCAL Compiler, P_Code object form.
- 6) PASH : Post_Processor, " " "
- 7) PINT : P_Code interpreter, 8080 " " "
- 6) COMPILE(*) : PASCAL Compile monitor, " " "
- 8) RUN(*) : PASCAL Run monitor, " " "
- 9) QUEENS.S, SORT.S, XREP.S, SOMA.S etc.
Various PASCAL sample programs.

(*) These programs are written by Drew Rogge and are applicable to the PROCESSOR TECHNOLOGY's PTDOS system only.

HOW TO USE THE SYSTEM UNDER PROCESSOR TECHNOLOGY PTDOS SYSTEM.

To compile a PASCAL program, just type:

```
COMPILE <source program name><CR>
```

The COMPILE sub_monitor, uses an auxiliary file called PAS.DEFS (on drive 0) to determine the names of the external files to be used as intermediate/object files in the compilation/post_processing process. If you want to supply your own set of files for these positions, you should create a set of definitions modeled after FNFILE and add the name of this file to the list of the arguments of the COMPILE command. For example "COMPILE MYPROG,MYDEFS<CR>" causes the file named MYDEFS to be used in determining the names of intermediate/object files for this compilation.

The intermediate file TEMP.P is the P_Code output of the compiler and TEMP.T contains procedure related tables which is also intended to contain Symbol Table related information to support run-time debugging at a later time. The source listing, if requested, is directed to the main display device. TEMP.P and TEMP.T also constitute the input to the post processor, which generates an object file with the default name POBJ and sends the summary of the translation process to the main display device.

If there are no compilation errors, you can then proceed to run the compiled program by typing:

```
RUN POBJ,<I/O file name list><CR>
```

The I/O file name list is the list of the external files to be assigned to the PASCAL files in the order they are used in the program. If only INPUT and OUTPUT files are used, and they are to be assigned to the KEYBOARD and DISPLAY devices respectively, the file name list may be omitted. RUN POBJ,#0,#1<CR> has the same effect as "RUN POBJ<CR>", likewise "RUN THIS,THISIN,THISOUT/1<CR>" starts the object program THIS and assigns the file named THISIN (on drive 0) to the first file used by the program and THISOUT (on drive 1) to the second file accessed by the PASCAL program.

The compiler can optionally enable and/or disable the source program listing or the generation of the object code. These option switches are set/reset by COMMENTS of the form:

```
(*L-,C+*)
```

"L+" enables the source listing, "C-" disables P_Code generation, which is useful if you want to syntax check your program or only get a source listing.

S O F T W A R E R E V I E W

F A S T G A M M O N

Are you interested in learning how to play backgammon or trying to improve your skill in backgammon? Here's a program that will play against you and let you improve your strategy, too. The program is called FASTGAMMON, and it is advertised in computer hobbyist magazines. The price is \$20 on CUTS/Sol cassette, or \$25 on Northstar diskette. (The cassette version loads from 2A00 thru 3FFF, so you can buy the cassette and save the program on your Northstar disk, and save \$5.)

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HARDWARE REVIEW:
SOL-20 KEYBOARD MODIFICATION KIT

10

Are you tired of trying to remember obscure control codes to perform certain functions in the ALS-8, Electric Pencil, or PTDOS EDIT programs? Then this product might be the answer for you. After installing this kit and appropriate software mods, some of which come with the kit, you will have custom keys to generate those control codes. Each key will be clearly labeled with its function, in a style identical to the Sol's other keys.

The kit consists of 25 plastic keytops which are identical to the Sol's charcoal-colored keys. There are 21 keys the size of the Sol's small keys (such as those in the numeric keypad) having the following imprints:

ENTER, RESET, LOAD, PRINT, INSRT, DELET,
INSRT LINE, DELET LINE, ERASE INPUT,
ERASE EOL, FORM FEED, PREV PAGE,
NEXT PAGE, ROLL (with an up arrow),
ROLL (with a down arrow), up arrow,
down arrow, left arrow, right arrow,
arrow symbolizing a line feed and cursor return,
and an arrow symbolizing a cursor return to left
margin of same line (no line feed).

There are also 4 keys the size of the Sol's HOME CURSOR key, having the following imprints:

LOAD SAVE, RESET, ENTER, PRINT.

In addition to the keytops, there is an IC which is a direct replacement for a ROM on the Sol's keyboard circuit board.

Installation of the keytops is simple. After deciding which keys on the Sol you want to replace, you simply pull the existing plastic top straight up and it snaps out. The new key-top is snapped in place. If the keyboard circuit has sockets for the IC's, replacement of the ROM is simply a matter of unplugging the old IC and plugging in the new one. If the IC's are soldered into the board with no sockets, the safest thing to do is to cut it off by cutting its pins, and carefully removing the pintails with a soldering iron and pliers. (The early Sols delivered before summer 1977 had sockets, according to the installation instructions.)

What the hardware modification does is change the keyboard decoder so that it generates a 1 in the high order bit (bit 7) when one of the keys on the 15-key pad is pressed. The other bits generated are unchanged, so that any software which masks out the high order bit will not be aware that the modification has been made. The normal keyboard input driver programs in CP/M and PTDOS both mask out this bit, because it is normally considered a parity bit and the other 7 bits are sufficient to represent the full ASCII set of characters. Programs which read the keyboard directly may or may not mask this bit out, so they may not consider the keys to be the same as before. The Sol's LOAD key, MODE SELECT, CLEAR, HOME CURSOR, and cursor arrow keys also will generate this high order 1 bit after the mod is made, but they do so anyway in the normal Sol. The PTDOS console driver can be set to remove or leave the high order bit simply by setting the BINARY mode with the CONFIGR command. In any case, a single instruction (ANI 7FH) will completely remove the effect of the modification if placed at the right spot in the input routine. Just by using the main keyboard keys instead of the keypad keys, all of your programs will function the same as they always did. You can't lose.

The idea is this. With the modification installed, you have the ability to identify any of the 15-keypad keys as distinct from the other keys on the main keyboard. Since they usually are duplicates of the keys on the main board, you can do perfectly well without some or all of them. What you do then is modify the input driver to watch for these keys and using a table look-up, replace its value with the desired control character's value before returning the input data to the main program. For example, you can pull off the asterisk on the keypad and replace it with the ENTER key. In software, the input driver which looks for a character at the keyboard

could check for this key now, and return a carriage return character in its place, otherwise just mask out the high bit. Then you would have a handy button on the keypad for entering numeric data. Likewise, you could give up the division sign and get another function. If you want to, you can give up the numeric keys, and get many special functions. Even without changing the keytops, you may want to install the IC so that your software has the option to recognize the keys on the pad. That way you could add your own labels to the front of the keys to perform whatever special function your program needs. Using the keys supplied, you can generate the control-R, control-T, control-this and control-that, which your editor uses to roll, insert, etc..

The kit comes with lucid installation instructions, program listings for modifying the Solos keyboard driver (if you want to reprogram your personality module or if you have Solos in RAM), listing for modifying CP/M's input driver for use with Electric Pencil II or other programs, listing for modifying ALS-8, and suggested keyboard layouts.

It also comes with a satisfaction guarantee: if you regret having purchased the kit after reading the documentation, return it unused for a full refund. What more can you ask?

The model CKB-1 kit sells for \$24.95 and is available from computer retailers or from the manufacturer: Barry A. Watzman, 560 Sunset Rd., Benton Harbor, Mich. 49022.

COPYING PTC BASIC PROGRAMS TO DISK

by Dick Lowe

Recent inquiries have suggested that your readers might be interested in the method I use to store Basic 5 programs, games, on a disk.

1. Catalogue the cassette tape to determine the length of each of your games.
2. Use the method recommended for your DOS to store Basic 5 on your disk.
3. Load and initialize basic and load one of the games from the cassette in the normal (old) fashion.
4. Leave basic and use DOS to save the game on the disk. It is necessary to save from address 1AD7 up to the end of the game as determined in step 1. This saves with the game a pointer which informs basic of the presence and length of the game.

After basic and the desired games have been stored on the disk, they may be retrieved, loaded, in the following manner:

5. Load basic from disk.
6. Jump to basic to initialize it. I assume that this step can be eliminated if in step 2 an initialized version of basic, rather than the standard version, is stored.
7. Return to DOS and load the desired game at address 1AD7. Then return to basic.

The same procedure will work for Extended Basic, however, the pointer(s) are located near 2E55 necessitating the storage of the extended functions, if used, with each game. Also, the length of the functions must be added to the length of the game in step 4. I have used this procedure successfully with a mix of games which use (and thus include on disk) the extended functions.

When the cassette length, in step 4, is unknown, just save from 1AD7 (2E55) to the address which is stored (in the usual reverse order) at 1AD7-8 (2E67-8).

ASCII - TO - BAUDOT OUTPUT DRIVER
by Bill Jones

Preface by Editor

Baudot is a data transmission code which pre-dates the current American Standard Code for Information Interchange, which we all call ASCII. Unlike ASCII, which has 7 bits per character, Baudot has 5 bits per character. Thus fewer characters can be represented in Baudot than ASCII. In fact, so few (only 32) that a trick had to be employed to transmit all of the alphabet, the digits, and essential punctuation. Instead of upper and lower case, Baudot uses "letters" and "figures" cases. There are only upper case letters in the character set. Two characters are reserved to shift the printer to "letters" or "figures". Thus all of the other characters have two interpretations, depending upon the state the printer is in from previous shift characters transmitted.

Here Bill presents a custom output driver which will send an ASCII character in the B register to a Baudot device on the Sol's serial port. Another possible use for this routine may be communication on the telephone with a deaf person who has a computer terminal. For a long while, the deaf have had a network for communication with each other via Baudot teletypes using modems over ordinary telephones. Baudot machines are getting harder to get, since they are antiques now. This program may help someone use their Sol instead of the Baudot machine. We suspect that Bill's motivation for writing the program was use of the older Baudot machines because they are available at very reasonable prices, when you can find them. Ham radio operators have traditionally used Baudot.

The program by Bill Jones:

```
C900      0000 *****
C900      0001 *      A S C I I   --- B A U D O T      *
C900      0002 *
C900      0003 * WRITTEN FOR SOL SYSTEM USERS BY:      *
C900      0004 *          B I L L J O N E S              *
C900      0005 *          5411 EASY STREET              *
C900      0006 *          MARION, OH 43302              *
C900      0007 *
C900      0008 * THIS ROUTINE WILL ALLOW USE OF A
C900      0009 * BAUDOT PRINTER WITH THE SOL. THE PROGRAM *
C900      0010 * RESIDES IN SOL SYSTEM RAM.              *
C900      0011 *
C900      0012 *
C900      0013 * IF A BAUDOT MACHINE WITH 100 WPM GEARS IS*
C900      0014 * USED, NO HARDWARE CHANGES ARE REQUIRED. *
C900      0015 * JUST SET UP THE UART(REFER TO SOL MANUAL)*
C900      0016 * FOR 75 BAUD,NO PARITY,FIVE CHARACTER WORD*
C900      0017 * LENGTH, AND TWO STOP BITS. THE BAUDOT *
C900      0018 * MACHINE WILL RUN AT FULL SPEED BECAUSE *
C900      0019 * THE MODEL 33 SHAFT SPEED AT 110 BAUD AND *
C900      0020 * THE MODEL 28 SHAFT SPEED AT 75 BAUD *
C900      0021 * ARE NEARLY IDENTICAL. NO HARDWARE HACKS *
C900      0022 * (OTHER THAN AN INTERFACE DIRECTLY AT THE *
C900      0023 * TTY) ARE REQUIRED.                          *
C900      0024 *
C900      0025 *          TRY TO GET 100 WPM GEARS(STANDARD
C900      0026 * FOR THE MODEL 28) SO THAT YOU WON'T *
C900      0027 * NEED TO BUILD UP A SPEED CONVERTOR CIR- *
C900      0028 * CUIT. THE ONLY HARDWARE REQUIRED IS AN *
C900      0029 * RS-232 TO 60 MA. LOOP INTERFACE.          *
C900      0030 *****
C900      0031 *
C900      0032 *
C900      0033 *
C900      0034 * THE FOLLOWING IS THE ASCII TO
C900      0035 * BAUDOT LOOKUP TABLE.
C900      0036 *
```

```
C900      0037 *
C900      0038 *
C900      0039 DB      01FH NUL
C901      0040 DB      01FH SOH
C902      0041 DB      01FH STX
C903      0042 DB      01FH ETX
C904      0043 DB      01FH EOT
C905      0044 DB      01FH ENQ
C906      0045 DB      01FH ACK
C907      0046 DB      005H BELL
C908      0047 DB      01FH BS
C909      0048 DB      01FH HT
C90A      0049 DB      002H LF
C90B      0050 DB      01FH VT
C90C      0051 DB      01FH FF
C90D      0052 DB      008H CR
C90E      0053 DB      01FH SO
C90F      0054 DB      01FH SI
C910      0055 DB      01FH DLE
C911      0056 DB      01FH DC1
C912      0057 DB      01FH DC2
C913      0058 DB      01FH DC3
C914      0059 DB      01FH DC4
C915      0060 DB      01FH NAK
C916      0061 DB      01FH SYN
C917      0062 DB      01FH ETB
C918      0063 DB      01FH CAN
C919      0064 DB      01FH EM
C91A      0065 DB      01FH SUB
C91B      0066 DB      01FH ESC
C91C      0067 DB      01FH FS
C91D      0068 DB      01FH GS
C91E      0069 DB      01FH RS
C91F      0070 DB      01FH US
C920      0071 DB      004H SPACE
C921      0072 DB      00DH EXCLAMATION POINT !
C922      0073 DB      011H QUOTATION MARK "
C923      0074 DB      014H NUMERAND #
C924      0075 DB      009H DOLLAR SIGN $
C925      0076 DB      020H PER CENT SIGN %
C926      0077 DB      01AH AND &
C927      0078 DB      00BH SINGLE QUOTE '
C928      0079 DB      00FH LEFT PARENTHESIS (
C929      0080 DB      012H RIGHT PARENTHESIS )
C92A      0081 DB      01FH STAR *
C92B      0082 DB      01FH PLUS SIGN +
C92C      0083 DB      00CH APOSTROPHE '
C92D      0084 DB      003H DASH -
C92E      0085 DB      01CH PERIOD .
C92F      0086 DB      01DH FRACTION BAR /
C930      0087 DB      016H 0
C931      0088 DB      017H 1
C932      0089 DB      013H 2
C933      0090 DB      001H 3
C934      0091 DB      00AH 4
C935      0092 DB      010H 5
C936      0093 DB      015H 6
C937      0094 DB      007H 7
C938      0095 DB      006H 8
C939      0096 DB      018H 9
C93A      0097 DB      00EH COLON :
C93B      0098 DB      01EH SEMICOLON ;
C93C      0099 DB      01FH LEFT CAROT <
C93D      0100 DB      020H EQUALS SIGN =
C93E      0101 DB      01FH RIGHT CAROT >
C93F      0102 DB      019H QUESTION MARK ?
C940      0103 DB      020H AMPERSAND @
```

<p>C941 C941 C941 03 C942 19 C943 0E C944 09 C945 01 C946 0D C947 1A C948 14 C949 06 C94A 0B C94B 0F C94C 12 C94D 1C C94E 0C C94F 18 C950 16 C951 17 C952 0A C953 05 C954 10 C955 07 C956 1E C957 13 C958 1D C959 15 C95A 11 C95B 1F C95C 1F C95D 1F C95E 1F C95F 1F C960 1F C961 C961 C961 03 C962 19 C963 0E C964 09 C965 01 C966 0D C967 1A C968 14 C969 06 C96A 0B C96B 0F C96C 12 C96D 1C C96E 0C C96F 18 C970 16 C971 17 C972 0A C973 05 C974 10 C975 07 C976 1E C977 13 C978 10 C979 15 C97A 11 C97B 20 C97C 20 C97D 20 C97E 20 C97F 20 C980 C980 C980</p>	<p>0104 * 0105 * 0106 0107 0108 0109 0110 0111 0112 0113 0114 0115 0116 0117 0118 0119 0120 0121 0122 0123 0124 0125 0126 0127 0128 0129 0130 0131 0132 0133 0134 0135 0136 0137 0138 * 0139 * 0140 0141 0142 0143 0144 0145 0146 0147 0148 0149 0150 0151 0152 0153 0154 0155 0156 0157 0158 0159 0160 0161 0162 0163 0164 0165 0166 0167 0168 0169 0170 0171 * 0172 * 0173 *</p>	<p>THIS SECTION A-Z IS UPPER CASE ASCII</p> <p>DB 003H A DB 019H B DB 00EH C DB 009H D DB 001H E DB 00DH F DB 01AH G DB 014H H DB 006H I DB 00BH J DB 00FH K DB 012H L DB 01CH M DB 00CH M DB 018H O DB 016H P DB 017H Q DB 00AH R DB 005H S DB 010H T DB 007H U DB 01EH V DB 013H W DB 01DH X DB 015H Y DB 011H Z DB 01FH LEFT BRACKET [DB 01FH SLASH \ DB 01FH RIGHT BRACKET] DB 01FH UP ARROW ↑ DB 01FH LEFT ARROW ← DB 01FH DEL</p> <p>THE FOLLOWING ARE LOWER CASE ASCII CHARACTERS (A-Z)</p> <p>DB 003H A DB 019H B DB 00EH C DB 009H D DB 001H E DB 00DH F DB 01AH G DB 014H H DB 006H I DB 00BH J DB 00FH K DB 012H L DB 01CH M DB 00CH N DB 018H O DB 016H P DB 017H Q DB 00AH R DB 005H S DB 010H T DB 007H U DB 01EH V DB 013H W DB 01DH X DB 015H Y DB 011H Z DB 020H [DB 020H \ DB 020H] DB 020H ↑ DB 020H ← DB 020H DEL</p>	<p>C980 C980 C980 C980 22 00 CA C983 78 C984 FE 20 C986 CA EB C9 C989 C8 C98A FE 0D C98C CA 92 C9 C98F C3 97 C9 C992 C992 C992 C992 3E 08 C994 CD A6 C9 C997 78 C998 CD AE C9 C99B 26 C9 C99D 6F C99E 7E C99F CD A6 C9 C9A2 2A 00 CA C9A5 C9 C9A6 C9A6 C9A6 C9A6 67 C9A7 CD F8 C9 C9AA 7C C9AB D3 F9 C9AD C9 C9AE C9AE C9AE C9AE 67 C9AF E6 40 C9B1 CA D2 C9 C9B4 C2 B9 C9 C9B7 7C C9B8 C9 C9B9 C9B9 C9B9 C9B9 3A FF C9 C9BC E6 01 C9BE C4 C3 C9 C9C1 7C C9C2 C9 C9C3 C9C3 C9C3 C9C3 3E 1F C9C5 F5 C9C6 CD F8 C9 C9C9 F1 C9CA D3 F9 C9CC 3E 0D C9CE 32 FF C9 C9D1 C9 C9D2 C9D2 C9D2 3A FF C9 C9D5 E6 01 C9D7 CC DC C9 C9DA 7C C9DB C9</p>	<p>0174 * CALL HERE WITH THE CHARACTER TO OUTPUT 0175 * HELD IN THE "B" REGISTER. 0176 ENTER EQU \$ 0177 SHLD HLSTOR SAVE HL PAIR IN RAM 0178 MOV A,B 0179 CPI 020H IS IT A SPACE? 0180 JZ SPCOUT SPACE OUT 0181 RZ 0182 CPI 00DH CR COMPARE 0183 JZ CROUT AND SEND A CR 0184 JMP CONT AND CONTINUE 0185 * 0186 * 0187 * 0188 CROUT MVI A,008H THE BAUDOT CR CODE 0189 CALL OUTPUT 0190 CONT MOV A,B 0191 CALL CASEST CASE TEST 0192 MVI H,PAGE 0193 MOV L,A SETUP THE HL POINTER 0194 MOV A,M AND PLACE THE CODE INTO "A" 0195 CALL OUTPUT 0196 LHLD HLSTOR GET HL PRIOR TO LEAVING 0197 RET 0198 * 0199 * 0200 * 0201 OUTPUT MOV H,A 0202 CALL INPUT OK TO SHIP A CHARACTER? 0203 MOV A,H 0204 OUT SIO OUTPUT TO SERIAL I/O 0205 RET 0206 * 0207 * 0208 * 0209 CASEST MOV H,A CASE TEST ROUTINE 0210 ANI 040H 0211 JZ FIGST FIGURES TEST 0212 JNZ LTRST LETTERS TEST 0213 MOV A,H 0214 RET 0215 * 0216 * 0217 * 0218 * THIS IS THE LETTERS TEST ROUTINE 0219 LTRST LDA CASEST CASE STORE 0220 ANI 001H 0221 CNZ LTROUT LETTER OUT 0222 MOV A,H 0223 RET 0224 * 0225 * 0226 * 0227 LTROUT MVI A,01FH 0228 PUSH PSW 0229 CALL INPUT 0230 POP PSW 0231 OUT SIO 0232 MVI A,0 0233 STA CASEST 0234 RET 0235 * 0236 * 0237 * 0238 FIGSTS LDA CASEST CASE STORAGE 0239 ANI 001H 0240 CZ FIGOUT 0241 MOV A,H 0242 RET</p>
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```

C9DC      0243 *
C9DC      0244 *
C9DC      0245 *
C9DC 3E 1B 0246 FIGOUT MVI A,01BH
C9DE F5    0247      PUSH PSW
C9DF CD F8 C9 0248      CALL INPUT
C9E2 F1    0249      POP PSW
C9E3 D3 F9  0250      OUT SIO
C9E5 3E 01  0251      MVI A,001H
C9E7 32 FF C9 0252      STA CASEST
C9EA C9     0253      RET
C9EB      0254 *
C9EB      0255 *
C9EB      0256 *
C9EB 43    0257 SPCOUT MOV B,E
C9EC CD F8 C9 0258      CALL INPUT
C9EF 3E 04   0259      MVI A,004H A BAUDOT SPACE
C9F1 D3 F9   0260      OUT SIO
C9F3 7C     0261      MOV A,H
C9F4 2A 00 CA 0262      LHL HLSTOR
C9F7 C9     0263      RET
C9F8      0264 *
C9F8      0265 *
C9F8      0266 *
C9F8 DB F8  0267 INPUT IN TBMT
C9FA 17     0268      RAL
C9FB D2 F8 C9 0269      JNC INPUT
C9FE C9     0270      RET
C9FF      0271 *
C9FF      0272 *
C9FF      0273 *
C9FF      0274 *-----END OF PROGRAM-----
C9FF      0275 *
C9FF      0276 *
C9FF      0277 *
C9FF      0278 PSW EQU 06
C9FF      0279 SIO EQU OF9H
C9FF      0280 CASEST DS 1
CA00      0281 HLSTOR DS 2
CA02      0282 TBMT EQU OF8H
CA02      0283 PAGE EQU OC9H

CASES  C9FF  CASET  C9AE  CONT  C997  CROUT  C992
ENTER  C980  FIGOU  C9DC  FIGST C9D2  HLSTO  CA00
INPUT  C9F8  LTROU  C9C3  LTRST C9B9  OUTPU  C9A6
PAGE   00C9  PSW    0006  SIO   00F9  SPCOU  C9EB
TBMT   00F8

```

ADDENDUM TO MSA - BASIC TAPE PATCHES

by Lewis Moseley, Jr.

Here's some more info on the patches reported in our previous issue.

Cuter users must make the following additional patch:

```

EN ICL17 (cr)
:00 00 00 00 00 00 00 00 00 00 / (cr)

```

The reason: During initialization, the CUTER version changes two bytes in the new tape handler, thus preventing proper operation. I didn't notice this right away, since I use a pre-initialized copy of BASIC as my working copy. This cuts tape loading time by almost one-fourth, as you only have to SAVE and GET from 0-1940 hex, rather than 0-1FFF. Sorry for any inconvenience.

PROTEUS (continued from page 1)

development of hardware and software compatible with Processor Technology computer systems. Our primary vehicle for achieving this has been our newsletter, Proteus News (formerly Solus News). Since August 1977, we have published 12 issues packed with news, program listings, letters from members, product reviews (hardware and software), hardware modification tips, and software modification patches. This year we are introducing more tutorial articles, such as our continuing series "Understanding PTDOS" and "Understanding CP/M". We will have material useful to the hobbyist, the novice, the experienced system developer, and the non-technical end-user who uses only preprogrammed systems.

A second vehicle for our goals is our Software Directory. Our October/November 1978 issue had the first edition of this cumulative source for descriptions of software products offered for sale, such as interpreters, business packages, operating systems, games, and so on. The second edition will be greatly expanded, and will have software which runs under SOLOS/CUTER, PTDOS, CP/M, and other operating systems. A similar directory for hardware products, with users' comments, will be issued this year. The objective is to provide a compact reference to answer questions such as "Will memory board X work with my Helios?", "Is program Y as good as it claims?", or "Where can I get an accounts receivable program for my system?".

Third, we have been working on a software library on tape and diskette. The tape library has been fraught with difficulties which made it come along so late that most users have mini-disk systems now and aren't interested in tape software. However, the cassette tape is the one machine readable medium we all have in common, so it may still be useful as a universal program exchange medium. While we are wrestling with these questions, we are distributing public-domain software for Helios systems, including a PASCAL compiler, since there is no other source. We are busily converting many public-domain programs from the CP/M library to run under PTDOS. By the time you read this, the cassette library will be available by mail. We are also working on passing BASIC programs to and from Northstar and Micropolis disk systems, since they are so popular among Sol owners.

Fourth, we have encouraged the formation of local chapters, of which we have had 20-30. We also have had regional meetings, such as at the West Coast Computer Faire. This year we plan to have an educational program at the Faire, as well as an exhibit booth where we can exchange software.

In the past, we were a rather loosely run group of hobbyists, supported by all-volunteer workers. We now have a paid, part-time staff so that we can be more business-like in our performance. The future direction of Proteus will be shaped by feedback from our members. We want to fill the voids between what Processor Technology can do for users, and what you can do yourself. We also want to pool our skills, so we can avoid re-inventing the same wheels.

If you would like to stay in touch with Proteus, join by sending \$12 (\$15 for foreign addresses, U.S. funds only, please) to Proteus
1690 Woodside Road, Suite 219
Redwood City, California 94061.

You will automatically receive the back issues of our publication for the current calendar year. All memberships expire on Dec. 31. Ordering information for the library and back-issues from prior years is in each issue. Dealers, software vendors, and hardware manufacturers are encouraged to send us product descriptions for free publication in the newsletter.

MEMORY TEST COMMANDS
by Lewis Moseley, Jr.

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```

1000 *THIS PROGRAM IS A FOUR FUNCTION MEMORY TEST
1010 *BASED ON A PROGRAM BY ROD HALLEN PUBLISHED
1020 *IN THE JULY 78 ISSUE OF KILOBAUD MAGAZINE.
1030 *
1040 *THIS VERSION 10/78 BY LEWIS MOSELEY, JR.
1050 *2514 GLENDALE CT., CONYERS, GA. 30207
1060 *
1061 *THANKS TO ATLANTA COMPUTER MART, 5091
1062 *BUFORD HWY, ATLANTA, GA. 30340 FOR THE
1063 *USE OF A DECRITER FOR THIS LISTING
1064 *
1070 *ALTERED TO ALLOW IT TO RUN AS A SOLOS/CUTER
1080 *CUSTOM COMMAND. LOADS IN THE 1K SCRATCHPAD RAM.
1090 *
1100 * COMMAND FROM SOLOS/CUTER HAS THE FORM
1110 * MTEST ADDR LENG (NUMBER)
1120 * WHERE 'MT' IS THE CUSTOM COMMAND NAME
1130 * 'ADDR' IS THE START ADDRESS IN HEX
1140 * 'LENG' IS THE NUMBER OF BYTES TO TEST
1150 * 'NUMBER' IS A OPTIONAL NUMBER OF TIMES
1160 * TO MAKE THE TEST. DEFAULT=1
1170 *
1180 * ALL PARAMETERS TO BE IN HEX. SOLOS/CUTER
1190 * ROUTINES ARE USED TO CONVERT ADDRESSES.
1200 *
1210 *THE FOLLOWING EQUATES BASED ON CUTER. SOLOS
1220 *USERS SHOULD MAKE APPROPRIATE CHANGES.
1230 *
1240 SCONV EQU 0C378H CONVERTS TO HEX, CHECKS ERRORS
1250 PSCAN EQU 0C3A5H SAME, BUT OPTIONAL
1260 RETRN EQU 0C004H REENTRY POINT
1270 SOUT EQU 0C019H STD OUTPUT
1280 ADOUT EQU 0C3D9H FROM 'DUMP' ROUTINE
1290 BOUT EQU 0C3F7H ALSO FROM 'DUMP'
1300 CRLF EQU 0C342H CR-LF ROUTINE
1310 CUTAB EQU 0CB3CH CUSTOM COMMAND TABLE
1320 *
1330 PSW EQU 6 DONE ON OLD-STYLE SWP#1
1340 *
1350 ORG 0CB00H SOLOS/CUTER RAM
1360 *WHEN EXECUTED AT CB00, THE ROUTINE
1370 *CREATES AN ENTRY IN THE SOLOS CUSTOM
1380 *COMMAND TABLE FOR ITSELF, OVERWRITING
1390 *THE PREVIOUS FIRST ENTRY.
1400 *
1410 ORG 0CB00H SOLOS/CUTER 1K RAM
1420 *
1430 LXI H, 'MT' COMMAND NAME (REVERSED)
1440 SHLD CUTAB
1450 LXI H, START EXECUTION ADDRESS
1460 SHLD CUTAB+2
1470 RET THRU WITH SETUP
1480 *
1490 *MEM TEST ROUTINE STARTS HERE
1500 START EQU $
1510 CALL SCONV GET START ADDRESS OF TEST
1520 SHLD BEGIN STORE FOR LATER USE
1530 CALL SCONV GET # OF BYTES TO TEST (0-OFFFFH)
1540 SHLD LENGT STORE
1550 LXI H, 0 GET 16-BIT 0
1560 SHLD ERRS CLEAR ERR CTR
1570 INX H SET UP FOR PSCAN
1580 CALL PSCAN GET OPT PARAM OR KEEP 1
1590 MOV A, L GET LOW ORDER BYTE
1600 STA TIMES STORE
1610 CALL CRLF
1620 *

```

```

1630 *THIS IS REENTRY POINT FOR MULTIPLE TESTS
1640 AGAIN LHLD LENGT
1650 XCHG D-E HAS # OF LOCATIONS TO TEST
1660 LHLD BEGIN H-L HAS STARTING ADDR
1670 *
1680 CLEAR XRA A ZERO ALL MEM LOCS TO BE TESTED
1690 MVI M, 0
1700 DCX D
1710 INX H
1720 CMP D NOW SEE IF THROUGH
1730 JNZ CLEAR
1740 CMF E
1750 JNZ CLEAR
1760 * ALL THROUGH WITH CLEAR.
1770 *
1780 *NOW DO TEST A: CHECK IF ALL CLEAR
1790 TESTA LHLD LENGT GET LENGTH WORD AGAIN
1800 XCHG TO D-E
1810 LHLD BEGIN GET START ADDR AGAIN
1820 TSTA1 XRA A
1830 CMP M MEMORY STILL CLEAR?
1840 CNZ ERRA NO, LIST ERROR
1850 DCX D SEE IF THRU WITH TEST A
1860 INX H
1870 CMP D
1880 JNZ TSTA1
1890 CMF E
1900 JNZ TSTA1
1910 *HERE MEANS TEST A COMPLETE
1920 *
1930 *NOW DO TESTS B,C, AND D
1940 *TEST B CHECKS TO SEE IF THE LOCATION IS STILL CLEAR
1950 *TEST C WALKS A BIT THRU THE MEM LOC
1960 *TEST D LOADS AND RECOVERS 'FF'
1970 *
1980 *FIRST, RESET BEGIN AND LENGTH
1990 LHLD LENGT
2000 XCHG
2010 LHLD BEGIN
2020 *
2030 TESTB XRA A TEST B STARTS HERE
2040 CMP M STILL CLEAR?
2050 CNZ ERRB NO, LIST ERROR
2060 *
2070 MVI A, 1 TEST C STARTS HERE
2080 TSTC1 MOV M, A MOVE TO MEMORY
2090 CMP M LOAD OK?
2100 CNZ ERRC NO, LIST ERROR
2110 JC TESTD IF CARRY SET BY ERRC
2120 RAL ROTATE TEST BIT
2130 JNC TSTC1 CHECKED 8 BITS YET?
2140 *
2150 TESTD EQU $
2160 MVI A, 0FFH TEST D STARTS HERE
2170 MOV M, A MOVE 'FF' TO MEMORY
2180 CMP M LOAD OK?
2190 CNZ ERRD NO, LIST ERROR
2200 *THRU WITH TESTS ON THIS BYTE
2210 *
2220 *NOW SEE IF THRU WITH ALL BYTES
2230 DCX D
2240 INX H
2250 XRA A
2260 CMP D
2270 JNZ TESTB
2280 CMP E

```



```

2290      JNZ TESTB
2300 *HERE MEANS ALL TESTS THRU FOR ALL BYTES
2310 *
2320 *PRINT '$' TO SHOW THAT 1 ITERATION IS COMPLETE
2330      CALL GOOD1
2340 *
2350 *NOW, SEE IF WE SHOULD DO IT MORE TIMES
2360      LDA TIMES      GET COUNTER
2370      DCR A
2380      JZ FINSH      ALL THRU
2390      STA TIMES
2400      JMP AGAIN    NOT YET, DO AGAIN
2410 *
2420 FINSH CALL CRLF    FINISH UP BY PRINTING
2430      CALL CRLF    TOTAL # OF ERRORS
2440      LHLD ERRS    IN HEX.
2450      MVI B,'E'
2460      CALL ERR2
2470      JMP RETRN
2480 *
2490 *FOLLOWING ARE THE ERROR ROUTINES
2500 *THEY PRINT THE LETTER CODE FOR THE TEST FAILED,
2510 *FOLLOWED BY THE HEX ADDRESS OF THE FAILED BYTE.
2520 *
2530 *FORMATTED TO NICELY FIT THE SOL/VDM DISPLAY
2540 *
2550 *
2560 ERRA MVI B,'A'
2570      JMP ERR1
2580 ERRB MVI B,'B'
2590      JMP ERR1
2600 ERRC MVI B,'C'
2610      STC          THRU W/THIS BYTE
2620      JMP ERR1
2630 ERRD MVI B,'D'
2640 ERR1 PUSH PSW
2650      PUSH H
2660      LHLD ERRS
2670      INX H
2680      SHLD ERRS
2690      POP H
2700 ERR2 CALL SOUT
2710      MVI B,':'
2720      CALL SOUT
2730      CALL ADOUT
2740      CALL BOUT    OUTPUT 1 MORE SPACE
2750      POP PSW
2760      RET
2770 *THIS PRINTS THE 'OK' CHARACTER
2780 GOOD1 MVI B,'$'
2790      CALL SOUT
2800      LDA ERRS      ANY ERRORS?
2810      ORA A        SET FLAGS
2820      RZ          NO,SD SKIP CRLF
2830      JMP CRLF    AND RET FROM THERE
2840 *7 BYTES OF DATA SPACE FOLLOW
2850 BEGIN DS 2
2860 LENGT DS 2
2870 ERRS DS 2
2880 TIMES DS 1

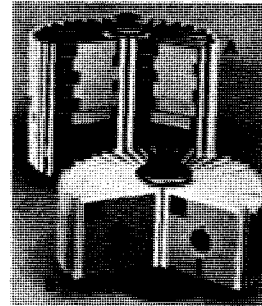
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PRODUCT ANNOUNCEMENT:

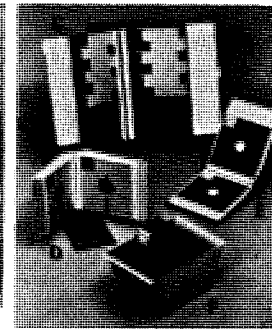
MEDIA FILING SYSTEMS

Looking for a good way to keep your tapes and diskettes in order for easy retrieval? Ring King Visibles has a line of storage systems which may interest you. The pictures below illustrate just part of their line. Write to Ring King Visibles 215 West Second Street, Muscatine, Iowa 52761, for the name of a dealer in your area.

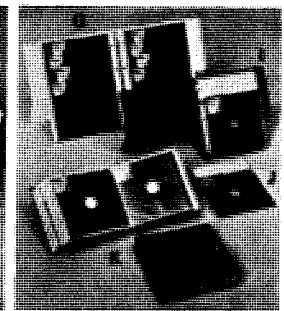
ROTARY FILES



DESK FILES



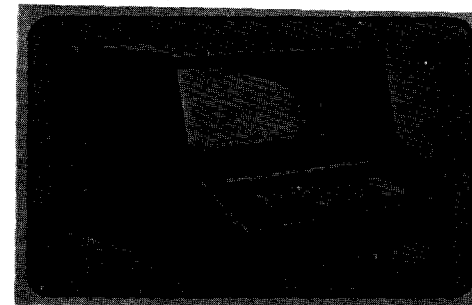
BINDERS



PRODUCT ANNOUNCEMENT:

SOUND CONTROL ENCLOSURES

Trying to cope with the noise of your impact printer or terminal? Jensen Engineering, Inc., makes over 400 different noise-suppressing cabinets for all of the major terminals and printers, such as Diablo, Qume, Anderson-Jacobsen, etc.. Since SolPrinters are made by Diablo, one enclosure in Jensen's line is probably right for them, too.



Write to Jensen Engineering, Inc., P.O. Box 7446, Santa Rosa, California 95401 or call toll free (800) 358-8272 or call collect in California (707) 544-9450.

LETTERS TO PROTEUS

...ON ELECTRIC PENCIL, CP/M'S "ED" AND "TEX", S.T. MUSIC, ETC.

Wednesday 14 February 1979

Letter to the Editor:

On page 10 of the June issue is a review of the Electric Pencil and mention of the TEX CP/M Formatter. I have used the Electric Pencil for a year and a half and just recently bought Electric Pencil II. In the past two years I have sold more than 50 magazine articles and I couldn't live without the Electric Pencil. I have TEX also but don't run it because ED.COM is too awkward to use. ED.COM was designed with a hard copy terminal in mind and it was very confusing to try and keep track of the invisible character pointer. After each change I'd have to rescreen the text to make sure that I was in the right place.

Electric Pencil is video oriented and changes take place before your eyes. You always know exactly what the result of any changes is. I've used the Electric Pencil on my SOL with the Teletype Model 43, Selectric, and now with the Malibu 160 line printer. Results have always been good. Underlining on the selectric can be handled in software by using a Back Space after each underlined character and then sending the underline. The limitations mentioned in the letter about the CR - LF problem is a Selectric limitation not that of Electric Pencil. The four listed desirable features are available in EP II.

And Finally, I don't think that Electric Pencil is overpriced. Unless personal Computerists are willing to pay the price for quality software there won't be any!

I had an article in the November 78 issue of Kilobaud on the Software Technology "Music System." This article generated a lot of phone and letter response but it appears that Software Technology has vanished from the face of the earth. Letters and calls to them and PTC have not gotten me an answer. Do you know how interested persons can get a copy of the "Music System" tape and manual? Maybe SOLUS could get permission to distribute this.

In the past two years my SOL and I have had many interesting adventures. I'm now using ThinkerToys Discus with CP/M and think that it is great. I didn't go for Helios because of the price and odd disk format. I'm using the Artec 32K RAM board and it works fine, too. The same goes for the Cromemco D+7 I/O board, Vandenberg 16K RAM board, and the Microsunder. The Malibu 160 line printer uses two parallel ports which I've built up on the Vector 8800-V protoboard. Never was able to get the Dutronics DZ-80 to work in the SOL and Dave was gentlemanly enough to give me a refund.

Even after going to CP/M, I continued to use Extended Cassette BASIC for a while. It was easy to load it on the disk and run it from there but I still had to load and save programs on tape. I finally went to Microsoft Extended Disk BASIC and I'm really glad I did. I'm also going to give the USCD Pascal a try soon.

Sincerely,

Rod

(Ed. note: Good idea about the Music System; I'll look into it. We will have an in-depth review of Electric Pencil in a future issue.)

Rod Hallen

ROAD RUNNER RANCH
P. O. BOX 73
TOMBSTONE, AZ 85638

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...ON WORDWIZARD, A USER'S VIEW

Dear Stan,

I was pleased and excited to receive the December SOLUS issue! The newsletter is jam full of usable information and all I can say is keep it coming.

I noticed that you were going to publish some information on the WordWizard. I am currently using the WordWizard and would like to give you my impressions:

As a system designed for the "user" who is not currently up-to-date on wordprocessors it is a very useful tool. I find the system takes into consideration that the user of the system does not have to know or keep track of many commands. The decal with the commands is a very useful item and I have friends who were able to use the system with little trouble because of the decal.

The manual is well written and has a good article on the use of backup disks. Each command is well described and a lot of effort has obviously gone into making the manual readable.

The ability to print and still edit another document is also a plus. I find myself using that capability more and more as I become used to using the system.

Changes I'd like to see include (1) The ability to be able to place more than 16 documents on one disk. Many of the documents that I write may be only one or two pages long and a lot of disk space is wasted. (2) A system that will allow the user to know exactly how much of a page (6 1/2 X 11) is used up. This could be done by some kind of numbering system on the video or perhaps a dry run of the print command on the monitor only. A word processing system shouldn't make you do any counting. (3) The ability of the system to center titles or any other text the user may elect.

Tony Severa
131 Highland Ave.
Vacaville CA 95688
January 17, 1979

(Ed. note: We've heard that the next version of WordWizard will have centering. I suppose that your dealer will upgrade it for you.)

...ON HELIUM

In reading over the years worth of SOLUS NEWS I just received, I'm only sorry it took so long in obtaining them. If I understood correctly one of your news letters, you will now also cover Helium that never got off the ground. If my understanding is correct, who can I get in touch with about obtaining my never cancelled check?

Sincerely,

Al Smith

(Ed. note: Dear Al, Helium is defunct; consider the check lost forever. I doubt it will ever be cashed. We are taking over the function Helium should have performed, but we have no knowledge of or connection with the Helium affair. Inquiries to the Helium address are not answered. PTC has no answers either.)

...ON A HARDWARE COMPATIBILITY GUIDE FOR PROTEUS

Enclosed are my 1979 dues. I'd like to thank you and the staff for an interesting and informative newsletter. Keep up the good work!

A good user's society is essential to those of us who live in technologically undernourished sections of the US. Unfortunately, owning any sort of electronic equipment more complex than a transistor radio in this part of the country is likely to result in many trips down to Ma Bell's offices carrying the bags of gold necessary to pay for the calls to Processor Tech, and an equally large annual expenditure for Roloids.

We must also have altogether too much to do with the first-place holder on my "10 Most Hated Things" list, the U.S. Postal Service. Mail-order buying is aggravating, even if everything works out.

Last fall, I purchased an S.D. Sales Expandoram board from a company in California that assured it would work with the Sol-20. The price was too good to be true (which should have told me something...) - 24K for \$240, kit-form. After 3 months of mailing the board here and there, I finally had to return it to the store in California for a refund - which, incidentally, after three weeks hasn't arrived. The store couldn't say why the board wouldn't work, S.D. Sales told me it worked fine on their IMSAI Z-80, but that "Maybe they just won't work on Sol's." My Sol hasn't dropped so much as a bit in the two years it's been running with a Dynabyte 16K board - so the computer isn't at fault.

As PROTEUS expands (as it hopefully will), perhaps you could compile a listing of Sol-compatible memory boards. Breaking down the list into categories such as "Fully compatible", "Compatible except for DMA", "Works, but not without major surgery and a dual-trace 'scope", etc. would be helpful. Information like this would be a boon to many Sol users. Eventually the list could be expanded to cover other, less commonly purchased peripherals.

It would be nice if compatibility hassles could be avoided simply by purchasing nothing but Processor Tech products, but sadly enough, this does not seem to be the answer. Some of us just cannot wait for the wizards in Pleasanton to finally market long-awaited accessories, the track-record of some of their items (i.e. the 16KPA) is not overly impressive, and there are simply not enough Protech dealers around. I went to California in December, and was astounded to learn that there was not a single dealer in Los Angeles county that handled the Sol. Simply amazing. A lot of people in the largest potential market area in the western U.S. are missing out on a terrific computer.

If you would like some help getting a compatibility guide together, I'd be happy to accept letters from Sol users describing their experiences, good and bad, and send PROTEUS a compilation every couple of months.

Sincerely,
Jordan L. Torgerson
Jordan L. Torgerson

Jordan L. Torgerson
5280 Leesway Blvd.,
Pensacola, FL 32504

5 FEB 79

(Ed. note: Dear Jordan, We accept! See the article elsewhere in this issue, on the Hardware Directory.)

...ON PTC SOFT1 ASSEMBLER

In my last letter, I reported the availability of extensions to an old version of Software #1. Since that time, I have acquired a copy of PTC's "new" cassette version of SOFT1. I would like to make a few comments about this new version, and then describe how I have adapted my changes to the new version.

My first comment: WHAT A DUD! After waiting for more than a year, they have added almost nothing to the original version, produced years ago, and have dropped the potentially useful breakpoint routines (I say potentially useful because I never used them when I was using the old version.) One thing really disturbs me about the program: how can you justify publishing an assembler which does not fully implement the target computer's instruction set? After all these years, SOFT1 still doesn't accept the instructions dealing with PSW or SP. I have seen a copy of the IMSAI version of software #1 dated 1976 which corrected the problem, after a fashion. You can solve this problem by using equates, as PTC suggests, or by using 'M' in place of PSW or SP in your source (i.e. 'POP M' == 'POP PSW'), or by implementing a permanent fix, as reported in Dr. Dobbs Journal a while back. Other than this (continuing) gaffe, the program works well, in its limited fashion. The tape save/load routines work well, and are a useful addition.

I have made the following additions of the new CUTS SOFT1:

1. Added the 'ASC' pseudo-op.
2. Added a command to resequence (i.e. assign new line numbers) all or a part of an assembler file, and another to set the value of the increment used in the renumbering.
3. Added a command to print out a copy of the most recent symbol table from the assembler.
4. Added an ASCII dump.
5. Modified the system to allow tape files to be appended onto existing assembler files, which permits the use of library routines.
6. Added a command to set the video speed.
7. Modified the system to accept control characters as special commands, such as setting the output pseudo-port, returning to SOLOS, etc., and documenting the method so you can add others as needed.
8. Modified the LIST command to allow a normal list, or a list with (pseudo-) tabs, or a listing without line numbers (for letters, etc.)

All of the above add about 1/2K to the effective size of the program.

In addition, I have instructions for incorporating these changes into SOFT1, and an index to the major routines of the monitor/editor section of the program (but not the assembler section), and an index to the programs' parameter storage area, known as the special system RAM. In all, there are six tape files totaling more than 35 pages of hard copy. The source listings of the additions are highly commented, in the fashion of my utility programs which have been published in SOLUS News.

I will make this material available to members for \$7.50, either as hard copy or on a 1200 baud CUTS format cassette tape, post-paid. The tape version is designed to be loaded as an assembler file and to, in effect, reassemble SOFT1 by automatically patching in jumps to the new routines as necessary.

I am not in the computer business, and therefore I must make the tapes, etc., when I have time. I'll try not to keep anyone waiting too long. By the way, I have no objection to local clubs ordering one copy and sharing it among their members.

Best Regards,

Lewis Moseley, Jr.
Lewis Moseley, Jr.

2576 Glendale Ct. NE
Conyers, Ga. 30208
January 5, 1979

P.S. If anyone wants to write with a question, please include a SASE, or at least postage for a reply. I'm also willing to consider trading the above for other software I can use.

17

...ON GODBOUR 32K ECONORAM (STATIC MEMORY)

An item of possible interest to the other users: I just purchased a Godbout 32K Econoram UNKit, \$599. Actually, I sent them the money before they wanted to take it--they wanted to wait until they had them on the shelf before taking orders. But, trusting their good reputation, I sent in my money, and indeed within a few days of when they said they would ship it, it was on my doorstep. I was pleased with the high quality solder-masked board, and Amp sockets and switches already installed. The "-kit" part of "UNKit" has you install half-a-dozen capacitors, the regulators and heatsinks (thermal joint compound not provided, but I'm not sure it's necessary, either) and install the chips. Again, quality parts where it matters; mm5257 memory chips, made in USA; but 741s04s from Korea.

My board was sent before the manual was back from the printer, but an enclosed sheet got me addressed, unprotected, and running. Absolutely no problem--worked perfectly and it runs fairly cool for this much static memory--you don't want to put your hand on the regulators after an hour or so, but the heat didn't affect any other boards. I'm running it with 24K of other memory and a homebuilt Votrax speech synthesizer interface, and we're running programs which use most of the available memory, so I can't tolerate dropped bits. All in all, I would recommend this 32K memory to anyone who needs a lot of memory in one slot and wants to run DMA stuff like a Dazzler.

Sincerely,

Douglas Williams
Psycho-Linguistic Research
2055 Sterling Av.
Menlo Park 94025

...ON WORDWIZARD AND ELECTRIC PENCIL, PRAISE FOR A DEALER

You mention that the next issue will have a detailed article on PTC WIZARD. I have had occasion to use it as well as ELECTRIC PENCIL. I like both of them. The footnoting and merging capability of WIZARD are a delight to use, as are the Archive and Retrieve functions. It was gratifying to find out how to transfer programs from PENCIL to WIZARD, using the WIZ command. I also have made good use of PENCIL to transfer programs from tape to disk. Moreover, I often write Basic Programs on PENCIL and then transfer them to PTDOS to run them. It is convenient to have PTDOS in one drive and PENCIL in another. Both systems are good, and each has its place, although I suspect that those involved with a great deal of writing might prefer WIZARD.

Although PTC was behind with some things, such as software, they seem to be catching up. I also must mention that they always have been helpful when asked for advice or explanations and trust that they will continue to do so. Their experts undoubtedly are harrassed at times, but when a consumer finds a willingness to back up the product and to give "first aid", he tends to support that company. Your suggestions on calling hours for various items deserves repeating. My local dealer, Computers Etc., 13A Allegheny Ave., Towson, Md. 21204, also have been cooperative and helpful. They carry a fairly complete line of computers and peripherals and if anyone needs something, they probably can get it - what is more, they are open 7 days (weekdays until 9 PM). Call David Egli, David Gardiner or John Norment at (301) 296-0520.

Meanwhile, keep up the fine work.

28 Alenbrooke Ct.
Baltimore, Md. 21204

Sincerely,
F. Sanders
F. Sanders

18

...ON MICROPOLIS, CP/M, AND SELECTRICS

Here are some questions that maybe some of the members could answer:

- (1) Is anyone running Lifeboat Associates' CP/M for Micropolis MetaFloppy diskettes on a SCL? (If so, how is it?)
- (2) Does anyone know of a way (program, etc.) to move the CP/M memory requirement from address 0, to allow things like PT BASIC to load and run at 0 under CP/M?
- (3) Is there a source other than IBM for Selectric type spheres and ribbons?

As you may have gathered from these questions, I am seriously considering adding a Micropolis MetaFloppy to my Sol; I haven't decided yet, mainly because of the above questions, and a letter I recently received from Mr. James R. Molenda of Micropolis. In his letter, he indicates that Micropolis intends to release a double-sided version of their product, giving a 100% increase in capacity at a cost increase of 30%-40%; the release date is supposed to be in late 1979. That may be worth waiting for. Thanks again, Stan, and keep up the good work.

Sincerely,

John Osudar
John Osudar
3027 Olive Road
Homewood, IL 60430
January 24, 1979

(Ed. note: (1) We've heard of people using it and haven't heard any complaints. Micropolis is supposedly an excellent disk drive, according to one well known microcomputer manufacturer we spoke with who selected the Micropolis drive for their product. "The best mini-drive on the market," he said. (2) CP/M doesn't really require low memory. See our series, "Understanding CP/M", for more info, but in brief you can tack a small initialization routine onto the end of PT BASIC that will move it down to address 0 after CP/M loads it. It must get control by a jump placed at location 100H, where CP/M application programs always start. Once it's moved, it will run independently of CP/M so the stuff at the bottom of memory can be destroyed. The "BYE" command in BASIC will return control to SOLOS/CUTER if you remember to load HL with the SOLOS/CUTER base address before jumping to BASIC. If you can find where BYE is processed in BASIC, you can patch it to jump to CP/M. The only exception to the rule of destroying CP/M's data in the base of memory is when CP/M must be used by the program and the CBIOS uses its scratch pad area at 40H. As I said, see the series for a more complete explanation. (3) Any good office supply store has Selectric ribbons (take your old one in for a match). They also have Correspondence code typespheres with common office character sets, but not EBCDIC ones. But IBM has an enormous selection of character sets, and the prices are cheap (\$18 each). They are no cheaper at the office supply stores I checked. A good Correspondence typesphere for programming is the ASCII sphere #154, which has the most commonly used symbols, such as <>?][@#%&*()-_+.)

...ON MANUALS FOR THE NON-COMPUTER-SPECIALIST

... I too would like to see more indications that software producers have tested their instructions on noncomputer specialists. Prior to their latest software manual, I thought North Star was the worst, now I would nominate Digital Research for that honor....

JACK HEINRICH, JR.
2958 Roundhill Road
Alamo, CA 94507
January 31, 1979

MEMORY FILL AND ASCII DUMP
by Lewis Moseley, Jr.

```

0000      1000 *ROUTINE TO FILL A RANGE
0000      1010 *OF MEMORY WITH A CHARACTER
0000      1020 *SPECIFIED IN THE COMMAND
0000      1030 *
0000      1040 *ALSO, ROUTINE TO DUMP
0000      1050 *MEMORY IN ASCII
0000      1060 *
0000      1070 *BOTH PATTERNED AFTER
0000      1080 *SOLOS/CUTER DUMP ROUTINE
0000      1090 *
0000      1100 *REVISED BY LEWIS MOSELEY, JR.
0000      1110 *2514 GLENDALE CT. NE, CONYERS,
0000      1120 *GA. 30207
0000      1130 *
0000      1140 *ADUMP WAS PUBLISHED IN DR. DOBBS
0000      1150 *JOURNAL, POB E, MENLO PK, CAL
0000      1151 *
0000      1152 *THANKS TO ATLANTA COMPUTER MART,
0000      1153 *5091 BUFORD HWY, ATLANTA, GA.,
0000      1154 *30340, FOR THE USE OF A DECRITER
0000      1155 *FOR THIS LISTING.
0000      1160 *
0000      1170 *FILL COMMAND TAKES THIS FORM
0000      1180 * FILL ADD1 ADD2 (CHAR)
0000      1190 * WHERE 'FI' IS A CUSTOM COMMAND
0000      1200 * 'ADD1' IS THE START ADDR
0000      1210 * 'ADD2' IS THE END ADDR
0000      1220 * 'CHAR' IS THE OPTIONAL
0000      1230 * CHARACTER USED TO FILL
0000      1240 *
0000      1250 *IF (CHAR) IS OMITTED, THE
0000      1260 *DEFAULT VALUE IS '00'
0000      1270 *
0000      1280 *THEN ADUMP WORKS JUST LIKE
0000      1290 *DUMP COMMAND, EXCEPT THE OUT-
0000      1300 *PUT IS IN ASCII, NOT HEX.
0000      1310 *
0000      1320 *ALL PARAMETERS TO BE IN HEX
0000      1330 *CONVERSION BY SOLOS/CUTER
0000      1340 *INTERNAL ROUTINES
0000      1350 *
0000      1360 *EQUATES REFER TO CUTER-IN-
0000      1370 *ROM, VERSION 1.3
0000      1380 *SOLOS USERS CHANGE AS
0000      1390 *NECESSARY
0000      1400 *
0000      1410 SCONV EQU 0C378H
0000      1420 PSCAN EQU 0C3A5H
0000      1430 RETRN EQU 0C004H
0000      1440 ADOUT EQU 0C3D9H
0000      1450 CRLF EQU 0C342H
0000      1460 BOUT EQU 0C3F7H
0000      1470 SOUT EQU 0C019H
0000      1480 CUTAB EQU 0C83CH
0000      1490 *
0000      1500 *WHEN EXECUTED AT CB00, THE ROUTINE
0000      1510 *CREATES ENTRIES FOR BOTH OF ITS PARTS
0000      1520 *IN THE SOLOS/CUTER CUSTOM COMMAND
0000      1530 *TABLE, OVERWRITING THE FIRST TWO
0000      1540 *EXISTING ENTRIES, IF ANY.
0000      1550 *THE TWO COMMANDS ARE DISPLAYED ON
0000      1560 *THE SCREEN FOR CONFIRMATION.
0000      1570 *
0000      1575 ENTER EQU $
0000      1580 ORG 0CB00H      SOLOS 1K RAM AREA
0000      1590 LXI H, 'IF'      COMMAND 'FI', REVERSED
0000      1600 SHLD CUTAB      SET UP FIRST COMMAND
0000      1610 LXI H, FILL      EX ADDRESS

```

```

CB00 21 46 49
CB03 22 3C CB
CB06 21 23 CB

```

```

CB09 22 3E CB      1620 SHLD CUTAB+2
CB0C 21 41 44      1630 LXI H, 'DA'      SECOND COMMAND 'AD'
CB0F 22 40 CB      1640 SHLD CUTAB+4
CB12 21 43 CB      1650 LXI H, ADUMP      IT'S EX ADDRESS
CB15 22 42 CB      1660 SHLD CUTAB+6
CB18 AF           1665 XRA A           GET A ZERO
CB19 32 44 CB      1666 STA CUTAB+8      MARK TABLE END
CB1C 21 8F CB      1670 LXI H, MSG
CB1F CD 83 CB      1680 CALL SCRN        ECHO COMMANDS TO SCREEN
CB22 C9           1690 RET              THRU WITH SETUP
CB23             1700 *
CB23             1710 FILL EQU $
CB23 CD 78 C3      1720 CALL SCONV        GET START ADDR
CB26 E5           1730 PUSH H
CB27 CD 78 C3      1740 CALL SCONV        GET END ADDR
CB2A E5           1750 PUSH H
CB2B 21 00 00      1760 LXI H, 0         SET UP FOR PSCAN
CB2E CD A5 C3      1770 CALL PSCAN        GET CHAR, OR KEEP 0
CB31 45           1780 MOV B, L          SAVE CHAR
CB32             1790 *NOW GET BACK ADDRESSES
CB32 D1           1800 POP D            END ADDR
CB33 E1           1810 POP H            START ADDR
CB34             1820 LOOP EQU $
CB34 70           1830 MOV M, B          PUT CHAR IN MEM
CB35 7C           1840 MOV A, H          IS CURRENT ADDR
CB36 BA           1850 CMP D            EQUAL END ADDR?
CB37 DA 3F CB      1860 JC LOOP1         NO, SO GO ON
CB3A 7D           1870 MOV A, L          TRY LOW ORDER BYTE
CB3B BB           1880 CMP E
CB3C D2 04 C0      1890 JNC RETRN        ALL THRU
CB3F             1900 LOOP1 EQU $
CB3F 23           1910 INX H
CB40 C3 34 CB      1920 JMP LOOP
CB43             1930 *
CB43             1940 *
CB43             1950 ADUMP EQU $
CB43 CD 78 C3      1960 CALL SCONV        GET START ADDR
CB46 E5           1970 PUSH H           SAVE
CB47 CD A5 C3      1980 CALL PSCAN
CB4A D1           1990 POP D
CB4B EB           2000 XCHG             HL=START, DE=END
CB4C CD 42 C3      2010 DLOOP CALL CRLF
CB4F CD D9 C3      2020 CALL ADOUT
CB52 CD F7 C3      2030 CALL BOUT
CB55 0E 10         2040 MVI C, 16
CB57 7E           2050 DLP1 MOV A, M
CB58 C5           2060 PUSH B
CB59 FE 20         2070 CPI 20H          < BLANK?
CB5B D2 60 CB      2080 JNC DOWN
CB5E 3E 2E         2090 MVI A, '.'       YES, MAKE DOT
CB60 FE 7F         2100 DOWN CPI 7FH    >= 7FH?
CB62 DA 67 CB      2110 JC DN1           NO
CB65 3E 2E         2120 MVI A, '.'       YES, MAKE DOT
CB67 47           2130 DN1 MOV B, A
CB68 CD 19 C0      2140 CALL SOUT        SEND CHAR OUT
CB6B 06 20         2150 MVI B, ' '
CB6D CD 19 C0      2160 CALL SOUT        SEND OUT SPACE
CB70 7C           2170 MOV A, H          NOW SEE IF FINISHED
CB71 BA           2180 CMP D
CB72 DA 7A CB      2190 JC DLP1A
CB75 7D           2200 MOV A, L
CB76 BB           2210 CMP E
CB77 D2 04 C0      2220 JNC RETRN        ALL THRU
CB7A             2230 DLP1A EQU $      CONTINUE
CB7A C1           2240 POP B
CB7B 23           2250 INX H            FIX POINTERS
CB7C 0D           2260 DCR C
CB7D C2 57 CB      2270 JNZ DLP1         MORE FOR THIS LINE
CB80 C3 4C CB      2280 JMP DLOOP        ELSE DO CRLF FIRST

```

19

(continued on page 20 left bottom)

PROGRAMMING QUICKIES

by Lewis Moseley, Jr.

20

Ever wish you could make SOLOS/CUTER double-space a HEX DUMP so you could more easily make comments and mark entry points? Or, ever triple or quad space? If your printer does not need NULLs after a CR, it's super simple - just write a short Custom Output routine which will translate NULLs into LINEFEEDS. Then SET N=1 for double space, N=2 for triple space, etc. If you do need NULLs, then let the CO routine look for CRs and provide its own NULLs, and still change SOLOS's NULLs to extra LINEFEEDS.

Ever need to use a short Machine Language routine with a version of BASIC which allows CALLS but not POKEs, thus requiring you to separately SAVE the machine language, and separately GET it each time you use the BASIC program? Try this - make a long statement such as this:

```
10 REM                                     XX, leave
BASIC, and use SOLOS to enter your machine language into
the place you filled with blanks in the remark statement.
Up to 50 or 60 bytes can be entered in this manner, and
then SAVED with the BASIC program. The LISings sometimes
look funny, but it still works. I have used this method
with PTCO BASIC5, and also Tiny Basic. With Tiny Basic,
you can also insert screen control characters into PRINT
statements. There may be some restrictions with this.
```

Want to use the excellent video editor in PTCO PILOT for composing letters, which you would then like to have typed out without wasting paper or having RUN appear on the letter? Using the methods shown in my last letters, EDIT the immediate command handler to add the following command:

```
M:TYPE
SETY: O=3 (or whatever port your printer uses)
LISTY:
SETY: O=0
JY: *%
```

This LISTS the EDITed letter on the printer, then changes back to the video screen.

FASTGAMMON (continued from page 9)

FASTGAMMON displays the backgammon board in a stylized fashion on the video screen. As you enter your move, it blinks the man to be moved and then relocates it on the board for you. The movement is slow enough that you can see what is going on, unlike some games that move so fast you can't tell if the move happened unless you watch carefully. The computer plays a good game, but not at the "Grand-Master" level, so to speak. You can even beat it if you are skillful and lucky. The manual gives the rules of the backgammon game, so that even a total novice can learn in a few minutes. It's a good program for the skilled players because it allows you to replay a game with the same rolls of the dice, so you can get back to a certain place in the game and try an alternative move to see how that works out. Order from: Quality Software, 10051 Odessa Av, Sepulveda, California 91343.

MEMORY FILL AND ASCII DUMP (cont. from page 19)

CBB3	2290	SCRN	EQU *	SEND OUT MESSAGE
CBB3 7E	2300	MOV	A,M	GET CHAR
CBB4 FE FF	2310	CPI	OFFH	TERMINATION CHAR?
CBB6 C8	2320	RZ		YES - MSG FINISHED
CBB7 47	2330	MOV	B,A	CHAR TO B REG
CBB8 CD 19 CO	2340	CALL	SOUT	SEND IT OUT
CBBB 23	2350	INX	H	BUMP POINTER
CBBC C3 83 CB	2360	JMP	SCRN	DO AGAIN
CBBF	2370	*		
CBBF	2380	MSG	EQU *	INIT MESSAGE
CBBF OD	2390	DB	ODH	<CR>
CB90 OA	2400	DB	OAH	<LF>
CB91 41 44 20	2410	ASC	'AD AND FI ENABLED'	
CBA2 FF	2420	DB	OFFH	TERM CHAR

LAST CALL FOR THE BEST OF THE S-100 BUS BOARDS

Owners of Sol, Altair, IMSAI, Vector Graphic, Cromemco, and other S-100 bus computers take note. Cheops Electronics has acquired limited quantities of the following Processor Technology products. Many thousands of these boards have already been sold to the owners of other brand computers. Recently Processor Technology discontinued them from their product line, in favor of their single board computer, Sol. Take this opportunity to enhance your computer by making it compatible with thousands of other S-100 bus systems. All items come with complete manuals. Note: A&T means Assembled and Tested, PCB means a bare board.

- HIGH PERFORMANCE MEMORY BOARD**
 The 8KRA is a low power static RAM memory board which originally sold for \$295.00 in kit form.
 8KRA A&T.....\$145.00
 8KRA Kit.....\$115.00
 8KRA PCB.....\$ 29.00
- THE ORIGINAL VIDEO DISPLAY MODULE**
 The VDM-1 module interfaces the computer with a tv monitor & has a 16x64 character display.
 VDM-1 PCB.....\$ 29.00
- THE CASSETTE TAPE STANDARD**
 The CUTS module interfaces with a cassette recorder for program loading and mass storage of up to 200000 characters per C-60 cassette.
 CUTS A&T.....\$ 85.00
 CUTS KIT & CUTER Tape.....\$ 60.00
 CUTS PCB.....\$ 20.00
- CUTER MONITOR & A GENERAL PURPOSE MEMORY CARD**
 CUTER is preprogrammed in a ROM and resides on the GEM module which also has 1K of RAM. CUTER commands include GET, SAVE, & CATALOG. Note: CUTER is not included with the "PCB".
 GEM A&T w/ CUTER ROM.....\$ 75.00
 GEM Kit w/ CUTER ROM.....\$ 50.00
 GEM PCB.....\$ 20.00
 CUTER ROM.....\$ 16.00
- ASSEMBLY LANGUAGE SYSTEM**
 Space is available on GEM for ALS-8 in ROM. Sol-10, A COMPLETE S-100 BUS COMPUTER Includes an 85-key keyboard, a power supply, an enclosure, and a manual.
 ALS-8 in 4 9216 ROMS.....\$ 34.00
 Sol-10 Kit.....\$695.00

The above merchandise is available in limited quantities and subject to prior sale. Please add \$3.00 for handling to orders under one hundred dollars. California residents add 6 1/2% sales tax. Parts guaranteed for 90 days on all merchandise. Please enclose your check or money order, payable to Cheops Electronics, or use your VISA or Master Charge.

name _____ sub-total \$ _____

address _____ 6 1/2% tax Cal. only \$ _____

city _____ state _____ zip _____ \$3.00 handling \$ _____

GRAND TOTAL \$ _____

Card Number, Master Charge or VISA _____

valid _____ thru _____

Interbank Number-Master Charge only _____

signature _____


CHEOPS ELECTRONICS
 441 SWALLOW CT. A
 LIVERMORE, CA 94550
 415 449 8080

A COMPLETE HAM RADIO SYSTEM FOR SOL

We've been asked many times by members who are amateur radio operators whether we have any info on how to use their Sol with their ham radio. Well, here's a way to do it First Class. Curtis Electro Devices sells this set of accessories for Sol that let's it send and receive Morse code and send and receive Baudot RTTY (radioteletype). It consists of an assembled S-100 board, a one-piece cover which suppresses RFI, and an interface box. Installation takes only a few minutes. The price is less than \$1000 for all of the components to turn your Sol into a ham computer.

HAM S-100

Morse Reader — Keyboard Keyer — Paddle Keyer — Baudot Terminal

The HAM S-100 is the plug-in circuit board used in the SYSTEM 4000 HAM COMPUTER. When placed in a Processor Technology SOL-20 or other S-100 bus hobby computer, the SYSTEM 4000 provides a complete CW and Baudot RTTY (Radio Teletype) operating system.

CW transmission may be made with CRT (TV Monitor) readout via either keyboard or paddle keyer with programmed or programmable message transmission modes available. CW reception is via CRT or Baudot TTY readout with automatic speed tracking.

Baudot transmission via keyboard with CRT readout is at 60 or 100 wpm with many operating features such as automatic RTTY and CW ID. Baudot reception is by CRT.

Break-in or non-break-in operation is selectable on both CW and RTTY.

The HAM S-100 contains 1K of RAM (Random Access Memory), 7K of EPROM (Erasable Programmable Read-Only Memory) and the receiver, transmitter and TTY interface circuitry. It is designed to be compatible with the S-100 bus system (Altair, IMSAI, SOL, etc.). One of the seven (1K byte) EPROMs serves as a translator to match port assignments between the HAM S-100 and the user's system. It also contains certain tables and routines common to the various ham programs. The 1K of RAM contained on the HAM S-100 is used for stack area and message storage independent of other system RAM. A tone monitor signal is provided.

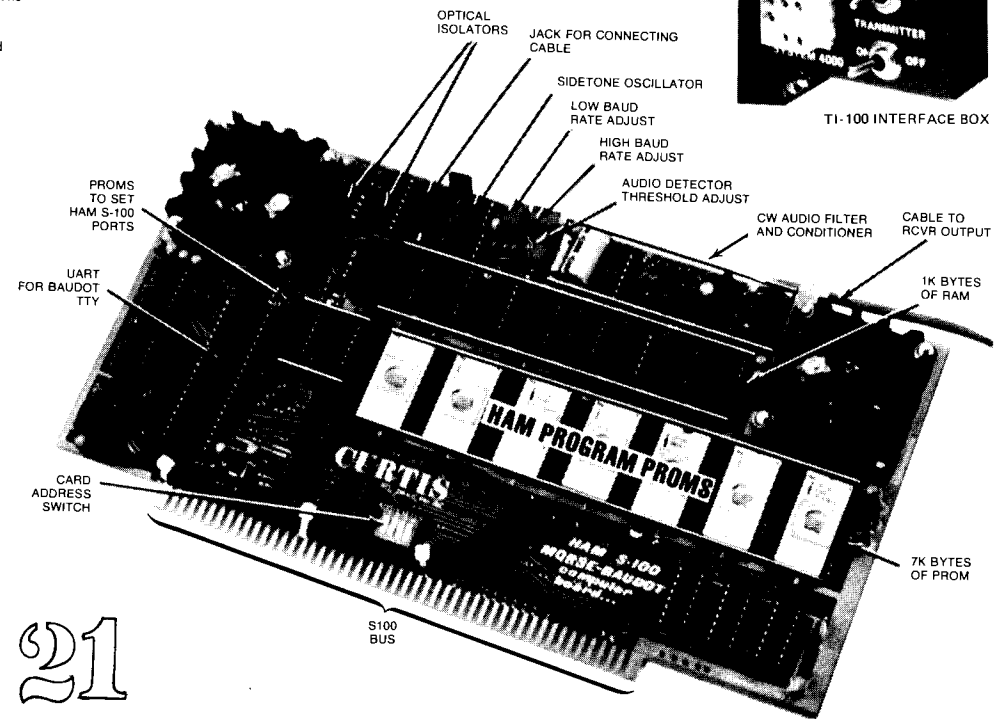
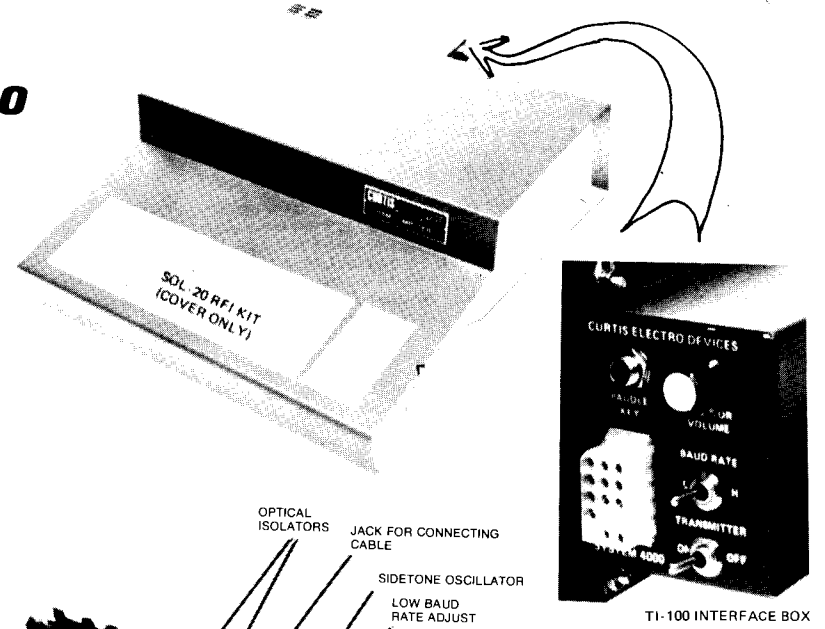
The receiver interface consists of a narrow filter and processing circuitry for an audio input from the receiver speaker output. The transmitter interface box contains circuitry designed to key amateur radio transmitters of either polarity.

A serial interface port (UART) is provided for five level TTY Baudot operation (60 and 100 wpm). Also, single line inputs and outputs are provided for station controls.

You will need an RTTY TU (Terminal Unit) to operate in this mode. They range in price from around \$200 to \$800. The inexpensive ones work satisfactorily for most purposes. Check the Ham magazines for sources.

CURTIS ELECTRO DEVICES, INC., P.O. Box 4090, Mountain View, CA 94040
(415) 964-3136

Listen for these SYSTEM 4000 stations on the air: K6KU, WA6ISX, WA2CBO, W6DYA, WB9OKV, K6RV, WD4IYS, K6OJO, VE7AVB, WABYYV/4



NEWS AND VIEWS

from
Joe Maguire

1-72 Horinouchi
Yokohama, Japan 232

P.O. Box 3742 DT
Anchorage, Ak 99510

February 19, 1979

Dear Stan,

Congratulations on another excellent issue of Proteus News. The new name conjures up something exotic; I like it.

I would suggest a frequency of publication of every three months rather than two. That gives a month for mailing and delivery, (yes, it has taken that long by slow dog sled to my mail drop in Alaska) a month for replies and a month to get out the new issue.

Enclosed you will find a listing of my Northstar I/O routine which has evolved over many months of use. I was reminded by some comments in the last newsletter that those of us who have trodden the rocky ground of learning this new hobby should share the wealth. I hope it can help someone.

NEWS ITEMS:

ALS8 CORRECTION In my article on relocating the ALS8, revision B, (Solus News Vol. 1, No. 6, pg 10) there was one error. The byte at FA64 should not be changed but should remain E9. This byte effects the EDIT routine.

TARBELL CONTROLLER BOARD I wanted to be able to have CP/M for my Helios so I ordered a Tarbell disk controller intending to follow Ron Parson's instructions for adapting it to the Helios drive. (Solus News Vol., 1 No. 5, pg 3) I should have guessed that Murphy's axiom would rise to the occasion, to wit, "any product from a manufacturer which has finally been successfully debugged by the user will be immediately followed by a revised product." Sure enough, my board turned out to be a revision D (Ron's was revision A) and all of the excellent instructions on how to use several unused gates and buffers on the board are no longer applicable. I think the adaptation can still be made, in a different way, but I haven't completed it yet. When I do, I'll pass along the info.

NOTE: CP/M is now available in Helios format from Lifeboat Associates.

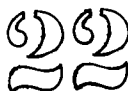
RALPH PALSSON LEAVES Ralph was PTC's former customer relations representative and has left their employment to take another job in the computer industry. Ralph was one of those rare persons in this type of job who really cared about the customer's problem. He always gave tirelessly of his time and effort to get the answer or provide the fix. He will be sorely missed. Good luck in your new endeavor Ralph and thanks for the many times you helped us.

CORONA FADES PTC's much heralded (on the cover of Nov '78 Popular Electronics) color graphics system for the Sol has been suspended. A spokesman used the word, "shelved." No explanation was given but my own conjecture is, that soon after the ballyhoo, someone rose out of the industry woodwork and accused PTC of possible patent infringement. Considering that color graphics probably made the Apple what it is today, PTC should take another hard look at Corona. In the meantime, we will just have to continue to view our Sols in dismal black and white.

PTC MINIDISK A minidisk system, patterned after its big brother Helios, is definitely in the works at Pleasanton. Helios .5, or whatever it will be called, (how about WHITE DWARF, a mini sol!) will offer a subset of PTDOS 1.5. If it is not too late to influence its development, (it probably is) I will offer some suggestions.

1. It should be double sided and double density. If it isn't, I predict it will follow Software Technology, Music System, Mathpack and possibly Corona into oblivion.

2. The system software should be relocatable. Forcing the user to put the DOS in a certain area of memory, as is the case with Helios,



will turn some buyers off. I'm just crazy enough to want both systems. Flexibility is the key to sales.

3. (PTC is going to choke on this) It should be compatible. By that I mean it should be able to read disks written on other manufacturers systems. Hopefully write too. Probably the greatest single reason for the success of CP/M was not that it was superior software, (PTDOS is better) but that it was offered in an established format, IBM soft sector. Disks written on dozens of systems could be read by each other and hence, popularity was immediate. If PTC comes up with a unique format, as they did with Helios, it's going to be tough selling.

NEW SOL DAWNS PTC will announce, around April, a newly redesigned Sol. I was told it will be functionally the same as the present model but that the inside will be completely changed. No further details were given but I suspect PTC is feeling the cost squeeze. No doubt many discrete parts will be combined into modular units, which will make servicing easier, and less costlier manufacturing techniques employed such as a one piece cabinet, etc. The bus will probably be brought into line to conform with the new IEEE S-100 standard. No mention of a change of processor was made but the 8085 is a good candidate for cost cutting since it requires less support chips than the 8080 while permitting all existing software to be used.

"N*K MEMORY I was fortunate to be able to get an early model of PTC's new memory board. After using this board for the past six months, I can say without qualification that it is 100% more reliable than the old 16KRA. To give it the acid test, about two months ago I turned off my extra fans and let it run at whatever temperature the Sol could generate. With a full complement of boards installed in the backplane including my hot Helios controller, I have not experienced a single memory malfunction during that time. It's almost a euphoric feeling not to have to transfer everything to a disk every 30 minutes or so anticipating a system crash.

All is not roses down memory lane however. The new boards are offered in a variety of capacities. They start with 16K of chips installed (16KRA-1) and go up to 64K. (64KRA-1) I have a 48KRA-1. I wanted to upgrade the capacity to a full 64K. At first this looks easy since all of the sockets are already installed and the board uses the ubiquitous uPD416 (4116) memory chip offered for the TRS-80, Apple, SO Sales and others. These chips are currently being offered for as little as \$75 for a set of eight. (16K) Ah, but there is a hooker. The "N*K boards use a custom programmed ROM to set the range of the address bank. Without the ROM you can't address the added chips. When I contacted PTC about getting the necessary ROM I was given a flat NO! I was told that this was a dealer modification where the chips and ROM would be sold only as a package. At \$375, as an estimate for the upgrade by the dealer, this computes as \$50 for the chips (quantity price), \$25 for plugging them in and \$300 for the ROM. Now come on PTC!! Bite the bullet!! I know that when this board was designed last year these chips were selling for \$25 each but times have changed. That ROM costs every bit of \$2.50 and few are going to want to pay \$300 for it! A drastic price reduction is in order. If it isn't forthcoming, some enterprising PROTEUS member with a ROM burner will offer them to members for, say, \$20 and make a handsome profit. That will literally leave PTC holding the bag -- full of IC's.

CHIP SHORTAGE The computer industry in general in now is the middle of a severe IC shortage. Several popular types used on memory and motherboards are in critical supply. Several manufacturers are quoting 90 to 120 days for product delivery. Whether or not PTC will be affected by this remains to be seen but they probably will be. Just what caused the dry up is not clear but most likely it is a fallout of past dog eat dog competition among IC makers who have just thrown in the towel and refused to manufacture types they had to sell at a loss.

SHUGART DRIVES In conversations with several dealers, I have been told that persons wishing to upgrade their Northstar disk systems to double density may not have to have their Shugart SA-400 drives modified. It seems that Shugart has been shipping drives capable of

(continued on page 23)

IS YOUR SAFE SAFE FOR MEDIA?

If you use your computer for processing business data, your magnetic storage media (diskettes, tapes) probably contain data that you want to keep safe. A careful program of "back-up" copying and off-site storage of duplicates is important, but inconvenient. It is tempting to put the diskettes or tapes in a document safe and feel confident that they could withstand the attack of fire. But are they safe in there? No. Ordinary record safes are designed to protect paper documents. To do so, the safe often is made with a gypsum insulation which releases water vapor as it is heated. When the temperature inside the safe reaches 150° F. or 85% relative humidity, information on EDP media can be destroyed, although paper documents would survive.

Safe manufacturers have developed special safes for EDP media. They generally protect against heat, smoke, humidity, and impact (explosion or fall thru collapsing floor). They also will protect microfilm media. The two Computer Media safes I've seen have had a variety of options, to accommodate various media, such as hangers for 9-track tape reels, shelves for disk packs, and BINS FOR DISKETTES. Unfortunately they are all rather large (4 feet high by 3 feet square) and expensive (about \$1500 base price plus optional shelves and freight charges). Perhaps the safe manufacturers will make a small one someday for the micro-computer user, but until then either get the right safe, or be extra careful with back-up copies. Don't count on ordinary safes or fireproof files.

MODS FOR CASSETTE TREK - 80

by Bruce Barron

I would like to suggest some changes for Trek-80. The first is really a correction to make the display agree with the manual. The manual says "-----S-R SENSOR-----" over the screen, however I get "Processor Technology" which I find offensive. Therefore:

1B30: 20 20 2D 2D 2D 2D 2D 2D 53 2D 52 20 53 45 4E 53

1B40: 4F 52 2D 2D 2D 2D 2D 2D /

will produce the display in the manual.

In addition to TREK-80 I also play several other versions of TREK. All of the other versions define directions with "0" to the right and proceed clockwise. While PTC's idea of "0" up is logical, it is easier to change this one version than all of the others, therefore:

17D3: 01 11 10 09 99 89 90 91 / will change the Warp drive

1914: 02 00 42 00 40 00 3E 00 FE FF BE FF C0 FF C2 FF /

will change everything on the short range scan (phasers, torps, impulse, and pods). In both cases movement is accomplished by adding numbers, so these changes just change the numbers to be added.

NEWS AND VIEWS (continued from page 22)

double density for some time. They just didn't certify them as such. In particular, if your drive was manufactured anytime in 1978 it will probably work satisfactorily. Have someone check it out with a double density controller if you are not sure. Also, Northstar is not offering the DD controller board as a separate item but some dealers are willing to break up a system for you. Some are also offering trade-ins so it pays to shop around. For those who do not yet enjoy a disk system, single density controllers can now be found at very good prices. Just about every piece of Northstar compatible software will continue to be offered in SD format so you won't miss out on a thing. The drives can be purchased as separate items from several sources.

CLASSIFIED ADS

SOFTWARE WANTED: We're looking for software packages for Dentists, Physicians, Churches, and retail sales stores. North Alabama Scientific & Engineering Consultants, P.O. Box 5124, Huntsville, Alabama 35805.

COMPUTER FOR SALE: Sol-3A system by Processor Tech, including Sol-20, Bootload personality module, 48K RAM, Helios II model 2 dual disk (up to 760K online), PT-872 video monitor, extended disk BASIC, all required cables and manuals. Completely assembled system purchased 10/78 as development system from Proc. Tech. dealer. Must now liquidate. List price \$6695, sale price \$5800. W. Harkness, 32 Larchwood Dr., Pittsford, N.Y. 14534, or call 716-423-3254 days, or 716-381-0201 evenings.

SOFTWARE TRADE: Computerized commodity and stock market is my interest--have developed 3 systems and interested in exchange with others oriented and successful in this area. E. Trachtenberg, P.O. Box 407, Little Neck, NY 11363.

FOR SALE OR TRADE: PERIPHERAL VISION S100 DISK CONTROLLER & 8" DRIVE, NEW - \$450. KIM-1, P/S & MANUALS \$135. PERCOM CI-812 S100 CASSETTE & RS-232 BD. NEW \$75. PAIA 8700 + EXTRAS. NEW \$100. ALL UPS PAID! SOL. RACK MOUNT, 11 SLOT MOTHERBOARD, KEYBD, 2 BASICS, & CASSETTE RECORDER \$800 - CAN'T SHIP SOL! WANT DIABLO, MEMORY, OR ? ROD HALLEN BOX 73 TOMBSTONE, AZ 85638

Proteus members may place up to 3 lines of advertising here in each issue, at no charge. Excess lines and all others placing ads will be charged at \$1 per line (max. 75 characters per line).

Write for display advertising rates.

NEW CHAPTERS

COLORADO, Boulder/Denver area

A group of users of PT hardware and/or software in the Boulder/Denver area has been formed. We met in February and intend to meet once per month. The next meeting will be held on March 11 at 3:30 PM at the National Center for Atmospheric Research in Boulder. Our group is a sub-group of the Denver Amateur Computer Society (DACS) and it was founded by one of its board members Rick Rathbun. For more information about this and future meetings call Rick at 771-0740 (Denver) or me at 443-2817 (Boulder).

Vim Toutenhoofd
980 University Ave
Boulder, CO 80302

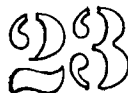
ARIZONA, Phoenix

Anyone in Phoenix area interested in a local chapter? Call me at 942-2311 extension 1438.

Bruce Barron
10237 N. 45th Ave
Glendale, AZ 85302

CALIFORNIA, Vacaville

Midway Computer Club. Contact Tony Severa, 131 Highland Ave., Vacaville, CA 95688, (707) 446-0417.



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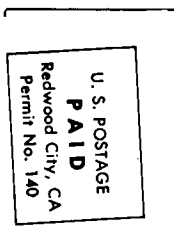
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Instructions to contributors: Letters and articles may be submitted in camera-ready form or on Sol/Cuts cassettes or Helios (PTDOS) diskettes. Camera-ready copy should be single-spaced, in a single column of 6 1/2 inch width, and with clean, dark type. Corrections can be made invisibly with opaque correction fluid ("liquid paper"). Please use a new ribbon. Machine-readable articles should be compatible with Solos, Cuter, or PTDOS input routines. Media will be returned only if requested.

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 REDWOOD CITY, CALIFORNIA 94061
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James D. McElroy
 2826 Crest Ave. N.
 Allentown, PA 18104



PROTEUS / NEWS

AN INDEPENDENT NEWSLETTER FOR OWNERS AND USERS OF PROCESSOR TECHNOLOGY CORPORATION COMPUTERS

FORMERLY SOLUS NEWS

VOLUME 2, NUMBER 3

PUBLISHED BIMONTHLY BY PROTEUS, 1690 WOODSIDE ROAD, SUITE 219, REDWOOD CITY, CA 94061, USA

MAY, JUNE 1979

THEY QUIT!

PROCESSOR TECH SHUTS DOWN!

PTC HAS LAID OFF ALL OF ITS EMPLOYEES AND ITS OFFICE FURNISHINGS ARE TO BE AUCTIONED OFF. According to our sources, PTC has not declared bankruptcy, has not filed for Chapter XI protection, and does not intend to do so. Apparently they intend to remain in business, but obviously not as they have been in the past. The entire course of events leading up to this are not clear to anyone, except perhaps the principals involved, but as of this day, June 8, 1979, here is what we know.

For many months now we have heard that PTC was feeling the pinch of a tight cash flow. They did not have a lack of orders; indeed, their dealers who were pursuing the word-processing market were doing a lot of business. Just today I heard that one dealer had completed a contract with a government agency for hundreds of Sol's, and sales everywhere were going well apparently.

The article in Electronic News, which is reported in the "News of the Industry" article elsewhere in this issue, quoted then president Gary Ingram as saying that PTC was undercapitalized, but they were not near insolvency. Gary Ingram later resigned "for personal reasons" and v.p. Bob Marsh took over as president of Processor Tech. Bob and others high up in PTC kept saying that they were talking to lots of financial people about "bringing in more financing." We have heard that they had many different offers, each with certain strings attached, and apparently none were acceptable to the directors of the corporation.

At the 4th West Coast Computer Faire, I learned quite by chance that PTC had laid off some people (later someone told me about 25) in March. Bob Marsh also repeated his statement that they were talking with someone about a deal for more financing. Bret Bullington of PTC spoke to Proteus members at the Faire about PTC's new products, the culmination of many months of quiet work back in Pleasanton. The new product line included a full range of disks (mini-, 8", and 28 Megabyte hard disk), a re-engineered Sol, a new universal disk controller, a high-speed communication interface to hook-up many Sols into a network sharing a common disk, a new video board, and so on. The new products were to be unveiled at the National Computer Conference (NCC) in New York, the first week in June. It looked as though PTC was finally going to come out with new products. There was a hint of what was to follow in Bret's remarks. He said that although PTC was selling well, the suppliers were tightening up on credit to all of their small computer manufacturers in the wake of the financial troubles of the other companies, such as IMSAI, Polymorphic Systems, Digital Group, etc. Cash flow was the big problem. This was May 11, 12, and 13.

The Tuesday after the Faire I called PTC about our local chapter's meeting, where I wanted someone from PTC to show us the new Sol. Apparently I was one of the first to learn that they were that day laying off virtually their entire staff, temporarily. As soon as the financial deal went through, they were going to recall people. The story was that they were afraid they couldn't meet the payroll, so they decided to cut out everyone except a skeleton crew -- a few people remained in customer service, a few in shipping, the officers kept having meetings, and the receptionist kept answering the phone as though business was as usual, but everyone "hadn't come in yet," or was "in a meeting."

One week later, a few people were recalled, but only a few. The meetings continued and rumors began to fly: PTC had filed Chapter XI; no they hadn't filed Chapter XI; they were going to be bought by a Large Company in Santa Clara Valley (INTEL); no they weren't. When I spoke with one corporate officer, he was pretty optimistic that funds were coming to let them recall most of their staff. Later that week I spoke with an employee of PTC who said it was "a pretty depressing place around here--Bob Marsh just told everyone that NCC was off." There wasn't enough time left to make final preparations for displaying their new products--they were hopelessly behind schedule due to the layoffs.

Tuesday, June 5, I called PTC again to see what was up, but the 829-2600 number was disconnected. I called one of my sources and I was told that PTC had a leased phone system and it was just cancelled. Ma Bell must have cut them off too, because the number wasn't being forwarded. Instead, I learned, they had a new number, probably installed at the PTC building in the name of one of the corporate officers personally. Later I heard that they had sent out a letter to their dealers informing them that they were "switching over to a new phone system and that the new number will be used temporarily; sorry for any inconvenience this may cause." It still sounded like business-as-usual.

Friday, June 8, I received many calls from all over the U.S. from people asking what was going on at PTC. With each call, I heard more rumors:

The special phone at PTC was now "out of service." The bank had placed a lien on the contents of the PTC building. Several sheriff cars went to the PTC building, apparently to serve papers on the officers, but were not given admittance to the building. Not having warrants, they went away. The bank announced that the office furnishings were to be auctioned off. Someone who has done programming for PTC was called in to discuss something there. PTC does not plan to go out of business. They do not intend to file bankruptcy. They are talking about keeping the software rights they have and going out of the hardware business and into the software business. They intend to license PTDOS and their other software for use on other equipment.

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These were the rumors. Who knows what the truth is? We'll just have to wait and see. It certainly is strange from this viewpoint. But one thing seems clear. PTC as we knew it is dead. There is more need than ever for owners of PTC equipment to stay together and recruit as many others into Proteus as possible. Proteus plans to remain alive and healthy and to continue acting on behalf of all owners of PTC equipment. Go to your local computer clubs and tell them what is happening to PTC and get owners of PTC equipment (Sol's, CUTS, 16KRA's, etc.) to join Proteus.

One thing we are doing is pulling together information on who can do what to help us. We are contacting Processor Technology dealers to establish service centers which can remain economically viable. The MicroSun Computer Center, in Walnut Creek, California, is one such center. See the story elsewhere in this issue about MicroSun servicing Processor Tech equipment. We also want to find factory-trained service centers in other parts of the country. If you know of a dealer who runs a good service department that can handle Helios, PTC's dynamic memory boards, etc., let us know.

We are also talking with former employees of PTC about continuing to support PTC products in some way. There is talk of making an inexpensive controller that is plug-compatible with the Helios drives and that would convert the system to a conventional soft-sectored IBM format without any modifications to Sol or Helios. This would give Helios owners a way out if our controller goes dead and we can't get it repaired.

We also intend to contact people who in the past have made custom hardware modifications for Sol's and see if we can get another production run as a sort of last chance group purchase. Specifically, we're thinking of the GraphicAdd and the keyboard modification kits. With no more Sol's being made, who will develop new products for it unless there is a reasonable demand?

Now, more than ever, we need to stick together.

**LATE NEWS: PTC IS GOING COMPLETELY OUT OF BUSINESS.
IGNORE ALL REMARKS TO THE CONTRARY IN THIS ISSUE.**

NEW COPYRIGHT POLICY FOR LIBRARY

A few members' remarks have convinced me that our copyright statement on the library cassettes and diskettes is overly restrictive and discourages people from donating programs they have written because they may someday want to enhance and sell them, or do something else with them. Consequently we will no longer ask for donors to give Proteus the copyrights. Instead, all that we ask is a statement that you are not donating someone's copyrighted program without appropriate permission if necessary and that you give Proteus license to reproduce the program. (This license is not necessarily exclusive--you can give the program to other users' groups too.) You may place your copyright on the programs you donate or leave it off, as you see fit.

Cassettes and diskettes we produce will continue to bear our copyright on the work as a whole. We still feel this is necessary to prevent commercial exploitation and splintering of the library into local pools rather than a large pool.

This library policy is constantly open to revision. Please let us know what you think should be done differently. As the library grows, I may someday remove all restrictions, except that against commercial use without permission. But for now, I'm afraid that would remove the incentives to contribute.

MOVING SOL TO F000

The video display memory, Solos scratchpad memory, and the ROM personality module on the Sol all use memory addresses located in the C000 block (hex). All Processor Technology software takes this into account, but it does present problems if you use other software that assumes you have RAM available from address 0000 to some address higher than C000. For example, when using CP/M you can only run in the 48K below C000. For some very large programs this is a problem.

Bob Goodman of Micro-AP, 9807 Davona Drive, San Ramon, CA 94583, (415) 828-6697, has a solution to the problem. The hardware change to move the system RAM, ROM, and video memory to F000 only requires that pins 9 and 12 on U-22 (on the Sol-PC board) be connected together with a jumper wire and the input gate to U-24 for Phantom be pulled to +5 volts with a 1.5K resistor. The jumpering can be through a switch should one want to revert back to the standard C000 address to use PTC software. Since the standard Solos program requires that it be at C000, Bob has reassembled Solos to F000 using the source code published by PTC and available from the CP/M library.

Bob has also offered to provide anyone who wants it a copy of Solos reassembled to F000 on 8" IBM diskette or on 2708 EPROMS which can be plugged into the 2708 personality module available from PTC, provided he can get PTC's consent.

Since Bob's data-base management software "Selector II" and "Selector III" prefer a 59K CP/M system, the relocation is recommended to run his system on a Sol.

PROTEUS IN WASHINGTON, DC

The Sol Users Group of the Washington Area consists of approximately 30 very active members who meet regularly on the third Thursday evening of each month and at other times on special subjects. We also cooperate with other organizations in the area such as The CP/M Users Group.

Anyone interested in participating in our activities is invited to contact me by phone (703) 893-5436 or by mail at 6636 Hazel Lane, McLean, VA 22101.

Jim Logan, Chairman
Sol Users Group of
Metropolitan Washington DC

NEWS OF THE INDUSTRY

Len Kalish, one of our members in Los Angeles, kindly sent me a clipping from the March 12, 1979, issue of Electronic News, which had a front-page special report on the pioneers of the home computer business. The gist of the story is that the small companies (many of whom began in a garage) who started the personal microcomputer business are not doing at all well financially since the large companies have entered the market.

The Digital Group and Interactive Products Corp. (Polymorphic Systems) had filed for Chapter XI protection (a court-managed debt situation). Realistic Controls (the "Rex" computer) was dissolved and its assets purchased by another company. American Used Computer liquidated its inventory of hobby-type micros. (After the article was published, IMSAI also went into Chapter XI. MITS, who started it all with their Altair computer, was previously bought by Perlec Computer Corporation and the Altair and MITS were never heard of again.)

(continued)

Of Processor Technology Corporation, the article says that then president Gary Ingram admitted that the company was undercapitalized, but they were nowhere near Chapter XI. They were planning to bring in more financing in the near future. (Sometime after the article was written, Gary Ingram resigned "for personal reasons" and Bob Marsh rose from V.P. to president.) The article went on to say that Processor Technology has been forced to the top end of the market by the heavyweights now in the low end of the business or contemplating entry into that market, such as Commodore, Apple, Atari, Texas Instruments, Radio Shack, and several Japanese manufacturers. Ingram was quoted as saying that entry into the low end by Processor Tech would be very inappropriate.

The article went on to say that the executives of the interviewed companies agreed the problem was too little capital to cope with their rapid growth. The more conservative companies in the hobby business are in better financial shape than those that tried to broaden their product lines quickly to compete in the saturated market.

HELIOS CONVERSION TO IBM FORMAT by Stan Sokolow

Since Helios uses a unique format for recording data on the disks, and since nearly every other manufacturer has chosen IBM soft-sectoring format, Helios owners are handicapped when it comes to software interchange with other computers. To be able to use standard 8" soft-sectored CP/M disks, we need another controller. I am investigating the new Disk Jockey 2D controller by Thinker Toys as a replacement for the Helios controller and formatter boards. I have one on order for testing. If it works out, we can get a discount by buying as a group, Proteus acting as a dealer. Price will be around \$400.

This controller can support all four IBM sector formats, single and double density, has on-board a serial port interface, 1K PROM with driver subroutines, 1K RAM for buffering, the WD 1791 dual density controller chip, and appears to be pin-compatible with our present ribbon cable and requires no modification to hardware. CP/M for it will cost around \$120-150, including customization for the extra speed of the Percsi drives we have. With the new IBM double density format (1024 bytes/sector) you can store 625,920 bytes per diskette, which nearly doubles the capacity of your Helios.

If you are seriously interested, send me a letter of intent to purchase one so that I can have a better idea of the demand. When I've checked it out, we can figure out the details of the transaction, but it will probably be done by credit card purchase.

PROTEUS TO UPDATE PTC SOFTWARE

PROTEUS has just arranged for Processor Technology to provide us with updates to their software whenever these updates are released to their dealers, and we will make these updates available to our members. We will update your original cassette or diskette to the new revision level and mail it back to you with appropriate documentation. There will be a small charge to cover packaging materials, postage, handling, photocopying, etc. Generally it will cost much less (probably nothing) to get this material from your local dealer rather than from us. We encourage you to try to obtain the update from PTC or from your local dealer, since he's really the one who is supposed to get it for you, but if you can't get it any other way, you can get it from us. Our agreement with PTC allows us to update onto original media only, since that is the only way we know who is a bona fide owner of the software item being updated.

The first few updates will be old ones, just to be sure everyone is caught up the the current level. (Our item codes represent "UD"=update document, "US"=update service. UD is just paper; US is alteration of machine readable media to current revision level.)

Proteus item UD1:

Extended Cassette BASIC Update 731064 (April 1978)--7 pages describing errata and addenda to Extended Cassette BASIC users Manual (First printing, Jan 1978, part number 727018) and fixing a bug in FOR/NEXT loop operation (supercedes incorrect fix published in ACCESS, Vol. 2, No. 1). Send \$1.30 plus a self-addressed, stamped envelope with adequate postage affixed for 2 ounces. This is documentation only--don't send your cassette, please.

Proteus item US1:

Extended Cassette BASIC, Rev. A (Part No. 727019)--This is the only version that has been released (I think), but if you have a cassette that doesn't say "Rev. A" on it, you may have an earlier one that got out somehow. If so, make a copy of the cassette, just for your own sake in case it's lost in the mails, and send us THE ORIGINAL CASSETTE imprinted with Processor Technology's markings. Send the cassette plus \$5.

Proteus item US2:

PTDOS 1.5 Rev. E (Part No. 727030)--This version is described in Proteus News, Vol. 2, No. 1. It is the most current version, as of December 28, 1979. The first release of PTDOS 1.5 was at Revision C. It corrected errors found in PTDOS 1.4 and added XREF command, CTAPE1 and CTAPE2 object files (device drivers), SolPrinter drivers, and Extended Disk BASIC. Revision D corrected the PTDOS resident, the GET command, and the Sol3 printer driver. Revision E updated Sol2 and Sol2E drivers. Copy your original PTDOS (1.4 or 1.5) diskette and send the original (bearing PTC's label) plus \$5. Order the manual for PTDOS 1.5 from PTC or through your local dealer. Manual Part No. 731029, second edition, plus updates to manual.

For information only:

WordWizard System Disk, Rev. B (Part No. 727212)--The first revision released was Rev A. Rev B updated Sol3 driver just as in PTDOS 1.5 Rev D. Rev C updated PTDOS on the WordWizard disk to Rev D. Rev D of WordWizard updated Sol2 and Sol2E just as on the Rev E PTDOS disk. I have Rev B of WordWizard. If you get PTDOS 1.5 Rev E, you can update the WordWizard system disk yourself by making the changes I have outlined here. Another revision of WordWizard is about to be released by PTC, so I won't make the revisions available until I get the latest ones. The new version will have centering and a modification that lets you keep typing during disk accesses.

For information only:

WordWizard Document Disk, Rev. D--The only changes made have been revision of the Sol3:A source file to reflect the changes to the driver files on the PTDOS and WordWizard disks.

For information only:

Extended Disk BASIC Update 731044 (Oct 78)--The way that EDBASIC is supplied now is in a file on the PTDOS diskette. Since this will be on unit 0, you should ignore the "/1" in the instructions in section 2.1 of the Extended Disk BASIC User's Manual, where it instructs you on making a working version of BASIC with the file MAKEBASIC. That's all that this update says, so there's no need to get it.

Proteus item UD2:

PTDOS Update 731072--Corrects errors and omissions from the PTDOS User's Manual, Second edition, First Printing, October 1978. 10 pages dated November 1978. Send \$1.75 plus a self-addressed, stamped envelope with postage for 2 ounces.

Proteus item UD3:

PTDOS Update 731073 (December 1978)--Describes the SolPrinter drivers in PTDOS Rev E and also provides notes on installing SolPrinters. 5 pages. Send \$1 plus a self-addressed envelope with postage for 1 ounce.

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(continued)



Proteus item UD4:
WordWizard Update 731075 (December 1978)--Describes space-averaging justification in the SolPrinter drivers, gives errata for the WordWizard User's Manual, provides specifications for custom printer drivers compatible with WordWizard and PTDOS, and explains use of the WIZ program ("the Electric Pencil sharpener") which converts files written on Electric Pencil I or II into WordWizard document files. 7 pages. Send \$1.30 plus a self-addressed stamped envelope for 2 ounces.

For information only:
A new update disk is about to be released by PTC for PTDOS, WordWizard, and FORTRAN. When it is, I'll announce it in the newsletter.

CONSIDER A MAINTENANCE CONTRACT

Charles Babb of the MicroSun Computer Center, Walnut Creek, California, sent us a copy of their maintenance agreement at our request. If you use your computer in your day-to-day business activities, you will quickly become so dependent upon your system that any interruption of service will have a crippling effect unless you can recover within a short time, say a day. One form of business interruption insurance is your computer maintenance contract. An alternative is for you to keep a complete stock of spare components that are easily replaced while the defectives are sent out for repair, provided you have someone with the skills and time to interchange the components, and then self-insure yourself on the repair costs. Most small businesses will be better off with a service contract.

The MicroSun Maintenance Agreement provides service for any site within a 100 mile radius of any of their stores. Preventive and remedial maintenance at the customers site is included. The monthly rate is 1% of the original retail price, payable quarterly in advance. Service can also be provided outside of the 100 mile radius, but will be negotiated individually. The complete product line of Processor Technology and most major microcomputer and printer product lines can be included under contract. Equipment that is not under maintenance contract from the date of installation will be subject to inspection and repair at prevailing rates prior to qualifying for maintenance contract.

MicroSun also provides service on a time-and-materials basis outside of maintenance contact, either by service call to your site or by a carry-in.

If you use your system heavily in your business, we suggest that you contact your nearest dealer and inquire about the service contract they provide.

LIQUIDATION BARGAINS

Because of their need for fast cash, Processor Technology is selling items in their inventory below wholesale prices. By the time you receive this newsletter, they will probably be all gone, but you can expect to see lots of bargains advertised soon as they are retailed out by the big buyers who snap them up. Items include cassette software practically for the cost of reproduction alone, Sol-PC boards, memory boards (remember the old 16KRA trade-ins?), Sol-20's new and used-in-house, etc. We are in contact with some of the people buying out the inventory. If you want to receive a list of items and prices, send Proteus a stamped, self-addressed envelope and a note saying you want the PTC bargain list. As soon as it's available, we'll send it out. Otherwise, you'll have to wait for the next newsletter and by then the good things will probably be sold out.

PROTEUS LOANS RECORDED LECTURES

Those of us who are in computer clubs in technologically rich metropolitan areas are fortunate to have a variety of people with expertise to call upon for lectures. To make some of these lectures available to those members who aren't so fortunately located, Proteus has begun a lending library of cassettes containing interesting lectures we have heard. We will maintain a few copies of each set and will mail them for you to listen to and return. We will ask for a deposit to cover replacement of the cassettes and album, plus a \$1 loan fee to pay for the envelope, the paperwork, etc., plus postage (mailing weight is 12 ounces per album of 4 cassettes). Please keep them no longer than 2 weeks. So far we have one album of 4 C-60 cassettes:

Proteus item LC1-4:

Lecture cassettes as follows--

LC1= Lecture on speech synthesis by rule, presented to the San Francisco Bay Area Chapter (Solus) by Carol Simpson and Doug Williams. They have been working under a grant to develop a portable speech prosthesis that can be used by handicapped persons who are only able to make a single movement (of an arm or leg). Using their Sol and Votrax speech synthesizer, they demonstrate the quality of speech they can produce using new synthesis rules developed by Ms. Simpson, a linguist. The tape includes a live demo. They also discuss several models of synthesizers, from the least expensive to the high-quality one they use. Running time 62 minutes on this tape, and continued on next one.

LC2, Side 1= completion of the speech synthesis lecture, with audience question-and-answer.

Side 2= Lecture by Howard Fulmer of Parasitic Engineering, presented 5-1-79 to the S.F. Bay Area chapter (Solus), on the "Sol-ution" expansion box manufactured by his company. It allows addition of more than 20 extra slots on the S-100 bus, in a remote (6 feet away) location, with high quality power supply that switches itself on and off automatically when the Sol goes on and off. He discusses the physical features and some engineering details that went into making this work reliably. 30 minutes.

LC3= Proteus General Meeting at the 4th West Coast Computer Faire, May 12, 1979, San Francisco, California. Moderator: Bill Burns. Speakers: Bret Bullington of Processor Technology Corporation, on the past, present, and future of Processor Tech, new software for business applications, new mini-disk, new hard-disk, etc.; Howard Fulmer of Parasitic Engineering, on the Solution box mentioned above; Bill Burns on his "Sol-Star" project to coordinate the software for Sol's with NorthStar disk systems; an astrologer (whose name we unfortunately misplaced) who has written a professional quality horoscope program to be sold by Processor Tech (the "SolSigns" program). 60 min.

LC4, Side 1= Conclusion of Proteus General Meeting at 4th Faire.

Side 2= empty.

To borrow this album, send two checks: one for \$13 refundable deposit, the other for \$2.58 to cover postage and the handling charge. (First class postage to anywhere in USA, Canada, or Mexico. Other foreign addresses, add additional postage. Mailing weight approximately 12.5 ounces.) Only US funds, please. The deposit check will be held, not cashed, until you return the album, and then returned to you.

If you are going to attend any lecture you think might interest Proteus members, please take your tape recorder. Check with the speaker to be sure he has no objection to our recording and distributing copies in this manner.

UNDERSTANDING CP/M
by Stan Sokolow

Recap

In the last issue we gave a brief overview of the CP/M operating system and covered its memory layout. We mentioned that the Console Command Processor (CCP) is the CP/M component which lets the human operator give commands to perform various manipulations of files. In this article we'll look at some of the console commands, and at the way an assembly language program instructs the operating system to do input and output from files or peripheral devices.

Files

Since CP/M is an operating system for computers with disk storage devices, one of the most fundamental features of CP/M is its organization of the data on the disk into storage units called files. CP/M as it's normally configured allows up to 64 such files to coexist on each diskette. The exact location of each file's data on the diskette is known only to CP/M (although the sophisticated programmer may be able to figure out how to get this information from CP/M). Under normal circumstances, the user only refers to the file by the name given to it when the file was created. The file names and the information needed to locate the file's contents are stored in an area of the disk known as the directory. As files enlarge during write operations, CP/M automatically assigns areas of the disk to the file as they are needed. Likewise, when files are deleted, CP/M reclaims their areas for re-use. The directory is automatically updated when a program completes its current use of the file and relinquishes control of it ("closes" the file).

File names consist of an 8 character prefix and a 3 character suffix. The prefix is the "given name" of the file's contents, and the suffix by convention indicates the type of data in the file. The two parts are separated by a period. For example, "MYPROG.BAS" could refer to your program which you call "MYPROG" and which is written in the language BASIC. If part of a name is not given (or does not use the full field size) it is taken to be filled with blanks. So, the file name "MYPROG" is given a suffix containing 3 blanks (spaces).

Some commands allow the user to give incomplete file names known as "ambiguous file names", which can refer to all of the files in the directory that have portions of the name in common. This is done by using question marks in place of some of the letters in the file name. The question mark acts like a "wild card" does in card games; that is, it will match any character in that position when the ambiguous file name is compared with a file name in the directory. An asterisk (*) in a file name means "fill the rest of this part of the name (prefix or suffix) with question marks." For example, "*.BAS" refers to all programs of type "BAS" in the directory. The extreme case of an ambiguous file name is "*.*" which refers to every file in the directory.

Commands

The Console Command Processor (CCP) recognizes two types of commands: built-in and transient. The built-in commands are performed by the CCP itself, whereas transient commands exist as disk files containing the machine language program to perform them. When the CCP is ready to accept a command, it gives the user a prompt on the console terminal. The prompt will be the name of the disk drive currently selected for use (A, B, C, ...) followed by the "greater-than" symbol (>). The user can then type a command and a carriage return, and CCP will execute the command.

Built-in Commands

To list the names of files contained in the directory of the currently selected disk, use the Directory command:

```
DIR *.*
Any specific or ambiguous file name can be given and the CCP will list all files matching that name. (Of course, if a specific file name is given, all you will see is the name of that file if it exists on the current disk.) Thus, you can list all file names of type ".COM" with
DIR *.COM
or all files beginning "MY" with
DIR MY*.*
which is the same as
DIR MY?????.???
and so on.
```

To switch to another disk drive, use the symbolic name of the drive (A, B, C, ...) followed by a colon:

```
B:
You can remove a file from the directory and reclaim its space for re-use. Use the Erase command:
ERA filename
Since ERA accepts ambiguous file names, you can remove all files on the disk with the single command
ERA *.*
```

Other built-in commands will RENAME a file, TYPE the contents of the file (assuming it to be ASCII characters) onto the console terminal, or SAVE portions of memory in pages (256 byte pages aligned on page boundaries) onto a disk file.

Transient Commands

When CCP doesn't recognize a command name as a built-in command, it assumes the name refers to a transient command file. It uses the given command name as the file name prefix, attaches ".COM" as the suffix, and then looks for a file with that name on the currently selected disk. If the file isn't found in the disk's directory, an error message is given and CCP prompts for another command. If the file is found, its contents are loaded into memory beginning at location 100H (hex), which is the beginning of the Transient Program Area (see previous article in this series). Then CCP jumps to the program beginning at location 100H. When the command program is done it returns control to the CCP, by jumping to the warm-start instruction in location zero for example.

Before CCP turns over control to the command program, it sets up certain parts of the memory in page zero. (See previous article for explanation of page zero.) The Default FCB is set up with the first two file names found in the argument field of the command line you typed, and the Default file buffer is set up with the entire argument field following the command name. Thus transient programs can read arguments to discover what to do.

You can make your own commands by creating a file of type ".COM" having the necessary machine program. To do this, you first get the program into memory somehow (we'll cover that later) and then store it in a file with the filename having your chosen command name as prefix and ".COM" as suffix. You can execute that command simply by giving CCP its name after the CCP prompt. The transient command "LOAD" will take the output ("HEX") file from the Assembler and convert it into a ".COM" file.

You can also eliminate any command you don't want on a CP/M system disk simply by erasing its file from the directory. This will let you customize and streamline your system to suit special needs.

(continued)

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Some of the standard transient commands are "ASM" (the assembler for translating assembly language programs into ".HEX" object files), "ED" (a text editor oriented for hard-copy terminals), "PIP" ("peripheral interchange program") which copies data between files and devices, "SUBMIT" (which creates a file of commands for CCP so that CP/M can run complex procedures in a batch mode), and DUMP (which gives a hexadecimal listing of a file). A multitude of other transient commands have been written and are available through the CP/M Users Group Library (CP/M Users Group, 164 West 83rd St., New York, NY 10024) or as proprietary programs which can be purchased from various vendors. These include compilers, interpreters, text editors, and so on.

Stratification of CP/M

Once a command file has been loaded and begins executing, its interaction with CP/M is not usually over, for it normally must do some input and output to be useful. Here's where another major feature of CP/M is important: hardware-independent input-output. CP/M was designed with a stratified structure. It exists conceptually in several levels of complexity, wherein each level utilizes the level directly below it without knowing what lies further down.

We've already seen that the highest level, the CCP-user interface, speaks in terms of commands, filenames, and disk units. This level is described in the CP/M manual called "An Introduction to CP/M Features and Facilities." The next level down is the one we're examining next, wherein machine language programs (commands) speak to the FDOS (floppy disk operating system) in terms of file control blocks, buffer areas of memory, and logical I/O (input/output) devices. This level is described in the "CP/M Interface Guide." On this level, programs can do I/O without knowing details of how the devices are operated by the computer.

At the next level down, the FDOS does all of the "bookkeeping" needed for I/O, but does its input/output by using the CP/M module called the CBIOS (Customized Basic Input Output System). The FDOS speaks to CBIOS in terms such as read a character from console device, write a character to the list device, select disk drive, select disk track, select disk sector, set buffer address, read selected sector, and so on. Thus the FDOS can do I/O without knowing the specific hardware-dependent details needed to perform these functions.

Finally at the lowest level, the CBIOS contains all of the hardware-specific subroutines (drivers) to work the particular devices for which it was customized. It speaks to the disk controller and peripheral devices in terms of I/O Ports, timing loops, head stepping commands, sector ID's, status bits, handshaking protocols, and so on. This level is described in the "CP/M System Alter ation Guide."

It is this stratification which has allowed CP/M to be adapted easily to so many different brands of disk units and yet remain compatible.

At the transient-program-to-FDOS level, which is usually as low as a programmer goes in the strata, input-output is done by setting up certain data in memory and in registers, and then CALLING the FDOS thru its standard entry point at location 0005H. In the next article in this series, we'll see just how this is done.

Extended Disk BASIC

A thorough explanation of EDBASIC would require an entire book, which someday may be written, but in this column we can't attempt it. Instead, from time to time, we will give tidbits of information that we find interesting.

EOF Processing in READ Statements

Although it is explained in the Extended Cassette BASIC manual, somehow the explanation was omitted from the EDBASIC Users' manual. Look at the statement numbered 100 on page 5-27 of the EDBASIC Users' Manual (Feb 1978 printing). It reads:

```
100 READ #1; S(I) : PRINT "EOF" : EXIT 200
```

This is an example of one way to detect the end of the data in a file. Normally when you place several statements on a single line separated by colons, BASIC will execute each statement from left to right. But in the case of the READ statement, the execution of the statements to the right of it on the line will only happen if the READ fails to find data in the file because you have reached the end of the file. When the READ finds data, it skips to the next numbered line rather than going on in the same line. This statement numbered 100 is the only hint of this fact that I could find in the manual. It certainly could drive you a bit nuts if you didn't know READ behaves this way. Typically this feature is used inside of a loop which reads and processes and loops back to do it again. In the example, the End of File (EOF) condition will cause a message to be printed and then exit from the loop.

FILL Statement

Extended Disk BASIC User's Manual update 731062 describes a statement that was added to EDBASIC after the manual was printed, but before BASIC was released to users. The general form is

```
FILL string, string-expression
```

where string can be a string variable or a substring function. What this does is fill each position of the string or substring with a copy of the first character in the string-expression's value. For example,

```
FILL L$(1,80),"**"
```

will fill the first 80 characters of the L\$ variable with asterisks. The FILL statement may also be used as a command.

SEARCH Statement Simplifies Table Look-ups

One use of the SEARCH statement is to look for a given string in a table to see if it is there and which one it is. For example, suppose you want to convert the name of a month into its corresponding number (JAN=1, FEB=2, ...). Here's an easy way to do that.

```
10 DIM T$(60)
20 T$="JAN1 FEB2 MAR3 APR4 MAY5 JUN6 JUL7 AUG8 SEPT9
OCT10NOV11DEC12"
30 INPUT M$
40 SEARCH M$(1,3),T$,I
50 V=VAL(T$(I+3,I+4))
60 PRINT V
70 END
```

T\$ is a table of 12 entries, 5 characters each. Statement 40 looks for the first three characters of M\$ in the table. If it is found there, I is set to the subscript value which points to the beginning of the entry in T\$. The value is 3 and 4 characters farther to the right, so statement 50 finds the appropriate value in the table and converts it to a numeric value from the ASCII in the table. You could enhance this program by adding an IF statement to detect I=0 when the given string isn't found in the table, and so on.

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To make sure you don't find an incorrect place in the table due to embedded occurrences of similar strings, you may need to concatenate a delimiter character that you know won't be found in the input string. This is best explained by example. "THE" will be found in the wrong place in this table because it is embedded in the other entries too: "ANOTHER THESE BREATHE THE". But if you tack a space on the ends, you will find the right one:

10 M\$=" " + "THE" + " "

20 SEARCH M\$, " ANOTHER THESE BREATHE THE ",K

You see, with the space on the beginning and end of "THE", the SEARCH statement will only find a match at the last occurrence in the table string. K will have the value 23 which is the position of the first blank before "THE". Notice that each entry has a blank before and after it too.

ANNOUNCEMENT OF SPECIAL INTREST GROUP

THE UNDERSIGNED WILL ACT AS COORDINATOR OF A PROTEUS SPECIAL INTREST GROUP FOR THOSE MEMBERS AND OTHERS WHO ARE INTERESTED IN DEVELOPING AND IMPLEMENTING COMPUTER-ASSISTED HOUSEHOLD OPERATING SYSTEMS. THESE SYSTEMS WOULD DO SUCH THINGS AS CONTROL HEATING AND AIRCONDITIONING, SECURITY SYSTEMS, ENERGY MANAGEMENT, ELECTRONIC MESSAGE CENTER, SCHEDULING OF LIGHTS & LAWN SPRINKLING, AND ? ? ? - YOU NAME IT!

NOW SEEKING INFORMATION FROM:

- * PERSONS WHO HAVE IMPLEMENTED SUCH A SYSTEM AND WHO WOULD LIKE TO SHARE THEIR EXPERIENCES.
- * PERSONS WHO HAVE DESIGNED, CONSTRUCTED, PURCHASED, OR USED HARDWARE OR SOFTWARE FOR SUCH A SYSTEM.
- * VENDORS, MANUFACTURERS, AND/OR WRITERS OF COMMERCIALY AVAILABLE HARDWARE AND SOFTWARE FOR SUCH A SYSTEM.
- * INTERESTED PERSONS WHO HAVE IDEAS ABOUT WHAT SUCH A SYSTEM SHOULD CONTAIN, OR ACCOMPLISH, AND HOW THIS MIGHT BE DONE, EVEN IF YOU HAVE NOT ACTUALLY DONE IT.
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THE GROUP WILL TRY TO COLLECT INFORMATION, REVIEW PRODUCTS, AND DEVELOP AN OUTLINE TO ASSIST PERSONS WHO WOULD LIKE TO TRY TO IMPLEMENT A HOME CONTROL COMPUTER. IF THE LEVEL OF INTEREST AND EFFORT PERMITS, WE WILL ALSO ATTEMPT TO PROVIDE ANSWERS TO SPECIFIC QUESTIONS FROM THE MEMBERSHIP. PLEASE FEEL FREE TO WRITE ABOUT ANYTHING WITHIN THE BROAD OUTLINE OF THE GROUP. IF YOU WANT OR NEED A PERSONAL REPLY, PLEASE ENCLOSE A SELF-ADDRESSED STAMPED ENVELOPE.

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HAS ANYONE HAD ANY SUCCESS IMPLEMENTING ONE OF THE INEXPENSIVE MODEMS (UNDER \$50) ADVERTISED IN BYTE AND OTHER MAGS? IF SO, HOW ABOUT A LETTER OR ARTICLE ABOUT YOUR EXPERIENCES.



MICROPI announces COMMON PILOT, the proposed standard CAI language for microcomputers. Offering capabilities comparable to those found on the world's most expensive CAI system, COMMON PILOT allows large scale computerized instruction on a micro. COMMON PILOT is a massive extension of various versions of Core PILOT available on hobby class computers. Features include floating point, scientific functions, varying length character strings, string manipulation, extensive pattern matching for answer processing and dynamic indirect execution of strings. Typical instructional language features for text presentation, response processing and decision making are complemented by all the features normally found in extended BASIC.

Programs are interpreted directly from disk thus reserving RAM for storage of variables, arrays and strings. Programs may be virtually any length limited only by disk space. This allows instructional courses to be richly branched and very conversational without having to squeeze into available memory. A typical 45 minute CAI course may be 30 to 100 K on disk.

Before it was available in a microcomputer version COMMON PILOT was run on a time sharing system at Western Washington University with over 400,000 student contact hours over a 4 year period.

MICROPI has developed several compatible versions of COMMON PILOT for different hardware. A 6800 version which supports the SWTPC CT-82 graphics terminal is available directly from Southwest Technical Products Corporation. An 8080/280 version may be purchased from MICROPI on minifloppy disk in North Star DOS format(\$275), or minifloppy CP/M format(\$275), or HELIOS II format(\$300). COMMON PILOT will soon be available on disk for the TRS-80 (\$195). A proprietary version written in PASCAL is also available which allows implementation on any system supporting interactive PASCAL. Also COMMON PILOT will soon be available for the Alpha Microsystems, Odell 85, Terak 8510 and PDP 11/34 with RT-11. In the interest of maintaining complete language compatibility on various computer systems, MICROPI is continuing to implement COMMON PILOT on a wide range of systems. Since resources are limited this is governed by demand and by support from hardware vendors.

MICROPI is also building a catalog of COMMON PILOT courseware it will distribute commercially. Royalties are available to authors of quality CAI material.

MICROPI is located at 2445 Lummi Island, WA 98262

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SOFTWARE REVIEW

by Newett Avl
PATB from DAIR Computer Systems

DAIR Computer systems is selling a package of software and a set of manuals to support this interesting software.

DAIR has come up with an extended version of Li-chen wang's Palo Alto Tiny Basic. This small version of BASIC has always been good. So good in fact, that Tandy made some changes to it and released it as their very own Level 1. DAIR has had the good taste to mention the software's parentage and have given Dr. wang credit for it's origination.

By calling their package "PATB", which stands for Palo Alto TOKEN Basic, they have created some confusion among those of us who recognize "PATB" as Palo Alto TINY Basic. As we go along, we will try to use the words TINY and TOKEN to refer to each of the packages.

For those who may have missed the original documentation that appeared in DR DOBBS JOURNAL, DAIR supplies the entirety of the source listing in their Technical manual (\$18.75). For the computerist who is never satisfied to leave a good thing alone, DAIR has spilled all the software beans, and you can modify and patch until nobody would recognize anything. The size of TINY has been increased from 2K to the TOKEN's 8K. If you start with TOKEN, just think, you could be the first on your block to have written a 56K basic and TRIUMPH is what I'm going to call mine, so don't use that, but TITANIC and TREMENDOUS weren't spoken for at press time. For those who want to study excellent programming techniques in 8030 assembly language, the technical manual is a gem, and cheap, as textbooks go.

To preserve the blazing numeric speed of TINY, DAIR kept the integer arithmetic features of the original TINY and have improved the speed still further. TOKEN increases the number of variables from 26 to 260, and the functions from 3 to 13. Integers are restricted to values in the range +/-32,767.

Variables are divided into two classes. Local variables can have a single letter name. Global variables have a single letter followed by a number. If you are not straight, you will love the "DOWN" feature: You can push all the variables (A-Z) on a stack and start a new set. When you have messed up those sufficiently, you can "UP" and have your old set back. You can DOWN 10 times before UP[ing] and still not understand what you did, unless you now use the single quote, in which case you get back your old messed "UP" ones instead. If you get so confused you don't remember how many DOWN[s] you did without UP[ing], you can always &STKLVL and let the computer tell you how many it DOWN[ed] because it is still trying to keep track despite what you do. [Many of you who read this will claim incorrectly that I was down on the UP function. Actually, just the reverse is true.] By careful use of the UP[s] and DOWN[s] you can write some interesting recursive code. If you have an aversion for recursion, but are otherwise straight, you can use the variables globally. Speed fiends and bench mark addicts will no doubt use only the single character variables because they are processed faster than the two character variables.

DAIR has pioneered the next feature as well, and it's high time too! There are two arrays. The "~" [tilde] array is located in the first physical memory location and addressed by a 16 bit address. The tilde array contains anything there, as well as DOS, TOKEN, and the other array which is located just after the last word of the program. Think of it! The whole system memory is one big array that you can get to by simply accessing a 16 bit array variable. This may be the most important new feature to self-destruct the system since POKE was invented.



This review cannot and did not cover the whole TOKEN package, but I hope that you found some of the features that I did mention, interesting enough to cause you to explore this package in more depth. TOKEN is small, fast, well documented and cheap. The code is solid and well thought out, and it will run in a very small machine with no trouble at all. The fact that the documentation is provided and the commented source listing is available makes it possible for the enterprising programmer to add his own features to suit himself. The theme is not original, but much of the thinking that went into the implementation is highly original and came into being because the coder needed the features in a compact and efficient basic. It is a good software buy.

ELECTRIC PENCIL II A SOFTWARE REVIEW by Stan Sokolow

Perhaps the most well-known program for word-processing on the 8080 microcomputer is the Electric Pencil, by Michael Shraver Software, 1253 Vista Superba Drive, Glendale, CA 91205. In Solus News (the former name of Proteus News) volume 1, number 4, one of our members reviewed the first version of Electric Pencil. In this review, we will examine the Electric Pencil II and compare it with the WordWizard, PTC's word-processor. Our experience is based upon working with version SSH for PTDOS.

As we mentioned in our review of WordWizard (Proteus News vol. 2, no. 1), a word-processor differs from a text editor used for writing computer programs. The text editor doesn't usually attach any significance to the breaks between words or at the end of paragraphs. A word-processor is a text editor specifically for typing ordinary text, such as letters or other documents. The word processor recognizes that words, paragraphs, margins, etc. exist, and it usually provides special conveniences for justifying, centering, underlining, and so on.

In WordWizard, the video display acts as though it were a window with the paper behind it. The document is constructed before your eyes almost as it will appear on the paper when it is printed. In Electric Pencil, a different approach is used. The screen shows the characters that you have entered, but it does most of the formatting of the document as it is being printed. What you see is the content and formatting indicators that instruct the "Pencil" to arrange the text.

For example, justification (filling short lines with extra blanks to make the right margin even) takes place right before your eyes in the Wizard, but the Pencil always displays the text unjustified. When lines are longer than the width of the video screen in the Wizard, the screen "pans" to the right to show the right side, but the Pencil lets the line wrap around to the next line of the display. It does move word fragments down to the next line, but it does not justify until it is printing out the document.

Another difference in approach is in the way documents are stored. In the Wizard, the document is stored on the disk and only small portions of it are brought into memory as needed. This is automatic. In the Pencil, the saving and loading of text is done by explicit commands from the operator, and the only portion accessible is that which has been loaded from disk. Basically, the Pencil expects that you will break long documents down into sections that fit into available memory, but the WordWizard does that automatically.

A significant difference between WordWizard and Electric Pencil is apparent when you begin to print a document. When the Pencil prints, the video screen shows a print counter which counts the number of copies printed, and that's all that you can use the system for until the document is done printing. You have to take a coffee break or do something else. On the other hand, when WordWizard begins printing a document, the activity menu returns to the screen and you can continue to use the system to edit another document. This simultaneous printing feature of WordWizard lets the computer and the typist remain productive while the printing is being done. This feature is enormously important to the business user.

Now that we have a general idea of how the Electric Pencil compares with the WordWizard, let's look at the features of the Pencil in more detail.

(continued)

First, the hardware required. Electric Pencil comes in many different versions, depending upon the type of storage device and printer you have. The particular version I have is for Helios with PTDOS and a Selectric terminal. The printer driver subroutine can be changed quite easily if you understand assembly language programming, and the manual has an appendix explaining the way to do this. Cassette versions as well as disk versions are available, and in fact the disk version includes the cassette drivers (and perhaps vice versa). The CP/M version was written before the PTDOS version, and it seems that the PTDOS version is just an adaptation of the CP/M version since some of the PTDOS features were not used where CP/M didn't provide these features. The minimum memory needed is 16K, but since the whole document plus the Electric Pencil must fit into memory, 16K will limit you to small documents.

Now, let's look at how you create and edit documents. When the Pencil first comes on, all that appears is the copyright notice. Depressing any key will cause the screen to blank and the letter to appear in the upper left corner (HOME) position. Typing can proceed normally and letters will continue to be placed on the screen. At the end of a line, the Pencil does what the Wizard does (when justification is off); that is, the word fragment at the end of the line is removed and placed at the beginning of a new line, and the typist continues to type on the new line. You can be unaware of line endings until you end a paragraph, and then you type a line-feed character. The carriage return is not used at the end of each line you see on the screen. Paragraphs actually exist as one large string of characters in the memory, ended with a line-feed. The line-feed prints on the screen as a left-arrow so that you can tell where you have given one. (In the Wizard, the return key is used instead of the line-feed, and it produces a special symbol, the inverted L, in column 64.)

To do anything but enter text, you need to use the special keys on the Sol or control characters formed by holding the CTRL key down while depressing another key. For example, the cursor can be moved around on the screen by using the arrow keys on the Sol, or control keys on non-Sol keyboards. CTRL-A moves it to the left, CTRL-S to the right, and so on. You can cause the text to move up or down on the screen to view other parts of the document. CTRL-E causes the text to scroll up continuously, CTRL-X scrolls down. While it is scrolling, the number keys can be depressed to alter the scrolling speed and the space bar can pause the scrolling. The RETURN key resumes scrolling after it has paused. The zero key will cause continuous scrolling to stop and page-at-a-time scrolling to begin each time you press the space bar. This scrolling is very flexible and fast. The WordWizard allows scrolling up and down continuously, but not page-at-a-time and not variable-speed in the present version. Line-at-a-time scrolling can be done by both Pencil and Wizard the same way, by using the vertical arrow keys to move the cursor beyond the top or bottom of the screen. Scrolling on the Wizard is interrupted occasionally for disk accesses as needed, and scrolling causes simultaneous printing to pause until the scrolling is done.

Character deletion on the Pencil is done with the CTRL-D. This removes the character at the cursor and pulls text from the right to fill in the gap. If a word from the beginning of the next line can now fit at the right end of the current line, it is pulled up onto the line and all lines below are similarly adjusted until the end of the paragraph. In the Wizard, deletions are done with the DEL key and they pull characters from the right on the same line, but not from lines below. When the deletion is done, you can give the Close Paragraph command in Wizard to close up the gap by pulling words from below and reformatting the paragraph.

Character insertion is done by switching on the insertion mode with the CTRL-F in Pencil. The character at the cursor is temporarily replaced by a right-arrow and anything you type is inserted there, pushing the rest of the paragraph to the right and down as you go. When the insertion is completed, you press the CTRL-F again and the right-arrow is replaced by the character that originally was there, and you are back in the over-write mode. In the Wizard, the insertion is done by splitting the current line at the desired location. The Insert Split command does this. Then the insertion is typed and the Close Paragraph command will close up the gaps again.

Electric Pencil has CTRL key commands to move the cursor to the beginning of the document, move to the end of the document, scroll, delete and insert characters or lines, erase to end of line, delete blocks of text, insert blocks of text, search through the text for a desired string of characters, search and replace character strings, and so on. It does not have commands to set margins or set tab stops. Margins are determined when printing is ready to be done, and tab stops don't exist. The tab key just advances the cursor 8 spaces, always.

When you want to print a document, you first give the CTRL-P command to enter the Print Sub-System. A table is then displayed showing the current settings of the variables which control the printing format (the print values). You can give new values using single letter codes to identify the values being changed, or you can use the existing values. A carriage return starts the printing and displays the print counter which counts the number of copies completed. As mentioned before, you can't do anything else with the system while printing is going on.

In the body of the document you can insert special codes that also change the print values as they are encountered in the printing phase. These Dynamic Print Formatting commands are identified with a period in the first column, followed by the same character codes as in the Print Sub-system. Comments that don't print can also be embedded in the text. WordWizard also provides dynamic print formatting, but not to the same extent because most of the formatting has already been done on the screen.

Centering is done in the Pencil by inserting a line beginning with a period and a capital C and ending with a line feed. Then the next line will be centered, provided it is shorter than the Line Length print value when the printing is done. The original release of the WordWizard did not have a centering command, but this has been added and old versions can be updated to include it. I haven't seen the update, but I have been told that centering can be done immediately on the screen, or deferred to printing time as in the Pencil. Multiple lines can be centered with one command.

Underlining in the Pencil is done just by marking the phrase to be underlined. An underscore is placed immediately before and after the character string to be underlined. For example,

This is a test of underlining.

The Diablo printer version allows boldface typing to be done in a manner similar to underlining, but the vertical bar is used instead of the underscore. Also in the Diablo version, the caret (^) will do negative line-feeds, so you can use this feature to roll the paper back and print another column of text next to the first one. WordWizard doesn't provide for negative line-feeds, so multi-column layouts must be done one column at a time and pasted up in multi-column form. Underlining and boldface can be done in Wizard, but not as easily as in the Pencil.

Page titles and page numbering are provided to a limited extent. The page title can be set with a line beginning with a dollar sign. Whatever follows the dollar sign until the line-feed will be used as a header on the subsequent pages. Page numbering will always appear in the upper right corner preceded by the word "PAGE". If your style manual calls for page numbers at the bottom center, or any other variation, you are out of luck with the Pencil. The WordWizard allows you to specify page headings and footings and to put the page number wherever in those lines you want. Headings and footings can be more than one line long. However the WordWizard (in the present version) doesn't allow you to do such fancy page numbering as alternating left and right the way it is usually done in books printed on both sides of the page. You could do it, but not automatically. Footings can be used for footnotes in the WordWizard, but no such provision is made in the Electric Pencil.

To manipulate files while you are in the Electric Pencil, you first enter the Disk Sub-system with the CTRL-K key. The screen then will show a table of commands you can give, but the commands are somewhat abbreviated. It also displays the number of words in the document you are editing and the number of paragraphs (number of line-feeds). From the sub-system you can save the document onto a disk file, load a new document from a disk file, view the disk directory, delete a disk file, read a document from cassette tape, save a document onto cassette tape, clear all text after the cursor, clear all before the cursor, clear all of the text, or exit back to the editing mode.

There are a few things annoying about the way this Disk Sub-system works. The Save command is designed to save text from the present cursor position to the end. I am constantly bungling this and entering the Disk Sub-system with the cursor positioned after the last thing I typed at the end of the document. When this happens, the Save command gives the error message "NO TEXT AFTER CURSOR" and then I have to exit back to the editor, give a CTRL-B to move the cursor back to the beginning of the file, and re-enter the disk Sub-system. After experience with the Electric Pencil, I am sure you will remember to do that, but the beginner or occasional user walks right into the error. I suppose the feature is there for a good reason, but I haven't had to use it yet. Also, when I enter the disk sub-system I am invariably in lower-case mode on the keyboard. The commands must be in upper case, and lower case gives a "BAD

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(continued)

SYNTAX" error. In the WordWizard, when upper-case is required, the program automatically converts lower-case to upper-case for this reason. The Directory command lists all of the files on the selected disk, rather than just the files of Electric-Pencil-type. You have to wade through the system file names, like RESIDENT, FSMAP, BOOTLOAD, and all of the command names in PTDOS, and all of the information protected files, and all of your other programs, and on, and on, just to see what documents you have. The documents are always recorded with type "P" (for Pencil), so the sub-system could just display these files that are of interest, but it doesn't. The non-programming operator will probably be confused by all of those files. I recommend creating a special system disk for you Electric Pencil and deleting from it all but the bare minimum files, or always store your documents on a data disk that has only your Electric Pencil files on it.

A few other things about the Electric Pencil are not as slick as they are in the WordWizard. When it first comes on, the Wizard gives a practically self-explanatory menu of functions, but the Pencil just sits there with a copyright notice until you press a key and then it begins editing with a virtually blank screen. The menu approach is much easier to learn from and easier to use if you only do word-processing occasionally.

When a disk is needed but it is unloaded from the drive, the WordWizard blanks the screen and flashes the message "Insert disk!", but the Electric Pencil just lets the operating system give its usual error message "DRIVE NOT READY". Actually, Michael Shroyer had little choice in this because CP/M doesn't let the application program intercept this error condition and perform a special error routine. Also, neither did PTDOS 1.4. But PTDOS 1.5 has had a "device not ready" trap added to it. The lack of error traps in CP/M causes Michael Shroyer to give the warning in his manual, "Under certain other disk error conditions, control of the system may also return to CP/M. If a file still remains in the Electric Pencil and needs to be saved, ALWAYS re-enter the Electric Pencil at address 185H ONLY!!! Entering at 100H will re-initialize the system and DESTROY all text files." Can you imagine giving these instructions to a typist using this fancy electronic typing system in the typing pool? PTDOS provides the application programmer with full control over error conditions so that appropriate recovery action can be taken or simple, intelligible messages can be issued to the non-technical user. I don't know if the Electric Pencil takes advantage of these error returns.

WordWizard provides a way to create standard clauses and merge them into the document being edited simply by giving their name. These standard clauses can be something as simple as names and addresses frequently used, or as complex as whole documents. In the printing industry, such standard text is often called boilerplate. This feature also can be used to move portions of documents from one file to another. Similar things can be done in Electric Pencil, but not without a lot of manipulation involving loading files and moving blocks around.

In the Electric Pencil, to exit and turn off the system completely, you first must enter the Disk Sub-system with a CTRL-K, save the text onto a disk file, ESCAPE back to the editing mode, give a CTRL-O to return to the operating system, answer "Y" to the reminder question it gives before leaving Pencil, "ALL TEXT SECURE?", and then you will get the operating system prompt. In the WordWizard, to quit editing all that you do is press the ESCAPE key to return to the word-processing menu, press ESCAPE again to leave the word-processing level and get the system function menu (for copying disks, etc.), and press ESCAPE again to return to Solos where you began. All text saving is automatic. The sequence is consistent--you want to escape to the next outer level. No run-around.

In Electric Pencil, some restrictions are placed upon what you can do, where in WordWizard they aren't. For example, the Pencil won't let you print one continuous column without page boundaries. For some reason, it insists upon placing at least 2 blank lines (and no more than 20 blank lines) between pages, and pages can only contain 1 to 72 lines each. Pencil makes no provision for superscripts and subscripts, but WordWizard allows you to vary the vertical line spacing to produce them. Both allow you to set the variable pitch for the Diablo printer, but the Pencil places the arbitrary restriction that pitch must be between 8 and 50, whereas the Wizard allows any pitch from 1 to 120. For special effects, you may want to use very close character spacing to produce unusual looking fonts similar to bold-face. Pencil gives you no choice on how pages are numbered; WordWizard lets you designate where and how page numbers are to appear.

Pencil makes no provision for widow prevention. A "widow" in typographical jargon is a fragment of a section that should remain together with the section that follows it. For example, beginning a new chapter title at the bottom of the last page of the previous chapter is definitely a stylistic no-no. To prevent that, you need to signal the beginning of a new page in the text. The WordWizard has the Eject statement to do this. It also has a Widow statement that allows you to say that the next N lines are to be kept together, and if they would otherwise be split across a page boundary, do a page eject before beginning. This Widow statement is useful to be sure that charts and tables appear on one piece rather than split across pages. It also can be used to leave blank space for a picture to be pasted on the printed document.

In summary, the Electric Pencil is an excellent program for word-processing of small documents where some concessions can be made about layout and where some fancy features like footnotes, superscripts, boilerplate insertion, and the like are not needed. It is not as comprehensive as WordWizard and not as easy to learn or use, but it certainly gets the job done. For the business user who expects his secretary to learn and use the system for day to day typing needs, I recommend the WordWizard, especially when you consider what it costs to train someone new to use the system. For the technical person or the hobbyist, the Electric Pencil will be fine. However, keep in mind its limitations. Sometimes you can't bend the rules of style (such as in dissertations and thesis) and the Pencil may come close, but not close enough.

NOVICE - TO - NOVICE

From time to time we have received letters from people new to computing who have learned a few things that they would like to pass on to other beginners, but who felt that they are out of their league in Proteus News. This column is to give them an opportunity to pass on what tidbits they have learned without feeling that their articles will be regarded as too elementary. Items submitted for this column need not be extensive, all-inclusive, nor definitive. Just send us anything you have found out about anything you didn't know before you found it out. Got the idea? Then let's hear from you. By the way, you need not still be a novice to contribute here, but the material submitted should be for the novice who knows very little. For example, ...

HOW TO GET 'REM' STATEMENTS TO LOOK LIKE YOU WANT THEM

Processor Technology's BASIC interpreters compact your statements when they are stored in the computer's memory and then expand them again when you LIST them. In the process, your REMARK statements may be changed slightly if you use the abbreviation 'REM'. You may have noticed that the blank spaces after the REM are eliminated when you LIST. To avoid this, just put some sort of punctuation after the REM. I prefer a period, since REM is an abbreviation, but it really doesn't matter. For example,

```
10 REMARK   FIRST COMMENT LINE
20 REM      SECOND COMMENT LINE
30 REM.    THIRD COMMENT LINE
40 REM--   FOURTH
50 REM:    FIFTH.
```

will LIST as

```
10 REMARK   FIRST COMMENT LINE
20 REMSECOND COMMENT LINE
30 REM.    THIRD COMMENT LINE
40 REM--   FOURTH
50 REM:    FIFTH.
```

Notice that BASIC removes blanks after the "REM" until it encounters anything other than a blank. Hence when the full word "REMARK" is used, nothing is changed. But when "REM" is used as in line 20, everything moves over. The punctuation in the other lines stops this blank-removal, so they look okay.

SOFTWARE REVIEW
by Joe Maguire

PATCH by Keith Turner: A program which acts as an interface between Processor Technology Extended Cassette Basic and the Northstar Disk Operating System. Price: \$19.95

ALS8 MOVER (author not given): A relocater for Processor Technology's ALS8 with patches to SOLOS. Included on the same disk is ASSI which allows assemblies from the Northstar Disk System. Price: \$19.95

THE DOS MOVER by Keith Turner: A relocater for the Northstar DOS. Also included is a relocater for Northstar Basic, Compact and Monitor. Price: \$19.95

The above programs are all distributed on Northstar disks and can be obtained from: (CA residents, don't forget sales tax)

THE DIGITAL DELI
80 WEST EL CAMINO REAL
MOUNTAIN VIEW, CA 94041
(415) 961 2670

[Ed. note: We have learned that The Digital Deli mentioned in Joe Maguire's article doesn't fill mail orders for these items, although he once did so. He apparently does sell them in his store. A member of Proteus has called The Digital Deli from Illinois many times and written letters and even asked me to investigate, all over many months' interval, and still no results. I think the Deli has arranged for John Dvorak to distribute these programs by mail. John sells a multitude of software packages for NorthStar disk users and produces a free newsletter that reviews the items he sells. For information or a free subscription, write to J. Dvorak, 704 Solano Ave., Albany, CA 94706. State your computer system configuration.]

Note: When ordering any of these programs, be sure to state which version of Northstar software you are using, particularly if it will be used with double density.

PATCH Patch is a cleverly written program which allows a user to load and save Extended Cassette Basic programs and files using a Northstar disk system. Patch does its job by replacing the CUTS tape routines in ECB with pointers to custom disk routines contained in an area following the Northstar DOS. A unique feature of Patch is that it is reversible. Typing the command PA from SOLOS inserts the patches to allow disk operation. Typing RP from SOLOS replaces the patches with the original tape handling routines. This makes for a very flexible system. Other custom commands available from SOLOS (all loaded when the program GEN.PA is first executed) are: DO, jump to DOS, BA, enter Basic and BT, reboot the Northstar DOS. Patch does require a relocated version of the DOS which can be obtained from the DOS MOVER program. (see below) All of the original tape commands are retained with Patch which means that existing programs can easily be converted to disk. The documentation provided is very good.

OVERALL EVALUATION: Excellent

(Note: When contacting users of this program for their comments, it became clear that not many are continuing to use PTC's ECB. Reasons ranged from too many bugs (PTC - where oh where is Access with the fixes?) to the fact that NS Basic, which was designed for disk operation, can handle programs better in this environment.)

ALS8 MOVER This program is able to relocate PTC's popular assembler/editor/simulator package to any memory address. The ALS8 MOVER differs from similar relocators which have appeared in Proteus/Solus News in that it is able to break up the program into segments. For example, it is possible to locate the main program from 0000 to 1FFF and designate the system RAM in an area above 2A00. This allows direct loading and execution with the standard Northstar DOS. A companion program on the ALS8 MOVER disk, ASSI, allows assemblies of one or more disk source files. This feature essentially gives a cassette ALS8/Northstar disk combination the power of Helios. The ALS8 Mover can be used with either revisions A or B. The documentation is excellent.

OVERALL EVALUATION: Excellent No user of ALS8 with a Northstar disk system should be without this program.

DOS MOVER The Dos Mover is one program that has gotten a lot of use with my computer system. With it, a Northstar owner can move the DOS from its odd standard address of 2000H (probably dictated by the early Altairs) to one which will permit non-Northstar software to be loaded and executed. A good example of this is PTC's Extended Cassette Basic. Without the Dos Mover, ECB must be loaded from tape each time it is wanted since the upper part of Basic occupies the same area as the DOS. This can be a frustrating experience for one who is used to disk speeds.

The Dos Mover not only moves the original code but carries any custom I/O routines along with it, adjusting all the jumps and calls correctly for the new location. An added feature is BOOT which allows automatic startup and relocation to a predetermined address. Release 4.0 of the Northstar DOS allows one filename to be loaded and executed automatically from the disk so with that, Dos Mover and Boot, PTC's ECB could be brought up and running with one keystroke!

Included on the DOS MOVER disk are relocators for Northstar Basic, Monitor and the utility program Compact. The double density version will include relocators for the CF, CD, and DT utilities. This combination allows, for example, the DOS at 0000 and Basic at 0000. (0000 for double density) One extra block is required with a relocated single density DOS to contain the PROM routines. That effectively gives the user up to an extra 8192 bytes of program room in a 32K system.

A handicap for some owners of the new double density system is that the DOS is larger than the previous one, extending up to 2D00. A lot of vendor software written for the NS system uses an origin of 2A00. Without the Dos Mover, a lot of this software cannot be used with DD. Also, DD permits an initial load of the DOS to any memory location as determined by the content of the first word of track 4, sector 1, on the disk. The Dos Mover gets to be a real bargain when one considers that Northstar will charge \$25 for each copy of custom origin software to take advantage of this feature.

The documentation provided is excellent with step by step instructions given to create your special copy. A special section deals with some oddball versions of PROMS and I/O routines which were released some time ago.

OVERALL EVALUATION: Excellent Another program that a Northstar owner should not be without.

PROTEUS CASSETTE C6
PTC ECBASIC programs--side 1 compiled, side 2 text format.

MULTP C 3C20 058A Multiplication practice
MULTP C 3C20 058A
ADD C 3C20 0587 Addition practice
ADD C 3C20 0587
SAIL C 3C20 0582 Navigate your boat to the islands
SAIL C 3C20 0582
CHOMP C 3C20 09DA Force the computer to chomp the last bite
CHOMP C 3C20 09DA (a 2-dimensional variation of Nim)
ROCKT C 3C20 1399 A sophisticated lunar-lander simulation
ROCKT C 3C20 1399
STOCK C 3C20 1230 A stock market simulation game
STOCK C 3C20 1230
CYLON C 3C20 093D A pursuit game in real-time.
CYLON C 3C20 093D
SCIFI C 3C20 0E82 Writes all-too-familiar science fiction plots
SCIFI C 3C20 0E82
SPEED C 3C20 0D70 Speed reading competition
SPEED C 3C20 0D70
AARON C 3C20 0BE5 A memory game (tricky)
AARON C 3C20 0BE5
TRUCK C 3C20 1700 Keeps track of vehicle operating costs in
TRUCK C 3C20 1700 several categories
FLOW C 3C20 07CA Estimates how long a supply of water will last
FLOW C 3C20 07CA
END C 3C20 0019 End-of-files.
END C 3C20 0019

PROTEUS CASSETTE C7
Assembly language source and object

SCS16 0100 2700 Assembly language system (Self-Contained System)
SCS16 0100 2700 Editor, assembler, disassembler. Version 1.6
CSEL D C863 035E Output driver for IBM 2741 Correspondence code
CSEL D C863 035E selectric terminal. EX C863; SET CO C903; SET Q=3.
CUP0 0001 055A Cassette Utility Package. Introductory documentation
CUP0 0001 055A is in CUP0 as ALS-8 file.
CUP1 0001 1C97 Cassette Utility Package. Documentation of CUP as
CUP1 0001 1C97 ALS-8 file.
CUP2 0001 19B8 CUP source code as ALS-8 file.
CUP2 0001 19B8
CUP3 0000 00FC CUP object code as Solos/Cuter file.
CUP3 0000 00FC
SCDO1 0001 13B2 A routine to execute a list of Solos commands on
SCDO1 0001 13B2 the screen. Documentation and source file.
SCDO2 0001 03CF
SCDO2 0001 03CF
LIST U 3E00 01D1 Makes a file at the beginning of your cassette and
LIST U 3E00 01D1 containing a directory of files on the cassette.
BSHIP G 0000 1121 Battleship game
BSHIP G 0000 1121
TAPE2 C900 0095 A tape test program to record and read back a test
TAPE2 C900 0095 pattern.
PRNIN CC00 0400 Displays instructions for PIRAN. Press CLEAR key
PRNIN CC00 0400 then MODE 15 times then type GE and press return key.
PIRAN G 1000 0901 Piranha game. Outmaneuver these voracious fish and
PIRAN G 1000 0901 swim to safety while amassing points.
SS2A F 2A00 0600 Single-line simulator. Single Steps through a
SS2A F 2A00 0600 machine language program, displaying registers at
SS3A F 3A00 0600 each step. The only difference between SS2A, SS3A,
SS3A F 3A00 0600 ...SS6A is the load point of the program. Each
SS4A F 4A00 0600 version begins execution at its starting point
SS4A F 4A00 0600 (2A00, 3A00, etc.). Program will then want a 4 digit
SS5A F 5A00 0600 address where simulation is to begin in your program.
SS5A F 5A00 0600 Space bar single steps. See complete instructions
SS6A F 6A00 0600 in C7 Documentation.
SS6A F 6A00 0600

BAUD C900 00FF Object file of ASCII-to-BAUDOT output driver by Bill
BAUD C900 00FF Jones. See Proteus News, Vol 2, No 2, p 11.
UTIL U CB00 00A0 Memory fill and ASCII dump utilities by Lewis Moseley.
UTIL U CB00 00A0 See Proteus News, Vol 2, No 2, p 19. Object file.
MTEST U CB00 00E0 Memory test by Lewis Moseley. See Proteus News, Vol 2
MTEST U CB00 00E0 No 2, p. 14. Object file.
UTSYM 2000 0F35 Utility program above, in source file (ALS-8 style).
UTSYM 2000 0F35
MTSYM 2000 1586 Memory test source file.
MTSYM 2000 1586
ASSM O F000 1000 Assembler similar to SCS16 above, based upon PTC's
ASSM O F000 1000 SP#1. Resides in top of memory.
TASSM O F000 1000 ASSM above, modified to assemble 300 baud cassettes
TASSM O F000 1000 from tape source to memory object.
ASSM 0100 237B Source modifications to original SP#1 to create ASSM.
ASSM 0100 237B
TASSM 0100 096D Source Modifications to ASSM to create TASSM object.
TASSM 0100 096D
DASCI 0100 05D2 Dump ASCII source code.
DASCI 0100 05D2
EODO 0100 0B34 Enter octal/dump octal, program source.
EODO 0100 0B34

CASSETTE LIBRARY SNAFU

In military jargon, "SNAFU" means "Situation Normal--All Fouled Up." Well, that describes our first experience with high-speed cassette copying. We discovered two problems with the tapes we distributed so far. Some tapes have a loud, intermittent popping that causes permanent RD errors, and some have no data on side 2. The popping was due to a static electricity discharge in the cassette during high speed copying. The blank side 2 was due to an intermittent connection in a cable between the master and slave units. We're waiting for the unit to be repaired and then will make a new set of tapes. If you have trouble with your library tape, please return it for an exchange. Sorry for the trouble it causes, but you can't imagine the trouble this is causing us too.

NOTES ON LIBRARY DISK H1
by Stan Sokolow

A few things about our Helios library disk H1 need a bit more explanation. Reproduced below is a listing of the files on the disk. The CONTENTS file, which is an annotated list of the files, was published in Solus News, volume 1 number 6. In the CONTENTS file listing I mention file INITPATB with regard to using PASCAL, but this remark should be disregarded -- INITPATB is irrelevant and can be deleted from the disk. To use Pascal, you should prepare a relatively empty system disk with PTDOS and associated command files, but without BASIC, TREK80, etc. Place this system file in drive 0 and H1 in drive 1. Give the command "DO PAS.GET/1" and the Pascal system will be copied onto your system disk in drive 0. You can get the sample programs onto your system disk by copying them or GETting them. For example, "GET I=/1,/0,GCD:S,P:S,QUEENS:S,SOMA:S". The Pascal sample programs can be identified by the suffix ":S" for "source" and file-type "P" for "Pascal". You can now remove H1 from drive 1. The command "COMPILE GCD:S" will compile the program "GCD:S" and put the resulting object file (p-code) into the file named "POBJ". You can copy POBJ into any file you desire. To execute a program, give the command "RUN file" where "file" is the filename of the object file, such as POBJ or whatever other file you have put the object code into.

I have no other documentation on SLAC Pascal other than what is in file PAS.DOC on H1. The compiler does respond to directives given in parentheses in the first source line, as described in the textbook on Pascal mentioned in PAS.DOC. The text is the reference manual to Standard Pascal, and it is essential for use of the compiler. I will try to get more documentation when the run-time interpreter is updated to include floating point. The source code for the SLAC Pascal is on library disk H2, described in this issue.

One member has asked if anyone has created a terminal mode command for PTDOS. The Solos source file on H1 has the Tterminal command in it; has anyone extracted that and made it into a PTDOS command? Please send it into the library if you have. I would do it, but I just don't have the time.

Let me know if you have any other questions.

11/08/78 FILES ON: HL1B1

NAME	TYPE	SIZE	BLKZ	ID	SEC	TRK	ATTRI	INDEX
COMPAR:S	8	6	0380	0090	12	32	K	
COMPILE	IS	4	04C0	00AB	0	47		
CONTENTS	T	27	0380	00ED	3	33		
COPYF:S	8	12	0380	0086	8	21	K	
DMOVE:S	8	9	0100	009A	15	24		
DSTAT	05	6	0240	0097	14	21		
F:S	P	4	04C0	00B5	4	52		
FEEDBACK	T	6	0240	00BC	8	56		
FOOTBALL	05	24	04C0	00B9	0	54		
FOUR	IG	12	04C0	00A2	10	20		
FSDISP:S	8	9	0380	0089	3	24	K	
GCD:S	P	4	04C0	00B7	0	53		
HELP	IC	4	0100	009E	0	1		
HELP:D	T	37	04C0	009F	4	1		110C
IAPS:S	8	28	04C0	008E	9	29	K	
INITPATB	I.	1	0100	00A9	13	17		
INTSEL:S	8	24	0380	008B	12	26	K	
LD	IC	4	04C0	009D	11	0		
MIND:S	8	36	04C0	00C1	8	35		
NEWFILES	IC	6	0380	00A1	4	20	KWN	
NEWGET	IC	12	04C0	00A0	8	19	KW	
NFILES	IC	1	0100	00BE	3	0		
NFILES?S	8	9	0380	0088	9	23	K	
NOTICES	T	8	04C0	00BA	11	55		
PAS.CMPL	T	1	0100	00AE	7	47		

PAS.DEFS	T	1	0100	00AC	15	36		
PAS.DOC	T	40	04C0	00A8	8	38		
PAS.GET	\$	2	0240	00AA	14	37		
PASCAL	p	72	04C0	00A5	10	37		
PASM	p	24	04C0	00A6	0	38		
PINT	p	12	04C0	00A7	4	38		
POBJ	p	4	04C0	00B1	0	48		
PRINTER	I.	4	0240	0098	9	36	K	
PRROM:S	8	6	0380	008D	3	29	K	
QUEENS:S	P	8	04C0	00B6	8	52		
RELOC:S	8	18	0380	0087	6	22	K	
REMNUM:S	8	6	0380	008A	12	24	K	
REORG:S	8	21	0380	008F	13	29	K	
RUN	IS	3	0100	00AD	4	47		
S	IC	5	0100	009C	6	0		
SFILES	IC	2	0100	00B8	13	53	KWN	
SFILES:S	8	12	0380	008C	6	28	KW	
SOL	IC	1	0100	0095	15	17		
SOL:S	8	2	0100	0099	15	22		
SOLOS1:S	8	64	04C0	007F	9	1	KW	
SOLOS2:S	8	52	04C0	0080	12	5	KW	
SOLOS3:S	8	56	04C0	0081	0	9	KW	
SOLOS4:S	8	12	04C0	0082	8	12	KW	
SOLOS5:S	8	64	04C0	0083	4	13	KW	
SOLOS:D	.	12	04C0	00C2	3	34		
SOLOS:S	8	2	0100	007E	15	0	K	
SOMA:S	P	32	04C0	00B2	4	48		
SORT:S	P	12	04C0	00B3	4	50		
TEMP.P	.	4	04C0	00B0	9	47		
TEMP.T	.	1	0100	00AF	8	47		
WARRANTY	T	4	0240	00BB	4	56		
XREF:S	P	20	04C0	00B4	0	51		

CONTENTS OF PROTEUS DISK H2

PAS.S	Source code for the SLAC Pascal compiler, written in Pascal. Read the file PAS.DOC on Proteus disk H1 for background information on the compiler. Also see Proteus News, Vol 2, No 2 and following issues for more details on SLAC Pascal. The object file from this program is on disk H1, along with all the supporting programs to compile Pascal programs of moderate size. Compiling PAS.S requires the 64K version of the SLAC system. Disk H1 has the 48K version. See INTRP.S below for information on creating a 64K version.
PASM.S	Source code for the post-processor (assembler) of the SLAC Pascal compiler.
RUN.S	Source code in 8080 assembly language for the RUN command that is described in PAS.DOC on disk H1.
COMPIL.S	Source code in 8080 assembly language for the COMPILE command described in PAS.DOC on disk H1.
INTRP.S	Source code in 8080 assembly language for the run-time interpreter that executes the compiled SLAC Pascal object programs. This interpreter simulates a pseudo-computer whose "machine language" is known as "P-code". Read the comments in the code to see how to reconfigure the interpreter to run in more memory space. The more space the interpreter has for the P-code, the larger the programs it can run. To compile a program as large as the Pascal source code PAS.S, you must reassemble the interpreter to utilize all available space in a 64K Sol. PLEASE NOTE: This is still only a preliminary version of the interpreter. Although the compiler will pro-

(continued)

9 March 1979

duce P-code for floating point arithmetic (REAL variables), the present interpreter will not execute these P-codes because the floating-point package has not been implemented. For the present, just avoid REAL variables. In future volumes of the Proteus library, we expect to have an updated version which implements floating point operations.

INTRPn.S where n=1,2,3,4. These are the portions of the interpreter for SLAC Pascal P-code. INTRP.S copies them into the input stream of the PTDOS assembler ASSM. They were divided this way just for ease of editing with EDIT.

SORT.B A sorting program for sorting a data file. This program is written in EDBASIC and uses the Shell sorting method. The READ statement will need to be modified to fit your file's data. The key items which the sort looks at to place the record in order can be modified. See the REM statements in the program.

SORT.F Similar to SORT.B, but written in PTC FORTRAN.

DSORT An EDBASIC program to create data files for SORT.B

DRAGON DRAGON ISLAND game. Hunt the dragon in his dark caves and win the hand of the princess.

WARRANTY The limited warranty on this diskette.

NOTICES Important notices regarding this diskette.

FEEDBACK How to report errors you find.

CONTENTS This file.

05/02/79 FILES ON: HLIB2

NAME	TYPE	SIZE	BLKZ	ID	SEC	TRK	ATTRI	INDEX
COMPIL.S	.	8	04C0	001C	8	66		
CONTENTS	.	12	04C0	0021	12	68		
DRAGON	05	8	04C0	0022	8	69		
DSORT	05	4	04C0	0024	4	70		
FEEDBACK	.	8	04C0	0020	4	68		
INTRP.S	.	4	04C0	001A	0	65		
INTRP1.S	.	60	04C0	0016	4	53		
INTRP2.S	.	24	04C0	0017	0	57		
INTRP3.S	.	56	04C0	0018	8	58		
INTRP4.S	.	48	04C0	0019	0	62		
NOTICES	.	8	04C0	001E	7	67		
PAS.S	.	580	04C0	0014	3	0		
PASM.S	.	244	04C0	0015	0	38		
RUN.S	.	20	04C0	001B	4	65		
SORT.B	05	4	04C0	0023	0	70		
SORT.F	.	8	04C0	0025	8	70		
WARRANTY	T	4	04C0	001F	0	68		

Dear Stan,

After a year of reading SOLUS News/Proteus and gleaning terrific amounts of data with which to tantalize my Sol-20, I guess it's time I wrote with some offerings of my own.

I am now writing a true layman's review of the Discus-1 from Thinker Toys/Morrow's Micro-Stuff. I'll send it along as soon as my poor fingers recover from the ordeal of 'hunt and peck' from this letter! Although I am rather mediocre at both hardware and software, I found the Discus-1 quite easy to hook up and use. The program I have included is used to move my existing programs to the 0100H start of CP/M file space. Once it moves the program desired, it attaches a relocater package on it to move it back to it's original execution address whenever loaded.

Since I now have CP/M up and running in the Discus-1, I wonder if anyone else has solutions to my problems:

a. After rewriting the 'CONOUT', 'CONIN' and 'CONST' I/O for CP/M, I found that my inclusion of the 'DEL' key to send a Backspace to SOUT (see listing) works under the main CP/M system only. When using ED (while inserting), the cursor will not back up and the characters being deleted are echoed one space to the left of the non-moving cursor (?). In DDT it does essentially the same thing.

b. Does anyone have any source code for PTCO. Extended Cassette BASIC? I am hoping I might be able to add disk handlers under CP/M and keep this BASIC going.

c. For that matter, does anyone have any plans to translate some of those neat PTDOS programs from the library to CP/M for us cheapies (that Helios is too expensive for us paupers) ?

d. Has anyone tried to customize the CP/M I/O to act like other Sol compatible software? What would really be great is having the on-line edit capabilities in CP/M that PTCO. BASIC has (left and right arrow keys to move the character pointer, for instance).

One last thing.... I have been using my Sol-20 (Rev-D) for cross referencing number systems between it and a ~~16 Bit~~ ^{32 bit} Data General Eclipse and a Univac UYK-7. To do it I have written several programs in Ext. BASIC using character strings. That was due to the fact I only had 16K for two years!! Now that I have the Discus-1 and 32K--look out!! If anyone would like these programs please write and I can give you the listing in BASIC. Please note--they are simple character string programs and convert 32 bit words into subfields and vice-versa. If I were a professional programmer--I would have starved a long time ago!!!

Keep up the good work--the Proteus membership provides three times the useful information of any other subscription or membership I have.

Jim
 Jim Bailey
 R.R.#1
 Caledon East,
 Ontario L0N 1E0
 Canada

(continued)

[Ed. note: (a) ED echoes back the character being deleted. You hit the DEL, SOUT backspaces the cursor, ED reads the DEL and outputs the deleted character. So the cursor goes back and then forward again. You see, CP/M's editor ED was designed for a teletype terminal, not a video terminal, so it can't backspace and erase what you typed incorrectly. Instead it repeats the character being removed. Getting around this will be tricky, it seems. Perhaps someone has a solution. Here is another example of what I mean when I say that it's worth something to have integrated hardware and software.

(b) As far as I know, PTC hasn't released the source listing. But there is a much better way to do what you want to do. ECBASIC is designed to run under Solos or Cuter. Since Cuter can reside anywhere in memory, ECBASIC uses the contents of the HL register on initial entry into it to determine the location of the Solos/Cuter jump table. You can fake it out, so that it thinks your program is Cuter, by providing a program that has a Solos/Cuter jump table, but with your own routines for doing the file I/O. Put the address of the table in HL and jump to the start of ECBASIC. See the Solos/Cuter manual for more details on this. Your file I/O routines can pretend they are doing tape I/O, when in reality they are doing CP/M I/O. You can even use the Sol's scratchpad RAM the way Solos does for file buffers. The other entries in the jump table can be the same as in Solos, so you don't have to provide those routines; just pass them on through to Solos. This software interface will let any of PTC's tape software run under CP/M, not just ECBASIC but also PILOT, etc.

(c) Several people are working on converting SLAC Pascal to run under CP/M. Consider also that PTC is going to make a mini-disk system that will run PTDOS and all of that "neat" software like WordWizard, etc.

(d) Don't know.
Perhaps readers will give more information for Jim.]

MODIFICATION OF CBIOS DRIVERS FROM CP/M

JIM BAILEY R.R. #1 CALEDON EAST, ONTARIO
L0N 1E0 CANADA

```

101: ;
102: CONST CALL SINP
103: JZ NOPE
104: STA INPTA IF YES - HOLD IT
105: MVI A,0FFH SAV SOMETHNG IS WAITING
106: JMP RETRN
107: NOPE XRA A
108: STA INPTA
109: RETRN RET
110: ;
111: INPTA DB 0
112: ;
113: CONOUT LDA HOLDER FOR 'DELETE'
114: CPI 7FH
115: JNZ NEXT
116: CLEER XRA A YES
117: STA HOLDER clear it
118: MVI C,5FH SEND BCKSP TO
119: JMP BCKSP SOUT - NOT DEL
120: NEXT MVI A,0DH
121: CMP C IF C/R - FORGET IT
122: JZ CREM clear cursor instead
123: MVI A,0AH
124: CMP C IF LINEFEED THEN
125: JZ CRLF do CR and LF
126: MVI A,7FH
127: CMP C IF DEL THEN BACK UP
128: JZ CLEER

```

```

129: BCKSP MOV B,C
130: JMP SOUT
131: ;
132: HOLDER DB 0
133: ;
134: SETTRK PUSH B
135: CALL SELDSK
136: POP B
137: JMP TSEEK
138: ;
139: CONIN LDA INPTA CHECK FOR INPUT
140: CPI 00H
141: JNZ RECLM
142: INTRG CALL SINP WAIT FOR INPUT
143: JZ INTRG
144: HOMER ANI 7FH STRIP OFF MSB
145: CPI 11H IF CTRL-G THEN
146: JZ MONITR QUIT
147: STA HOLDER SAVE IN CASE IT IS
148: RET A 'DEL'
149: RECLM PUSH PSW SAVE IT
150: CALL NOPE clear INPTA
151: POP PSW RESTORE
152: JMP HOMER
153: ;
154: LIST MVI A,01H LIST GOES TO
155: MOV B,C Printer
156: JMP AOUT
157: ;
158: READER CALL TAPIN Reader is TAPE
159: ANI 7FH INPUT
160: RET
161: ;
162: PUNCH IN TAPPT PUNCH IS TAPE
163: ANI 80H SAVE
164: JZ PUNCH
165: MOV A,C
166: OUT TDATA
167: RET
101: *

```

```

; PGMCPCY9.ASM PROGRAM MOVER FOR CP/M
;
; WRITTEN BY JIM BAILEY
; R.R. #1
; CALEDON EAST,
; ONTARIO L0N 1E0
; CANADA
;
; ORG 0C900H ;THIS RESIDES IN SOLOS SCRATCHPAD RAM
;
; TO SAVE PROGRAMS THAT RESIDE IN THE C900H AREA OF SOLOS,
; REASSEMBLE THIS PROGRAM WITH THE 'ORG' SET AT 0000H.
;
; EQUATES TABLE
START EQU 0000H
MONITR EQU 0C00H 0C00H ;START OF SOLOS
FILER EQU 0103H ;CP/M FILE START+3
SCONV EQU 0C33AH ;CONVERTS FIRST ADDRESS TO H,L
PSCAN EQU 0C310H ;CONVERTS END ADDRESS TO H,L
SOUT EQU 0C019H ;STANDARD OUTPUT FOR SOLOS
SINP EQU 0C01FH ;STANDARD INPUT FOR SOLOS
CUTAB EQU 0C83CH ;FIRST SPOT IN CUSTOM COMMAND TABLE
CRLF EQU 0C2F9H ;OUTPUT A CR AND LF
ADOUT EQU 0C3E8H ;OUTPUT H,L AS HEX NUMBER
;
; EXECUTION OF THE 'ORG' ADDRESS WILL PUT THE CUSTOM COMMAND
; 'DC ADDRESS' INTO THE FIRST POSITION OF THE CUSTOM COMMAND
; TABLE.

```

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```

;***THIS PUTS THE CUSTOM COMMAND INTO THE TABLE***
;
C900 214443      LXI   H,'DC'      ;THE COMMAND
C903 223CC8      SHLD  CUTAB      ;STORE IT
C906 210DC9      LXI   H,DISKIT    ;START OF THIS PROGRAM
C909 223EC8      SHLD  CUTAB+2  ;STORE START ADDRESS
C90C C9          RET

;
; NOW ANY TIME A PROGRAM IS TO BE PUT INTO THE CP/M FILE
; AREA, THE COMMAND 'DC START ADDR. END ADDR.' IS ENTERED.
; THE LAST ADDRESS OF THE ENTIRE PACKAGE WILL PRINTOUT AND
; THE SOLOS '>' PROMPT WILL REAPPEAR WHEN THE MOVE IS COMPLETE.
; THEN, A COLD BOOT OF THE CP/M IS PERFORMED FOLLOWED BY
; THE 'SAVE N FILENAME.TYPE' COMMAND IS THEN EXECUTED TO
; SAVE THE PROGRAM ON DISKETTE.

;
; WHEN THE PROGRAM IS CALLED BY CP/M, IT WILL BE LOADED INTO
; THE 0100 FILE, THE JMP INSTRUCTION AT 0100H WILL EXECUTE
; THE RELOCATOR PACKAGE AND UPON COMPLETION OF THE MOVE TO
; THE ORIGINAL LOCATION, A RET INSTRUCTION EXECUTES THE
; PROGRAM.

;
; THIS CONVERTS THE START AND END ADDRESSES FROM THE VDM
; AND CALCULATES THE NEW END OF FILE.

DISKIT CALL  SCONV  ;START ADDRESS
        PUSH  H      ;SAVE IT
C911 CD10C3     CALL  PSCAN  ;END ADDRESS
C914 EB         XCHG   ;D,E HAVE THE END ADDRESS
C915 C1         POP   B      ;B,C HAVE THE START
C916 C5         PUSH  B      ;SAVE IT AGAIN

;
; CALCULATE NUMBER OF BYTES TO MOVE
;
C917 D5         PUSH  D      ;SAVE END
C918 7B         MOV   A,E
C919 91         SUB   C
C91A 5F         MOV   E,A
C91B 7A         MOV   A,D
C91C 98         SBB  B
C91D 57         MOV   D,A

;
; NOW FIND THE END OF NEW FILE
C91E 210301     LXI   H,FILER ;NEW FILE START
C921 19         DAD  D
C922 D1         POP   D      ;RESTORE D,E
C923 E5         PUSH  H

;
; NOW H,L HAVE NEW END AND D,E HAVE OLD END
;
; THIS MOVES THE PROGRAM TO 0100H
;
MOVUM LDAX  D
C925 77         MOV   M,A
C926 1B         DCX  D
C927 2B         DCX  H
C928 79         MOV   A,C      ;B,C HAVE OLD START SO SEE
C929 BB         CMP   E      ;IF WE ARE FINISHED YET
C92A C224C9     JNZ  MOVUM
C92D 78         MOV   A,B
C92E BA         CMP   D
C92F C224C9     JNZ  MOVUM  ;NOPE--KEEP GOING
C932 1A         LDAX  D      ;YES--ONE MORE TO GO
C933 77         MOV   M,A

```

```

C934 E1        RESET  POP   H
C935 23        INX   H      ;H,L HAVE NEW END+1
C936 220101    SHLD  0101H  ;INITIAL ADDRESS IN
C939 3EC3      MVI   A,0C3H  ;A 'JMP' INSTRUCTION
C93B 320001    STA  0100H  ;NOW START JMP IS FINISHED
C93E 226AC9    SHLD  TRIPPR+1 ;LAST ADDRESS TO MOVE
C941 110A00    LXI   D,000AH  ;NOW FOR THE MOVIT'
C944 19        DAD  D
C945 227AC9    SHLD  FIRST+1
C948 227FC9    SHLD  SECOND+1 ;NOW THE JNZ ARE READY
C94B E1        POP   H      ;GET BACK START ADDRESS
C94C 226DC9    SHLD  TRIPPR+4
C94F 2A0101    LHL  0101H  ;NOW GET RELOCATOR ADDRESS

;
; THIS PUTS THE RELOCATOR PACKAGE ONTO THE PROGRAM
C952 1169C9    LXI   D,TRIPPR
C955 0E1D      MVI   C,1DH      ;THERE ARE 1DH BYTES TO MOVE
C957 1A        MORE  LDAX  D
C958 77        MOV   M,A
C959 23        INX   H
C95A 13        INX   D
C95B 0D        DCR   C
C95C C257C9    JNZ  MORE      ;FINISHED?
C95F CDF9C2    CALL  CRLF   ;YES--CLEANUP FOR LAST ADDRESS
C962 CDE8C3    CALL  ADOUT  ;PRINT LAST ADDRESS
C965 CDF9C2    CALL  CRLF   ;LOOKS NICE
C968 C9        RET

;
;****THIS IS THE RELOCATOR PACKAGE****
;
C969 010000    TRIPPR LXI   B,START ;ANYTHING WILL DO
C96C 110000    LXI   D,START ;BECAUSE THESE CHANGE
C96F 210301    LXI   H,FILER

;
C972 D5        PUSH  D
C973 7E        MOVIT MOV  A,M
C974 12        STAX  D
C975 13        INX   D
C976 23        INX   H
C977 7D        MOV   A,L      ;SEE IF FINISHED YET
C978 B9        CMP   C
C979 C273C9    FIRST JNZ  MOVIT
C97C 7C        MOV   A,H
C97D B8        CMP   B
C97E C273C9    SECOND JNZ  MOVIT ;REALLY FINISHED?
C981 210000 210000 LXI   H,MONITR ;YES--THIS IS FOR SOME PTC PROGRAMS
C984 C9        RET      ;GOES TO EXECUTE THE PROGRAM

```

JUST A SHORT NOTE TO CORRECT A LITTLE MIXUP IN THE LAST ISSUE - VOL. 2, #2. ON THE LAST PAGE THERE WAS A REFERENCE TO NEW CHAPTERS, SPECICALLY THE BOULDER/DENVFR AREA. THE CHAPTER WAS FOUNDED BY RICK DOWNS NOT RICK BATHRUN.

WE DO MEET EVERY MONTH ALTERNATING LOCATIONS BETWEEN DENVER AND BOULDER. WE ARE CURRENTLY STARTING AN 8000 ASSEMBLY LANGUAGE COURSE TO BE PART OF OUR MONTHLY MEETINGS. THIS COURSE WILL BE TAUGHT BY ONE OF OUR OWN, AND DESIGNED WITH THE SOL IN MIND.

I APPRECIATE THE EFFORT OF EVERYONE INVOLVED TO EDIT AND PUBLISH PROTEUS. I THINK IT IS ONE OF, IF NOT THE ONLY, CONSISTENT AND INFORMATION-PACKED USERS NEWSLETTER. I CAVE UP ON THE NORTH STAR GROUP. IF THERE IS ANYTHING OUR CHAPTER CAN ASSIST IN PLEASE DO NOT HESITATE TO LET ME KNOW.

FOR FURTHER INFORMATION ABOUT OUR CHAPTER I CAN BE REACHED AT 303 751-7283.

RICK DOWNS

Rick

;THIS PUTS THE CORRECT JUMP ADDRESSES INTO THE RELOCATOR PACKAGE.

FIXES FOR MICROPOLIS MDOS/RES/BASIC VERSIONS 3.0

by Richard Greenlaw

```

0000 *
0000 *           251 COLONY CT.
0000 *           GAHANNA, OHIO 43230
0000 *           2/10/79
0000 * DEAR STAN,
0000 *   SINCE MICROPOLIS DISKS SEEM POPULAR WITH SOLUS
0000 * MEMBERS I BELIEVE THE LISTING ATTACHED WILL BE
0000 * OF CONSIDERABLE USE. IT FIXES SEVERAL WEAKNESSES
0000 * IN MICROPOLIS MDOS/RES/BASIC VERSIONS 3.0.
0000 *
0000 *   1. PROVIDES EDITTING OF EXISTING BASIC LINES!
0000 *   2. PREVENTS EARLY CARRIAGE RETURNS DUE TO COUNTING
0000 *     BACKSPACES AS FORWARD CURSOR MOTIONS.
0000 *   3. PROVIDES SPACE BAR PAUSE/RESUME OF OUTPUT,
0000 *     INSTEAD OF CONTROL-S/OTHER.
0000 *   4. CONVERTS MODE OK CONTROL-# TO CONTROL-C AS
0000 *     THE BREAK CHARACTER.
0000 *   5. CORRECTS ERRATUM NUMBER 7.
0000 *   6. FIXES A BUG IN THE PAUSE ROUTINE OF RES WHICH
0000 *     LUCKED OUT UNTIL I REWROTE CDIN, BUT DIDN'T
0000 *     MEET THE REQUIKEMENTS OF SECTION 2.2.4.3.3.
0000 *
0000 *   THE EDIT FEATURE IS NOT UNIQUE TO BASIC, BUT
0000 *   BASIC IS ITS PRIMARY USE. TO USE IT, JUST TYPE
0000 *   A LIST COMMAND FOR THE LINE YOU WANT TO EDIT,
0000 *   BUT USE CONTROL-E INSTEAD OF CARRIAGE RETURN.
0000 *   THIS WILL INITIALIZE A BUFFER TO CAPTURE A COPY
0000 *   OF EVERYTHING GOING THROUGH THE CONSOLE OUTPUT
0000 *   DRIVER EXCEPT CONTROL CHARACTERS UNTIL THE BUFFER
0000 *   IS FULL OR YOU USE CONTROL-L.
0000 *
0000 *   THE FIRST TIME YOU TYPE CONTROL-L (OR THE SOL'S
0000 *   LOAD KEY) THE OUTPUT CAPTURE FLAG IS RESET AND THE
0000 *   POINTER IS RESET TO THE BEGINNING OF THE BUFFER.
0000 *   THE FIRST CHARACTER IN THE BUFFER WILL BE RECEIVED
0000 *   AS IF YOU HAD TYPED IT. AFTER THAT, EACH CONTROL-L
0000 *   WILL BRING IN SUBSEQUENT CHARACTERS FROM THE BUFFER
0000 *   AS IF YOU HAD TYPED THEM. THE REPEAT KEY IS USEFUL
0000 *   IN BRINGING IN THE BASIC LINE UP TO THE POINT WHERE
0000 *   CHANGE IS REQUIRED. YOU CAN TYPE NEW CHARACTERS
0000 *   OR BACKSPACE OVER CHARACTERS BROUGHT IN BY CONTROL-L
0000 *   AT ANY TIME. WHEN YOU HAVE THE DESIRED NEW LINE
0000 *   JUST HIT THE CARRIAGE RETURN AS USUAL.
0000 *
0000 *PROCEDURE:
0000 *ENSURE YOU HAVE BACKUP OF SYSTEM ON SEPERATE DISKETTE.
0000
0000 *BUILD A SOURCE FILE OF THE PROGRAM BELOW.
0000 *   >ASSM "THISPGM" "RESFIX"
0000 *   >TYPE "RES" 0
0000 *   >SCRATCH "RES"
0000 *   >TYPE "RESFIX" C
0000 *   >RESFIX
0000 *   >SAVE "RES" 288 146B 3
0000 *YOU MUST SCRATCH RES SO THE NEW COPY CAN BE IN THE
0000 *SAME DIRECTORY POSITION FOR BOOTSTRAP. RESFIX CAN
0000 *ONLY BE LOADED IMPLICITLY SINCE IT OVERLAYS RES.
0000 *NOTE EXECUTION IS FUDGED TO @WARMSTART.
0000 *
0000 *           BEST WISHES,
0000 *
0000 *           Richard Greenlaw
0000 *           RICHARD GREENLAW
0000 *
0000 *
0000 *           TAB 8,13,25
0000 *           LINK 'SYSQ1'
0000 *           ORG @CIOTABLE+6
0000 *
0000 *ADDRESSES OF SUBSTITUTE CONSOLE DRIVERS

```

```

04F6 1B 06      DW CDIN
04F8 66 06      DW CDOUT
04FA 86 06      DW CDBRK
04FC 60 06      DW CDINIT
04FE           ORG @LIOTABLE+8
050A           *ADDRESSES AND PARAMETERS FOR LIST DEVICE DRIVERS
050A A0 06      DW LDOUT
050C A5 06      DW LDATN
050E 9E 06      DW LDINIT
0510 00         DB 0           ;WRAP FLAG OFF
0511 03         DB 3           ;NULL COUNT
0512 47         DB 71          ;WIDTH (MY IY HAS AUTO CKLF I
N COL 72)
0513
0513 * CORRECT CURSOR POSITION DURING BACKSPACING.
0513 * FOR TERMINALS WHICH CAN MOVE CURSOR/HEAD BACK.
0513 * LIST OUT ROUTINE WOULD NEED SIMILAR CHANGE IF
0513 * PRINTER COULD BACKSPACE.
0513           ORG 549H
0549 C3 91 05   JMP BSPCUR
054C           ORG 591H           ;FREE AREA
0591 25         BSPCUR DCR H           ;BACKUP CURSOR (BAD COMMENT AT
           52E)
0592 25         DCR H           ;TO BALANCE INR LATER
0593 06 5F     MVI B,5FH         ;ORIGINAL INSTRUCTION AT 549H
0595 C3 4C 05   JMP 54CH           ;TO COUTI
0598           *PART OF MY BUG FIX
0598 CD 8D 07   INPTOA CALL 78DH         ;@CDIN - INPUT TO B
059B 78         MOV A,B
059C C3 85 05   JMP 565H
059F           *BUG FIX (ERRATA ITEM 7 WAS WRONG!)
059F           ORG 5F4H
05F4 CD E5 07   CALL 7E5H           ;(WAS OK ON MY DISK)
05F7
05F7 *BUG FIX I DISCOVERED
05F7           ORG 582H
0582 C3 98 05   JMP INPTOA
0585           *USE SPACE BAR TO PAUSE/RESUME OUTPUT
0585           ORG 57EH
057E 20         DB ' '           ;REPLACE ONLY 1ST CNTS
057F           ORG @PCON
061B
061B *CONSOLE DEVICE DRIVERS WITH EDIT FEATURE
061B *INPUT TO B. CHANGES A. CLEARS CY FLAG.
061B CD 92 06   CALL CHINA         ;INPUT TO A OR SET Z.
061E CA 1B 06   JZ CDIN           ;UNTIL INPUT OCCURS
0621 47         MOV B,A           ;THE INPUT
0622 E5         PUSH H
0623 E6 7F     ANI 7FH
0625 FE 05     CPI 05H           ;CNTL-E
0627 C2 37 06   JNZ CDIN2
062A           *SET CAPTURE FLAG AND POINTER
062A 06 0D     MVI B,0DH         ;CONVERT TO CH
062C 3E 01     MVI A,1
062E 32 A7 06   STA CAPFG
0631 21 AA 06   LXI H,CAPBUFF
0634 22 A8 06   SHLD CAPBPTR
0637 FE 0C     CPI 0CH           ;CNTL-L/LOAD
0639 C2 5D 06   JNZ CDINX
063C           *WANTS INPUT FROM BUFFER
063C LDA CAPFG
063F B7         ORA A
0640 CA 4D 06   JZ BUFFIN
0643           *1ST TIME - RESET CAPTURE FLAG AND POINTER
0643 XRA A
0644 32 A7 06   STA CAPFG
0647 21 AA 06   LXI H,CAPBUFF
064A 22 A8 06   SHLD CAPBPTR
064D 2A A8 06   LHL CAPBPTR           ;POINTER
0650 3E 1F     MVI A,0FFH+CAPBEND ;LOW BYTE OF BUFFER END ADD
R
0652 BD         CMP L
0653 06 07     MVI B,7           ;BELL TENTATIVE

```

17

(continued)

1S

NORTHSTAR MICRODISK INPUT/OUTPUT ROUTINE FOR SOL COMPUTER

By Joe Maguire, Feb 79

```

0655 CA 5D 06      JZ  CDINX      ;IF NO MORE INPUT BELL
0658 46           MOV  B,M      ;INPUT FROM BUFFER
0659 23           INX  H
065A 22 A8 06     SHLD CAPBPTR
065D E1           CDINX  POP  H
065E AF           XRA  A
065F C9           RET
0660
0660 *
0660 *CONSOLE DEVICE INITIALIZATION USES A, CLEARS CY.
0660 AF           CDINIT XRA  A
0661 32 A7 06     STA  CAPFG     ;EDIT CAPTURE FLAG OFF
0664 0E 0B       MVI  A,0BH    ;CLEAR VIDEO SCREEN
0666 *
0666 *OUTPUT FROM B. CHANGES A. CLEARS CY FLAG.
0666 CD 19 C0     CDOUT CALL 0C019H ;SOUT (USES CURRENT OUT DEVICE)
)
0669 3A A7 06     LDA  CAPFG     ;CAPTURE FLAG
066C B7           ORA  A
066D C8           RZ              ;IF NO CAPTURE REQUEST
066E *
066E *CAPTURE UNLESS CNTL CHAR
066E E5           PUSH H
066F 3E 1F       MVI  A,1FH
0671 B8           CMP  B
0672 F2 83 06     JP   CDOUTX    ;IF <SPACE
0675 2A A8 06     LHLD CAPBPTR
0678 3E 1F       MVI  A,0FFH&CAPBEND ;LOW BYTE OF BUFFER END ADDR
R
067A BD           CMP  L
067B CA 83 06     JZ   CDOUTX    ;IF BUFFER FULL
067E 70           MOV  M,B      ;LOAD BUFFER
067F 23           INX  H
0680 22 A8 06     SHLD CAPBPTR
0683 E1           CDOUTX POP  H
0684 AF           XRA  A
0685 C9           RET
0686
0686 *
0686 *BREAK CHECK: NZ IF NO INPUT OR INPUT IN B. USES A.
0686 CD 92 06     CDBRK CALL CHINA   ;INPUT TO A OR SET Z.
0689 CA 8F 06     JZ   NOINP
068C 47           MOV  B,A
068D AF           XRA  A
068E C9           RET
068F AF           NOINP XRA  A
0690 3C           INR  A
0691 C9           RET
0692
0692 *
0692 *INPUT CHAR TO A OR SET Z FLAG IF NONE.
0692 *CONVERT MODE AND CTL-0 TO CTL-C.
0692 CD 1F C0     CHINA CALL 0C01FH ;SOLOS/CUTER SINP (CURRENT POR
T)
0695 C8           RZ              ;IF NO INPUT
0696 47           MOV  B,A      ;SAVE W/ PARITY
0697 E6 7F       ANI  7FH     ;STRIP BIT 7
0699 78           MOV  A,B
069A C0           RNZ      ;IF NOT MODE/CTL-0
069B C6 03       ADI  3       ;CTL-C
069D C9           RET
069E
069E *
069E *LDINIT MVI B,0DH ;INITIALIZE BY CR
06A0 *LIST DEVICE OUT FROM B. USES A. CLEARS CY (NO ATTN)
06A0 3E 01       LDOUT MVI A,1 ;SOLOS/CUTER SERIAL PSEUDOPORT
)
06A2 CD 1C C0     CALL 0C01CH   ;AOUT. OUTPUT FROM B
06A5 06A5       LDATN EQU $   ;DUMMY PRINTER ATTENTION
06A5 AF           XRA  A
06A6 C9           RET
06A7
06A7 *
06A7 *SPACE FOR EDIT FEATURE BUFFER
06A7 CAPFG DS 1     ;CAPTURE FLAG
06A8 CAPBPTR DS 2   ;POINTER INTO BUFFER
06A8 CAPBUFF DS 720H-$ ;CAPTURE BUFFER
0720 071F       CAPBEND EQU $-1
0720           END  @WARMSTART

```

This routine will allow the Sol Computer to take maximum advantage of the Northstar Microdisk system software. It incorporates all of the desirable features found in a variety of other programs.

To implement this routine into your Northstar DOS, refer to the DOS manual section, "Personalizing your version of the DOS".

SPECIAL NOTE TO DOUBLE DENSITY USERS:

This routine will also work with the double density DOS from North Star but two sign on messages will be displayed. The first will be the message as shown in this listing and the second will be from a routine called by the DOS located above address 2A00. To disable the message in this routine, put a RET (C9) at address 2950.

Also note that the personalizing DOS example given in the double density Software Technical Manual is in error. Refer to the errata sheet which accompanies the Northstar documentation.

Northstar Basic has its own routine for detecting a control/C so the Sol MODE key may not work in every case.

```

0000 *
0001 *           * ALSO FILENAME "DOS10" *
0002 *
0003 * THIS IS AN INPUT/OUTPUT ROUTINE FOR THE NORTHSTAR
0004 * MICRODISK DOS TO BE USED WITH A SOL COMPUTER.
0005 * IT HAS THE FOLLOWING FEATURES:
0006 *
0007 * SPEED CONTROL FOR VIDEO SCROLLING SIMILAR TO ALSB
0008 * SPACE BAR HALT FOR VIEWING SIMILAR TO SOLOS DUMP
0009 * PRINT DEVICE SELECTION SIMILAR TO THAT OF CP/M
0010 * SOL MODE KEY CAN BE USED FOR PROGRAM INTERRUPT
0011 * RETURN TO SOLOS MONITOR BY USE OF ESCAPE KEY
0012 * SIGN ON MESSAGE AND INITIALIZATION OF VDM
0013 * NORTHSTAR SOFTWARE ACCEPTS SOL DELETE KEY
0014 * USE OF CLEAR KEY TO ERASE VIDEO SCREEN
0015 *
0016 * THE ENTRY POINTS OF THE NORTHSTAR DOS SHOULD BE
0017 * PATCHED AS FOLLOWS: (STANDARD DOS AT 2000H)
0018 *
0019 *           2000 C3 20 29   COUT
0020 *           2010 C3 00 29   CIN
0021 *           2013 C3 50 29   TINIT
0022 *           2016 C3 60 29   CQNTC
0023 *
0024 *           ORG           2900H
0025 *
0026 *           * SYSTEM EQUATES *
0027 *
0028 *           C01F 0028 SINP  EQU  0C01FH   SOL SYSTEM INPUT
0029 *           C019 0029 SOUT  EQU  0C019H   SOL SYSTEM OUTPUT
0030 *           C004 0030 SOLOS EQU  0C004H   SOLOS MONITOR
0031 *           C040 0031 SROUT EQU  0C040H   SOL SERIAL OUTPUT
0032 *           C0F6 0032 PROUT EQU  0C0F6H   SOL PARALLEL OUTPUT
0033 *           C08F 0033 SPEED EQU  0C08FH   VDM SPEED BYTE
0034 *
0035 *           2900 0035 START EQU  $
0036 *
0037 *           * CHARACTER INPUT ROUTINE *
0038 *
0039 * THE INPUT ROUTINE CHECKS FOR ESCAPE, CLEAR,
0040 * DELETE AND CONTROL/P KEYS AS WELL AS NORMAL
0041 * DATA ENTRY. CONTROL/P (PORT) WILL DIRECT
0042 * THE OUTPUT THE SAME AS IF SET WITH THE SOLOS
0043 * SET 0-<PORT> COMMAND. PORT NUMBERS RANGE
0044 * FROM 0-3. OUTPUT IS ALSO ECHOED TO THE VDM.

```

(continued)

```

0045 * THE NORTHSTAR BASIC PRINT#- AND LIST#- ARE
0046 * FULLY SUPPORTED BUT DOES NOT ECHO TO THE VDM
0047 * THESE DIRECTIVES TAKE PRIORITY OVER CONTROL/P
0048 * THE SOL DELFTE CHARACTER (?F) IS CHANGED TO
0049 * THAT RECOGNIZED BY NORTHSTAR SOFTWARE. (5F)
0050 *
2900 CD 1F C0 0051 INPUT CALL SIMP
2903 CA 00 29 0052 JZ INPUT
2906 F6 7F 0053 ANI 7FH
2908 FE 1F 0054 CPI 1FH ESCAPE KEY?
2900 CA 04 C0 0055 JZ SOLOS RETURN TO SOLOS
2900 FE 0F 0056 CPI 0FH CLEAR KEY?
290F CA 01 29 0057 JZ CLEAR
2912 FE 10 0058 CPI 10H CONTROL/P?
2914 CA 7F 29 0059 JZ PRINT
2917 FE 7F 0060 CPI 7FH DELFTE?
2919 C0 0061 RNZ
291A 3E 5F 0062 MOV A,5FH CHANGE TO #*
291C C9 0063 RET
0064 *
0065 * * CHARACTER OUTPUT ROUTINE *
0066 *
2920 0067 ORG START+20H
0068 *
2920 FE 01 0069 OUTPUT CPI 1 1=SERIAL OUTPUT PORT
2922 CA 09 29 0070 JZ SFRIO
2925 FE 02 0071 CPI 2 2=PARALLEL OUTPUT PORT
2927 CA 0C 29 0072 JZ PARAO
292A FE 03 0073 CPI 3 3=CUSTOM OUTPUT ROUTINE
292C CA AF 29 0074 JZ CUSTO
292F CD 19 C0 0075 CALL SOUT DEFAULT IS VIDEO SCREEN
2932 30 FF 29 0076 LRA STORE IS CONTROL/P PRINT ON?
2935 FE 31 0077 CPI 31H SERIAL PORT OUT
2937 CA 09 29 0078 JZ SFRIO
293A FE 32 0079 CPI 32H PARALLEL PORT OUT
293C CA 0C 29 0080 JZ PARAO
293F FE 33 0081 CPI 33H CUSTOM OUTPUT ROUTINE
2941 CA AF 29 0082 JZ CUSTO
2944 78 0083 MOV A,B
2945 C9 0084 RET
0085 *
0086 * * INITIALIZATION ROUTINE *
0087 *
2950 0088 ORG START+50H
0089 *
2950 21 B3 29 0090 WRITE LXI H,MSG CLEAR SCREEN AND
2953 0F 38 0091 MUI C,38H PUT OUT SIGN ON MESSAGE
2955 46 0092 MOV R,M
2956 AF 0093 XRA A
2957 CD 19 C0 0094 CALL SOUT
295A 23 0095 INX H
295B 00 0096 DCR C
295C 07 55 29 0097 JNZ WJ
295F C9 0098 RET
0099 *
0100 * * SCROLL SPEED AND PROGRAM ABORT *
0101 *
2960 DB FC 0102 CONTC IN 0FCH SOL KEYBOARD PORT
2962 F6 7F 0103 ANI 7FH
2964 C8 0104 RZ *
2965 FF 03 0105 CPI 3 MODE KEY ABORT?
2967 C8 0106 RZ CONTROL/C 100!
2968 FF 20 0107 CPI 20H
0108 *
0109 * SPACE BAR HALT?
0110 * SPACE BAR GIVES ONE LINE
0111 * ANY OTHER KEY KEEPS GOING
0112 *
296A CC 9A 29 0113 CZ WAIT
0114 *
0115 * * SCROLL SPEED CONTROL ROUTINE *
0116 *
0117 * HIT ANY NUMBER KEY DURING OUTPUT TO CHANGE
0118 * VIDEO DISPLAY SPEED 9=SLOWEST, 0=FASTEST

```

```

0119 *
0120 CPI 3AH
0121 RNC
0122 CPI 30H
0123 RC
0124 ANI 0FH
0125 RAL
0126 RAL # FOR MORE DELAY PUT
0127 NOP # ANOTHER RAL HERE
0128 STA SPEED
0129 ORI 1 RESET ZERO FLAG
0130 RET
0131 *
0132 * * OUTPUT DEVICE SELECT ROUTINE *
0133 *
0134 PRINT CALL SIMP
0135 JZ PRINT
0136 ANI 7FH
0137 CPI 34H
0138 JNC P1
0139 CPI 30H
0140 JC P1
0141 STA STORE
0142 JMP INPUT
0143 PJ STA STORE
0144 RET
0145 *
0146 WAIT CALL SIMP
0147 JZ WAIT
0148 RET
0149 *
0150 CLEAR MOV B,0BH
0151 CALL SOUT
0152 JMP INPUT
0153 *
0154 * SERIAL OUTPUT
0155 *
0156 SERIO JMP SDROT SOLOS SERIAL OUTPUT
0157 *
0158 * PARALLEL OUTPUT
0159 *
0160 PARAO JMP PROUT SOLOS PARALLEL OUTPUT
0161 *
0162 * CUSTOM OUTPUT ROUTINE
0163 *
0164 CUSTO MOV A,B
0165 DB 0C3H,0,0 PUT YOUR JUMP HERE
0166 *
0167 * SIGN ON MESSAGE
0168 *
0169 MSG DB 0BH,0AH,0DH
0170 ASC #NORTHSTAR DOS 4.0 (SOL)#
4E 4F 52 54
48 53 54 41
52 20 44 4F
53 20 34 2E
30 20 28 53
4F 4C 29
29CD 00 00 0171 DW 0A0DH
29CF 43 4E 4E 54 0172 ASC #CONTROL/P <PORT> FOR PRINT#
52 4F 4C 2F
50 20 3C 50
4F 52 54 3E
20 46 4F 52
20 50 52 49
4E 54
29F9 00 0A 0173 DW 0A0DH
0174 *
29FF 0175 ORG START+0FFH
0176 *
0177 STORE RB 0
0178 *

```

19

No assembly errors

21 labels were defined.

CB06 2360 *HERE TO CHECK FOR PAGINATION
 CB06 2370 PRINT EQU \$
 CB06 2380 *MY PRINTER DOES NOT NEED <NULL>S,
 CB06 2390 *SO I USE NULLS AS A CONVENIENT
 CB06 2400 *METHOD OF DOUBLE- OR TRIPLE-
 CB06 2410 *SPACING LISTINGS, ETC. YOU MAY
 CB06 2420 *HAVE TO CHANGE OR DELETE THIS
 CB06 2430 *VERY USEFUL FEATURE.
 CB06 78 2440 MOV A,B GET CHAR
 CB07 B7 2450 ORA A <NULL>?
 CB08 C2 0D CB 2460 JNZ P1 NO, SO GO ON
 CB08 06 0A 2470 MVI B,0AH SUB <LF> FOR <NULL>
 CB0D 2480 P1 EQU \$
 CB0D 78 2490 MOV A,B GET CHAR
 CB0E FE 0A 2500 CPI LF LINE FEED?
 CB10 CA 2E CB 2510 JZ LFEEED YES
 CB13 FE 0C 2520 CPI FF FORM FEED?
 CB15 CA 3D CB 2530 JZ FFEEED YES
 CB18 2540 *
 CB18 2550 *HERE TO SUPPRESS PAGINATION
 CB18 2560 *
 CB18 2570 *NOW, SEND OUT CHAR TO THE VIDEO
 CB18 2580 *SCREEN AND TO THE PRINTER
 CB18 2590 BOTH EQU \$
 CB18 AF 2600 XRA A 0=VIDEO
 CB19 CD 1C CO 2610 CALL ADUT SEND TO SCREEN
 CB1C 2620 *
 CB1C 2630 *OR, TO THE PRINTER ONLY
 CB1C 2640 PONLY EQU \$
 CB1C 3E 01 2650 MVI A,PORT PRINTER'S PSEUDOPORT
 CB1E C3 1C CO 2660 JMP ADUT AND RET FROM THERE
 CB21 2670 *IF YOUR PRINTER REQUIRES A SPECIAL
 CB21 2680 *HANDLER, YOU MAY INSERT IT IN
 CB21 2690 *PLACE OF THE CALL TO ADUT ABOVE.
 CB21 2700 *
 CB21 2710 SCRIN EQU \$ MESSAGE HANDLER
 CB21 7E 2720 MOV A,M GET MSG CHAR
 CB22 FE FF 2730 CPI OFFH TERMINATION CHAR?
 CB24 C8 2740 RZ YES-THRU WITH MSG
 CB25 47 2750 MOV B,A SAVE CHAR
 CB26 AF 2760 XRA A VIDEO = 0
 CB27 CD 1C CO 2770 CALL ADUT CHAR TO SCREEN
 CB2A 23 2780 INX H POINT TO NEXT CH
 CB2B C3 21 CB 2790 JMP SCRIN DO AGAIN
 CB2E 2800 *
 CB2E 2810 LFEEED EQU \$ LINE FEED
 CB2E 2820 *DO FORMFEED IF NECESSARY, ELSE
 CB2E 2830 *PROCEED WITH LINEFEED
 CB2E 3A 1A C8 2840 LDA LINES
 CB31 3C 2850 INR A BUMP COUNTER
 CB32 FE 3D 2860 CPI 3MARG PAGE FULL?
 CB34 D2 3D CB 2870 JNC FFEEED YES, SO FORMFEED
 CB37 32 1A C8 2880 STA LINES ELSE UPDATE...
 CB3A 2890 *COUNTER AND SEND OUT LINE FEED
 CB3A C3 18 CB 2900 JMP BOTH TO PRINTER & SCREEN
 CB3D 2910 *
 CB3D 2920 FFEEED EQU \$ FORM FEED
 CB3D 2930 *A <FORMFEED> CONSISTS OF LINEFEEDS
 CB3D 2940 *TO THE BOTTOM-OF-PAGE, THEN A
 CB3D 2950 *TEAR-LINE, THEN MORE LINE-FEEDS
 CB3D 2960 *FOR THE TOP MARGIN.
 CB3D C5 2970 PUSH B SAVE REG C
 CB3E 3A 1A C8 2980 LDA LINES ON THE PAGE SO FAR
 CB41 4F 2990 MOV C,A TO REG C
 CB42 3E 42 3000 MVI A,PAGE LINES-PER-PAGE
 CB44 91 3010 SUB C A=LINES LEFT THIS PAGE
 CB45 4F 3020 MOV C,A TO REG C
 CB46 0C 3030 INR C
 CB47 3040 *DO A <CR> JUST TO BE SURE

CB47 3050 *ALSO, ENTRY POINT FROM INIT.
 CB47 3060 *FOR 1 CR-LF, THE TEAR-LINE, AND
 CB47 3070 *THE TOP MARGIN
 CB47 06 0D 3080 F10 MVI B,CR
 CB49 CD 1C CB 3090 CALL PONLY
 CB4C 3100 *NOW, DO LINE-FEEDS TO END OF PAGE
 CB4C 06 0A 3110 MVI B,LF
 CB4E CD 1C CB 3120 F11 CALL PONLY
 CB51 0D 3130 DCR C
 CB52 C2 4E CB 3140 JNZ F11
 CB55 3150 *NOW, DO THE TEAR-LINE. IF YOU USE
 CB55 3160 *PERFORATED PAPER, YOU PROBABLY WILL
 CB55 3170 *DELETE THE NEXT 7 LINES, AND DROP
 CB55 3180 *THE '-1' FROM THE 'MVI C' IN THE
 CB55 3190 *TOP MARGIN SECTION BELOW.
 CB55 06 2D 3200 F12 MVI B,-1
 CB57 0E 40 3210 MVI C,40H LENGTH OF TEAR LINE
 CB59 CD 1C CB 3220 F13 CALL PONLY
 CB5C 0D 3230 DCR C
 CB5D C2 59 CB 3240 JNZ F13
 CB60 06 0D 3250 MVI B,CR
 CB62 CD 1C CB 3260 CALL PONLY
 CB65 3270 *NOW, DO TOP MARGIN
 CB65 0E 06 3280 MVI C,TMARG-1 ALLOW FOR TEAR LINE
 CB67 06 0A 3290 MVI B,LF
 CB69 CD 18 CB 3300 F14 CALL BOTH
 CB6C 0D 3310 DCR C
 CB6D C2 69 CB 3320 JNZ F14
 CB70 3330 F15 EQU \$ PRESET LINE COUNTER
 CB70 3E 07 3340 MVI A,TMARG
 CB72 32 1A C8 3350 STA LINES
 CB75 C1 3360 POP B GET BACK REG C
 CB76 C9 3370 RET
 CB77 3380 *
 CB77 0D 3390 SMSG1 EQU \$
 CB78 0A 3400 DB CR
 CB79 4E 4F 2D 3410 DB LF
 CB86 3420 ASC 'NO PAGINATION'
 CB86 0D 3430 *FALL THRU TO SMSG2
 CB86 0A 3440 SMSG2 EQU \$
 CB87 0A 3450 DB CR
 CB88 50 52 49 3460 DB LF
 CB89 0D 3470 ASC 'PRINTER INITIALIZED'
 CB9C 0A 3480 DB CR
 CB9D FF 3490 DB LF
 3500 DB OFFH

SYMBOL TABLE

PAGE 0042	TMARG 0037	TEXT 0036	BMARG 003D
CR 003D	LF 000A	F1 003C	UPRT CB02
CUTAB CB3C	SINP C01F	SDUT C019	ADUT C01C
PORT 0031	LINES CB1A	TYPE CAB4	TYPE1 CABE
SETUP CACF	SET1 CAD8	NOPAG CAF4	ENTER CB07
ALTEN CB03	PRINT CB06	P1 CB0D	BOTH CB18
PONLY CB1C	SCRN CB21	LFEEED CB2E	F1:ED CB3D
F10 CB47	F11 CB4E	F12 CB55	F13 CB59
F14 CB69	F15 CB70	SMSG1 CB77	SMSG2 CB86

DEAR STAN,

I KEEP HEARING ABOUT THESE ALS-8 APPLICATION NOTES BUT PROCESSOR TECHNOLOGY REFUSES TO SEND THEM TO ME UNTIL THE NEW ACCESS COMES OUT. THIS IS VERY FRUSTRATING AS I HAVE BEEN TRYING TO USE ALS-8 SINCE LAST YEAR. IT SEEMS THAT EVERYTIME I CALL THEM I GET A DIFFERENT STORY. ON MARCH 27, 1979 WHEN I CALLED THEM THEY TOLD ME THAT THEY DID DISTRIBUTE ALS-8 APPLICATION NOTES. THIS CAUSES ME MUCH GNASHING AND GNAWING BECAUSE I RE-READ JOE MAGUIRES'S LETTER (IN THE SOLUS NEWS, VOL 1, NO. 6) FOR THE 10TH TIME. WHEN I CALLED PROC TECH ABOUT A MONTH AGO THEY INSISTED THAT THE ALS-8 APPLICATION NOTES WOULD BE SENT OUT TO ME WITH THE NEW ISSUE OF ACCESS. TODAY IS MARCH 30, 1979 AND STILL NO WORD. NOTHING. I'M BEGINNING TO THINK PROC TECH IS ABANDONING THEIR HOBBY FRIENDS AND ARE GOING ONLY FOR THE SMALL BUSINESS USER. IF ANY KIND READERS WOULD TELL ME WHERE TO GET THE APPLICATION NOTES I'D BE VERY GRATEFUL.

I'M LOOKING FOR A PRINTER FOR MY SOL-20, HAS ANYONE INTERFACED A DECWRITER TO A SOL? I LIKE A LOT ABOUT THE DEC LA-36. I'M NOT INTERESTED IN THE KEYBOARD BUT IT WOULD BE NICE TO HAVE A SECOND ONE ON HAND. I ALSO LIKE THE LOOK OF THE TEXAS INSTRUMENTS 810 BUT THE PRICE SEEMS WAY TOO STEEP. I AM FIRMLY AGAINST ANY THERMAL PRINTER, OF ANY PRINTER WHICH REQUIRES SPECIAL PAPER. FOR MY NEEDS A PRINT WOULD HAVE TO BE ABLE TO PRINT 132 POSITIONS AND BE ABLE TO USE 15 INCH PAPER WITH STANDARD PIN FEED HOLES. SPEED'S NOT THAT IMPORTANT TO ME SO THE DEC SEEMS TO BE A REASONABLE COMPROMISE. PERHAPS YOUR READERS COULD SUGGEST OTHER ALTERNATIVES I HAVEN'T MENTIONED.

I WOULD LIKE TO PARTICIPATE IN THE EXCHANGE OF SOFTWARE THROUGH YOUR LIBRARY BUT IT SEEMS I HAVE VERY LITTLE TO CONTRIBUTE IN THE WAY OF ORIGINALITY. I'VE DONE TONS OF BASIC PROGRAMMING BUT I'M JUST NOW STARTING TO LEARN 8080 ASSEMBLY LANGUAGE. PILOT LOOKS INTERESTING ALSO ARE THERE VERY MANY PILOT PROGRAMS OUT THERE ANYONE?

THANKS TO SOLUS NEWS, A FELLOW BY THE NAME OF BOB SPARKS CALLED TO SAY HE SAW MY NAME IN SOLUS NEWS AND THAT HE ALSO HAD A PROCESSOR TECHNOLOGY SOL-20 AND WE HAD A GREAT TIME TALKING AND EXCHANGING BASIC PROGRAMS. BOB'S A SUPER GUY AND HIS 3 DIMENSIONAL LUNAR LANDER GAME IS VERY DIFFICULT AND FUN. I'M GOING TO TRY TO TALK HIM INTO SENDING IT IN TO THE SOFTWARE LIBRARY WITH A FEW OTHER PROGRAMS HE HAS WRITTEN

I'D BE DELIGHTED TO HEAR FROM ANYONE ABOUT THEIR EXPERIENCES. IF ANYONE WISHES TO CONTACT ME FEEL FREE TO WRITE TO ME:

ROBERT HEERDINK
C/O NATIONAL SHAREDATA CORP.
P.O. BOX 3895
EVANSVILLE, IN 47737

ALSO I THINK THIS A GREAT IDEA, SENDING LETTERS IN ON CUTS CASSETTES. IT IS ESPECIALLY NICE FOR US HOBBYISTS WHO HAVE A TEXT EDITOR BUT NO PRINTER BECAUSE IT ENABLES US CONTRIBUTE LETTERS TOO. I PREPARED THIS LETTER IN ONLY 2 HOURS USING MY ALS-8 TEXT EDITOR.

SINCERELY,

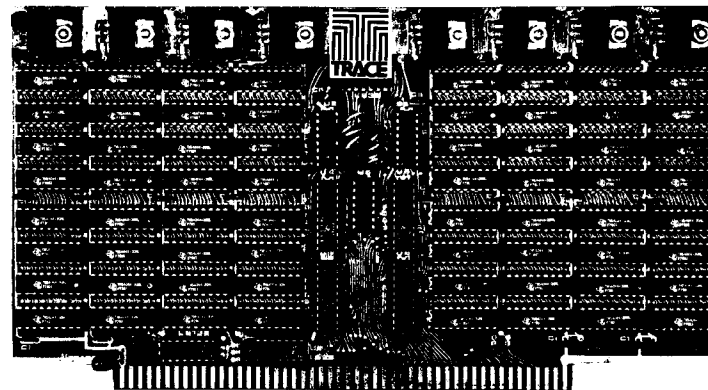
ROBERT W. HEERDINK

(Ed. note: Bob sent us this letter on cassette as an ALS-8 file. You can do this too. If you don't have ALS-8, you can use the editor in SCS16 on our library tape C7 or any equivalent editor, or you can send the letter as a BASIC program which we will list and cut-off the extraneous parts. Files on Helios diskette or CTAPE format are fine also. We'll return your media promptly. If you have a printer, please use a fresh ribbon and send th. letter in camera-ready form--single spaced.

We have been told by PTC that we can have the ALS-8 notes for publication as soon as they can find them in the files of the person who was working on them last. We're interested in building a PILOT courseware library, too.)



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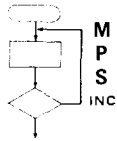
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Wes Clarkson
Marketing Manager



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- Megextend™:** up to one megabyte can be addressed providing there is a 4 bit output port in the system. This allows up to 32 model 3200 boards per system, as long as the power requirements are met.
- Power Required** is 1.7A at 8V for model 1600 and 3.3A at 8V for model 3200. Current TI TMS 4044 devices use approximately 20% less power.
- Phantom:** This card is equipped with the phantom feature which comes disabled.



Microproducts and Systems, Inc.

2307 East Center Street
Kingsport, Tennessee 37664
Phone (615) 245-8081

NEWS INFORMATION -- FOR IMMEDIATE RELEASE SORT AND INDEX FOR THE SOL

Microproducts and Systems, Inc. of Kingsport, Tennessee is announcing a SORT/INDEX package for the Processor Technology SOL/20* computer and Helios** floppy disk system.

Users of the 8080 microprocessor can now take advantage of a full-disk sort and index package that was designed for high speed and convenient operator interface. Written in 8080 machine language, the package utilizes the efficient Shell-Metzner sort algorithm combined with multi-file merge capabilities. Both the SORT and INDEX programs dynamically allocate work space to take advantage of available memory. The package is fully compatible with the standard PTDOS operating system found on Processor Technology's Helios II and Helios IV floppy disk systems.

Both the SORT/MERGE program and the INDEX/MERGE program can be invoked as stand-alone utilities, called from other assembly language programs, or called from user programs written in BASIC or FORTRAN. Features of the SORT program include sorting on files with record sizes up to 256 bytes long, multi-key collating sequence, user-definable data types and field delimiters. Through the use of a user definable call list it is possible to sort a data file into virtually any collation sequence. The call list allows for specification of multi-field sorting, optional field delimiters, optional record delimiters, variable length fields, fixed length fields, data type and specification of data file structure.

The INDEX program is capable of creating a sorted index file from a typically much larger data file. User definable features of the INDEX program are identical to those of the SORT program. A typical application would be in creating an index file of part numbers from a inventory file. The resulting index file can then serve as a look-up table using a fast binary search. A binary search function written in BASIC is also included in the software package.

Also included in the SORT/INDEX package is BTASK, a BASIC or FORTRAN callable machine language program which allows the user to invoke up to 100 different procedure files with subsequent branching into BASIC, FORTRAN, or machine language programs. BTASK makes diskcopying, sorting, indexing, etc. an automatic feature with very little user intervention. In order to illustrate the use of the SORT/INDEX package, several Basic programs and files are included.

A 26 page User's Manual describes in detail the features of the SORT, INDEX, and BTASK programs and gives examples of their proper use.

The price of the SORT/INDEX package is \$75.00. Discounts for dealers and special pricing for use in other software packages are available upon request.

*Sol is a registered trademark of Processor Technology Corporation
**Helios is a trademark of Processor Technology Corporation

CLASSIFIED ADS

CORRESPONDENCE WANTED: I'd be delighted to hear from anyone about their experiences with Sol, etc. Robert Heerdink, c/o National Sharedata Corp., P.O. Box 3895, Evansville, IN 47737.

EQUIPMENT FOR SALE: 2 - 16KPA \$300 each or \$550 both; 1 - 3P+S kit unassembled \$100; 1 - GPM-SOL with ALS-8 ROMS \$125, GPM-SOL alone \$100, ALS-8 ROMS alone \$45; 1 - ASR33 teletype, RS-232, stand, motor driven paper winder, paper tape punch & reader, exlnt cond \$600. P.W. Sparks, 140 Shady Lane, Monterey, CA 93940.

EQUIPMENT FOR SALE: Centronics uP-1 printer, cabled for Sol. \$450/offer. W.D. Loughman, 393 Gravatt Dr, Berkeley, CA 94705, tel (415) 841-7528 eves, 666-3121 days.

EQUIPMENT FOR SALE: Sol-3A system with Sol-20, bootload pers. module, Helios II, PT-872 video monitor, EDBASIC, cables, manuals. Purchased 10/78 as assembled system, for system development, must now liquidate as it is a 2nd system for me. \$5300. W. Harkness, 32 Larchwood Dr. Pittsford, NY 14534, (716) 423-3254 days, 381-0201 eves.

INFORMATION WANTED: I am looking for a memory board that uses 2114 IC's for 32K on one board, available as kit or bare board. I have heard of one by Advanced Micro Products--does anyone have any experience with it? Do you know of any others? Edward C. Enderle, 1 Candlewood Ct, Huntington, NY 11743.

INFORMATION WANTED: I need some help programming an interface to the D.C. Hayes modem for Sol. Also have questions about I/O in general. Would like to correspond with someone who could help. Paul W. Sparks, 140 Shady Lane, Monterey, CA 93940, (408) 646-2636 work (no collect calls there, please), 373-0505 home (collect calls okay, 5 pm to 11:30 pm, say "Proteus calling").

FREE: Newsletter reviewing NorthStar disk compatible software that I sell. For free subscription write to J. Dvorak, 704 Solano Ave, Albany, CA 94706. State your computer system configuration.

FREE: Write for free issue of ON LINE, the Buy & Sell Forum for the Computer Hobbyist, a Classified ad newsletter with circulation over 6500. ON LINE, Dave Beetle, publisher, 24695 Santa Cruz Hwy, Los Gatos, CA 95030. Mention your read about it in Proteus News.

SOFTWARE AVAILABLE: CP/M Users' Library disks are now available on Helios-CP/M format. First 23 disks available now, the rest soon. \$10/disk. David Dalva, 1010 - 5th Ave, New York, NY 10028. [Ed. note: This is the authentic CP/M Users' Group library which Dave has had transferred over to the Helios. You need Helios-CP/M operating system, instead of PTDOS, to run these programs. Order that from Lifeboat Associates, 164 West 83rd Street, New York, NY 10024, telephone (212) 580-0082. Proteus is also working on transporting some of these programs over to the Helios and converting them to run under PTDOS.]

SOFTWARE WANTED: Astrology programs for Sol (E.C.BASIC or Microsoft BASIC) in tropical and sidereal systems, etc. Curt Kobylarz, 1710 N. Wisconsin, Peoria, IL 61603.

SOFTWARE WANTED: Physician software packages, especially with 3rd party billing, accounting, diagnosis. Dr. W.C. Lawson, 9954 MacArthur Blvd, Oakland, CA 94605, (415) 569-4327.

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WANT TO BUY SOURCE CODE?

Processor Tech hasn't yet decided what to do with the source code of the programs they developed, but there is a good possibility that they will be sold to the highest bidder. Processor Tech users may be the most interested buyers, since the source code will allow them to keep the system alive and growing, rather than stagnating. Proteus will negotiate this with PTC, but we need to know how much we can offer. If we can get enough buyers among our members, we may be able to do it.

Would you be interested in the source code in machine-readable form for ALS-8, PTDOS, Extended Cassette BASIC, or Extended Disk BASIC at approximately \$50 each? We would sell this without a copyright on it, that is it would go into the public domain, so you can do anything you want with it. If you are seriously interested, send me a self-addressed, stamped envelope (or international reply coupon for foreign mail) and a note saying which programs you would buy and how much you are willing to bid for each one. You must reply fast (within one week of receiving this newsletter). As far as I know, these are the only major programs that PTC owns the source code of, the others were just licensed to PTC as exclusive distributors.

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Instructions to contributors: Letters and articles may
 be submitted in camera-ready form or on Sol/Cuts
 cassettes or Helios (PTDOS) diskettes. Camera-ready
 copy should be single-spaced, in a single column of
 6 1/2 inch width, and with clean, dark type.
 Corrections can be made invisibly with opaque correction
 fluid ("liquid paper"). Please use a new ribbon.
 Machine-readable articles should be compatible with
 Solos, Cuter, PTDOS input routines. Media will be
 returned only if requested.

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--

James D. McElroy
 2826 Crest Ave. N.
 Allentown, PA 18104

PROTEUS / NEWS

AN INDEPENDENT NEWSLETTER FOR OWNERS AND USERS OF PROCESSOR TECHNOLOGY CORPORATION COMPUTERS

FORMERLY SOLUS NEWS

VOLUME 2, NUMBER 4
JULY, AUGUST 1979

PUBLISHED BIMONTHLY BY PROTEUS, 1690 WOODSIDE ROAD, SUITE 219, REDWOOD CITY, CA 94061, USA SINGLE ISSUE \$2 (US)

IN THIS ISSUE

Most of our time since the last issue has been spent sorting through a whole roomful of documents we picked up from PTC before they moved out of their factory. In this issue you will find a catalog of the things we have, as well as our previously announced items. Some of the new documents are notable. We found the two issues of the ALS-8 Users Notes from 1977 (Proteus items D34 and D77). We have a few ParaSol Debugger manuals (Proteus item D66) which describe the hardware debugging board that lets a good Sol diagnose problems in a sick Sol. The manual includes schematics and software listings, so you can homebrew your own if you want. We also have the big, loose-leaf manuals on the Sol and Helios describing the assembly, testing, and principles of operation of the machines.

Look through the Catalog in this issue to see the extent of our stock. These are in various quantities, from just a few of some items to dozens of others. If you think you might want one of the items, act quickly because when they're gone that's it, except for the non-copyrighted items that we can legally reproduce. Until the ownership of the copyrights is clear, we don't want to make unauthorized copies. Actually, this huge amount of stuff is taking up more space than we can stand. If the empty office we're using to store it becomes rented, we'll have to discard some of it. Now's your chance.

Point of clarification: The items in the "D" series (D1, D2, ...) are documents only, and do not include the hardware, cassette, or diskette. Some of the items announced in the previous Proteus News issue have been renumbered. Use the new catalog, please.

The cassette library prices have been lowered because we have too many cassettes left over from our mass-copying spree for the West Coast Computer Faire. Several new library cassettes are in preparation and we need the space.

There is a new Helios library diskette, H3, containing a variety of donated programs. There is a gem on it, donated by Joe Maguire. The ZAP command source file, when assembled, will give you the ability to make PTDOS disregard the Attribute-change-protect flag on a file, so that you can reattribute any file.

The subscription price for 1980 has been increased so that we can continue to provide a large volume of information in each issue. Our budget is a little too tight.

By the way, again I must apologize for the lateness of issue no. 3. The issue was all ready to go to the printers, when PTC began to go out of business. I had to keep redoing articles that were irrelevant. Then when it finally went to press, the printer had a major press breakdown and there's only one man who can repair it on the West coast. We try, anyway.

HELIOS DISK CONTROLLERS AVAILABLE

Would you like to buy the two-board set of Helios disk controller and formatter? We've located the electronics junk dealer who bought the assembled boards from PTC when they were liquidating. His company name is Mike Quinn Electronics, and he's on Langley Road at the old North Field of the Oakland airport, Oakland, California. He's asking \$150 per set. Unfortunately, he doesn't do mail-order business at all, but if we have a sufficient number of orders, I will charge a moderate mark-up for the trouble, and act as the middleman and fill mail-orders from Proteus members.

The boards are completely assembled with sockets for all IC's, but they have had 3 scarce IC's removed. (I heard that Cromemco bought all of them from PTC for their own products. The missing parts are the 9401 on the formatter and the 9403's on the controller. Delivery on the missing IC's is quoted at 90 to 120 days from the distributor; no one has them in stock around here.) Ribbon cables are not included. Most of the boards are new from the assembly house and have the latest revisions already installed. A few were already "burned-in", that is, endurance tested at PTC. A few were older boards used in-house for testing other components of Sol systems. A few were defective boards sent in for warranty repair. We'll use our best judgement in selecting the boards for you, and we'll avoid the ones tagged as defective unless you state that you'll even take one of them if that's all that is left.

The purchase is strictly on an as-is basis. I do know of several former PTC employees who are capable of trouble-shooting them, and I've gotten recommendations for dealers who also seem most capable of servicing Helios. I'll pass this information along to those who want it. I've considered paying one of these PTC technicians to check-out all of the boards and get them working before I send them, but that doesn't seem practical since (1) we don't have all of the IC's yet, (2) I don't have PTC memory so getting the boards to work in my system won't guarantee they will work in yours, and (3) it makes it too difficult for me to quote a price in advance.

I don't recommend buying the board set with the intention of making your own Helios system unless you already have a Helios. Someone starting from scratch would be better off buying a soft-sectored controller, such as the one we are investigating as an upgrade-option for existing Helios units. (See story elsewhere in this issue.) But the serious user of a Helios system, such as the businessman who is counting on his system for business use, would be wise to buy a spare controller set to swap-in when his existing controller needs service. The way service is these days, it may take months to get a defective system back in operation unless you have spares like this. Just parts alone could take 3 to 4 months, as I mentioned.

(continued on page 12)

and look at that sheet of 8080 op codes I had somewhere. Lo and behold, there was a whole family of MOV instructions--and if that didn't look like what Petrie had written about, nothing else did! There was MOV B,C and MOV D,H and MOV B,E and ... wait a minute! Weren't those the two registers in which I had a special interest? My heart began to pound--not from fear this time, but from the adventure of discovery! I vaguely recalled from somewhere that these instructions had to be read backwards. That is, if you wanted to move what was in E to register B, you used MOV B,E and not MOV E,B. So MOV B,F it was! And while perusing the list of op codes, I happened upon some with a familiar ring--CALL and RET. Apparently they were like a GOSUB or CALL and RETURN in BASIC. A dangerous plan began forming in my fevered mind. Could I write an entire machine language subroutine to move the contents of register E to register B, call the VDM driver routine, and then get back to BASIC? My mind boggled at my own cleverness!

My first machine language subroutine sprung to life full blown from my forehead:

```
MOV   B,E           43
CALL  C098H or in hex CD 98 C0
RET   C9
```

If this CALL instruction worked like the one in BASIC, then it would return back to the CALLing routine automatically after finishing the VDM driver routine. Since my routine was CALLED from BASIC, it should then return to the BASIC program after finding the RET instruction. All I had to do was to put my subroutine somewhere in some free memory and call it from BASIC with the character I wanted in inverse video passed as the argument in the BASIC CALL statement. Who said machine language programming was difficult? I knew I could do it all along!

My first requirement was some free RAM. I knew that SOL had some scratchpad RAM at CB00H, so I figured that I would put my subroutine there. But could I do it in BASIC--that was the question! A thought was poking at me from the back of my memory--the FILL statement! Checking with my trusty NorthStar BASIC manual I found that

This statement permits filling a specified byte in the computer memory with a given expression value. For example, FILL 100,J+3 will fill memory byte 100 with the binary encoded value of J+3, truncated to 8 bits.

I needed to FILL memory starting at CB00H with 43H, CDH, 98H, COH, C9H. But FILL wanted decimal arguments. No problem--my requirements were met with

```
FILL 51968,67
FILL 51969,205
FILL 51970,152
FILL 51971,192
FILL 51972,201
```

I could then CALL(51968,C) where C was the value of the character (in decimal) that I wanted to print. I quickly figured out a way to use a FOR-NEXT loop and the LEN and ASC functions to get decimal values of each individual character in a message string. Then LEN function returns the length of a specified string while ASC returns the ASCII code of the first character in a string. By adding 128 to the ASCII code and passing this as C in CALL(51968,C), I could print to my heart's content in inverse video.

The fruits of my labor are presented in Listing #2. It all seems so easy in retrospect. Of course, I was never really afraid of machine language programming. It was just that I never got around to it. You know how it is.

Hmm...I wonder if I can CALL my Music System program from BASIC to play the StarTrek theme before a game of STARTREK...

LISTING #1

Abbreviated version of Digate's program from ACCESS, Vol.2,#1

```
10 REM * SOL VDM DEMONSTRATION PROGRAM
.
.
.
80 DATA 201,238,246,229,242,244,229, 228
90 DATA 160,214,233,228,229,239
.
.
.
95 DIM J(30)
.
.
.
140 FOR I=1 TO 14: READ J(I): NEXT
160 PRINT "The SOL can print in upper and lower"
170 PRINT "case and can even print ";
180 FOR I=1 to 14 : REM * PRINTS "Inverted video"
190 C=J(I):GOSUB 65010
200 NEXT I
.
.
.
65010 B=ARG(V2*V1):B=CALL(V0):B=ARG(V3*V1):B=CALL(V0)
65020 B=ARG(C*V1):B=CALL(V0):RETURN
.
.
.
65040 REM * V0 = ADDRESS OF VDM DRIVER IN SOLOS
65050 REM * V1 = 256 TO SHIFT CHARACTER INTO B REG
65060 REM * V2 = 27 FOR ESCAPE CHARACTER
65070 REM * V3 = 05 FOR ESCAPE CODE TO SEND CHAR TO
65080 REM * SCREEN WITHOUT CHANGING HIGH ORD BIT
```

LISTING #2

Inverse video routine for NorthStar BASIC

```
10 REM ROUTINE TO DISPLAY INVERSE VIDEO ON THE SOL
20 REM USING NORTHSTAR BASIC
30 REM BY BOB STEK
40 N=51968/REM 51968=CB00 HEX. FREE RAM FOR SUBROU
50 FOR I=0 TO 4/REM PUT IN SUBROUTINE IN DECIMAL
60 READ J
70 FILL N+1, J
80 NEXT
90 DATA 67,205,152,192,201/REM IN HEX-43 CD 98 C0 C9
100 REM MOV B,E
110 REM CALL C098H OCHAR IN SOLOS, PART OF VDM DRIV
120 REM RET
130 DIM M$(80)/REM RESERVE SPC FOR INVERTED MSG
140 REM PUT MSG IN M$. INIT CHAR MUST BE BLANK.
150 M$=" HAPPY COMPUTING!"
160 GOSUB 1000
170 PRINT "NEXT PRINT STMT FOLLOWS IMMEDIATELY"
180 END

1000 FOR I=1 TO LEN(M$)
1010 C=128+ASC(M$(I,I))
1020 A=CALL(N,C)
1030 NEXT
1040 RETURN
```

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SOFTWARE REVIEW

SID, MAC, AND TEX FROM DIGITAL RESEARCH

There have been many write ups on CP/M which is the defacto standard for 8" disks and now that it is available for the TRS 80, the 5" people will undoubtedly use it too. There has been so much said about this operating system that I see no point in saying more. I will freely admit it is not the best DOS I've seen but its wide usage justifies its continual use. [Circular reasoning which also justifies FORTRAN (anyone remember MAD, MADTRAN, etc.) and BASIC.] I would like to make some comments on the extension software:

SID--SYMBOLIC INSTRUCTION DEBUGGER

This package is an extension of Digital Research's DDT, both of which have features found in DEBUG 8080 which I've mentioned in the past. SID is used for debugging machine code. The expected features are included: move memory, fill memory, modify memory, load from mnemonic (assemble in place), dump (hex and ascii) (not set up from a 64 character screen), simple step-display and modify registers. With SID you can set 2 break points and 8 pass points. A pass point is put in a loop to cause a break on the Nth pass through the loop. When single stepping or dumping in mnemonic (disassembly), SID will display symbols and labels from a predefined table in addition to the HEX values. SID also has the capability of giving a backtrace to show what happened before. Another nice utility will provide a histogram of addresses. This will show where all of the run time is being spent. One feature I miss is mask and search (from DEBUG 8080) which I use to find I/O's in strange software.

MAC--MACRO ASSEMBLER

This is a macro assembler with some interesting features and one or two minor problems. This is a disk assembler, i.e. the source is on disk. The resulting output winds up on disk. Because of the disk operations, these types of assemblies are by nature slow compared to memory assemblers such as ALS-8. However very large programs can be handled. MAC will produce the object code in Intel hex format, a symbol table (compatible with SID) and a print file. This is the source with the object code added. For speed any of these files can be deleted or vectored to the printer. A 70K source will assemble in about 8 minutes if the print file is deleted (it won't fit on the disk anyway). The Intel MACRO DISK assembler takes 40 minutes on the same program. MAC does not require line numbers, but you can use them if you want. Comments must be preceded with a semi-colon, so it is not totally compatible with ALS-8. MAC will assemble MACROS, CONDITIONALS, and REPEATS as in the Intel software manual. All code is absolute however. One disadvantage of MAC is when the source specifies more than 5 bytes--eg. in a DB or DW statement the LST file will only give the first 5 bytes of object code rather than using multiple lines. The HEX code will be correct so the program will work but the LST file is confusing. Two unusual features: 1. MAC can be made to forget its code table. This allows defining new code definitions with macros--i.e. a super simple cross assembler even with conflicting mnemonics (except for zylog mnemonics, because of the parentheses). 2. Macros don't have to be defined in the source file. They can be in the library files on the disk. Digital Research provides several nice libraries; one allows easy access to the disk.

TEX--TEXT EDITOR

This is a TEXT editor. Commands are inserted into a text file. TEX operates on this file and produces a new, fully formatted file. TEX will set margins, right justify, set paragraphs, center titles, number pages, etc.--much the same as Electric Pencil. One problem is that the original file is



created with the CP/M Editor. This is set up for a serial type terminal rather than a memory mapped video. If you already have the CP/M set up, TEX is a nice piece of software. But if much word processing is to be done, I would recommend a software package designed for a VDM type display. It is far easier and faster to use.

Since these packages are expensive, I strongly suggest buying the manuals first to see if it is really what you want. Manuals can be purchased from Digital Research and some distributors such as JADE or LIFEBOAT.

If you just occasionally dabble with assembly language and machine language, I'd suggest ALS-8 and DEBUG 8080. (Does BAY AREA TIMESHARE INC. still exist? I haven't seen their ad since I got mine in May 1977.)

HARDWARE REVIEW TARBELL 32K STATIC RAM

I recently purchased a 32K STATIC RAM card from TARBELL Electronics. I received the unit within a week of placing the order. Before discussing the technical aspects, I must first comment on some anomalies.

1. I don't know who makes the board. Tarbell's name isn't on the board anywhere, nor is any one else's. The Tarbell name only appears in the manual once, as part of the copyright notice, and it appears to have been stamped in later.
2. Tarbell sells the board for \$625 with 32K installed, assembled, and tested. Delta products sells what appears in the magazine ads to be the identical for \$485. Both offer a 16K for less.
3. The manual gives no info as to access time. Looking up the specs on the chips is meaningful only if they are prime parts.
4. Based on Tarbell's reputation, I'm sure he'll stand behind the warranty. However, considering how simple the board is, I would have no qualms about buying this mysterious board from Delta.

The board is set up in 4K blocks with the addressing selected by jumpers. What is nice (and different) is that each physical block of chips can be set to any 4K address. The output buffers are tri-stated from the address selectors such that only the strapped addresses affect the buffers. What this means is that the board can be set to cover all of high core skipping the "C000" block (and never selecting one row of parts). Two additional address lines are set up to allow 256K of addressing if you have your own provisions for activating these lines. There is also a phantom line (not needed with SOL). The manual states that forced air cooling is required with 32K on the board and implies there may be problems with two of these cards in consecutive slots. The problem is that the (undefined) access times increase with temperature, causing data drop outs. However, they do not say if there are problems with an 8080 or only a Z80 at 4 MHz. I have had no problems in my super hot SOL in the Arizona sun. As expected, the board works with my 8" floppy with no problems. I am very happy with it; I only wish I knew who to credit.

(Ed. Note: Sorry, we lost the name of the author of these reviews. If he writes to us, we'll be glad to acknowledge him in the next issue.)

CONTENTS OF HELIOS LIBRARY DISK #3

1979CAL The 1979 calendar.

AUTO.SYS, AUTO, RATES, RATES-C, CHANGE, R.FILE-S, R.FILE-C
An insurance agency software package, for rating
CSL or split limits automobile insurance. Read text file
AUTO.SYS for complete explanation. [Martin Hill, Jr.]

SETDATE, DATE?,DATE:S
A 'SAFE' program to set the date in PTDOS global
area, designed to be placed in STARTUP primarily. DATE?
similarly fetches the date from memory for checking. SETDAT:S
and DATE:S are their respective source codes.

HEAD
A header program. Before you list your program,
you will want to XEQ HEAD. HEAD will print out the name of your
program, ask you to GET and then LIST the program you want. At
the end of your listing, XEQ E and you will now be back at
video control. The SET OF= command is on line 88; change it to
have the name of your output driver. Mine is PRNT1 for a
Centronics 701 and PRNT3 for an old communi- cations printer.
[Donated by Roy Heybrock.]

HGRAPH:S
HGRAPH:S is an extended basic bar-graph program
which includes 4 functions used in plotting numeric bar graphs.
An array is passed to the function to produce the bar graph.
Included are functions to create both axes plus an overlay
grid. Also histograms may be drawn by passing the median value
to the plot function along with the array.

HYTYPE
PTDOS driver for Diablo HyType printer using
Processor Tech's HyType interface board and plugged into the
parallel port of the Sol. This driver is WordWizard compatible.
It assumes a Courier 10 printwheel, or equivalent arrangement.
It is based on the SolPrinter2 driver, with references to the
extra features of the SolPrinter interface deleted. [S Sokolow]

MEMTEST
A 48K memory test. Test lower 48K memory. Puts BEL
character out after each cycle. To quit, reset system and
re-boot.

MTEST:D
Documentation of MEMTEST.

OKIDATA
Source code for PTDOS driver to operate Okidata
printer on serial port of Cromemco TU-ART interface board.

PRNT1
Centronics 701 driver. [Donated by Roy Heybrock.]

PRNT3
Driver for an old communications printer. [?]
[Donated by Roy Heybrock.]

S154C
PTDOS & WordWizard driver for a Selectric terminal
IBM 2741-type, Correspondence coded, on the Sol serial port,
modified to do 134.5 baud. [Stan Sokolow]

RETIR
An updated version of RETIR on H1 disk to change
graph headings that were not set up right. [Donated by Roy
Heybrock, CFP.]

MASTERMD

This is a dual mastermind game. Two people play at
the same time on two different game boards. The game features a
none repeat of numbers within the matrix, automatic return, and
a more than one game set to determine the winner. Each play
enters his or her try as part of one large entry. (i.e. The
first player enters a guess and a comma. The second player
writes his guess on the other side of the comma and the machine
automatically continues without the need for the carriage
return. [Michael Richardson]

CAL\$\$\$

I teach Mechanical Technology at Saunders
Technical High School in Yonkers. This program will print
Mechanical Technology - as easy as Pi on the top of a calendar.
What's nice about the program is that the calendar is
generalized so that any year in the 20th century can be entered
and an accurate calander will be produced. There is also an
interesting generalized, large print, printing of the year.
(This is what is taking the time between the picture printing
and the calendar printing) [Michael Richardson]

S0, S1, S2, S3, S4, S5

My start up programs. [Michael Richardson]

CALENDAR

A program to give the day of the week and the
number of days old you are. It also gives the Julian day number
for those of us who are into Astronomy. [Michael Richardson]

MULTABLE

A multiplication practice program. [Michael
Richardson]

SUMTABLE

An addition practice program. [Michael Richardson]

W1

A program that I use whenever I go on a diet. The
data is recorded in data steps at the end of the program. Each
time a new day is entered the program expects the data to be
the day number, the food, the calories, and the weight at the
beginning of the day. (The weight is omitted for all other
entries on that day.) There are alphabetized calory counts for
some of the foods already written into the program in PEI
statements. [Michael Richardson]

W2

A graph drawing program that I use whenever I go
on a diet that is drastic enough for me to use program W1.
[Michael Richardson]

TT

The program I use to automatically right hand
justify a letter. [Michael Richardson]

T

The program I use to print a file I've already
right justified. It is info protected (I attribute). [Mike
Richardson]

CMPF.A

File compare command, in assembly source code. See
the program comments. [Tom M. Quinn]

MEMBNK.A

Memory bank-select, Cromemco-style. See the source
code. [Tom M. Quinn]

BAUD.A

Command to select baud rate on 3P+S board. [Tom M.
Quinn]

5



LOOK.A Command to find specified bytes in memory or in a disk file. [Tom M. Quinn]

SETPRT.A Command to initialize TI 810 printer. [Tom Quinn]

TI810.A TI 810 printer driver based upon Sol Printer 3 driver. [Tom M. Quinn]

SORT.F Shell sorting in PTDOS-FORTRAN. [Earl Dunham]

SORT.L Same as SORT.F, but written in BASIC. [Earl Dunham]

USORT A BASIC program which creates data files for SORT.D [Earl Dunham]

PROCESS A video-type editor to be used with the EDITOR program. To learn how to use PROCESS, run the BASIC program EDITOR. When it asks for the file name, enter PROCES:D. That file contains commands to PROCESS and also doubles as an example as to the usage of EDITOR. [Al Smith]

EDITOR EDITOR:D contains information on using the commands available within the basic program EDITOR. To use EDITOR:D you must run EDITOR from basic. When asked for file name input EDITOR:D. [Al Smith]

LETTER A letter from Al Smith regarding PROCESS and EDITOR.

L Device driver for parallel printer. [Michael Richardson]

PROGRAMS Explains the programs submitted by Michael Richardson.

STARTERS Explains the starter programs by Michael Richardson.

EDIT:D A brief explanation by Michael Richardson of why he renamed the PTDOS editor from EDIT to E. It also has a brief synopsis of the EDIT features.

BOOT:S The source for the Helios bootstrap loader.

COPYCA:S A screen doodling program which places a duplicate copy in memory for saving. Good for designing playing fields for video games.

DSKPORTS Equates for the Sol ports serving Helios Gives port definitions and bit equates for all the ports used by the Sol for communicating with Helios.

DOSIO:S An I/O routine for the Sol for use with the North Star Microdisk system. Includes many desirable features.

8KRA:S Memory test programs:
 16KPA:S
 16K-1:S
 32KRA:S
 32K-1:S
 48K-1:S A collection of memory test programs tailored for the various boards produced by PTC. [J. Maguire]
 MTEST:S [Editor's note: This MTEST is not same as MTEST:D on this disk]

OCTAL:S An Octal Enter and Dump routine. Gives ASCII values and a Hex address for reference.

PABAS:S Is the source code for Lichen Wang's Palo Alto Tiny Basic from early issues of Doctor Dobb's Journal. A few enhancements in this version.

SPINWR:S NEC Spinwriter 5510/5520 device driver. A bi-directional, logic seeking printer driver fully compatible with WordWizard. It includes "space averaging"- an ability to restructure the line producing "type set" quality printing.

TERM:S The missing TERM command from Sol Bootload prom.

ZAP:S Zap let's you defeat the attribute protection of PTDOS. UNZAP:S gets you back. Use with caution!!



GRT Corporation
 Consumer Computer Group

Editor's note; G/2 division of GRT corporation doesn't exist any more. GRT is in Chapter XI, which is one step from bankrupt. We can't get any more of their cassette software for Sol. Here is a fix for the Microsoft Basic they sold for Sol.

1286 N. Lawrence Station Road Sunnyvale, California 94086 (408) 734-2910 TWX 910 339-9212

TECHNICAL BULLETIN

G/2 SOL EXTENDED BASIC

Users have used glowing terms to describe this product. We shipped only a few when it was discovered that there were a couple of minor "bugs" in the programming. We immediately put a "hold" on further shipments.

One of the bugs has had the corrective patch determined. The other is being written by MICROSOFT. But the pressure has been on us to release this interpreter; we have decided to do so since we can give you the simple "patch" for one of the bugs, and the other function is not used all that much.

The GET command allows reading of programs that are in Processor Technology Extended BASIC. Please use the following patch for the GET function:

Enter the following statement immediately after G/2 Extended BASIC is initialized:

FOR X=2541 TO 2546: POKE X,0: NEXT X

The other "bug" is the SAVE command which allows recording of programs in a format acceptable to P.T. Extended BASIC. The fix for this command will be forthcoming for those who need it. Please return the enclosed registration card and you will be notified by mail when the patch for this command becomes available.

G/2 Technical Bulletin No. 2
 June 25, 1979

PROTEUS CATALOG

Proteus item D1: (one only)

Helios II User's Manual--This is a simple operating and light maintenance manual for users of the Helios II floppy disk memory system, models 2 and 4.

Proteus item D2: (three only)

DEBUG: 8080 Debugger User's Manual--This program is an aid for debugging a machine language program developed and assembled on any 8080 computer system using CUTER software and CUTS format cassette tape.

Proteus item D3: (one only)

Extended Disk BASIC User's Manual--This is an adaptation of BASIC for use with PTDOS and Helios II Disk Memory System.

Proteus item D4: (one only)

VDM-1 Video Display Module User's Manual: Assembly and Test Instructions-- This manual supplies the information needed to assemble, test and use the VDM-1 Video Display Module, an ultra-high speed display generator designed to operate with S-100 computers.

Proteus item D5: (one only)

8080 Cassette FOCAL User's Manual (Part No. 727025, April 1978)--FOCAL is an interpreter which communicates with the user through an I/O device like a teletype.

Proteus item D6: (one only)

ASSM Advanced 8080 Assembler User's Manual, Release 1.0 (Part No. 727120, July 1978)--This manual accompanies a cassette tape with 3 programs: ASSM, PACK, and UNPAC. ASSM is designed for use on computers that use the CUTER monitor program and CUTS module. PACK and UNPAC convert a cassette file from either of the two SOLOS/CUTER file formats (single-block and multiple-block) to the other.

Proteus item D7: (two only)

BASIC/5 User's Manual (Manual No. 727001, November 1977)--This manual describes the features and restrictions of PT's SOL BASIC programming language.

Proteus item D8: (one only)

SOL Terminal Computer User's Manual (Part No. 730021, March 1979)--This manual is a light operating guide and reference manual for all SOL users. It can serve as the novice's learning book or as an experienced user's introduction to the full capability of the SOL Terminal Computer.

Proteus item D9: (one only)

SOFTWARE #1--This is a self-contained program development system for any computer based on the Intel 8080 micro-processor. The package includes an executive to handle memory files, an assembler, and a line oriented editor. This is the manual for the original paper-tape version.

Proteus item D10: (two only)

5K BASIC (SOFTWARE #2)--This is a source listing of 5K BASIC, the original paper-tape version.

Proteus item D11:

SOLOS CUTER User's Manual (Part No. 727004, June 1978)--This manual describes the SOLOS and CUTER monitor programs. CUTER operates in 8080-based computers other than the SOL that are equipped with PT CUTS tape interface board, VDM-1 video display board and 3P+S Parallel/Serial I/O board.

Proteus item D12:

CUTS Computer Users Tape System User's Manual (Manual No. 730005, July 1977)--This manual supplies the information needed to assemble, test, and use the CUTS System. CUTS is a high-speed, simple to use audio cassette interface that operates at 300 and 1200 bps data rates under program control.

Proteus item D13:

General Purpose Memory Module, GPM and GPM-SOL, Assembly and Test Instructions (Manual No. 210,003, July 1977)--This manual provides all information necessary to assemble, test, and use the GPM module. GPM is an S-100 bus compatible memory module for use in 8080-based computers.

Proteus item D14:

Subsystem B User's Manual (Manual No. 730013, August 1977)--PT's Subsystem B is a set of five S-100 compatible modules which convert most microprocessor mainframe assemblies into computing systems comparable in power to the SOL20. It comprises two memory modules and three interface modules.

Proteus item D15:

Cassette PILOT Update 731069, 6/78, 1 p.--Correction to manual recording LOAD PLTST or WAPP.

Proteus item D16:

Cassette PILOT Update 731069, 7/78, 4 pp.--Patches for PILOT 2.2 (Mod 0).

Proteus item D17:

SOFTWARE #1 Update 731070, 7/78, 3 pp.--Error correction for SOFTWARE #1, Release 1.0 (Mod 0).

Proteus item D18:

Extended Disk Basic User's Manual Update 731062, 3/78, 2 pp.--Added demonstration programs, new FILL statement.

Proteus item D19:

VDM-1 Update 731063, 3/78, 2 pp.--Errata in User's Manual.

Proteus item D20: (UD1)

Extended Cassette BASIC Update 731064, 4/78, 7 pp.--Errata and addenda to User's Manual, first printing, fixing a bug in FOR/NEXT loop operation.

Proteus item D21: (one only)

Extended Disk BASIC Update 731065, 3/78, 1 p. --Fixing the PTDOS GET command on BASIC diskette.

Proteus item D22:

8080 CHESS Update 731043, 9/78, 3 pp.--Changes to sections 4.6, 5.1, 6.1.1, 6.2, and pages 6-3, 6-4, 7-1.

Proteus item D23: (UD2)

PTDOS Update 731072, 11/78, 10 pp.--Corrections and omissions to PTDOS User's Manual, Second Edition (does not apply to first edition).

Proteus item D24:

PTDOS and WordWizard Update 731074, 1/79, 4 pp.--Revision levels of PTDOS 1.5 System Disk, WordWizard System Disk, and WordWizard Document Disk.

Proteus item D25: (UD4)

WordWizard Update 731075, 12/78, 7 pp.--Space-averaging on SOL Printers 2 and 2E, errata to WordWizard User's Manual, specifications for custom printer drivers, and WIZ--the electric pencil sharpener.

(continued)



Proteus item D26:
16KRA Dynamic Read/Write Memory Module User's Manual (Part No. 730003, April 1978)--This manual supplies the information needed to test and use the 16KRA Dynamic Read/Write Memory Module which is designed to operate in the SOL S-100 bus and a number of other 8080-based computers.

Proteus item D27:
32KRA Dynamic Read/Write Memory Module User's Manual (Part No. 730017, March 1978)--This manual supplies the information needed to test and use the 32KRA Dynamic Read/Write Memory Module which is designed to operate in the SOL S-100 bus and a number of other 8080-based computers.

Proteus item D28:
32KRA-1 Dynamic Read/Write Memory Module User's Manual (Part No. 730026, July 1978)--This manual supplies the information needed to test and use the 32KRA-1 Dynamic Read/Write Memory Module which is designed to operate in the SOL S-100 bus and a number of other 8080-based computers.

Proteus item D29:
48KRA-1 Dynamic Read/Write Memory Module User's Manual (Part No. 730027, July 1978)--This manual supplies the information needed to test and use the 48KRA-1 Dynamic Read/Write Memory Module which is designed to operate in the SOL S-100 bus and a number of other 8080-based computers.

Proteus item D30:
ACCESS, March 1977. Hardware mods to 3P+S & VDM. Mods to upgrade rev. D Sol to rev. E (except parallel port), CUTER listing.

Proteus item D31: (two only)
The Small Computer Catalog. PTC's colorful catalog.

Proteus item D32: (one only)
8080 FOCAL User's Manual (June 1, 1976). The original paper-tape version.

Proteus item D33: (one only)
SOFTWARE #2 (BASIC/5) paper-tape object program and user's manual.

Proteus item D34: (unbound)
ALS8 Newsletter Vol. 1, No. 2--User's Notes, Sept. 1977. 68 pp. Errata, addenda, and explanation of internal routines useful to the programmer.

Proteus item D35: (two only)
ALS8 Program Development System User's Manual (Part No. 727013, November 1977)--This manual describes the capabilities of

ALS-8, a single terminal operating system designed for use with 8080-based micro-computers.

Proteus item D36:
ALS8 Manual Change Notice #2 (Jan. 1978)--Describes several new features contained in Revision B ALS8 program (pp. 81-83, 83.1-83.3).

Proteus item D37:
Extended Disk Basic Reference Card.

Proteus item D38: (one only)
CUTS, Computer User's Tape System: Assembly and Test Instructions (1977)--This manual supplies the information needed to assemble, test and use the CUTS, Computer User's Tape System.

Proteus item D39: (one only)
CUTER Monitor Program Source Listing.

Proteus item D40:
FORTRAN Update 731077, 2/27/79, 25 pp.--Distinction between "terminal" and "console" in Extended Disk FORTRAN, errata and addenda to Extended Disk FORTRAN User's Manual, revised descriptions of subroutines, Appendices 6 and 7.

Proteus item D41:
Extended Disk FORTRAN Update 731040A, 7/78, 2 pp.--Additional programs on FORTRAN Diskette.

Proteus item D42:
SOL Manual Addenda 1 and 3, 6/77 and 7/77--Cassette recorders for use with SOL.

Proteus item D43:
SOL Terminal Computer Systems Manual (Part No. 730000, February 1978)--Describes the assembly, testing, and principles of operation of the SOL computer. Loose-leaf. Incorporates the change notices issued prior to Feb 1978.

Proteus item D44:
Engineering Change Notice #7, 4/21/77, 6 pp.--Describes solution to a rare problem which can occur on the SOL-PC under certain conditions, where U97 cannot sink enough current to actuate the relays K1 and/or K2.

Proteus item D45: (one only)
SOL Manual Change Notice #9, 7/77, 4 pp.--A modification for all SOL's which have the brown-out transformers, if they are used at a line voltage of 110-120 v.a.c.

Proteus item D46:
SOL Manual Change Notice #10, 7/77, 1 p.--Change to Section X, Drawing X-17, Serial Data Interface/U.A.R.T. block.

Proteus item D47:
SOL Manual Change Notice #11, 9/77, 6 pp.--Change to Section X, Drawing X-19, SOL audio tape I/O schematic.

Proteus item D48:
SOL Manual Change Notice #13, 11/77, 1 p.--Side panel assemblies; supercedes Change Notice #12.

Proteus item D49:
SOL Manual Change Notice #14, 11/77, 1 p.--Change to Step 27, page II-14.

Proteus item D50:
SOL Manual Change Notice #16, 1/78, 2 pp.--Vectored interrupt capability for SOL.

Proteus item D51:
SOL Update 731049, 12/78, 5 pp.--Describes a variety of changes to the SOL that were being incorporated into the then current factory production.

Proteus item D52:
Assembly Procedure Change Notice #RSC Rev. A, 5/10/77, 1 p.

Proteus item D53: (two only)
8KRA Static Read/Write Memory Assembly and Test Instructions.

Proteus item D54:
Assembly Procedure Change Notice #6-2 Rev. C, 2 pp.--Crowbar fix for SOL Rev. B Regulator P.C. Board, flat washers in final cabinet assembly.

Proteus item D55:
SOL-Hytype Interface Update 731076, 12/78, 5 pp.--SOL Printer interface.

Proteus item D56:
nKRA Installation Guide (Part No. 730038, March 1979)--This guide introduces you to any member of the nKRA family memory boards.

(continued)

Proteus item D57:
16KRA & 32KRA Update 731066, 5/78, 2 pp.--Describes the factory modifications to the 16KRA and 32KRA circuit boards.

Proteus item D58:
64KRA-1 Memory Module Product Description (Part No. 730035, 10/78), 4 pp.--Supplements 48KRA-1 Dynamic Read/Write Memory Module User's Manual.

Proteus item D59:
16KRA Update 731047, 11/78, 8pp.--Describes modifications to nKRA memory boards which make the boards compatible with many more S-100 computers based on the 8080.

Proteus item D60:
Diagnostic Test 16KRA Dynamic Read/Write Memory Module (Section VII), 1977.

Proteus item D61:
16KRA Manual Change Notice #2, 1/78, 2 pp.--Modifications to portions of the assembly drawing which were made to increase reliability of the 16 KRA P.C. board.

Proteus item D62:
16KRA & 32KRA Update 731041, 7/78, 2 pp.--Modification to correct marginal memory address timing, errata in long memory test appendix.

Proteus item D63: (one only)
16KRA & 32KRA Update 731042, 9/78, 1 p.--Modification to improve rise time of match lines.

Proteus item D64:
Helios Update 731067, 6/78, 2 pp.--Describes modification to the Helios Controller circuit board.

Proteus item D65: (UD3)
PTDOS Update 731073, 12/78, 5 pp.--SOL Printer drivers on the PTDOS 1.5 system disk, notes on installing SOL Printers.

Proteus item D66:
Para Sol Debugger Kit User's Manual (Part No. 900038) (Manual No. 730018, April 1978).

Proteus item D67:
Helios Update 711048, 3 pp.--Describes modifications to Helios Formatter circuit boards.

Proteus item D68:
Helios Update 731071, 8/7/78, 3 pp.--Describes modifications to Helios II Controller PCB which bring that PCB from assembly revision level H to J.

Proteus item D69:
Field Retrofit Notice, 4/1/79, 4 pp.-- Modifications to Helios II Formatter board to correct timing problem that causes tendency for PTDOS errors relating to disk structure.

Proteus item D70:
Field Retrofit Notice, 4/19/79, 2 pp.--Extended Disk Fortran Disk, WordWizard System Disk, WordWizard Document Disk.

Proteus item D71:
PerSci PCB Assemblies Logic & Schematic Diagram Diskette Drive Models 270/272/277, 2/22/79.

Proteus item D72:
Helios II Disk Memory System Manual (Part No. 730009, March 1978)--This manual is an operating and light maintenance reference for Helios II floppy disk memory system in its various configuration.

Proteus item D73:
Helios II Manual Change Notice #3, 10/77, 3 pp.--Modifications to Regulator PCB. Reset to beginning of disk system test, PTDOS, CONFIGR command password.

Proteus item D74:
Helios II Manual Change Notice #4, 10/77, 3 pp.--Modifications to Controller PCB Assy 301000.

Proteus item D75:
Rev. A Updates to the original loose-leaf Helios II Disk Memory System Manual.

Proteus item D76:
WordWizard Update No. 3, 4/3/79, 8 pp.--Updates to WordWizard User's Manual, First Edition, Manual Part No. 727211.

Proteus item D77: (one only)
ALS8 Newsletter, Volume 1, No. 1, March 1977. 63 pp. Addenda errata, and application notes. Relates to the Pre-Sol version, but much still applies.

Proteus item D78:
Chapter VIII of Sol System Manual--Theory of operation of Sol. Explains how the Sol circuitry works, internal signals, etc.

Proteus item D79:
Diablo Series 2300 Matrix Printer Maintenance Manual--the detailed manual on the SolPrinter 3 mechanism, describing programming and hardware maintenance procedures.

Proteus item D80:
Diablo Systems Maintenance and Special Items Pricing--the prices are probably out of date, but it will give you a list of what is available for Diablo products with respect to accessories and maintenance tools.

UPDATE SERVICE

Proteus item US1:
Update for Extended Cassette BASIC to Rev. A (Part No. 727019)--see PROTEUS News, Vol. 2, No. 3, p. 3. Send original PTC cassette.

Proteus item US2:
Update your PTDOS diskette to PTDOS 1.5 Rev. E (Part No. 727030)--see PROTEUS News, Vol. 2, No. 3, p. 3. Send original PTC diskette.

CASSETTE LIBRARY

Proteus item C1:
Extended cassette BASIC programs--see PROTEUS News, Vol. 2, No. 2, p. 2.

Proteus item C2:
Extended Cassette BASIC programs--see PROTEUS News, Vol. 2, No. 2, p. 2.

Proteus item C3:
Extended Cassette BASIC programs--see PROTEUS News, Vol. 2, No. 2, p. 2.

Proteus item C4:
Software Tech Music Selections--see PROTEUS News, Vol. 2, No. 2, p. 3.

Proteus item C5:
BASIC/5 programs and Palo Alto Tiny BASIC-- see PROTEUS News, Vol. 2, No. 2, p. 3.

Proteus item C6:
ECBASIC programs--see PROTEUS News, Vol. 2, No. 3, p. 12.

Proteus item C7:
Assembly Language Source and Object programs--see PROTEUS News, Vol. 2, No. 3, p. 12.

(continued)

HELIOS DISK LIBRARY

Proteus item H1:
see PROTEUS News, Vol. 2, No. 3, p. 13.

Proteus item H2:
see PROTEUS News, Vol. 2, No. 3, p. 13.

PROTEUS NEWS SUBSCRIPTION AND BACK-ISSUES

Proteus item PN0:
PROTEUS News Volume 0, 1977 back-issues.

Proteus item PN1:
PROTEUS News Volume 1, 1978 back-issues.

Proteus item PN2:
PROTEUS News Volume 2, 1979 back-issues and subscription for remainder of 1979. Subscriptions expire at end of calendar year (Dec. 31) and include membership in PROTEUS, required to purchase library programs or obtain discounts on commercial products.

Proteus item PN3:
PROTEUS News Volume 3, 1980 subscription.

POINTERS by Bob Sparks

Here are some bits of information sent to PROTEUS by Bob Sparks in May.

1. Using REM statement area for machine program (ala Lewis Moseley).

Everything remains good except if you attempt the edit command on the REM line. Even if you do no editing the machine program probably will be altered. Listing is O.K.

2. Two byte memory clear program.

From: Micro Service of Indiana, Inc.
Enter @ 0 : 33 C7
Ex 0

All contiguous memory thru 0000 cleared except for 0000 0001 and 0D09.

3. BASIC 5 Data Arrays

If all data to be used is positive, the negative bit marker (BYTE 5 of array) can be used as miscellaneous data position. Computational answers (+, -, *, /) are unaffected. Comparisons (> <) require ABS(X) to work.

Only bit #1 affects negative or positive. If = 1 then number negative; if 0, positive. So even with negative numbers, seven bits (markers) are still available for use.

Software Report
CP/M on Helios disk from Lifeboat Associates
by Joe Maguire

CP/M, written by Digital Research Corp., was originally offered only in the IBM soft sectored format since that was the more or less standard at the time CP/M was first created. Since that time others have come into use such as the 'firm sectored' format of Helios. (firm sectoring is a combination of hard and soft) Various advantages have been given as the reason for departing from soft sectoring but one serious disadvantage for the user is incompatibility. It's impossible to read an IBM formatted disk with the Helios controller.

In the meantime, CP/M has become the most popular disk operating system among microcomputers. How then, does an owner of a Helios get in on the world of action with CP/M? One solution has been provided by Lifeboat Associates. They have taken the CP/M software, married it with the necessary disk operating commands of Helios, and written it onto a disk in the Helios format. How well does it work? In my opinion, well, but there are limitations.

So far, I have been able to get every CP/M program available on my IBM disks to work satisfactorily with the Helios version. But therein lies the limitation. How does one get a program transferred from one format to another?

One possibility is to order the Helios version from Lifeboat. The literature accompanying my CP/M master disk mentioned that such programs as Fortran, Basic, SID, TEX, etc. were available but nothing was said about Users Group disks. In my opinion, the real wealth lies there, as there are now some 35 disks in the library.

Another solution is to get a second controller for the Helios which can read IBM disks. That is what I have done. I purchased the Tarbell controller and wired it up according to the instructions for the PerSci 270 drive. (that's the one used in the Helios) The procedure I use now is: disconnect the Helios controller; plug in the Tarbell controller; read the desired programs from the IBM disk into the TPA with DDT; save the memory image on cassette tape; reverse the controllers; read the tape back into memory and save it on the Helios CP/M disk. This sounds like a cumbersome process but actually it need be done only once for each disk.

Some readers will recall that Ron Parsons outlined a method for using the Tarbell controller with Helios in previous issues of Proteus. Unfortunately, that procedure no longer works because Tarbell has changed the design of their board.

All in all, I'm very pleased with my Helios CP/M. A few minor restrictions were required in the adaptation but they are not significant. For example, only 13 sectors of each track of the disk are used instead of the 16 available with Helios. This reduces the disk capacity somewhat but there is still plenty of room. The disk boots up using the standard BOOT command of the Bootload personality module. Helios CP/M and Helios PTDOS are not compatible. Any attempt to read the CP/M disk with PTDOS gives a DISK STRUCTURE BAD error.

PROTEUS SOFTWARE DIRECTORY

PROGRAM NAME: THE BUILDER CATEGORY: Builders and Contractors

DESCRIPTION: The Builder is complete job bid, billing, and job costing system. Programs included perform the following:
1. Print formal bid with all line items for construction job.
2. Update completion status and print periodic invoices.
3. Update account receivable.
4. Update sub-contractors invoices and payments and print job cost report. 5. Print summary job cost reports.
MINIMUM HARDWARE REQUIRED: 32 K RAM, including all system RAM; 2 North Star disk drives; SOLOS/Cuter; printer.
SOFTWARE REQUIRED: North Star Basic 10 Digit precision, if desired.
RESTRICTIONS: None

DOCUMENTATION: Complete, easy to follow users manual. Also includes programmers guide.
MEDIA: North Star diskette
DATE CURRENT VERSION WAS RELEASED: 7/20/78
WARRANTY: 90 days repair; one year update
PRICE: \$475.00
ORDER FROM: Fraser Associates, Ltd., P.O. Box 123, Holly, Michigan 48442 (sole distributor)

REMARKS: This system has been developed for, and field tested, in a commercial user environment.

PROGRAM NAME: THE BILLER CATEGORY: Business

DESCRIPTION: The Biller is a complete billing and accounts receivable package. Programs included perform the following:
1. Print invoices, bills of lading and shipping labels
2. Update accounts receivable files 3. Age accounts receivable and print aged trial balance 4. Convert from manual system to The Biller 5. Process account inquiries 6. Create master diskettes
MINIMUM HARDWARE REQUIRED: 32K RAM, including all system RAM; 2 North Star disk drives; SOLOS/Cuter; printer.
SOFTWARE REQUIRED: North Star Basic 10 Digit precision, if desired.
RESTRICTIONS: None

DOCUMENTATION: Complete, easy to follow users manual. Also includes programmers guide.
MEDIA: North Star diskette
DATE CURRENT VERSION WAS RELEASED: 7/15/78
WARRANTY: 90 days repair; one year update
PRICE: \$525.00 pre-paid
ORDER FROM: Fraser Associates, Ltd., P.O. Box 123, Holly, Michigan 48442 (sole distributor)

REMARKS: This system has been developed for, and field tested in a commercial user environment.

PROGRAM NAME: LB01 - Law Billing CATEGORY: LAW

DESCRIPTION: Profitability analysis by attorney or case type, Full audit trails, Multiple matters per client, Numerous fields per matter, Historical information retained (Year to date and Case to date), Pre-statement verification, Statements, User defined transaction codes.

MINIMUM HARDWARE REQUIRED: Printer, 32K, CRT, 2 disk drives

SOFTWARE REQUIRED: CP/M, CBASIC, QSORT

RESTRICTIONS:

DOCUMENTATION: Complete and easily understood user's manual.

MEDIA: Single or Double Density Diskette
DATE CURRENT VERSION WAS RELEASED: 10-12-78
WARRANTY: 6 months
PRICE: Write for price information
ORDER FROM: H & H Associates, Inc.
P.O. Box 19504
Denver, Colorado 80219
(303) 355-1067

REMARKS:

PROGRAM NAME: BIG PRINT CATEGORY: SIGN MAKER

DESCRIPTION: The copyrighted program BIG PRINT is used to print giant block characters to create any message on 14 7/8 inch paper. Each character is printed sideways on the paper so words cover several sheets of paper. The characters available are the letters A-Z upper and lower case, the numbers 0-9, and the special characters \$ - . , ; ' ' ? !
Only the object code is released.

MINIMUM HARDWARE REQUIRED: 10K RAM plus SOLOS/CUTER and system RAM; 132 print position printer. HELIOS version requires additional 12K.
SOFTWARE REQUIRED: Version SS requires SOLOS/CUTER.
Version SS-H additionally requires HELIOS (PTDOS).
RESTRICTIONS: Only conversant in English.

DOCUMENTATION: All the documentation and instructions are via the VIDEO DISPLAY.
MEDIA: SOLOS/CUTER version on cassette; PTDOS version on cassette.
DATE CURRENT VERSION WAS RELEASED: September 1978.
WARRANTY: 90 Day repair/replace.
PRICE: \$29.95 plus 6% sales tax. We welcome VISA and MASTER CHARGE.
ORDER FROM: COMPUTER DEMO ROOM, INC.
509-B Francisco Blvd
San Rafael, CA 94901
Phone (415) 457-9311

REMARKS:

(Software Directory to be continued in next issue.)

PROTEUS HARDWARE DIRECTORY

THIS DIRECTORY IS INTENDED TO SUMMARIZE PROTEUS MEMBER'S EXPERIENCES REGARDING COMPATIBILITY OF VARIOUS HARDWARE ITEMS WITH THE SOL AND HELIOS SYSTEMS. PRICE AND TECHNICAL SPECIFICATIONS MAY BE FOUND IN VARIOUS MAGAZINE AD'S, COMPUTER STORES, ETC. NEITHER I, NOR PROTEUS CAN TAKE RESPONSIBILITY FOR THE ACCURACY OF THIS COMPILATION - SO IF A BOARD THAT GOT GOOD REVIEWS BY A PROTEUS MEMBER DOESN'T WORK IN YOUR SYSTEM, PLEASE DON'T COME AFTER US!! MOST STORES WILL REFUND YOUR MONEY IF AN ACCESSORY DOESN'T WORK, BUT THIS MAY NOT APPLY IN ALL CASES, PARTICULARLY WITH KITS. ALWAYS INQUIRE AS TO REFUND POLICIES BEFORE YOU BUY!

PROTEUS MEMBERS ARE ENCOURAGED TO REPORT THEIR EXPERIENCES WITH HARDWARE ACCESSORIES, GOOD AND BAD, TO:

LEIGH TORGERSON
7920 LE GRANDE DRIVE,
PENSACOLA, FL 32504

YOUR INPUTS WILL BE OF HELP TO ALL OF US - NOW THAT PROTECH SEEMS TO HAVE ROLLED OVER AND PUT IT'S LITTLE FEET UP IN THE AIR, WE ARE ON OUR OWN WHEN IT COMES TO TECHNICAL SUPPORT...

VOLUME AND NUMBER REFERENCES ARE TO BACK ISSUES OF PROTEUS NEWS.

*** MEMORY BOARDS ***

-ARTEC 16K/32K STATIC RAMS

SEVERAL GOOD REPORTS FROM DMA AND NON-DMA USERS.

-BASE 2 16K RAM BOARDS

REPORTED TO WORK WELL IN THE SOL. SEE JOE MAGUIRE'S LETTER IN VOL. 1 NO. 4.

-DYTRON 32K STATIC RAM

HIGHLY RECOMMENDED BY RON PARSONS IN A REVIEW IN VOL. 1 NO. 4. WORKED WELL WITH HELIOS AND TARBELL DISK CONTROLLERS.

-EXTENSYS 32K AND 64K DYNAMIC RAMS

GOOD REPORT ON 32K BOARD IN A NON-DISK SYSTEM (BOB STEK, VOL. 1 NO. 1). A REVIEW IN VOL. 1 NO. 3 STATES THAT THE RM64 64K BOARD "... APPEARS TO WORK WELL IN MOST STANDARD SOLS." THE NEWER MODEL RM-650 64K BOARD IS REPORTED TO WORK WITH HELIOS - SEE VOL. 1 NO. 4 FOR REVIEW.

-MICROBYTE 32K STATIC RAM

GOOD REPORT BY STAN SOKOLOV IN VOL. 1 NO. 4. HELIOS COMPATIBLE.

-MSA 8K BOARD

NO REPORT ONE WAY OR THE OTHER, BUT IT'S USE IN A NON-DMA SYSTEM REPORTED IN VOL. 1 NO. 3.

-S. D. SALES EXPANDORAMS

DYNAMIC MEMORIES. SOME PROBLEMS REPORTED. TWO 24K BOARDS (ONE KIT AND ONE ASSEMBLED) TRIED WITH NON-DMA SOL WITHOUT LUCK. A 32K BOARD HAS BEEN REPORTED TO WORK SATISFACTORILY WITH A DISK SYSTEM AS LONG AS THE DOS IS NOT RESIDENT IN THE EXPANDORAM. S. D. SALES UNABLE TO EXPLAIN INCOMPATIBILITY PROBLEMS. HAVE HEARD THAT CHANGING THE MEMORY CHIPS FROM 4115'S TO 4116'S HAS CURED SOME PROBLEMS. GOOD PRICE FOR THE BOARDS. SO IT MIGHT BE WORTH A TRY IF YOU CAN GET A REFUND IF THE BOARD DOESN'T WORK IN YOUR SYSTEM.

-SEATTLE COMPUTER PRODUCTS 16K STATIC RAM
RAN WITH SEVERAL DMA DEVICES AND WITH THE ITHACA AUDIO Z-80 CONVERSION. ONLY PROBLEM IS THAT BOARD REQUIRES A MAX OF 9V ON THE 8V LINE, OTHERWISE SUPPLEMENTAL COOLING MAY BE REQUIRED, AND THE WARRANTY MAY BE VOIDED. MANY SOL'S HAVE 10V OR MORE ON THE 8V LINE. SEE REVIEW BY BILL BURNS IN VOL. 1 NO. 3.

-SPACE BYTE 16K STATIC RAMS

REPORTED TO BE "FLAKY" WITH HELIOS - SEE VOL. 1 NO. 1.

-VANDENBERG DATA PRODUCTS 16K RAM

STATIC MEMORY CHIPS WITH DYNAMIC SUPPORT CIRCUITS. SOME DMA INCOMPATIBILITY. RAN FLAWLESSLY WITH NORTHSTAR, INSAI DISK AND ONE HELIOS, BUT WOULDN'T RUN WITH ANOTHER HELIOS. SEE REVIEW BY BILL BURNS, VOL. 1 NO. 3.

*** OTHER ACCESSORIES ***

-HEURISTICS SPEECHLAB 50

GOOD WRITE-UP AND FAVORABLE REVIEW BY BRUCE BARRON IN VOL. 2 NO. 1.

-KEA MICRO DESIGN GRAPHICADD

128H X 48V GRAPHICS ADD-ON BOARD FOR \$50. FAVORABLE REVIEW IN VOL. 1, NO. 4.

*** REVIEWS WANTED ***

-SEMIONICS REM 5-100 4K ASSOCIATIVE MEMORY

-MK ENTERPRISES MK-11 DTMF TELEPHONE TRANSCEIVER

-CENTRAL DATA CORP MEMORY BOARDS

-SSM MEMORY BOARDS

-SEALS MEMORY BOARDS

-ANYTHING ELSE YOU RECOMMEND OR HATE!

[Ed. Note--Leigh would like to hear from anyone who might know where he can get a maintenance manual for an OKIDATA CP-110 Printer, or who might know what it would take to convert its RS-232 Interface Board to allow it to print lower case.]

(continued from front page)

For \$175 I'll send you a two-board set as I've described. Add \$5 to cover handling and postage to U.S. or Canada, or \$10 to other foreign addresses, and California residents should add \$10.50 sales tax. Mention that you are ordering the "Helios board set". Please allow about 4-5 weeks for delivery, since I'll have to order suitable shipping boxes and find the time to get over to Oakland. I prefer payment by check, but if you don't want to do that, send me your Visa or Master Charge number and expiration date, and I'll open a charge-card account through my bank.

If you want the 3 missing IC's, send \$60 plus \$3 for handling and postage. California residents add \$3.60 sales tax. Allow 4 months for delivery! (It's crazy but true. Apparently, these IC's are made by only one manufacturer in limited production relative to the demand, and the prices are quite high compared with run-of-the-mill IC's.) Mention that you are ordering "the missing Helios IC's".

If you don't have the technical manual on the Helios (the big loose-leaf binder giving the assembly and testing instructions and theory of operation on Helios), you may want to order one from us. We have a few. See the Catalog and order form in this issue.

NEVADA

COBOL

FOR THE

8080/Z80/8085



Ellis Computing

0001 IDENTIFICATION DIVISION.
0002 PROGRAM-ID. RENUMBER.
0003 AUTHOR. ELLIS COMPUTING.
0004 INSTALLATION. SAN FRANCISCO PROGRAMMING CENTER.
0005 DATE-WRITTEN. JANUARY 11, 1979.
0006 DATE-COMPILED. JANUARY 20, 1979.
0007 SECURITY. NONE.
0008* This program rennumbers a NEVADA COBOL source program file.
0009 ENVIRONMENT DIVISION.
0010 CONFIGURATION SECTION.
0011 SOURCE-COMPUTER. 8080-CPU.
0012 OBJECT-COMPUTER. 8080-CPU
0013 MEMORY SIZE 8192 CHARACTERS.
0014 INPUT-OUTPUT SECTION.
0015 FILE-CONTROL.
0016 SELECT FILE-TO-RENUMBER ASSIGN TO I-O DISK
0017 RECORD DELIMITER IS "'0D"'.
0018 DATA DIVISION.
0019 FILE SECTION.
0020 FD FILE-TO-RENUMBER
0021 LABEL RECORDS ARE STANDARD
0022 VALUE OF FILE-ID IS RE-NUMBER-FILE-NAME
0023 DATA RECORD IS A-RECORD.
0024 01 A-RECORD.
0025 02 SEQ-NUMBER PIC 9999.
0026 02 FILLER PIC IS X(76).
0027 WORKING-STORAGE SECTION.
0028 01 NEW-SEQ-NUMBER PIC 9999 VALUE IS 0001.
0029 01 RE-NUMBER-FILE-NAME PIC X(10) VALUE IS "FILENAME/0".
0030 PROCEDURE DIVISION.
0031 BEGIN.
0032 DISPLAY "ENTER FILE NAME ".
0033 DISPLAY RE-NUMBER-FILE-NAME WITH NO ADVANCING.
0034 ACCEPT RE-NUMBER-FILE-NAME.
0035 OPEN I-O FILE-TO-RENUMBER.
0036 MOVE SPACE TO A-RECORD.
0037 GET-NEXT-RECORD.
0038 READ FILE-TO-RENUMBER AT END
0039 GO TO END-OF-JOB.
0040 MOVE NEW-SEQ-NUMBER TO SEQ-NUMBER.
0041 ADD 1 TO NEW-SEQ-NUMBER.
0042D DISPLAY A-RECORD.
0043 REWRITE A-RECORD.
0044 GO TO GET-NEXT-RECORD.
0045 END-OF-JOB.
0046 CLOSE FILE-TO-RENUMBER.
0047 DISPLAY "RENUMBERING COMPLETE".
0048 STOP RUN.
0049 END PROGRAM RENUMBER.

PRODUCT DESCRIPTION

NEVADA COBOL Copyright (C) 1979 by Ellis Computing

COBOL (Common Business Oriented Language) is by far the most popular language used by large Corporations. Almost every University, College and Junior College teaches the programming language to satisfy the appetite of the hungry business community. Every day in the U.S. thousands of jobs for COBOL programmers go unfilled. Just look in the classified advertising of any Newspaper and you quickly get the picture. It has been estimated that between 200,000 and 300,000 computer programmers trained in the COBOL language have written 10 Billion Dollars worth of COBOL programs.

NEW PRODUCT

A New product, **NEVADA COBOL**, is now available to translate source language programs into machine language on 8080/280/8085 microprocessors. Designed specifically for small businesses using microprocessors, **NEVADA COBOL** is simple, fast and easy to use. Standard Features include:

- Random access file support
- Sequential files both fixed and variable length
- Debugging capability
- Copy statement
- Data types: Character string, 16-bit binary
and packed decimal (COMP-3)
- 18-digit accuracy
- Hexidecimal non-numeric literals
- Powerful editing with English language error messages
- Interactive ACCEPT/DISPLAY
- Subset of ANSI-74

The high-performance compiler generates fast in-line machine language object programs at a rate up to 650 lines/minute on an 8080-CPU. Currently operating under Processor Technology's operating system (PTDOS), the compiler requires a minimum of 32K RAM.

Outstanding price/performance and delivery is immediate. Want a closer look? The **NEVADA COBOL** Programmers Reference Manual is available for \$25 and the Diskette is \$275. California residents please add sales tax.



Ellis Computing

1480 17th Ave
San Francisco, CA. 94122
(415) 664-1534

ORDER FORM

- Please send the **NEVADA COBOL** manual.
\$25 enclosed.
- Please send the **NEVADA COBOL** Diskette.
\$275 enclosed.
- Please send both the **NEVADA COBOL** Manual and Diskette.
\$300 enclosed.

To: Name _____
Address _____
City _____ St _____ Zip _____

California residents please add sales tax.



Ellis Computing

1480 17th Ave
San Francisco, CA 94122

**RESOLVING CONFLICTS BETWEEN
N* DOS AND LARGE PROGRAMS WITH
ORIGIN AT 0**

LEONARD MORGENSTERN

If your NORTH STAR DOS is located at 2000, you have a problem with PT-EDIT, ELECTRIC PENCIL, PT-BASIC, and other programs that need the RAM used by the DOS. Here is how I solved the problem for PT-EDIT. The same principle should work for other programs.

PT-EDIT resides in RAM from 0 to 1A44, and the text extends from 1A45 on up. Actually, most of RAM from 1800 to 1A44 is made up of I/O buffers and parameters. Therefore, we can imagine PT-EDIT to be made up of an unchangeable portion between 0 and 17FF and a variable portion from 1800 to memory limit.

Loading is accomplished as follows:

- (1) Load variable portion at 2D00 (2A00 for single-density DOS)
- (2) Load unchangeable portion at 0
- (3) Sew together the blocks residing at 2D00 and 0 by moving the former down to 1800

Step (1) is done "by hand", but steps (2) and (3) are accomplished by a prewritten program E located at C863, an area not used by EDIT. E has 2 entries, SEW and RIP. All I have to type is:

```
+LF file 2D00
+GO E
```

Now the computer loads E, enters at the entry SEW, which loads the unchangeable part of EDIT, moves the variable data at 2D00 down, "sewing" it to the unchangeable part, and jumps to 0. This, of course, wires out DOS.

The above loads the files, but what about storing them back on the disk? To accomplish this you need a way to get from EDIT back to the entry RIP of E. I have assigned the F\$\$ command for this purpose. RIP then splits memory in two, moving the variable part, (whose low order byte is now at 1800) to 2D00, and then jumps to E800 (E900 for single density), thus loading DOS into the gap left by the move. Then the modified file can be saved by

```
+SF filename 2D00.
```

The following scheme simplifies the calculation of the move commands. Fill in the blanks in the scheme:

```
Unchang. memory (a)..... to (b).....
Low var. memory (c)..... to (d).....
DOS              (e)..... to (f).....
Hi var. memory  (g)..... to (h).....
First unavail. mem. (i).....
```

For the EDIT program, the values are:

```
Unchang. memory (a) 0 to (b) 17FF
Low var. memory (c) 1800 to (d) 1FFF
DOS              (e) 2000 to (f) 2CFF
Hi var. memory  (g) 2D00 to (h) 7EFF
First unavail. mem. (i) 7F00
```

(My variable memory ends at 7EFF because I reserve the area from 7F00 TO 7FFF for another purpose)

The MOVE DOWN commands are

```
LXI D,(g)          LXI D,2D00H
LXI H,(c)          LXI H,1800H
LXI B,(i)-(g)      LXI B,5200H
```

The MOVE UP commands are

```
LXI D,(i)-(g)+(c)-1 LXI D,69FFH
LXI H,(h)            LXI H,7EFFH
LXI B,(i)-(g)        LXI B,5200H
```

Next, I set my memory limit to (i)-(g)+(c)-1.

SETTING THE F command: Memory locations 296-297 should be changed to the RIP entry point of E.

304 Rheem Blvd., Moraga, CA, 94556

File: N#HLP

Page 1

```
0000 *****
0001 *
0002 *
0003 *
0004 *
0005 * E: helper for loading programs that overlap
0006 *     North Star DOS area
0007 *
0008 *
0009 * Written by Leonard Morgenstern, 1979
0010 * This version written 4/6/79
0011 *
0012 *
0013 * See accompanying text for explanation on
0014 * how to compute buffer addresses
0015 *
0016 *
0017 *****
0018     ORG     OC863H
0019 *
0020 *JUMP TABLE
0021     JMP     SEW
0022     JMP     RIP
0023 *
0024 *****
0025 *
0026 *
0027 * SEW: This loads the unchangeable part of the
0028 *     program, and "sews" the
0029 *     variable part to it.
0030 *
0031 *****
0032 *
0033 * Reset stack pointer and push SOLOS entry
0034 *
0035 SEW     EQU     $
0036     LXI     SP,OCBFEH
0037     LXI     H,OC004H
0038     PUSH    H
0039 *
0040 * Load unchangeable part
0041 *
0042     LXI     H,LABL1
0043     LXI     D,0     DE=Address
0044     CALL    LDSK    Load file from disk into memory
0045 *
0046 * MOVE DOWN
0047 *
0048     LXI     D,2D00H Low addr of block to be moved
0049     LXI     H,1800H Low addr of destination area
0050     LXI     B,5200H Number of bytes to be moved
0051     LDAX   D
0052     MOV    M,A
0053     INX   H
0054     INX   D
0055     DCX   B
```

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(continued)

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File: N*HLP

N*HLP

Page 3

```

C887 7B      0056      MOV      A,B
C888 B1      0057      ORA      C
C889 C2 82 C8 0058      JNZ      CY1
0059 *
0060 * Move completed, now JUMP to Program entry
0061 *
0062      LXI      H,0C000H Needed for some PT Programs
C88C 21 00 C0 0063      JMP      0
C88F C3 00 00 0064 *
0065 *****
0066 *
0067 * RIP will split file and move variable part
0068 * Then it calls North Star loader
0069 *
0070 *****
0071 *
0072 * MOVE UP
0073 *
0074 RIP EQU $
C892      EQU $
C892 11 FF 69 0075      LXI      D,69FFH High addr of block to be moved
C895 21 FF 7E 0076      LXI      H,7EFFH High addr of destination area
C898 21 00 52 0077      LXI      H,5200H Number of bytes to be moved
C89B 1A      0078 CY2 LDAX D
C89C 77      0079      MOV      M,A
C89D 2B      0080      DCX      H
C89E 1B      0081      DCX      D
C89F 0B      0082      DCX      B
C8A0 7B      0083      MOV      A,B
C8A1 B1      0084      ORA      C
C8A2 C2 9B C8 0085      JNZ      CY2
0086 *
0087 * Jump to N* loader
0088 *
0089      JMP      NSTAR
C8A5 C3 00 E8 0089 *
0090 *
0091 *****
0092 *
0093 *
0094 * This subroutine searches disk directory for label
0095 * and reads data into memory
0096 * HL points to label DE is memory address for read
0097 *
0098 * Entry points to DOS are defined in
0099 * EQU table at end of assembly
0100 *
0101 *****
0102 LDSK EQU $
C8A8      EQU $
C8A8 D5      0103      PUSH D
C8A9 3E 01 0104      MVI      A,1 This specifies default=DISK #1
C8AB CD 1C 20 0105      CALL DLOOK
C8AE DA 2C 20 0106      JC      DOSER
0107 *
0108 * HL points to disk label
0109 * Move disk address to DE and sector count to A
0110 *
0111      MOV      E,M
C8B1 5E      0111      MOV      E,M
C8B2 23      0112      INX      H
C8B3 56      0113      MOV      D,M
C8B4 23      0114      INX      H
C8B5 77      0115      MOV      M,A
C8B6 EB      0116      XCHG      , Disk addr now in HL
C8B7 D1      0117      POP      D Restore RAM address to DE
C8B8 01 81 01 0118      LXI      B,RSPEC Specify drive and density
C8BB CD 22 20 0119      CALL DCOM
C8BE DA 2C 20 0120      JC      DOSER
C8C1 C9      0121      RET
0122 *
0123 * LABEL GOES HERE
0124 *
0125 LABEL1 ASC /EDIT /
C8C2 45 44 49 54 20

```

```

0126 *
0127 *
0128 *EQU TABLE FOR NORTH STAR DOS
0129 * (DOUBLE DENSITY)
0130 *
201C      0131 DLOOK EQU 201CH
2022      0132 DCOM EQU 2022H
202C      0133 DOSER EQU 202CH
E800      0134 NSTAR EQU 0E800H (E900 for single dens)
0135 *
0136 * RSPEC SETS B=1 FOR READ
0137 * AND C=81 FOR UNIT 1 DOUBLE DENSITY
0138 *
0181      0139 RSPEC EQU 181H

```

ALS8 NEWSLETTER HAS BEEN DUG UP

Among the junk we sifted through at the PTC factory clean-out, we found a single copy of the ALS8 Newsletter, Volume 1, No. 1, March 15, 1977. We also found a box of Vol. 1, No. 2, Sept 1977. We are making these available for purchase. See the article on the other documents we found at PTC for more details. The two issues relate to the Pre-Sol release of ALS8, when it was on PROM or paper tape for use with a teletype and an Altair or Imsai.

Much of the content is still relevant, I think. There are some addenda and errata, but mostly the newsletters have explanations of the internal features of ALS8 that are useful to the user. Many internal subroutines are identified and explained, so that you can use them. The internal file structure is explained, as well as ALS8 parameter passing conventions for internal subroutines. Utilities for Tarbell cassettes, a page printer program, listing of the ALS8 global area, more info on custom commands, conversion routines, subroutine and command return routines, and so on, are included.

Since we don't have enough copies to meet the expected demand, I am setting the price of the newsletter high enough to cover the cost of photocopying it for you (including secretarial time). I'd like to be able to make good on the subscriptions some of you lost out on when you originally joined the ALS8 users' group, but we have to make this activity support itself and there isn't any way to get the money that was never refunded. I had no relationship to that group.

NEW PRODUCT RELEASE: FOR MORE INFORMATION CONTACT:
FOR IMMEDIATE RELEASE! JOE SWOPF (215) 265-9220

A LOT OF I/O BY TRACE ELECTRONICS

A SINGLE I/O CARD FOR THE S-100 BUS CONTAINS: FOUR PROGRAMMABLE PARALLEL PORTS, TWO DUPLEX SERIAL PORTS, BAUD RATE GENERATOR, TWO 16 BIT PROGRAMMABLE INTERVAL TIMERS, ROOM FOR UP TO 16K OF EPROM (2708,2716,2732) AND A CONNECTOR TO ADAPT THE PERSCI 1070 INTELLIGENT FLOPPY DISK CONTROLLER TO THE S-100 BUS.

THIS SINGLE CARD CAN INTERFACE CRT TERMINALS, KEYBOARDS, PRINTERS, PAPER TAPE READERS, EPROM PROGRAMMERS, UP TO FOUR FLOPPY DISK DRIVES (WITH CONTROLLER) AND STILL PROVIDE EPROM SPACE AND TWO 16 BIT TIMERS.

THE "FLOPPY I/O" CARD FROM TRACE ELECTRONICS INC., DEVELOPED BY CGRS MICROTECH, IS COMPATIBLE WITH ALTAIR 8800, IMSAI 8080 AND THE CGRS 6502/S-100 MPU. THE "FLOPPY I/O" IS AVAILABLE IN KIT FORM (\$169.95) AND ASSEMBLED (\$219.95).

TRACE Electronics Inc., 570 W DeKalb Pike, King of Prussia, Penna 19406

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CB61      2400 *WHEN FINISHED, COME HERE. IF NO
CB61      2410 *MATCH, PRINT MESSAGE. IN EITHER
CB61      2420 *CASE, RETURN TO SOLOS/CUTER
CB61 3A B1 CB 2430 EXIT LDA FLAG ANY MATCHES?
CB64 B7      2440 DRA A SET FLAGS
CB65 C2 71 CB 2450 JNZ EXIT1 YES, WRAP UP
CB68 CD D9 C3 2460 CALL ADOUT NO, GIVE END ADDR
CB65 21 93 CB 2470 LXI H,MSG2 AND TELL USER
CB6E CD 77 CB 2480 CALL SCR N
CB71 CD 42 C3 2490 EXIT1 CALL CRLF
CB74 C3 04 C0 2500 JMP RETRN TO SOLOS/CUTER
CB77      2510 *
CB77      2520 *SUBROUTINE TO PRINT STRING FROM
CB77      2530 *(HL) UNTIL 0 BYTE FOUND.
CB77 7E      2540 SCR N MOV A,M GET CHAR
CB78 07      2550 DRA A ZERO?
CB79 C8      2560 RZ . YES, THRU
CB7A 47      2570 MOV B,A ELSE, SET UP...
CB7B CD 19 C0 2580 CALL SOUT PRINT IT...
CB7E 23      2590 INX H BUMP POINTER...
CB7F C3 77 CB 2600 JMP SCR N AND DO NEXT CHAR
CB82      2610 *
CB82 53 45 41 52 2620 MSG1 ASC 'SEARCH UTILITY ENABLED'
      43 48 20 55
      54 49 4C 49
      54 59 20 45
      4E 41 42 4C
      45 44
CB98 0D      2630 DB 0DH <CR>
CB99 0A      2640 DB 0AH <LF>
CB9A 09      2650 DB 0 TERMINATOR
CB9D 2D 20 4E 4F 2660 MSG2 ASC '- NO MATCH FOUND'
      20 4D 41 54
      43 48 20 46
      4F 55 4E 44
CBAD 0J      2670 DB 0
CBAC      2680 *
CBAC      2690 *STORAGE AREAS - WITH DEFAULT VALUES
CBAC 09 0D 2700 SADDR DW 0 START ADDRESS
CBAE FF FF 2710 EADDR DW 0FFFFH END ADDRESS
CB9D 0J 2720 TIMES DB 0 VALUES ON THIS LINE
CB91 0D 2730 FLAG DB 0 MATCH FOUND FLAG
CB92      2740 *
CB92      2750 BYTE1 EQU 0 DUMMY VALUE
CB92      2760 BYTE2 EQU 0 DUMMY VALUE
CB92      2770 *
CB92      2780 *EQUATES TO SOLOS/CUTER.
CB92      2790 *THESE VALUES ARE THE SAME FOR BOTH.
CB92 2800 RETRN EQU 0C004H
CB92 2810 SOUT EQU 0C019H
CB92 2820 CUTAB EQU 0C83CH
CB92 2830 *THESE VALUES DIFFER, SO BE SURE TO
CB92 2840 *USE THE APPROPRIATE VALUE.
CB92 2850 * CUTER SOLOS
CB92 2860 * VALUE VALUE
CB92 2870 * ----
CB92 2880 SCONV EQU 0C37BH 0C33AH
CB92 2890 ADOUT EQU 0C3D9H 0C3EBH
CB92 2900 CRLF EQU 0C342H 0C2F9H
CB92 2910 *
CB92 2920 PSW EQU 6

```

...ON CP/M FILE TRANSFER VIA CUTS TAPE, MICROPOLIS DISKS
AND CENTRAL DATA MEMORY

Dear Stan,

I am currently using CP/M On Micropolis from Lifeboat Associates and I have successfully traded diskettes with a friend who uses the version by Computer Mart of New Jersey. Note however that many of the utility programs available from the users group to dump file directories and to deal with absolute track and sector or CP/M group access will not work with these Micropolis versions as they are received.

This is because they assume 26 sectors per track and a certain sequence of sector usage which is different from the Micropolis versions. To get this type of access they use the jump table described in CP/M Alteration Guide and this interface cannot quite follow the published standard in that detail. Another difference is that the unit of storage allocation (the group) has to be 2K instead of 1K. An extent is still 16K - only half of the disk allocation map in the file control block is used.

Fortunately, nearly all CP/M programs restrict themselves to the "public" interface described in the CP/M Interface Guide. These interfaces seem to be completely standard and I have written programs using the latter manual with no problems beyond the need to experiment a bit to clarify the manual. I have also run BASIC-E and various other programs from the CP/M users group.

I should note that writing disk file routines for the CP/M interface has been easier than with Micropolis MDOS because the manual for MDOS Version 3 (4 is out, but I don't have it) wasn't always enough for the more sophisticated routines it provides! I also found it difficult to find the combination of MDOS routines to accomplish my task (interface tiny-c).

My first package of software written in CP/M should be of interest to all users of SOLOS and CUTER because it provides CP/M file transfer between CP/M systems with any disk systems using CUTS tapes. I am enclosing a tape for your possible use in any exchange you may set up for CP/M. It contains two command files, DISKTAPE and TAPEDISK, and a short DOCUMENT file. The TAPEDISK program can be run from the tape using a bootstrap procedure. It will copy all the files onto the currently logged in disk, assuming CP/M is in memory.

These programs don't care what is in the files and there is no length limit since tape blocks are chained to provide buffering in 8K blocks. The CP/M file name is also in the tape block. TAPEDISK will not overwrite an existing file.

Both SOLOS/CUTER and CP/M I/O is restricted to the standard interfaces. Only about 15K is required for standard CP/M. Tarbell should run in 16K and Micropolis in 17K.

You may pass this tape around. I haven't submitted it to the cassette library because they want the copyright and I have no wish to give up my privilege to give it to other groups or eventually publish it.

I will also provide cassettes to PROTEUS readers for \$5 as described above and \$10 with the addition of source files.

About dynamic memory - I have Central Data's dynamic memory in my SOL (32K of a 64k board). It worked fine with the SOL as shipped but I had to return it for modification for use with memory mapped disk I/O. They sent me the modification instructions as well - a cut trace and 3 jumpers. Supposedly applies to Micropolis and Thinker Toys Disk Jockey1. Their latest ads seem to offer a new version of the board.

I also use DYNABYTE's 16K dynamic board without need for modification.

Dick Greenlaw

(ED. Note;

(ED. Note: Dick's file transfer routines are in our library now--we told him about the new policy about library copyright. He donated the routines. They'll be in a future issue from the cassette library.)

*THE DISKTAPE AND TAPEDISK COMMANDS PROVIDE A METHOD
 *OF EXCHANGING CP/M FILES BETWEEN SYSTEMS WITH
 *INCOMPATIBLE DISK SYSTEMS, SUCH AS BETWEEN 8"
 *AND VARIOUS 5" SYSTEMS.

*THE MEDIUM OF EXCHANGE IS CUTS FORMAT CASSETTE TAPE,
 *WHICH CAN BE READ AND WRITTEN BY SYSTEMS USING
 *PROCESSOR TECHNOLOGY'S SOLOS OR CUTER MONITORS.

*THE TAPES ALSO PROVIDE INEXPENSIVE BACKUP FILES.

*THE DISKTAPE AND TAPEDISK COMMAND PROGRAMS
 *WILL RUN ON ANY CP/M SYSTEM OF 15K OR MORE
 *WITH THE SOLOS OR CUTER MONITOR AT C000
 *AND THE STANDARD CP/M TPA AT 100H, ETC.
 *EACH COMMAND HAS ONLY ONE REFERENCE TO SOLOS/CUTER
 *SO NON-STANDARD CUTER ORIGINS AREN'T A DISASTER.

* DISKTAPE UFN
 *WILL COPY A CP/M FILE OF ANY SIZE, TYPE AND CONTENT
 *TO THE CASSETTE IN TAPE UNIT 1 AT 1200 BAUD.
 *DATA IS UP TO 8K PER TAPE BLOCK, AND IS PRECEDED
 *IN THE TAPE BLOCK BY 16 BYTES OF INFO ABOUT THE
 *DISK FILE. TAPE BLOCKS ALL HAVE SOLOS/CUTER
 *FILE NAME OF "CPM", BUT THE ORIGINAL DISK FILE
 *NAME IS IN THE INTERNAL HEADER. EACH TAPE BLOCK
 *ALSO HAS A ONE LETTER BLOCK IDENTITY WITHIN THE FILE.
 *THE FIRST BLOCK OF A FILE IS "A", THE LAST BLOCK
 *ID IS FOLLOWED BY AN "+". THE LETTER ONLY IS
 *ALSO COPIED INTO THE TYPE FIELD OF THE SOLOS/CUTER
 *TAPE HEADER TO AID IN TAPE POSITIONING.

* TAPEDISK
 *HAS NO ARGUMENTS. IT READS TAPE AND COPIES FILES
 *ONTO THE CURRENT LOGGED IN DISK UNTIL IT ENCOUNTERS
 *A FILE NAMED "END". THIS FILE CAN BE WRITTEN ON THE

*TAPE BY:
 * SAVE 0 END
 * DISKTAPE END

*CERTAIN ERRORS WILL ABORT TAPEDISK, OTHERS ATTEMPT
 *TO MUDDLE ON AFTER PRINTING WARNINGS.

*GETTING STARTED:
 *IF YOU HAVE A TAPE WRITTEN BY DISKTAPE WHICH HAS
 *THE TAPEDISK.COM FILE ON IT YOU CAN RUN TAPEDISK
 *FROM THE TAPE AS FOLLOWS:

- * 1. LOAD CP/M THEN RESET THE COMPUTER TO GET TO
 * SOLOS OR CUTER.
- * 2. POSITION THE TAPE TO READ TAPEDISK.COM. (YOU
 * WON'T SEE THE NAME VIA >CA OR >GET BECAUSE
 * ALL THESE FILES HAVE SOLOS/CUTER NAME "CPM".)
 * THE SOLOS/CUTER FILE TYPE WILL BE "A", INDICATING
 * THE FIRST BLOCK OF A CP/M FILE.
- * 3. >GET CPM F0
 * THIS WILL LOAD THE TAPE BLOCK WITH THE INTERNAL
 * HEADER FROM 00F0-00FF AND THE DATA (THE CP/M FILE)
 * FROM 0100 UP. THE HEADER CONTAINS THE CP/M
 * FILE NAME WITHOUT THE PERIOD IN 00F0-00FA.
- * 4. POSITION THE TAPE TO READ ALL THE FILES YOU
 * WANT TO TRANSFER TO DISK, PROBABLY AHEAD OF
 * TAPEDISK.COM AGAIN.
- * 5. >EX 100
 * THIS WILL MOVE FILES TO DISK UNTIL A FILE NAMED
 * "END" IS READ.

*EXAMPLES:

* A>DISKTAPE STUFF.ASM
 * B>A:DISKTAPE STUFF.COM
 * A>DISKTAPE ANYNAME.XXX
 * A>DISKTAPE B:NAME.TYP
 *
 * A>TAPEDISK
 * B>TAPEDISK

Richard Greenlaw
 251 Colony Ct.
 Gahanna, Ohio 43230
 May 13, 1979

LETTER

JUNE 14, 1979

DEAR STAN,

AS YOU CAN SEE I'M NOW THE PROUD OWNER OF A PRINTER. I DECIDED
 ON THE TEXAS INSTUMENTS \$10 RO TERMINAL. I APOLOGIZE FOR NOT
 HAVING THE LOWER CASE CHARACTER SET, BUT IT IS ON ORDER AND
 I HOPE IT GETS HERE QUICKLY. I WOULD LIKE TO TELL ALL MEMBERS
 THAT IN MY HUMBLE OPINION IT IS THE BEST BUY ON THE MARKET. I
 PURCHASED MINE FROM DATA DISCOUNT CENTER, FLUSHING, NEW YORK.
 ALTHOUGH THE DELIVERY WAS 2 WEEKS LATER THAN STATED, AT LEAST
 I DID RECEIVE IT WITHIN 4 WEEKS.

I REMEMBER THE HOW HARD IT WAS FOR ME TO DEBUG PROGRAMS WITHOUT
 A LISTING TO SCAN EASILY INSTEAD OF A CRT SCREEN, SO I AM
 OFFERING THE USE OF MY PRINTER TO ANYONE WHO CAN PRODUCE A CUTS
 TAPE AND WOULD LIKE A HARD COPY. FOR A REASONABLE FEE I WILL
 LIST THE TAPE OR DO A 'CAT' OF IT IF DESIRED. I NOW HAVE AN
 UP TO DATE CATALOG OF THE MATERIAL OF ALL MY TAPES SIMPLY BE-
 CAUSE I SAT DOWN AND DID 'CAT'S OF ALL OF THEM, BOUND TOGETHER
 THE PAGES AND CREATED A TAPE FILE DIRECTORY. I BELIEVE TEN
 CENTS PER PAGE TO BE A REASONABLE CHARGE; MINIMUM FEE \$2.00.
 TAPES SENT TO ME MUST BE ON CASSETTE TAPE IN THE 1200 BAUD
 CUTS FORMAT BECAUSE THIS IS THE ONLY FILE I/O THAT I HAVE.
 NATURALLY TAPES MUST BE SENT TO ME IN RE-USABLE PACKING, WITH
 PAYMENT IN ADVANCE AND PROPER RETURN POSTAGE. THE PRICE IS NOT
 FIXED AND MAY GO UP OR DOWN DEPENDING ON COSTS & READERS
 REACTIONS.

INCIDENTALLY, CABLING THE SOL-20 SERIAL PORT TO THE TI 810 WAS
 NO PIECE OF CAKE AND I COULD NOT HAVE DONE IT WITHOUT THE HELP
 OF CLUB MEMBERS DON SCHNAUTZ, MIKE KUNTZ, AND DAVE DISBROW.
 ANYONE INTERESTED IN INTERFACING THE TI 810 TO A SOL CAN CONTACT
 ME AT:

ROBERT W. HEERDINK
 C/O NATIONAL SHAREDATA CORP
 P.O. BOX 3895
 EVANSVILLE INDIANA 47737

ANOTHER THOUGHT WORTH MENTIONING IS THAT THE SERIAL OUTPUT
 ROUTINE IN SOLOS DOES NOT WAIT FOR A READY SIGNAL FROM THE
 PRINTER. DON WROTE A SHORT PROGRAM TO SOLVE THIS PROBLEM AND
 IT WORKS FINE:

```
CAB4 IN F8
      ANI 20H ;TEST FOR PRINTER READY
      JNZ CAB4 ;LOOP UNTIL READY
      JMP C04A ;READY, JUMP TO SOLOS SERIAL OUTPUT RTN
```

I CANNOT FIND THE ALS-8 APPLICATION NOTES ANYWHERE. PROC TECH
 SAYS THEY NO LONGER CAN GET THEM AND THERE WILL BE NO MORE IN
 THE FUTURE. THEY ARE NO LONGER INTERESTED IN THE HOBBY MARKET.
 I WOULD BE GLAD TO PAY FOR A COPY OF WHAT I UNDERSTAND IS 3
 ISSUES PRODUCED BY THE DEFUNCT ALS-8 USER GROUP. I'D BE VERY
 GRATEFUL TO ANYONE WHO COULD HELP ME.

THANKS STAN FOR THE FANTASTIC WORK YOU'VE DONE ON SOLOS AND
 PROTEUS. YOU HAVE MADE LIFE WITH A SOL MUCH MORE PLEASANT.
 PLEASE KEEP UP THE GOOD WORK AND DON'T EVER QUIT.

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ROBERT W. HEERDINK

LOADING AND SAVING MICROPOLIS BASIC PROGRAMS
FROM/ON SOLOS BYTE-MODE CASSETTES
By Melvin M. Dalton

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INTRODUCTION

Two program sets are provided for SOL-20 users who also have one or more MICROPOLIS Mod I/II drives. All programs assume you are using MICROPOLIS PDS VS 4.0 (1978). The cassette files are in SOLOS byte mode and contain only ASCII characters from 20H to 7EH except that each line is terminated with a single OD 0A sequence (i.e. CRLF).

The primary programs are in MICROPOLIS BASIC. They call assembly language routines to open and/or close the cassette files. These routines also switch the MICROPOLIS Console input/output drivers to SOLOS Pseudo Port 3 as needed where special drivers do the cassette read or write. Thus the cassette acts as a substitute keyboard or CRT when the corresponding BASIC program is run.

CHANGES TO MICROPOLIS PDS 4.0

The SOL-20 configuration of PDS 4.0 as supplied by MICROPOLIS does NOT support programmed or SOLOS commanded changes to the pseudo port assignments. A simple change to the RES module will solve this problem. First, boot your MDOS system into operation. Next, execute the following exactly as listed:

```
>ENR 41B  
CD 1F C0 CA 1B 06 47 FE 80 CA 04 C0 A7 C9  
>ENR 63B  
CD 19 C0 B7 C9
```

Save the modified version of the RES module on disk using the procedures of paragraph 2.2.6 of the MICROPOLIS user manual. Now @CDIN & @CDOUT will respond to the current pseudo port. Furthermore, the MODE SELECT key will exit MICROPOLIS and put you in SOLOS command mode. An EX 4E7 will put you back in MDOS or BASIC.

PREPARING THE PROGRAMS FOR USE

For the two BASIC programs, use the following procedure:

1. Call up MICROPOLIS BASIC.
2. Enter program 1 as line zero.
3. The program is only ONE line long.
(let the wrap logic echo it on more than one line i.e. hit the return key only once at the end of the program)
4. Do a SAVE 'N:CSAVEB' to save program on drive 0.
5. Enter program 2 as line zero.
6. Same as 3. above
7. Do a SAVE 'N:CLOADB' to save program on drive 0.

For the two assembly language programs, use the following procedure:

1. Call up MICROPOLIS LINEEDIT.
2. Enter the list of EQU's called SOLEQU.
3. Save equates under the file name SOLEQU.
4. Clear the LINEEDIT buffer and then enter program 3.
5. Save program 3 in source text form under file name 'CSAVEBAS'.
6. Test assemble 'CSAVEBAS' for errors only and correct typos if any.
7. Repeat 4,5 & 6 above for program 4 using file name 'CLOADBAS'.
8. Assemble 'CSAVEBAS' into object code file 'CSAVEBA'.
9. Assemble 'CLOADBAS' into object code file 'CLOADBA'.

HOW TO SAVE A BASIC PROGRAM ON TAPE

Insert the desired tape in the recorder. Position it wherever you wish to make the recording. Set the recorder to RECORD and proceed as follows:

1. Go to BASIC and wait for READY.
2. LOAD the BASIC program you wish to save on tape.
3. Be sure it doesn't have a line 0. RENUM as needed.
4. Do a MERGE 'CSAVEB'.
5. RUN. Program will prompt for cassette file name.
Enter name with five or less characters.
6. Recorder will start and run until program is saved.
7. Completion message FILE XXXXX SAVED will appear on CRT.

HOW TO LOAD A BASIC PROGRAM FROM TAPE

Insert the desired tape in the recorder. Position it just ahead of program you wish to load. Set the recorder to PLAY and proceed as follows:

1. Go to BASIC and wait for READY.
2. Do a PLOADG 'CLOADB'.
3. Program will prompt for cassette file name.
Enter name with five or less characters.
4. Recorder will start and run until program is loaded.
5. Program will echo to the CRT as it comes from the tape.
6. Completion message FILE XXXXX LOADED will appear on CRT.
7. CRT will prompt in SOLOS (i.e. >).
Execute a warmstart, EX 4E7, to return to BASIC.
8. Delete line 0 and then save program on disk.

ERROR MESSAGES

The following error messages may appear and have the meanings specified:

1. FILE XXXXX/SAVED or FILED XXXXX/LOADED.
The / means the file name you save was six or more characters long and was truncated to five before use.
2. ALREADY OPEN. Appears if SOLOS detects file 1 open when program attempts to open it for use.
3. ALREADY CLOSED. Appears if SOLOS detects file 1 closed when program attempts to close it after use.
4. READ ERROR. Appears if SOLOS detects parity, CRC, or interrupted readings during tape reading process.
5. WRITE ERROR. Appears if SOLOS detects error during tape write operations.
6. All MICROPOLIS BASIC or MDOS error messages have the meanings assigned them in the users manual.

HERE ARE THE SOLOS EQUATES TO BE SAVED UNDER THE NAME 'SOLEQU'

0000	NLIST	
0010	IFORT	EQU 0C806H
0020	OPORT	EQU 0C807H
0030	UIPORT	EQU 0C800H
0040	UDPORT	EQU 0C802H
0050	USARE	EQU 0CAB4H
0060	FCBA11	EQU 0C855H
0070	FCBA12	EQU 0C85CH
0080	FBUF11	EQU 0C863H
0090	FBUF12	EQU 0C963H
0100	SCREEN	EQU 0CC00H
0110	CRLF	EQU 0C2F9H
0120	START	EQU 0C000H
0130	INIT	EQU 0C001H
0140	RETRN	EQU 0C004H
0150	FOPEN	EQU 0C007H
0160	FCLOS	EQU 0C00AH
0170	RIBYT	EQU 0C00DH
0180	WRBYT	EQU 0C010H
0190	RIBLK	EQU 0C013H

(continued)


```

0200 WRBLK      EQU    0C016H
0210 SDUT      EQU    0C019H
0220 ADUT      EQU    0C01CH
0230 SINP      EQU    0C01FH
0240 AINP      EQU    0C022H
0250 ADOUT     EQU    0C3E8H
0260 THEAD     EQU    0C81CH
0270 DHEAD     EQU    0C82CH
0280           LIST

```

PROGRAM 1

```

0 DEF FAA=16RCAB4; DEF FAB=16RCB15; LOAD 'CSAVERA'; INPUT 'SOL-
20 CASSETTE FILE NAME (5 CHAR)';B#: A#=FAA(B#); LIST 1-65529;
C#=FAB; PRINT A#;LEFT$(B#,5);C#: STOP

```

PROGRAM 2

```

0 DEF FAA=16RCAB4; LOAD 'CLOADBA'; INPUT 'SOL-20 CASSETTE FILE
NAME (5 CHAR)';B#: A=FAA(B#); STOP

```

PROGRAM 3

```

0000          *
0000          * ROUTINE FOR WRITING FROM MICROPOLIS BASIC
0000          * TO SOL-20 BYTE-WISE CASSETTE FILES
0000          *
0000          * USED BY BASIC PROGRAM 'CSAVER'
0000          *
0000          * MELVIN M. DALTON   VERSION 1.1   5/79
0000          * COPYRIGHT ASSIGNED TO PROTEUS   6/79
0000          *
0000          *           TAB 8,13,22
0000          *           LINK 'SOLEQU'
0000          *           RESULT EQU 1A0H
0000          *           ARG1  EQU 4BCH
0000          *           ORG  UOPORT
0000          *           DW  WRITE
0000          *           ORG  THEAD
0000          *           FILL 6,0
0000          *           ORG  USARE
0000          *
0000          * CALL HERE FOR BASIC FUNCTION 'FAA'
0000          * TRANSFER CUTS BYTE MODE FILE NAME
0000          * AND OPEN FILE '1'. RETURN
0000          * WITH START OF COMPLETION MESSAGE
0000          *
0000          * OPEN  LHL  ARG1      ;POINT TO ARG1
0000          *           INX  H
0000          *           INX  H
0000          *           MOV  A,M      ;GET ARG1 LENGTH
0000          *           MOV  B,A      ;SET LENGTH OF MOVE
0000          *           SUI  6        ;MUST BE <=5
0000          *           CP   LENERR   ;TRUNCATE IF NEEDED
0000          *           INX  H        ;POINT TO 1ST BYTE OF ARG1
0000          *           LXI  D,THEAD ;POINT TO SOLOS FILE HEADE
0000          *           R

```

```

CAC4 7E      MOVE    MOV  A,M      ;GET BYTE
CAC5 12      STAX  D        ;STORE BYTE
CAC6 23      INX   H
CAC7 13      INX   D
CAC8 05      DCR   B
CAC9 C2 C4 CA JNZ  MOVE    ;RPT. TILL DONE
CACC 21 D8 CA LXI  H,#+12   ;CORRECT FOR STACK
CACF E5      PUSH  H        ;ERROR IN SOLOS 1,3
CAD0 21 1C CB LXI  H,THEAD ;POINT TO HEADER
CAD3 3E 01   MVI  A,1      ;POINT TO FILE #1
CAD5 CD 07 C0 CALL  FOPEN   ;OPEN FILE
CAD8 21 3C CB LXI  H,ERRORP ;POINT TO ERROR MESSAGE
CADB DA 6E CB JC   ERRMES  ;OUTPUT MESSAGE IF ERROR
CADE E1      POP   H        ;IF NO ERROR, RETURN
CADF         ;STACK TO ORIGINAL STATE
CAE0 21 2B CB LXI  H,FAA    ;POINT TO FAA MESSAGE
CAE2 CD 62 CB CALL  RESMESS ;PUT MESSAGE IN BUFFER
CAE5 3E 03   MVI  A,3
CAE7 32 07 CB STA  OPORT   ;SET OUTPUT TO 3
CAEA 3E C2   MVI  A,'B'+80H ;WRITE TAPE TYPE
CAEC 32 22 CB STA  THEAD+6 ;INSERT TYPE IN HEADER
CAEF C9      RET
CAFO         *
CAFO         * CALL HERE FOR PSEUDO PORT 3 WITH BYTE IN 'B'
CAFO         * NULLS ARE STRIPPED & ONLY ONE CRLF AT
CAFO         * END OF PROGRAM IS ALLOWED
CAFO         *
CAFO 7B      WRITE  MOV  A,B      ;BYTE IN "A" FOR TEST
CAF1 A7      ANA   A        ;SET FLAGS
CAF2 C8      RZ         ;SKIP NULLS
CAF3 D6 20   SUI  20H     ;CHECK IF "CR" OR "LF"
CAF5 F2 05 CB JP   WRITE1   ;NORMAL CHAR. PROCESSING
CAF8 3A 61 CB LDA  FLAG     ;GET CRLF FLAG
CAF9 3C      INR   A        ;COUNT
CAFB 32 61 CB STA  FLAG     ;SAVE CRLF FLAG
CAFC 32 61 CB SUI  3        ;NO MORE THAN 2 ALLOWED
CAFF D6 03   RP         ;SKIP IF 3 OR MORE
CB01 F0      JMP  WRITE2  ;CONTINUE IF NOT
CB02 C3 09 CB WRITE1 XRA  A
CB05 AF      STA  FLAG     ;ZERO CRLF FLAG
CB06 32 61 CB WRITE2 MVI  A,1      ;POINT TO FILE 1
CB09 3E 01   CALL  WRBYT   ;PUT BYTE ON TAPE
CB0B CD 10 C0 LXI  H,ERRWR  ;POINT TO ERROR MESSAGE
CB0E 21 48 CB JC   ERRMES  ;OUTPUT MESSAGE IF ERROR
CB11 DA 6E CB RET
CB14 C9
CB15
CB15          *
CB15          * CALL HERE FOR BASIC FUNCTION 'FAB'
CB15          * CLOSES CUTS FILE '1' AND RETURNS
CB15          * WITH REST OF COMPLETION MESSAGE
CB15          *
CB15          * CLOSE  MVI  A,1      ;POINT TO FILE 1
CB17 CD 0A C0 CALL  FCLOS   ;CLOSE FILE
CB1A 21 53 CB LXI  H,ERRCL  ;POINT TO ERROR MESSAGE
CB1D DA 6E CB JC   ERRMES  ;OUTPUT MESSAGE IF ERROR
CB20 21 33 CB LXI  H,FAB    ;POINT TO FAB MESSAGE
CB23 CD 62 CB CALL  RESMESS ;PUT MESSAGE IN BUFFER
CB26 AF      XRA  A
CB27 32 07 CB STA  OPORT   ;OUTPUT TO CRT
CB2A C9      RET
CB2B
CB2B          *
CB2B          * MESSAGES
CB2B          *
CB2B 03 28 05 FAA  DB  3,40,5
CB2E 46 49 4C DTH  'FILE '
CB31 45 A0
CB33 03 28 06 FAB  DB  3,40,6
CB36 20 53 41 DTH  'SAVED'
CB39 56 45 C4
CB3C 41 4C 52 ERRORP DTH 'ALREADY OPEN'
CB3F 45 41 44
CB42 59 20 4F
CB45 50 45 CE

```

```

CB48 57 52 49  ERRWR  DTH  'WRITE ERROR'
CB48 54 45 20
CB4E 45 52 52
CB51 4F D2
CB53 41 4C 52  ERRCL  DTH  'ALREADY CLOSED'
CB56 45 41 44
CB59 59 20 43
CB5C 4C 4F 53
CB5F 45 C4
CB61 00          FLAG  DB   0          ;SPACE FOR CRLF COUNTER
CB62          *
CB62          * ERROR HANDLERS
CB62          *
CB62 11 A0 01  RESMESS LXI  D,RESULT ;POINT TO RESULT BUFFER
CB65 7E          OUT    MOV  A,M      ;GET MESSAGE BYTE
CB66 12          STAX  D          ;PUT IN RESULT
CB67 13          INX   D
CB68 23          INX   H
CB69 17          RAL
CB6A D2 65 CB   JNC   OUT          ;REPEAT TILL DONE
CB6D C9          RET
CB6E 46          ERRMES MOV  B,M      ;GET MESSAGE BYTE
CB6F 3E 00       MVI  A,0        ;POINT TO CRT
CB71 CB 1C C0   CALL  AOUT       ;OUTPUT BYTE
CB74 23          INX   H          ;POINT TO NEXT BYTE
CB75 78          MOV  A,B        ;IN "A" FOR TEST
CB76 17          RAL
CB77 D2 6E CB   JNC   ERRMES   ;REPT. TILL MESSAGE DONE
CB7A AF          XRA   A          ;ZERO IN "A"
CB7B 32 95 CB   STA  FCBA11    ;CLEAR FILE STATUS
CB7E C3 04 C0   JMP  RETRN      ;GO TO SOLOS
CB81 06 05       LENERR MVI  B,5        ;MOVE ONLY 5 BYTES
CB83 3E 2F       MVI  A,'/'      ;TRUNCATE SYMBOL
CB85 32 36 CB   STA  FAB+3    ;STORE IN RETURN MESSAGE
CB88 C9          RET
CB89          END

```

ERRORS THIS ASSEMBLY 0000

PROGRAM 4

```

0000          *
0000          * ROUTINE FOR READING SOL-20
0000          * BYTE-WISE CASSETTE FILES
0000          * INTO MICROPOLIS BASIC PROGRAM SPACE
0000          *
0000          * USED BY BASIC PROGRAM 'CLOADB'
0000          *
0000          * MELVIN M. DALTON  VERSION 1.1  5/79
0000          * COPYRIGHT ASSIGNED TO PROTEUS  6/79
0000          *
0000          TAB  B,13,22
0000          LINK 'SOLEQU'
0000 04BC  ARG1  EQU  4BCH
0000          ORG  UIPORT
CB00 EE CA     DW   READ
CB02          ORG  DHEAD
CB2C 06 00     FILL 6,0          ;INITIALIZE HEADER=0
CB32          ORG  USARE
CB4          *
CB4          * CALL HERE FOR BASIC FUNCTION "FAA"
CB4          * TO TRANSFER NAME OF CUTS FILE
CB4          * AND OPEN CASSETTE BYTE MODE FILE "1"
CB4          *
CB4 2A BC 04   OPEN  LHLD  ARG1    ;POINT TO ARG1
CB7 23        INX   H
CB8 23        INX   H          ;POINT TO ARG1 LENGTH
CB9 7E        MOV  A,M

```

```

CABA 47        MOV  B,A          ;SET LENGTH OF MOVE
CABB D6 06     SUI  6          ;MUST BE <=5
CABD F4 77 CB  CP   LENERR     ;TRUNCATE AT 5 & PUT
CAC0          // IN EOF MESSAGE FOR USER
CAC0 23        INX   H          ;POINT TO 1ST BYTE OF ARG1
CAC1 EB        XCHG          ;PUT IN "DE"
CAC2 21 2C CB  LXI  H,DHEAD    ;POINT TO SOLOS FILE HEADE
R
CAC5 E5        PUSH H          ;SAVE ON STACK
CAC6 21 28 CB  LXI  H,FNAME    ;POINT TO FILE NAME
CAC9          ;IN EOF MESSAGE
CAC9 1A        MOVE  LDAX  D          ;GET BYTE
CACA 77        MOV  M,A        ;PUT BYTE IN FNAME
CABC 23        INX   H
CACC E3        XTHL          ;POINT TO DHEAD
CADD 27        MOV  M,A        ;PUT BYTE IN DHEAD
CADE 23        INX   H
CAEF E3        XTHL          ;FNAME IN "HL"
CAD0          ;THEAD BACK ON STACK
CAD0 13        INX   D          ;NEXT BYTE OF ARG1
CAD1 05        DCR   B
CAD2 C2 C9 CA  JNZ  MOVE          ;RPT. TILL DONE
CAD5 21 E1 CA  LXI  H,#+12    ;CORRECT FOR STACK
CAD8 E3        XTHL          ;ERROR IN SOLOS 1.3
CAD9 21 2C CB  LXI  H,DHEAD    ;POINT TO HEADER
CADC 3E 01     MVI  A,1        ;POINT TO FILE #1
CADE CD 07 C0  CALL  FOPEN      ;OPEN FILE
CAE1 21 35 CB  LXI  H,ERROP    ;POINT TO ERROR MESSAGE
CAE4 DA 61 CB  JC   ERRMES   ;OUTPUT MESSAGE IF ERROR
CAE7 E1        POP   H          ;IF NO ERROR, RETURN
CAE8          ;STACK TO ORIGINAL STATE
CAE8 3E 03     MVI  A,3
CAEA 32 06 CB  STA  IPORT    ;SET INPUT TO 3
CAED C9        RET
CAEE          *
CAEE          * PSEUDO PORT 3 CALLS HERE
CAEE          * FOR INPUT BYTE.
CAEE          *
CAEE C5        READ  PUSH  B          ;SAVE REGISTERS
CAEF D5        PUSH  D
CAF0 E5        PUSH  H
CAF1 AF        XRA   A          ;RDBYT WON'T WORK IF
CAF2 32 06 CB  STA  IPORT    ;IFPORT=3 SO CHANGE IT!
CAF5 3E 01     MVI  A,1        ;POINT TO FILE 1
CAF7 CD 0D C0  CALL  RDBYT    ;GET BYTE
CAF8 DA 5B CB  JC   RDERR     ;ERROR
CAF9 FE 0A     CPI   OAH        ;LINE FEED
CAFF CA F5 CA  JZ   READ1    ;SKIP LF
CB02 E1        POP   H
CB03 D1        POP   D
CB04 C1        POP   B
CB05 A7        ANA   A          ;SET FLAGS
CB06 F5        PUSH  PSW
CB07 3E 03     MVI  A,3
CB09 32 06 CB  STA  IPORT    ;NOW BACK TO PORT 3
CB0C F1        POP   PSW
CB0D C9        RET
CB0E          *
CB0E          * CLOSE BYTE MODE FILE "1"
CB0E          * AND RETURN "DONE" MESSAGE
CB0E          *
CB0E 3E 01     CLOSE MVI  A,1        ;POINT TO FILE 1
CB10 CD 0A C0  CALL  FCLOS    ;CLOSE FILE
CB13 21 4D CB  LXI  H,ERRCL    ;POINT TO ERROR MESSAGE
CB16 DA 61 CB  JC   ERRMES   ;OUTPUT MESSAGE IF ERROR
CB19 AF        XRA   A
CB1A 32 06 CB  STA  IPORT    ;INPUT FROM KEYBOARD
CB1D 21 23 CB  LXI  H,DONE    ;POINT TO "OK" MESSAGE
CB20 C3 61 CB  JMP  ERRMES   ;OUTPUT MESSAGE
CB23          *
CB23          * ERROR MESSAGES
CB23          *

```

(continued)

```

CR23 46 49 4C DONE DT 'FILE '
CR26 45 20
CR28 06 00 FNAME FILL 6,0
CR2E 20 4C 4F DTH ' LOADED'
CR31 41 44 45
CR34 C4
CR35 41 4C 52 ERRORP DTH 'ALREADY OPEN'
CR38 45 41 44
CR3B 59 20 4F
CR3E 50 45 CE
CR41 0D 0A ERRRD DB 0DH,0AH
CR43 52 45 41 DTH 'READ ERROR'
CR46 44 20 45
CR49 52 52 4F
CR4C D2
CR4D 41 4C 52 ERRCL DTH 'ALREADY CLOSED'
CR50 45 41 44
CR53 59 20 43
CR56 4C 4F 53
CR59 45 C4
CR5B *
CR5B * ERROR HANDLERS
CR5B *
CR5B FA 0E CB RDERR JM CLOSE ;EOF
CR5E 21 41 CB LXI H,ERRRD ;POINT TO ERROR MESSAGE
CR61 46 ERRMES MOV B,H ;GET MESSAGE BYTE
CR62 3E 00 MVI A,0 ;POINT TO CRT
CR64 CD 1C C0 CALL AOUT ;OUTPUT BYTE
CR67 23 INX H ;POINT TO NEXT BYTE
CR68 78 MOV A,B ;IN 'A' FOR TEST
CR69 17 RAL
CR6A D2 61 CB JNC ERRMES ;REPT. TILL MESSAGE DONE
CR6D AF XRA A ;ZERO IN "A"
CR6E 32 55 CB STA FCBA11 ;CLEAR FILE STATUS
CR71 32 06 CB STA IPORT ;KEYBOARD ACTIVE
CR74 C3 04 C0 JMP RETRN ;GO TO SOLOS
CR77 06 05 LENERR MVI B,5 ;MOVE ONLY 5 BYTES
CR79 3E 2F MVI A,'/' ;TRUNCATE SYMBOL
CR7B 32 2E CB STA FNAME+6 ;PUT AFTER NAME
CR7E C9 RET
CR7F END

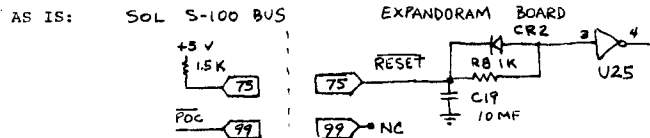
```

ERRORS THIS ASSEMBLY 0000

A BUG THAT'S BITING SOL-20 USERS WHO HAVE S.D. SALES

EXPANDORAM MEMORY BOARDS

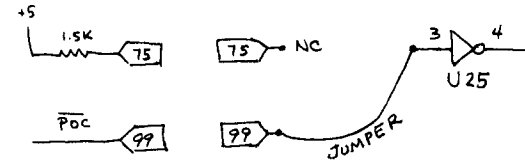
Howard Marshall has found a problem with expandoram memory boards and wants to pass the "fix" to all other SOL users who have been suffering with the problem.



When "UPPER CASE" and "REPEAT" are held down to restart SOL, memory refresh stops thru the convention logic on the expandoram memory board and to keep it going reset must go low. It does not, therefore the longer the restart is held down the more memory dies.

REMEDY:

SOL S-100 BUS



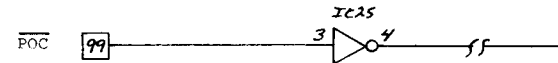
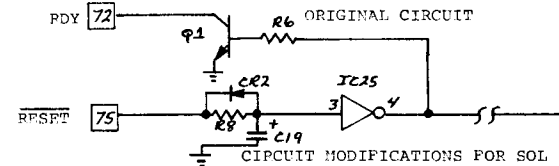
Remove CR2, R8 and C19 and add jumper and the program destroyer is dead! (POC is low when "UPPER CASE AND REPEAT" restart keys are down which turns on the refresh circuits.)

Howard D. Marshall
874 Scott Street
Stroodsbury, PA. 18360

ANOTHER LETTER ON EXPANDORAM PROBLEM

I recently read about a PROTEUS reader that had problems with the S.D. Sales "EXPANDO-RAM" dynamic memory board when used in his SOL. With a very slight modification, I have used the EXPANDO-RAM for over 1700 hours (according to the running time meter I installed in my SOL) with NO problems whatever. Two friends with identical equipment have also reported flawless operation with the modification I supplied to them.

The problem concerns the use of S100 pin 75 (RESET) on the EXPANDO-RAM. The drawing below best describes the changes:



Delete Q1, R6, C19, CR2, and R8.

The EXPANDO-RAM runs extremely cool in the SOL, even with a full complement of memory. However, as indicated by S.D. SALES, the memory is not designed for DMA operation. I hope that this information will be of use to readers who desire a source of reliable, cheap, and cool operating temperature memory when used in a non-DMA environment.

Sincerely,

Bill Jones
Bill Jones
541 Easy Street
Marion, OH 43302

CC S.D. SALES CO.

INFO WE DUG UP AT THE PTC RUINS

PTC saved a huge pile of things for us when they were cleaning out their building for liquidation. Most of the items are listed in our PROTEUS Catalog. Here are a few things we thought were worth publishing.

ProcessorTechnology

Processor Technology
Corporation

7100 Johnson Industrial Drive
Pleasanton, CA 94566 (415) 829-2600
Cable Address: PROCTEC

MEMORANDUM

March 30, 1978

SUBJECT: Extended Disk BASIC

A bug in BASIC has been found and fixed. The bug will exist in all Extended Disk BASIC shipments prior to 3/29/78. The bug is fixed in all shipments made on 3/29/78 and after.

The bug occurs in two cases: 1) When using the VAL function on a string that has leading blanks before the number contained within the string. 2) When reading numbers from a file which were printed using a formatted PRINT statement.

How to circumvent the bug - Case 1
The programmer must write BASIC statements that will strip off the leading spaces in the string before using the VAL function.

How to circumvent the bug - Case 2
The programmer must write BASIC statements to:

- 1) Read the number from the file into a string
- 2) Strip the leading spaces off of the string
- 3) Take the VAL of the string

FIELD RETROFIT NOTICE 4/3/79

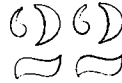
PRODUCT: Helios II, the following models:

Model 2, 117 VAC 300000
Model 4, 117 VAC 304000
(220/240 VAC models are not affected.)

ASSEMBLY: Regulator PCB Assembly, Model 2, 302000 (G to H)
Regulator PCB Assembly, Model 4, 304025
Rear Panel Assembly, Model 2, 304000 (G to H)
Rear Panel Assembly, Model 4, 304030 (C to D)

BRIEF DESCRIPTION OF RETROFIT:

The 40 V, 10,000 microfarad electrolytic capacitor at C8 on the regulator is to be replaced with a 50 V, 7,300 microfarad capacitor. (ECN 10517 and 10446)



The fuses on the rear panel assemblies are to be replaced with ones of lower value. A label must be applied to cover the existing silkscreened values. (ECN 10525)

STATUS: MANDATORY

The capacitor on the regulator and the fuses on the rear panels must be changed to safeguard the user, the service technicians and the Helios II units. All units in inventory and all units previously sold, now in the hands of the users, must be retrofitted. These changes are also necessary to avoid possible liability damages against the factory-authorized dealers and Processor Technology. Units not retrofitted represent a serious safety hazard.

The Warranty Repair Department of Processor Technology will provide the parts to the retrofitting dealer on a one time basis. All the dealer need do to obtain the parts is to provide Warranty Repair with a list of serial numbers of the units to be retrofitted.

PRIOR RETROFITS:

A) Regulator

Change Notice #3, 10/77, P/N 731032, contained a retrofit which brought the regulator 302000 from a REV B to a C. The retrofit in CN #3 should be performed first, for safety reasons and so that the units can be marked and readily identified by the revision level and retrofit systems. Revisions to the regulator from C to G were factory changes which required no retrofits.

B) Rear Panel

Revisions up to C on the Model 4 rear panel and revisions up to G on the Model 2 rear panel were factory changes requiring no field retrofits.

PARTS REQUIRED:

ITEM	P/N	QTY	DESCRIPTION	DESIGNATION
1	707050	1	CAP, 7,300 Microfarad; Alum. electrolytic, 50V	C8
2	723021	1	1A FUSE, SLO-BLO (Model 2)	F2
3	723022	1	6.25A FUSE, SLO-BLO (Model 2 and 4)	F1
4	723016	1	2A FUSE, SLO-BLO (Model 4)	F2
5	732001	1	LABEL, Fuse, pair, 1A, 6.25A (Model 2)	
6	732002	1	LABEL, Fuse, pair, 2A, 6.25A (Model 4)	

HARDWARE MODIFICATION PROCEDURE:

A) Regulators: Model 2, 302000 and Model 4, 304025

(The procedure is the same for both models except for marking the new REV letter.)

- 1) Remove the top cover of the Helios II.
- 2) Remove the rear panel.
- 3) Remove the regulator PCB assembly.
- 4) Unscrew and remove the 40V, 10,000 microfarad capacitor at C8.
- 5) Install the 7,300 microfarad, aluminum, electrolytic capacitor, 50V, P/N 707050, at C8.

(continued)

C L A S S I F I E D A D S

- 6) Mark an adhesive label with the letter "H" and apply the label to the component side of the Model 2 regulator so that it covers the previous REV letter. The REV letter follows the assembly number which is silkscreened on the PCB just above C8. (Refer to Fig. 8-8, Note 2, Helios Disk Memory System Manual, 730009, 2nd Printing, March 1978.)

302000, the Model 2 regulator is a subassembly of the Model 4 regulator 304025. Do not mark the REV level of the Model 4 regulator.

- 7) Re-install the regulator and rear panel according to the Disk Memory System Manual, 1st Printing, 730009, August, 1977, 3.5.7, "Power Supply Assembly," steps 2 through 10.

B) Rear Panel, Model 2, 305000

- 1) Apply the label provided by Processor Technology that reads "1A SB" to the rear panel above the upper fuse so that it covers the designation "3.2A SB."
- 2) Apply the label that reads "6.25A SB" below the lower fuse so that it covers the designation "7A SB."
- 3) Remove the 3.2 A SLO-BLO fuse from the upper fuse holder and replace with a 1 A SLO-BLO fuse.
- 4) Remove the 7 A fuse from the lower fuse holder and replace with a 6.25A SLO-BLO fuse.

C) Rear Panel, Model 4, 304030

- 1) Apply to the rear panel the label that reads "2 A SB" above the upper fuse holder so that it covers the designation "3.2 SB."
- 2) Apply the label that reads "6.25 SB" below the lower fuse holder so that it covers the designation "7 A."
- 3) Remove the 3.2 A fuse from the upper fuse holder and replace with a 2 A SLO-BLO fuse.
- 4) Remove the 7 A fuse from the lower fuse holder and replace with a 6.25A SLO-BLO fuse.

CORRESPONDING MANUAL UPDATE

Revision pages or a new edition of the Helios II Disk Memory System Manual (Helios II Technical Manual) will be issued at a later date to reflect the above changes.

POWER CONSUMPTION OF Sol SYSTEM COMPONENTS

Most components of a Sol system are often plugged into the convenience outlets of the Helios II floppy disk drive. Care should be taken not to overload the AC current carrying capacity of the convenience outlets. The fuse protecting these outlets may blow when the rating on the F1 label (6.25A is exceeded). The AC current consumption during normal operation for components of a typical Sol system is given as follows:

Sol-20	1.5A
Helios II Model 2	0.8A
Helios II Model 4	1.6A
TV/Monitor	0.4A
SolPrinter 2 & 2E	1.7A
SolPrinter 3	2.0A

EQUIPMENT FOR SALE: Randolph and Associates of Birmingham, AL, has an unusual offering--two SOL System II's with 16K, never uncrated, and a perfectly functioning Helios II. The whole system at dealer prices at \$6000 or best offer. Home phone (205) 979-1162, Business phone (205) 822-2339, or write Jack W. Randolph, 586 Shades Crest Rd., Birmingham, AL 35226. ..

INFO WANTED: I was wondering if anyone has hooked up the Heath Printer--H-14 to the SOL20. I would like to have the info--(for Baud Rates greater than 110) hardware as well as software. M.E. Schwanbeck, Marcella, AR 72555, (501) 652-3491 (collect).

FOR SALE: We have a good stock of P.T. software which we would obviously like to liquidate. We are offering a 50% discount on any cassette or disk package in stock. We will offer an additional 20% discount on five or more packages (any mix) ordered and shipped together. (We accept VISA, Master Charge, personal checks as well as shipping C.O.D.) We also have some kits and assembled boards in stock (CPM, Sol, Sol PC, etc.) which we are offering "as is" (some work, some don't) at \$200 and \$400 respectively. A good buy even if you use them to back yours up. Reynolds Tokunaga, Manager, BYTE SHOP: The Affordable Computer Store, 1920 Blossom St., P.O. Box 5144, Columbia, South Carolina 29205, (803) 771-7824.

SOL SYSTEM FOR SALE: SOL System II, factory assembled. 48K RAM: PT 16KRA and Dynabyte 32K static boards, leaving three free slots. Panasonic PT-872 TV/monitor and two Panasonic recorders. MECA Beta-1 random access digital tape unit (expandable to four drives), 500 bytes/sec., 500K on 300 ft. digital tape. Working parallel interface plugs into SOL connector. Selectric-based terminal operates at 15 bytes/sec., and includes ASCII and APL type elements and extra ribbons, plus cables and driving software. Software includes: Electric Pencil Version SS (which was used to produce this ad); ALS8; Tiny-C interpreter; Software Technology Music System including hardware; Extended Cassette BASIC, BASIC5, and FOCAL interpreters; ASSM, EDIT, DEBUG systems software; Dynamic Debugging System (DDS); GAMEPAC's 1 and 2; TREK80; 8080 CHESS. Patches for Beta-1 may be included in some of the above (presently working on these!). All original manuals are included. All SOLUS/PROTEUS newsletters through end of 1979. PT's ACCESS, all issues they produced, as well as ALS8 users group stuff. Many audio cassettes, some with programs recorded. Ten certified 300 ft. digital cassettes for Beta-1. Will throw in a couple of books and miscellaneous stuff. Original price was \$4700; will accept best offer. Will also sell without Selectric terminal if you prefer. I will deliver personally to any Chicago area buyer (for others, buyer makes shipping arrangements). Send offer or questions to: John Osudar, P. O. Box 1451, Homewood, IL 60430. Offer open only until December 15, 1979.

Proteus members may place up to 3 lines of advertising here in each issue, at no charge. Excess lines, and all others placing ads, will be charged at \$1 per line (max. 75 characters per line). Write for display advertising rates.

C H A P T E R S

SASKATCHEWAN (CANADA), Regina

Contact Bob Stek, 19 Mayfield Road, Regina, Saskatchewan, CANADA S4V 0B7, (306) 523-7184.

6263

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PROGRESS REPORT
 HELIOS SOFT-SECTORED REPLACEMENT CONTROLLER

As I mentioned in the last issue, I'm investigating various disk controllers that could be used to convert the Helios into a dual-density, standard soft-sectored system. The Disk Jockey II controller, which runs the Discus 2D system, was the one I mentioned last time. But the manufacturer, Thinker Toys, has told me that it wasn't designed for the PerSci drive and they don't have the time to work with us on adapting it. So that's out.

Micromation's controller was designed for the PerSci and they've expressed interest in working it out. They even had a technician who owns a Helios himself try the controller on his system. It required a few changes to jumpers on the PerSci drive, but then it ran single and double density just fine, they said. So far it has been all talk and no action, though. They haven't sent the documentation or the board. (The person I've been dealing with there is Loren Wiley, the former head of marketing for PTC. Hummm...)

I'm also investigating the Delta Products dual density board which has been advertised in Byte. A local distributor for Delta has had the boards on order for months, and so far it's the familiar "two weeks". It also was designed for the PerSci, and it looks like it can control the new PerSci 299 double-sided, double-density drives.

Both of these boards can be configured to operate other brands of drives as well, so non-Helios owners may be interested in them too. Both are CP/M compatible. We will probably offer the new CP/M 2.0, configured for the controller we select, as an option.

It is probable that PTDOS will be converted to run on systems other than Helios, but when, I don't know. If so, I'll work with the authors to get it customized for whatever controller Proteus finally adopts.

P R O T E U S / N E W S

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 copy should be single-spaced, in a single column of
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 Corrections can be made invisibly with opaque correction
 fluid ("liquid paper"). Please use a new ribbon.
 Machine-readable articles should be compatible with
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PROTEUS / NEWS

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VOLUME 2, NUMBER 5

FORMERLY SOLUS NEWS

SEPT, OCT 1979

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A Call to Arms
(or where do we go from here?)
by Joe Maguire

Many, after learning of the demise of Processor Technology, have asked themselves: What do I do now? What if I need repairs or spare parts for my PTC products? What about software fixes or updates? What about.....?? This article will attempt to provide some answers.

First of all, PTC is out of business - period. There is no possibility of help from them. During their grand auction on June 27th, they sold everything - parts, manuals, partially completed equipment, office furniture, even the kitchen sink! One thing they did not sell, at that time, was the manufacturing rights to their products and the rights to their software. One PTC official told me, "there's gold in them there hills." He's right. After the negotiations for the sale of the rights are completed, some other manufacturer should be in a position to provide some spare parts and there may be other sources for software fixes and updates. But, undoubtedly, there will be a few voids. That leads us to the title of this article.

What I propose is a collective effort on the part of all Proteus members. If you know of someone doing repairs on various PTC equipment or a source for parts, send Proteus the information. If you found the fix for a software bug, let us know. In short, we ourselves must provide the future support in order to keep up the value of our equipment. One reminder. The patents and copyrights owned by PTC are still in effect. This means that reconstructed source code of PTC software is not in the public domain. You are not free to copy, for others, any machine code. What you can provide are your own patches, extensions, etc. to PTC software which improve performance. On a positive note, I have been told that PTC may provide the source code for some software, maybe some portions of PTDOS, on a limited use basis. This means that you can use it for your own information but you cannot sell it. The Solos source code in your Sol manual is an example of this type.

Finally, if you have any doubts about the suitability of some information you have discovered about any PTC equipment or software, let Stan Sokolow be the judge. Send it to him. He is in contact with the former officers of PTC and may be able to get a release for publication in Proteus News. If you are not the writing type, jot down the rough information or telephone it in. There are volunteers who will put it in article form for you. If we all pull together we can still make PTC products and software enviable to own. The result will be to keep the value of our investment high.

BITS AND PIECES

GRT is in financial trouble and their computer software division G/2 is out of business, so we can't get any more of their Sol BASIC (Microsoft). But we noticed that Hobby World Electronics, 19355 Business Center Drive #6, Northridge, CA 91324, bought out G/2's remaining inventory, so you can get them from Hobby World. Sol BASIC is \$34.95, Clinic and Beat the House are \$14.95 each. The BASIC has Microsoft-style string arrays, but it doesn't have a good facility for storing variables on tape the way PTC BASIC does.

Two interesting electronics graveyards: Mike Quinn Electronics at the old North Field of Oakland Airport, Oakland, California has lots and lots of surplus electronics (new and salvaged). A.W. Boyd Electronics, (warehouse: 3436 Helen St., Oakland, California; mailing address: 621 Sandalwood Isle, Alameda, CA 94501, telephone 415-523-3271), is known for his "PC boards by-the-pound" and all sorts of other salvaged electronics. Quinn bought some of PTC's and IMSAI's inventory when they sold out. Neither company does any mail order business, as far as I know.

From a former high-level employee of PTC who had direct contact with lots of their dealers, I have received recommendation that the following dealers' service abilities are better than average for Sol and Helios: Byte Shop of the Northwest, Beaverton or Portland, Oregon; Madison Computer Store, Madison, Wisconsin; Microcomputer Systems, Tampa, Florida; Microproducts and Systems, Kingsport, Tenn; Tyson's Computer Emporium, suburban Washington, D.C.; Basic Computer Group Ltd, Vancouver, B.C., Canada.

For PerSci drive repairs, I've heard MicroComputerworks, Venice, California, is a company owned and run by a former head tech from PerSci.

Earl Dunham (one of our members) has given high recommendations for John Mock's "Bits and Bytes" computer store, College Business Park, 679-D S. State College Blvd, Fullerton CA 92631. John was a PTC dealer and is a PerSci dealer. He can repair Sol computers and PerSci drives and his rates are reportedly reasonable.

Fischer-Freitas Company was formed by former Imsai employees to do service and repairs on Imsai and PerSci equipment. They'll service the drives in the Helios, but not the controller. A number of people I know have used Fischer-Freitas and the only complaint seems to be that they are overworked, but they seem to know what they are doing and their fees are reasonable. They charge a flat rate of \$90 plus parts for servicing a PerSci drive. I took them my drive, which was making noise. They brought the drive electronics up

(continued on pg. 9)

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Processor Technology Corporation closed its doors as a microcomputer manufacturer on June 30th, 1979, after a period of phenomenal success with their Sol, VDM-1 and other products. How then did this seemingly paradoxical situation occur?

What follows is my attempt to piece together the bits and threads of the story from talking with PTC dealers, employees and 'the man in the street' among computer hobbyists. All conclusions are my own and do not necessarily agree with those expressed by the former management of Processor Technology.

Processor Technology began in the early part of 1975 as the typical 'garage' operation in a small space on Fourth Street in Berkeley California. This space was also shared by another fledgling operation to become known later as North Star Computers.

PTC was the brainchild of two astute design engineers: Bob Marsh and Lee Felsenstein. Within months of the announcement of the Altair 8800 microcomputer, these two saw the potential market for accessories for what was sure to be, "The computer in every home." The Altair was severely lacking in ability to communicate with the outside world. The I/O board offered by MITS was often temperamental, had a limited port capability, and required a Teletype as the I/O device. For the typical high school or college student, this represented an insurmountable financial obstacle.

Enter now PTC. Their first products were an I/O board (3P+S) which offered both serial and parallel ports, and better yet, a board which would enable printing to an ordinary TV monitor. (VDM-1) The latter became extremely popular since it represented a cost of about 1/3 that of a Teletype. It also didn't eat up reams of paper and the display speed was absolutely mind boggling by comparison. Rounding out the product line was a reliable static memory (4KRA) which represented several magnitudes of improvements over the often flakey, and expensive, dynamic memory offered by MITS.

The response was overwhelming! It seemed as though every purchaser of an Altair (and later Imsai too) was also buying a VDM and sometimes the complete PTC lineup. The stage for the emergence of the Sol was set. The young designers, flushed with success, began dreaming of bigger and better things.

(If I may diverge for a moment, I would like to pay tribute to Lee Felsenstein's genius in the design of the VDM. In effect, he set the standard for all future video display modules. His concept, if not the actual design, has been copied by many other manufacturers.)

We now race ahead some two years to the spring of 1977. The Sol has been designed and is on the market. Because it includes everything needed, in one box, it has become a big success. It is the first 'turnkey' system. (The Sol was named incidentally, for Leslie Solomon, the Technical Editor of Popular Electronics magazine, who gave the designers encouragement during the early stages.)

In April of 1977, the First West Coast Computer Faire was held in San Francisco's Civic Auditorium. PTC had the biggest and flashiest display of any of the Microcomputer manufacturers. They had it all: hardware, software, excellent documentation, reasonable prices and above all, a good reputation as a responsible company. The only direction for them was up - watch out IBM! And indeed, as a result of the Faire, PTC enjoyed the biggest influx of orders in its history. The summer and fall of 1977 was the peak period of the company's activity. But, at about the same time that the Faire was going on, a seemingly insignificant event happened that was to set into motion the chain of events which would eventually result in collapse.

That event was the purchase of five Sols by a group of individuals who represented themselves as starting up a computer store in a midwest city. They were extended the dealer price and PTC looked forward to adding the store to their dealer list.

Somewhat later, PTC followed up on the new dealer only to learn, to their horror, that they had been conned! There was no store. Some shrewd members of a computer club had concocted the story to get their Sols at the dealer price. PTC's management was livid. They issued the order that henceforth, a potential new dealer had to meet a rigid qualification test. The test included such things as: an operating store location, (photos required) a financial statement, resumes of all store personnel to assure they were qualified and a minimum purchase contract. As I'll explain in a moment, this last requirement was the straw that broke the camels back.

Unrelated to the above incident, PTC had become concerned that dealers were not ordering their Sols with memory. This stemmed from the dealers experience with the 16KRA board. The early versions suffered from an almost 100% failure rate. PTC felt that the problems had been solved (they weren't) and insisted that the dealer purchase at least one memory board with each Sol. One dealer explained to me how he handled this situation.

"As soon as I received a shipment of Sols, I would immediately open the box take out the memory board and throw it in the trash. Then I'd replace it with a brand which I knew worked. The Sol was selling so well that I felt it was worth my peace of mind (the customer wouldn't return with a memory complaint) to absorb the cost."

The huge rush of orders in the latter part of 1977 taxed PTC's production capabilities to the limit. Some sort of order had to be introduced into the manufacturing process. They decided on a "quarterly contract scheduled delivery" plan. The edict of a minimum purchase was incorporated into the plan and it worked like this:

The dealer had to place his order for the next calendar quarter several weeks in advance of its start. In addition, he had to commit himself for something like \$35,000 worth of products (dealer cost) divided among several categories. He was required to order from each category - no exceptions. One of the categories was naturally, memories. But that wasn't the worst. The minimum number of Sols he could order was 12. From the software category he had to order a minimum of 100 items. An elementary calculation showed that he must sell more than eight software items per Sol. Since almost all of the software was tailored for Solos or Cuter, the dealer was unable to get rid of it along with other equipment sales. The dealer was required to place an order every quarter. If he missed one he was dropped.

The results were predictable. Within six months PTC lost over fifty percent of their dealers. My dealer friend explained his decision this way.

"In my store, I do about \$20,000 worth of business a month. PTC in effect wanted me to commit half of my sales to their products, something my traffic wouldn't support. In addition, this business is highly sensitive to new products. PTC wanted me to order on a basis of projected sales up to four months in advance. If a hot new product comes out in the meantime, I'm stuck with a high level of their inventory. My cash flow won't permit that sort of capital tieup."

At about the same time that this new plan was going into effect, (early 1978) MITS announced the purchase of their company by Perdec. Perdec in turn told the former MITS dealers that the Altair would no longer be sold in 'hobbyist stores' but would be marketed in the manner of DEC, Data General and other minicomputers.

Another friend, who was a MITS dealer, now saw his chance to affiliate with PTC - something he had always wanted but was unable to do while representing MITS. Now, this dealer was doing about five times the gross of the one mentioned above. He eagerly applied to PTC to take on their product line. PTC resolutely sent along their requirements for the new dealer to complete. My friend was so incensed by this attitude (he had been one of the largest MITS dealers in the USA and was well known) that he dropped all plans of representing PTC and instead went with Apple - a wise decision on his part.

(continued)

Around the latter part of 1978, PTC finally woke up to what was happening around them. They scrapped their order plan and tried frantically to entice their former dealers back. It didn't work. A typical reply was, "burned once but not twice." PTC found their sales shrinking and their costs rising. In order to hang on they raised the price of their products. Realizing that the hobbyist could not afford the new prices, they turned their attention to the small business market. The main emphasis centered on a Sol/Helios combination with either a word processing package (WordWizard) or a business package. (MailMaster and others) The Helios had finally been perfected after an unfortunate delay caused by the death of the chief project engineer. But still the dealer problem remained. They didn't have the numbers they needed to support their plan and sales continued to be slow. In the spring of 1979, the financial position of the company became critical. Various banks in the San Francisco area were contacted in order to obtain long term financing. None considered the outlook worth the risk. After an agonizing period, the decision was finally made to close the company while it could still hold it's head above water.

A company official told me, "We decided to liquidate rather than declare bankruptcy. PTC may be down but it's not out. We want to come out of this thing clean, not owing anyone. The manufacturing operation is at an end but PTC may continue, perhaps in the software area, we just don't know yet. We have had offers for the manufacturing rights to our products. The Sol may rise again!"

My own assessment is that the Sol will rise again. The design is sound and there were improvements in the works such as a high resolution graphics version of the VDM. (not Corona) It was the high overhead of the operation in Pleasanton which forced the price up to about twice where it should have been. Given to another company, with better marketing connections, and a more modest overhead, it could again compete with the Apple and the TRS-80. The fate of Helios is less secure. The unique disk format makes it an orphan in a world of IBM soft sector. There is a good bet that the PTDOS software will be shifted over to work with the soft sector format. At worst, present owners of Helios may have to buy another controller such as the Tarbell to take advantage of further releases of PTDOS.

In the final analysis, it was Processor Technology's restrictive dealer policy which caused their demise. Management may talk of labor and manufacturing costs and market conditions but their competitors faced these same items and some, such as Apple and North Star prospered while PTC did not. A look through any recent microcomputer magazine will confirm that it is the dealer's advertizing of a product, not the manufacturer's, which instills the urge to buy in the customer. If a product is offered in many ads, the customer is drawn to the conclusion that this must be a good thing and the herd instinct prevails to get in on it. The offer of a discount here and there just whets his appetite. PTC had none of this going for them.

Contributing factors were a few blunders (the design of the 16KRA) and some plain bad luck like not being able to find a marketing director the caliber of Mike Markkula of Apple.

All in all, it was an exciting whirlwind existence. After the dust has settled for awhile, it will be interesting to watch the second time around.

PERSONALITY MODULE CHANGE NOTICE

An old memo discovered in the PTC junk may still be relevant to some older personality modules. Dated December 23, 1977: PM 2708 personality modules manufactured prior to this date may suffer from overheating of current limiting resistors R1 and R2, resulting in marginal operation. Solution: Change resistors R1 & R2 from 100 ohm to 130 ohm, 1/2 watt, 5% tolerance resistors.

USING HEATH H14 PRINTER with SOL,

July 22, 1979

by Richard Greenlaw

* CP/M 1.0 for SOL-28 with TTY and/or Heath H14 Printer.

* By: Richard Greenlaw

* 251 Colony Ct.

* Gahanna, Ohio 43230 July 22, 1979

* This document was printed on the H14

* printer in the narrow character mode.

*

* The following CP/M 1.0 interface routines for SOL-28

* implement the following special features:

*

* 1. The character delete feature gives a true backspace effect on the CRT for characters which display as a single character. The effect is incomplete when backspacing over characters which display as more than one character, such as control characters and TABs.

*

* 2. The list device routine distinguishes between a TTY and the Heathkit H14 printer by the status indications they return to the serial port and provides the proper handshakes for each.

*

* 3. A conversion cable is described which allows the Heathkit H14 printer to be connected to the SOL-28.

*

* The console routines and stack handling are based on

* the code generated by the configurator program

* provided by Lifeboat Associates for the SOL.

*

* This program constitutes the USER area of the CP/M on

* Microrollis version of CP/M by Lifeboat Associates,

* but it should fit directly into any CP/M BIOS.

*

* NULL MODEM CABLE

* The Heathkit H14 printer cannot be directly connected to

* the SOLs RS-232 connector because both the SOL and the

* H14 think they are the terminal side of the interface

* so they both transmit on the same lead, etc. The null

* modem cable provides the same transposition of leads

* as a pair of modems connected via a communications line.

* It consists solely of a male and a female DB25 connector

* connected as follows:

*

* SOL (male cable end) H14 (female cable end)

* 1 ground 1 ground

* 2 transmit 3 receive

* 3 receive 2 transmit

* 5 clear-to-send 4 request-to-send

* 6 data set ready 20 data terminal ready

* 7 signal ground 7 signal ground

*

* The Heath H14 sends its ready signal on its pin 20

* when the power is on. It appears as a zero in bit 1

* of input port F8 and distinguishes the H14 from a

* current loop TTY.

*

* The TTY output routine simply calls SOUT in SOLDS since

* the TTY can print as fast as the UART will accept

* data at 110 baud.

*

* The H14 output routine assumes the baud rate is set

* much higher than the printer can keep up with.

* Relying on the printer buffer to keep the printer

* usefully employed while the SOL prepares more

* output. The H14 signals the SOL when the buffer

* is getting full or when it can't accept data because

* it is actually printing a line. This signal is an

* inverted request-to-send which is seen as a zero

* in bit 5 of input port F8 when no more data should

* be sent. Because this indication is the reverse of

* the normal request-to-send Heath provides instructions

(continued)

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*USER AREA FOR SOL-20 WITH SERIAL PORT LIST
002E = MSIZE EQU 46 ;NOMINAL CP/M SIZE IN K
0030 = BIOS EQU (MSIZE*1024)-200H
0032 = USER ORG BIOS+600H
0034 = ROUT EQU 0001CH ;SOLDS OUTPUT DRIVER
*JUMP VECTORS
0038 C318BC JMP CINIT ;COLD INIT
003C C318BC JMP WINIT ;WARM INIT
003E C318BC JMP CONST ;CONSOLE STATUS
0040 C318BC JMP CONIN ;CONSOLE INPUT
0042 C318BC JMP CONOUT ;CONSOLE OUTPUT
0044 C318BC JMP LIST ;LIST OUTPUT
0046 C318BC JMP LIST ;PUNCH OUTPUT
0048 C318BC JMP CONIN ;REORDER INPUT
*
004A 3E91 CINIT MVI A,1 ;10BYTE
004C 320300 B01A STA 3
004E C9 RET
*
0050 C9 WINIT RET
*
*INPUT TO A WITH PARITY RESET
*IF RUBOUT, RESET ECHO FLAG TO TRIGGER BACKSPACE.
0054 C088BC CONIN CALL NEWSTACK
0056 C034BC CONINLHP CALL CONGETCH
0058 C022BC JZ CONINLHP ;IF NO INPUT
005A C022BC MVI A,7FH ;RUBOUT=BACKSPACE
005C 3E7F SUB H
005E 96 B02A STA ECHOFG ;ECHO OUTPUT CHR FLAG
0060 3206BC MOV A,M ;BUFFERED CHR
0062 7E B02F MVI M,0 ;MARK BUFFER EMPTY
0064 567F ANI 7FH
0066 C9 RET
*
0068 2109BC CONGETCH LXI H,CONCHFB ;TO C BUFF
006A 54 INR M
006C 35 DCR M
006E C8 RIE ;IF CHR IN BUFF
*TRY TO GET FROM CONSOLE DEVICE
0070 3E80 MVI A,0 ;SOLDS KEYBOARD PSEUDOPORT
0072 C022BC CALL 00022H ;SOLDS RIMP - PRES ALL BUT A
0074 77 MOV A,R ;PUT IN BUFF
0076 C9 RET
*
*CONSOLE OUTPUT FROM C
*IF ECHO FLAG RESET DO BACKSPACE INSTEAD.
*ED TEXT INPUT ECHOS RUBOUTS SO MUST IGNORE ECHO
*AFTER RUBOUT.
0078 C088BC CONOUT CALL NEWSTACK
007A C5 PUSH B
007C 41 MOV B,C
007E 3A04BC LDA CONDEF
0080 C078BC CALL CRCHK
0082 C078BC JZ CONDON ;IF 2ND CR IN A ROW
0084 79 MOV A,C
0086 3204BC STA CONDEF ;REMEMBER LAST CP/M OUT CHR
0088 5E7F CPI 7FH ;RUBOUT/BACKSPACE
008A C8 JZ CCUT ;DON'T LET IT USE UP IGNORE
*WHEN CP/M DELETES A CHR DUE TO RUBOUT INPUT
*IT ECHOS THE CHARACTER DELETED. WE SUBSTITUTE
*BACKSPACE,SPACE,BACKSPACE.
008C 3A06BC LDA ECHOFG
008E B7 ORA A
0090 3E91 MVI A,1
0092 3206BC STA ECHOFG
0094 C274BC JNZ COUT ;IF ECHO FLAG SET
*LAST INPUT (RUBOUT) CLEARED ECHO FLAG
0096 065F MVI B,5FH ;SOLDS BACKSPACE
0098 3E90 MVI A,0 ;DISPLAY
009A C010C0 CALL ROUT
009C 0628 MVI B,7
009E 3E90 MVI A,0
00A0 C010C0 CALL ROUT
00A2 065F MVI B,5FH ;BACKSPACE OVER SPACE

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COUT MVI A,0 ;SOLDS VIDEO PSEUDOPORT
0074 3E80 CALL ROUT ;SOLDS ROUT - SAVES ALL BUT A
0076 C010C0 POP B
0078 C1 MOV A,C
007A 79 RET
*
007C FE80 CRCHK CPI 00H ;CR?
007E C8 RNZ ;IF NOT
007F B8 CIP B
0080 C9 RET
*
*CONSOLE INPUT STATUS - A=FF IF READY, 0 IF NOT
0082 C088BC CONST CALL NEWSTACK
0084 C034BC CALL CONGETCH
0086 C8 RZ
0088 3E7F MVI A,0FFH
008A C9 RET
*
*SETUP A PRIVATE STACK FOR SOLDS CALLS
008C E3 NEWSTACK XTHL ;HL=RETURN ADDRESS, HL ON STACK
008E E5 PUSH H ;RETURN ADDRESS
0090 218200 LXI H,2
0092 39 DAD SP
0094 2207BC SHLD STACKS ;REMEMBER THIS STACK
0096 E1 POP H ;RETURN ADDRESS
0098 31FFBC LXI SP,USER+1FFH ;END OF USER AREA
009A E5 PUSH H ;RETURN ADDRESS
009C 2196BC LXI H,OLDSTACK ;WHERE TO COME BACK
009E E3 XTHL ;HL=RET ADDR, ST=OLDSTACK
00A0 E9 PCHL ;BACK TO CALLER W/ NEW STACK
00A2 2A07BC OLDSTACK LHAL STACKS ;USERS SP BEFORE NEWSTACK
00A4 F9 SPHL ;RESTORE IT
00A6 E1 POP H ;USERS HL
00A8 C9 RET
*
*LIST DRIVER FOR SERIAL SOLDS PORT
00AA C088BC LIST CALL NEWSTACK
00AC C5 PUSH B
00AE 41 MOV B,C
00B0 D8F8 IN 0F8H
00B2 E682 ANI 2 ;NOT DSR
00B4 C036BC JZ H14 ;IF DSR, IT'S HOT TTY.
*RESUME TTY SINCE DATA SET READY IS NOT SET.
00B6 3E91 MVI A,1 ;SOLDS SERIAL PSEUDOPORT
00B8 C010C0 CALL 0001CH ;SOLDS ROUT - SAVES ALL BUT A
00BA 78 MOV A,B
00BC FE80 CPI 00H ;CHECK IF CR
00BE C278BC JNZ LISTDN
*KILL TIME FOR CARRIAGE RETURN
00C0 3E91 MVI A,1
00C2 0680 MOV B,0 ;NULL
00C4 C010C0 CALL 0001CH
00C6 3E91 MVI A,1
00C8 C010C0 CALL 0001CH
00CA C1 POP B
00CC C9 RET
*
*VERTICAL H14 PRINTER - HANDSHAKE TO AVOID OVER-FLOWING
*ITS BUFFER. ALSO DON'T SEND NULLS AFTER CARRIAGE RETURN.
00CE D8F8 H14 IN 0F8H
00D0 E682 ANI 20H ;NOT CTS
00D2 C036BC JZ H14 ;IF H14 IS BUSY
00D4 3E91 MVI A,1
00D6 C010C0 CALL 0001CH ;SOLDS SERIAL OUTPUT
00D8 C1 POP B
00DA C9 RET
*
*SCRATCH RAM AND PRIVATE STACK
00DC 00 STACKS US 2 ;OLD SP
00DE 00 CONDEF US 0 ;CONSOLE INPUT BUFFER
00E0 00 CONDEF US 0 ;CONSOLE OUTPUT BUFFER
00E2 00 ECHOFG US 1 ;ECHO NEW CHR FLAG
*PRIVATE STACK IS FROM USER+1FFH BACK TO HERE
00E4 BDC END

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PROGRAMMING QUICKIES

By Lewis Moseley, Jr.

PTCo Extended Basic shares an unusual set of string operators with N* Basic... and almost no one else. PTCo's way is as good as Microsoft's, and better in that you can use the string operator on the left side of an assignment statement, i.e., change part of a string with a single simple statement. However, some people have not realized how easy it is to substitute the PTCo coding for Microsoft coding when entering a program from a magazine. Therefore:

<u>Microsoft</u>	=	<u>PTCo.</u>
RIGHT\$(A\$,x)	=	A\$(x)
LEFT\$(A\$,x)	=	A\$(1,x)
MID\$(A\$,x,y)	=	A\$(x,y)

HELP!!! Has anyone come up with, or even considered, the hardware and/or software necessary to let us read in a TRS-80 (or, Apple, or PET) cassette tape? Think what a wealth of software that would open to us! It would be well worth the editing and other customizing that would be necessary. Lets hear from you in PROTEUS.

A LABEL WRITER PROGRAM
by Lewis Moseley, Jr.

Dear Members,

As some of you have noticed, I do a good bit of corresponding with PROTEUS and PROTEUS members. I have a couple of items to offer the membership.

The first of these is a program. Being a rather lazy person at heart, I have tired of writing address labels and return address information on letters and packages, so I decided to let my computer do the work for me. Once every couple of weeks, I load a roll of gummed labels (about \$10 per 1000) into my printer and turn out my estimated needs. The program handles return address labels, and also custom mailing labels. Although it is done entirely from the keyboard now, with a little work it could be made to search a list of data statements for a name, etc.

The second offering is in the form of a suggestion. I suggest that members, when writing to the club or to a fellow member, enclose a self-addressed stamped envelope. This would seem to be only common courtesy, but very few people bother to do so. Consider your own position if you were to write a program, and 50 or 100 others wrote you about it, and expected you to foot the bill for the reply. This goes for the club as well, since a reply to you at the club's expense takes money which could be used to help everyone.

I've received for review an excellent program which incorporates a number of useful utilities, including a machine code relocater. It is by Fr. Thomas McGahee, et al, who have submitted material to the club newsletter in the past. I'll do a write-up of this for the next issue.

Best regards,

Lewis Moseley, Jr.
2576 Glendale Ct. NE
Conyers, Ga. 30208

7/21/79

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LIST

```

10000 REM- ADDRESS LABEL PRINTER
10010 REM- BY LEWIS MOSELEY, JR.
10020 REM- 2576 GLENDALE CT. NE
10030 REM- CONYERS, GA. 30208
10040 REM
10050 REM- PRINTS NOW SET UP FOR LABELS 6 LINES LONG,
10060 REM- THAT IS, 6 LINE FEEDS TAKE YOU FROM LINE 1 OF
10070 REM- ONE LABEL TO LINE 1 OF THE NEXT.
10080 REM
10090 DIM A$(30),B$(30),C$(30),D$(30),E$(30)
10100 PRINT "GK"
10110 PRINT " LABEL WRITER"
10120 PRINT
10130 PRINT
10140 REM- MY PRINTER USES PSEUDOPORT 3 - CUSTOM DRIVER
10150 REM- IF YOURS DOESN'T, DELETE THE NEXT 6 LINES
10160 IF PEEK(51202)<>0 AND PEEK(51203)<>0 THEN 10220
10170 PRINT "CUSTOM OUTPUT ROUTINE NOT READY"
10180 PRINT "LOAD FROM TAPE OR INITIALIZE"
10190 PRINT
10200 PRINT
10210 BYE
10220 REM-SELECT FUNCTION
10230 INPUT (1,0)"R=RETURN, M=MAILING, E=END. WHICH? ",A$
10240 IF A$="E" THEN END
10250 INPUT (2,0)"HOW MANY LABELS? ",X
10260 IF A$="R" THEN 10300
10270 IF A$="M" THEN 10430
10280 GOTO 10230
10290 REM
10300 REM- PRINT LABELS WITH MY ADDRESS ON THEM
10310 SET OP=3
10320 FOR I=1 TO X
10330 PRINT "LM J M LEWIS MOSELEY, JR."
10340 PRINT "LMM MM 2576 GLENDALE CT NE"
10350 PRINT "LMM M M CONYERS, GA. 30208"
10360 PRINT "LLLLLL"
10370 PRINT
10380 PRINT
10390 NEXT I
10400 SET OP=0
10410 GOTO 10100
10420 REM
10430 REM- READ DATA FROM KEYBOARD, THEN PRINT
10440 REM- THIS LINE LETS YOU JUDGE THE LENGTH OF THE ADDRESSES
10450 REM- TO BE SURE THEY WILL FIT THE LABEL
10460 PRINT "LENGTH GAUGE: 12345678901234567890123456"
10470 REM- NOW GET UP TO 5 LINES OF ADDRESS
10480 INPUT (26,0)"LINE 1: ",A$
10490 INPUT (26,0)"LINE 2: ",B$
10500 INPUT (26,0)"LINE 3: ",C$
10510 INPUT (26,0)"LINE 4: ",D$
10520 INPUT (26,0)"LINE 5: ",E$
10530 REM- NOW PRINT THE ADDRESS STRINGS, EVEN THE EMPTY
10540 REM- STRINGS, WHICH ACT LIKE SIMPLE <CR>,<LF>'S
10550 REM- THE LAST PRINT STATEMENT JUMPS THE GAP BETWEEN LABELS
10560 SET OP=3
10570 FOR I=1 TO X
10580 PRINT A$
10590 PRINT B$
10600 PRINT C$
10610 PRINT D$
10620 PRINT E$
10630 PRINT
10640 NEXT I
10650 SET OP=0
10660 GOTO 10100

```

Fr. Thomas McGahee
 Don Bosco Tech Computer Courses
 Don Bosco Technical High School
 202 Union Ave.
 Paterson, New Jersey
 07502
 ph. (201) 595 8800
 April 21, 1979



PRICING: \$10 for all the above on a single disk, plus documentation.
 Note: 5" soft-sector CP/M (such as VISTA) is also supported.
 Users of MICROPOLIS and NORTHSTAR, or any other system, may optionally obtain the files on tape in SOLOS/CUTER format. These can be loaded into memory via cassette, and then SAVED onto disk. Full instructions on how this is done included with tape versions. (All versions cost \$10).

STATE version desired!
 SEND CHECK OR MONEY ORDER TO:
 Fr. Thomas McGahee
 202 Union Ave.
 Paterson, N.J. 07502

NOTE; requires SOLOS ROM

THE MODIFIER: UTILITIES FOR THE SOL COMPUTER

Dear Mr. Stan Sokolow,

We have been keeping ourselves busy here at Don Bosco Tech Computer Courses. Since you published our article on the memory search routines for SOL, we have expanded them considerably. We have prepared a package of utility programs that we call THE MODIFIER. I just finished writing up the documentation on THE MODIFIER, and am enclosing a copy of the documentation as well as a tape of the program for you to review.

I have also prepared a product announcement sheet that I hope you will include in the next issue of SOLUS NEWS. It contains a summary of the utilities provided by THE MODIFIER, and pricing information.

We are hoping to get a company to distribute this software, but until then we will be making it available in the same form that you received: A first-generation tape in SOLOS/CUTER format, 1200 baud (recorded twice on one side), and the documentation (high quality Xerox copy on bond paper, plastic spiral binding with protective covers). We are asking \$10 for the tape and documentation for THE MODIFIER, and an additional \$10 for the ASSEMBLY LISTING. The ASSEMBLY LISTING comes as a 16 page booklet, and also includes a cassette copy of the assembly file that can be listed and re-assembled using the ALS-8 assembler. The user may modify the programs any way he wants. The only restriction we place is that the programs provided are purchased for use on only ONE system, and we retain all rights to the original software. (Simply put, this means that if a friend wants a copy, he must buy it from us, and you cannot sell or give away any of the utilities we provide. If software is simply ripped off, there remains no incentive for our going to all the effort of writing these programs and preparing the documentation. We hope to make enough money from our various endeavours to purchase additional computer hardware and software for our computer courses).

CUSTOM BIOS PATCHES FOR SOL and CP/M

These patches come on a single-density 8" disk, soft-sectored. They come in the form of LIB (LIBRARY) files so you can integrate them into your existing BIOS with a minimum of hassle. They provide the I/O utilities in a way that will make SOL users very happy: Deletions result in a visual backspace: ANY SOL pseudo-port can be called to become the current console device AT ANY TIME, even in the middle of performing a listing! Input and Output devices 0-3 are called up using a control key followed by I or O, and the port number. In addition, one version also supports a DIABLO 1610/1620 or equivalent printer (and it runs at FULL speed!), allowing it to be accessed as the printer, (meaning a control P can toggle it in), and also as output device number 4 (This means output devices may be called up in the range 0-4).

Another file allows you to incorporate a user-defined routine as device #4 and the printer, in place of the DIABLO.

Also on the same disk is a custom BIOS for the ELECTRIC PENCIL II <DS-II>. This is the version that supports a SOL running a DIABLO. An interesting aspect of this BIOS is that it can be set up so that on a cold boot it loads in the ELECTRIC PENCIL II automatically, and then lists the Directory, freeing the user from doing these steps manually.

Sufficient information is supplied with the disk to allow the user to integrate these patches into his system. These patches will work with all CP/M systems.

THE MODIFIER is a set of utilities for the SOL computer. Hardware requirements are: at least 2K of RAM in low memory, and a SOL computer with SOLOS ROM. Program comes on first-generation cassette tape in SOLOS/CUTER format at 1200 baud. Distribution version is set to load and run starting at 0100H, and ends at 0655H. The program is self-relocatable anywhere in memory. Manual contains over 16 pages of documentation. A handy reference table of all commands is included, as well as information on how to relocate the program, and information is given on how to customize the program.

THE MODIFIER includes the following utilities, all of which are accessed by means of custom commands:

HELP: Lists all available commands, gives relocation information for the program, and allows the user to choose which group of custom commands should be made current.

FIND STRING allows the user to locate ASCII text. The address of the match is given, and the found string is shown IN CONTEXT via a window to memory. Strings up to 55 characters may be found.

FIND NUMBER allows the user to locate sections of code in memory. Up to 55 contiguous bytes of code can be searched for. Great for locating machine code sequences. The address of the match is given, and the section of code is shown IN CONTEXT.

MEMORY allows the user to see any page of memory via a window to memory. The user may specify the address of the first byte to be displayed, or may "flip" through memory pages using the space bar.

INPUT TEXT allows the user to directly enter ASCII text and most control codes (including CR and LF) directly into memory as a string of typed characters. Allows the user to optionally append a terminator in the range 00 to FF to the entered text at the moment text entry is ended.

FILL MEMORY allows the user to fill any portion of memory with any value from 00 to FF.

MOVE allows the user to move sections of memory from one place to another. (Two movers are included: one moves head-first, and the other moves tail-first).

RELOCATOR allows the user to quickly relocate programs so they will run anywhere in memory. This relocator prompts the user, and all relocating information is entered in a manner that is hassle-free. We let the computer do all the hard stuff, like calculating offsets. You can relocate programs like the ALS-8 ASSEMBLER in a fraction of the time it would take with most other relocators. Complete information is given on how to relocate THE MODIFIER (A fast typist can do it in 15 seconds!)

RERUN is an adjunct to the RELOCATOR, that allows you to skip the entry of more than half the information that the RELOCATOR normally asks for. This is used primarily when relocating programs that need a lot of fixing due to data being scattered around within the main body of the program.

The use of each utility is explained in detail, and the documentation has been prepared with the user in mind.

PRICING: THE MODIFIER tape and documentation for \$10.

ASSEMBLY LISTING includes cassette file for ALS-8 for \$10.

If both are ordered at the same time, price is \$16.

SEND CHECK OR MONEY ORDER TO:
 Fr. Thomas McGahee
 202 Union Ave.
 Paterson, N.J. 07502

COMMON SYMPTOMS OF FAILURE IN THE Sol

WARNING: WHENEVER A PROBLEM OCCURS, IT IS ADVISABLE TO FIRST CHECK THE OUTPUTS OF THE POWER SUPPLY .

This section is designed to aid the technician in the location and isolation of problem areas in the Sol computer. It is not intended to be a point-to-point troubleshooting guide, therefore, it only identifies ICs by number and not pin numbers.

- 1) The screen fills with alternating nines and nulls, screen flickers:

NOTE: THIS CONDITION IS REFERRED TO AS A "STACK CRASH," AND IS CAUSED BY THE CPU ENCOUNTERING AN 'FF' ON THE DATA BUS DURING AN INSTRUCTION CYCLE.

A> Bad RAM (U3-10).

B> Open or short on INT bus:

NOTE: PROBLEMS WITH THE INT BUS CAN SOMETIMES BE CAUSED BY BAD UART'S (U51, 69).

C> Bad MUX's or MUX select logic (U24, 36, 47, 48, 61, 65, 66, 78, 79, 83).

D> Bad FOUR-PHASE-WONDER (U22, 23, 24, 76, 77).

- 2) Screen fills with random characters and flickers:

A> MWRITE not present (U46, 49, 50, 107), plus one of the above symptoms.

- 3) Screen fills with random characters and does not flicker:

A> CPU not running (No PSYNC or DBIN);

1) No -5,+5,+12 volts.

2) Bad CPU (U105).

3) No clock to CPU (XTAL, U77, 90, 91, 92, 104).

4) Ready line held low (U48, 63).

5) Hold line held high (U64).

6) INT (Interrupt) line held high (U45).

B) CPU running (PSYNC and DBIN present);

1) No MWRITE to video section (U44).

- 4) Screen clears, displays cursor and prompt, but also displays an extra character on the screen or incorrect characters:

A> Bad display RAM (U14-21).

B> Intermittent or floating MWRITE (U44, 46, 49, 50, 107).

- 5) Screen clears momentarily, displays cursor then fills with flickering nines and nulls as in symptom 1:

A> Bad system RAM (U3-10).

- 6) Screen is blank:

A> No video output (U41, 59, 74, 87).

B> CPU not running, +5, +12, or -5 voltage not present.

C> Reset (RST) line from keyboard is held low.

- 7) Will not scroll correctly:

A> Bad scroll latch or MUX circuitry (U1, 2, 11, 13, 30, 32).

- 8) Characters on screen are incomplete or broken up:

A> Shift register bad (U41).

- 9) Cannot enter from keyboard:

A> Bad keyboard (see section on kybd problems).

B> Keyboard flag logic (U53, 54, 70, 71).

C> Bad MUX or MUX decode logic (U36, 65, 66, 78, 769).

- 10) Keyboard output continuously displayed:

A> Keyboard flag logic (U53, 54, 70, 71).

- 11) Will not respond to commands:

A> Places question mark on screen in command (U29, 89, PHASE 1 and 2 timing incorrect).

B> Stack crash-bad RAM (U3-10).

- 12) Will not read cassette tape-doesn't give error message: (Will not respond to CAT command, also)

A> Bad AGC circuit (Q3, 4, 5, U108, 109).

B> Bad read logic (U98, 99, 100, 112, 113, 119).

C> Bad UART (U69).

1) Bad data input (see A and B).

2) Bad data output (UART).

3) Bad status in (UART, U22, 23, 24, 36, 93, 94).

4) Bad status output.

D> Bad clock to UART (U85, 86, 109, 111, 112).

E> PLL inoperative (U110).

NOTE: CHECK VALUES OF ALL DISCRETE COMPONENTS AT INPUT.

- 13) Will not read cassette tape-gives error message:

A> Bad PLL (U110) or PLL not adjusted correctly.

B> Bad clock to PLL (U11,112).

C> Bad UART (U69).

D> Two Baud Rate Switches on at one time (S3).

(continued)

14) Will not write to cassette:

- A> Bad UART (U69).
- B> Bad clock to UART (U85, 86, 109, 11, 112).
- C> Bad write logic (U98, 99, 100, 101, 109).

NOTE: CHECK VALUES OF ALL DISCRETE COMPONENTS AT OUTPUT.

15) Motor control of cassette inoperable (won't turn off or on):

- A> Bad control logic (U97).
- B> Bad relay (K1, K2).

16) Power supply failure:

- A> No +5V (U2, Q1, 2, 3, D1, SCR1, FWB1).
NOTE 1: Check reference voltages on U2.
NOTE 2: Check values of all discrete components.
- B> Ripple on +5V (FWB1, U2-reference voltages).
- C> No +12V (U1, D3, C5, FWB2).
- D> Ripple on +12V (C5, FWB2).
- E> No -12V (U3, D4, C4, FWB2).
- F> Ripple on -12V (C4, FWB2).
- G> No + or -16V Unregulated (FWB2).

COMMON SYMPTOMS OF FAILURE IN THE I/O SECTION.

1) No data output from TTY section:

- A> Bad UART (U51).
- B> Bad strobe to UART (U22, 23, 35).
- C> Bad TTY driver logic (U55, 56, Q1, D2).
- D> +12V missing at Q12.
- E> + or -12V missing at U56 (reference voltages).

2) Incorrect data out from TTY section:

- A> Two Baud Rate Switches selected at once (S3).
- B> Bad UART (U51).
- C> Wrong word length selected (S4).

3) No data input to TTY section:

- A> Bad receive logic (U38, 39, D1, 3, 4, 5, 6).
- B> Bad UART (U51).
- C> Bad strobe to UART (U22, 23, 36).

4) Incorrect data input to TTY section:

- A> Two Baud Rate Switches selected at once (S3).
- B> Bad UART (U51).
- C> Wrong word length selected (S4).



5) No data output from RS-232 section:

- A> Bad UART (U51).
- B> Bad strobe to UART (U22, 23, 35).
- C> Bad RS-232 driver logic (U55, 56).
- D> Handshaking signal missing (External).

6) Incorrect data output from RS-232 section:

- A> See same symptom for TTY.

7) No input data to RS-232 section:

- A> Bad RS-232 driver logic (U37, 38).
- B> Bad UART (U51).
- C> Bad strobe to UART (U22, 23, 36).

8) Incorrect data input to RS-232 section:

- A> See same symptom for TTY.

9) No data output from parallel section:

- A> Bad output latches (U95, 96).
- B> Bad strobe to latches (U35, 54).

10) No data input to parallel section:

- A> Bad input multiplexers (U65, 66, 78, 79).
- B> Bad input MUX logic (U36, 47, 48).

11) Bad sense switch operation:

- A> Bad drivers (U57, 58).
- B> Bad strobe logic (U36).

COMMON SYMPTOMS OF FAILURE IN THE Sol KEYBOARD

1) No data output:

- A) No +5V.
- B) Bad output logic (U1, 2, 28, 10).
- C) Bad decode logic (U10, 14, 15, 25, 26, 27).
- D) Bad key detect circuitry (U17, 19, 21, 22).

NOTE: CHECK FOR SHORTS ON MATRIX

- E) Bad clock generation (U7, 8).
- F) Bad KTC circuit.
 - 1) No amplification (Q2, 4, 7).
 - 2) No PKD signal (Q3, 4, U10, 16, 20, 26, 27).

(continued)

HELIOS NOTES

Contributed by Joe Maguire

- 2) Character continually repeated:
 - A) Strobe line held low (U10, 11).
 - B) Repeat oscillator malfunctioning (U3, C3, R4, 5).
 - C) Addressable latch output low (U12).
- 3) Shift, shift lock, upper case, local, control, break, tab keys not functional:
 - A) Bad addressable latch (U12).
- 4) LED's won't light:
 - A) Bad LED's.
 - B) Bad driver (U24).

BITS AND PIECES (continued from pg. 1)

to the latest revision level, replaced the incandescent bulb in the positioner scale mechanism (it gets weak after a while), adjusted the spindle cones that grip the diskette, adjusted the eject cam, and realigned the drive, all for the flat fee plus parts. I was impressed that they gave complete service, not just patch-up service to satisfy the immediate complaint. Service took about 2 weeks. They'll accept work shipped to them, but I suggest you call first. That's Fiscner-Freitas Company, Microcomputer Sales and Service, 910 - 81st Ave. Bldg 14, Oakland, California. Telephone (415) 635-7615 and 635-7616. (They work out of a mini-warehouse, so don't be shocked when you go there.)

The power supply in the Helios drive seems to be designed to provide ample power for a multi-slot S-100 system as well as the PerSci drive. The rectifier bridge for +8v is rated at 35 amps, and by adding a few components to the regulator board and a transformer you can get the +/- 16v supply. A single PerSci drive requires 2.2 amps max from +5v and 2.0 amps max from +8v (peaks 10.0 amps for 50ms @ 1% duty). So it looks like there is about 4.2 amps draw on the +8v secondary of the Helios transformer, leaving plenty for an S-100 bus. Does anyone know how much current the existing Helios transformer can really handle at +8v? The Helios was designed to contain a complete S-100 computer system in a single box, and I wonder if we can do it this easily. Wameco makes a 9-slot motherboard that has the right dimensions to fit right in, and it can use Altair-style card guides that fasten to the motherboard, so a card-cage isn't necessary.

Another Helios idea: the new technological wave is the 8" Winchester-type hard disk drive that is the size of the 8" floppy drive. Maybe someday soon we'll be able to drop a hard disk into the empty side of the Helios cabinet, hook it up to the unused half of the power supply, get a suitable controller board, and be ready to fly with multi-megabytes and 8" floppies. Maybe we could get someone from PTC who still has PTDOS's source code to put the new controller's driver software into PTDOS the way they had planned to do, but there's always CP/M 2.0 to rely upon.

Lew Moseley has sent praise about The Stockroom, 2901 Southway Dr, Memphis TENN 38111. They have a nice line of preprinted pin-feed forms which they will sell in quantities small enough to interest the personal computerist market. Post-cards, self-adhesive labels, business forms, etc. Fast service. Write for samples and prices.

ATTRIBUTE DEFEAT As the employees were scurrying off the sinking PTC ship in Pleasanton, one passed along a previously close kept secret about how to defeat the attribute protection of PTDOS. To do the dirty work, proceed as follows:

PTDOS 1.5 Enter a NOP (00) at memory address A890

PTDOS 1.4 Enter a NOP (00) at memory address A8B1

To restore, ENTER a 10 Hex at the above address.

After the NOP has been ENTERED, proceed with the normal REATR command of PTDOS. Even previously changed protected files can now have all their attributes removed. (With PTDOS 1.4 the warning message will be displayed but the attributes will be changed anyway) Good luck with this but BE CAREFUL!!

PTDOS 1.5 BUGS This may just be a glitch in my system, but I have found on several occasions that the READ command does not work properly. If an Image file containing several Origin blocks (gaps in the code) is READ into memory, some of the blocks of code may be out of position by a byte or two. If you are trying to move the RAM image to ROM, it sure messes it up!! Check it first.

The Input/Output/Test addresses given with the SYST L command are in error. (PTDOS 1.5 Rev. G) The correct addresses are as follows:

Input - B511 / Output - B594 / Test - B539

SOLOS EXTENSION I recently received the first Helios Library disk from Proteus and discovered that the Extended Solos program, written by Ron Parsons, will not work with PTDOS 1.5. After some probing I discovered that PTDOS 1.5, on bootup, checks to see if it is working with Solos, Cuter or something else. If it determines a "something else" it rewrites the I/O routines to those of an Altair or Imjai. Because of one byte that PTDOS checks, Extended Solos falls into the latter category. There are several solutions:

PTDOS checks the bytes at C000, C001, C004 and C007 to see if they agree with Solos or Cuter. The byte at C007 is the one out of sync in Extended Solos. PTDOS expects a C3 there but it finds a CD instead. Change 1. Reorder the code in Ex.Solos.

The routine which does the checking is loaded into the CXBUF (BCC0) during a coldstart boot of PTDOS. It is possible, using the attribute defeat info given above, to patch RESIDENT (that's the file which contains PTDOS) to enable the correct I/O routines to be selected. Change 2. Good luck!

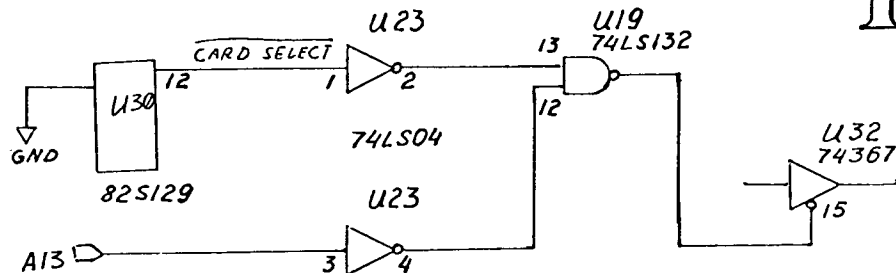
GOSSIP ITEM Chuck Grant, the president of North Star Computers was in Japan recently to conclude a deal between North Star and C. Itoh Company. C. Itoh is one of the worlds largest import/export conglomerates. Judging from the dealer price of the Horizon computer in Japan now, (it's lower than in the USA) the deal involved a huge quantity of NS's products or a very lucrative licensing agreement.

Why do I mention this item here? Because Processor Tech was offered a similar deal nearly 18 months ago but dragged their feet so badly on it that it never materialized. Oh well!

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1 (1)

19 Mayfield Road
Regina, Saskatchewan Canada
August 29, 1979



Perform following changes:

1. Cut the trace between U30 pin 12 and U32 pin 15.
2. Cut the trace between U30 pin 4 and pin 85 of S100 connector.
3. Install jumper between U30 pin 4 and U30 pin 8.
4. Install jumper between U30 pin 12 and U23 pin 1.
5. —||—||—||—||— U23 pin 2 and U19 pin 13.
6. —||—||—||—||— U23 pin 4 and U19 pin 12
7. —||—||—||—||— U19 pin 11 and U32 pin 15
8. Install jumper between U23 pin 3 and pin 85 of S100 connector.

See change notice #1:

for serial data input perform step a':
type IODR_ /SYSIO/_@_FE77 CR, CR
 space space twice

Santa Claus
North Pole

Dear Santa,

It may be a little early to send you my Christmas list, but I thought that I would catch you before you got too busy. Here is what I want for Christmas this year:

1. A patch so I can make PT's Qubic, Hangman, 8080 Chess into NorthStar GO files. If I just SF then at 0H and make them GO files, my screen just flickers and wipes memory. I have to LF game 0, JP C004, and EX 0 to make them work.
2. A patch to "disk-ify" PT's PILOT to NorthStar DOS and also to CP/M so you can save and load PILOT programs on disk.
3. A patch to allow the use of PT's Music System from NorthStar Basic. Or even a simple routine usable from Basic to poke some tones onto the INTE line which the Music System uses.
4. A BIOS for CP/M on NorthStar which would be like Joe Maguire's customized NorthStar DOS for the SOL. That is, you could use the space bar to halt listings rather than control-S, you could change display speeds during output, tie in the cursor control keys, etc.
5. A patch to allow Electric Pencil I to run on double-density NorthStar.
6. A patch to create a customized version of Electric Pencil (I and II) which could operate on NorthStar files (or CP/M files) directly, without having to use a converter program.
7. A patch to get Micro Mike's CSUB routines to work correctly on the SOL.
8. A patch to get Micro Mike's 8INIT routine from their DOSCHG package to run correctly on the SOL.
9. I know you can get CP/M for Helios, but how about a relocatable modified version of PTDOS to run on other systems? (I know, Santa. That one is a biggie, but think of the flexibility and the increased freedom of interchange among SOL owners!)
10. Apparently 3P+S users can have their baud rate software selectable. Can SOL owners do the same? It sure is a pain taking that cover off every time you want to switch between a modem and a printer.
11. Do you have an address for Bob Heath, formerly of 629 Mojave Avenue, Livermore, California? He owes me money!

One last request, Santa. Please see if there is anything you can do for the ailing?/now deceased? ProcTechCo. There are an awful lot of us who would love to see PT resurrected. Let's see... if 10,000 SOL owners each contributed \$50, no strings attached.....

I am also sending a copy of this letter to PROTEUS News. I hope that if you think I've been a good boy and deserve any of the presents I've asked for, then please send copies to PROTEUS also. I'm sure that I'm not the only one who could make good use of these presents.

Thank you Santa. Best regards to Mrs. Claus and the elves.

Bob Stek

PROGRAMMING QUICKIES

by Lewis Moseley, Jr.

Here is a quickie that will save you a little time and effort at the keyboard. Say that you have just finished working on a program, and are ready to save it. So, you type: SAVE SNAKO 1171 3988 <cr>. You wait until the save is complete. Then, being naturally smart, or having been burned before, you decide to make another copy for backup. You have to type the whole Save command again, right? WRONG! Instead, do the following: <cursor-left>, <cursor-left> <cursor-up>. This places you in the last column of the line containing the Save command you used before. Hit <return> and SOLOS/CUTER reads the last line again, and executes it. Simple, but a time-saver for two finger typists, like me.

POWER LINE INTERFERENCE CONTROL DEVICES

Catalog 971 from Electronic Specialists, Inc., presents their product line of protective devices and power line interference suppression devices. With a variety of configurations, these units provide "nash" filters, line isolation, spike suppression, circuit breakers, switches, etc. to allow you to protect your equipment from electrical noise that enters thru the power cord. Electronic Specialists, 171 S. Main Street, Natick, Mass 01760. (617) 655-1532.

THE HELIOS PARAMETER SCANNER

Larry McDavid

The Parameter Scanner is a powerful PTDOS routine that allows user-written programs to access parameters entered to the Command Interpreter (CI). This article explains the use of the Parameter Scanner and gives assembly-language examples helpful to first-time users.

A concise description of the Parameter Scanner (PS) may be found starting on page 4-11 of the PTDOS 1.4.0 manual. Assembly-language programs using the PS must provide the program steps required to call the PS and to handle all error returns. Further, the calling program must provide a 20-byte buffer area to which the PS returns its data; the user then extracts the desired data from this buffer.

Use of the PS is best described by example. Figure 1 is a source listing of the program steps required to extract a single, hex-address entered as a parameter to the command which loaded the program. Detected errors result in JUMPS to error subroutines which will be described in a future article; for now, the reader is referred to page 6 of Appendix C of the PTDOS manual for typical error handling.

Referring again to Figure 1, line 203 causes a CRLF, which clears the command line entered to the Command Interpreter; thus, correct entry to the user routine is verified by positioning of the cursor on the line following the command line. This CRLF also prepares the console for use of the error utilities to be described subsequently.

Line 204 calls the subroutine GETVA, which in turn calls the PS asking for a "value," or address, parameter. Line 215 loads the A-register with the PS operation code for a "value" search. It is assumed that the user-program assembly source has COPY'd PTDEFS to obtain the system label values, such as PSV.

Line 216 points the D,E-registers to the PS buffer area selected by the user. Having now set the required registers, line 217 calls the PS. Return from a PS call is always to the instruction following the call; errors found by the PS are identified by a return with the CARRY-flag set. Thus, line 218 causes an exit to the error utilities if a PS error resulted; note that the E-register contains error information needed by the error utilities.

Line 219 causes the delimiter character found by the PS to be saved at a user-selected buffer location; this character is subsequently inspected by other user-written PS subroutines. Line 220 provides a RETURN from the GET(VA) subroutine.

Still in Figure 1, we now return to line 205. It is assumed the user program required one parameter (e.g., address). If the GETVA subroutine found no errors but also found no parameter before the delimiter, the ZERO-flag will be set and line 205 will cause an error-utility exit.

Lines 206 and 207 store the 16-bit binary value of the first parameter at a user-established buffer location. We must now inspect the balance of the command line to ensure that no unexpected parameters were entered and also to set up the CI in case an additional command was delimited by a ';'.

11

Line 208 calls the subroutine CKDEL, which inspects the delimiter character found by the previous call to the PS. Line 222 loads the delimiter character to the A-register; line 223 checks for a comma. Since a comma is a common and valid delimiter, line 224 causes a return, allowing the calling routine to inspect for another parameter. If the delimiter was not a comma, line 225 checks for a CR; if it was a CR, line 226 transfers execution out of the PS routines and starts processing of the user program.

If the delimiter was neither a comma nor CR, line 227 checks for a ';', the PTDOS command delimiter. If neither comma, CR, nor ';', line 228 will cause an error-utility exit. Having found a ';', line 229 transfers execution to the user program.

Still in Figure 1, if a comma delimiter was verified by the CKDEL subroutine at line 223, we return to line 210 to inspect whatever follows the comma in the command line. The GETVA subroutine is again called; this time, however, no additional parameter (or incorrectly-delimited command) is allowed. The GETVA subroutine performs as previously described, and (if no error results) returns to line 211. If the ZERO-flag is reset, indicating that a parameter was found, line 211 will cause an error-utility exit. If another delimiter (but no parameter) was found, line 212 calls the CKDEL subroutine, but enters at CKDEL, since the delimiter character is still in the A-register. If CKDEL verifies a CR or ';' delimiter, execution is transferred to the user program.

If an invalid delimiter was verified, CKDEL will cause an error-utility exit. If another comma was found, CKDEL returns to line 213, which repeats the delimiter search sequence until a valid end-of-command delimiter, or an error, is found.

Now, you may ask, "Why bother?" Well, we are trying to write a thorough assembly-source routine which can be used with only minor modifications by other user-written programs. Skipping successive commas may be required by a program which allows several optional parameters, some of which may be omitted by entering successive commas. Thoroughness is the key to efficient computer programming.

Figure 2 is a source listing of the program steps required to extract two hex-address values as well as a single, optional parameter character. In this example, it is assumed both address parameters are required by the user program.

The reader is referred to the preceding text for a detailed description of the PS subroutines in Figure 2. Lines 213-217 extract the first hex-address parameter exactly as in Figure 1. Line 218 loads the delimiter character to the A-register; line 219 checks for a comma. If the delimiter was not a comma, line 220 will cause an error-utility exit. Lines 221-224 extract the required second parameter.

Line 225 inspects the delimiter following the second parameter; if it is a comma, the optional parameter character is to be extracted. Since the optional parameter is not necessarily a hex character, the "value" PS operation cannot be used. Line 226 loads the A-register with the PS operation code for a "name" search.

(continued)

Line 227 causes GET to extract the third parameter, all characters of which are loaded to the PS buffer. If no characters were found, line 228 will cause an error-utility exit. Lines 229-230 load the first character of the third parameter to the A-register. At this point, the user may inspect and act on the character(s) as required. Line 238 inspects the delimiter following the third parameter. If it was a comma, execution falls through to the NXDEL subroutine, which scans delimiters until a valid end-of-command delimiter, or an error, is found.

The basic structure of the PS routines exemplified here can be used for all PS operations. The number and type (name, value, character, file, etc.) are limited only by the programmer's imagination.

```

0200 *
0201 ***** SCAN COMMAND PARAMETERS *****
0202 *
F000 CD 4D F3 0203 START CALL CRLF ;CLEAR COMMAND LINE
F003 CD 1C F0 0204 CALL GETVA ;READ 1ST PARAM VALUE
F006 CA 6A F1 0205 JZ ERR1 ;ERR; NO 1ST PARAM
F009 EB 0206 XCHG . ;BINARY 1ST PARAM TO H,L
F00A 22 F4 F3 0207 SHLD BBUF ;SAVE 1ST LOC PARAM
F00D CD 2B F0 0208 CALL CKDEL ;CK DELIM; "CR" EXIT
0209 *
F010 CD 1C F0 0210 NXDEL CALL GETVA ;READ TO NEXT DELIM
F013 C2 6D F1 0211 JNZ ERR3 ;NO CHARS ALLOWED; SYNTAX
F016 CD 2E F0 0212 CALL CKDEL ;INSPECT DELIM FOUND
F019 C3 10 F0 0213 JMP NXDEL ;ANOTHER COMMA; LOOK MOR
0214 *
F01C 3E 85 0215 GETVA MVI A,PSV ;GET PSCAN VALUE OP
F01E 11 0D F4 0216 GET LXI D,PSBUF ;POINT TO PS BUFFER
F021 CD 99 BC 0217 CALL PSCAN ;SCAN PARAMS FROM CIFILE
F024 DA 64 F1 0218 JC ERR0 ;PCAN ERR; E-REG HAS #
F027 32 0C F4 0219 STA DLMTR ;SAVE DELIM CHAR
F02A C9 0220 RET ;
0221 *
F02B 3A 0C F4 0222 CKDEL LDA DLMTR ;GET DELIM CHAR
F02E FE 2C 0223 CKDEL CPI ',' ;CHECK FOR COMMA
F030 C8 0224 RZ . ;COMMA IS OK; CONT
F031 FE 0D 0225 CPI 0DH ;CHECK FOR "CR"
F033 CA 3E F0 0226 JZ ENTR ;"CR" IS END OF PARAMS
F036 FE 3B 0227 CPI ',' ;MORE CMNDS FOR PTDOS?
F038 C2 6D F1 0228 JNZ ERR3 ; NO; INVALID DELIM
F03B C3 3E F0 0229 JMP ENTR ; YES; FINISH HERE FIRST

```

Figure 1. Extraction of a single "value" parameter.

```

0210 *
0211 ***** SCAN COMMAND PARAMETERS *****
0212 *
F000 CD 37 F4 0213 START CALL CRLF ;CLEAR COMMAND LINE
F003 CD 4F F0 0214 CALL GETVA ;READ 1ST PARAM VALUE
F006 CA EE F1 0215 JZ ERR1 ;ERR; NO 1ST PARAM
F009 EB 0216 XCHG . ;BINARY 1ST PARAM TO H,L
F00A 22 DE F4 0217 SHLD BBUF ;SAVE 1ST LOC PARAM
F00D 3A F6 F4 0218 LDA DLMTR ;GET DELIM CHAR
F010 FE 2C 0219 CPI ',' ;WAS IT "COMMA"?
F012 C2 EE F1 0220 JNZ ERR1 ; NO; 2ND ADDR MISSING
F015 CD 4F F0 0221 CALL GETVA ;READ 2ND PARAM VALUE
F018 CA EE F1 0222 JZ ERR1 ;ERR; NO 2ND PARAM
F01B EB 0223 XCHG . ;BINARY 2ND PARAM TO H,L
F01C 22 E0 F4 0224 SHLD BBUF+2 ;SAVE LAST LOC PARAM
F01F CD 5E F0 0225 CALL CKDEL ;CK DELIM; "CR" EXIT

```

```

F022 3E 05 0226 MVI A,PSN ;NAME OP FOR 3RD PARAM
F024 CD 51 F0 0227 CALL GET ;READ 3RD PARAM
F027 CA F4 F1 0228 JZ ERR3 ;ERR; DELIM BUT NO CHAR
F02A 21 F8 F4 0229 LXI H,PSBUF ;POINT TO PS BUFFER
F02D 7E 0230 MOV A,M ;GET 1ST PARAM CHAR
F02E FE 49 0231 CPI 'I' ;IS IT "I" FOR INHIBIT?
F030 CA 3B F0 0232 JZ STAR1 ; YES; INHIBIT "RNGCK"
F033 FE 56 0233 CPI 'V' ;IS IT "V" FOR VERIFY?
F035 C2 F1 F1 0234 JNZ ERR2 ; NO; INVALID OPTION
F038 32 E6 F4 0235 STA FBUF ;SAVE CHAR AS FLAG
F03B 3E C9 0236 STAR1 MVI A,0C9H ;GET "RET" CODE
F03D 32 67 F1 0237 STA RNGCK ;INHIBIT "RNGCK" TESTS
F040 CD 5E F0 0238 CALL CKDEL ;CK DELIM; "CR" EXIT
0239 *
F043 CD 4F F0 0240 NXDEL CALL GETVA ;READ TO NEXT DELIM
F046 C2 F1 F1 0241 JNZ ERR2 ;NO CHARS ALLOWED
F049 CD 61 F0 0242 CALL CKDEL ;INSPECT DELIM FOUND
F04C C3 43 F0 0243 JMP NXDEL ;ANOTHER COMMA; LOOK MOR
0244 *
F04F 3E 85 0245 GETVA MVI A,PSV ;GET PSCAN VALUE OP
F051 11 F8 F4 0246 GET LXI D,PSBUF ;POINT TO PS BUFFER
F054 CD 99 BC 0247 CALL PSCAN ;SCAN PARAMS FROM CIFILE
F057 DA E8 F1 0248 JC ERR0 ;PCAN ERR; E-REG HAS #
F05A 32 F6 F4 0249 STA DLMTR ;SAVE DELIM CHAR
F05D C9 0250 RET ;
0251 *
F05E 3A F6 F4 0252 CKDEL LDA DLMTR ;GET DELIM CHAR
F061 FE 2C 0253 CKDEL CPI ',' ;CHECK FOR COMMA
F063 C8 0254 RZ . ;COMMA IS OK; CONT
F064 FE 0D 0255 CPI 0DH ;CHECK FOR "CR"
F066 CA 71 F0 0256 JZ CLOD ;"CR" IS END OF PARAMS
F069 FE 3B 0257 CPI ',' ;MORE CMNDS FOR PTDOS?
F06B C2 F4 F1 0258 JNZ ERR3 ; NO; INVALID DELIM
F06E C3 71 F0 0259 JMP CLOD ; YES; FINISH HERE FIRST
0260 *

```

Figure 2. Extraction of two "value" and one optional "name" parameters.

NEW CHAPTER: ANN ARBOR

I volunteer to coordinate a local group here. If anyone is interested, they can write me at:

Mike McKelvey
P.O. Box 7937
Ann Arbor, MI 48107

or call me at 313-769-6480.

In the Football Game on H-1, I found the cursor jumping around distracting. I think adding the following improves the game:
405 SET CM=0 .

A question for readers:

I tried using my SOL Printer 2E as a plotter as described in the June 1979 Creative Computing article "Computer Graphics with the Diablo." The program didn't work for me. I suspect this may be because Proc. Tech. might have replaced a ROM in the printer with the software driver which makes it impossible to send information directly out the parallel port to the printer. Does anyone know how to use the 1/120 " horiz. & 1/48 " vert. spacing with BASIC?

(ED. NOTE: The PTC Hytype interface manual describes how their interface software passes commands from the parallel port to the Hytype printer. The Diablo Hytype Manual describes the commands needed to get the printer to do just about anything you want, including the high-resolution increments for graphics. The info is there, but you have to dig it out carefully. See Proteus catalog for the manuals you need.)

PROTEUS SOFTWARE DIRECTORY

BUSINESS APPLICATIONS

PROGRAM NAME: **Financial Pack 1** CATEGORY: **Business**

DESCRIPTION: **3 programs:**
Loans
Depreciation
Investments

MINIMUM HARDWARE REQUIRED: **SOL TERMINAL COMPUTER with 32K RAM
plus 1 cassette recorder**

SOFTWARE REQUIRED:
SOLOS/CUTER; PTC ECBASIC

RESTRICTIONS:

DOCUMENTATION: **Operations reference manual**

MEDIA: **SOLOS/CUTER cassette**

DATE CURRENT VERSION WAS RELEASED: **January, 1979**

WARRANTY: **10 day exchange; 90 day repair/replace; 6 month notify**

PRICE: **\$13.00/prepaid**

ORDER FROM: **H. Geller Computer Systems
Dept. P. P.O. Box 350
New York, New York 10040**

REMARKS: **Allow 4 to 6 weeks delivery**

PROGRAM NAME: **Financial Pack 2** CATEGORY: **Business**

DESCRIPTION: **3 programs:**
Mortgage & Loan Amortization Table
Business Analysis; Rate of Growth with Future Projections
Business Risk Analysis

MINIMUM HARDWARE REQUIRED: **SOL TERMINAL COMPUTER with 32 K RAM
plus 1 cassette recorder**

SOFTWARE REQUIRED:
SOLOS/CUTER; PTC ECBASIC

RESTRICTIONS:

DOCUMENTATION: **Operation's Reference Card**

MEDIA: **SOLOS/CUTER cassette**

DATE CURRENT VERSION WAS RELEASED: **January, 1979**

WARRANTY: **10 day exchange; 90 day repair/replace; 6 month notify**

PRICE: **\$13.00/prepaid**

ORDER FROM: **H. Geller Computer Systems
Dept. P. P.O. Box 350
New York, New York 10040**

REMARKS: **Allow 4 to 6 weeks delivery**

PROGRAM NAME: **T.D.Q. Appointment Scheduling** CATEGORY: **Business Application**

DESCRIPTION: **T.D.Q. Appointment Scheduling** consists of a pre-defined Tape Data Query file structure on cassette tape and a user's manual. The user's manual guides the user to; load data into the Appointment Scheduling file; update and maintain data in the file; extract information from the Appointments Scheduling file.

ABSOLUTELY NO PROGRAMMING KNOWLEDGE IS REQUIRED

MINIMUM HARDWARE REQUIRED: **SOL TERMINAL COMPUTER with 32K RAM
plus 2 cassette recorders**

SOFTWARE REQUIRED:
SOLOS/CUTER; PTC ECBASIC

RESTRICTIONS:

Tape Data Query package required

DOCUMENTATION:
User's manual

MEDIA: **SOLOS/CUTER cassette**

DATE CURRENT VERSION WAS RELEASED: **January, 1979**

WARRANTY: **10 day exchange; 90 day repair/replace; 6 month notify**

PRICE: **\$25.00/prepaid**

ORDER FROM: **H. Geller Computer System
Dept. P. P.O. Box 350
New York, New York 10040**

REMARKS: **Allow 4 to 6 weeks delivery**

PROGRAM NAME: **T.D.Q. Customer Directory** CATEGORY: **Business Application**

DESCRIPTION: **T.D.Q. Customer Directory** consists of a pre-defined Tape Data Query file structure on cassette tape and a user's manual. The user's manual guides the user to; Load data into the Customer Directory file; update and maintain data in the file; extract information from the Customer Directory file.
ABSOLUTELY NO PROGRAMMING KNOWLEDGE IS REQUIRED

MINIMUM HARDWARE REQUIRED: **SOL TERMINAL COMPUTER with 32K RAM
plus 2 cassette recorders**

SOFTWARE REQUIRED:
SOLOS/CUTER; PTC ECBASIC

RESTRICTIONS:

Tape Data Query package required

DOCUMENTATION:
User's manual

MEDIA: **SOLOS/CUTER cassette**

DATE CURRENT VERSION WAS RELEASED: **January, 1979**

WARRANTY: **10 day exchange; 90 day repair/replace; 6 month notify**

PRICE: **\$25.00/prepaid**

ORDER FROM: **H. Geller Computer Systems
Dept. P. P.O. Box 350
New York, New York 10040**

REMARKS: **Allow 4 to 6 weeks delivery**

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PROGRAM NAME: T.D.Q. Accounts Receivable CATEGORY: Business Application

DESCRIPTION: T.D.Q. Accounts Receivable consists of a pre-defined Tape Data Query file structure on cassette tape and a user's manual. The user's manual guides the user to: load data into the Accounts Receivable file; update and maintain data in the file; extract information from the Accounts Receivable file.

ABSOLUTELY NO PROGRAMMING KNOWLEDGE IS REQUIRED

MINIMUM HARDWARE REQUIRED: SOL TERMINAL COMPUTER with 32K RAM plus 2 cassette recorders

SOFTWARE REQUIRED: SOLOS/CUTER; PTC ECBASIC

RESTRICTIONS: Tape Data Query package required

DOCUMENTATION: User's Manual

MEDIA: SOLOS/CUTER cassette
DATE CURRENT VERSION WAS RELEASED: January, 1979
WARRANTY: 10 day exchange; 90 day repair/replace; 6 month notify
PRICE: \$35.00/prepaid
ORDER FROM: H. Geller Computer Systems
Dept. P. P.O. Box 350
New York, New York 10040

REMARKS: Allow 4 to 6 weeks delivery

PROGRAM NAME: T.D.Q. Accounts Payable CATEGORY: Business Application

DESCRIPTION: T.D.Q. Accounts Payable consists of a pre-defined Tape Data Query file structure on cassette tape and a user's manual. The user's manual guides the user to: load data into the Accounts Payable file; update and maintain data in the file; extract information from the Accounts Payable file.

ABSOLUTELY NO PROGRAMMING KNOWLEDGE IS REQUIRED

MINIMUM HARDWARE REQUIRED: SOL TERMINAL COMPUTER with 32K RAM plus 2 cassette recorders

SOFTWARE REQUIRED: SOLOS/CUTER; PTC ECBASIC

RESTRICTIONS: Tape Data Query package required

DOCUMENTATION: User's manual

MEDIA: SOLOS/CUTER cassette
DATE CURRENT VERSION WAS RELEASED: January, 1979
WARRANTY: 10 day exchange; 90 day repair/replace; 6 month notify
PRICE: \$35.00/prepaid
ORDER FROM: H. Geller Computer Systems
Dept. P. P.O. Box 350
New York, New York 10040

REMARKS: Allow 4 to 6 weeks delivery

PROGRAM NAME: T.D.Q. Order Processing CATEGORY: Business Application

DESCRIPTION: T.D.Q. Order Processing consists of a pre-defined Tape Data Query file structure on cassette tape and a user's manual. The user's manual guides the user to: load data into the Order Processing file; update and maintain data in the file; extract information from the Order Processing file.

ABSOLUTELY NO PROGRAMMING KNOWLEDGE IS REQUIRED

MINIMUM HARDWARE REQUIRED: SOL TERMINAL COMPUTER with 32K RAM plus 2 cassette recorders

SOFTWARE REQUIRED: SOLOS/CUTER; PTC ECBASIC

RESTRICTIONS: Tape Data Query package required

DOCUMENTATION: User's manual

MEDIA: SOLOS/CUTER cassette
DATE CURRENT VERSION WAS RELEASED: January, 1979
WARRANTY: 10 day exchange; 90 day repair/replace; 6 month notify
PRICE: \$35.00/prepaid
ORDER FROM: H. Geller Computer System
Dept. P. P.O. Box 350
New York, New York 10040

REMARKS: Allow 4 to 6 weeks delivery

PROGRAM NAME: T.D.Q. Inventory Control CATEGORY: Business Application

DESCRIPTION: T.D.Q. Inventory Control consists of a pre-defined Tape Data Query file structure on cassette tape and a user's manual. The user's manual guides the user to: load data into the Inventory Control file; update and maintain data in the file; extract information from the Inventory Control file.

ABSOLUTELY NO PROGRAMMING KNOWLEDGE IS REQUIRED

MINIMUM HARDWARE REQUIRED: SOL TERMINAL COMPUTER with 32K RAM plus 2 cassette recorders

SOFTWARE REQUIRED: SOLOS/CUTER; PTC ECBASIC

RESTRICTIONS: Tape Data Query Package required

DOCUMENTATION: User's manual

MEDIA: SOLOS/CUTER cassette
DATE CURRENT VERSION WAS RELEASED: January, 1979
WARRANTY: 10 day exchange; 90 day repair/replace; 6 month notify
PRICE: \$35.00/prepaid
ORDER FROM: H. Geller Computer Systems
Dept. P. P.O. Box 350
New York, New York 10040

REMARKS: Allow 4 to 6 weeks delivery

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PROGRAM NAME: CMBS

CATEGORY: BUSINESS

DESCRIPTION: An interactive accounting system for small business: general journal, general ledger, payroll, payables, inventory, receivables--all in one integrated turn-key package. Receivables and payables transactions update the book inventory automatically. Payroll produces all necessary government forms too. Checkwriting, order entry, invoices, inventory status reports, purchase orders, mailing lists, income statements, balance sheets, etc. MINIMUM HARDWARE REQUIRED: North Star disk

SOFTWARE REQUIRED: North Star ver. 4.0 operating system

RESTRICTIONS: On a single density diskette, up to 500 customers, 800 vendors, 1500 inventory items, 500 employees, 125 general ledger accts. DOCUMENTATION: Files can be expanded by multiple disks. Complete and clearly written.

MEDIA: 3 diskettes (Data, Transaction, and Maintenance)

DATE CURRENT VERSION WAS RELEASED:

WARRANTY:

PRICE: \$395. Quantity discounts available.

ORDER FROM:

Computer Products of America
633-B West Katella Avenue
Orange, Ca. 92667

REMARKS:

PROGRAM NAME: OE01- Order Entry CATEGORY: Business

DESCRIPTION: Customer and Manufacturer history and sales information Commission figures, Automatically prints inquiry letters, Immediate retrieval of information for customer inquiries, CRT displays of customer orders, Prints order reports showing priority orders

MINIMUM HARDWARE REQUIRED: Printer, 32K, CRT, 2 disk drives

SOFTWARE REQUIRED: CP/M, CBASIC, and QSORT

RESTRICTIONS:

DOCUMENTATION: Complete and easily understood user's manual.

MEDIA: Single or Double Density Diskette
DATE CURRENT VERSION WAS RELEASED: 7-30-78

WARRANTY: 6 months

PRICE: Write for price information

ORDER FROM: H & H Associates, Inc.
P.O. Box 19504
Denver, Colo. 80219
(303) 355-1067

REMARKS:

PROGRAM NAME: AR01 - Accounts Receivable CATEGORY: Business

DESCRIPTION: Handles both Balance Forward and Open End accounts, Automatic and/or manual service charging, Full Audit controls and reporting, Generates Cash Receipts Journal, Trial Balance, Ageing Report, Service Charge Report, and Daily Transaction Journal. Retains High, Low balance, Date last payment, Date last activity, Statement cycle, Credit status, Salesman code, 30,60,90 day balances and numerous other information.

MINIMUM HARDWARE REQUIRED: Printer, 32K, CRT, 2 disk drives

SOFTWARE REQUIRED: CP/M, CBASIC, QSORT

RESTRICTIONS:

DOCUMENTATION: Complete and easily understood user's manual.

MEDIA: Single or Double Density Diskettes

DATE CURRENT VERSION WAS RELEASED: 7-78

WARRANTY: 6 months

PRICE: Write for price information

ORDER FROM: H & H Associates, Inc.
P.O. Box 19504
Denver, Colorado 80219
(303) 355-1067

REMARKS:

PROGRAM NAME: IC01 CATEGORY: Business

DESCRIPTION: Inventory Control offers automatic ordering, full audit trails, optional vendor and/or manufacturer information, number on hand, number on back order, number on order, order point, order quantity, sold MTD, sold YTD, last sale, last order, 5 prices, 3 costs, and unit of measure.

MINIMUM HARDWARE REQUIRED: Printer, 32K, CRT, 2 disk drives.

SOFTWARE REQUIRED: CP/M, CBASIC, QSORT

RESTRICTIONS:

DOCUMENTATION: Complete, easily understood user's manual.

MEDIA: Single or Double density Diskette

DATE CURRENT VERSION WAS RELEASED: 7-78

WARRANTY: 6 months

PRICE: Write for price information.

ORDER FROM: H & H Associates, Inc.
P.O. Box 19504
Denver, Colorado 80219
(303) 355-1067

REMARKS:

SCIENTIFIC

PROGRAM NAME: CONVERSION CATEGORY: SCIENTIFIC

DESCRIPTION: This comprehensive unit conversion program handles unit conversions for weight, volume, distance, speed, power, angular units, temperature, and others. The operator keys in quantity and units. The program then outputs the converted quantity in other measurement systems in a list.

MINIMUM HARDWARE REQUIRED: Sol-20 with 32k.
SOFTWARE REQUIRED: Extended Cassette BASIC.
DOCUMENTATION: Instruction manual included.
MEDIA: 1200 Baud CUTS cassette.
DATE CURRENT VERSION WAS RELEASED: January 1, 1979
WARRANTY: One year limited warranty.
Contact COMPUTER PORT for warranty replacement.

PRICE: \$19.50 Order number EC-016.
Add 3% for freight and handling.
Add 5% sales tax for Texas residents.
Visa and MasterCharge: send card #, expiration date.

ORDER FROM: COMPUTER PORT
926 N. Collins
Arlington, TX 76011
(817)469-1502

PROGRAM NAME: Statistics Pack I CATEGORY: Statistics

DESCRIPTION: 4 programs:
Mean & Deviation
Distribution
Linear Correlation & Regression
Contingency Table Analysis

MINIMUM HARDWARE REQUIRED: SOL TERMINAL COMPUTER with 32K RAM
plus 1 cassette recorder

SOFTWARE REQUIRED:
SOLOS/CUTER; PTC ECBASIC

RESTRICTIONS:

DOCUMENTATION: Operation's Reference Card

MEDIA: SOLOS/CUTER cassette
DATE CURRENT VERSION WAS RELEASED: January, 1979
WARRANTY: 10 day exchange; 90 day repair/replace; 6 month notify
PRICE: \$19.00/prepaid
ORDER FROM: H. Geller Computer Systems
Dept. P. P.O. Box 350
New York, New York 10040

REMARKS: Allow 4 to 6 weeks delivery

PROGRAM NAME: BASIC 3D Graphics CATEGORY: Engineering, Education,
Science

DESCRIPTION: Accurate 3D to 2D graphic transformations. User creates data bases in the standard X,Y,Z coordinate system. Program asks for field of view (telephoto or wide angle), objects location, and viewing angle (pitch, bank, and heading). Output is perspective drawing line endpoints (X,Y coordinates) for output to graphic display devices.

MINIMUM HARDWARE REQUIRED: 16K RAM plus RAM for BASIC

SOFTWARE REQUIRED: Minimal subset BASIC (no trig functions)

RESTRICTIONS: not fast enough for animation.

DOCUMENTATION: 60 page BASIC 3D Graphics manual with listing.

MEDIA: listing only
DATE CURRENT VERSION WAS RELEASED: August 1977
WARRANTY: none needed - proven errorless
PRICE: \$22

ORDER FROM: Sublogic
Box V
Savoy, IL 61874
(217) 367-0299

REMARKS:

PROGRAM NAME: 8080 3D Graphics CATEGORY: Engineering, Education,
Science

DESCRIPTION: Fast 3D to 2D graphic transformations. User creates data bases in the standard X,Y,Z coordinate system. User has dynamic control over field of view (telephoto or wide angle), viewer's location, and viewing angle (pitch, bank, and heading). Output is perspective drawing line endpoints (X,Y coordinates) for output to graphic display devices. 300-500 lines per second is typical of 4MHz systems.

MINIMUM HARDWARE REQUIRED: 8080, 8085, or Z80 processor,
6K memory, graphic display device.

SOFTWARE REQUIRED: graphic driver to draw lines between two points.

RESTRICTIONS: input coordinate values $\pm 32,000$. output automatically scaled to display device.

DOCUMENTATION: 80 page manual, relocatable loader, object listing

MEDIA: paper tape, tarbell cassette, non-relocatable North Star Disk
DATE CURRENT VERSION WAS RELEASED: April 1978
WARRANTY: 2 year notify
PRICE: \$30 (\$40 with disk option)

ORDER FROM: Sublogic
Box V
Savoy, IL 61874
(217) 367-0299

REMARKS: specify media

TEXT EDITING AND
WORD PROCESSING



PROGRAM NAME: EDIT-80 CATEGORY: Text editor

DESCRIPTION: Text editor for 8080/Z80 microcomputers. Random access, line oriented editor, supports a full range of editing capabilities, including global find and substitute, line renumbering, multiple-page files, and a full set of Alter Mode Subcommands.

MINIMUM HARDWARE REQUIRED: 32K ram, disk drive

SOFTWARE REQUIRED: CP/M or TRSDOS operating system

RESTRICTIONS:

DOCUMENTATION: 50-page user's guide

MEDIA: floppy disk

DATE CURRENT VERSION WAS RELEASED: January, 1979

WARRANTY:

PRICE: \$120

ORDER FROM: Microsoft
10800 NE Eighth, Suite 819
Bellevue, WA 98004

REMARKS:

PROGRAM NAME: WORD-MASTER CATEGORY: VIDEO TEXT-EDITOR

DESCRIPTION: Visual manipulation of CP/M compatible files; Features: word tab, scroll line/page-bidirectional; fully disk buffered; search/replace; insert; delete. HELP key for operator.

MINIMUM HARDWARE REQUIRED: *CP/M operating system and device with addressable cursor/screen clear/backspace. 32k.

SOFTWARE REQUIRED: CP/M (Digital Research) use with TEX-WRITER.

RESTRICTIONS: None

DOCUMENTATION: Use Guide and Programmer Manual.

MEDIA: 8" IBM; Micropolis II and NorthStar 5"

DATE CURRENT VERSION WAS RELEASED: 4/79

WARRANTY: As advertised or refund.

PRICE: \$150.00

ORDER FROM: MicroPro International Corporation or Dealers
1299 4th Street
San Rafael, Ca 94901
415-457-8990

REMARKS: Will ship within 48 hours of order. Must have prior "End-User Agreement" signed.

PROGRAM NAME: WORD-STAR CATEGORY: WORD PROCESSOR

DESCRIPTION: Totally integrated on screen text composition capabilities on par with \$15,000-\$20,000 dedicated word processors-- screen menus for immediate productivity by untrained operators.

MINIMUM HARDWARE REQUIRED: 40k-terminals or video board @ cursor addressing.

SOFTWARE REQUIRED: CP/M operating system.

RESTRICTIONS: None

DOCUMENTATION:

MEDIA: 8" or 5"

DATE CURRENT VERSION WAS RELEASED: 5/79

WARRANTY: As advertised

PRICE: \$495.00

ORDER FROM: MicroPro International Corporation or Dealers
1299 4th Street
San Rafael, Ca 94901
415-457-8990

REMARKS: The \$495.00 that makes a \$4,000 micro behave like a \$15,000 dedicated word processor.

PROGRAM NAME: TEX-WRITER CATEGORY: TEXT FORMATTER

DESCRIPTION: Right and left margins and all other standard formatting features. PLUS ability to substitute variable (name,address, etc) from disk files or keyboard, also chains print modules.

MINIMUM HARDWARE REQUIRED: 32k CP/M operating system.

SOFTWARE REQUIRED: Use with WORD-MASTER

RESTRICTIONS: None

DOCUMENTATION: Manual

MEDIA: 8" or 5" IBM-Micropolis, NorthStar

DATE CURRENT VERSION WAS RELEASED: 4/79

WARRANTY: As advertised.

PRICE: \$75.00

ORDER FROM: MicroPro International Corporation or Dealers
1299 4th Street
San Rafael, Ca 94901
415-457-8990

REMARKS: Soon to be added: N/A file creation and printing module.

PROGRAM NAME: THE ELECTRIC PENCIL **CATEGORY:** WORD PROCESSING SYSTEM
II

DESCRIPTION: The Electric Pencil II is a highly sophisticated word processor that adds 20 new features to the original Electric Pencil. This version accesses four disk drives, dynamic print formatting, talking screen, stops at the end of page, nine speeds of bidirectional scrolling, video page at a time scrolling, total left margin control, print value scoreboard, plus centering, underlining and boldface. There are even more great new features to THE ELECTRIC PENCIL II that make it one of the most popular application software packages on the market today.

MINIMUM HARDWARE REQUIRED: SOL Computer system, video monitor, Standard or Diablo Printer, 16K memory, and some CP/M Disk System.

SOFTWARE REQUIRED: CP/M Disk Operating System.

RESTRICTIONS: Must use a video interface board and monitor.

DOCUMENTATION: An excellent 38 page user's manual that is simple to read and written with the turnkey user in mind.

MEDIA: 8" softsectored diskette, NStar minidiskette, or Micropolis minidiskette

DATE CURRENT VERSION WAS RELEASED: March 1978

WARRANTY: Software support

PRICE: Standard Printer \$225.00 Diablo Hyterm Printer \$275.00

ORDER FROM: MICHAEL SHRAYER SOFTWARE, INC.

1253 VISTA SUPERBA DRIVE
GLENDALE, CA 91205

REMARKS: All orders are shipped from stock. Orders are prepaid or COD. Also available at local computer stores across the country. All Pencils can be upgraded. Here's how: send in the original media, \$15 upgrade charge plus the price difference between the old and new versions and include \$2 for shipping and handling. You will receive new media and new documentation.

PROGRAM NAME: THE ELECTRIC PENCIL **CATEGORY:** WORD PROCESSING SYSTEM
II

DESCRIPTION: This is the HELIOS version of The Electric Pencil II and has all the great features as described above. In addition, this version is completely compatible with PTDOS.

MINIMUM HARDWARE REQUIRED: SOL Computer system, video monitor, Standard or Diablo Hyterm Printer, Helios Disk System, 24K memory minimum.
SOFTWARE REQUIRED: PT DOS

RESTRICTIONS: Must have video interface and monitor; the program will not run on a serial CRT such as a Soroq or Hazeltine.

DOCUMENTATION: A 40 page user's manual that is easy to read and simple to understand.

MEDIA: An 8" diskette for use on HELIOS SYSTEM

DATE CURRENT VERSION WAS RELEASED: JUNE 1978

WARRANTY: Software support

PRICE: Standard Printer \$250.00 Diablo Hyterm Printer \$300.00

ORDER FROM: MICHAEL SHRAYER SOFTWARE, INC.

1253 VISTA SUPERBA DRIVE
GLENDALE, CA 91205

REMARKS: All orders are shipped from stock. Orders are prepaid or COD. This program is also available from computer dealers across the country. Please note the upgrade policy as mentioned above; you may always upgrade to a later version of the Pencil or change versions when your equipment has been upgraded.

PROGRAM NAME: THE ELECTRIC PENCIL **CATEGORY:** WORD PROCESSING SYSTEM

DESCRIPTION: This is a character-oriented word processor that is extremely flexible and has had wide market acceptance for two years. It does global search and replace, pagination, right justifies, bidirectional scrolling; text has wraparound feature on the screen, left hand margin control, titles pages, underlines and much more. It is sophisticated yet simple to use. The system is very fast and all editing work is seen instantly on the video display. Print formats are very broad as the user decides on line, page and **MINIMUM HARDWARE REQUIRED:** character spacing.

SOL-20, Video monitor, Standard or Diablo Printer, Cassette Recorder or NorthStar Disk. Minimum 8K (cass.) or 12K memory.

SOFTWARE REQUIRED:

SOLOS/CUTER or NorthStar DOS

RESTRICTIONS: Will only work with video interface and monitor.

DOCUMENTATION: A 35 page easy-to-read manual written with the turnkey user in mind.

MEDIA: CUTS CASSETTE or North Star Diskette

DATE CURRENT VERSION WAS RELEASED: FEB. 1977

WARRANTY: Software support

PRICE: Cassette Prices; Stand. Ptr. \$100/Diablo \$150 NSDisk add \$25.00

ORDER FROM: MICHAEL SHRAYER SOFTWARE, INC.

1253 VISTA SUPERBA DRIVE
GLENDALE, CA 91205

REMARKS: All shipments are made from stock. Orders must be prepaid or COD. The Electric Pencil is also available at local computer dealers across the country and in Canada.

HOME APPLICATIONS

PROGRAM NAME: General Pack 1 **CATEGORY:** Home

DESCRIPTION: 3 programs:
Checkbook Balancer
Tic Tac Toe
Complete Metric Conversion

MINIMUM HARDWARE REQUIRED: SOL TERMINAL COMPUTER with 32K RAM plus 1 cassette recorder

SOFTWARE REQUIRED:
SOLOS/CUTER; PTC ECBASIC

RESTRICTIONS:

DOCUMENTATION: Operation's reference card

MEDIA: SOLOS/CUTER cassette

DATE CURRENT VERSION WAS RELEASED: January, 1979

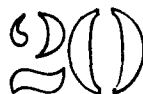
WARRANTY: 10 day exchange; 90 day repair/replace; 6 month notify

PRICE: \$11.00/prepaid

ORDER FROM: H. Geller Computer Systems
Dept. P. P.O. Box 350
New York, New York 10040

REMARKS: Allow 4 to 6 weeks delivery

RECREATION



 PROGRAM NAME: Game Pack 1 CATEGORY: Recreation

 DESCRIPTION: 5 programs:
 Basketball
 Object Removal
 Bowling
 Darts
 Gopher

 MINIMUM HARDWARE REQUIRED: SOL TERMINAL COMPUTER with 32K RAM
 plus 1 cassette recorder

 SOFTWARE REQUIRED:
 SOLOS/CUTER; PTC ECBASIC

RESTRICTIONS:

DOCUMENTATION: Operation's reference card

 MEDIA: SOLOS/CUTER cassette
 DATE CURRENT VERSION WAS RELEASED: January, 1979
 WARRANTY: 10 day exchange; 90 day repair/replace; 6 month notify
 PRICE: \$20.00/prepaid
 ORDER FROM: H. Geller Computer Systems
 Dept. P. P.O. Box 350
 New York, New York 10040

REMARKS: Allow 4 to 6 weeks delivery

 PROGRAM NAME: General Pack 2 CATEGORY: Recreation

 DESCRIPTION: 4 programs:
 Space Patrol
 Biorhythm
 Battlestar
 One-Armed Bandit

 MINIMUM HARDWARE REQUIRED: SOL TERMINAL COMPUTER with 32K RAM
 plus 1 cassette recorder

 SOFTWARE REQUIRED:
 SOLOS/CUTER; PTC ECBASIC

RESTRICTIONS:

DOCUMENTATION: Operation's reference card

 MEDIA: SOLOS/CUTER cassette
 DATE CURRENT VERSION WAS RELEASED: January, 1979
 WARRANTY: 10 day exchange; 90 day repair/replace; 6 month notify
 PRICE: \$19.00/prepaid
 ORDER FROM: H. Geller Computer Systems
 Dept. P. P.O. Box 350
 New York, New York 10040

REMARKS: Allow 4 to 6 weeks delivery

 PROGRAM NAME: MICROCHESS CATEGORY: GAME

 DESCRIPTION: An intelligent chess playing program with widespread
 popularity. Will play at any one of three levels of skill. Will
 display chess board on ASCII printer or CRT. Will play against
 itself. Will allow you to setup positions before play. Can be
 interfaced to other graphic displays.

MINIMUM HARDWARE REQUIRED: 4K RAM

SOFTWARE REQUIRED: SOLOS/CUTER

 RESTRICTIONS: Supplied in SOLOS version; requires patches (supplied
 in documentation) for CUTER or CONSOL.

 DOCUMENTATION: User's manual gives complete details for interfacing
 to any user's system.

 MEDIA: SOL/CUTS cassette, paper tape, Poly 88 tape, KC tape, T'bell.
 DATE CURRENT VERSION WAS RELEASED:

WARRANTY:

PRICE: Manual and hex dump \$15; Cassettes \$5; paper tape \$3.

 ORDER FROM: local computer store, or
 MICRO-WARE LIMITED
 27 Firstbrooke Rd.,
 Toronto, Ontario, CANADA M4E 2L2

REMARKS:

Has been available for over 2 years.

 PROGRAM NAME: FASTGAMMON CATEGORY: GAME

 DESCRIPTION: Plays the board game Backgammon: you against computer.
 Displays the board in realistic graphic form on video screen.
 Allows you to replay a game with the same sequence of dice
 rolls so that you can try different moves to refine your skill.
 Uses a fairly simple strategy, so you can beat it if you are
 careful and lucky, but is competitive even against good players.

MINIMUM HARDWARE REQUIRED: Sol with memory from 2A00 thru 3FFF.

SOFTWARE REQUIRED:

RESTRICTIONS:

 DOCUMENTATION: Directions for loading program. Eight page pamphlet
 giving the rules of Backgammon and instructions for FASTGAMMON.

MEDIA: Sol/CUTS cassette, Northstar disk. Also avail. for TRS-80, etc.

DATE CURRENT VERSION WAS RELEASED: Version S1--Feb. 1979

WARRANTY:

 PRICE: Cassette \$20, diskette \$25.
 ORDER FROM: Quality Software
 10051 Odessa Avenue
 Sepulveda, CA 91343

REMARKS: See review in Proteus News, Vol. 2, No. 2.

PROGRAM NAME: AMAZN

CATEGORY: GAME

DESCRIPTION: Find your way through the maze! Try for a new record time. Compete against an opponent. This maze game generates a new maze every time from a special random maze generator. Sound effects are provided through the Software Technology Music System board or through an AM radio. You are penalized for taking time to study the maze or for colliding with walls. The cursor control keys are used to move around in the maze. When the maze is solved, the program draws the correct solution path on the screen before generating the next maze.

MINIMUM HARDWARE REQUIRED: Sol-20 with 8K of RAM.
SOFTWARE REQUIRED: none, program is written in machine code.
DOCUMENTATION: Instruction manual included.
MEDIA: 1200 Baud CUTS cassette
DATE CURRENT VERSION WAS RELEASED: January 1, 1979
WARRANTY: One year limited warranty.
Contact COMPUTER PORT for warranty replacement.

PRICE: \$19.50 Order number EC-018.
Add 3% for freight and handling.
Add 5% sales tax for Texas residents.
Visa and MasterCard: send card #, expiration date.

ORDER FROM: COMPUTER PORT
926 N. Collins
Arlington, TX 76011
(817)469-1502

PROGRAM NAME: SINK

CATEGORY: GAME

DESCRIPTION: Three dimensional war game of your naval fleet against the computer's fleet. Your fleet consists of destroyers in your home port and submarines hidden in the enemy port. The computer has destroyers in his port and submarines in your home port. The destroyers move and fire depth charges at the opposing hidden submarines. But watch out, the submarines can fire back with torpedoes. The size of the playing areas can be changed to fit available memory or to alter game complexity.

MINIMUM HARDWARE REQUIRED: Sol-20 with 32k allows games with port sizes up to size 5. 48K is recommended for largest sizes.
SOFTWARE REQUIRED: Extended Cassette BASIC.
DOCUMENTATION: Instruction manual included.
MEDIA: 1200 Baud CUTS cassette
DATE CURRENT VERSION WAS RELEASED: January 1, 1979
WARRANTY: One year limited warranty.
Contact COMPUTER PORT for warranty replacement.

PRICE: \$25.00 Order number EC-017.
Add 3% for freight and handling.
Add 5% sales tax for Texas residents.
Visa and MasterCard: send card #, expiration date.

ORDER FROM: COMPUTER PORT
926 N. Collins
Arlington, TX 76011
(817)469-1502

PROGRAM NAME: DROIDS

CATEGORY: GAME

DESCRIPTION: You play against the computer in this fast-moving action game. Try to escape from the Droids by hiding behind electric fences. The game features a static practice mode for skill development and real time attack mode with selectable difficulty factors.

MINIMUM HARDWARE REQUIRED: Sol-20/SOLOS with 8K of RAM.
SOFTWARE REQUIRED: none, program is written in machine language.
RESTRICTIONS:
DOCUMENTATION: Instruction manual included.
MEDIA: 1200 Baud CUTS cassette.
DATE CURRENT VERSION WAS RELEASED: October 1, 1978.
WARRANTY: One year limited warranty.
Contact COMPUTER PORT for warranty replacement.

PRICE: \$19.50 Order number EC-012.
Add 3% for freight and handling.
Add 5% sales tax for Texas residents.
Visa and MasterCard: send card #, expiration date.

ORDER FROM: COMPUTER PORT
926 N. Collins
Arlington, TX 76011
(817)469-1502

PROGRAM NAME: BLOCKADE

CATEGORY: GAME

DESCRIPTION: Two players play this action video game on the same keyboard. One uses the left portion of the keyboard while the other uses the right. Nine different playing speeds can be selected. Each player controls a man which builds a wall on the screen as he moves. The object is to trap the other player and make him move into a wall. Sound effects are available with an AM radio or the Software Technology Music System.

MINIMUM HARDWARE REQUIRED: Sol-20/SOLOS with 8K of RAM.
SOFTWARE REQUIRED: None, program is written in machine code.
RESTRICTIONS:
DOCUMENTATION: Instruction manual included.
MEDIA: 1200 baud CUTS cassette.
DATE CURRENT VERSION WAS RELEASED: May 1, 1978
WARRANTY: One year limited warranty.
Contact COMPUTER PORT for warranty replacement.

PRICE: BLOCKADE, Order # EC-003 \$14.00
Add 3% for freight and handling.
Add 5% sales tax for Texas residents.
Visa and MasterCard: send card #, expiration date.

ORDER FROM: COMPUTER PORT
926 N. Collins
Arlington, TX 76011
(817)469-1502

6D6D
~ ~

PROGRAM NAME: SOFTPAC #1

CATEGORY: GAMES

DESCRIPTION: Four games written in BASIC/5. These are WAR, CRAPS, BLACKJACK, and STAR. STAR is a Startrek game that makes you a starship commander fighting the Klingons. BLKJK is Las Vegas style blackjack. It is a junior version of the bigger Smartmouthed Blackjack which is offered as a separate package. CRAPS allows you to play Las Vegas craps and keeps track of your winnings. WAR is a nuclear battle situation where you try to launch ICBM missiles on target before the enemy gets you. The computer will keep you advised of damages sustained while providing tracking information of the enemy launching pad sites.

MINIMUM HARDWARE REQUIRED: Sol-20 with 16K RAM.
SOFTWARE REQUIRED: BASIC/5.

RESTRICTIONS:

DOCUMENTATION: Instruction manual included.

MEDIA: 1200 baud CUTS cassette.

DATE CURRENT VERSION WAS RELEASED: May 1, 1978.

WARRANTY: One year limited warranty.

Contact COMPUTER PORT for warranty replacement.

PRICE: SOFTPAC #1, Order # EC-002 \$18.00

Add 3% for freight and handling.

Add 5% sales tax for Texas residents.

Visa and MasterCard: send card #, expiration date.

ORDER FROM: COMPUTER PORT
926 N. Collins
Arlington, TX 76011
(817)469-1502

PROGRAM NAME: Mnoply

CATEGORY: game

DESCRIPTION: 2 user version of popular board game Complete, except: 1) only 2 players, 2) no Hotels (has houses), 3) buys your way out of jail automatically Otherwise same as original board game. Program uses disk files for move control, etc. Source listing not supplied with diskette. Available as option for \$3.00 additional. Listing available separately for \$3.00 for those who like to type.

MINIMUM HARDWARE REQUIRED: 32K ram 2000>,N*/MDS-sngl density, SOL

SOFTWARE REQUIRED: Rel 4 BASIC, DOS, SOLOS

RESTRICTIONS:

DOCUMENTATION: 15 page manual/optional 10 page commented listing

MEDIA: North Star Minidisk

DATE CURRENT VERSION WAS RELEASED: 11-78

WARRANTY: damaged media replaced first 2 wks if retrnd w/orig pk mtl

PRICE: \$25.00/diskette; \$10.00/source listing; \$28/both; \$2/shipping

ORDER FROM: Microcomputer Resources, Inc
3000 Medical Park Drive, Suite 108
Tampa, Fl 33612
(813) 977-5940

REMARKS: Program handles well, written by a local Sol - N* owner. Comes with manual. Program uses large amounts of memory; program not commented due to size. Supplied in 'squished' form to conserve memory. Commented listing \$10.00 sep, \$3.00 with disk requires 32K to run without comments/36-40K with.

PROGRAM NAME: SAM76 Adventure CATEGORY: Game

DESCRIPTION: The text data base and the interrelationship tables for the game of Adventure originated by Willie Crowther. Data base is upper/lower case. Preliminary SAM76 language control script is also provided as a guide and learning tool to implementing the game fully using this language.

MINIMUM HARDWARE REQUIRED: 32K CPM system.

SOFTWARE REQUIRED: SAM76 language interpreter with CPM interface.

RESTRICTION: Credit to original authors.

DOCUMENTATION: SAM76 Language manual.

MEDIA: CPM Diskettes.

DATE CURRENT VERSION RELEASED: October 1978.

WARRANTY: You will probably get lost.

PRICE: \$15.00 for diskette.

ORDER FROM: SAM76 Inc., PO Box 257, RR1, Pennington, NJ, 08534, USA.

REMARKS: This is NOT a truly functional game - so do not expect to just run it

PROGRAM NAME: GAMEDOS

CATEGORY: Recreational

DESCRIPTION:

Chess program and video games including target, pattern, life and asteroids callable under Micropolis MDOOS

MINIMUM HARDWARE REQUIRED: 16K including system, CRT

SOFTWARE REQUIRED: Micropolis MDOOS (PD5) Version 3.0

RESTRICTIONS:

DOCUMENTATION: Complete, easily understandable instruction guide

MEDIA: Micropolis 5" Minifloppy double density

DATE CURRENT VERSION WAS RELEASED: July 1978

WARRANTY: 90 days

PRICE: \$35.-, add \$2.- for postage. Orders must be prepaid

ORDER FROM:

KALMAN BLONDER
KEREN YALDENU CENTER, Inc.
P.O.Box 819 Jerusalem ISRAEL

REMARKS:

PROGRAM NAME: SMARTMOUTHED BLACKJACK CATEGORY: RECREATION

DESCRIPTION: LAS VEGAS blackjack with double down, insurance, house limits, dealer wise-cracks, etc. VDM shows picture of card and options. Player can ask for a reshuffle on any hand. Complete rules are given at the first of the game if selected.

MINIMUM HARDWARE REQUIRED: Sol-20, 32K RAM
SOFTWARE REQUIRED: PT ECBASIC/SOLOS
RESTRICTIONS: Operator must have sense of humor.
DOCUMENTATION: Operating instructions are included.
MEDIA: 1200 baud CUTS cassette.
DATE CURRENT VERSION WAS RELEASED: May 1, 1978
WARRANTY: One year limited warranty.
Contact COMPUTER PORT for warranty replacement information.
PRICE: \$19.50. Order number EC-008.
Add 3% if ordering by mail for freight and handling.
Add 5% sales tax for Texas residents.
Visa and MasterCard acceptable. Send number, exp. date.

ORDER FROM: COMPUTER PORT
926 N. Collins
Arlington, TX 76011
(817)469-1502

REMARKS: This is a very extensive program with about 600 lines of BASIC statements. It is ideal for demonstrating the Sol capabilities. Watch out for the surprise endings!

PROGRAM NAME: BIORHYTHM CATEGORY: RECREATION

DESCRIPTION: Gives biorhythm plot of physical, emotional, and intellectual potential for an individual. Simple listings of critical days is also available. Provisions are made to direct listings and plots to any pseudo port. Input name, date and hour of birth, date and hour to start listing, and number of days to compute. Available in two versions, BASIC/5 and Extended Cassette BASIC.

MINIMUM HARDWARE REQUIRED: Sol-20/SOLOS, 16K ram for BASIC/5 version, 24K RAM for Extended Cassette BASIC version.
SOFTWARE REQUIRED: BASIC/5 or ECBASIC.
RESTRICTIONS:
DOCUMENTATION: Instruction manual included.
MEDIA: 1200 baud CUTS cassette.
DATE CURRENT VERSION WAS RELEASED; May 1, 1978.
WARRANTY: One year limited warranty.
Contact COMPUTER PORT for warranty replacement.

PRICE: BIORHYTHM (BASIC/5) - Order # EC-009 \$19.50
BIORHYTHM (ECBASIC) - Order # EC-010 \$19.50
Add 3% for freight and handling.
Add 5% sales tax for Texas residents.
Visa and MasterCard: send card #, expiration date.

ORDER FROM: COMPUTER PORT
926 N. Collins
Arlington, TX 76011
(817)469-1502

PROGRAM NAME: CALENDAR & TIME CATEGORY: RECREATION

DESCRIPTION: Gregorian calendar and digital clock programs on the same cassette. The calendar is designed for video, but hard copy is easily obtained with little modification. Output any month or a whole year. The digital clock program displays the time on the screen in hours, minutes, and seconds.

MINIMUM HARDWARE REQUIRED: Sol-20 with 16K of RAM.
SOFTWARE REQUIRED: BASIC/5
RESTRICTIONS:
DOCUMENTATION: Instruction manual included.
MEDIA: 1200 Baud CUTS cassette.
DATE CURRENT VERSION WAS RELEASED: May 1, 1978
WARRANTY: One year limited warranty.
Contact COMPUTER PORT for warranty replacement.

PRICE: \$10.00 Order number EC-005.
Add 3% for freight and handling.
Add 5% sales tax for Texas residents.
Visa and MasterCard: send card #, expiration date.

ORDER FROM: COMPUTER PORT
926 N. Collins
Arlington, TX 76011
(817)469-1502

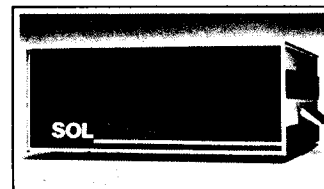
Just plug The **SOLUTION™** Expander System into your **SOL™** computer. And you've got a 23-slot **SOL**, over a 400% increase in your **SOL's** capacity.

The **SOLUTION** is a handsome, free-standing unit with a big, wonderfully noise-free bussboard equipped with 19 deluxe S-100 edge connectors. The **SOLUTION** has its own independent 26-amp Constant Voltage power supply to support all power requirements of your added boards. The **SOLUTION** is connected to your **SOL** via 6 feet of flat cable and the **SOLUTION** Interface Board, which includes on-board circuitry to properly interface your mainframe and expander, special circuitry to improve **SOL** signal quality, and sensors to turn The **SOLUTION** unit on and off automatically.

The **SOLUTION** lets you continue to grow with your **SOL**, without trading up to high-density memories or other expensive space-saving measures. Later, you can expand The **SOLUTION** into a full-fledged mainframe with just the addition of a CPU board (the components are identical to our famous **EQUIBOX™** mainframe component system and **EQUINOX 100™** computer).

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The introductory price of The **SOLUTION** Expander System is only **\$995** (cash or credit card) until June 30, 1979. Thereafter, The **SOLUTION** will list for \$1,295.



Send your check or money order today to Parasitic Engineering, P.O. Box 6314, Albany, CA 94706. Or call BAC/Visa and MC orders to (415) 547-6612, 10 AM to 4:30 PM Pacific Time.

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T A B L E O F C O N T E N T S

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C L A S S I F I E D A D S

EQUIPMENT FOR SALE: We are liquidating our computer portrait company. Malibu line printers (\$1195 new), Integral Data printers (\$885.55 new) are typical examples. Limited quantities. Write for full price list. Haggard and Kristen, Inc., 4535 South Padre Island Drive Suite 18, Corpus Christi, Texas 78411, (512) 855-3857.

CLUB DISCOUNTS: Cromemco 20%, North Star 16%. Similar discounts on other equipment. SARA TECH ELECTRONICS, P.O. Box 692, Venice, Florida 33595, (813) 485-3559.

WANTED: Source code on CUTS format cassette tape, to save my poor, tired typing fingers (both of them). Need Palo Alto Tiny Basic, from Dr. Dobbs Volume 1, #5. Also, Video Chase, from Dr. Dobbs, Volume II, #5. Will return your tape with some of my software to trade, or pay reasonable amount. I plan to upgrade PATB with Sol/CUTER features, and release to the Society. I can use either block access memory image in ALS-8 format, or byte access text format. Thanks. Lewis Moseley, Jr., 2576 Glendale Ct. NE, Conyers Ga. 30208.

INFORMATION WANTED: Richard Hodgson, 25 Downsview Cres., Ottawa, Ontario, CANADA, K2G 0A4. I am writing to see if you are aware of any descriptions of the internal operating structure of North Star DOS. In particular I am interested in interfacing assembler routines with DOS in order to transfer files to and from disk. I have dis-assembled DOS, but have not had time to examine the internal workings in any detail. If this information is available, I would be interested in obtaining a copy of it.

FOR SALE: 1 Rev E SOL-PC with SOLOS--90% complete, all parts and documentation--\$300; 1 5V. 10A Commercial regulated P.S. \$55; 1 ASCII keyboard with 12 key pad \$75; 1 8" convac monitor CBN8 \$75. Millard Edgerton, 49 Showers Dr. #458, Mountain View, CA. 94044, (415) 948-3818.

P R O T E U S / N E W S

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Instructions to contributors: Letters and articles may be submitted in camera-ready form or on Sol/Cuts cassettes or Helios (PTDOS) diskettes. Camera-ready copy should be single-spaced, in a single column of 6 1/2 inch width, and with clean, dark type. Corrections can be made invisibly with opaque correction fluid ("liquid paper"). Please use a new ribbon. Machine-readable articles should be compatible with Solos, Cuter, PTDOS input routines. Media will be returned only if requested.

PROTEUS
 1690 WOODSIDE ROAD, SUITE 219
 REDWOOD CITY, CALIFORNIA 94061
 U.S.A.

<p>BULK RATE U. S. POSTAGE PAID Permit No. 140 Redwood City, Calif.</p>

James D. McElroy
 2826 Crest Ave. N.
 Allentown, PA 18104

PROTEUS / NEWS

AN INDEPENDENT NEWSLETTER FOR OWNERS AND USERS OF PROCESSOR TECHNOLOGY CORPORATION COMPUTERS

FORMERLY SOLUS NEWS

VOLUME 2, NUMBER 6

NOV, DEC 1979

PUBLISHED BIMONTHLY BY PROTEUS, 1690 WOODSIDE ROAD, SUITE 219, REDWOOD CITY, CA 94061, USA SINGLE ISSUE \$3 (US)

PROTEUS MAKES SOME CHANGES

Since Processor Technology has gone out of business, Proteus has become much more than a hobbyist club. To ensure that all of our tasks are performed well, we have split up the responsibilities.

Lewis Moseley, Jr., a name familiar to regular readers of Proteus News, is our new librarian for cassette software. He is putting finishing touches on several new cassettes for distribution. Lewis has a record of all those members who still have credits due to them for programs previously donated. Orders for all library cassettes should be sent directly to

Proteus Cassette Software Library
Lewis Moseley, Jr.
2576 Glendale Court NE
Conyers, GA 30268

Also effective immediately, Tony Severa is handling the Helios disk library. He has edited a new diskette H4, which is listed in this issue. Orders for H4 and future diskettes should be sent direct to Tony, although orders for H1 through H3 will still be handled through the Proteus address through the end of 1979. In 1980, all orders for Helios library diskettes, and program submissions for inclusion into the library should be sent to Tony. Tony also has a NorthStar disk system, so he plans to create a library on that medium, too. Read his article elsewhere in this issue. Send Helios library orders and program donations to

Proteus Helios Library
Tony Severa
131 Highland Avenue
Vacaville, CA 95688

And here's a big announcement. Proteus News is to have a new editor. Stan Sokolow, who has been the editor, publisher, and production staff of the newsletter since the founding of the users' group in 1977, has decided to turn over the editorship to someone else. He will remain the Executive Director of Proteus and publisher of the newsletter, and he will continue to work on other projects of interest to Proteus.

The new editor will be Tony Severa, who has ample experience in microcomputing, users' groups, and newsletter editing. Mail for the newsletter should still be directed to the Proteus address, as always. Proteus will continue to handle the subscriptions and business aspects of the newsletter. Materials will be forwarded to the appropriate department. Excepting the diskette and cassette library orders, all correspondence should be sent to

Proteus
1690 Woodside Road, Suite 219
Redwood City, CA 94061.

PROTEUS DISTRIBUTES COMMERCIAL SOFTWARE FOR HELIOS

In the last few months before Processor Technology sank into oblivion, they began distributing a superb set of business software for their Sol+Helios systems. For a while, this software was in limbo, but now Proteus has arranged to import the software from the Canaorian firm that produced it. We have added these packages to the Proteus Catalog under the "Proprietary Software" section. Here's a brief description of what's available for Helios systems. We've been told that similar software will be available for NorthStar and Cromemco systems, and probably general CP/M systems.

WordWizard is a simple-to-operate, but very powerful, text editor and word processing system. We reviewed the original release of it in Proteus News, volume 2, number 1, and compared it with Electric Pencil II in volume 2, number 3. A number of improvements have been made since those reviews.

The current release has added the ability to center automatically, the ability to continue typing during disk accesses, and a screen-print activity which lets you preview the document exactly as it will appear on paper (with the exception of proportional spacing and underlining). Screen-print lets you "pan" the video window to the right and left to view documents up to 127 columns wide, and scroll through the simulated printing a line or screen at a time. More printers are supported (DECwriter and CDC). The redisplay of the copyright message has been eliminated.

I use WordWizard almost every day and find it to be a pleasure. It is the kind of software that is so well done that you won't hesitate to let anyone use it regardless of their expertise in computers (or lack of it). In a few minutes of instruction, anyone will be able to create, save, and print documents flawlessly. Yet it has the sophistication to allow features found on the more expensive dedicated word processors. I have also used WordWizard to let me edit the source file of the SLAC Pascal compiler, a program which is about 70 pages long. If you have a Sol with Helios disk, you shouldn't be without WordWizard. It will run on a 2-slot Helios and needs at least 48K of memory.

MailMaster is a general-purpose mailing list management program which works hand-in-hand with WordWizard. You can define up to 99 items to be stored with each address in the list. Each item has a name you give it and a length you choose. You can print mailing labels to all names in order of Zip code or just names selected by the values stored in the items of that name.

Using WordWizard you can define a document which MailMaster will send to each name on the list, or to selected names. The skeleton can have the name and address and any of the other items inserted anywhere in the document by MailMaster, so you can use this to produce personalized form letters or special reports on the names in the list.

(continued on page 2)

Indeed, the list doesn't need to be a mailing list. Processor Technology used MailMaster internally to keep track of their inventory items. You can think of MailMaster as a computerized filing-card system with report generation capability. On a 2-slot Helios, you can store up to 3247 entries (names with associated data) per list-disk, depending upon the number of items and their length. On a 4-slot system, you can store up to 5095 entries. Entries can be retrieved by "name" or by "zip code". Even when you have filled the list to its capacity, the system can locate any name within two seconds.

MailMaster will let you maintain a list (create, add, delete, change), print reports, and produce mailing labels in formats you design, or print customized form letters from WordWizard documents. You can obtain a printed record of all updates made to the list as you work with it, so that you can recover from errors. As with all of the programs in this series, you can select between several printers attached to your Sol (low speed, high quality printer versus high speed, dot-matrix printer). The documentation is an extensive, user-oriented manual. The program is easy to use because it prompts you with "menus" on the screen. Once the list has been defined (items named, mailing label formats described, etc.) the program can easily be used by a secretary or other non-technical clerk with just a small amount of instruction.

MailMaster and all of the programs described below require a full 64K system and will run on a 2- or 4-slot Helios with Sol.

MailSort is a supplement to MailMaster. MailMaster will let you produce reports or labels in order of Name or "Zip code" (which can be any 6 character code you want, such as a part-number, not just a postal code). MailSort lets you select entries and sort them on the basis of any items in the mailing list, not just Name and Zip. Thus you can produce reports in any sequence you want: dates, dollar-amounts, etc. If you think you might use MailMaster to store more than a name and address, then you should get MailSort, too.

AccPac (Accounting Package) is a collection of programs which can be used as an integrated system or as separate units. They can be used by a single business, by a business with many departments (revenue centers), or by an accounting firm with many such clients. The programs have excellent flexibility and can be applied to many types of businesses. They were written by professional programmers and an accounting firm. They were designed so that the person responsible for the accounting does not need to be the one who operates the computer. The manual is divided into separate sections for the accountant and for the operator.

General Ledger and Financial Reporting come together as a set. Up to 1000 accounts can be defined freely by the user to describe the general ledger of the company. Account codes and division (department, revenue center) code formats can be defined. A history of the balances for each of the past 24 months is stored and reported as desired. Extensive error detection is performed automatically. Listings provide clear audit trails. Transactions can be entered directly, by transfer from the Accounts Receivable and Payable programs, or by transfer from custom programs you provide. Posting and reporting is done in the sequence and timing you prefer (weekly, monthly, etc.). Year-end closing is done automatically when you request it. General Ledger produces many standard listings, but to meet the special needs of your company, the Financial Reporting module can produce any special reports you may need.

The Financial Reporting module allows you to define any number of reports you wish to produce. Using WordWizard, you describe in a coded fashion the format and content of the reports, computed from any of the accounts and any of the historical periods (prior months). You can produce a "Statement of Income Sources", "Expense Report", "Balance Sheet", or whatever you desire from the general ledger accounts. Reports can be by revenue center (department) or by

totals. It is very versatile and easy to modify as your business needs change.

The Accounts Receivable system (A/R) can be used independently or in conjunction with the General Ledger system. On a 2-slot Helios you can define up to 500 active customer accounts on one data disk. On a 4-slot Helios system, you can have up to 1200 customer accounts on 3 disks. As with all of the programs, the search for any account is very rapid due to the indexed-sequential access method used. (I spoke with a user of a different system written by a firm near my home. She complained that her system took several minutes to update a single account with a new transaction! Evidently that system must search for the account by reading through all of them sequentially. AccPac is much more sophisticated than that.)

A/R allows you to enter invoices, cash receipts, and adjustments. Each account can contain descriptive data, such as contact name, salesman (or provider-name if you are a service oriented company), interest to be assessed (if any) on past-due amounts, credit limit, etc. Two accounting methods are provided: balance forward and open-item. Each account can be designated as an open-item or balance-forward type.

With the open-item method, each invoice keeps its own balance. Payments are distributed to the appropriate invoices by the operator with the help of the prompts by the system. At month-end, each invoice is balance-forwarded and carried to the next month as an open item if a balance is still due. Under the balance forward method, all items (invoices, adjustments, and payments) in the account are combined together at month-end to produce a single balance for the whole account. Details of transactions for the current month appear on the statement, but invoices which have only received partial payment are purged from the system at month-end in the balance forward accounts. Only the total balance for the account will remain at the beginning of the next month.

Ageing of past-due accounts is done in time categories you select. You don't need to stick to the customary 30-days, 60-days, 90-days, etc. You can charge interest on any or all accounts. You can define your own grace period for interest.

Sales (invoices) can be distributed into various categories (product lines, service codes, or whatever) and various departments (providers, revenue centers). Totals for each category will be passed to the General Ledger program if you desire. Miscellaneous transactions not attributed to any customer account can be passed to General Ledger, too. Extensive error detection is done automatically. Many reports are produced to provide customer listings and audit trails.

Statements are produced at intervals you select. You can design the format of your statements to fit stock statement forms of a wide variety. You can provide for detailed remittance coupons if you desire. As with General Ledger, the format of statements is designed using WordWizard.

Accounts Payable (A/P) can maintain up to 400 vendor accounts on one data disk in a 2-slot Helios, or up to 1000 vendors on 3 disks in a 4-slot system. Each account can contain information on the vendor, such as normal discount and payment terms, year-to-date purchases, etc.

Reports can be produced to show your future cash requirements for invoices posted, aged balances of invoices that are overdue, discounts that can be taken on current invoices, etc. Checks can be printed and remittance advice coupons can be produced. The formats of checks and remittance advices are designed using WordWizard to fit the needs of your pre-printed forms. The company name and address is taken from the company profile data on the disk, rather than embedded in the format description, so that the same formats can be shared among several businesses or divisions you control (or among various clients of your bookkeeping service). You can have a list of checks to be issued instead of the checks themselves, so that small businesses need not use computer-printed checks if that isn't appropriate. The program allows you to defer payment to a specified future date or to make partial payments.

(continued)

As with A/R, the A/P transaction data can be distributed among various general ledger accounts and the data can be passed to the General Ledger program automatically.

The final package in this set of programs is called the AccPac Programming Package. This is intended for use by the sophisticated programmer who wants to produce custom programs that integrate with the other programs in the system, or programs that use the same file and screen techniques.

Special subroutines are provided to augment Processor Technology's FORTRAN compiler for writing AccPac modules. Programs for creating and manipulating the indexed-sequential files used by AccPac are provided. A turn-key utility for sorting files from FORTRAN programs is supplied in a form that can be chained to and which will chain back to other programs. Five-level sorts (five independent keys) can be done. This is the sort utility used by MailSort. Routines are also provided to define screen formats with protected and unprotected zones for reading and writing screen "forms". An Extended Precision Arithmetic package for FORTRAN is also included.

WordWizard, MailMaster, and AccPac are very well done, user-oriented programs that compare with programs costing thousands of dollars for the big-name minicomputers. If you own a small business, have extensive personal bookkeeping data, do a lot of correspondence, or want to go into a side-business of providing data processing and word processing services to local clients, you should consider these programs.

The programs have not been abandoned. The firm producing them is still maintaining them and is transporting the system to a machine-independent version, written in the language "C" using their own compiler. It is now available for some other microcomputers (NorthStar and Cromemco). They have indicated to me that owners of the present version will be given an option to upgrade to the new version if they move on to new equipment in the coming years. As new technology filters down to our level (16-bit microprocessors, Winchester hard-disks, video disks, etc.) the machine-independent version will be adapted to new equipment. You will not be buying a dead-end, but rather, a beginning.

Prices for the programs are discounted from the list prices. Compare the versatility of these programs with that of the competitors and you will see that these are really quite reasonably priced. Prices include diskettes, user's manual, and postage to anywhere in the U.S..

PROGRAM NAME	LIST PRICE	PROTEUS PRICE
WordWizard word processor	\$300	\$250
MailMaster list manager	\$400	\$350
MailSort adjunct to MailMaster	\$150	\$125
Package deal--all three above	\$850	\$675
AccPac General Ledger & Financial Reporting	\$600	\$500
AccPac Accounts Receivable	\$600	\$500
AccPac Accounts Payable	\$600	\$500
Package deal--all three AccPac	\$1800	\$1400
The works--all 6 above	\$2650	\$1995
Programmer's Package	\$150	\$125

Manuals may be purchased separately for each of the above programs for \$35 each, except for MailSort and Programmer's Package which are \$25 each. Price of the manual will be applied to the program price if you later purchase.

From time to time updates to various modules in this package have been made available. Proteus will continue to service the programs by reporting detected errors to the authors and by updating users' systems for a nominal handling charge. See our Proteus Catalog and its addenda for currently available updates. See our Order form inserted in this issue.

TERM:S

<TERM:S> is a program to make the Sol-20 a dumb terminal with half-full duplex options.

TERMIN:S

<TERMIN:S> is a program similar to <TERM:S> with the addition of a routine that will upon command allow the incoming information to go into the buffer of <PROCESS>, an editing program. By doing this it is easy to get programs from other people & computers via a modem. With <PROCESS> you can edit and save these programs on Helios.

FCHECK

A file checking command very similar to the DCHECK command on PTDOS 1.5, but FCHECK gives you the names of the files as it checks the files. The check consists of opening the file, reading through it to the end, and reclosing it. Device files are skipped with a message, as are read-protected files. When the command is executed, it will wait at the beginning. Press RETURN key to begin.

MAIL:D

A simple mailing list program package, written by Foothill Computer Service. MAIL:D has a brief letter on the package. To use it, execute the BASIC program called "MENU". The other programs are information-protected (attributes IAM). [Allan Olson] NOTE: THE PROGRAMS ASSUME THEY RESIDE ON THE SYSTEM DEFAULT DISK, SO BEFORE USING THE SYSTEM, COPY THE RELEVANT FILES ONTO YOUR SYSTEM DISK--NOTICE THEY ARE INFO PROTECTED.

ACNTS:S

An accounts receivable package designed for a counseling center. This is an extensive group of programs that require two disks to operate. The programs are: MENU.; DELETE; RPT1.CRF; RPT.NAME; AKBDTA; ADDITION; MK.ORDER; CHANGES; RPT.DELQ; RPT1.0; JOURNAL; MK.ALLTF; MK.ONETF; RPT1.1; MK.AKB?; MK.NAMES; RPT.NUM; RPT.MTF. (MAKE SURE ALL PROGRAMS ARE IN SLOT#0 AND A DATA DISK IS PLACED IN SLOT #1.) (NOTE: MAKE SURE THE PROGRAM MENU. IS RENAMED TO MENU)

PHONUM:S

Converts phone numbers to words using the correlation of numbers to letters shown on the phone dial. This is a BASIC program which takes a seven-digit phone number and converts it into a seven-character word according to the letters on the phone dial which correspond to the individual digits.

The program will ask for your phone number and then display the various permutations on the screen at a speed slow enough for comfortable reading.

CPM-TXT

This BASIC program will convert PT Basic programs or other text over to Lifeboat CP/M. The file "CONVERT" gives the instructions and the file "CPM-TXT" is the program.

JOB OPPORTUNITY

Microbyte Computer Store, San Jose, California, is looking for a technician/engineer with Sol and Helios experience. Call (408) 377-4665 or write Microbyte Computer Store, 2626 Union Avenue, San Jose, CA 95125.

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ADDITIONS TO PROTEUS CATALOG

These are additions to the Proteus Catalog published in Proteus News, volume 2, number 4. See current Proteus price list for prices and ordering information.

UPDATE SERVICES

Proteus item US3:

Update your WordWizard diskette to version 4.0 mod 1. This version has automatic centering, screen preview of printing, more printer drivers, type-ahead feature to capture key presses during disk accesses, correction of rare but serious bugs. Documentation included.

Proteus item US4:

Update your MailMaster to version 3.0 mod 2, correcting errors in previous releases.

Proteus item US5:

Update your AccPac Accounts Payable to version 1.0 mod 2.

Proteus item US6:

Update your AccPac General Ledger to version 1.3 mod 2.

Proteus item US7:

Update your AccPac Financial Reporting system to version 1.1 mod 2.

PROPRIETARY SOFTWARE

Proteus item P1:

WordWizard electronic typing system for the Sol with Helios disk, by BCG. See description in Proteus News, Vol. 2, Number 6.

Proteus item P2:

MailMaster list management system for Sol with Helios disk, by BCG. See description in Proteus News, Vol 2, Number 6.

Proteus item P3:

MailSort supplement to MailMaster, by BCG. See description in Proteus News, Vol 2, Number 6.

Proteus item P4:

AccPac General Ledger and Financial Reporting system for Sol with Helios disk, by BCG. See description in Proteus News, Vol 2, No 6.

Proteus item P5:

Acc Pac Accounts/Receivable system for Sol with Helios disk, by BCG. See description in Proteus News, Vol 2, No 6.

Proteus item P6:

AccPac Accounts/Payable system for Sol with Helios disk, by BCG. See description in Proteus News, Vol 2, No 6.

Proteus item P7:

AccPac Programmer's Package for creating custom AccPac programs, by BCG. See description in Proteus News, Vol 2, No 6.

Proteus item P8:

WordWizard, MailMaster, and MailSort all ordered together as a package deal. That is, P1 thru P3.

Proteus item P9:

WordWizard, MailMaster, MailSort, and all three AccPac programs (A/R, A/P, G/L) as a package deal. That is, P1 thru P6.

(continued at right)

PROTEUS LIBRARY ANNOUNCES BEGINNING OF NORTH STAR LIBRARY

Our library has obtained several disks of North Star software that was designed to operate on the Sol20-North Star disk system. The library is willing to support the sharing of North Star software for the Sol and will announce guidelines in the near future.

Anyone wanting to submit North Star software to the library can do so by sending the program on single density diskette to the Librarian. (See article this issue on Library change of hands)

We are also working at translating several of these programs to operate on the Helios and will include them in the Helios Disks when they become available. Anyone willing to assist in this can get in touch with Tony Severa for further information.

Any ideas or suggestions on guidelines for submission of these programs would be appreciated.

CASSETTE LIBRARY TO DISTRIBUTE CP/M PROGRAMS TOO

Lewis Moseley, our new cassette librarian, has announced a new feature. He will accept programs on 5" soft-sectored, standard CP/M, single-density, diskettes. The programs will be copied to cassettes and distributed in the cassette library so that people with CP/M on Helios, NorthStar, Micropolis, etc. can exchange programs with standard CP/M systems and with each other. This is something we've been talking about for a long time, the interchange medium--Sol/CUTS cassettes.

In our first issue of 1980, we will have detailed articles from Lewis and from Tony Severa, our Helios and NorthStar librarian, describing the library procedures.

HOBBYWORLD DISCOUNTS AVAILABLE TO PROTEUS MEMBERS

Hobbyworld, a computer retailer with mail-order and in-store business in southern California, has established a "Computer Club Alliance", which is their way of getting more names for their mailing lists. The deal is this: Send them a letter of request and a photocopy of the page of Proteus News that has your address imprinted, and they'll send you a membership card which entitles you to a 10% discount from their prices, except for special sales and asterisked items on their flyers. Hobbyworld, 19511 Business Center Drive, Northridge, CA 91324. Ask for membership in the "Computer Club Alliance".

CATALOG CONTINUED

HELIOS DISK LIBRARY. Programs donated by members.

Proteus item H3:

See Proteus News, Vol 2, No 4, page 5.

Proteus item H4:

See Proteus News, Vol 2, No 6.

LOCAL GROUPS OF SOL OWNERS

Fort Wayne, Indiana: Contact Don Slane, 7220 Miahquean Ct., Fort Wayne, Indiana 46815.

Washington, DC area: Wants to meet other Sol owners. Ray Miller, 10334 Layton Hall Dr. #411, Fairfax, VA 22030.

Other areas have been listed in past issues. See especially, Volume 1, number 4 (June 1978).

SOFTWARE REVIEW

CP/M - SELECTOR-III
CBASIC-2
ETCETERA

DEAR STAN:

I PROMISED A PERSONAL REPORT AND OBSERVATION ON THE "LIFEBOAT" ASSOC. VERSION OF CP/M FOR HELIOS AND THE VARIOUS APPLICATION PROGRAMS I HAVE ACQUIRED FOR IT. THIS IS TOO MUCH FOR ONE REPORT SO I WILL CONCENTRATE ON ONE PROGRAM. BUT LET ME LAY A LITTLE GROUNDWORK FIRST. ONE MIGHT RIGHTLY ASK 'WHY BOTHER WITH CP/M ? PTDOS IS A SUPERIOR DOS AND PT BASIC AND FORTRAN ARE QUITE ADEQUATE'. TRUE, BUT WE ARE BUSINESS PEOPLE, NOT PROGRAMMERS AND ALTHOUGH WE CAN DO QUITE WELL ON MINOR PROGRAMS, WE DO NOT HAVE THE TIME OR TALENT TO WRITE THE EXTENSIVE APPLICATION SOFTWARE THAT WE WANT FOR OUR BUSINESS NEEDS. WE HAVE WAITED MORE THAN A YEAR AND A HALF FOR THE SOFTWARE WE WERE SURE WOULD COME FROM SOMEWHERE. BUT, ALAS, IT HAS NOT AND IS NOT LIKELY TO SOON APPEAR.

COMES NOW "LIFEBOAT" WITH CP/M AND A WORLD OF PROVEN SOFTWARE. SO WE HAVE SENT GOOD MONEY AFTER GOOD, AND WE ARE NOT SORRY. IN ADDITION TO CP/M WE BOUGHT CBASIC-2, NAD, QSORT, TEX, AND SELECTOR III (A DATA MANAGEMENT SYSTEM). IT IS ABOUT SELECTOR THAT I WILL BRIEFLY REPORT. AS TO THE REST IT IS ENOUGH TO SAY THAT THIS REPORT WAS GENERATED ON CP/M "ED" AND FORMATTED WITH "TEX". THE REST OF THE STUFF WORKS EQUALLY AS WELL. WE DO OUR OWN MAILING LABELS NOW WITH "NAD" AT A FRACTION OF THE COST OF COMMERCIAL LABELS.

WE CHOSE SELECTOR OVER OTHER BETTER KNOWN SYSTEMS BECAUSE GENERAL BUSINESS SYSTEMS JUST DO NOT MEET OUR UNIQUE NEEDS. WE WANTED A FLEXIBLE SYSTEM WE COULD TAILOR, THAT REQUIRES SOURCE CODE AND MICRO-AP SUPPLIES THEIRS WITH SELECTOR (AN UNCOMMON THING). IT WAS A SMALL GAMBLE, INVESTMENT-WISE, BUT IT HAS WORKED OUT O.K.

BRIEFLY THE SYSTEM WORKS LIKE THIS: SELECTOR III IS MADE UP OF ABOUT THIRTY DIFFERENT PROGRAMS. USING CBASIC-2 S %INCLUDE, CHAINING, AND OTHER FEATURES, ONLY FIVE OF THE PROGRAMS ARE COMPILED, THE REST ARE CALLED BY THE MAIN PROGRAMS AS NEEDED. THE MAIN PROGRAMS ARE CALLED "DEFINE", "UPDATE", "SET", "SELECT", AND "REPORT". THERE ARE ALSO EIGHT GENERAL APPLICATION PROGRAMS WHICH ROUGHLY FOLLOW THE USUAL BOOKKEEPING PRACTICES OF RECIEVABLES, PAYABLES, INVENTORY, ETC. THE BALANCE OF THE PROGRAMS ARE AUXILLARY TO THE MAIN PROGRAMS. SINCE EACH TASK MAY REQUIRE DIFFERENT COMBINATIONS OF MAIN AND AUXILLARY PROGRAMS, CONSIDERABLE THOUGHT HAS GONE INTO THE DIVISION OF LABOR AMONGST THE PROGRAMS SO THAT A MINIMUM OF MEMORY IS REQUIRED FOR EACH TASK. IF ONE DOES NOT WISH TO USE THE SUPPLIED APPLICATION PROGRAMS, HE MAY CREATE HIS OWN DATA-FILES QUITE SIMPLY. THE PARAMETERS OF THE FILE ARE FIRST DEFINED IN THE PROGRAM "DEFINE". THE NUMBER OF ITEMS IN EACH RECORD, THE SIZE OF THE RECORD, AND THE NUMBER OF ITEMS THAT WILL BE KEYS (FOR SORTING AND SELECTING) ARE INPUT AND ARE RETAINED IN THE FILE "DIRECT.ORY". THE OTHER PROGRAMS CAN THEN READ THE SPECS. SO DEFINED AND CHECK THE VALIDITY OF DATA INPUT THERAFTER. ANY ITEM MAY BE A KEY AND AS MANY AS 41 ITEMS ARE PERMITTED PER RECORD, OF COURSE 255 IS ALWAYS THE LIMIT TO THE SIZE OF ANY RECORD.

THE DATA IS INPUT THROUGH THE PROGRAM "UPDATE" THE WORK-HORSE OF THE SYSTEM. MANIPULATION OF THE DATA, DELETING, ADDING, CHANGING, BROWSING, ETC. IS ALL DONE HERE. "UPDATE" READS THE PARAMETERS OF THE FILE ESTABLISHED AS DESCRIBED AND IF THE DATA IS INVALID REPORTS THE ERROR AND FORCES REENTRY UNTIL CORRECT VALUES ARE INPUT. MEMORY SIZE IS CHECKED HERE AND THE NUMBER OF RECORDS THAT MAY BE ENTERED PER SESSION IS SET AND WHEN THE LIMITS ARE REACHED AUTOMATIC SORTING AND THE WRITING OF KEY-FILES IS DONE. USING THE APPLICATION PROGRAMS PROVIDED, ALL THE ABOVE IS EVEN MORE EASILY DONE.

THE USUAL NEXT STEP IS TO PRODUCE FROM THE MAIN DATA-BASE ANY SUB-SETS DESIRED, IF AT ALL, AND TO SELECT OR SORT THESE OUT. THE TWO MAIN PROGRAMS "SET" AND "SELECT" HANDLE THIS TASK AND NEARLY ANY IMAGINABLE SUB-SET CAN BE DERIVED USING THE BOOLEAN LOGIC SYSTEM WHICH MAKES UP THE TECHNICAL END OF "SET". SORTED SETS ARE PRODUCED IN ANY COMBINATION THAT WORKS; ITEMS SORTED WITHIN ITEMS WITHIN ITEMS ARE EASILY PRODUCED. "SET" DEFINES THE SUB-SET, "SELECT" DOES THE ACTUAL SORTING AND SELECTION.

"REPORT" IS THE FINAL MAIN PROGRAM AND NEARLY ANY TYPE OF REPORT, CONSOLE OR HARD-COPY, OF ANY COMBINATION OF ITEMS WITHIN RECCORDS IN ANY SEQUENCE OF ITEMS, BY SEQUENTIAL RECORD OR BY KEY, IS EASILY PRODUCED. REPORTS ONCE DEFINED MAY BE SAVED AND QUICKLY REPRODUCED. VERY LITTLE MEMORY WORK IS REQUIRED HERE OR IN THE OTHER PROGRAMS; THE MENU AND DESIGNATORS ARE DISPLAYED IN EACH PROGRAM. THE LITTLE BIT ONE MUST RECALL IS LOGICAL AND SOON BECOMES REFLEXIVE.

ALL IN ALL, CONSIDERING THE NOMINAL COST AND THE FACT THAT THE SOURCE-CODE IS SUPPLIED MAKING THE ALTERATION OF THE SYSTEM POSSIBLE, SELECTOR SEEMS TO ME TO BE ONE OF THE BEST BUYS AVAILABLE. SELECTOR-III IS \$295.00 AND SELECTOR-III C2 (THE MOST RECENT REVISION WHICH EXPLOITS CBASIC-2 AND ITS IMPROVEMENTS OVER CBASIC) IS \$345.00. IF ONE HAS SELECTOR-III THEY WILL UPDATE IT FOR \$50.00, NOT A BAD DEAL AT ALL. WE HAVE NOT BEGIN TO USE ALL THE POSSIBLE APPLICATIONS FOR THIS SYSTEM AND WILL NOT FOR A LONG TIME IF EVER.

WE HAVE NOT LOST OUR ENTHUSIASM FOR THIS ULTIMATE IN PERSONAL CHALLENGES. THE ATTEMPT TO MASTER COMPUTING IS ALWAYS FRESH AND THE POSSIBILITIES EXPAND EXPONENTIALLY AS ONE NEARS THAT GOAL. EVERYTHING ELSE HAS COME TO SEEM JUST SO MUCH TRIVIA. WE HAVE GROWN PERSONALLY AND SEE THE MUNDANE WORLD ABOUT US SO DIFFERENTLY SINCE WE EMBARKED ON THIS "TRIP". ONE CANNOT ADEQUATELY TELL ANOTHER WHO HAS NOT EXPERIENCED IT JUST HOW IT IS. BUT I'LL BET YOU KNOW WHAT I MEAN.

STAN, IT IS DIFFICULT NOT TO BE EITHER TOO BRIEF OR TO LENGTHY. IF YOU TOUCH AT ALL UPON THE COMPLEXITIES THE THING JUST GROWS AND GROWS. SO I WILL JUST LET IT GO AT THAT. I HOPE I HAVE GIVEN AN IDEA OF WHAT THIS SYSTEM IS ALL ABOUT.

YOURS:

EARL

P.S. A NOTE ABOUT "LIFEBOAT": WE HAD SOME PROBLEMS WITH OUR PRINTER DRIVER (CENTRONIX IS DIFFERENT ABOUT VERTICAL SPACING, CR/LF, ETC). I TALKED WITH THEM BY PHONE, EXPLAINED THE THING, AND IN ABOUT TWO WEEKS THEY SENT ME A TAILOR-MADE DRIVER, QUITE COMPLEX AND COMPREHENSIVE AND IT WORKS. THEY DIDNT CHARGE ME A THING. THAT IS WORTH REPORTING I THINK.

E.

EARL DUNHAM
941 N. RUSSELL
LA HABRA, CA
90631

SPARE PARTS FOR SOL KEYBOARDS

Proteus has obtained a stock of spare keytops and other parts for the Sol keyboards. We have all of the keytops for the 15-key numeric keypad, all of the white keytops, the ESCAPE key, and the SHIFT LOCK. We suspect that these were special order items. We also have some of the key springs (both the black and the red ones), the key screws, and the protective black caps which cover unused key locations (used in Sol-10, we think). We'll send you any of these for 25 cents each, plus \$1 per order to cover packaging, handling, and postage.

Other replacement parts can be obtained from the manufacturer: Key-Tronic Corp., Bldg 14, Spokane Industrial Park, Spokane, WA 99216. (509) 928-8000.

5

PROGRAMMED INSTRUCTION: STATE CAPITALS

(Sorry, we lost author's name. Author, who are you?)

G

```

5 PRINT CHR(11)
10 PRINT "THIS IS A DEMONSTRATION OF CAI PROGRAMED LEARNING;"
20 PRINT "THE STUDENT WORKS WITH THE COMPUTER TO IMPROVE HIS"
30 PRINT "KNOWLEDGE OF THE GIVEN SUBJECT MATTER; AND RECEIVE"
40 PRINT "POSITIVE FEED BACK AND ENCOURAGEMENT DURING THE LEARNING"
50 PRINT "EXPERIENCE."
60 PRINT : PRINT "HERE IS A QUIZ TO SEE HOW MANY STATE CAPITALS YOU CAN NAME!"

```

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70 PRINT : PRINT "PLEASE GIVE ME 77.54 SECONDS TO ESTABLISH A RANDOM"
80 PRINT "PRESENTATION OF THE 50 STATES."
90 CLEAR

```

```

100 DIM B(1,50),T$(20),C$(20),S$(20),N$(25)

```

```

110 LET Z=0

```

```

120 LET Z=Z+1

```

```

130 LET C=INT(50*RND(0))+1

```

```

140 FOR X=1 TO 50

```

```

150 IF B(1,X)=C THEN GOTO 130

```

```

160 NEXT X

```

```

170 LET B(1,Z)=C

```

```

180 IF Z<50 THEN GOTO 120

```

```

185 PRINT CHR(11)

```

```

186 PRINT : PRINT : PRINT : PRINT : PRINT

```

```

190 INPUT "HELLO, MY NAME IS 'SOL', WHAT'S YOURS? ",N$

```

```

191 PRINT CHR(11)

```

```

200 FOR F=1 TO 50

```

```

210 LET A=B(1,F)

```

```

220 IF A=1 THEN LET S$="ALABAMA",C$="MONTGOMERY"

```

```

230 IF A=2 THEN LET S$="ALASKA",C$="JUNEAU"

```

```

240 IF A=3 THEN LET S$="ARIZONA",C$="PHOENIX"

```

```

250 IF A=4 THEN LET S$="ARKANSAS",C$="LITTLE ROCK"

```

```

260 IF A=5 THEN LET S$="CALIFORNIA",C$="SACRAMENTO"

```

```

270 IF A=6 THEN LET S$="COLORADO",C$="DENVER"

```

```

280 IF A=7 THEN LET S$="CONNECTICUT",C$="HARTFORD"

```

```

290 IF A=8 THEN LET S$="DELAWARE",C$="DOVER"

```

```

300 IF A=9 THEN LET S$="FLORIDA",C$="TALLAHASSEE"

```

```

310 IF A=10 THEN LET S$="GEORGIA",C$="ATLANTA"

```

```

320 IF A=11 THEN LET S$="HAWAII",C$="HONOLULU"

```

```

330 IF A=12 THEN LET S$="IDAHO",C$="BOISE"

```

```

340 IF A=13 THEN LET S$="ILLINOIS",C$="SPRINGFIELD"

```

```

350 IF A=14 THEN LET S$="INDIANA",C$="INDIANAPOLIS"

```

```

360 IF A=15 THEN LET S$="IOWA",C$="DES MOINES"

```

```

370 IF A=16 THEN LET S$="KANSAS",C$="TOPEKA"

```

```

380 IF A=17 THEN LET S$="KENTUCKY",C$="FRANKFORT"

```

```

390 IF A=18 THEN LET S$="LOUISIANA",C$="BATON ROUGE"

```

```

400 IF A=19 THEN LET S$="MAINE",C$="AUGUSTA"

```

```

410 IF A=20 THEN LET S$="MARYLAND",C$="ANNAPOLIS"

```

```

420 IF A=21 THEN LET S$="MASSACHUSETTS",C$="BOSTON"

```

```

430 IF A=22 THEN LET S$="MICHIGAN",C$="LANSING"

```

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440 IF A=23 THEN LET S$="MINNESOTA",C$="ST. PAUL"

```

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450 IF A=24 THEN LET S$="MISSISSIPPI",C$="JACKSON"

```

```

460 IF A=25 THEN LET S$="MISSOURI",C$="JEFFERSON CITY"

```

```

470 IF A=26 THEN LET S$="MONTANA",C$="HELL-ENA"

```

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480 IF A=27 THEN LET S$="NEBRASKA",C$="LINCOLN"

```

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490 IF A=28 THEN LET S$="NEVADA",C$="CARSON CITY"

```

```

500 IF A=29 THEN LET S$="NEW HAMPSHIRE",C$="CONCORD"

```

```

510 IF A=30 THEN LET S$="NEW JERSEY",C$="TRENTON"

```

```

520 IF A=31 THEN LET S$="NEW MEXICO",C$="SANTA FE"

```

```

530 IF A=32 THEN LET S$="NEW YORK",C$="ALBANY"

```

```

540 IF A=33 THEN LET S$="NORTH CAROLINA",C$="RALEIGH"

```

```

550 IF A=34 THEN LET S$="NORTH DAKOTA",C$="BISMARCK"

```

```

560 IF A=35 THEN LET S$="OHIO",C$="COLUMBUS"

```

```

570 IF A=36 THEN LET S$="OKLAHOMA",C$="OKLAHOMA CITY"

```

```

580 IF A=37 THEN LET S$="OREGON",C$="SALEM"

```

```

590 IF A=38 THEN LET S$="PENNSYLVANIA",C$="HARRISBURG"

```

```

600 IF A=39 THEN LET S$="RHODE ISLAND",C$="PROVIDENCE"

```

```

610 IF A=40 THEN LET S$="SOUTH CAROLINA",C$="COLUMBIA"

```

```

620 IF A=41 THEN LET S$="SOUTH DAKOTA",C$="PIERRE"

```

```

630 IF A=42 THEN LET S$="TENNESSEE",C$="NASHVILLE"

```

```

640 IF A=43 THEN LET S$="TEXAS",C$="AUSTIN"

```

```

650 IF A=44 THEN LET S$="UTAH",C$="SALT LAKE CITY"

```

```

660 IF A=45 THEN LET S$="VERMONT",C$="MONTPELIER"

```

```

670 IF A=46 THEN LET S$="VIRGINIA",C$="RICHMOND"
680 IF A=47 THEN LET S$="WASHINGTON",C$="OLYMPIA"
690 IF A=48 THEN LET S$="WEST VIRGINIA",C$="CHARLESTON"
700 IF A=49 THEN LET S$="WISCONSIN",C$="MADISON"
710 IF A=50 THEN LET S$="WYOMING",C$="CHEYENNE"
720 PRINT "WHAT IS THE CAPITAL OF ";S$; " ";
730 INPUT T$
740 IF T$=C$ THEN GOTO 860
750 IF T$<>C$ THEN GOTO 1020
760 PRINT
770 NEXT F
780 PRINT : PRINT "OUT OF 50 STATE CAPITALS,"
790 PRINT "YOU GOT";R;" CORRECT AND";W;" WRONG."
800 PRINT : PRINT
810 INPUT "WANT TO TRY AGAIN (ANSWER Y-N)?",A$
820 PRINT : PRINT
830 IF A$="Y" THEN GOTO 70
840 PRINT "OK ";N$;" THANKS FOR TAKING THE QUIZ ON STATE CAPITALS."
850 END
860 REM***RIGHT ANSWERS
870 LET R=R+1
880 LET P=P+1
890 IF P=6 THEN LET P=0
900 IF P=1 THEN GOTO 960
910 IF P=2 THEN GOTO 970
920 IF P=3 THEN GOTO 980
930 IF P=4 THEN GOTO 990
940 IF P=5 THEN GOTO 1000
950 IF P=0 THEN GOTO 1010
960 PRINT C$;" IS RIGHT, ";N$;". GOOD GOING!"; GOTO 760
970 PRINT "ANOTHER RIGHT ANSWER, ";N$;". KEEP IT UP."; GOTO 760
980 PRINT "GOOD FOR YOU, ";N$;";";C$;" IS CORRECT."; GOTO 760
990 PRINT N$;" THAT'S RIGHT! KEEP DOING IT!"; GOTO 760
1000 PRINT "GOOD! ";N$;"; YOU HAVE";R;" RIGHT SO FAR!"; GOTO 760
1010 PRINT N$;" YOUR DOING VERY WELL ";C$;" IS CORRECT."; GOTO 760
1020 REM***WRONG ANSWERS
1030 LET Q=Q+1
1040 IF Q=6 THEN LET Q=0
1050 IF Q=1 THEN GOTO 1110
1060 IF Q=2 THEN GOTO 1160
1070 IF Q=3 THEN GOTO 1210
1080 IF Q=4 THEN GOTO 1260
1090 IF Q=5 THEN GOTO 1310
1100 IF Q=0 THEN GOTO 1360
1110 PRINT "NO, ";T$;" IS NOT RIGHT. TRY AGAIN!"
1120 PRINT S$;: INPUT "? ",T$
1130 IF T$=C$ THEN GOTO 860
1140 PRINT "SORRY, ";N$;"; THE CORRECT ANSWER IS ";C$
1150 LET W=W+1: GOTO 760
1160 PRINT "SOME PEOPLE THINK ITS, ";T$;". TRY AGAIN!"
1170 PRINT S$;: INPUT "? ",T$
1180 IF T$=C$ THEN GOTO 860
1190 PRINT "GOOD TRY, ";N$;"; BUT THE CORRECT ANSWER IS ";C$
1200 LET W=W+1: GOTO 760
1210 PRINT "THAT'S NOT CORRECT, ";N$;". TRY AGAIN."
1220 PRINT S$;: INPUT "? ",T$
1230 IF T$=C$ THEN GOTO 860
1240 PRINT "TO BAD, ";N$;"; THE CORRECT ANSWER IS ";C$
1250 LET W=W+1: GOTO 760
1260 PRINT "WELL, THAT'S CLOSE, ";N$;"; PLEASE TRY AGAIN!"
1270 PRINT S$;: INPUT "? ",T$
1280 IF T$=C$ THEN GOTO 860
1290 PRINT "NOT CLOSE ENOUGH, ";N$;"; THE CORRECT ANSWER IS ";C$
1300 LET W=W+1: GOTO 760
1310 PRINT "THINK AGAIN!";N$
1320 PRINT S$;: INPUT "? ",T$
1330 IF T$=C$ THEN GOTO 860
1340 PRINT N$;"; NOT HARD ENOUGH, THE CORRECT ANSWER IS ";C$
1350 LET W=W+1: GOTO 760
1360 PRINT N$;"; WRONG, PLEASE TRY HARDER!"
1370 PRINT S$;: INPUT "? ",T$
1380 IF T$=C$ THEN GOTO 860
1390 PRINT "WELL, ";N$;"; THE CORRECT ANSWER IS ";C$
1400 LET W=W+1: GOTO 760

```

PROTEUS SOFTWARE DIRECTORY

DATA BASE MANAGEMENT
(including mailing
list programs)

PROGRAM NAME: SELECTOR II CATEGORY: DATA BASE MANAGEMENT

DESCRIPTION: A system for entering data into files created by the system, retrieving records by keywords or numbers or ranges, sorting the retrieved records, and printing a formatted report. Numerical summaries can be produced. Once the record format is defined by the user, all of Selector II's functions can be used. Functions are "menu-selectable."

MINIMUM HARDWARE REQUIRED: 40K (48K is ideal), at least 180K capacity on disk (or two 78K mini-disks), terminal or video.
SOFTWARE REQUIRED: CBASIC or Microsoft Extended Disk BASIC.

RESTRICTIONS:

DOCUMENTATION: User's Manual, includes source code.

MEDIA: 8" CP/M standard disk; mini-disk available for surcharge \$20
DATE CURRENT VERSION WAS RELEASED:
WARRANTY:
PRICE: \$195 (add \$20 for mini-disk); Manual alone \$20.
ORDER FROM: local dealers or
Micro-Ap
8939 San Ramon Road
Dublin, CA 94566
Telephone (415) 828-6697

REMARKS: CBASIC-2 available at reduced price with Selector II.
Specify CBASIC or MBASIC (Microsoft) version when ordering system.
Write for information and order blank.
A new version with multi-keyed ISAM is now available: SELECTOR III

PROGRAM NAME: SELECTOR III CATEGORY: DATA BASE MANAGEMENT

DESCRIPTION: A data base management system that allows users of CP/M systems to enter records and update files interactively. Also provides query and report functions. Distributed with a library of predefined record formats in a data dictionary, and programs to manage and report: sales activity, inventory, payables, receivables, check register, expenses, appointments, and name & address file. Up to 24 items (keys) per record.
MINIMUM HARDWARE REQUIRED: 48K, CP/M or equivalent, 2 mini single density or 1 8" drives, terminal with "up cursor" and "erase screen"
SOFTWARE REQUIRED: CBASIC

RESTRICTIONS:

DOCUMENTATION:

MEDIA:
DATE CURRENT VERSION WAS RELEASED: Nov 78
WARRANTY:
PRICE: \$295. Selector II users can upgrade for \$100 plus copy fee.
ORDER FROM: local dealer or
Micro-Ap
9807 Davona Drive
San Ramon, CA 94583
Telephone (415) 828-6697

REMARKS:

PROGRAM NAME: Mail for N* CATEGORY: Data base control

DESCRIPTION: Mailing label system for SOL-N* MDS-single density. Up to 600 names on one minidiskette. Sorts by name, zip. Also stores phone number. Stores date name entered as well. Sorts when data entry finished.

MINIMUM HARDWARE REQUIRED: Sol/N* MDS-single density

SOFTWARE REQUIRED: REL 4/SOLOS

RESTRICTIONS:

DOCUMENTATION: None: Menu system & prompting

MEDIA: N* minidiskette
DATE CURRENT VERSION WAS RELEASED: 9-78
WARRANTY: damaged media replaced first 2 wks if retnd w/orig pk mtl
PRICE: \$40.00
ORDER FROM: Microcomputer Resources, Inc
3000 Medical Park Drive, Suite 108
Tampa, Fl 33612
(813) 977-5940

REMARKS: Automatically re-sorts file when done editing and inserting. Self prompting, with much human-CPU interaction

PROGRAM NAME: MAILBOX CATEGORY: BUSINESS

DESCRIPTION: MAILBOX is general purpose mailing list program for a Helios disk system, featuring on line editing for data entry, selectable output ports (drivers included), pre-sorted label printing by zip code (any range), label search, and label modification. A file status function gives the operator a report on number of valid names and number of deleted records. A file compression function packs the information on the disk and reallocates space for labels which have been deleted. A hardcopy listing will print any zip code range to the printer in either 2 or 4 column format.

MINIMUM HARDWARE REQUIRED: Sol-20, Helios, 48K of RAM.

SOFTWARE REQUIRED: none.

RESTRICTIONS:

DOCUMENTATION: Instruction manual included.

MEDIA: PTDOS compatible diskette.

DATE CURRENT VERSION WAS RELEASED: October 1, 1978.

WARRANTY: Six month limited warranty.

Contact COMPUTER PORT for warranty replacement.

PRICE: \$45.00 Order number ED-014.
Add 3% for freight and handling.
Add 5% sales tax for Texas residents.
Visa and MasterCard: send card #, expiration date.

ORDER FROM: COMPUTER PORT
926 N. Collins
Arlington, TX 76011
(817) 469-1502

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PROGRAM NAME: ML01 CATEGORY: General Purpose

DESCRIPTION: Prints mailing labels from a name and address file.
The file has 4 lines of 35 characters each. The labels can be sorted
by zip code

MINIMUM HARDWARE REQUIRED: Printer with tractor feed, CRT, 32K, 2 disk
drives.

SOFTWARE REQUIRED: CP/M, CBASIC, QSORT

RESTRICTIONS:

DOCUMENTATION: Complete, easily understood user's manual.

MEDIA: Single or Double Density Diskette
DATE CURRENT VERSION WAS RELEASED: 6-78
WARRANTY: 6 months
PRICE: Write for price information.
ORDER FROM: H & H Associates, Inc.
 P.O. Box 19504
 Denver, Colorado 80219
 (303) 355-1067

REMARKS:

PROGRAM NAME: CI01 CATEGORY: General Purpose

DESCRIPTION: Categorizes clients and files, immediate retrieval of any
information indexed, cross indexes any information entered, name and
address retention, prints reports of customers or clients by 1) Reference
code, 2) Record id, 3) Zip code, 4) Category and/or code. Prints address
labels for mailing lists.

MINIMUM HARDWARE REQUIRED: Printer, 32K, CRT, 2 disk drives

SOFTWARE REQUIRED: CP/M, CBASIC, QSORT

RESTRICTIONS:

DOCUMENTATION: Complete, easily understood user's manual.

MEDIA: Single or Double Density Diskette
DATE CURRENT VERSION WAS RELEASED: 5-78
WARRANTY: 6 months
PRICE: Write for price information.
ORDER FROM: H & H Associates, Inc.
 P.O. Box 19504
 Denver, Colorado 80219
 (303) 355-1067

REMARKS:

PROGRAM NAME: Tape Data Query CATEGORY: Data Management System

DESCRIPTION: T.D.Q. is a file management system that provides
complete record-keeping capabilities. An interactive query
language, with English-like commands, facilitates the
creation and maintenance of data files. T.D.Q. commands
also provide powerful information retrieval capabilities.
Among the many commercial functions that can be automated
with T.D.Q. are inventory control, order processing, etc.

MINIMUM HARDWARE REQUIRED: SOL TERMINAL COMPUTER with 32K RAM plus
2 cassette recorders.

SOFTWARE REQUIRED:

SOLOS/CUTER; PTC ECBASIC

RESTRICTIONS:

DOCUMENTATION: User's manual and reference card

MEDIA: SOLOS/CUTER cassette
DATE CURRENT VERSION WAS RELEASED: January, 1979
WARRANTY: 10 day exchange; 90 day repair/replace; 6 month notify
PRICE: \$50.00/prepaid
ORDER FROM: H. Geller Computer Systems
 Dept. P. P.O. Box 350
 New York, New York 10040

REMARKS: Allow 4 to 6 weeks delivery

PROGRAM NAME: T.D.Q. Utilities CATEGORY: Data Management System

DESCRIPTION: The UTILITY program gives the Tape Data Query user
greater flexibility in creating and maintaining data files.
Utility commands permit the changing of a file's name, its
password and the names of data elements within the file, as
well as adding new data fields or removing existing data
fields.

MINIMUM HARDWARE REQUIRED: SOL TERMINAL COMPUTER with 32K RAM
plus 2 cassette recorders

SOFTWARE REQUIRED:

SOLOS/CUTER; PTC ECBASIC

RESTRICTIONS:

Tape Data Query package required

DOCUMENTATION:

User's Manual and reference card

MEDIA: SOLOS/CUTER cassette
DATE CURRENT VERSION WAS RELEASED: January, 1979
WARRANTY: 10 day exchange; 90 day repair/replace; 6 month notify
PRICE: \$40.00/prepaid
ORDER FROM: H. Geller Computer Systems
 Dept. P. P.O. Box 350
 New York, New York 10040

REMARKS: Allow 4 to 6 weeks delivery

EDUCATION

PROGRAM NAME: T.D.Q. Report Generator CATEGORY: Data Management System

DESCRIPTION: The Report Generator greatly simplifies the task of producing computer generated reports. Report Generator permits reports to be produced for either the video display or a hard-copy printer. Once the report format has been specified, TDQ Report Generator automatically takes care of page breaks, page headings, and titles.

MINIMUM HARDWARE REQUIRED: SOL TERMINAL COMPUTER with 32K RAM plus 2 cassette recorders

SOFTWARE REQUIRED: SOLOS/CUTER; PTC ECBASIC

RESTRICTIONS: Tape Data Query package required

DOCUMENTATION: User's manual and reference card

MEDIA: SOLOS/CUTER cassette
 DATE CURRENT VERSION WAS RELEASED: January, 1979
 WARRANTY: 10 day exchange; 90 day repair/replace; 6 month notify
 PRICE: \$40.00/prepaid
 ORDER FROM: H. Geller Computer Systems
 Dept. P. P.O. Box 350
 New York, New York 10040

REMARKS: Allow 4 to 6 weeks delivery

PROGRAM NAME: Game Pack 2c CATEGORY: Recreation/Education

DESCRIPTION: 3 children's programs:
 Arithmetic God
 Addition Dice
 Travel

MINIMUM HARDWARE REQUIRED: SOL TERMINAL COMPUTER with 32K RAM plus 1 cassette recorder

SOFTWARE REQUIRED: SOLOS/CUTER; PTC ECBASIC

RESTRICTIONS:

DOCUMENTATION: Operation's Reference Card

MEDIA: SOLOS/CUTER cassette
 DATE CURRENT VERSION WAS RELEASED: January, 1979
 WARRANTY: 10 day exchange; 90 day repair/replace; 6 month notify
 PRICE: \$13.00/prepaid
 ORDER FROM: H. Geller Computer Systems
 Dept. P. P.O. Box 350
 New York, New York 10040

REMARKS: Allow 4 to 6 weeks delivery

PROGRAM NAME: DIAGNOSTIC II CATEGORY: Diagnostic

DESCRIPTION: Check your user RAM, system RAM, SOLOS or BOOTLOAD operating system, keyboard, video, and cassette interface. A "ROM data file" is included on the cassette for checking the personality module. Side one is for SOLOS while side two is for BOOTLOAD. The RAM diagnostic is a comprehensive memory test with dual addressing test options. The operator inputs starting and ending addresses for the memory test. The diagnostic has built-in self protect checks to prevent destroying the program during memory tests. The RAM memory test includes four quick pre-tests before proceeding with the optional dual addressing test.

MINIMUM HARDWARE REQUIRED: SOL-20 with 8K of RAM.

SOFTWARE REQUIRED: None, program is written in machine code.

RESTRICTIONS:

DOCUMENTATION: Instruction manual included.

MEDIA: 1200 baud CUTS cassette.

DATE CURRENT VERSION WAS RELEASED: October 1, 1978.

WARRANTY: One year limited warranty.
 Contact COMPUTER PORT for warranty replacement.

PRICE: DIAGNOSTIC II, Order # EC-015 \$50.00
 Add 3% for freight and handling.
 Add 5% sales tax for Texas residents.
 Visa and MasterCard: send card #, expiration date.

ORDER FROM: COMPUTER PORT
 926 N. Collins
 Arlington, TX 76011
 (817)469-1502

PROGRAM NAME: Education Review CATEGORY: Education

DESCRIPTION: Education Review is a program that utilizes a High School subject tape with 50 questions to test and grade the user's knowledge in the subject area. All questions are multiple choice. Each question is repeated until answered correctly. The user is penalized for each incorrect response. Nine subject tapes are available.

MINIMUM HARDWARE REQUIRED: SOL TERMINAL COMPUTER with 32K RAM plus 1 cassette recorder

SOFTWARE REQUIRED: SOLOS/CUTER; PTC ECBASIC

RESTRICTIONS:

DOCUMENTATION: Operation's reference card

MEDIA: SOLOS/CUTER cassette
 DATE CURRENT VERSION WAS RELEASED: January, 1979
 WARRANTY: 10 day exchange; 90 day repair/replace; 6 month notify
 PRICE: Review Program - \$10.00/prepaid; Subject tapes - \$4.00 each/prepaid
 ORDER FROM: H. Geller Computer Systems
 Dept. P. P.O. Box 350
 New York, New York 10040

REMARKS: Allow 4 to 6 weeks delivery
 High School Subjects Available: French (3 yr); American Hist(2 yr)
 Spanish (2 yr); Comp. Eng (4 yr); Geometry; Elementary Algebra;
 Eleventh Year Math; Biology; Earth Science

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PROGRAMMING LANGUAGES
AND AIDS

10

PROGRAM NAME: MACRO-80 CATEGORY: Assembler

DESCRIPTION: Relocatable macro assembler for 8080/Z80 microcomputers. Fast and powerful. Supports a full Intel-standard macro facility (including IRP, IRPC, REPEAT, local variables, and EXITM), and has an assembly rate of over 1000 lines per minute. Accepts 8080 and Z80 opcodes, and supports comment blocks, variable input radix, titles and subtitles, listing controls and conditional pseudo-ops. Loader and cross reference facility included.

MINIMUM HARDWARE REQUIRED: Resides in 14K memory.
SOFTWARE REQUIRED: CP/M, ISIS-II, TEKDOS, or DTC operating system

RESTRICTIONS:

DOCUMENTATION: 55-page manual included

MEDIA:

DATE CURRENT VERSION WAS RELEASED: March, 1979

WARRANTY:

PRICE: \$200.00

ORDER FROM: Microsoft
10800 NE Eighth, Suite 819
Bellevue, WA 98004

REMARKS:

PROGRAM NAME: FORTRAN-80 CATEGORY: Compiler

DESCRIPTION: FORTRAN for 8080/Z80 microcomputers. Includes all of ANSI-66 FORTRAN (except the COMPLEX data type), plus many enhancements for microcomputer use. Supplied with relocatable macro assembler (MACRO-80) and linking loader (LINK-80).

MINIMUM HARDWARE REQUIRED: 32K ram, disk drives

SOFTWARE REQUIRED: CP/M, ISIS-II, TEKDOS, or TRSDOS operating system

RESTRICTIONS:

DOCUMENTATION: 175-page manual in 3-ring binder

MEDIA: 8" floppy disks (TRS-80 version on 5" diskettes)

DATE CURRENT VERSION WAS RELEASED: March 15, 1979

WARRANTY:

PRICE: \$500 (TRS-80 version, \$350)

ORDER FROM: Microsoft
10800 NE Eighth, Suite 819
Bellevue, WA 98004

REMARKS:

PROGRAM NAME: COBOL-80 CATEGORY: Compiler

DESCRIPTION: COBOL compiler for 8080/Z80/8085 microcomputers. ANSI-74 COBOL with fully tested ISAM and many advanced features such as ACCEPT/DISPLAY, COPY, EXTEND, SEARCH, COMPUTE, STRING. Packed decimal data representation conserves memory. Supplied with relocatable macro assembler (MACRO-80) and linking loader (LINK-80).

MINIMUM HARDWARE REQUIRED: 48K ram and disk drives

SOFTWARE REQUIRED: CP/M or ISIS-II operating system

RESTRICTIONS:

DOCUMENTATION: 175-page manual in 3-ring binder

MEDIA: 8" floppy diskettes

DATE CURRENT VERSION WAS RELEASED: January 31, 1979

WARRANTY:

PRICE: \$750.00

ORDER FROM: Microsoft
10800 NE Eighth, Suite 819
Bellevue, WA 98004

REMARKS:

PROGRAM NAME: BASIC-80 CATEGORY: Interpreter

DESCRIPTION: BASIC interpreter for 8080/Z80 microcomputers. ANSI-standard BASIC plus many unique features like full PRINT USING, EDIT, AUTO, RENUM, error trapping, sequential and random disk file access, matrices with up to 255 dimensions, trace facilities, dynamic string space allocation, nested IF/THEN/ELSE, double precision arithmetic. Three versions: 8K, Extended, Disk.

MINIMUM HARDWARE REQUIRED: Disk version requires 20K ram & floppy disk drive

SOFTWARE REQUIRED: Disk version requires CP/M, ISIS-II, or TEKDOS operating system

RESTRICTIONS:

DOCUMENTATION: BASIC-80 Reference Manual included

MEDIA: 8" floppy disks (non-disk versions-paper tape)

DATE CURRENT VERSION WAS RELEASED: 5-30-79

WARRANTY:

PRICE: \$150 (8K), \$250 (Extended), \$350 (Disk)

ORDER FROM: Microsoft
10800 NE Eighth
Suite 819
Bellevue, WA 98004

REMARKS:

PROGRAM NAME: EMPL CATEGORY: Programming language
(Micro APL)
DESCRIPTION: EMPL is a micro version of APL for the 8080. It has numeric and character vectors, user-defined niladic, monadic, and dyadic functions, 22 primitive functions, 9 system commands, and other special operators and characters. Double-byte integer arithmetic gives ± 32767 range of numbers. EMPL is set up to run in ASCII, but directions are given for converting it for use with an APL character set.
MINIMUM HARDWARE REQUIRED: Any 8080/z-80 system with at least 8K of RAM beginning at 0000H.
SOFTWARE REQUIRED: Operating system appropriate to medium.

RESTRICTIONS:

DOCUMENTATION: User's Manual

MEDIA: Tarbell cassette, Northstar, 8" CP/M, CUTS, MITS cassette, DATE CURRENT VERSION WAS RELEASED: /HELIOS, paper t.
WARRANTY:
PRICE: 8" CP/M or Helios \$30; N*, CUTS, MITS, paper tape \$20; T'bell
ORDER FROM: \$10

ERIC T. MUELLER or Computer Consultants
Britton House 101 Volney St.
Roosevelt, NJ 08555 South Houston, TX 77587

REMARKS:

PROGRAM NAME: T Basic CATEGORY: Basic Interpreter

DESCRIPTION: Tarbell Basic with line descriptors (labels), assignment of I/O, chaining, random access, procedures, and multi-file capability, has 10 digits of BCD accuracy, and uses 23 K bytes of memory, A SEARCH function searches a file at high speed for a string.

MINIMUM HARDWARE REQUIRED: 24 K memory, console

SOFTWARE REQUIRED: None for cassette version, CP/M for disk version.

RESTRICTIONS:

DOCUMENTATION: Manual included, listing for I/O section included full listing optional

MEDIA: Tarbell cassette or CP/M disk
DATE CURRENT VERSION WAS RELEASED: 4-29-79
WARRANTY: Limited 6 months
PRICE: \$48 for object, \$25 additional for listing or source on disk
ORDER FROM: Tarbell Electronics
950 Dovlen Place Suite B
Carson, Calif 90746

REMARKS:

PROGRAM NAME: PILOT CATEGORY: Computer Assisted Instruction(CAI) language

DESCRIPTION: The Micropi COMMON PILOT language interpreter is the most powerful CAI language available on a microcomputer. Features include: Unlimited program length, floating point math, scientific functions, varying length string manipulation, pattern matching and dynamic indirect execution of strings. This language is the proposed national standard implementation of PILOT.

MINIMUM HARDWARE REQUIRED: 8080/z80 based system; terminal; 32K of RAM; Northstar or standard 8" CP/M or HELIOS II disk drive.
SOFTWARE REQUIRED: Host operating system for above disks and disk based text editor.
RESTRICTIONS: Object code only available.

DOCUMENTATION: 83 page language manual plus implementation notes.

MEDIA: Northstar single density disk, or standard 8" CP/M, or DATE CURRENT VERSION WAS RELEASED: Nov 1, 1978 HELIOS II disk.
WARRANTY: 30 days exchange.
PRICE: Northstar-\$275, CP/M-\$275, HELIOS-\$300, manual only-\$6.
ORDER FROM: MICROPI

2445 Nugent
Lummi Island, WA 98262

REMARKS: Compatible with TRS-80, 6502, TERAK(UCSD PASCAL), and SWTPC 6800/6809 versions of Micropi COMMON PILOT. Courseware available from Micropi. New courseware is solicited(royalties offered).

PROGRAM NAME: CP/M conversion CATEGORY: Programming Language Aid for PTC ECBASIC

DESCRIPTION:

This program converts Proc. Tech. Extended Cassette BASIC to a Disk BASIC running under CP/M 1.4 operating system. All tape functions are converted to Disk file functions. A trace feature has been added to BASIC. Will work with single or dual drive systems having 32K or more.

MINIMUM HARDWARE REQUIRED: Sol or CUTS tape input to read the program, 32K disk system (CP/M compatible)
SOFTWARE REQUIRED: CP/M 1.4, you must supply your own copy of PTC ECBASIC which this program patches.
RESTRICTIONS:

DOCUMENTATION: User's manual

MEDIA: 1200 Baud Sol/CUTS cassette
DATE CURRENT VERSION WAS RELEASED:
WARRANTY:
PRICE: \$49.95 (Manual alone \$5)
ORDER FROM:

TAD Enterprises
P.O. Box 257
Hazelcrest, IL 60429

REMARKS:

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PROGRAM NAME: SAM76 CATEGORY: Interpreter

DESCRIPTION: General purpose interpreter particularly effective for character string manipulation. Powerful resident functions for pattern matching and sorting. Infinite precision arithmetic and logic functions, recursive and nestable to any depth - limitation being only size of memory. Approximately 150 resident functions.

Disk version interfaces with CPM and contains some thirty additional functions, including means for block checksummed communications between any data source and any data destination.

MINIMUM HARDWARE REQUIRED: RAM or ROM 6K for Z80 9K for 8080, plus 3K for disk and extra functions; keyboard, output device - upper and lower case full USASCII character set desirable.

SOFTWARE REQUIRED: Input and Output drivers plus CPM if disk system used.

RESTRICTIONS: None to my knowledge; with a modest amount of ingenuity any task is accomplishable.

DOCUMENTATION: SAM76 Language Manual, Dr. Dobb's, Creative Computing. Source for CPM interface with SAM is available. Main program source available only to individuals who are able to prove extensive knowledge and understanding of the language and its philosophy and who wish to implement on another machine.

MEDIA: CPM standard and North Star, Paper Tape, POLYmorphic Cassette, and TDL/ATAN SMB.

DATE CURRENT VERSION WAS RELEASED: October 1978

WARRANTY: None except for pleasure and satisfaction unless the user is skilled or likes BASIC and the like.

PRICE: SAM76 manual - \$12.00; CPM diskettes - \$15.00 Tape or cassettes \$10 (with additional info).

ORDER FROM: SAM76 Inc., Box 257 - RR1, Pennington N. J., 08534, USA. Phone (609)-466-1129/1130 for info. Letters not answered with dispatch.

REMARKS: It is not advisable to get the book unless you have an operational SAM76 system. Users are encouraged to distribute copies of the object code.

PROGRAM NAME: Z80 Assembler CATEGORY: Assemblers

DESCRIPTION: Package of 3 BASIC programs: EDITOR for entering and editing of source text, ASSEMBL for one pass (with automatic back-patching) assembly of source text, LOADER for handling of object code. Programs augmented with 16 Z80 machine code routines called from BASIC. File oriented package, max. of 1545 lines of source code can be assembled at one time.

MINIMUM HARDWARE REQUIRED: Z80 processor, 32 K of memory (total), one North Star disk drive with controller. Printer optional.

SOFTWARE REQUIRED: North Star DOS and BASIC, Release 4 or later. Single density version.

RESTRICTIONS: No macros, fixed source text format with no expressions, 4 character identifiers, hex constants only.

DOCUMENTATION: 40 pages of manual and complete listing of tables, BASIC programs and Z80 machine routines in assembled source text.

MEDIA: One single density diskette (5 inch, North Star hard sector) DATE CURRENT VERSION WAS RELEASED: May 1, 1979

WARRANTY: Replacement of defective diskette

PRICE: \$35.00 diskette and manual, \$10 documentation only. U.S. postage ORDER FROM: and handling included.

NEMCO DATA PROCESSING, 9 WALNUT STREET, RUTHERFORD, NEW JERSEY 07070

REMARKS:

PROGRAM NAME: SMAL/80 CATEGORY: Programming language

DESCRIPTION: SMAL/80 is a compiled, structured microprocessor language for 8080 and 8085 microprocessors. Included is a macro processor that permits conditional expansion of statements and unlimited nesting of macros.

MINIMUM HARDWARE REQUIRED: 16K bytes of memory plus disk system plus usual input/output peripherals.

SOFTWARE REQUIRED: CP/M or Isis I operating systems.

RESTRICTIONS: Current version is non-relocatable.

DOCUMENTATION: SMAL/80 User's Guide

MEDIA: CP/M or Isis I disks

DATE CURRENT VERSION WAS RELEASED: June, 1978

WARRANTY: Free exchange for defective disks. Registered owners get PRICE: \$75.00. Mastercharge/Visa accepted. updates.

ORDER FROM: CHROMOD Associates

PO Box 3169

Grand Central Station

New York, NY 10017

REMARKS: Relocatable 8080 and Z-80 versions in tape cassette formats will become available sometime early in 1979. We will undoubtedly have SOLOS/CUTER and PTDOS versions available by the spring of 1979.

PROGRAM NAME: SAM76 Graphics CATEGORY: Plotter

DESCRIPTION: Graphics extension to the SAM76 language interpreter with a set of the vector lists for some twenty character fonts developed by A. V. Hershey of the U.S. Navy Weapons Development Lab., Dahlgren, VA.

MINIMUM HARDWARE REQUIRED: Plotting device - can be CALCOMP or equivalent incremental plotter, or display with graphics capability. With a modicum of cleverness any character oriented display device can be used.

SOFTWARE REQUIRED: SAM76 language with CPM disk interface.

RESTRICTION: Authorship credit for the font designs should be given to Dr. A. V. Hershey on any material to be distributed more than casually.

DOCUMENTATION: SAM76 Language manual. Source listing of SAM76 plotter program.

MEDIA: CPM diskettes

DATE CURRENT VERSION WAS RELEASED: March 1978

WARRANTY: Good looking graphics.

PRICE: \$15.00 for diskette.

ORDER FROM: SAM76 Inc., PO Box 257, RR1, Pennington, NJ, 08534, USA.

REMARKS: None.

PROGRAM NAME: TINY-C CATEGORY: Programming Language Processor

DESCRIPTION: TINY-C is an interpreter for a subset of the C programming language. Structured programming now possible in 16K in an interactive environment. Includes Program Preparation System (Editor) and augmented function library. Two byte integers, character strings, peek and poke, calls to assembly language routines. Read and write files. Custom interface uses facilities of operating system for character and file I/O.

MINIMUM HARDWARE REQUIRED: 16K RAM plus RAM/ROM for operating system.

SOFTWARE REQUIRED: Three versions: SOLOS/CUTER, HELIOS(PTDOS) and NORTHSTAR in two forms, standard and premium.

RESTRICTIONS: No floating point. Only one open file at a time in this version.

DOCUMENTATION: TINY-C Owners Manual (350+ pp). Separate manuals for each operating system (15+pp).

MEDIA: SOLOS/CUTER-cassette. HELIOS-diskette. NORTHSTAR-diskette.

DATE CURRENT VERSION WAS RELEASED: Sept. 1, 1978

WARRANTY: 30 da exchange. 1 yr notification. (Subject to change).

PRICE: Owners Manual \$40. Standard version: SOLOS \$30, HELIOS, NORTHSTAR

ORDER FROM: diskette \$35. add \$20 for Premium version.

METRON Computerware Inc. P.O.Box 865. N.Y., N.Y. 10025
Also available from some dealers.

REMARKS: Postage and handling extra for orders outside of USA and for purchase orders not accompanied by payment. Prices subject to change. Standard version has load-and-go interpreter plus Program Preparation System. Premium version has applications programs, segmented PPS, piranha fish game, Upper and Lower case mods. Source for TINY-c and custom interface on request- write for quot

PROGRAM NAME: DISAM CATEGORY: PROGRAMMING AID

DESCRIPTION: 9090 Disassembler and dumper.

The disassembler operates on program in memory to display or append to a file in memory the equivalent source code. Two passes can be controlled by operator to suppress unneeded labels. Program can be rearranged or selected sections can be combined. The dump command gives combined hex and ASCII dump.

Appears as 5 custom commands under SOLOS/CUTER.

MINIMUM HARDWARE REQUIRED: RAM DAAF-DF7C plus stack and SOLOS, CUTER or my command interpreter. Or get source files and reassemble.

SOFTWARE REQUIRED: SOLOS, CUTER or optional command interpreter.

Memory files work with ALS-8, Software 1, Micropolis MDOS. assemblers.

RESTRICTIONS: You must guide it around data tables if you want perfect results in disassembly. Doesn't build DB, DW etc.

DOCUMENTATION: Dr. Dobb's Journal ... #27 (Aug 78) carried article and assembly listings. Command list available on request.

MEDIA: CUTS cassette (300 or 1200 baud) or MOD II Micropolis (send diskett)

DATE CURRENT VERSION WAS RELEASED: 3/23/78 assembly date.

WARRANTY: Refund if returned with statement no copy made. Consultation.

PRICE: \$4 assembled as stated, \$8 special origin, \$6 source 20K file),

ORDER FROM: \$8 source in 3 parts.

Richard Greenlaw (not currently available
251 Colony Ct. through dealers.)
Gahanna, Ohio 43230

REMARKS:

No credit cards. Checks ok. I provide a cheap cassette and first class US postage. Extensively tested. If you don't have the article ask for brief summary of instructions and commands. This is not a business - sometimes there are delays, but I haven't exceeded 30 days yet.

PROGRAM NAME: DOC CATEGORY: UTILITY

DESCRIPTION: OPTIMIZES NORTH STAR BASIC PROGRAMS BY:

1. COMPACTING THEM SO THAT THEY REQUIRE LESS MEMORY.
2. CONCATENATING STATEMENTS SO THAT THEY EXECUTE FASTER.

DOCUMENTS PROGRAMS BY PROVIDING:

1. FORMATTED PROGRAM LISTINGS.
2. VARIABLE CROSS REFERENCE LISTINGS
3. 'GOTO' CROSS REFERENCE LISTINGS

MINIMUM HARDWARE REQUIRED:

32k BEGINNING AT 2000 HEX

SOFTWARE REQUIRED:

NORTH STAR DOS, AND BASIC

RESTRICTIONS:

NONE KNOWN

DOCUMENTATION:

20 PAGE INSTRUCTION MANUAL, AND 14 ADDITIONAL PAGES OF EXAMPLES.

MEDIA: SINGLE DENSITY NORTH STAR 5" DISKETTE

DATE CURRENT VERSION WAS RELEASED: 3-24-79

WARRANTY: NONE

PRICE: \$29.00

ORDER FROM:

MINI BUSINESS SYSTEMS

P.O. BOX 15587

LOCAL COMPUTER STORE OR SALT LAKE CITY, UTAH 84115

REMARKS: IF DESIRED, THIS PROGRAM CAN ALSO MAKE YOUR NORTH STAR BASIC PROGRAMS MORE CONFIDENTIAL. IF THE USER SELECTS TO CONCATENATE STATEMENTS IN LINES GREATER THAN 132 CHARACTERS, THEN THE 'LIST' AND 'EDIT' FUNCTION OF NORTH STAR BASIC WILL NO LONGER WORK CORRECTLY.

PROGRAM NAME: MPIOLOT CATEGORY: Educational

DESCRIPTION:

MPIOLOT is the original Dr Dobb's Pilot adapted to work under Micropolis MDOS and to be compatible with linedit and ALS-8 files format!

MINIMUM HARDWARE REQUIRED: 24K including system

SOFTWARE REQUIRED: Micropolis MDOS (PDS). Version 3.0

RESTRICTIONS:

DOCUMENTATION: Complete, including instruction guide and Pilot programming guide.

MEDIA: Micropolis 5" double density

DATE CURRENT VERSION WAS RELEASED: November 1978

WARRANTY: 90 days repair/replace

PRICE: \$55.-. Add \$2.- for postage. Orders must be prepaid.

ORDER FROM:

KALMAN BLONDER
KEREN YALDENU CENTER, Inc.
P.O.Box 819 Jerusalem ISRAEL

REMARKS:

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PROGRAM NAME: BYTE-FINDER

CATEGORY: UTILITY

DESCRIPTION: This machine language program will search or search/replace 1, 2, or 3 bytes in memory. The program has four versions loading at 0000H, 4000H, 7000H, and D000H. The operator selects starting and ending search addresses, number of bytes to be searched for (1, 2, or 3), bytes to be searched for (hex values), and the optional bytes for replacement. A list of addresses where the byte pattern was found is output to the selected pseudo port. The Byte-Finder program is protected against self-destruct.

This program is very handy for operators who patch I/O ports or make other modifications to machine language programs.

MINIMUM HARDWARE REQUIRED: Sol-20. RAM needed is 3K plus memory for program to be searched.
 SOFTWARE REQUIRED: none, program is written in machine language.
 DOCUMENTATION: Instruction manual included.
 MEDIA: 1200 Baud CUTS cassette
 DATE CURRENT VERSION WAS RELEASED: January 1, 1979
 WARRANTY: One year limited warranty.
 Contact COMPUTER PORT for warranty replacement.

PRICE: \$19.50 Order EC-022.
 Add 3% for freight and handling.
 Add 5% sales tax for Texas residents.
 Visa and MasterCard: send card #, expiration date.

ORDER FROM: COMPUTER PORT
 926 N. Collins
 Arlington, TX 76011
 (817)469-1502

PROGRAM NAME: UN-Z80

CATEGORY: System development

DESCRIPTION: UN-Z80 disassembles Z-80 object code and produces assembly listing format output or source code for storage, edit & reassembly. Generates TDL mnemonics. Object to be disassembled may be segmented or contiguous anywhere in the available memory space. User input specifies format(byte, word or program) for each segment. Load bias is adjusted, and labels generated for all references. All I/O byte oriented.

MINIMUM HARDWARE REQUIRED: For list output- 8K (depend on module to be disassembled. For cassette or disk output, CUTER, NS DOS or CPM required.
 SOFTWARE REQUIRED: Standalone, if generating list output. Appropriate I/O interfaces provided by user
 RESTRICTIONS: Generates TDL mnemonics. Not necessarily a limitation, if good macro-assembler is available.
 DOCUMENTATION: Provided both in paper and machine readable form.

MEDIA: CUTER 1200 baud cassette, North Star, or CPM(8" or mini) floppy diskettes.
 DATE CURRENT VERSION WAS RELEASED: April 1978
 WARRANTY: 30 day media warranty. Agreement enclosed.
 PRICE: Nort Star(2A00H)-\$40, CPM versions(100H)-\$50, CUTER or NS reloc versions-\$55
 ORDER FROM: alphaBIT Microsystems, Box 1107, 2000 Center St., Berkeley, CA 94704
 Check or money order must be accompanied with order. Overseas orders must add \$7.00 per order for airmail and registration.(not including Canada). California residents must include sales tax.
 REMARKS: UN-Z80 code itself is only 3K approx. including tables and patch area. Symbol table is generated in a workspace, and requires 7 bytes per symbol. This workspace defaults to the end of the program, but may be moved, and limited in size if the user wishes. Inquire from your local dealer if available from him yet.

PROGRAM NAME: DIS-ASSEM-BLER

CATEGORY: UTILITY

DESCRIPTION: Allows conversion of machine language programs to assembly language. Features operator selectable output ports for hard copy or video display. Output can also be directed to cassette tape storage. This utility permits easier modification or relocation of machine language programs. The symbol table can be anywhere in RAM and is assigned by the operator upon program initialization. Line numbers and labels are automatically assigned during disassembly. Special characters will be displayed in the line number as a flag when line numbers exceed 9999. This indicates the need to divide the machine code for 2 or more passes. Tape storage (if selected) is done byte-by-byte (text) for use with assemblers other than ALS-8 or software #1.

MINIMUM HARDWARE REQUIRED: Sol-20/SOLOS with 8K RAM plus enough RAM for the machine code program to be disassembled.
 SOFTWARE REQUIRED: none, program is in machine code.
 RESTRICTIONS:
 DOCUMENTATION: Instruction manual included.
 MEDIA: 1200 Baud CUTS cassette
 DATE CURRENT VERSION WAS RELEASED: October 1, 1978.
 WARRANTY: One year limited warranty.
 Contact COMPUTER PORT for warranty replacement.

PRICE: \$30.00 Order number EC-013.
 Add 3% for freight and handling.
 Add 5% sales tax for Texas residents.
 Visa and MasterCard: send card #, expiration date.

ORDER FROM: COMPUTER PORT
 926 N. Collins
 Arlington, TX 76011
 (817)469-1502

PROGRAM NAME: MODEM1

CATEGORY: Operating System

DESCRIPTION: MODEM1 is an assembly-language program designed to provide telephone-line interface to HELIOS PTDOS. This program, with the D. C. Hayes 80-103 S-100 buss modem, provides remote-terminal operation of the HELIOS system. Automatic answer, sign-on message, and total system operation from the remote terminal are provided. Local-console control is maintained for supervision and optional display of system usage. Total unattended HELIOS system operation is routine.

MINIMUM HARDWARE REQUIRED: less than 2K RAM plus usual 12K for PTDOS. The D. C. Hayes 80-103 S-100 buss modem board is required.
 SOFTWARE REQUIRED: HELIOS PTDOS

RESTRICTIONS: 110 and 300 baud operation only.

DOCUMENTATION: 20-page user's manual with full description of operation and options. Source listings of patchable areas are provided.
 MEDIA: HELIOS data-diskette.
 DATE CURRENT VERSION WAS RELEASED: November, 1978
 WARRANTY: 30 days exchange, repair/replace; 1 year notify for changes.
 PRICE: \$34.95 postpaid; add tax to California orders.
 ORDER FROM: LMC ENGINEERING
 185 South Alice Way
 Anaheim, CA 92806

REMARKS: Various PTDOS system-global parameters are changed. Optional nulls after linefeed may be added to support remote printers. A modification is described to allow remote control of the disk-drive spindle motor to reduce disk wear during idle periods. MODEM1 runs unchanged on any HELIOS system but many patch provisions are included for user customization.

MODEM1 is furnished on a formatted HELIOS data-diskette which may be copied or used for other purposes.

OPERATING SYSTEMS
AND AIDS

PROGRAM NAME: SOLCPM CATEGORY: OP SYSTEM
DESCRIPTION: CP/M COMPATIBLE INTERFACE SOFTWARE AND FIRMWARE
FOR SOL20 / ICOM DISK MODEL FD3712

MINIMUM HARDWARE REQUIRED: 16K EXCLUSIVE OF OP SYSTEM

SOFTWARE REQUIRED: CP/M, CBASIC

RESTRICTIONS:

DOCUMENTATION: OPERATING INSTRUCTIONS AND SOURCE LISTING ARE
INCLUDED WITH 2708 PROM

MEDIA: PRE-PROGRAMMED PROM
DATE CURRENT VERSION WAS RELEASED: JULY 4, 1978

WARRANTY: 90 Day

PRICE: \$ 150.00 + \$ 2.00 Shipping

ORDER FROM:

Computer Mart Ltd.,
1543 Bayview Avenue, Toronto, Ontario CANADA M4G 3B5

REMARKS: CP/M, CBASIC MUST BE PURCHASED SEPARATELY FROM
DIGITAL RESEARCH CORP., OR COMPUTER MART LTD.
DELIVERY 2 WEEKS

PROGRAM NAME: CP/M CATEGORY: Operating System

DESCRIPTION: CP/M provides a full disk operating systems for
floppy disk systems. Includes assembler, editor, Basic-E,
debug, pip, copy, format, submit, sysgen, stat, load programs
and source for I/O section on disk.

MINIMUM HARDWARE REQUIRED: 24K memory

SOFTWARE REQUIRED: None

RESTRICTIONS:

DOCUMENTATION: 6 CP/M Manuals and I/O section listing and
users guide

MEDIA: 8" of 5" CP/M soft-sectored Diskette
DATE CURRENT VERSION WAS RELEASED: 11-13-78

WARRANTY: 6 months

PRICE: \$100 including all manuals

ORDER FROM: Tarbell Electronics
950 Dovlen Place Suite B
Carson, Calif 90746

REMARKS:

(Editor's note; CP/M is produced by Digital Research and
distributed by many vendors in various forms. We presume
the version listed here is pre-customized for the Tarbell
disk controller and use on other disk controllers would
require modification. Find a version of CP/M customized
for your particular disk controller.)

PROGRAM NAME: SECURITY SYSTEM CATEGORY: BUSINESS

DESCRIPTION: This is a security system for a Sol System III or
IV in applications where controlled access to the system is
required. The application system menu is displayed only if the
operator enters correct privilege codes. If an unauthorized
break-in attempt occurs, the system reverts to a locked mode.
The applications system menu is integrated with the SECURITY
SYSTEM and can be easily expanded or upgraded as new
applications software is added. Implementation of the
SECURITY SYSTEM requires modification of the PTDOS diskette
and/or Extended Disk BASIC and is supplied on audio cassette
tape for use with the "CTAPE" routine supplied with the Sol.
Ten levels of authorization are available plus a supervisor
authorization level. Only the supervisor level has access to
code assignment and modification. The supervisor has access to
the following menu:

0. System menu.
1. Enter employee codes.
2. Update employee codes.
3. Break-in attempt report.
4. System usage report.
5. Display operators logged.
6. Operator code generator.

MINIMUM HARDWARE REQUIRED: Sol System III or IV, 48K RAM,
cassette tape recorder.

SOFTWARE REQUIRED: PTDOS and Extended Disk BASIC.

DOCUMENTATION: Instruction manual included.

MEDIA: 1200 baud CUTS cassette

DATE CURRENT VERSION WAS RELEASED: January 1, 1979

WARRANTY: One year limited warranty.

Contact COMPUTER PORT for warranty replacement.

PRICE: \$160.00 (standard version) Order number EC-019
\$250.00 (custom version) contact store for details.
Add 3% for freight and handling.
Add 5% sales tax for Texas residents.
Visa and MasterCard: send card #, expiration date.

ORDER FROM: COMPUTER PORT
926 N. Collins
Arlington, TX 76011
(817)469-1502

MISCELLANEOUS UTILITIES

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PROGRAM NAME: PTDOS UTILITIES CATEGORY: UTILITY

DESCRIPTION: This is a collection of useful PTDOS files, including Dis-assembler, Byte-Finder, ASCII dump from memory, assorted drivers (including source code), drivers with title/date/pagination, tape duplicator, tape rewinds, video mask generator, media conversion program (video screen to printer), terminal command, BASIC tests, and more.

MINIMUM HARDWARE REQUIRED: Sol System III or IV, 48K RAM.
 SOFTWARE REQUIRED: none
 DOCUMENTATION: Instruction manual included.
 MEDIA: PTDOS compatible diskette.
 DATE CURRENT VERSION WAS RELEASED: January 1, 1979
 WARRANTY: Six months limited warranty.
 Contact COMPUTER PORT for warranty replacement.

PRICE: \$65.00 Order number ED-021.
 Add 3% for freight and handling.
 Add 5% sales tax for Texas residents.
 Visa and MasterCard: send card #, expiration date.

ORDER FROM: COMPUTER PORT
 926 N. Collins
 Arlington, TX 76011
 (817)469-1502

PROGRAM NAME: SUPER-SORT CATEGORY: UTILITY

DESCRIPTION: Sort/Merge--Select/Exclude program. High speed, multiple files/keys; fixed or variable fields/records; ASCII or binary data.

MINIMUM HARDWARE REQUIRED: 32k
 SOFTWARE REQUIRED: CP/M operating system.

RESTRICTIONS:

DOCUMENTATION: Manual

MEDIA: 8" or 5"
 DATE CURRENT VERSION WAS RELEASED: 3/79
 WARRANTY: As advertised
 PRICE: \$250.00

ORDER FROM: MicroPro International Corporation or Dealers
 1299 4th Street
 San Rafael, Ca 94901
 415-457-8990

REMARKS: The Standard--The Best. IBM-main frame type Quality/Documentation.

PROGRAM NAME: ALS-8 UTILITIES CATEGORY: Utility

DESCRIPTION: The ALS-8 mag tape utilities cassette provides custom commands for cassette I/O operations when used with ALS-8. Five clear memory commands are also included. Commands include GET1, GET2, SAV1, SAV2, TAP1, TAP2, and COPY. Two tape recorders are required to use the COPY command (for backup tapes). Program comes on cassette as ALS-8 source code addressed at 5000H. Assembled code requires only 12C (hex) bytes of RAM.

MINIMUM HARDWARE REQUIRED: Sol-20/SOLOS with 16K
 SOFTWARE REQUIRED: ALS-8 cassette.
 RESTRICTIONS:
 DOCUMENTATION: Instruction manual included.
 MEDIA: 1200 Baud CUTS cassette.
 DATE CURRENT VERSION WAS RELEASED: May 1, 1978
 WARRANTY: One year limited warranty.
 Contact COMPUTER PORT for warranty replacement.

PRICE: ALS-8 Utilities, order # EC-001 \$15.00
 Add 3% for freight and handling.
 Add 5% sales tax for Texas residents.
 Visa and MasterCard: send card #, expiration date.

ORDER FROM: COMPUTER PORT
 926 N. Collins
 Arlington, TX 76011
 (817)469-1502

REMARKS: If you use ALS-8, these utilities will pay for themselves in time saved.

PROGRAM NAME: PITS CATEGORY: Teleprocessing

DESCRIPTION: Personal Interactive Telecommunication with Scripts (PITS) allows the SOL to be an intelligent terminal which communicates with a timesharing system by following a predefined script. For example, a script could be written to sign on to a timesharing system, transfer a file from the local memory of the SOL, execute a language processor at the remote system, return the results to local memory and sign off the timesharing system. The system contains a simple set of commands for creating and editing script files, for "playing" the script, for entering "dumb" terminal *
 MINIMUM HARDWARE REQUIRED: PITS requires 4K at 0000H. Additional memory required for scripts and files. Also 300 baud modem/acoustic coupler.
 SOFTWARE REQUIRED: SOLOS/CUTER

RESTRICTIONS: All files in ALS8 format. ALS8 not required but useful for editing scripts and files.
 DOCUMENTATION: Complete 20 page user's manual with examples. (Available separately for \$10.00).
 MEDIA: SOL/CUTS cassette
 DATE CURRENT VERSION WAS RELEASED: February 1979
 WARRANTY: 90 day repair/replace/refund for cause
 PRICE: \$50.00
 ORDER FROM: Newth, Ink
 61 Dendron Rd., Suite 910
 Peace Dale, RI 02879

REMARKS: Has been tested with DEC (UNIX, TOPS-20, VMS), CDC (INTERCOM), IBM (CALL-OS), and Telenet. Will relocate for \$20.00. Expected to work at baud rates up to 1200 (untested).

* mode, and for transferring to other programs resident in the SOL.

INPUT-OUTPUT DRIVERS

PROGRAM NAME: DOS-SOLOS IO#1 **CATEGORY:** IO Driver

DESCRIPTION: N*-SOLOS interface. Ties cursor keys to N* editor; VDM speed control & start-stop; Mode select swaps output device; dirctry listings during run; supports clear to send, nulls; null character setable; supports all 3 IO ports

MINIMUM HARDWARE REQUIRED: N* MDS-single density

SOFTWARE REQUIRED: SOLOS or CUTER rom

RESTRICTIONS: No tape CUTER

DOCUMENTATION: On diskette. Has necessary patch points for clear to send, IO port for swap, null count and character,etc

MEDIA: minidiskette

DATE CURRENT VERSION WAS RELEASED: 1-1-77

WARRANTY:damaged media replaced first 2 wks if retnd w/orig pk mtl

PRICE: \$10.00 + \$2.00 shipping & handling with each order

ORDER FROM: **Microcomputer Resources, Inc**
 3000 Medical Park Drive, Suite 108
 Tampa, Fl 33612
 (813) 977-5940

REMARKS: In use for quite a while. One known problem:
 Use of this IO interface with single character input
 of numeric data causes speed change.

PROGRAM NAME: DOS-SOLOS IO#1.1 **CATEGORY:** IO driver

DESCRIPTION: Similar to DOS-SOLOS IO#1, but has numeric input bug fixed. Improvements: MODE causes output to both port of choice & VDM, Single character numeric does not change speed, bell characters going to screen routed to printer.

MINIMUM HARDWARE REQUIRED: SOL/ N* MDS-single density

SOFTWARE REQUIRED: SOLOS/N* software

RESTRICTIONS: DOES not support CUTER

DOCUMENTATION: On diskette

MEDIA: N* minidiskette

DATE CURRENT VERSION WAS RELEASED: 11-78

WARRANTY:damaged media replaced first 2 wks if retnd w/orig pk mtl

PRICE: \$10.00 + \$2.00 per order shipping and handling

ORDER FROM: **Microcomputer Resources, Inc**
 3000 Medical Park Drive, Suite 108
 Tampa, Fl 33612
 (813) 977-5940

REMARKS: CUTER version available as custom assembly for
 an additional \$5.00. Due to size of routines, we were
 unable to make it all fit into 256 bytes without using
 routines in SOLOS.

PROGRAM NAME: DOS-SOLOS IO#2 **CATEGORY:** IO driver

DESCRIPTION: Tape IO system: Tape output is in CUTER format supplied by SOLOS, Saves programs and data. Programs reloaded through LOAD key, VDM Start-Stop/speed control more primitive (hex characters, and stops anywhere rather than end of line),no clear-to-send supports, no directory listings from programs, Uses 2 ports-4 for input, 5 or output.

MINIMUM HARDWARE REQUIRED: SOL/ N* MDS-single density

SOFTWARE REQUIRED: SOLOS/ N* MDS-single density

RESTRICTIONS:

DOCUMENTATION: On diskette

MEDIA: N* minidiskette

DATE CURRENT VERSION WAS RELEASED: 1-78

WARRANTY:damaged media replaced first 2 wks if retnd w/orig pk mtl

PRICE: \$15.00/diskette;\$2.00 shipping handling with order

ORDER FROM: **Microcomputer Resources, Inc**
 3000 Medical Park Drive, Suite 108
 Tampa, Fl 33612
 (813) 977-5940

REMARKS: Routine will load programs saved in text form from PT
ECBASIC. Programs saved will not load in PT ECBASIC.
No null count control, no nulls supplied; DOES NOT support CUTER

PROGRAM NAME: DOS-SOLOS IO#3 **CATEGORY:** IO driver

DESCRIPTION: Tape IO package that allows transfer to PT ECBASIC. No VDM speed control, No Clear to Send, Does not support CUTER. CUTER assembly available for additional \$5.00
Saves programs with name NSTAR.

MINIMUM HARDWARE REQUIRED: SOL/ N*

SOFTWARE REQUIRED: SOLOS/ N* rel 4

RESTRICTIONS:

DOCUMENTATION: On diskette

MEDIA: minidiskette

DATE CURRENT VERSION WAS RELEASED: 2-78

WARRANTY:damaged media replaced first 2 wks if retnd w/orig pk mtl

PRICE: \$20.00 + \$2.00 per order shipping and handling

ORDER FROM: **Microcomputer Resources, Inc**
 3000 Medical Park Drive, Suite 108
 Tampa, Fl 33612
 (813) 977-5940

REMARKS: Less convenient to use that other routines.
 Special purpose driver for program transfer



PROGRAM NAME: DOS-SOLOS IO#4 **CATEGORY:** IO driver

DESCRIPTION: Similar to 1.1, except that it operates as an IO distributor. You set the port to n by PRINT #N+1, which sets all output to N. Switching back is PRINT #1. Supports Clear to Send, and has all other features of 1.1 except MODE SELECT.

MINIMUM HARDWARE REQUIRED: SOL, N* MDS-single density

SOFTWARE REQUIRED: SOLOS, Rel 4

RESTRICTIONS:

DOCUMENTATION: on diskette

MEDIA:

DATE CURRENT VERSION WAS RELEASED: 3-78

WARRANTY:damaged media replaced first 2 wks if retnd w/orig pk mtl

PRICE: \$25.00

ORDER FROM: **Microcomputer Resources, Inc**
3000 Medical Park Drive, Suite 108
Tampa, Fl 33612
(813) 977-5940

REMARKS: Has been used for 1 year + by OEM users.

PROGRAM NAME: DOS-SOLOS IO#6 **CATEGORY:** IO driver

DESCRIPTION: similar to DOS-SOLOS IO#2, except that data is placed on tape in straight ASCII (SWTPc 6800 format). This driver is made up of two routines. One saves programs and data, the other re-loads programs. The VDM controls, editor linkages & other refinements of #2 are in the saving routine, but loading programs lost all features due to size of program

MINIMUM HARDWARE REQUIRED: SOL/N* MDS-single density

SOFTWARE REQUIRED: SOLOS/ Rel 4 N*

RESTRICTIONS:

DOCUMENTATION: on diskette

MEDIA: minidiskette

DATE CURRENT VERSION WAS RELEASED: 2-78

WARRANTY:damaged media replaced first 2 wks if retnd w/orig pk mtl

PRICE: \$20.00/diskette;\$2.00 shipping & handling w/order

ORDER FROM: **Microcomputer Resources, Inc**
3000 Medical Park Drive, Suite 108
Tampa, Fl 33612
(813) 977-5940

REMARKS: Two sets of drivers supplied on one diskette requires you to separate them onto your own diskettes for use. Supplied ready to go on two diskettes for additional \$3.00

PROGRAM NAME: DOS-SOLOS IO#5 **CATEGORY:** IO driver

DESCRIPTION: N*-Helios transfer. Allows you to transfer data and programs from a N* MDS-single density into a HELIOS. Automatically creates files. Formatting must be done in BASIC program to arrange data for easy recovery. Has almost no editing enhancements/does not support CUTER, or clear to send.

MINIMUM HARDWARE REQUIRED: N* MDS-single density, HELIOS II, SOL

SOFTWARE REQUIRED: 1.4,1.5 PTDOS, Rel 4 N*

RESTRICTIONS:

DOCUMENTATION: On diskette

MEDIA: minidiskette

DATE CURRENT VERSION WAS RELEASED: 3-78

WARRANTY:damaged media replaced first 2 wks if retnd w/orig pk mtl

PRICE: \$40.00 + \$2.00 shipping & handling w/each order

ORDER FROM: **Microcomputer Resources, Inc**
3000 Medical Park Drive, Suite 108
Tampa, Fl 33612
(813) 977-5940

REMARKS: Requires editing of program before PT DBASIC can load due to leading CR/LF string. If all program less than 64 characters, VDM editor can be used, else macros are provided for EDT3 to allow easy program patching. Has saved many hours in program transfer.

PROGRAM NAME: HELP1 **CATEGORY:** Operating System

DESCRIPTION: HELP1 is an operating-software package consisting of five standalone assembly-language programs designed to run under HELIOS PTDOS. Included are: a device-driver file for the Tarbell Cassette Interface for tape/disk operations; CLOD and CSAV for tape/memory operations; and ASCII-hex memory enter and dump commands. All programs operate as direct console commands with parameters.

MINIMUM HARDWARE REQUIRED: less than 2K system RAM plus the usual 12K for PTDOS.

SOFTWARE REQUIRED: HELIOS PTDOS.

RESTRICTIONS: none.

DOCUMENTATION: 30-page user's manual with full description of operation and options. Source listings of patchable areas are provided.

MEDIA: HELIOS data-diskette.

DATE CURRENT VERSION WAS RELEASED: March, 1978

WARRANTY: 30 days exchange, repair/replace; 1 year notify for changes.

PRICE: \$22.95 postpaid; add tax to California orders.

ORDER FROM: **LMC ENGINEERING**
185 South Alice Way
Anaheim, CA 92806

REMARKS: This software is flexible and includes many command parameter options and recorder controls. All programs run unchanged on any HELIOS system but many patch provisions are included for user customization.

HELP1 is furnished on a formatted HELIOS data-diskette which may be copied or used for other purposes.

PROTEUS PRICE LIST

See the Proteus Catalogs in Proteus News, volume 2, numbers 4 and 6, for descriptions of the items shown below by code number. Prices and availability subject to change without notice. UNLESS STATED OTHERWISE, ALL ITEMS SHOULD BE ORDERED FROM

PROTEUS
1690 WOODSIDE ROAD, SUITE 219
REDWOOD CITY, CALIFORNIA 94061

PROGRAM NAME: ANGLOPHONE CATEGORY: SPEECH SYNTHESIS

DESCRIPTION: This program is a subroutine callable from an assembly language or higher level language program. It converts an ASCII string in ordinary English into phonetic codes stored in a buffer. An additional subroutine reads the codes and drives a speech synthesizer to produce the corresponding spoken sounds. Synthesized speech from cheaper synthesizers requires considerable practice to understand; better ones produce better quality.

MINIMUM HARDWARE REQUIRED: SOL-20, 16K RAM (or 12K ROM and 4K RAM), and speech synthesizer (VOTRAX VS-6 or VSK or Computalker).

SOFTWARE REQUIRED: SOLOS/CUTER. Computalker version requires Computalker's CSR-1 software package. Diskette versions: N*, CP/M

RESTRICTIONS: May make minor mispronunciations when dealing with words that are unusual and irregular in pronunciation.

DOCUMENTATION: User's manual, including assembled, annotated source code.

MEDIA: SOL/CUTS cassette, Northstar disk, CP/M 8" disk, Paper tape. DATE CURRENT VERSION WAS RELEASED: Nov 1978

WARRANTY: limited to replacement of defective media

PRICE: Computalker version \$45; Votrax VS-K \$100; Votrax VS-6 \$200.

ORDER FROM: UPPER CASE books

502 E. John St. Telephone (217) 384-4382
Champaign, IL 61820

REMARKS: Also available: 8080 talking terminal interface software, complete talking terminal for the blind, ASCII to phonetics device, custom programming. MANUALS AND PROGRAMS ARE AVAILABLE FREE TO NON-PROFIT INSTITUTIONS FOR USE IN TALKING TERMINALS FOR THE HANDICAPPED. Prof. Peter B. Maggs, Univ. of Ill. College of Law.

PROGRAM NAME: Universal Graphics Interpreter CATEGORY: Engineering, Education, Science

DESCRIPTION: Graphics Driver for Cromemco Dazzler, Vector Graphic Hi-Res Display board, Matrox ALT-256 and Alt-512. Allows user to create and easily access display file. Graphic commands include point, line, circle, shaded circle, rectangle, shaded rectangle, ray, ellipse, polygons, shaded polygons, alphanumerics, and more. Control commands include selectable origin, cursor control for moving images, and more.

MINIMUM HARDWARE REQUIRED: 8080 or Z80 processor, S-100 bus computer, graphic display, 5K memory.

SOFTWARE REQUIRED: none

RESTRICTIONS: coordinate values restricted to $\pm 32,000$ or 0 to 65,000

DOCUMENTATION: 68 page manual, relocatable loader, object listing

MEDIA: paper tape or Tarbell cassette

DATE CURRENT VERSION WAS RELEASED: January 1, 1979

WARRANTY: 2 year notify

PRICE: \$35 except Alt-512 is \$50

ORDER FROM: Sublogic

Box V
Savoy, IL 61874
(217) 367-0299

REMARKS: Specify display board and media

PROCESSOR TECHNOLOGY DOCUMENTS. After December 31, 1979, order these directly from Tony Severa at his address shown below under Helios library.

D1 ***	D2 ***	D3 ***	D4 ***	D5 ***	D6 ***
D7 ***	D8 ***	D9 ***	D10 ***	D11 \$5	D12 \$5
D13 \$5	D14 \$5	D15 \$.55	D16 \$1	D17 \$.85	D18 \$.70
D19 \$.70	D20 1.50	D21 \$.55	D22 \$.65	D23 2.03	D24 \$1
D25 1.50	D26 \$5	D27 \$5	D28 \$5	D29 \$5	D30 \$1
D31 \$1	D32 ***	D33 ***	D34 \$7	D35 ***	D36 \$.85
D37 \$.70	D38 ***	D39 ***	D40 4.41	D41 \$.70	D42 ***
D43 ----	D44 1.30	D45 \$1	D46 \$.55	D47 1.30	D48 \$.55
D49 \$.55	D50 \$.70	D51 1.15	D52 \$.55	D53 ***	D54 \$.70
D55 1.15	D56 \$3	D57 \$.70	D58 \$1	D59 1.73	D60 \$3
D61 \$.70	D62 \$.70	D63 \$.55	D64 \$.70	D65 1.15	D66 \$15
D67 \$.65	D68 \$.85	D69 \$1	D70 \$.70	D71 \$5	D72 \$25
D73 \$.85	D74 \$.85	D75 1.73	D77 \$7	D78 2.03	D79 2.03
D80 \$7					

UPDATE SERVICES. Send your original diskette to us for updating to more recent revision level.

US1 \$5 US2 \$5 US3 \$10 US4 \$10 US5 \$10 US6 \$10
US7 \$10

CASSETTE LIBRARY (DONATED PROGRAMS). Order directly from Lewis Moseley Jr., Proteus Cassette Librarian, 2576 Glendale Court NE, Conyers, GA 30208.

C1 \$16* C2 \$18* C3 \$16* C4 \$18* C5 \$18* C6 \$18*
C7 \$18*

HELIOS LIBRARY DISKETTES (DONATED PROGRAMS). After December 31, 1979, order these diskettes from Tony Severa, Helios Librarian, 131 Highland Avenue, Vacaville, CA 95688.

H1 \$25* H2 \$25* H3 \$25* H4 \$25*

PROPRIETARY PROGRAMS. Price after the slash is for manual if ordered without the software, creditable to the software price if purchased later.

P1 \$250 / 35 P2 \$350 / 35 P3 \$125 / 25
P4 \$500 / 35 P5 \$500 / 35 P6 \$500 / 35
P7 \$125 / 25 P8 \$075 / 95 P9 \$1995 / 200

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PN0 \$2 PN1 \$10 PN2 \$15** PN3 \$18**

*Each donated program or file gives one discount credit toward purchase of a library cassette or diskette. Library cassettes are \$8 plus a discount credit. Library diskettes are \$10 plus a discount credit.

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***Limited quantity. Special arrangements will be required to borrow item from PROTEUS.

---Sold out and no longer available.

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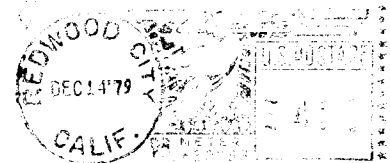
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For your convenience, you may use a copy of this form to order any items in the PROTEUS Catalog. Cost of items are shown in a separate price list. For Update Service, send original cassette or diskette with your order. California residents, add 6% sales tax. Total amount of purchase to be made payable to PROTEUS in U.S. funds only, please.

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