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. Reported, the trade-in values are high, so that customers can upgrade their systems at minimal cost. The nRA 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.

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.

PRIORITY AUTHORIZATION IS NOW REQUIRED FOR RETURNS TO PTC SERVICE DEPARTMENT

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.

IN THE COMING ISSUES

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 HELIOS and the ALC-G 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.

PROTEUS / NEWS

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Instructions to contributors: Letters and articles may be submitted in camera-ready form or on Sol/Cuts cassette 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.

UPDATE ON PROTEUS PROJECTS

The S.L.A.C. Pascal Compiler is available among other programs on the 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 on 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.
A REVIEW OF PTO DOS 1.5

The original release of PTO DOS (version 1.4) has been improved and released as version 1.5. The new manual describes the changes in addition to those shown in version 1.4.

Three new commands have been added: HELP, DCHECK, and XOR. The HELP command takes an argument list of command names and gives a brief description of each command named. No argument is given about how to use the HELP command itself. This command is essentially an abridged manual of PTO DOS, so you don't have to leaf through the printed version one so far.

The DCHECK command generates a cross-reference listing of an assembly language program. It works faster than the XOR command, which it replaces in version 1.4.

The PTO DOS 1.5 system disk also contains the Extended Disk Basic interpreter which is 1.4.

BITS AND PIECES

Some error messages have been reversed, and the manual now has a separate section containing each PTO DOS error message in detail. Some error messages have been reworded, and the manual now has an entire section containing each PTO DOS error message in detail. Suggestions are made on how to work around errors in version 1.4.

The screen editor (EDIT) now supports 'tab' stops on the screen. The TAB key sets a tabulation point in each line of text. The LOAD key 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-orientation pseudo-ops to control the output. It also has a pseudo-op which works like "AEC" to create an ASCII string, except it appends a NULL (00H) character as delimiter in the PTO DOS conversion program. Labels may have lower case letters, and a few other small changes have been made. The changes are not something we think any error flags given on some more useful tables, and explains a sample listing. The DEBUG program now supports the XDEBUG program, rather than using its internal XVR driver as default. The chapter on DEBUG has been greatly expanded and includes a "walk-through" example.

The entire PTO DOS 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. There are no archive file formats. 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 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, PTO DOS 1.5 is the next evolutionary step in Processor Technology's disk operating systems. The most significant change is the improved DDISK command. The most significant change in the manual is the next chapter on version 1.4. I don't yet know how PT intends to handle upgrading for users of PTO DOS 1.4. That is, what price will existing users have to pay for the new version. It will be the same as one other major change: the additional manual and diskette. When I find out, I'll pass the info along.
I N T R O D U C T I O N T O P A S C A L
by Chip Weems

AN INTRODUCTION TO PROGRAMMING IN PASCAL

Chip Weems
Graduate Teaching Assistant
Department of Computer Science
Oregon State University
Corvallis, Oregon 97331

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 procedure and function. Emphasis will be placed on using Pascal statements, although some discussion of the power of user defined data types will also be included.

One 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 of the others 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 in 1642. By the end of his life he had published in 1657.

The Pascal language was originally specified in 1968 by Niklaus Wirz at the Institut für Informatik, Zurich. This makes it a relative newcomer to the family 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 must compilers are not introduced until three to five years after their initial specifications. (For example, APL was initially specified in 1962.)

<table>
<thead>
<tr>
<th>Language</th>
<th>Introduction Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>FORTRAN</td>
<td>1957</td>
</tr>
<tr>
<td>CORDIC</td>
<td>1960</td>
</tr>
<tr>
<td>ALGOL</td>
<td>1960</td>
</tr>
<tr>
<td>LISPE</td>
<td>1961</td>
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<tr>
<td>SNOLDL</td>
<td>1962</td>
</tr>
<tr>
<td>BESK</td>
<td>1963</td>
</tr>
<tr>
<td>PL/1</td>
<td>1965</td>
</tr>
<tr>
<td>APL</td>
<td>1967</td>
</tr>
<tr>
<td>Pascal</td>
<td>1971</td>
</tr>
</tbody>
</table>

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 a discussion with groups of programmers: Some love it, and some hate it. However, those who love 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 modified if necessary. The concept of a structured program usually involves stepwise refinement, or top-down programming. Languages designed

structured programming in mind will usually include a large group of program-flow control structures, which are entered at one end 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 program. 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; far 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 with 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 the code exists as a form of shorthand which will make sense as English phrases. This would seem to take the place of program comments, but even so, Pascal provides one of the most flexible comment schemes possible. Comments can appear anywhere in a Pascal program except in the middle of words.

Stepwise Refinement:

In writing a Pascal program it becomes very easy to refine your program by top-down, or stepwise refinement. This is mainly due to the flexibility and ease of writing procedures, functions, and subroutines. It is not unusual to see incredibly complex Pascal programs in which main program accounts for less than one hundred lines, in which the entire main program accounts for less than one hundred lines. Such a main program will usually consist of the overall program flow logic, driven by 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, or procedures in FORTRAN. They can also include declarations of variables and functions 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 loop, English-like pseudocode.

One thing should be noted here: Pascal is probably best classified as a descendant of ALGOL. People who know Algol well have a distinct advantage 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 is a language with very few 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 need it. Because Pascal also requires that each variable be defined before it is used, it is a good idea to describe and code the program in advance. This is not to say that careless pre-planning often becomes quite self-evident just by looking at the declarations.

The flexibility which gives Pascal its power is the thing which makes it difficult for non-Pascal programmers typically to understand and use. These are the things which make Pascal interesting to work with, and, when you understand how to use them, you will probably be interested in learning more about this language.

The most difficult single new idea to come out of Pascal is the use of deference data type. This construct, which appears in the declarations, permits the use of only one type 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 quite easy.

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Probably the greatest single new idea to come out of Pascal is the user defined data type. This construct, which appears in the declarations, permits the use of only one type 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 quite easy.

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Users may define data types as outrageously complex as arrays, pointers, and complex numbers. The programming power added by this concept makes it almost impossible to imagine, let alone design. 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 work the way many people think it does, because there is an almost infinite number of possible branches in a program. How can you prove that a block of code will work correctly, when you can't even figure out 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. Such a section is invoked by the GOTO from 20 different locations in the program. In addition, these GOTO statements jump into the scoring routine code at six different points, depending on the data present and the event. Depending on the data present and the exit 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 when it returns, it will branch to several places in itself, loop in two places, or fall straight through.

This is one of the reasons why it is so much easier to write programs in structured languages. When the program is broken down into small units, it is much easier to see how each unit works, and how the whole program works.

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

1. DO IF CONDITION
2. IF CONDITION
3. THEN
4. STATEMENT
5. ELSE
6. STATEMENT

The WHILE statement has the form:

1. WHILE
2. CONDITION
3. DO
4. STATEMENT
5. END

This next one is the REPEAT-UNTIL statement. This is important, because the WHILE statement is a Pascal statement, while the REPEAT-UNTIL statement is a BASIC statement. The difference is that the WHILE statement is executed after the condition is true, while the REPEAT-UNTIL statement is executed before the condition is true.

The CASE statement is somewhat like the ON-GOTO statement in BASIC, except that it is restricted to an increment of 1. This is intended to add to the reliability of the construct.

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BOX 1579, PALO ALTO CA 94302

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BOX 1579, PALO ALTO CA 94302
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 =, *, /, \, ( \ , ) \ , : \ , + (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 digit must be different than the first character of any other name. Examples:

ENDOFDATA TYPES AVERAGE SN7073A TOTAL SCORES PAYTAXE CARDCOUNT

Numbers:
Numbers in Pascal are either real or integers. They may be signed or unsigned. Integers are a string of digits. Examples:

+7 43 365 -18 898607 4092 0

REAL have three forms:
digits.digits.digits.digits.E+factor

digits.digits.E+factor

digits.scale factor

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

Examples:
3.1415 6.02233 9.11E-31 -169

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
• Division (integer part only, remainder discarded)
• Addition
• Subtraction

MOD
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
=
USED with data type SC, 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
SUR Square
TRUNC Truncate to integer part
ROUND Round-up integer form
SUCC Next highest (integer or char)
PREV Next lowest (integer or char)
SIN Trigonometric sine
COS Trigonometric cosine
ARCTAN Trigonometric arc tangent
LN Natural (base e) logarithm
EXP e raised to the power
SQR Square root
ORD Numeric value associated with the character

Note that the constant definitions can continue onto more than one card. These variables 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

Variable Definition:

VAR varname, varname,...; type;
varname, varname,...; type;

Example:

VAR score, max, min, total: INTEGER;
RADIUS, DIAMETER, CIRCUMFERENCE: REAL;
FOUND, DONE, FLAG: BOOLEAN;

Procedure Definition:

PROCEDURE procedure (value parameters); VAR variable parameters);
body of procedure

Example:

PROCEDURE INCDEMENTBY (INCREMENT: REAL);
VAR VARIABLE: INCDEMENTBY: REAL;
BEGIN
VARIABLE := VARIABLE + INCREMENT;
END;

Function Definition:

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

Example:

FUNCTION radius (circumference: REAL): REAL;
BEGIN
RADIUS := CIRCUMFERENCE / 2 * PI;
END;

Assignment Statements:

vname := expression

Examples:

WEEKS := YEAR * HOURS; WORKED;
WEEKS := HOURS * DAYS;
WORKED := (PI + SQRT(RADIUS) * HEIGTH) / 3.0;
ARRAFICATION := ARRAYLOCATION + 1;

Note that the assignment statement is very flexible—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.
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
  SCOUREM = SCORESUM + SCORE;
  SCORECOUNT = SCORECOUNT + 1;
END
```

```
BEGIN
  x := (x + 3) / 4;
  y := (y - 1) / 2;
  z := (z * 2) / 3;
END
```

Place 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 statement takes the place of a semicolon in separating the two statements.

Conditional Statements:

The IF-THEN Statement:

```
IF expression THEN statement
```

Example:

```
IF x > y THEN
```

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

Example:

```
IF x < 0 THEN
```

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

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

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

Rerative Statements:

```
The WHILE-DD Statement:
WHILE expression DD statement
```

Example:

```
WHILE NOT EOF(INPUT) DO
```

```
The REPEAT-UNTIL Statement:
REPEAT group-of-statements UNTIL expression
```

Example:

```
REPEAT
  x := x + 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 ARRAY Length DO
  ARRAY [INDEX] := 0
FOR INDEX := 100 DOWNTO ARRAY Length 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 GOTOs 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.

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)
READ( pathname , variable-list)
```

Example:

```
READ('A', 'B', 'C')
```

```
WRITE('A', 'B')
```

```
WRITE('C', 'D')
```

```
WRITE('A', 'B', 'C')
WRITE('D')
```

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Example:

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```

```
WRITE('A', 'B')
```

```
WRITE('C', 'D')
```

```
WRITE('A', 'B', 'C')
WRITE('D')
```

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

Examples:

```
WRITE('A', 'B')
WRITE('C', 'D')
```

```
WRITE('A', 'B', 'C')
```

```
WRITE('D')
```

```
WRITE('A', 'B', 'C')
WRITE('D')
```

Formatting numeric output is very easy in Pascal. Each expression in a WRITE statement must have one of the following three forms:

expression
expression/width-expression
expression/width-expression/fraction
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 isn't large enough, the value will be padded with blanks. The value may be 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[i..2], C[137875, 3217], D[10, 128, 3492]
WRITE(A[5..9], B[5..9], C[10..5], D[9..3]) would output
100 1.5137875 3217 128.3492
WRITE(A[3..5], B[5..12], C[9..1]) would output
100 1.50 37875.

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
emulated by the monitor or operating system, in software.

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

<table>
<thead>
<tr>
<th>Character</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space</td>
<td>Deletable, single spacing</td>
</tr>
<tr>
<td>0 (zero)</td>
<td>Double space, skip 1 line</td>
</tr>
</tbody>
</table>

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 variance-list : constant..constant;

Examples:

```
A[1..5] FOURSPACE(X,Y,Z) LIST(N+1)
```

Record Types:
* TYPE typename = RECORD field-list
  END;

VAR variance-list : RECORD field-
list END;

Examples:

```
TYPE COEFFICIENTS = ARRAY[0..4] OF REAL;
VAR sampelenums : RECORD[0..100] OF REAL

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

END;

set комплексний список ДЕ "указатели" привязываются
до всех доступных функций на ограниченном списке.
```

Example:

```
WITH EML, COMB D D BEGIN
  A := NAME;
  B := ADDRESS;
  C := REAL;
  D := IMAGINARY
END
```

Set Types:
* TYPE typename = SET OF base-type;

VAR variance-list : SET OF base-type;

Examples:

```
TYPE letter = SET OF 'A'..'Z';
VAR digits : SET OF 0..9;
VAR sizes : SET OF ('SMALL', 'MEDIUM', 'LARGE');
```

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

Set Operations:
- union
- set intersection
- set difference
- set equality
- set inequality
- set inclusion

IN leads operand is a scalar, right operand is a set. Evaluation is
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 variance-list : FILE of type;

Examples:

```
TYPE DATA = FILE of INTEGER;
VAR ciphertext : FILE of CUSTFILE;
```

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 head) as was noted earlier, a buffer with the same name,
followed by an f symbol is created. This buffer variable is like a window

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on the current position of the file.

Examples:

B: CUSTFILE
CUSTFILE := XYZ

The standard 1/0 procedures for use with files are:

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

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

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

PUT(file) Appends the current value of file name to the file. If the file name is at end-of-file, the file name becomes undefined after a PUT.

EDF(file) Evaluates 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(file, varname-list) 
READLN(file, varname-list) 
WRITELN(file, varname-list)

Priority Types:

- TYPE : typename := type;
- VAR : varname := type;

Examples: (A linked list)

TYPE LINK := PART;

PART := RECORD
  NEXTLINK: LINK;
END;

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Conway, Richard; Grzes, David; and Zimmerman, C. C. A Guide to Pascal

Bowles, Kenneth L. Problem Solving

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.

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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 on the WordWizard User's Manual (Library of Congress catalog card no.: 76-67204). In a future article we plan to compare it with competitive programs, such as the Electric Pencil II by Michael Shrayer (see our review directory in News, vol. 3, no. 6). In this preliminary review, we will also describe our "hands-on" experience 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 situations that are called word processors, from personal computers with some sort of recording medium to multi-terminal computer systems using the 80-character terminal. Basically it is a system for composing and editing documents into a machine-readable form 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 WordWizard. First, of course, is the computer, unlike Processor Technology's previous software, WordWizard is designed to run on a Sol with a 80-column display. Because of the versatility of the PDP-8, the disk operating system for Helios, it is possible to run it on any number of computers that can read a Helios disk, but PDP isn't marketing the system as an add-on for other computers, just for the Sol. The marketing brochures say that WordWizard is suitable for installation on a Sol with an 80-column display, in place of the monitor that comes with the Sol and Helios diskette at a time, so the 4-disk model of Helios isn't of any advantage. Any personal computer can be used with WordWizard, as long as it meets the processor's requirements (48K of RAM, two disk drives, or two diskettes, a dot-matrix printer and one dot-matrix printer) or the Xerox/Diablo 160/180 terminal. Although provision is made for a cassette drive to operate other printers. The WordWizard package also contains a set of self-adhesive labels that are to be placed above the keyboard, aligned with the top margin. 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 "BOOT" 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 remaining space 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 50K of space for about 5K letters of text in upper-case.

At this point the typist can select one of the following actions: create a new document, rename an existing document, edit a document, select a document for use as a merge base, or copy a document into the system disk (the "archive") for other programs or for retrieval later, retrieve 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 document to the system disk, format a new document disk, select a printer, or return to the word processing activities.

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-letter-quality printer for final drafts.

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 typist to do the work of two or three less-sophisticated systems—a factor which may be very important 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 76th column is used for a break character which indicates end of paragraph. Using the cursor control (arrow) keys the typist can move the cursor around within the window of text. The typist moves the cursor moves the edge of the window (either with the arrow keys or by entering text) the window moves (scrolls) in the appropriate direction. For example, in 80 characters wide, horizontal moves of the window are made in 32-character groups so that the typist isn't given a headache from trying to keep track of the cursor. Horizontal scrolling is 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 end of the line or the screen.

Once the desired place is found, the typist moves the cursor to the top margin and begins typing something to be done, and leaves 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, justifying 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 resizes the window to accommodate the margin. All of this occurs instantaneously and without interrupting the typist. The only time the typist is aware of 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 4000 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 margins, set the justification, or add a new tab setting. The typist can also change the characters on the screen 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 edited, but not letter-by-letter. It's not possible to put partial letter-size changes. The finished body of the document before it is printed. The changes are done on the screen as the document is typed so that the typist has a visual preview of the document before it is sent to the printer, so they can't be seen on the screen in final form.
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 the typed text or a typist can type over an error. When the typist has finished editing, 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, press the INSERT function key and type the text into a line from a two-line, with everything to the left of the cursor moved up onto the second line. To type in a sentence with the first word on the first line, and the rest on the second, no space is left between the words. The use of space between words is determined by the spacing mode. The insertion can be typed in the gap created by deletion.

To close the gap created by insertion and deletion, the CLOSE function key is used. This resets the position of the cursor and the rest of the text in the line to the original position. The use of space between words is determined by the spacing mode. Blocks of text can be deleted, moved, or copied anywhere in groups of up to 16 lines per block. Any number of blocks can be moved or deleted at one time using the TAB key. Non-printing comments can be inserted to identify portions of the document to the typist, to remind the typist to add a line 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 separated further by justification. 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 Merge feature 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 the above features have been accomplished without the use of command lines inserted in the text, because the formatting is done in the non-printing phase prior to printing. The design of the WordWizard emphasizes all of the formatting in the interactive editing phase, so that the system acts much like a very capable electronic typewriter. It would be difficult for the typist to 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: spaces, line spacing, page numbering, front and back matter, and so on. These programs, heavy use is made of command lines inserted in the text, because the formatting is done in the non-printing phase prior to printing. The design of the WordWizard emphasizes all of the formatting in the interactive editing phase, so that the system acts much like a very capable electronic typewriter. It would be difficult for the typist to 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.

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MODIFICATION OF PTC MUSIC SYSTEM FOR THE NORTHSTAR

by N. C. PATE

Here is a quick and dirty modification that will adapt your Processor Technology Corp. Music System to use with your Northstar 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 easier if you can do it.)
2. Get and execute the program MUSIC from your PTC tape. (Do this either by "XRQ 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 1FF" for a high memory address of 3K.)
4. Leave MUSIC. (Execute the Return command, "R", and you will be back in SOLOS or CUTER.)
5. Change the following memory locations.

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000-0002H</td>
<td>C3 E0 08 (JMP 00E0H)</td>
</tr>
<tr>
<td>0089-00B8H</td>
<td>04 CO (C004H, SOLOS entry)</td>
</tr>
<tr>
<td>018C-018D8H</td>
<td>04 2A (2A04H, new MUSIC file beginning)</td>
</tr>
<tr>
<td>0860-0861H</td>
<td>21 00 2A (LIX 2A00H)</td>
</tr>
<tr>
<td>0863-0864H</td>
<td>36 00 (MV 0)</td>
</tr>
<tr>
<td>0865H</td>
<td>23 (IN 0)</td>
</tr>
<tr>
<td>0866-0867H</td>
<td>36 C3 (MV 0, OCH3)</td>
</tr>
<tr>
<td>0868H</td>
<td>23 (IN 0)</td>
</tr>
<tr>
<td>0869-086AH</td>
<td>36 00 (MV 0)</td>
</tr>
<tr>
<td>086BH</td>
<td>23 (IN 0)</td>
</tr>
<tr>
<td>086C-086DH</td>
<td>36 00 (MV 0)</td>
</tr>
<tr>
<td>086E-086FH</td>
<td>31 FD C1 (LIX SP, OCHDH)</td>
</tr>
<tr>
<td>08F1-08F3H</td>
<td>C3 E0 03 (JMP 3)</td>
</tr>
</tbody>
</table>

*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, "CM 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 256H, 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 2A04"). Your 2A01H 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 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 now as REM S-100 made by Seminetics, 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 REM is available to perform 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 everyday 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. 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 has 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), file may still be open. When you remove the diskette, put another one in the same slot and allow PTDOS to close the open files, it will write out 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.

If you don't avoid this? First, if you doubt whether files are still open, you can open files listed with the "OPEN" command. The CENV-C key given at the beginning of a command (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 open file operations. This won't harm the new diskette, but the old one's files that were never closed may become lost data that stayed behind in the buffer.

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

Another puzzling problem can arise when you retyp 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 system 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. How the program runs a while and PTDOS refuses to do a file operation because the file is protected. You look at the file at the time both files and find that neither is "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. Then 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 PFD's from the previous openings. This is a useful feature designed into PTDOS to allow files to be "multitype". Each instance of the opening creates its own PFD so it is independent of the others. One of the rules about multiple-open files is that only the first opening can read and new blocks by writing beyond the existing end-of-file. Then your program got to the point where file A had to be written, PTDOS refused because of this rule. Apparently PTDOS keeps track of the rule by marking the second and subsequent openings as though they have the "I" attribute, which protects against errors when that file is written. Hence you get this puzzling but correct error message.

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

What's it wrong to close the files after an abnormal end? Only when you want to keep the cursor pointing to the current level in the file. If you can have the program resume execution where it left off, you shouldn't close the file because it will interfere with the program's operation on the file. For example, if the program is interrupted by the "WRITE" operation, 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. However, an error report from PTDOS will 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 power 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 you finally come back, the printer has stopped. You are told that the pages are too long and are unprintable. Print the whole thing over? You would have to redial every file you wanted to reprint 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. Then you get the last good lines printed, interleave the copy with the MODE SELECT key on the Sol or CT/60. The COPY program will finish the cursor up 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 in,device"

where "in" 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 numbering you have. If you have punched 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 PTDOS 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 can list lines only when you use the "LINE" command all the numeric keys. It's great when you want to get something very 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 PROTDOS, WE ALSO WOULD LIKE TO RUN SIMILAR ARTICLES ON CF/M, NORTHSTART, MICROFILM, AND OTHER DISK OPERATING SYSTEMS. ARTICLES ON THESE SYSTEMS ARE WELCOME.
SPEECHLAB REVIEWED
by Bruce Barron

SPEECHLAB 50 is just that—a speech lab. It teaches the user the basics of speech recognition and to create and test speech generation. The SPEECHLAB 50 from Hewlett-Packard is a single board, a microcomputer, and a software system. The board contains the hardware, and the software contains the interface. The user can then use the board to communicate with the computer.

The SPEECHLAB 50 is designed to be used by generating a tone and playing it through the microphone. Unfortunately, when the system is first turned on, the circuit is not activated, and it is necessary to send a turn-on command out via the port. This can also be fixed by using hardware at the front panel to allow the user to enter the port directly. 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 IEEE manual explains the testing and also gives the theory of operation, although knowledge of the hardware is not necessary for the use of the lab. The IEEE manual is quite comprehensive. It starts off with an explanation of how speech is generated and then goes on to discuss the phonetic alphabet for "American English". The first two experiments use a machine language program, which is the software is treated as a black box. In this program, the user "trains" the machine with words or phrases up to and including 10 seconds long. The second half of the program then types out a word in response to the user's vocal input. Very impressive, using 5 folks response in one software change required when using the SOL with voice alone or a VOX with a Vocoder or other devices. The Vocoder subroutine writes a CR and then the LF. This is a popular technique and other parts of the documentation will also write a LF if the "V" function is interrupted.

The rest of the experiments use a modified "C" version 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 speech signal is a complex phenomenon, it is quite an impressive job. The user may suggest two additions to the package: an interpreter, both of which are easily added and a "S" function to return to the monitor and second "CLEAR" since this function is not automatic with your text is in most "C" driven. I have sent source code for these additions to Hewlett-Packard. The package does not have provisions for saving a program but the interpreter is short enough to record it and the program intact.

Throughout the manuals, Hewlett-Packard sets the user to keep them informed of hardware and software changes and interesting experiments. 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.
SOL UTILIT\XY COMMAND: 16-BIT INTEGER MATH

by Lewis Moseley, Jr.

0000  SDT UTILITY PROGRAM TO DO 16-BIT
0010  INTEGER ARITHMETIC
0020  
0030  SDT COURTESY OF LEWIS MOSELEY, JR.
0040  2514 OGDEN CT NE
0050  WCONYERS; GA. 30207
0060  SDT THIS VERSION DATED 12/01/78
0070  
0080  SDT COMMAND TAKES THE FORM:
0090  SDT # MATH <P1> <P2>
0100  SDT WHERE P1 AND P2 ARE HEX NUMBERS
0110  
0120  SDT THE RESULT IS DISPLAYED AS FIVE
0130  SDT HEX NUMBERS, AS FOLLOWS:
0140  SDT #P1+F #P1-P #P1* #P1/ #P1 MOD #P2
0150  SDT WHERE P1/#P2 MEANS INTEG. DIVISION
0160  SDT #P1 MOD #P2 MEANS THE REMAINDER
0170  SDT OVERFLOWS ARE IGNORED.
0180  
0190  SDT THANKS TO ATLANTA COMPUTER MTR,
0200  SDT #5091 BUFORD HWY, ATLANTA, GA. 30340
0210  SDT #FOR THE USE OF A DECWRITER FOR THIS
0220  SDT LISTING.
0230  
0240  SDT THIS PROGRAM RESIDES IN THE SOLOD
0250  SDT KEY SYSTEM RAM AREA, WHEN SAVING TO
0260  SDT #STAP; SET XEG CB00. THEN, WHEN
0270  SDT #LATER LOADED BY THE XED #COMMAND,
0280  SDT #THE PROGRAM SETS ITSELF UP AS A
0290  SDT #CUSTOM COMMAND FOR EASE OF USE.
0300  SDT INTERNAL SOLOD/CUTER ROUTINES ARE
0310  SDT #HUGED TO EXTRACT THE TWO PARAMETERS
0320  SDT #AND TO PRINT OUT THE RESULTS.
0330  SDT THIS COULD BE CHANGED IF NECESSARY.
0340  
0350  SDT #REQUIRED TO CUTER-#IN-ROM, VER 1.3
0360  SDT #OTHERS CHANGE AS NECESSARY
0370  SDT 
0380  SDT CRC0 EQU 0342H
0390  SDT 
0400  SDT AADD EQU 0359H
0410  SDT 
0420  SDT SUBT EQU 0120H
0430  SDT 
0440  SDT CUTC EQU 020CH
0450  SDT 
0460  SDT RTRN EQU 0006H
0470  SDT 
0480  SDT CUTO V EQU 0004H
0490  SDT 
0500  
0510  SDT INIT EQU 9
0520  SDT 
0530  SDT SET UP AS CO COMMAND
0540  SDT 
0550  SDT LXI H, 'AM' 'AM' REVERSED
0560  SDT 
0570  SDT SHLD CUTAB PUT IN SOLOD RAM
0580  SDT 
0590  SDT LXI HSTART ROUTINE ADDR
0600  SDT 
0610  SDT SHLD CUTF#2 PUT IT IN
0620  SDT 
0630  SDT XRA A
0640  SDT 
0650  SDT STA CUTF#4 MARK TABLE END
0660  SDT 
0670  SDT CALL CRLF
0680  SDT 
0690  SDT LXI H, Z#ES POINT TO MSO
0700  SDT 
0710  SDT CALL SCR
0720  SDT 
0730  SDT JMP RETRN TRU/W/INITIALIZATION
0740  SDT 
0750  SDT STORAGE AREA FOR THE TWO PARAMS
0760  SDT 
0770  SDT 
0780  SDT 
0790  SDT 
0800  SDT 
0810  SDT 
0820  SDT 
0830  SDT 
0840  SDT 
0850  SDT 
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1530  SDT 
1540  SDT 
1550  SDT 
1560  SDT 
1570  SDT 
1580  SDT 
1590  SDT 
1600  SDT 
1610  SDT 
1620  SDT
1630 #
1640 START EQU # MATH ROUTINES
1650 CALL PSCAN GET FIRST PARAMETER
1660 SHLD P1 SAVE
1670 CALL PSCAN MUST HAVE TWO
1680 SHLD P2 SAVE IT, TOO
1690 CALL CRLF
1700 #
1710 #ADDITION ROUTINE
1720 CALL RESET GET PARMS BACK
1730 DAD D DO ADDITION
1740 CALL ABOUT SEND RESULTS
1750 #
1760 #SUBTRACTION ROUTINE
1770 CALL RESET GET PARMS BACK
1780 CALL DBSUB
1790 CALL ABOUT SEND RESULTS
1800 #
1810 #MULTIPLICATION ROUTINE
1820 #WORKS BY REPEETITIVE ADDITION
1830 CALL RESET
1840 PUSH H COPY HL...
1850 POP B ...TO BC
1860 LHI X+0 16-BIT ZERO
1870 MOV A+B
1880 ORA E FINISHED YET?
1890 JZ M2 YES
1900 JNZ NO ADD AGAIN
1910 DCX D AND DROP COUNTER
1920 JMP M1 GO BACK FOR MORE
1930 M2 CALL ABOUT
1940 #
1950 #DIV AND MOD ROUTINE. ADAPTED
1960 #FROM 10/74 ISSUE OF DR DOBB
1970 #JOURNAL, BOX E, TEMPLE, PA 19085
1980 ENTER WITH: H-L = DIVIDEND
1990 #
2000 #RETURNS: B-C = H-L MOD D-E
2010 #
2020 #
2030 CALL RESET
2040 MOV A+D CHECK FOR DIV-BY-0
2050 ORA E
2060 JZ DUERR YES - ERROR
2070 PUSH H
2080 MOV L+H DIVIDE H BY DE
2090 MVI H+0
2100 CALL DIVI
2110 MOV B+C SAVE RESULT IN B
2120 MOV A+L (REMAINDER)+DE
2130 #
2140 MOV H A
2150 CALL DIVI
2160 XCHG E SAVE ML
2170 PUSH B COPY BC...
2180 POP H ...
2190 CALL ABOUT SEND OUT DIV RESULT
2200 XCHG H GET BACK MOD RESULT
2210 CALL ABOUT AND SEND IT OUT
2220 CALL CRLF
2230 RET ALL FINISHED
2240 #
2250 #DIVIDE-BY-ZERO ERROR
2260 #DIVIDE ERROR
2270 #DIVIDE BY 0
2280 #DIVIDE ROUTINE
2290 DIV1 IU CE-1 RESULT ENDS UP IN C
2300 DIV2 INR C ROUTINE DIVIDES BY...
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 CLOSERLY AT THE CODE, YOU WILL SEE THAT IT SEEMS TO BE A COPY OF MITS BASIC, PATCHED (BUT NOT PROPERLY) 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 PATCHED 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 #B3 HEX FROM 01 (WHY 01?!) TO 5F HEX.

3. I LIKE MY PROGRAMS TO BE CONSISTENT IN THE USE OF CONTROL CHARACTERS. SO I MADE THE MODE KEY REPLACE 'B' AS THE LINE-DELETE CHAR, AND REPLACE <CTRL-C> FOR THE 'BREAK' FUNCTION, DO THIS BY CHANGING THE BYTES AT #F8 AND #5F7 HEX TO 09.

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 154-15A 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 1979 ISSUE OF DR. DOBB'S 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 #B0 HEX. YOU CAN LEARN THE LOCATION OF A NUMBER OF IMPORTANT DATA STORAGE LOCATIONS, INCLUDING 'TEXT' AND 'SCALAR', 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.
6514 GLENDALE COURT NE
CONYERS, GEORGIA 30097

1140 1000 'REVISED AND IMPROVED TAPE SAVE
1140 1010 #MAND READ ROUTINES FOR MSA BK.
1140 1020 #BASIC, USING THE SOLOS/CUTER
1140 1030 #BLOCK SAVE/LOAD ROUTINES.
1140 1040 #THESE NEW ROUTINES ARE SHORTER
1140 1050 #THAN THE ORIGINAL MSA ROUTINES.
1140 1060 #MAND CAN EASY FIT EASILY
1140 1070 #PLACE WITHIN BASIC.
1140 1080 #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. 30097
1140 1140
1142 FE A6
1144 CA D0 06
1147 CD 94 0A
114A E5
114B CD 54 10
114C #
114D #
114E 21 1C 08
1151 E5
1152 CD 71 11
1155 2A 06 01
1158 22 25 0B
115A 67 CD 0A
115C 2A 02 02
115F #
1160 7D
1161 93
1164 6F
1167 9A
1168 67 CD 0A
116A 22 23 0B
116D EI
116A 3E 80
116C CD 16 00
116E EI
1170 C9
1171 #
1172 #
1173 #
1174 1A
1176 FE 23
1177 #
117A DA D0 06
117A C3 83 11
117B 1A
117F FE 23
1180 DA 91 11
1183 77
1184 23
1185 13
1187 C2 7D 11
118A 36 00
118B BC 23
118C 36 CD
118F CF 11
1190 CD 79 00
1191 36 00
1193 93 03
1194 05
1195 C2 91 11
1197 C3 8A 11
1199 #
119B #
119C #
119D #
119E #
119F #
2100 CPI OA6H
2110 JZ GDOG
2120 CALL GDOG
2130 CALL GDOG
2140 CALL GDOG
2150 #
2160 #NEW CODE STARTS HERE.
2170 #FIRST BUILD THE TAPE HEADER
2180 LXP L0XH HEAD POINT TO HEADER
2190 CALL HMP MOV NAME & TYPE IN
2210 CALL TNTX BASIC'S E-O-F FNTR
2220 CALL LOAD TAPE LOAD ADDRESS
2230 CALL XCHG B-D TO D-E
2240 CALL XP LD B-D TO D-E
2250 CALL XP LD B-D TO D-E
2260 CALL XP LD B-D TO D-E
2270 CALL XP LD B-D TO D-E
2280 CALL XP LD B-D TO D-E
2290 CALL XP LD B-D TO D-E
2300 CALL XP LD B-D TO D-E
2310 CALL XP LD B-D TO D-E
2320 CALL XP LD B-D TO D-E
2330 CALL XP LD B-D TO D-E
2340 CALL XP LD B-D TO D-E
2350 CALL XP LD B-D TO D-E
2360 CALL XP LD B-D TO D-E
2370 CALL XP LD B-D TO D-E
2380 CALL XP LD B-D TO D-E
2390 #
2400 #
2410 #NEW MVN TAKES 5 CHAR FROM (DE)
2420 #PUTS THEM AT THE ADDRESS OF THE
2430 #HEADER POINTED TO BY H-L, THEN
2440 #MOVES IN THE 0 BYTE AND THE
2450 #TYPE BYTE WHICH IS "M-80H", TO
2460 #DISTINGUISH IT FROM CUTS BASIC.
2470 #MVNN STOPS MOVING CHARS WHEN
2480 #IT FINDS A BLANK, OR THE ENDING
2490 #DOUBLE-QUOTE, AND FILLS THE
2500 #HEADER NAME WITH O'S & A LA SOLOS.
2510 #MVNN IS USED BY BOTH SAVE AND
2520 #LOAD
2530 MVNN EQU # FILE NAME MOV
2540 MVNN EQU # FILE NAME MOV
2550 MVNN EQU # FILE NAME MOV
2560 MVNN EQU # FILE NAME MOV
2570 MVNN EQU # FILE NAME MOV
2580 MVNN EQU # FILE NAME MOV
2590 MVNN EQU # FILE NAME MOV
2600 MVNN EQU # FILE NAME MOV
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2760 MVNN EQU # FILE NAME MOV
2770 MVNN EQU # FILE NAME MOV
2780 MVNN EQU # FILE NAME MOV
2790 MVNN EQU # FILE NAME MOV
2800 MVNN EQU # FILE NAME MOV
2810 #
2820 #
BOOK REVIEW

"FORTY-FIVE BASIC PROGRAMS" by Dickaxx

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 a hardcover of 230 pages, more 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. Any 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 PDP BASIC because they use features not available in PDP's dialect. For example, several use PEEK/POKE statements, program 4b uses 16 ON ERROR processing, and program 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 PRINT "EXPECTED VALUE IS" followed by a value in red, 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 "FRACTION REDUCER" is not a general-purpose program one might think. In fact, it is for helping a petroleum product vendor estimate the cost for regular, unleaded, and premium gasoline, oil and jet fuel by simple averaging the sales over the prior three-month period, which is 10 times the number of the previous three months. On the other hand, the "MONTHLY EXPENSES" computes expected value of a variable "sales" based upon data from the past three months. A lot of such use for cost projections is not too easy.

Another program, the "EXPECTED VALUE" computes expected value of a variable "sales" based upon data from the past three months. A lot of such use for cost projections is not too easy. The "DISCOUNTED CASH FLOW" is specific to a manufacturing situation involving "sales forecasts", "unit price", "design capacity", etc., and the "INVENTORY CONSUMPTION" program is for a chemical production company.

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, even if you only want a few of the programs in this book. In explanation of the programs or the background theory comes in the text, so you have better understand the problem pretty well.

You can order this book from Dickaxx, 45 Penley Rd., Buffalo, NY 14216. The price is $10.

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

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GENERAL DESCRIPTION

The MK-II DTMF transceiver was developed as an S100 interface for Touch-Tone® telephones. The 2" 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.

DIP switches permit programming of address within last 4K of memory

CRC-8030 LSI digital chip detects DTMF frequencies

AGC amplifier insures positive DTMF detection

Interface Socket allows connection to FCC approved coupler with ribbon cable

J2 inhibits DTMF receiver when transmitting

SPDT switch selects memory mapped or isolated I/O addressing

J1 single or dual-tone option

Vectored interrupt DIP socket allows programming of interrupt location

FIFO memory stores up to 16 outgoing digits

CMOS tone generator permits outward dialing

MK ENTERPRISES
8911 Norwick Road
Richmond, Virginia 23229
(804) 740-8380
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 timeshares 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 telephone 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.

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

MK-II DTMF TRANSCIEVER PRICING INFORMATION

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>DISCOUNT</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 - 10</td>
<td>25%</td>
<td>$318.75</td>
</tr>
<tr>
<td>11 - 25</td>
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<td>$297.50</td>
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<tr>
<td>26 - 100</td>
<td>35%</td>
<td>$276.50</td>
</tr>
<tr>
<td>100 up</td>
<td>consult factory</td>
<td></td>
</tr>
</tbody>
</table>

FCC registered DAA coupler (Money 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 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

...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?

- Media transfer (such as paper tape to cassette)
- Copying (same medium)
- Program listing
- PKM programming
- Assemblies
- Dis-assemblies
- Cross reference list for BASIC programs

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

What kind of PKMs 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) 220-0109

...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 already low prices. The quantities required for discounts are listed below:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Discount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
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<tr>
<td>3-4</td>
<td>10%</td>
</tr>
<tr>
<td>5-7</td>
<td>15%</td>
</tr>
<tr>
<td>8-11</td>
<td>20%</td>
</tr>
<tr>
<td>12 and up</td>
<td>25%</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Size of Board</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>16K</td>
<td>$245.00</td>
</tr>
<tr>
<td>32K</td>
<td>$425.00</td>
</tr>
<tr>
<td>48K</td>
<td>$595.00</td>
</tr>
<tr>
<td>64K</td>
<td>$775.00</td>
</tr>
</tbody>
</table>

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 systems 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
SOUS NEWS
1020 Woodside Road # 219
Redwood City, CA 94061

Dear Mr. Sokolow:

We just received our back issues of SOUS 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 Metrolaploy dual drive. We want to be able to transfer data from our 370/165Fs to Micropolis disk. Do you - or does anyone out there - have a cookbook procedure for this? Is anyone interfacing (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 Keizer
Professor
Library Science/Educational Technology
Phone: 919 576-5710

...ON SOL IN SMALL BUSINESS SERVICE BUREAU

TONY'S DATA SERVICE
131 Highland Ave.
Vacevile, CA 95686
707-446-0417

Solus News
San Jose, Calif. 95133

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 Sanf10 (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 1976 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 Xybyte daisywheel printer, and a large amount of software.

For word processing I have the WordWizard and an IBM model and more used to it and find it very helpful for letter writing and report generation. Recently I printed four first copy 35 page reports using the new system. It took me two weeks to code the programs to use the new system. I took me two weeks to do what would take 5 typists and I weeks to provide. Obviously I am very pleased with my system.

If you should have any complaints about the Sol Users Group, 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 46k board and received 2 16k boards instead) and have to have the boards repaired.

For recommendations I would like to express my dissatisfaction with the service and support. I have received from Charlie Hamb at the Walnut Creek Byte Shop. These people have been assisting me since I started buying magazines since their shop in 1978. They worked hard correct my soldering mistakes when I built my first SOL and never charged me a dime. They are always there (at least by phone) when I don't understand something in the manual or when I have a problem occur. These are good people and they are highly recommended.

On a final note I am currently working on possibly setting up a "community memory" project in the Fairfield/Vaceville area. Obviously money is a concern but I believe in public access to computers and will do it. I do not think there are 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

(GREENSBOURG, NORTH CAROLINA 27437
THE UNIVERSITY OF NORTH CAROLINA is involved in the distance public service initiatives in North Carolina as equal opportunity employer)

(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 16Ks 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 FTC. They are encouraging people to trade in small memory boards against the newer high density boards. If you happen to have problem boards, now is your chance.)
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PROTEUS ORDERING INFORMATION

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 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 wanted 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 3)

PROTEUS DISCOUNT 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 on 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.

(Continued on page 3)

MICROSOFT BASIC FOR SOL

An enhanced version of the famous Microsoft Extended BASIC is now available at reasonable cost for Sol (and CUTS 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, Tnsal, 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 SWAPPED, BUT YOU must copy them onto a Sol/Cuts cassette as either a block image file (SAVE command) or as a boot file (byte-transfer thru Solos/Cuts) 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 computer can read programs donated by someone with CP/M on a Heilco, 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 microcomputer systems, and a useful backup in case of disk malfunction (say in a commercial system where you can continue collating data for processing later when the disk is restored). To maximize the interchange quality of our library, we have recorded all programs where ever possible, in simple text form as well as in a compiled ("compiled") form. This will let you move programs into files on your disk and make any necessary changes, and then run them under your own version of disk BASIC or other language. We will try to do this with assemblers as source programs as well, so that they can be read in co-called ABC-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 use of compatibility 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 EC BASIC, and G/2 Extended BASIC is a modified Microsoft BASIC for Sol. (Microsoft BASIC is the most common disk 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 prices 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 do not want 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 tape.

Each cassette costs $8 plus a donated program, or $12 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 magazine, such as Dr. Dobbs'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 certainly want to encourage people to submit the 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. We are hoping to distribute the tapes on any platform (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 medium (SOL/CUTS tape or Helios diskette) and ask for a credit slip toward a future purchase from the library.
Contents of Proteus Cassette #4 -- Software Tech Music Selections

CNTRY 08D3 04BE CIGUE 08D3 099C
COKES 08D3 043E COTYR 08D3 0976
SCAR 08D3 0804 SONAT 08D3 0641
AQUAR 08D3 093A RAIN 08D3 0964
GRROH 08D3 048A LIGHT 08D3 038A
YTRI 08D3 038F LSTRY 08D3 0377
GONNGS 08D3 0677 LOST 08D3 0499
VING 08D3 037A CLOSE 08D3 0496
GREEN 08D3 0439 GCORS 08D3 08A9
SILVR 08D3 031D GREN2 08D3 0439
NOWBY 08D3 038D HAN 08D3 068C
YANK 08D3 04FB YNEW 08D3 0672
RACH 08D3 1325 TAKY 08D3 0857
NECK 08D3 087A WOULD 08D3 0370
MICHL 08D3 050D MX2RT 0 08D3 04C3
HUNG 08D3 0444 WACTH 0 08D3 1109
RING 08D3 0469 GWAND 0 08D3 0491
FRCKL 08D3 055F GDNA2 0 08D3 0583
P212 08D3 07AD GDNA 0 08D3 0497
MAREF 0 08D3 0257

(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 1ADD 128E Slot machine simulation.
SLOTG 1ADD 120E Guesing game.
BLACKJ 1ADD 1784 Blackjack.
CRAPS 1ADD 070D Craps.
ACROBAT 1ADD 070C Acrobatic game.
MIND 1ADD 1945 Mastermind game.
KING 1ADD 1121 You are King; manage your Kingdom.
QUEEN 1ADD 1126 Children's literature quiz.
STARS 1ADD 0415 Shooting stars game.
TRAP 1ADD 0587 A number guessing game.
TASS 1ADD 0492 A number factoring game.
REVUS 1ADD 0880 Number manipulation game.
HUMPH 1ADD 0433 Find the Humph in the coordinate plane.
TTTTT 1ADD 049E 3-dimensional Tic-Tac-Toe: challenging!

Side 2 -- Palo Alto Tiny BASIC programs

BLACKJ O 0000 2000 Blackjack in Palo Alto Tiny Basic, includes BASIC.
BTERK 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 SCGI INTERFACE 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 SHRAP (continued from bottom right)

The reason for this is that we don't want to steal programs from 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 even useful or amusing programs 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 renameruing, long variable names, trace function for debugging the program, PRINT USING command for "picture"-type formatting, compatibility with other Microsoft BASICs, etc. The extended Microsoft BASIC has been produced by G/2 corporation specifically for compatibility with SOLOS/CUTER and Processor Technology's BASIC/5 and Extended Cassette BASIC.

G/2 Extended BASIC can read tapes created by Processor Technology's BASICS and it can interchange tapes with G/2 BASIC for the SNTFC 6809 computer.

G/2, a division of GRT Corporation (a 13-year-old corporation in the same space-economical business with annual sales in excess of $55 million per year), is now producing numerous programs for the Apple, Pet, Sorcerer, TRS-80, S/NFC, and Sol. Their 5OL 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, Roulette, and Slot machine) which simulates the Las Vegas rules and payoffs. Outwit has 3 games relating to biorhythms, diet, and personal health. Outwit has 3 games which pit you against the computer. Vines (a number addition game), Towers of Tibet (a strategy game), and Line-of-Five (a game of increasing difficulty).

G/2 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 SHRAP (continued from page 1)

We are going to rent a high speed cassette copier for the weekend of the Fair. We've tried the coiper before and know it reproduces Sol tapes with no apparent degragation of reliability. (We've already tried a tape made on a CUTE board and read the copy on the cassette.) 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's blank tapes. 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 the 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 Fair. We'll do as many complete tapes as we can ahead of time, so everyone will have the same selection at the booth. You can pick up your original cassette at the booth. This will 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 25 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 Fair--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 $2.50 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 in 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 list and with comments from readers on problems they have encountered. Jordan Torgerson's letter explaining the problems he had installing a S.D. Sales Expandor board in his 8000D led him 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 improvements will not be unjustly criticized.

You 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 PA64 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 note 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 numeric 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 this address in 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 advertised 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, which 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 spacing and right-to-left padding, so that the extra white space is more uniformly distributed.

In our 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 drives 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 change from the dot-matrix draft printer to the 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 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 Solas 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 incentive to sell Solas, 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 given 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 CVMS 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 820 SolR and 820 SolO have the same pin assignments as the Rev. E and later Sol Rs.) There is a "Sol Service and Maintenance Manual".
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 widely used operating system for personal microcomputers with floppy disks. It was written by Professor78 Conrad 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 Miicropollis, Helios, and in a modified form on the RadioShack TBS-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 makes CP/M its greatest strength is the fact that it is 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 CP/M.

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 the user accessible memory (so that from the input/output standpoint which is the hardware-dependent portion of the system, and a BDOS (Basic Disk Operating System) which is the hardware-independent portion of the system). The BDOS is the part which allows the operating system to work on the disk files. When CP/M is customized for a particular disk controller (hardware), the BDOS is the part which is altered to contain the instructions on the disk files. The customized BIOS (or "CRIOS") is usually provided by the manufacturer for their particular machine. The software vendor (Lifeboat Associates) which is now providing CP/M with CRIOS's for disks made by maverick manufacturers. Understanding this relationship of the BIOS to the operating system or the application program is necessary. BIOS is not adequate if 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, but the BIOS remains a critical 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 8 characters long. By convention, the prefix is the name of the subject matter in the file, and the suffix indicates the type of data in it (BASIC source program, machine code, etc). For example, "MYFROG.ASM" is the assembly language source file for the program you call "MYFROG", and "MYFROG.PRN" is the printer listing file produced by the assembler when it assembled "MYFROG.ASM".

To load a program and run it, it must exist in a file as an exact 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). CCP is initially loaded 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 memory system so we understand where things are. The FDOS itself is located at the top (high address) and provides the operating system (so that memory from the last address before the FDOS is all available. When the system boots itself into memory from the disk, it also places the Console Command Processor (CCP) in memory. CCP, but application programs can overlay and destroy the CCP if the space is needed. The application program returns control to the system upon its completion, the memory system 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, all locations below the 4K overhead of the BIOS or the interrupt vector of the start of the BIOS are not accessible. The BIOS is not necessary 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, but the BIOS remains a critical 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.

(continued on page 7 left)
Understanding PDOS

Preace

After the last issues I received a number of letters from members who were concerned that we were going too heavily into PDOS at the expense of other operating systems, such as CP/M. I feel that someone has to go heavily into PDOS 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 like 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 blankey-blank thing to execute a program once you have assembled it. The answer is that you simply use the object file name as a PDOS command, and the command interpreter of PDOS will load the file and turn over control to the entry point specified in the EQU pseudo-operation of the assembly source program. (This is virtually the same in CP/M, except that CP/M programs have no EQU entry because they always load at 100k and begin there. That is, all except TSR-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 (CT) input file directly, or through the PDOS parameter scanner entry point.

The sequence of events is this. First, EDIT your assembly language source program into a new file. Then ASM 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 compressed 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 you do is give its name after the PDOS prompting asterisk. If the file is not on the default unit (usually 0), you can give the object file name after the file name using a slash and the unit number, in the usual fashion, with no intervening spaces. (For example, *SCRUNCH/P2). 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:

ASM PROGRAM,#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 note of it for later correction of the source program file. You can leave the debugger and re-EDIT the source file, reassemble and load the new object file and debug 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 reasonable and listing is plain 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 PDOS but not to my knowledge of CP/M. The reason is that PDOS's loader can load "image segments" anywhere in memory, whereas CP/M's loader only loads object files beginning at address 1000H. This difference becomes 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 another 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 new 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 all the program origin at the location to be patched and give the replacement instructions to be overlaid there. Then reset the origin to a new 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 456H;THIRD PATCH
JMP P2;JUMP TO PATCH IN REMOTE AREA
ORG 355H;REMOTE AREA BEYOND END OF PROGRAM
P1 **** ;CORRECT INSTRUCTIONS
* ****
**** ****
**** ****
**** ****
JMP 2345H;RETURN TO CORRECT PLACE IN PROGRAM
P2 **** ;CORRECT INSTRUCTIONS
* ****
**** ****
**** ****
**** ****
JMP 2345H;RETURN TO CORRECT PLACE IN PROGRAM

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

The above special addresses are also part of the PVT area (locations 0-7). Notice that a PVT 0 or JMP 0 will act like a CP/M reset, initializing a warm (partial) start. The other processor program areas are not used, so that systems which generate interrupts can use them. There is one exception: the area 8F7-8F7 (locations 8F7,8F8,8F9) will contain a JMP to the debugger (DPT) when it is loaded. This location was chosen because an address where no memory is installed will return a new 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 will a PVT 7. Thus, the debugger will remain control when such a PWT 7 occurs in a program being debugged. (DPT also places PVT 7 instructions where it wants to set a breakpoint.) The PVT 6 area, like the PVTs not used by CP/M system programs, is designated as reserved for future use by CP/M.

Locations 08H-5FH are reserved for possible use as a scratchpad area by the BIOS. Some of these 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-51H are reserved for future use. Locations 5CH-7CH are used as a default file control block and locations 80H-FEH are used as a default file buffer. Your system may use this area for the file buffer. Locations 7DH-7FH are also reserved.

Thus we see that CP/M has defined or reserved all of the first page (256 bytes) of memory. However, only a few starting addresses on this page will require the user to 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 make a cold-start (usually by a system reset button) to reload all of the system. For example, if you want to load and run Extended DOS BASIC from disk, you can do this even though it resides from location 0 on up. CP/M won't need CP/M at all, so it can be destroyed, the BIOS once it is loaded. You can also run programs that reside at location 0 and use the BIOS, as long as you save the address given by the BIOS. Locations 6 and 7 for loading your calls to the system, provided that you can run the program in a CP/M system that doesn't use the BIOS scratchpad area or the 10BYTE. Of course, you might even be able to patch the program so it leaves those areas alone for CP/M use. Getting the program to load at location 0 is not automatic, because CP/M normally loads programs at location 000H. 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.

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 /L
SAVE name/2 1 ccc start

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 (start=starting address) and the count (ccc=counter or file length). This will appear to the right of the GET command:

GET /L name/2 start ccc cccc (t-type)

Then the SAVE command will write the file onto unit 1 with the same name 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 start. (Here 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 "/L" instead of "/T" in the SAVE command. The reason this works is that when you load the file into location 0001, the last byte of the file contains 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 $100
03 0

and a note should be added that only control-C will create a break when BASCI expects input. Richard has submitted a revised version which converts the MODE or control-O to a control-C, for consistency with FPC conventions. The revision also explains the installation procedure better. It will be published in a future issue.
SLAC PASCAL FOR THE 8080/380

by S. Hazeghi and L. Wang

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The SLAC Micro PASCAL system consists of a PASCAL [1] compiler, a Post_Processor and (currently) an 8080/380 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 8080/380 family of microprocessors, 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 8080 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 procedures or 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 largely in the domain of hardware and firmware experts, but the interpretive approach is probably the easiest, though naturally the least efficient. 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 problems.

The current 8080/380 interpreter (which does not implement the PASCAL arithmetical operations) is about 2.5K bytes long and requires 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 systems 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 a 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 assumptions about its host system and, in particular, 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 8080 line 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 4K area 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 1600 words per minute and the execution times of our benchmarks 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:

ADGONNE CODE CENTER,
ADGONNE NATIONAL LAB.
9700 S. CASS AVE.
ADGONNE, IL 60059

or through various computer clubs.


Appendix A: Restrictions and Extensions.

1) Files are limited to TEXT (i.e. FILE OF CHAR) files.

2) Procedure/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 macros EXIT*(l: INTEGER), TRAP*(l: INTEGER, VAR i: ANENT: and CLOCK*(l: INTEGER) have been added to the set of predefined procedures. EXIT is to simplify terminating the user program and returning 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 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 L..B may be used instead
evereying all the values A, A+1, ... B-1, B is in a set
constructor (e.g., ['A', 'A+', 'C+', 'C', 'J', 'B']) 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; )

S. Mazeghi
L. Wasp
Stanford Linear Accelerator Center
Stanford, CA. 94305

Updated: July -15-76

PASCAL RELATED FILES:
1) PAS.DOC : This text.
2) PAS.S : PASCAL Compiler, source form.
3) PASM.S : PASCAL Post_Processor, source form.
4) PENTRP.S : P_Code Interpreter, source form.
5) PASCAL : PASCAL Compiler, P_Code object form.
6) PASM : Post_Processor, " " "
7) PINT : P_Code Interpreter, 8080 " "
8) COMPILE(*) : PASCAL Compile Monitor, " " "
9) RUN(*) : PASCAL Run Monitor, " " "
10) QUEENS.S, SORT.S, XREF.S, SIMD.S etc.
    Various PASCAL sample programs.

(*) These programs are written by Drew Rogge and are applicable
    to the Processor Technology's PTOS System only.

HOW TO USE THE SYSTEM UNDER PROCESSOR TECHNOLOGY PTOS SYSTEM.

To compile a PASCAL program, just type:

COMPILE <source program name> <program>

The COMPILE sub-monitor, uses an auxiliary file called PAS.DEPS
onto 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 TIFFILE and add the name of this file
to the list of the arguments of the COMPILE command. For
example, "COMPILE MNPB,MYDEFS.PSC" causes the file named MYDEFS
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
needs 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.C,CTO file name list><CR>

The I/O files base 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 base list may be omitted. "RUN POBJ,40,41,42" has the
same effect as "RUN POBJ,C", likewise "RUN THIS,TSS,TSSORT,<CR>
starts the object program "THIS", and
assigns the file named TSSIN (on drive 0) to the first file
used by the program and TSSORT (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 the command of the form:

("SL-<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.

SOFTWARE REVIEW

PASTGAMMON

Are you interested in learning how to play backgammon or
try to improve your skill in backgammon? Here is a program that
will play against you and let you improve your strategy, too.
The program is called PASTGAMMON, and it is advertised in computer
hobbyist magazines. The price is $20 on 8080/CUTS/Sol cassette, or
$25 on Northstar diskette. (The cassette version loads from 2AO
thru JFF, so you can buy the cassette and save the program on your
Northstar disk, and save $5.)

(continued on page 20)
Hardware Review: Sol-20 Keyboard Modification Kit

Are you tired of trying to remember obscure control codes to perform certain functions in ASC-8, 8086, Electric Pencil, or PTDOS/EDIT programs? Then this product might be the answer for you. After installing this kit and appropriate software mods, some functions which come with the kit, you'll be able to remember only the control codes to use, not which control codes to use.

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 keycaps 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, INSERT, DELETE, INS/DEL LINE, DEL LINE, ERASE, FORM FEED, PREV PAGE, NEXT PAGE, ROLL (with an arrow), ROLL (with a down arrow), ROLL (with a down arrow), DOWN ARROW, LEFT ARROW, RIGHT ARROW, ARROW SYMBOLIZING A 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, the kit will be available at your local hardware store for $24.95. It is available from computer retailers or from the manufacturer: Harry A. Katzman, 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 copy 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 disk.
4. Leave basic and use DOS to save the game on the disk.

It is necessary to save from address IAD7 up to the end of the data as determined in step 1. This must be 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 and initialize it. Assume that this step can be eliminated if in step 2 an initialization version of basic, rather than the standard version, is stored.
7. Return to DOS and load the desired game at address IAD7. Then return to basic.

The same procedure will work for Extended Basic, however, the pointer(s) are located near 2855 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 1. I have used this procedure successfully with a mix of games which use PTDOS (and thus include on disk) the extended functions.
Baudot is a data transmission code which pre-dates the current American Standard Code for Information Interchange (ASCII) 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". 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  ASCII --- BAUDOT  *
C900  0002  *
C900  0003  * WRITTEN FOR SOL SYSTEM USERS BY:
C900  0004  * BILL JONES
C900  0005  * 555 EAST STREET  
C900  0006  * MARION, OH 43030  
C900  0007  *
C900  0008  *
C900  0009  * THIS ROUTINE WILL ALLOW USE OF A
C900  0010  * BAUDOT PRINTER WITH THE SOL. THE PROGRAM
C900  0011  * RESIDES IN SOL SYSTEM RAM.
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 GART(REFERS TO SOL MANUAL)
C900  0016  * FOR 75 BAUD, NO PARITY, FIVE CHARACTER MODE.
C900  0017  * LENGTH, AND TWO STOP BITS, THE BAUDOT
C900  0018  * MACHINE WILL RUN AT FULL SPEED BECAUSE
C900  0019  * THE BAUDOT 33 SHAFT SPEED AT 110 BAUD AND
C900  0020  * THE MODEL 25 SHAFT SPEED AT 75 BAUD
C900  0021  * ARE NEARLY IDENTICAL, NO HARDWARE HACKS
C900  0022  * (OTHER THAN AN INTERFACE DIRECTLY AT
C900  0023  * THE 5TH) ARE REQUIRED.
C900  0024  *
C900  0025  * TRY TO GET 100 WPM GEARS(STANDARD
C900  0026  * FOR THE MODEL 25 SO THAT YOU WONT
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 W. LOOP INTERFACE.
C900  0030  *
C900  0031  * THE FOLLOWING IS THE ASCII TO
C900  0032  * BAUDOT LOOKUP TABLE.
C900  0033  *
```
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 SOLUS/CUSER, PTOOD, 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 PTOOD. 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, which are so popular among hobbyists.

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 a 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 Proteus or Technology can do for users, and what you can do for 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 December 31. Ordering information for the library and back-issues from prior years is in each issue. Dealers, software suppliers, and hardware manufacturers are encouraged to send us product descriptions for free publication in the newsletter.
MEMORY TEST COMMANDS
by Lewis Moseley, Jr.

1000 # THIS PROGRAM IS A FOUR FUNCTION MEMORY TEST
1010 # BASED ON A PROGRAM BY ROD HALLIN PUBLISHED
1020 # IN THE JULY 78 ISSUE OF KILBORN MAGAZINE.
1030 #
1040 # THIS VERSION 10/78 BY LEWIS MOSELEY, JR.
1050 # 2514 OLENDALE CT., CONYERS, GA. 30012
1060 #
1061 # THANKS TO ATLANTA COMPUTER MART, 5091
1062 # RUFORD HAY, ATLANTA, GA. 30340 FOR THE USE OF A DECWRITER FOR THIS LISTING
1064 #
1070 # ALTERED TO ALLOW IT TO RUN AS A SOLOS/CUTER
1080 # CUSTOM COMMAND: LOADS IN the IN SCRATCHPAD RAM.
1090 #
1100 # COMMENT FROM SOLOS/CUTER HAS THE FORM
1110 # \MTEST ADDR LEN\ (NUMBER)
1120 # WHERE "M" is the CUSTOM COMMAND NAME
1130 # "ADDR" is the START ADDRESS IN HEX
1140 # "LEN" 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 SCOMV EQU OC37BH CONVERTS TO HEX herb CHECKS ERRORS
1250 PSCM EQU OC3A4H SAME, BUT OPTIONAL
1260 REVTR EQU OC040H REENTRY POINT
1270 SDRT EQU OC019H STD OUTPUT
1280 ASRB EQU OC389H FROM "BUMP" ROUTINE
1290 RST EQU OC3F7H ALSO FROM "BUMP"
1300 CRLF EQU OC342H CR-LF ROUTINE
1310 CUTFR EQU OC83CH CUSTOM COMMAND TABLE
1320 #
1330 PSW EQU & DOME ON OLD-STYLE SWP
1340 #
1350 ORG OCBOOH SOLOS/CUTER RAM
1360 # WHEN EXECUTED AT CBOO, THE ROUTINE
1370 # CREATES AN ENTRY IN THE SOLOS CUSTOM
1380 # COMMAND TABLE FOR ITSELF, OVERWRITING
1390 # THE PREVIOUS FIRST ENTRY.
1400 #
1410 ORG OCBOOH SOLOS/CUTER IN RAM
1420 #
1430 LIX "TH" COMMAND NAME (REVERSED)
1440 SHLD CUTFR
1450 LIX "H" START EXECUTION ADDRESS
1460 SHLD CUTFR+2
1470 RTU THRU WITH SETUP
1480 #
1490 # WHEN TEST ROUTINE STARTS HERE
1500 # START EQU #
1510 CALL SCOMV GET START ADDRESS OF TEST
1520 SHLD BEGIN STORE FOR LATER USE
1530 CALL SCOMV GET # OF BYTES TO TEST (0-OFFFH)
1540 SHLD BEGIN STORE
1550 LEX "H" GET 16-BIT O
1560 SHLD CTR 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 LSHL LENM
1650 LSHL XCHG D-E HAS # OF LOCATIONS TO TEST
1660 LSHL BEGIN H-L HAS STARTING ADDR
1670 #
1680 # CLEAR XRA A ZERO ALL MEM LOCS TO BE TESTED
1690 MVI M+0
1700 DEX D
1710 INX H
1720 CMP D NOW SEE IF THROUGH
1730 JNZ CLEAR
1740 CMP E
1750 JNZ CLEAR
1760 # ALL THROUGH WITH CLEAR.
1770 #
1780 # NOW DO TEST A: CHECK IF ALL CLEAR
1790 TEST B LSHL LENM GET LENGTH WORD AGAIN
1800 XCHG TO D-E
1810 GRT BEGIN GET START ADDR AGAIN
1820 TSTT E XRA A
1830 CMP M MEMORY STILL CLEAR?
1840 CNZ ERRB NO+ LIST ERROR
1850 DEX D IF SEE THRU WITH TEST A
1860 INX H
1870 CMP D
1880 JNZ TSTT
1890 CMP E
1900 JNZ TSTT
1910 # HERE MEANS TEST A COMPLETE
1920 # EQU & DOME ON OLD-STYLE SWP
1930 # WHEN EXECUTED AT CBOO, THE ROUTINE
1940 # CREATES AN ENTRY IN THE SOLOS CUSTOM
1950 # COMMAND TABLE FOR ITSELF, OVERWRITING
1960 # THE PREVIOUS FIRST ENTRY.
1970 #
1980 ORG OCBOOH SOLOS/CUTER RAM
1990 # WHEN EXECUTED AT CBOO, THE ROUTINE
2000 # CREATES AN ENTRY IN THE SOLOS CUSTOM
2010 # COMMAND TABLE FOR ITSELF, OVERWRITING
2020 # THE PREVIOUS FIRST ENTRY.
2030 # ORG OCBOOH SOLOS/CUTER IN RAM
2040 # WHEN EXECUTED AT CBOO, THE ROUTINE
2050 # CREATES AN ENTRY IN THE SOLOS CUSTOM
2060 # COMMAND TABLE FOR ITSELF, OVERWRITING
2070 # THE PREVIOUS FIRST ENTRY.
PRODUCT ANNOUNCEMENT:
MEDIA FILING SYSTEMS

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

ROTARY FILES

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) 350-8272 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 18 of the June issue is a review of the Electric Pencil and mentions 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 machine 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 hand written term and it was very confusing to try and keep track of the invisible character pointer. After each change I'd have to re-screen 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 Telotyper Model 42, Seatican, and now with the Malibu 168 line printer. Results have always been good. Underlining on the seatican 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 Seatican 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 computer users 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 DiskWrite with CP/M and think that it is great. I didn't go for Heliost because of the price and odd disk format. I'm using the artec 32K RAM board and it works fine too. Same goes for the Cromamco D/7 1/0 board. Vandalberg 16K RAM board, and the Microsounder. The Malibu 168 line printer uses two parallel ports which I've built up on the Vector BRRB-16 prototype board. Never was able to get the Utronics D2-88 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 Basics as a while. It was easy to load it on disk and run it from there but I still had to load and save programs on tape. Finally went to Microsoft Extended Disk BASIC and I'm really glad I did. I'm also going to give the USO Pascal a try soon.

Sincerely,

Rod Hallen
ROAD RUNNER RANCH
F. O. BOX 72
TOMBSTONE, AZ 85638

...ON WORDWIZARD, A USER'S VIEW

Dear Stan,

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

I noticed that you were going to publish more information on the WordWizard. I am currently using the WordWizard and would like you to impress me more:

As a system designed for the "user" who is not currently adept at using a computer, it is 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 user can control the commands is a very useful feature and I have friends who were able to use the system with little trouble because of the design.

The system 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 feature 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 print 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 display on 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 Sevoca
131 Highland Ave.
Vernon CH 06066
January 17, 1979

...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 articles, you will now also cover Heliost 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,

[Signature]

[Ed. note: Dear Al, Heliost 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 U.S. 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 downtown to look at new electronic devices carrying the baggage necessary to pay for the calls to Processor Tech, and an equally large annual expenditure for Rolodex.

We must also have a 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-10 Sales I/O Expander 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, 27K for $270. 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 had arrived. The store couldn't say why the board wouldn't work, S-10 Sales told me it worked fine on their IMSAI 80-20, but that "Maybe they just don't work on Sol's!" My Sol didn't droop so much as a hint in the two years it's been running with a Dynabyte 16K board - so the computer isn't at fault.

As PROTEUS expands (as hopefully will) perhaps you could create a listing of Sol-compatible memory boards.

I would like to see the IMSAI list in a catalog such as "fully compatible, compatible except for RAM, 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 1K RAM) is not overly impressive, and there are simply not enough ProTech dealers around. I went to California last fall to buy my Sol-20 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 mission out on a terrific computer.

If you would like some help netting 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
Pensacola, FL 32504

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

...ON FTC SOFTI ASSEMBLER

In my last letter, I reported the availability of extensions to 10 old version of Software #1. Since that time, I have acquired a copy of FTCO's "new" cassette version of SOFTI. 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 DUMB! After writing for more than a year, they have added almost nothing to the original version, and not one of these features does not fully implement the target computer's instruction set. After all these years, SOFTI still doesn't accept the instructions dealing with PSW or SP in the instruction set. I have seen a copy of the IMSAI version of Software #1 dated July 76 which corrected the problem, after a fashion. You can solve this problem by using 'MP' in place of PSW or SP in your source code (i.e. 'MP H' = 'MP PSW'), or by implementing a permanent fix, as reported in Dr. Dobbs Journal, and in 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 CUES SOFTI:
1. Added the "ASC" pseudo-op.
2. Added a command to resquence (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 resqueuing.
3. Added a command to pull out a copy of the most recent symbol table from the assembler.
4. Added an ASCI dump.
5. Modified the assemblers 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 characters, including "returning" the output pseudo-op to SULOS, 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 Software #1, and an index to the major routines of the monitor/editor section of the program (but not the assembler section), and a listing of the "special parameter storage area" in the special system RAM. In all, there are six tape files totaling more than 35 pages of hard copy. The space listings of the additions are highly commented, in the fashion of my utility programs which have been published in SULOS News.

I will make this material available to members for $7.50, either as hard copy or on a 1200 baud UMS format cassette tape, postpaid.

The current version is designed to be loaded as an assembler file and to, in effect, reassemble SOFTI by automatically patching in jumps to the new routines as necessary.

I am not in the computer business, and therefore I must make the tape, 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,

2376 Glendae Ct. NE
Conyers, Ga. 30013

January 5, 1979
ON GODBOUT 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 shelf before taking orders. But, trusting their good reputation, I sent 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 and all were installed. The "kit" part of UNkit does it itself, half-a-dozen capacitors, the regulators and heat sinks (thermal compound not provided, but is not sure it is necessary, either) and install the chips. Again, quality parts where it matters; me5257 memory chips, made in USA; but 741s04a from Korea.

My board was sent before the manual was back from the printer, so 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. In running it with 24K of other memory and a home-built Vortex speech synthesis 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.
Memlo Pack 94023

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ON WIZARD AND ELECTRIC PENCIL, PRAISE FOR A DEALER

You mention that the next issue will have a detailed article on PCC WIZARD. I hope you will use this opportunity to discuss 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 facilities. It was gratifying to find out how to transfer programs from PENDICHT to WIZARD, using the WP 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 PENDICHT to run them. It is convenient to have PENDICHT in one drive and PENCIL in another. Both systems are good, and each has its place, though I suspect that those involved with both would prefer having a writing night prefer WIZARD.

Although PCC 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 harried at times, but when a consumer finds a willingness to backup 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 Avenue, No. 2200, 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 Gardner or John Morten at (301) 295-0520.

Meanwhile, keep up the fine work.

28 Allenbrooke Ct.
Methion, Md. 21204

Sincerely,

---

ON MICROPOLIS, CP/M, AND SELECTICS

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

1. Is anyone running Lifeboat Associates' CP/M for "Micropolis" Metallogy diskettes on a CP/M? (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 XT BASIC to load and run at 0 under CP/M?
3. Is there a source other than 125 for Selectic type spheres and ribbons?

As you may have gathered from these questions, I am seriously considering adding a Micropolis Metallogy to my Sol t; I haven't decided yet, mainly because of the above questions, and a letter I recently received from Mr. James F. Holanda of Micropolis. In his letter, he indicated that Micropolis intends to release a double-sided version of their product, giving it a 100% increase in capacity at a cost increase of 3040%; the release date is supposed to be in late 79. That may be worth waiting for. Thanks again, Stan, and keep up the good work.

Sincerely,

John Cesar
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 more memory. See our series, "Understanding CP/M." For more info, but in brief you can tack a small initialization routine that will move at 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 pointer location 100H, where CP/M application programs always start. Once it's moved, it will run independent of CP/M, 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 destrying CP/M's data in the base of memory is when CP/M and you must be used by the program and the BIOS uses its scratch pad area at 40H. As I said, see my series for a more complete explanation. 3) Any good office supply store has Selectical ribbons (take your old one in for a match). They also have Correspondence code typefaces 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 typeface for programming is the ASCII sphere 124, which has the most commonly used symbols, such as <2>\[189\#\$\&\*\)](.-')

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ON MANUALS FOR THE NON-COMPUTER SPECIALIST

...I also would like to see more indications that software producers have reacted to 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.

1000 #ROUTINE TO FILL A RANGE
1010 # OF MEMORY WITH A CHARACTER
1020 #SPECIFIED IN THE COMMAND
1030 #
1040 #ALSO, ROUTINE TO DUMP
1050 # MEMOY IN ASCII
1060 #
1070 # BOTH PATTERNED AFTER
1080 # SOLDS/CUTER DUMP ROUTINE
1090 #
1100 # REVISED BY LEWIS MOSELEY, JR.
1110 # 2520 GLENDALE CT. NE. CONYERS,
1120 # GA. 30239
1130 #
1140 # DUMP WAS PUBLISHED IN DR. DOBB.
1150 # JOURNAL, P.OB E. MENLO PK. CA
1151 #
1152 # THANKS TO ATLANTA COMPUTER MART,
1153 # 5091 BUFORD HWY. ATLANTA, GA.
1154 # 30340 FOR THE USE OF A DECWRITER
1155 # FOR THIS LISTING.
1160 #
1170 # FILL COMMAND TAKES THIS FORM
1180 # FILL ADD1 ADD2 (CHAR)
1190 # WHERE 'FI' IS A CUSTOM COMMAND
1200 # 'ADD1' IS THE START ADDR
1210 # 'ADD2' IS THE END ADDR
1220 # 'CHAR' IS THE OPTIONAL
1230 # CHARACTER USED TO FILL
1240 #
1250 # IF (CHAR) IS OMITTED, THE
1260 # DEFAULT VALUE IS '00'
1270 #
1280 # THEN ADUMP WORKS JUST LIKE
1290 # DUMP COMMAND, EXCEPT THE OUT-
1300 # PUT IS IN ASCII, NOT HEX.
1310 #
1320 # ALL PARAMETERS TO BE IN HEX
1330 # COMMAND BY SOLDS/CUTER
1340 # INTERNAL ROUTINES
1350 #
1360 # RESERVES REFER TO CUTER-IN-
1370 # ROM, VERSION 1.3
1380 # SOLDS USERS CHANGE AS
1390 # NECESSARY
1400 #
1410 # SCNON EGU O0C78H
1420 # PSCON EUQ O0C36H
1430 # RETURN EGU O0C04H
1440 # ABOUT EGU O0C24H
1450 # CRLF EGU O0C24H
1460 # BOUT EGU O0C3F7H
1470 # SOUT EGU O0C019H
1480 # CUTFAR EGU O0C83H
1490 #
1500 # WHEN EXECUTED AT CB00, THE ROUTINE
1510 # CREATES ENTRIES FOR BOTH OF ITS PARTS
1520 # IN THE SOLDS/CUTER CUSTOM COMMAND
1530 # TABLE, OVERWRITING THE FIRST TWO
1540 # EXISTING ENTRIES; IF ANY,
1550 # THE TWO COMMANDS ARE DISPLAYED ON
1560 # THE SCREEN FOR CONFIRMAION.
1570 #
1580 # ENTER EQU #
1590 # ORG O0C000H SOLDS IN RAM AREA
1600 # LIX H='IF' COMMAND 'FI', REVERSED
1610 #
1620 # SHLD CUTAB+2
1630 # LIX H='DA'
1640 # SHLD CUTAB+4
1650 # LIX H='ADUMP'
1660 # SHLD CUTAB+6
1670 # XRA A
1680 # STA CUTAB+8
1690 # LIX H='MSG'
1700 # CALL SCN1 ECHO COMMANDS TO SCREEN
1710 # FILL EQU #
1720 # CALL SCNON GET START ADDR
1730 # PUSH H
1740 # CALL SCNON GET END ADDR
1750 # PUSH H
1760 # LIX H='O'
1770 # CALL PSCON GET CHAR OR KEEP 0
1780 # MOV B=L
1790 # MOV A=L
1790 # HOW GET BACK ADDRESSES
1800 # POP D END ADDR
1810 # POP H START ADDR
1820 # LOOP EQU #
1830 # MOV H=O PUT CHAR IN MEM
1840 # MOV A=H IS CURRENT ADDR
1850 # CMP D EQUAL END ADDR?
1860 # JMP LOOP 100G G0 ON
1870 # MOV A=L TRY LOW ORDER BYTE
1880 # CMP A=H
1890 # JNC RETRN ALL THRU
1890 # LOP0L EQU #
1900 # INX H
1910 # BFL EQU #
1920 # JMP LOOP
1930 #
1940 #
1950 # ADUMP EQU #
1960 # CALL SCNON GET START ADDR
1970 # PUSH H SAVE
1980 # CALL PSCON
1990 # CONVERSION D
2000 # XCHG HL=START-DE=END
2010 # BLOOP CALL CRLF
2020 # CALL ADDU
2030 # CALL BOUT
2040 # MVC I=O
2050 # DLPI MOV A=H
2060 # PBUSH B
2070 # CPI 20H < BLANK?
2080 # JNC DOWN
2090 # MVC A=H,< YES> MAKE D0T
2100 # BOWH CPI 7H > 7H?
2110 # JD D1N NO
2120 # MVC A=H,< YES> MAKE D0T
2130 # D1N MOV B=H
2140 # CALL SOUT SEND CHAR OUT
2150 # MVC B=H
2160 # CALL SOUT SEND OUT SPACE
2170 # MOV A=H NOW SEE IF FINISHED
2180 # CMP D
2190 # JC DLPIA
2200 # MOV A=H
2210 # CMP E
2220 # JNC RETRN ALL THRU
2230 # DLPIA EQU # CONTINUE
2240 # POP B
2250 # INX H FIX POINTERS
2260 # DCR C
2270 # JNZ DLPI MORE FOR THIS LINE
2280 # JMP DBL0P ELSE DO CRLF FIRST

(continued on page 20 left bottom)
ever wish you could make SOLOS/CUTER double-space 8 HzX DUMP so you could more easily examine and mark entry points? Or, ever triple or quad space? If so, you might be interested in this program. It does not need NULLS after a CA, it's super simple—just write a short custom output routine which will translate NULLS into LINEFEEDS. Then use $N=1 for double space, $N=2 for triple space, etc. If you do need NULLS, then let the CUTER routine look for CA 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 FORGs, 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:
\[ \text{10 REM} \]
\[ \text{XX, leave} \]
\[ \text{BASIC, and use SOLOS to enter your machine language into} \]
\[ \text{the place you filled with blanks in the remarks section.} \]
\[ \text{Up to 50 or 60 bytes can be entered in this manner, and} \]
\[ \text{then SAVE with the BASIC program. The Listings sometimes} \]
\[ \text{look funny, but it still works. I have used this method} \]
\[ \text{with PICO BASICS, and also Tiny BASIC. With Tiny BASIC,} \]
\[ \text{you can also insert screen control characters into PRINT} \]
\[ \text{statements. There may be some restrictions with this.} \]

Want to use the excellent video editor in PICO EDITOR or PICO PILOT for composing letters, which you would then like to have typed out without wasting paper or having UN appear on the letter? Using the methods shown in my last letter, EDIT the Immediate command handler to add the following command:
\[ \text{M:TYPE} \]
\[ \text{SET: O=3} \]
\[ \text{LIST:} \]
\[ \text{GET: O=0} \]
\[ \text{P:Y=2} \]

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

FASTGAMMON (continued from page 9)

A backgammon board that 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 happening, 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 point 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)

<table>
<thead>
<tr>
<th>CB83</th>
<th>CB86</th>
<th>CB88</th>
<th>CB8F</th>
<th>CB91</th>
</tr>
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<tbody>
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<td>2290</td>
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</tr>
</tbody>
</table>

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

Owners of Sol, Altair, NSM, 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. Price: $245.00.

BROMA AMT...$245.00
BROMA KIT...$245.00
BROMA PCB...$24.00

THE ORIGINAL VIDEO DISPLAY MODULE

The DVM-1 module interfaces the computer with a TV monitor and a 1024X character display.

THE CASSETTE TAPE STANDARD

The CNM module interfaces the computer with a cassette recorder for program loading and mass storage of up to 300000 characters per C-60 cassette.

THE SYSTEM MEMORY BOARD

The MVM-1 module interfaces the computer with a cassette tape and a diskette drive.

THE ASSEMBLY LANGUAGE SYSTEM

The SUM-1 module interfaces the computer with a cassette tape and a diskette drive.

THE CATALOG MEMORY BOARD

The CMB-1 module interfaces the computer with a cassette tape and a diskette drive.

THE CATALOG MEMORY BOARD

The CMB-1 module interfaces the computer with a cassette tape and a diskette drive.

THE CATALOG MEMORY BOARD

The CMB-1 module interfaces the computer with a cassette tape and a diskette drive.
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 TTY (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.

**HAMI S-100**

**Morse Reader -- Keyboard Keyer -- Paddle Keyer -- Baudot Terminal**

The HAMI S-100 is the plug-in circuit board used in the SYSTEM 4000 HAMI 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 TTY (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 HAMI 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 HAMI S-100 and the user's system. It also contains tables and routines common to the various ham programs. The 1K of RAM contained on the HAMI S-100 is used for stack area and message storage independent of other system RAM. A tone monitor signal is provided.

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 $900. 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, W4B6X, W2C2D, W6QYA, W6WOKV, K5RV, W9HYS, K8OJO, V6TAJ, W4BTVV/J/4
Dear Stan,

Congratulations on another excellent issue of Proteus News. The new look is very nice, and I think you did a good job with the redesign. The new design is very clean and professional. I really like the way you've organized the content and made it easy to read. Keep up the good work!

On a side note, I found your article on the new memory board for the 68000 to be very interesting. I am currently working on a project that requires a lot of memory, and I was wondering if you could provide me with more information on the board you mentioned. Specifically, I am interested in knowing the details of the memory expansion and how it fits into the overall system. I am also interested in knowing if there are any benchmarks or performance tests available for this board.

Thank you for your time and I look forward to hearing from you.

Best regards,

John Doe
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 "backing 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 is often made with a gypsum insulation which releases water vapor as it is heated. When the temperature inside the safe reaches 150°F or 85°F 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 through 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 RACKS FOR DISKETTES. Unfortunately they are all rather large (4 feet high by 3 feet square) and expensive (about $150 base price plus optional shelves and freight charges). Perhaps the safe manufacturers will create a small one someday for the microcomputer user, but until then it might be extra careful with back-up copies. Don't count on ordinary safes or fireproof files.

M O D S F O R C A S S E T T E T R E K - 8 0

by Bruce Barron

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

1830: 20 2d 2d 2d 2d 2d 2d 2d 2d 52 20 53 45 53
1840: 4p 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 "O" to the right and proceed clockwise. While PTG's idea of "O" up is logical, it is easier to change this one version than all of the others that are there.

1703: 01 11 10 09 69 90 91 / will change the Warp drive
1914: 02 00 40 00 00 00 00 PE PF BF BF CC PF CC 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, Northera 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 offering trade-ins so it pays to shop around. For those who do not yet enjoy a DD system, single density controllers can now be found at very good prices. Just about every piece of Northera compatible software will continue to be offered in SD format so you won't miss out on a thing.

The drives can be purchased at separate items from several sources.

C L A S S I F I E D A D S

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, bootstrap personality module, 48K RAM, Hollis II model 2 dual disk (up to 768K online), PR-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 $4695, sale price $3500. W. Hardner, 32 Larchwood Dr., Pittsford, N.Y. 14534, or call 716-772-2724 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 11631.

FOR SALE OR TRADE: PERIPHERAL VISION SI/00 DISK CONTROLLER & 8" DRIVE, NEW - $650. KYI-I, P/S & MANUALS $135. PERCOM CI-BL2 SI/00 CASSETTE & RS-232 BD. NEW $75. PATA 8700 + EXTRAS, NEW $100. ALL UPS PAID: SOL. MACK MOUNT, 11 SLOT RACK, BOARD, KEYBD, 2 BASICS, CASSETTE RECORDER S/000 CAN'T SHIP SOL. WANT DIABLO, MEMORY, OR ? ROD HALLEN 73 MONTMOUTH, 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 91 per line (max. 75 characters per line).

W R I T E FOR DISPLAY ADVERTISING RATES.

N E W S C H A P T E R S

COLORADO, Boulder/Beaver area

A group of users of PT hardware and/or software in the Boulder/Beaver area has formed. We met in February and intend to meet once a month. The next meeting will be held on March 11 at 3:30 at the National Center for Atmospheric Research in Boulder. Our group is a sub-group of the Denver Amateur Computer Society (DACS) and was formed by one of its board members Rich Rathbun. For more information about this and future meetings call Rick at 771-8740 (Boulder) or me at 443-2817 (Boulder).

Via Tootenhoff
980 University Ave
Boulder, CO 80302

ARIZONA, Phoenix

Anyone in Phoenix area interested in a local chapter? Call me at 942-3311 extension 1438.

Bruce Barron
10527 N. 45th Ave
Glendale, AZ 85302

CALIFORNIA, Vacaville

Midway Computer Club, Contact Tony Severa, 331 Highland Ave., Vacaville, CA 95688, (707) 446-0417.
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 were pursuing the word-processing market and 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 it was 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 Fair, 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 Fair about PTC's new products, the culmination of many months of quiet work 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 Sol's 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 at the end of 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 something that although PTC was tightening up on credit to all of their small computer manufacturers in the wake of the financial troubles of the other companies, such as INMEL, Polymeric Systems, Digital Group, etc. Cash flow was the big problem. This was May 11, 12, and 13.

The Tuesday after the Fair 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 PCC 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 phone 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 then announced that the office furniture would have to be auctioned off. Someone who has done programming for PTC was called in to discuss something there. Proteus does plan to go out of business, but 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 PTCOS and their other software for use on other equipment.
These were the rumors. Who knows what the truth is? We'd 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 work together and recruit as many others into Proteus as possible. Proteus plans to remain alive and healthy and to continue acting on behalf of PTC owners to your local computer clubs and tell them what is happening to PTC and get owners of PTC equipment (Sol's, CUTF, ISKRA, 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. The problem is, will they 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. Specificity, we're thinking of picking up the Graphics Add 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 IN CONTRARY TO THIS ISSUE.

NEW COPYRIGHT POLICY FOR LIBRARY

A few members' remarks have convinced me that our current 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 that you not be donating someone's copyrighted program without appropriate permission if necessary and that you give Proteus a 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 included. 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 if you use other software that assumes you have RAM available from C000 to some address higher than C000, for example, when using CP/M you can only run in the area below C000. For some very large programs this is a problem.

Bob Goodman of Micro-Ap, 9007 Davona Drive, San Ramon, CA 94583, (415) 828-6697, has a solution to the problem. He is working on a hardware change to move the system RAM, ROM, and video memory to F000 only requires that pins 9 and 10 on the 6522 (after the Sol-PC board) be connected together with a jumper wire and that the gate to U-24 for Phantom be pulled to +5 volts with a 1.5K resistor. The jumpering can be done through a switch which should want to revert back to the standard C000 address to use the CP/M 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 10 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 Kallish, 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 as 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 machines. (After the article was published, IMSAI also went into Chapter XI. MITS, who started it all with their Altair computer, was previously bought by their 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 under-funded, 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 was made 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 heavy losses in the low end of the business or contemplating entry into that market, such as Commodore, Apple, Atari, Zenith, 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.

Patrick went on to say that the prices 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. This 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 will support all four IBM sector formats, single and double density, has on-board a serial port interface, and allows easy PROM with driven subroutines. From this floppy, 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 Persci 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 interest and 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 by their dealers, and we will make these updates available to our members. We will update your existing Helios diskette 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, etc. Generally it will cost much less (probably nothing) to get this mailing if you go to your local dealer, since he's the one who is supposed to get it to you. If you can't get it any other way, you can get it from us. We encourage you to try to obtain the update from PTC or your local dealer, since he's really the one who is supposed to get it to you. If you can't get it any other way, you can get it from us. 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 to 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 USD: Extended Cassette BASIC Update 731044 (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 POR/DTR loop operation (A-supercodes incorrect fix published in ACCESS, Vol. 2, No. 1). Send $1.30 plus a self-addressed, stamped envelope with adequate postage affixed for mailing. This is documentation only—don't send your cassette, please.

Proteus item USI: Extended Cassette BASIC, Rev. A (Part No. 727019)—This is the only version that has been released (I think), but if you have a copy in POR/DTR loop operation (A-supercodes incorrect fix 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, etc.) The ORIGINAL CASSITEC imprinted with Processor Technology’s markings. Send the cassette plus $5.

Proteus item US2: PDTPS 1.5 Rev. E (Part No. 727030)—This version is described in Proteus New PDTPS 2, No. 1. It is the first release of December 28, 1979. The first release of PDTPS 1.5 was at revision C. It corrected errors found in PDTPS 1.4 and added XREF command, CTAPE1 and CTAPE2 object files (device drivers), SoPrinter drivers, and Extended Disk BASIC. Revision D corrected the PDTPS resident, the GET command, and the So13 printer driver. Revision E updated So12 and So1ZE drivers. Copy your original PDTPS (1.4 or 1.5) diskette and send the original (bearing PTC's label) plus $5. Order the manual for PDTPS 1.5E 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 So13 driver just as in so13 diskette, Rev C updated PDTPS on the WordWizard disk to Rev D. Rev D of WordWizard updated So12 and So1ZE just as on the Rev E PDTPS disk. I have Rev B of WordWizard. If you get Proteus version of WordWizard, you can update 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 revision available until I get the latest one. 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 Solish source file to reflect the changes to the driver files on the PDTPS 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 PDTPS 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 like MARGASIC. That's all that this update says, so there's no need to get it.


Proteus item U3D: PDTPS Update 731073 (December 1978)—Describes the SoPrinter driver and also is the note on installing SolPrinters. 5 pages. Send $1 plus a self-addressed envelope with postage for 1 ounce.

(continued)
CONSIDER A MAINTENANCE CONTRACT

Charles Bahb 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 daily business activities, you will quickly become 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 defects are sent out for repair, provided you have someone with the skills and time to interchange the components, and then self-insure your repair costs. Most small businesses that are 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 based on the computer's retail price and is payable quarterly in advance. Service can also be provided outside the 100-mile radius, but will be negotiated individually. The contract covers all pre-defined computer failures 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 contract, 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 advertised software for sale in the coming months. We are informed that several of the items that were sold out by the time we put this newsletter to press. Items include cassette software practically for the cost of reproduction alone, Sol-PC boards, memory boards (remember the old 8K/16K trade-lots?), Sol-20's new and used, and other items. 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 a self-addressed stamped envelope and a note saying where you want the 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 resources available to those located who are so conveniently 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 make them available to you to listen to and return. We will ask for a deposit consisting of the amount of the cassettes and album 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 4-60 cassettes:

Proteus item LCL-4:
Lecture cassettes as follows--
LCL-1 Lecture on speech synthesis by rule, presented to the San Francisco Bay Area chapter (Solus) by Carol Risling and Doug Williams. They have been working under a grant to develop a portable speech synthesis system 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. Risling, 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.
LCL-2 Side 1 completion of the speech synthesis lecture, with audience question-and-answer.
LCL-2 Side 2 Lecture by Howard Pulmer of Parasitic Engineering, presented to Sol-20's-79 to the S.F. Bay Area chapter (Solus), on the "Sol-union" expansion box manufactured by MicroSun. It allows addition of more than 20 extra slots on the Sol's, provides complete pre-programmed features and some engineering details that went into making this work reliably. 30 minutes.
LCL-3 Proteus General Meeting at the 4th West Coast Computer Fair, 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 Pulmer of Parasitic Engineering, on the software 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 an unusual quality horoscope program that will be sold by Processor Tech (the "Solsigns" program). 60 min.
LCL-4 Side 1= Conclusion of Proteus General Meeting at 4th Fair.
LCL-4 Side 2= empty.

To borrow this album, send two checks: one for $13 refundable deposit, the other for $2.50 to cover postage and the handling charge. (First class postage to anywhere in USA, Canada, or Mexico; other foreign post paid by the foreign addresses, and 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 or yourself please take your recorder to check with the speaker to make sure he has no objection to our recording and distributing copies in this manner.
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 issue we'll look at some of the CCP 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 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 exist on any 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 knows the name of the file 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 reclaim their areas for 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 blank in the directory. For example, "MPROGR.BAS" could refer to a program which you call "MPROGR" 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 "MPROGR" 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.

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 in the name of that file if it exists on the current disk.) Thus, you can list all file names of type "COB" with

```
DIR *.COB
```

or all files beginning "IV" with

```
DIR IV?.*
```

which is the same as

```
DIR IV????????
```

and so on...

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

```
USE A:
```

You can remove a file from the directory and reclaim its space for re-use. Use the Erase command:

```
ERASE
```

Since ERA accepts ambiguous file names, you can remove all files on the disk with the single command

```
ERASE
```

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. It uses the given command name as the file name prefix, attaches "COB" 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 commands are loaded into memory beginning at location 1000 (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 1000. 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 ".COB" having the necessary machine program strings. 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 ".COB" 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 ",COB" 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)
Some of the standard transient commands are "KMT" (the assembler for translating assembly language programs into machine code), "ED" (a text editor oriented for ASCII terminals), "SIP" (a peripheral interprogram system) which copies data between files and devices), "SUNYIS" (which creates a file of commands for CCP for that CP/M can run complex procedures in a batch mode), and "PDP" (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 111th 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 (as normally) it 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 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) speck 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 CHIORS (Customized Basic Input Output System). The FDOS speaks to CHIORS in terms specified by a character from the console device, write a character to the Input 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 those functions.

Finally at the lowest level, the CHIORS 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, disk sector ID's, status bits, hardshaking protocols, and so on. This level is described in the "CP/M System Architecture 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 EBDRASIC would require an entire book, which someday may be written, but in this column it's attempted. 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 EBDRASIC Users' manual. Look at the statement numbered 100 on page 5-27 of the EBDRASIC User's Manual (Feb 1978 printing). It reads:

```
100 READ 41: S(1) : 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 statement 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 jumps to the next numbered line rather than go 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 EBDRASIC 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 EBDRASIC 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 'c(1,80)''*
```

will fill the first 80 characters of the LS 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.

```
100 DIM TS(12)
200 T*="JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC"
300 INPUT M$
400 SEARCH $S(1,12),TS,M$
500 Ve=VAL(15+T+1,4)+4)
600 PRINT Ve*
700 END
```

TS is a table of 12 entries, 5 characters each. Statement 40 looks for the first three characters of MS in the table. If it is found there, I is set to the subscript value which points to the beginning of the entry in TS. 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 table in the machine. You could enhance this program by adding an IF statement to detect 1=0 when the given string isn't found in the table, and so on.

(continued)
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. "$" will be found in the wrong place in this table because it is embedded in the other entries too. "ANOTHER BREATHE THE", but if you tack a space on the ends, you will find the right one:

10 IF X"" = """" THEN Y = X

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

ANNOUNCEMENT OF SPECIAL INTEREST GROUP

THE UNDERSIGNED WILL ACT AS COORDINATOR OF A PROPOSED SPECIAL INTEREST 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 AIR CONDITIONING, SECURITY SYSTEMS, ENERGY MANAGEMENT, ELECTRONIC MESSAGE CENTER, SCHEDULING OF LIGHTS & LAWN SPRINKLING, AND 7 7 - 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 COMMERCIALLY 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.
* PERSONS WHO HAVE SUCCESSFULLY IMPLEMENTED THINGS WHICH WOULD BE USEFUL IN SUCH A SYSTEM, SUCH AS INTERRUPTS, REAL TIME CLOCKS, A.C. CONTROL BOARDS, MULTIPLIERS, AND CONVERTERS, TEMPERATURE, MOTION, HEAT, AND INTRUSION DETECTORS, ETC.
* PERSONS WILLING TO HELP IN THE OPERATION OF THE GROUP.

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 FILL OUT THE FORM BELOW, IF YOU WANT OR NEED A PERSONAL REPLY, PLEASE UNCLOSE A SELF-ADDRESSED STAMPED ENVELOPE.

LEWIS N. DWOJECK, A.A.
2876 GLENDALE CT NE
CONOVER, GA. 30238

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 PRESS RELEASE

MICROPI announces COMMON PILOT, the proposed standard CAI language for microcomputers. Offering capabilities comparable to those found on the world's most expensive CAI systems, 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 retaining all useful features and data. Programs may be virtually any length limited only by disk space. This allows instructional courses to be easily branched and very conversational without having to squeeze into available memory. A typical 45 minute CAI course may be 30 to 100K 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 SWCPC CTIO+ graphic terminal is available directly from Southwest Technical Products Corporation. An 8080/8080 version may be obtained from MICROPI on minifloppy disk in North Star DOS format($27.50), or minifloppy CP/M format($27.50), or HELIOS II format($3300). 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 Turbo Microsystems, Odell 85, Tektronics 8510 and PDP 11/34 with VS-11. In the interest of maintaining a 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 Lumen Island, WA 98262

445 Nisqually Lumen Island WA 98262
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 the editor operates with no trouble at all. The fact that the documentation is improving 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 microprocessor system is Electric Pencil, by Michael Greenspan, 1253 Vista Superba Drive, Glendale, CA 91205. In File News (the former name of Protox News) volume 1, number 4, one of our reviewers reviewed the first version of Electric Pencil. In this review, we will examine the Electric Pencil II and compare it with the Wordwizard, PET's word processor. Our experience is based upon working with version 3.11 for PET/PW.

As we mentioned in our review of Wordwizard (Protox 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 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 typing (entering, underlining, etc.) 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 followed. The screen shows the characters, but it uses 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. Whole 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, all the information is kept on the disk, in sections that fit into memory as needed. This in automatic. In Electric Pencil, the saving and loading of text is done by explicit commands from the operator, and the only portion accessed through the program is the one buffer which has the current screen. Electric Pencil expects that you will break long documents down into sections that will fit into available memory, but the Wordwizard does that automatically.

Another 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. You can set the system for the document to be 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 as you see fit. This shows that the continual 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 world.

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 can perform in many different versions, depending upon the type of storage device and printer you have. The particular version I have is for Helios with PCL-8. The only assembly required, nothing more than running the installation disk, is the keyboard, and the fact that 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 PCL version of the Electric Pencil does not work with the CP/M version. The only features were not used where CP/M didn't provide those features. The minimum memory needed is 16K, but since the whole document plus the Electric Pencil source loaded, you will need at least 50K of RAM.

Now, let's take a 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 move the cursor to the HOME letter (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: it inserts a line feed, the virtual space bar. When the space bar is reached, the word 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 V, in cursor.

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, CTRL-A moves the cursor to the beginning of the line. CTRL-A moves it to the left, CTRL-5 to the right, and so on. You can cause the text to move up or down by using the arrow keys. CTRL-A moves the cursor to the beginning of the line and line feeds are deleted. The carriage return key will cause continuous scrolling to stop and page-at-plane to begin each time you press the space bar. This scrolling is very flexible and fast. The Wizard allows scrolling up and down continuously, but not line-by-line. The page-at-a-time mode 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 DEL key. The character at the cursor and the 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 cursor, the DEL key feeds the line and the character is 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 the left. When the DEL key is depressed, you type the command in Wizard to close up the gap by pulling words from below and reformattting the paragraph.

The insertion mode 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 is in the cursor. The insertion characters and functions by the insert 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 Parameter command follows it.

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, and more. For desired assistance for desired assistance, 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 printing mode. The computer will then ask for a set of options settings of the variables which control the printing format (the print values). You can give new values using the single letter codes to identify the variable, or you can give a complete command which 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 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 commands are identified by a ! character followed by the same character codes as in the Print Sub-system. Comments that don't print can also be included in the text. WordWiz also provides dynamic print formatting 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 following with a period. With a line beginning with a period, followed by a line beginning with a period, this centered, provided it is shorter than the Line Length print value when the line is done. The original release of the WordWiz did not have a centered feature, but this has been added recently and you may include it. I haven't seen the update, but have been told that centering can be done immediately on the screen, or deferred to printing time as in the Wizard. Multiple lines can be centered with one command.

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

This is a test of underlining.

The Diabolic printer version allows boldface typing to be done in a manner similar to centering, but the Diabolic line is used instead of the underscore. Also in the Diabolic 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 column. In the Pencil version, line feeds aren't provided, so you must output columns 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 is the name you give to the beginning of each page. One 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 WordWiz 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 WordWiz (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 this automatically. Footings can be used for footnotes in the WordWiz, but no such provision is made in the Electric Pencil.

If 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 disk directory, on tape or on disk, and reads a disk or tape (subsystem). From the tape or tape system you can read the document onto a disk file, load a new document from a disk file, view the disk directory, or any other 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. The printing system works.

The Save command is designed to save text from the present cursor position to the end. I am constantly using this and entering the Disk System again and again at the end of the file, and re-enter the Disk Sub-system. 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. If you suppose the feature is there, but this good reason, but if I haven't seen this 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
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 it 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 specify that the next N lines are to be kept together, and if they would otherwise be split across a page boundary, move 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 panted on the printed document.

In summary, the Electric Pencil is an excellent program for word-processing of small documents where some accommodations 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 theses) and the Pencil may come close, but not close enough.
SOFTWARE REVIEW
by Joe Maguire

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

The Digital Deli (author not given): A relocater for Processor Technology's ALSB 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
84 WEST EL CAMINO REAL
MOUNTAIN VIEW, CA 94041
(415) 961 2670

[Ed. note: For more information about The Digital Deli and its ALSB, please refer to the previous paragraph.]

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.

OVERALL EVALUATION: Excellent

(Note: When contacting users of this program for their comments, it became clear that not many are continuing to use PIC's ECR. Reasons ranged from too many bugs in PIC's (where oh where, in access with the fixes?) to the fact that NS Basic, which was designed for disk operation, can handle programs better in this environment.)

OVERALL EVALUATION: Excellent

This program is able to relocate PIC's popular assembler/editor/simulator package to any memory address. The ALSB MOVER differs from similar relocaters which have appeared in Protes/Proset/Solus News in that it is able to break up the program into separate executable modules. It is possible to load the main program from 0000 to 1FFF and designate the system RAM in an area above 2000. This allows direct loading and execution with the standard Northstar DOS. A copy on one program on the ALSB MOVER disk: ASSI, allows assembly of one or more disk source files. This feature essentially gives a cassette ALSB/Northstar disk combination the power of Helios. The ALSB Mover can be used with either revisions A or B. The documentation is excellent.

OVERALL EVALUATION: Excellent

No user of ALSB with a Northstar disk system should be without this program.

DOS MOVER: The Dos Mover is a 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 micros) to one which will permit non Northstar software to be loaded and executed. A good example of this is PIC's Extended Cassette Basic. Without the Dos Mover, ECM 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 speed.

The Dos Mover not only moves the original code but carries any custom 1/0 routines along with it. Adjusting all the numbers and calls correctly for the new location. An added feature is RET which allows automatic start 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. In other words, with the Dos Mover and Boot, PIC's ECM could be brought up and running with a keystroke.

Included on the Dos Mover disk are relocaters for Northstar Basic, Monitor and the utility program Compact. The double density version will include relocaters for the CF, CD, and DI utilities. This combination allows, for example, the DOS at 0000 and Basic at 2000H (2000 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 36K 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 2000H. A lot of vendor software written for the HS system uses an origin of 2000. Without the Dos Mover, a lot of this software cannot be used with the ALSB. DOS retains an initial load of the DOS to any memory location which is the content of the first word on 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 instruction. Somehow I was able to create your special copy sheet and print it deals with some oddball versions of PROMS and 1/0 routines which were released some time ago.

OVERALL EVALUATION: Excellent

Another program that a Northstar owner should not be without.

11
PROTEUS CASETTE C6

PTC ESBASIC programs--side 1 compiled, side 2 text format.

MULTP C 3C20 058A Multiplication practice
MULTP C 3C20 058A Addition practice
AUG C 3C20 0587 Addition practice
USD C 3C20 0587
SAIL C 3C20 0582 Navigate your boat to the islands
SAIL C 3C20 0582
CHOMP C 3C20 099A Force the computer to chop the last bite
CHOMP C 3C20 099A (a 2-dimensional variation of Him)
HOCKT C 3C20 1399 A sophisticated lunar-lander simulation
HOCKT C 3C20 1399
STOCK C 3C20 1230 A stock market simulation game
STOCK C 3C20 1230
CYLON C 3C20 093U A pursuit game in real-time,
CYLON C 3C20 093U
ECFI C 3C20 0982 Writes all-too-familiar science fiction plots
ECFI C 3C20 0982
SPRED C 3C20 0170 Speed reading competition
SPRED C 3C20 0170
AARON C 3C20 08E5 A memory game (tricky)
AARON C 3C20 08E5
TRUCK C 3C20 1700 Keeps track of vehicle operating costs in
TRUCK C 3C20 1700 several categories
TRUCK C 3C20 1700
PLOW C 3C20 07CA Estimates how long a supply of water will last
PLOW C 3C20 07CA
END C 3C20 0019 End-of-files.
END C 3C20 0019

PROTEUS CASETTE C7

Assembly language source and object

SCS16 0100 2700 Assembly language system (Self-Contained System)
SCLS D 3C63 035E Editor, assembler, disassembler. Version 1.6
CSL D 3C63 035E Output driver for IBM 274L Correspondence code
CSL D 3C63 035E Selective terminal. EX 3C63; SET CS CR03; SET PS-
CUP Y 0001 035A Cassette Utility Package. Introductory documentation
CUP 0001 035A is in CUP0 as ALS-8 file.
CUP1 0001 1371 Cassette Utility Package. Documentation of CUP as
CUP1 0001 1371 ALS-8 file.
CUP 0001 1988 CUP source code as ALS-8 file.
CUP 0001 1988
CUP 0000 00FC CUP object code as Solos/Cutter file.
CUP3 0000 00FC
SCDO 0001 1302 A routine to execute a list of Solos commands on
SCDO 0001 1302 the screen. Documentation and source file.
SCDO1 0001 1302
SCDO2 0001 03CF
SCDO2 0001 03CF
LIST U 3E00 0101 Makes a file at the beginning of your cassette and
LIST U 3E00 0101 containing a directory of files on the cassette.
BHGHP C 0000 1121 Battleship game
BHGHP G 0000 1121
TAPE2 C 3900 0995 A tape test program to record and read back a test
TAPE2 C 3900 0995 pattern.
PNIN C 0000 0400 Displays instructions for PIRAN, Press CLEAR key
PNIN C 0000 0400 then MODE 15 times then type GE and press return key.
PNIN C 0000 0400
PIRAN G 1000 0991 Piranha game. Outmaneuver these voracious fish and
PIRAN G 1000 0991 swim to safety while amassing points.
SSA F 2A00 0600 Single-line simulator. Single Steps through a
SSA F 2A00 0600 machine language program, displaying registers at
SSA F 2A00 0600 each step. The only difference between SSA, SSA,
SSA F 3A00 0600 ...SSA is the load point of the program. Each
SSA F 3A00 0600 version begins execution at its starting point
SSA F 4A00 0600 (2A00, 3A00, etc.). Program will then want a digit
SSA F 5A00 0600 address where simulation is to begin in your program.
SSA F 5A00 0600
SSA F 6A00 0600 Space bar single steps. See complete instructions
SSA F 6A00 0600 in C7 Documentation.
SSA F 6A00 0600

CASSette LIBRARY SNAFU

In military jargon, "SNAFU" means "Situation Normal--All Foul 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 pepping that causes permanent 00 errors, and some have no data on side 2. The pepping 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 Slac 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 INITPATH with regard to using PASCAL, but this remark should be disregarded -- INITPATH 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, FTRKB8, etc. Place this system disk in drive 0 and H1 in drive 1. Give the command "DO PASCHEL" and the Pascal system will be copied onto your system disk in drive 0. You can then run the sample programs on your system disk by copying them from the disk or putting them on file.

For example, "GET /1,0,GCDs,Fs,QUEENS,S,MAN". The Pascal sample programs can be identified by the suffix "p" for "source" and file-type "P" for "Pascal". You can now remove H1 from drive 1. The command "COMPILE GCDs.p" will compile the program "GCDs.p" and put the resulting object file "P-code" into the file named "PORDP". You can copy "PORDP" 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 "PORDP" or whatever other file you put the object code into.

I have no other documentation on SLAC Pascal other than what is in file PASCHEL 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 PASCHEL. 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 floatation 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 terminal command in it; anyone extracted that and made it into a PTDOS command? Please send it to the library if you have. I would do it, but Ijust don't have the time.

Let me know if you have any other questions.

11/08/78 FILES ON HLIB1

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<td>9</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NAMESPACE</td>
<td>IC</td>
<td>6</td>
<td>0308</td>
<td>004A</td>
<td>4</td>
<td>20</td>
<td>K</td>
<td></td>
</tr>
<tr>
<td>NEWGET</td>
<td>IC</td>
<td>12</td>
<td>0400</td>
<td>00A0</td>
<td>8</td>
<td>19</td>
<td>K</td>
<td></td>
</tr>
<tr>
<td>NFILES</td>
<td>IC</td>
<td>1</td>
<td>0100</td>
<td>008E</td>
<td>3</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NFILES28</td>
<td>B</td>
<td>8</td>
<td>0308</td>
<td>0069</td>
<td>9</td>
<td>23</td>
<td>K</td>
<td></td>
</tr>
<tr>
<td>NOTICES</td>
<td>T</td>
<td>8</td>
<td>0400</td>
<td>00B8</td>
<td>11</td>
<td>55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PALCMPL</td>
<td>T</td>
<td>1</td>
<td>0100</td>
<td>00AE</td>
<td>7</td>
<td>47</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CONTENTS OF PROTEUS DISK H2

PAS.S Source code for the SLAC Pascal compiler, written in Pascal. Read the file PROTEUS, 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.

PAS.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.

COMPL.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 simple 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)
Dear Stan,

After a year of rereading SOLUS News/Proteus and gleanings 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 Thinner Toys/Narrow’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 #1888 start of CP/M file space. Once it moves the program desired, it attaches a relocator package on it to move it back to its 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 DD it does essentially the same thing.

b. Does anyone have any source code for PTCCo. 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 PTCCo. 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 Data General Eclipse and a Unicov UYK-7. To do it I have written several programs in Ekt. 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 Bailey
R.R.1
Caledon East.
Ontario L9N 1B9
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 forwards 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 RAM register on initial entry into it by 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 PTDS 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  LBN 128  CANADA

129: BCKSP  MOV  B,C
130: JMP  SOUT
131:
132: HOLDER  DB  8
133:
134: SETTRK  PUSH  B
135: CALL  SEDSK
136: POP  B
137: JMP  TSEEK
138:
139: CONOUT  LDA  INPTA  ;CHANGE FOR MAKE
140: CPI  #NN
141: JSR  RECLM
142: INTRG  CALL  SING  ;WAIT FOR INPUT
143: JSR  INTSG
144: HOMER  AMI  7FH
145: CPI  #1H
146: JSR  MONTR  ;QUIT
147: STA  HOLDER  ;SAVE IN CASE IT IS A 'DEL'
148: RET
149: RECLM  PUSH  PSW  ;SAVE IT
150: CALL  NOPE  ;INPTA
151: POP  PSW  REETAB
152:
153: ;
154: LIST  MVI  A,8EH  ;LIST GOES TO
155: MOV  MVI  ,.B,C
156: JMP  AOUT
157:
158: READER  CALL  TAPIN  ;READER IS THE
159: ANI  7FH  ;INPUT
160: RET
161: ;
162: PUNCH  IN  TAPPT  ;PUNCH IN THE
163: ANI  80H  ;SAVE
164: JSR  PUNCH  A,C
165: MOV  XBA  OUT
166: OUT  TODATA
167: RET
168: ;
169: CONOUT  LDA  HOLDER  ;FOR 'DELETE'
170: CPI  7FH
171: JNS  NEXT
172:
173: CONOUT  LDA  DB  8
174:
175: ;
176: CONOUT  LDA  DB  8
177: CPI  7FH
178: JNS  NEXT
179:
180: ;
181: ;
182: ;
183: ;
184: ;
185: ;
186: ;
187: ;
188: ;
189: ;
190: ;
191: ;
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243: ;
244: ;
245: ;
246: ;
247: ;
248: ;
249: ;
250: ;
251: ;
252: ;
253: ;
254: ;
255: ;
C998  ORG  8C98H  ;THIS RESIDES IN SOLOS SCRATCHPAD RAM

; TO SAVE PROGRAMS THAT RESIDE IN THE C998H AREA OF SOLOS.
; REASSIGNED THIS PROGRAM WITH THE ORG 'SET AT 8C99H.'

; EQUATES TABLE
; START  EQU  8000H
; MUNITR EQU  8001H  ;START OF SOLOS
; FILER  EQU  8133H  ;CP/M FILE START+3
; SCOMM EQU  @C13AH  ;CONVERSION FIRST ADDRESS TO H/L
; PSCAN  EQU  @C100H  ;CONVERSION END ADDRESS TO H/L
; CSUB  EQU  @C190H  ;OUTPUT FOR SOLOS
; CSUB  EQU  @C190H  ;OUTPUT FOR SOLOS
; CSUB  EQU  @C1BCH  ;FIRST SPOT IN CUSTOM COMMAND TABLE
; CSUB  EQU  @CFF9H  ;OUTPUT A CR AND LF
; CSUB  EQU  @C1E5H  ;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.

(continued)
;***THIS PUTS THE CUSTOM COMMAND INTO THE TABLE***

C946 1A
C947 2B
C948 25
C949 26
C94A CD3AC3
C94B 19
C94C 3A
C94D 32
C94E 33
C94F 34
C950 35
C951 36
C952 37
C953 38
C954 39
C955 3A
C956 3B
C957 3C
C958 3D
C959 3E
C95A 3F
C95B 40
C95C 41
C95D 42
C95E 43
C95F 44
C960 45
C961 46
C962 47
C963 48
C964 49
C965 4A
C966 4B
C967 4C
C968 4D
C969 4E
C96A 4F
C96B 50
C96C 51
C96D 52
C96E 53
C96F 54
C970 55
C971 56
C972 57
C973 58
C974 59
C975 5A
C976 5B
C977 5C
C978 5D
C979 5E
C97A 5F
C97B 60
C97C 61
C97D 62
C97E 63
C97F 64
C980 65
C981 66
C982 67
C983 68
C984 69
C985 6A
C986 6B
C987 6C
C988 6D
C989 6E
C98A 6F
C98B 70
C98C 71
C98D 72
C98E 73
C98F 74
C990 75
C991 76
C992 77
C993 78
C994 79
C995 7A
C996 7B
C997 7C
C998 7D
C999 7E
C99A 7F
C99B 80
C99C 81
C99D 82
C99E 83
C99F 84
C9A0 85
C9A1 86
C9A2 87
C9A3 88
C9A4 89
C9A5 8A
C9A6 8B
C9A7 8C
C9A8 8D
C9A9 8E
C9AA 8F
C9AB 90
C9AC 91
C9AD 92
C9AE 93
C9AF 94
C9B0 95
C9B1 96
C9B2 97
C9B3 98
C9B4 99
C9B5 9A
C9B6 9B
C9B7 9C
C9B8 9D
C9B9 9E
C9BA 9F
C9BB A0
C9BC A1
C9BD A2
C9BE A3
C9BF A4
C9C0 A5
C9C1 A6
C9C2 A7
C9C3 A8
C9C4 A9
C9C5 AA
C9C6 AB
C9C7 AC
C9C8 AD
C9C9 AE
C9CA AF
C9CB B0
C9CC B1
C9CD B2
C9CE B3
C9CF B4
C9D0 B5
C9D1 B6
C9D2 B7
C9D3 B8
C9D4 B9
C9D5 BA
C9D6 BB
C9D7 BC
C9D8 BD
C9D9 BE
C9DA BF
C9DB C0
C9DC C1
C9DD C2
C9DE C3
C9DF C4
C9E0 C5
C9E1 C6
C9E2 C7
C9E3 C8
C9E4 C9
C9E5 CA
C9E6 CB
C9E7 CC
C9E8 CD
C9E9 CE
C9EA CF
C9EB D0
C9EC D1
C9ED D2
C9EE D3
C9EF D4
C9F0 D5
C9F1 D6
C9F2 D7
C9F3 D8
C9F4 D9
C9F5 DA
C9F6 DB
C9F7 DC
C9F8 DD
C9F9 DE
C9FA DF
C9FB E0
C9FC E1
C9FD E2
C9FE E3
C9FF E4
C9E0 E5
C9E1 E6
C9E2 E7
C9E3 E8
C9E4 E9
C9E5 EA
C9E6 EB
C9E7 EC
C9E8 ED
C9E9 EE
C9EA EF
C9EB F0
C9EC F1
C9ED F2
C9EE F3
C9EF F4
C9F0 F5
C9F1 F6
C9F2 F7
C9F3 F8
C9F4 F9
C9F5 FA
C9F6 FB
C9F7 FC
C9F8 FD
C9F9 FE
C9FA FF

; WHEN THE PROGRAM IS CALLED BY CP/M, IT WILL BE LOADED INTO
; THE B10H FILE, THE JMP INSTRUCTION AT B10H 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.

; NOW FIND THE END OF NEW FILE

; NOW, H,L HAVE NEW END AND D,E HAVE OLD END

; THIS MOVES THE PROGRAM TO B100H

; THIS PUTS THE CORRECT JUMP ADDRESSES INTO THE RELOCATOR
; PACKAGE.
FIXES FOR MICROPOLIS MODES/RES/BASIC VERSIONS 3.0

by Richard Greenlaw

251 COLONY CT.
GAINESVILLE, FL 32601
2/10/79

DEAR STAFF,

SINCE MICROPOLIS DISKS SEEM POPULAR WITH SOLUS
MEMBERS I BELIEVE THE LISTING ATTACHED WILL BE
OF CONSIDERABLE USE. IT FIXES SEVERAL WEAKNESSES
IN MICROPOLIS MODE/RES/BASIC VERSIONS 3-8.

1. PROVIDES EDITING OF EXISTING BASIC LINES!
2. PREVENTS EARLY CARRIAGE RETURNS DUE TO COUNTER
   BACKSPACES AS FORWARD CURSOR MOTIONS.
3. PROVIDES SPACE BAR PAUSE/RESUME OF OUTPUT,
   INSTEAD OF CONTROL-3/OTHER.
4. CONVERTS MODE ON CONTROL-E TO NORMAL AS
   THE BREAK CHARACTER.
5. CONNECTS CARRIAGE NUMBER 7.
6. FIXES A BUG IN THE PAUSE ROUTINE OF RES WHICH
   LACKED OUT UNTIL I REMODED CODE. BUT IT'S OK.'
7. MEET THE REQUIREMENTS OF SECTION 2.4.3.3.
8. 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 INITIATE 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 BUFFER 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 BLANKS OVER CHARACTERS BROUGHT IN BY CONTROL-L
   AT ANY TIME. WHEN YOU HAVE THE DESIRED NEW LINE
   JUST HIT THE CARRIAGE RETURN AS USUAL.

PROCEDURE:

ENSURE YOU HAVE A BACKUP OF YOUR SYSTEM ON SEPARATE DISKETTES

BUILD A SOURCE FILE OF THE PROGRAM BELOW:

ASM "THISPOW" "HESFIX"

TYPE "HES" B

TYPE "HES" C

TYPE "HESFIX" C

RESFIX

SAVE "HES" 298 1480 3

YOU MUST SCRATCH RES SO THE NEW COPY CAN BE IN THE
SAME DIRECTORY AS FOR BOOTSTRAP. HESFIX CAN
ONLY BE LOADED IMPLICITLY SINCE IT OVERLAYS RES.

NOTE EXECUTION IS FUGGED TO #MAINSTART.

BEST WISHES,

RICHARD GREENLAW

TAB &13,55
LINK "SYS501"
ORG #HITABLE+6

$ADDRESSES OF SUBSTITUTE CONSOLE DRIVERS$
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 NorthStar but two signs 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 ZA00. To disable the message in this routine, put a HR (09) at address ZB00.

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.

(continued)
DEAR STEVE,

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 every time I call them they tell me that they did distribute ALS-8 APPLICATION NOTES, this causes me much chagrin and chagrin because I read Joe Mcguire's letter in the SOLUS NEWS, VOL 1, NO. 6 for the last time. When I called them 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 interchanged a daughtor at 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, or any printer which requires special paper. For my needs a printer 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 exchange 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 and there are many many pilot programs out there anywhere.

Thanks to SOLUS NEWS, a fellow by the name of Bob Speaks called to say he saw my name in SOLUS NEWS and that he also uses proc processor technology SOL-20 and we had a great time talking and exchanging basic programs. Bob's a super guy and the 3 dimensional lunar lander game is very different and fun. I'm going to try to talk him into sending it in to the SOLUS 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 HEEDINK
C/O NATIONAL SHAREDATA CORP.
P.O. BOX 3893
EVANSTON, ILL 60204

ALSO I THINK THIS A GREAT IDEA, SENDING LETTERS IN ON CUTS CASSETTES. IT IS ESPECIALLY NICE FOR US Hobbists WHO HAVE A TEXT EDITOR BUT NO PRINTOUT BECAUSE IT ENABLES US TO USE LETTERS TOO. I PREPARED THIS LETTER IN ONLY 2 HOURS USING MY ALS-8 TEXT EDITOR.

Sincerely,

ROBERT W. HEEDINK

(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 spaces 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 the 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 PILS coursework library, too.)

---

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**FOR A LIMITED TIME ONLY:**

- Model 32K Card $649.00 (250 ns. memory devices)
- Model 16K Card $349.00 (250 ns. memory devices)

- Base Boards Available

Trace Electronics has established itself as a memory supplier for large government agencies, military research and development projects, universities, businesses and OEMs. Where reliability counts, Trace provides the memory.

Frankly the emphasis we have placed on quality has never before permitted us to compete in the cost conscious logistic market. At last volume has grown and we feel confident we can compete and retain our reputation for field reliability and support. Certainly most computer users can appreciate the extraordinary buffering, versatile addressing and reliability of design inherent in our product. Now we hope you can appreciate our price.

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Wes Clarkson
Marketing Manager

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**TRACE'S 32K/16K RAM Card Features**

1. Capacity: 32768 Bytes for model 3200 16384 Bytes for model 1600
2. Addressing: Each 4K block sequentially addressable on any 4K boundary. Allows memory to be placed at the top, bottom, and anywhere in between.
3. Wait States: none
4. Speed: 250 ns
5. FULLY STATIC: no clocking, no refreshing
7. Full sockets: even the 16K board contains sockets for all 32K of memory.
8. Fully assembled, tested, and burned in.
9. Lower power than equivalent capacity of low power 2102 type memory, but only one 2102.
10. DMA Compatible
11. Fully Buffered: All address and data lines buffered with powerful state of the art buffers equipped with Schmitt triggers on their inputs.
12. Special Thermal Design: Each 4K of memory has a separate regulator thereby distributing the heat dissipation over 6 separate regulators. They are placed at the top of board to allow the most efficient heat dissipation possible.
13. Rectified:™ up to one megbyte can be addressed providing there is a 4 to 8 output port in the system. This allows up to 32 model 3200 boards per system, as long as the power requirements are met.
14. Power Required: 1.7A at 8V for model 1600 and 3.3A at 8V for model 3200. Current TI TMS 4044 device use approximately 20% less power.
15. 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) 246-8081

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/29 computer and Helios** floppy disk system.

Users of the 8808 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 8808 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 PTDDOS 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 sort keys and field delimiters. Through the use of a user definable call list is possible to sort a data file into virtually any 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 typical large data file. User programmable 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 an inventory file. The resulting index file can then serve as a look-up table using a fast binary search. A binary search write 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 188 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 $75.80. 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

FREE: newsletter reviewing Northstar disk compatible software that I sell. For subscription write to J. Dvorak, 704 Solano Ave, Albany, CA 94706. State your computer system configuration.

FREE: Write for free issue of ONLINE, The Buy & Sell Forum for the Computer Hobbyist, a Classified ad newsletter with circulation over 6500. ONLINE, 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 has transferred over to the Helios. You need Helios/CP/M operating system, instead of PTDDOS, to run these programs. Order that site from Lifeboat Associates, 164 West 33rd Street, New York, NY 10024, telephone (212) 580-0082. Proteus is also working on transmitting some of these programs over to the Helios and converting them to run under PTDDOS.)

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, 9934 Naeathur Blvd, Oakland, CA 94605, (415) 569-4327.

CLASSIFIED ADS

CORRESPONDENCE WANTED: I'd be delighted to hear from anyone about their experiences with Sol, etc. Robert Neerding, c/o National Sharedata Corp., P.O. Box 3895, Evansville, IN 47727.

EQUIPMENT FOR SALE: 2 - 16KPA $300 each or $550 both; 1 - 3P+8 kit only was $100b 1 - CPM-8 $125. CPM-8 alone $100, ALG-8 ROMS alone $45; 1 - AGR3 teletype, RS-232, stand, motor driven paper工伤, paper tape punch & reader, exml cond $600. P. Ors, 140 Shady Lane, Monterey, CA 93940.

EQUIPMENT FOR SALE: Centronics up-1 printer, cable for Sol, $450/offer. W.D. Loughman, 393 Gravatt Dr, Berkeley, CA 94705, tel (415) 841-7528 ever, 666-3121 days.

EQUIPMENT FOR SALE: Sol-3A system with Sol-20, load and monitor, Helios II, PT-872 video monitor, ENRASIC, cables, manuals. Purchased 10/78 as assembled system, for system development, must now liquidate as it is a 2nd system for me. 59300, H. Harkness, 224 Alcross Dr, Pittsford, NY 14534, (716) 423-3524 days, 381-0201 ever.

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.O. Hayes modem for Sol. Also have questions about IRC in general. Would like to correspond with someone to could help. Paul N. Ornack, 140 Shady Lane, Monterey, CA 93940. (408) 646-2636 work (no collect calls there please), 272-0505 home (collect calls okay). 5 p.m. til 11:30 p.m., any "Proteus calling".

FREE: Newsletter reviewing Northstar disk compatible software that I sell. For subscription write to J. Dvorak, 704 Solano Ave, Albany, CA 94706. State your computer system configuration.

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WAIT 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 PTOC, but we need to know how much we can offer. If we can get enough buyers among our readers, we may be able to do it.

Would you be interested in the source code and machine readable form for all 65, PTOC, Extended Cassette BASIC, or Extended Disk BASIC at approximately $250 each? We would sell this without a copyright on it, that is it would go for license in 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) with 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 PTOC owns the source code of, the others were just licensed to PTOC an exclusive distributors.
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 FTC 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 ALP-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 you 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 they're gone, 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 "P" series (P1, P2, ...) 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 Fair. Several new library cassettes are in preparation and we need the space.

There is a new Helios library diskette, FL, containing a variety of donated programs, there is a new one, donated by Joe Maguire. The ZAP command source file, when assembled, will give you the ability to make it a tool to display 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 I began to go out of business and 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 FTC when they were liquidating. His name is Mike Quinn Electronics, and he's on Langley Road at the old Northfield of the Oakland airport, Oakland, California. He's selling $150 per set. Unfortunately, he doesn't do mail-order business at all, but if we have a sufficient number of orders, I will change a moderate markup 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 FTC for their own products. The missing parts are the 9402 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 "burnt-ins", that is, endurance tested at FTC. 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 take any and that they're all that is left.

The purchase is strictly on an as-is basis, I do know of several former FTC employees who are capable of trouble-shooting them, and I've gotten recommendations for dealers who also are good at servicing Helios. I'll pass this information along to those who want it. I've considered paying one of these FTC 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 FTC 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 system. Someone starting from scratch would be better off buying a soft-secured controller, such as 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 done these days, it may take months to get a defective system back in operation unless you have spare like this. Just parts alone could take 3 to 4 months, as I mentioned.

(continued on page 12)
How I learned to Stop Worrying and Love Machine Language

by Robert Stek

Until recently I was a hexadecimal phobic—had a strange irrational fear of anything that vaguely resembled hexadecimal notation or machine language. I'm sure I could watch a memory dump page by page with only a small knot in my stomach. And I even became accustomed to entering "PRINT 909" on my 801 in order to lead Northstar BASIC (though I had to get a friend with a P.H.D. in computer science to test my 801/0 program to do it for me). But whenever a book or article on assembly language programming, I would break out in a cold sweat and could easily think of a dozen reasons to use "GO BASIC" and play a game of STARTARK or OTHELLO. All those odd codes, registers, accumulators, program status words, jumping and pushing stacks—YEECH! My neurotic fear and loathing could be traced back to being frightened by 1401 Autocoder when I was in high school!

But as surely as programs expand to fill available memory, it had to happen that I eventually would have a face-to-face confrontation with a machine language subroutine. It all began quite innocently with a program published in Processors Technology's ACCESS. Written by Tom Digate, it demonstrated how to produce an inverse video display from P.T.'s BASICs. Now, what could be more impressive than printing out messages in inverse video! I just had to learn how to do that. Indeed, it used a machine language subroutine, and I really didn't understand how it worked. But I figured that if I didn't have to understand it—as long as I could use the program as an example, I would be okay. (See listing #1.) I cleverly figured out that all I had to do was 1) look up the decimal value of the ASCII character I wanted in inverse video, 2) add 128, and 3) put it in a DATA statement in the example. Simple, no? Simple, yes—in BASIC.

But after all, BASIC was just a limited cassette BASIC and I was now standardizing on Northstar BASIC. Outwardly, I knew that I might have to do some minor translating between the two BASICs. So, let's see... in BASIC there are two machine language functions: ARC and CALL to quote the BASIC manual:

When the ARC function appears... such as B=ARC(V1), the argument will be evaluated as a sixteen bit integer and temporarily stored in the basic monitor. Should linkage be made to an assembly language (8080) program segment via the CALL function, the previously stored sixteen bits will be passed to the assembly language code in the B,C register pair.

When the CALL function is invoked... such as 8=CALL (5,2,4), the argument of the CALL function will be evaluated as a sixteen bit address and the VOM driver will transfer control to a routine at that address using an 8080 CALL instruction.

In Northstar BASIC:

The built-in function CALL takes a first argument which is the address of a machine language subroutine to call. The optional second argument is a value, which is converted to an integer and passed to the machine language subroutine in RC. The CALL function returns value as value the integer which is in HL when the machine language subroutine returns.

Well, there they were—B,C register pair, DE, HL—YEECH! Ignore them; I wasn't worried. The translation was obvious:

in BASIC
B=ARC(V1)=CALL(V0)
B=CALL(V0,C/V1)

So I confidently proceeded to translate the BASIC program to Northstar BASIC, little realizing the perilous path I was pursuing. Oh boy, I couldn't wait to use that inverse video in some games, or even better, in some business application programs to make my "sophisticated" display.

After I had translated everything, entered the program, and typed "RUN", nothing happened—at least, there was no inverse video! I had the distinct feeling that somewhere a B,C register pair was laughing at me. But I was determined—remembered a letter to the editor in that same issue of ACCESS that referred to inverse video. Don Petrie had written:

The solution to this problem lies in addressing that portion of the VOM driver starting at location COBB [in CUTER; C098 in SOLOS] after having put the [character] into register B. That can be done as an immediate move in machine code, necessitating a call from BASIC to your machine code which in turn calls the driver, or by using the ARC command in BASIC before the call to the driver.

When I checked in the source code for the SOLOS monitor under the heading of "Video Display Routines", it stated that "on entry, the character for output is in register B." (Imagine, I was looking at a whole page of source code without even fainting.)

So, I now knew that whatever character I wanted to see in inverse video had to be put in register B. Suddenly Listing #1 began to make some sense. The ARC function stored its value in the register pair sixteen bits lower than the letter I, for example, is 73. Add 128, and presto—201, the first value in the data statement in Listing #1. You obviously don't need sixteen bits to store 201. So internally, it probably looked something like this:

Register B C
000 201

And in Listing #1, 201 (stored in variable C) was multiplied by 256 (line 65020) to get it into register B. Somehow, this made some sort of intuitive sense to me: 256°C was too warm to eat in just C, so it was carried over into the-to-day-B register, just where the VOM driver routine needed it.

All very well and interesting, you say, but how could I apply this great insight to Northstar BASIC? Its CALL function passed value into register pair CH. How could I get the value which was in register E (arguing analogously from the BASICS ARC function) to register B where the VOM driver could output it in inverse video? A sentence from Petrie's letter sprung out at me: "That can be done as an immediate move in machine code..." Machine code: ARC? ! I panicked! I had been lulled into a false sense of security thinking about register pairs and such. But machine code? Maybe I could call that gnu from the computer club to help me—probably know someone like him: about 16 or 17 and he thinks in binary.

But, no... after my initial wave of panic had subsided, I realized that after my brief encounter with the VOM driver routines, I was still in one piece; all my registers, uh, I mean marbles, were intact. So why not live dangerously

(continued)
and look at that sheet of 8080 op codes I had somewhere. Lo and
behold, there was a whole family of MVM instructions—and if
that didn't look like what Petrie had written about, nothing
ever would. There was MVM R,C and MVM D,H and MVM D,E and
wait a minute! Weren't those the two registers in which I had a
special interest? My heart leaped to pound—not from fear at
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 MVM D,E and not MVM E,B. So MVM R,E it
was! And while perusing the list of op codes, I happened upon
something with a familiar ring—CALL and RTN. 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 DARTS? My mind boggled at my own cleverness.

My first machine language subroutine sprung to life full
blown from my forehead:

```
NOW B,E 43
CALL CB9BH or in hex CD 98 CD
```

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 video passed as the
argument in the BASIC CALL statement. Who said machine language
programming was difficult? I knew I could do it all alone.

My first requirement was some free RAM. I knew that SOL
had some scratchpad RAM at CB000H, so I figured that I could
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 fills memory byte 100
with the binary encoded value of J+3, truncated to 8
bits.
```

I needed to FILL memory starting at CB000H with 43H, 59H, 98H,
40H, C9H. But FILL wanted decimal arguments. No problem—my
requirements were met with

```
FILL 51968,67
FILL 51960,365
FILL 51970,152
FILL 51971,152
FILL 51972,201
```

I could then CALL(S1968,C) where C was the value of the
character (in decimal) that I wanted to print. I quickly
got a way to use a FOR-NEXT loop and the LEFT-AR
functions to get decimal values of each individual character in
a message string. Then LEN function returns the length of a
specified string while ARC 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(S1968,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.

```
( )
( )
```

Here...I wonder if I can CALL my Music System program from
BASIC to play the StarTrek theme before a game of STARTREK...
SOFTWARE REVIEW

STD, MAC, AND TEX FROM DIGITAL RESEARCH

There have been many write ups on CP/M which is the de-facto standard for 8" disks and now that it is available for the 8088, the CP/M set up will undoubtedly be used. We have been so much said about this operating system that I see no need to re-write it. However, 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 remembers MAD, MACROF, etc.) I would like to make some comments on the extension software:

STD---SYMBOLIC DEBUGGER

This package is an extension of Digital Research's DDT, both of which have features found in DEBUG 8800 which I've mentioned in the past. STD is used for debugging machine language. The expected features are included: move memory, fill memory, modify memory, load from mnemonics (assembly in place), dump (hex and ascii) (not set up from a 64 character display), simple step-display and modify registers. With STD you can set 2 break points and 8 pass points. A pass point is put in a loop to cause a break on the 8th pass through the loop. Then single stepping or dumping in mnemonics (disassembly), STD will display symbols and labels from a predefined table in addition to the HEX values. STD 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 8800) which I use to find Z/0'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 output is on disk. The resulting output winds up on disk. Because of the disk operations, these types of assemblers are of lower speed compared to memory assemblers such as ALG-8, but any large programs can be handled. MAC will produce the object code in Intel hex format, a symbol table (compatible with a print file) and a print file. This is the source with the object code added. For speed any of these files can be deleted or vectorized to the printer. A 70K source will assemble in about 8 seconds if the print file is deleted. A 44K object file takes 40 minutes on a single program. MAC does not require line numbers, but you can insert them if you want. Comments must be separated by semi-colon, so it is not totally compatible with ALG-8. MAC will assemble MACROS, CONDITIONALS, and SEPARATES as is in the Intel software manual. All code is absolute however.

One disadvantage of MAC is when the source specifies more than 5 bytestm, e.g. in a 68000 statement the LDP instruction 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 LDT instruction is confusing. Two unusual features: 1. MAC can be made to forget its code table. This allows defining new macro symbols with macros-i.e. a super simple cross assembler. 2. MAC macros aren'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, 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 a monitor, CP/M won't run. TEX is a nice piece of software. But as much word processing is to be done, I would recommend a software package designed for a VDT 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 LIFEROAD.

If you just occasionally dabble with assembly language and machine language, I'd suggest ALG-8 and DEBUG 8800. (Does anybody remember PICCOLO? I still exist! I haven't seen their ad since I got mine in May 77.)

HARDWARE REVIEW

TARRELL 32K STATIC RAM

I recently purchased a 32K STATIC RAM card from TARRELL 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. Tarrell's name isn't on the board anywhere, nor is any one else. The Tarrell name only appears in the manual once, as part of the copyright notice, and it appears to have been stamped in later.

2. Tarrell 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 Tarrell'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-estadoed 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 (understandably) access times increase with temperature, causing data drop outs. However, they do not say if there are problems with an 8800 or only a 180 at 4.5MHz. 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.

(Em. 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 WILLO'S LIBRARY DISK #3

1979CAL
The 1979 calendar.

AUTO, AUTO, AUTO, DATES, DATES-C, CHANG, R, PLOT-4, R, PLOT-C
An insurance agency software package, for rating
CCL or split limits automobile insurance. Read text file
AUTO, AUTO for complete explanation. (Martin Hill, Jr.)

SETDATE, DATES, DATES-A
A 4x5 CRT program to set the date in PDOS global area, designed to be placed in STARTUP primarily. DATES-A
similarly fetches the date from memory for checking. SETDATE
and DATES 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 MP command is on line 83; chance it to have the name of your output driver. Mine is PRINT for a Centronics 701 and PRINT2 for an old communi-cations printer. [Donated by Roy Heybrook.]

EGRAPHIC
EGRAPHIC 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.

HTYPE
PDOS driver for Diablo HuType printer using Processor Tech's HuType interface board and plugged into the parallel port of the KII. This driver is WordWiz compatible. It assumes a Courier 10 printable, or equivalent arrangement. It is based on the SonPrinter2 driver, with references to the extra features of the SonPrinter interface deleted. [Skelow]

HEETEST
A 48K memory test. Test lower 48K memory. Puta RET character out after each cycle. To quit, reset video and re-boot.

HTEST1D
Documentation of HEETEST.

OKDATA
Source code for PDOS driver to operate Okidata printer on serial port of Cromemco 7U-A2 interface board.

PRINT
Centronics 701 driver. [Donated by Roy Heybrook.]

PRINT2
Driver for an old communications printer. [?] [Donated by Roy Heybrook.]

S154C
PDOS & WordWiz driver for a Selectric terminal
IER 2741-type. Correspondence coded, on the 201 serial port, modified to do 134.5 baud. [Stan Skelow]

RDTIR
An updated version of RFDIR on U1 disk to change graph headings that were not set up right. [Donated by Roy Heybrook, CFP.]
LOOK.A Command to find specified bytes in memory or in a
disk file. [Tom M. Quinn]

SETEXT.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.P Shell sorting in PTDOS-FORTRAN. [Earl Dunham]

SORT.E Same as SORT.P, but written in BASIC. [Earl Dunham]

USORT A BASIC program which creates data files for SORT.E
[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 PROCESS.D.
That file contains commands to PROCESS and also doubles as an
equivalent to the usage of EDITOR. [Al Smith]

EDITOR.D contains information on using the commands available
within the basic program EDITOR. To use EDITOR you must
run EDITOR from basic. If 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 L. It also has a brief
syntactic of the EDIT features.

BOOT.S The source for the Helios bootstrap loader.

COPYC:A A screen doodling program which places a duplicate
copy in memory for saving. Good for designing
playing fields for video games.

DSPG0RT0 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.

DOGISIO An I/O routine for the Sol for use with the North Star
Microdisk system. Includes many desirable features

BADTA.B Memory test programs:

16KFA.B
16KFB.B
32KFA.B
32KFB.B
48KFA.B

MTEST.B A collection of memory test programs tailored
for the various boards produced by PTC. [J. Mauk]

[Editor's note: MTEST.B is not the same as MTEST.B
on this disk]

OCTAILS An Octal Enter and Dump routine. Gives ASCII
values and a hex address for reference.

FADD50S Is the source code for Richard Fang's Palo Alto
Tiny Basic from early issues of Doctor Bob's Journal.
A few enhancements in this version.

SPINWPR NEC Spinwriter 5510/5520 device driver.
A bi-directional, logic seeking printer driver
fully compatible with Wordwiz. It includes
"space averaging" an ability to restructure
the line producing "type set" quality printing.

TERM.S The missing TERM command from Sol Bootload prompt.

ZAP.S Zap let's you defeat the attribute protection
of PTDOS. UNZAP.S gets you back.
Use with caution!

---

1206 N. Lawrence St. Santa Ana, California 92704: 714-255-1045

GRT CORPORATION
Consumer Computer Group

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 GRT command allows recording of programs that are in
Processor Technology Extended BASIC. Please use the fol-
lowing patch for the GRT function:

Enter the following statement immediately after G/2 Extended
BASIC is initialized:

FOR X=2541 TO 2546; FORD, X:O; 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)
DEOS: 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 CUTER format cassette tape.

Proteus item D3: (one only)
Extended Disk BASIC User's Manual—This is a modification of BASIC for use with PTDOs and Helios II Disk Memory System.

Proteus item D4: (one only)
VDN-1 Video Display Module User's Manual; Assembly and Test Instructions—This manual supplies the information needed to assemble, test and use the VDN-1 Video Display Module, an ultra-high speed display generator designed to operate with 5-180 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)
ASSA: Advanced 8080 Assembler User's Manual, Release 1.0 (Part No. 727120, July 1978)—This manual accompanies a cassette tape with 3 programs: ASSMA, Pacak, and UNPACK. ASSMA is designed for use on computers that use the Cutter monitor program and CUTER modules. Pacak and UNPACK 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/S User's Manual (Manual No. 727001, November 1977)—This manual describes the features and restrictions of PT's SOLO BASIC programming language.

Proteus item D8: (one only)
SOLO Terminal Computer User's Manual (Part No. 730021, March 1979)—This manual is a light operating guide and reference manual for all SOLO users. It can serve as the novice's learning book or as an experienced user's introduction to the full capability of the SOLO 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 microprocessor. The package includes an executive to handle personal files, an assembler, and a line-oriented editor. This is the manual for the original paper-tape version.

Proteus item D10: (two only)
SK BASIC (SOFTWARE 12)—This is a source listing of SK BASIC, the original paper-tape version.

Proteus item D11: (one only)
SOLO Cuter User's Manual (Part No. 727004, June 1978)—This manual describes the SOLO and CUTER monitor programs, CUTER operation in 8080-based computers other than the SOLO, and CUTER equipped with PT CUTER tape interface board, VDN-1 video display board and DB-5 Parallel/Serial I/O board.

Proteus item D12: (one only)
CUTER Computer Users Tape System User's Manual (Manual No. 730005, July 1977)—This manual supplies the information needed to assemble, test, and use the CUTER System. CUTER is a high-speed, single to use audio cassette interface that operates at 300 and 1200 bps data rates under program control.

Proteus item D13: (one only)
General Purpose Memory Module, GM and GM+GLC Assembly and Test Instructions (Manual No. 721009, July 1977)—This manual provides all information necessary to assemble, test, and use the GM module. GM is an 8-100 bus compatible memory module for use in 8080-based computers.

Proteus item D14: (two only)
Subsystem B User's Manual (Manual No. 730013, August 1977)—PT's Subsystem B is a set of five 5-100 compatible modules which convert most microprocessor mainframe assemblies into computing systems comparable to the 8080. It comprises two memory modules and three interface modules.

Proteus item D15: (one only)
Cassette PILOT Update 731068, 6/78, 1 p.—Correction to manual recording LOAD PILOT OR DISK.

Proteus item D16: (one only)
Cassette PILOT Update 731069, 7/78, 4 pp.—Patches for PILOT 2.2 (Mod 0).

Proteus item D17: (one only)
SOFTWARE #1 Update 731076, 7/78, 3 pp.—Error correction for SOFTWARE #1, Release 1.0 (Mod 0).

Proteus item D18: (two only)
Extended Disk Basic User's Manual Update 731062, 7/78, 2 pp.—Added demonstration programs, new TIL statement.

Proteus item D19: (one only)
VDN-1 Update 731063, 7/78, 2 pp.—Errata in User's Manual.

Proteus item D20: (UDJ)
Extended Cassette BASIC Update 731064, 4/78, 7 pp.—Errata and addenda to User's Manual, first printing, fixing a bug in TOS/NECT loop operation.

Proteus item D21: (one only)
Extended Disk BASIC Update 731065, 7/78, 1 p.—Fixing the PTDOs GET command on BASIC diskette.

Proteus item D22: (one only)
8080 CHEERS 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: (UDJ)

Proteus item D24: (one only)
PTDOs and Nordwizard Update 731074, 1/79, 4 pp.—Revision levels of PTDOs 1.1 System Disk, Nordroid System Disk, and Nordroid Document Disk.

Proteus item D25: (UDJ)
Workwizard Update 731075, 12/78, 7 pp.—Sparse averaging on SOL Printers and 2E, Errata to Nordroid User's Manual, specifications for custom printer drivers, and 175B's electric pencil sharpener.

(continued)
Proteus item D26:
16KRA Dynamic Read/Write Memory Module User's Manual (Part No. 730001, 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:

Proteus item D31: (two only)
The Small Computer Catalog, DTC's colorful catalog.

Proteus item D32: (one only)

Proteus item D33: (one only)
SOFTWARE #2 (BASIC/5) paper-tape object program and user's manual.

Proteus item D34: (unbound)

Proteus item D35: (two only)
ALSO Program Development System User's Manual (Part No. 720013, November 1977)--This manual describes the capabilities of ALSO, a single terminal operating system designed for use with 8080-based micro-computers.

Proteus item D36:
ALSO Manual Change Notice #2 (Jan. 1978)--Describes several new features contained in Revision B ALSO program (Rev. B1-B3, B31-B33).

Proteus item D37:
Extended Disk Basic Reference Card.

Proteus item D38: (one only)
CUT5, Computer User's Tape System: Assembly and Test Instructions (1977)--This manual supplies the information needed to assemble, test, and use the CUT5, Computer User's Tape System.

Proteus item D39: (one only)
CUTER Monitor Program Source Listing.

Proteus item D40:

Proteus item D41:
Extended Disk FORTAN Update 731040, 7/78, 2 pp.--Additional programs on FORTAN 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. 730065, 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-TC under certain conditions, where U97 cannot sink enough current to activate the relays R1 and/or R2.

Proteus item D45: (one only)
SOL Manual Change Notice #9, 7/7, 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/PS/RTC. Both.

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; supersede Change Notice #12.

Proteus item D49:

Proteus item D50:
SOL Manual Change Notice #16, 1/78, 2 pp.--Vectorized 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 BSC Rev. A, 5/10/77, 1 p.

Proteus item D53: (two only)
BSC Static Read/Write Memory Assembly and Test Instructions.

Proteus item D54:

Proteus item D55:
SOL-NTYPC Interface Update 731076, 12/78, 5 pp.--SOL Printer Interface.

Proteus item D56:
SOL Installation Guide (Part No. 730038, March 1979)--This guide introduces you to any number of the SOL memory boards.

...
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 64KRA-1 Dynamic Read/Write Memory Module User's Manual.

Proteus item D59: 32KRA Update 731047, 11/78, 8 pp.--Describes modifications to 32KRA memory boards which make the boards compatible with many more S-100 computers based on the 8086.

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 16KRA 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) PDOS Update 731073, 12/78, 5 pp.--SOL Printer drivers on the PDOS 1.5 system disk, notes on installing SOL printers.


Proteus item D67: Helios Update 731048, 3 pp.--Describes modifications to Helios Formatter circuit boards.

Proteus item D68: Helios Update 731071, 8/77, 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 PDOS errors relating to disk structure.


Proteus item D72: Helios II Disk Memory System Manual (Part No. 730089, 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, PDOS, CONDFOR command password.

Proteus item D74: Helios II Manual Change Notice #4, 10/77, 3 pp.--Modifications to Controller PCB Assy 301060.

Proteus item D75: Rev. A Updates to the original loose-leaf Helios II Disk Memory System Manual.


Proteus item D77: (one only) AUR 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 US2: Update your PDOS diskette to PDOS 1.5 Rev. X (Part No. 727010)--see PROTEUS News, Vol. 2, No. 3, p. 3. Send original FTC diskette.

CASSette LIBRARY


(continued)
HELIOS DISK LIBRARY

Proteus item H1:

Proteus item H2:

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:

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
Mooseley).

   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 8 0 : 33 C7
   All contiguous memory thru 0000 cleared except for 0000 0001
   and 0009.

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 AEX(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
transfer.

In the meantime, CP/M has become the most popular disk
operating system among microcomputers. Now there, 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, SIO, 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 278 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 DDV; save
the 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.

If you are not familiar with Helios CP/M and Helios PDOS are not compatible. Any attempt to read the
CP/M disk with PDOS gives a DISK STRUCTURE BAD error.
PROTEUS SOFTWARE DIRECTORY

PROGRAM NAME: THE BUILDER CATEGOR Y: Builders and Contractors

DESCRIPTION: The Builder is a 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 subcontractor 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: 20 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 CATEGOR Y: 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: LSOLO - Law Billing CATEGOR Y: 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, 38K, CRT, 2 disk drives

SOFTWARE REQUIRED: CP/M, BASIC, QUINT

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: K & B Associates, Inc.
P.O. Box 1904
Denver, Colorado 80219

REMARKS:

PROGRAM NAME: BIG PRINT CATEGOR Y: SIGN MAKER

DESCRIPTION: The copyrighted program BIG PRINT is used to print giant block characters to create any messages 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 * - ; : .

MINIMUM HARDWARE REQUIRED: 10K RAM plus SOLOS/CUTER and system RAM; 132 print position printer. HELIOS version requires additional 1K.
RESTRICTIONS: Only conversant in English.

DOCUMENTATION: All the documentation and instructions are via the VIDEO DISK.

MEDIA: SOLOS/CUTER version on cassette; PDPO version on cassette.

DATE CURRENT VERSION WAS RELEASED: September 1978

WARRANTY: 90 Day repair/replace

PRICE: $29.95 plus 5% sales tax. We welcome VISA and MASTERCARD.

ORDER FROM: COMPUTER DEVO INK, INC.
509-B Francisco Blvd
San Rafael, CA 94901

Phone (415) 457-9231

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 ads, computer stores, etc. Neither 1 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 blame 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 JORGENSEN
7520 LE GRAND DRIVE,
PENSACOLA, FL 32504

Your inputs will be of help to all of us - now that Proteus 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 ***

-ARTIC 16K/25K STATIC RAMS
  SEVERAL GOOD REPORTS FROM DMA AND NON-DMA USERS.

-BASE 2 32K RAM BOARDS
  REPORTED TO WORK WELL IN THE SOL. SEE JOE MAGUIRE'S LETTER IN VOL. 1 NO. 4.

-DYRON 32K STATIC RAM
  HIGHLY RECOMMENDED BY RON PARSONS IN A REVIEW IN VOL 1 NO 4, WORKED WELL WITH HELIOS AND TARELL DISK CONTROLLERS.

-EXTENSYS 32K AND 64K DYNAMIC RAMS
  GOOD REPORT ON 32K BOARD IN A NON-DISK SYSTEM (8QB, STEK, VOL. 1 NO 1). A REVIEW IN VOL 1 NO 1 STATES THAT THE 8QB 64K BOARD "APPEARS TO WORK WELL IN MOST STANDARD SOLS" THE NEVER MUDER RH-128 64K BOARD IS REPORTED TO WORK WITH HELIOS - SEE VOL 1 NO 4 FOR REVIEW.

-MICROBYTE 32K STATIC RAM
  GOOD REPORT FROM STAN SOKOLOM IN VOL 1 NO 4, HELIOS COMPATIBLE.

-MHS 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.O. SALES EXPANDAROMS
  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 SATISFACTORY WITH A DISK SYSTEM AS LONG AS THE DOS IS NOT AFFECTED IN THE EXPANDAROM. S.O. SALES UNABLE TO EXPLAIN INCOMPATIBILITY PROBLEMS HAVE HEARD THAT CHANGING THE MEMORY CHIPS FROM 4116'S TO 4114'S 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
  WITH SEVERAL DMA DEVICES AND WITH THE ITMAC AUDIO Z-RAY CONVERSION. ONLY PROBLEM IS THAT BOARD REQUIRES A MAX OF 7V ON THE 8V LINE OTHERWISE SUPPLEMENTAL COOLING MAY BE REQUIRED, AND THE WARRANTY MAY BE VOIDED. MANY SOL'S HAVE 18V 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
  A VERY GOOD BOARD WITH DYNAMIC SUPPORT CIRCUITS SOME DMA INCOMPATIBILITY. RAM FLAKES WITH 4116'S BUT WON'T WORK WITH ANOTHER HELIOS. SEE REVIEW BY BILL BURNS. VOL. 1 NO. 2.

*** OTHER ACCESSORIES ***

-HEURISTICS SPEECLAB 500
  GOOD WRITE-UP AND FAVORABLE REVIEW BY BRUCE BARRON IN VOL 2 NO 1.

-KEA MICRO DESIGN GRAPHIC 120 X 40V GRAPHICS ADD-ON BOARD FOR $50. FAVORABLE REVIEW IN VOL. 1, NO. 4.

*** REVIEWS WANTED ***

-SENITIONIX REM 5-100 4K ASSOCIATIVE MEMORY
  NOT ENTERED IN THE DIT TP TELEPHONE TRANSCEIVER
-CENTRAL DATA CORP MEMORY BOARDS
-66H MEMORY BOARDS
-SEALS MEMORY BOARDS
-ANYTHING ELSE YOU RECOMMEND OR HATE?

(End. Note-Leigh would like to hear from anyone who might know where he can get a maintenance manual for an OKIDATA CP-310 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 D.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 $10.50 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.
0006 DATE-COMPILED. JANUARY 20, 1979.
0007 SECURITY. NONE.
0008* This program renumbers 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 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
- Hexadecimal 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.

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
RELEASED DOS AND LARGE PROGRAMS WITH
ORIGIN AT O

LEONARD MORGENSEN

If your NORTH STAR DOS is located at 2000 you have a
problem with PT-EDIT, ELECTRIC PENCIL, 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 144, and the text extends
from 145 on up. Actually, most of RAM from 1800 to 144 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 2000 (2400 for
default-density DOS).
(2) Load unchangeable portion at 0.
(3) Sew together the blocks residing at 2000 and 0
by moving the former down to 1800.

Step (1) is done "by hand"; but steps (2) and (3) are
accomplished by a rewritten program E located at (863), an
area not used by EDIT. E has 2 entries: SEW and RIP. All I
have to type is:

+LF file 2000
+GO E

Now the computer loads E; enters at the entry SEW,
which loads the unchangeable part of EDIT, moves the
variable data at 2000 down, "sews" 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 F8
command for this purpose. RIP then sets memory in two
movements: The low order byte is now at 1800 to 2000, and
then jumps to 0800 (1800 for default density), thus loading
DOS into the gap left by the move. Then the modified file can be saved by

+BF filename 2000.

The following scheme simplifies the calculation of the move
commands. Fill in the blanks in the scheme:
Unchange. 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:
Unchange. memory (a) 0 to (b) 17FF
Low var. memory (c) 1800 to (d) 1FFF
DOS (e) 2000 to (f) 2EFF
Hi var. memory (g) 2000 to (h) 7EFF
First unavail. mem. (i) 7FFF

(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(1)-I(8)
LXI H(c)
LXI B(I)-L(1)

13

The MOVE UP commands are:
LXI D(1)-I(8)
LXI H(9)
LXI H(9)
LXI B(1)-L(9)

Next I set up memory limit (i) to (g) to (c),

SETTING THE E command: Memory locations 296-297 should be
changed to the RIP entry point of E.

304 Rhone Blvd., Moraga, CA, 94556
14

NHLP

ALSl NEWSLETTER HAS BEEN DUG UP

By 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 SWOOP (215) 264-5920

A LOT OF 1/O BY TRACE ELECTRONICS

A SINGLE 1/O CARD FOR THE S-100 BUS CONTAINS: FOUR

PROGRAMMABLE PARALLEL PORTS, TWO DUPLEX SERIAL PORTS, BAND RATE

GENERATOR, TWO 16 BIT PROGRAMMABLE INTERVAL TIMERS, ROOM FOR UP

TO 16K OF EPROM (2708, 2716, 2732) AND A CONNECTOR TO ADAPT THE

PERECI 170 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 CURS MICROTECH, IS COMPATIBLE WITH ALTAIR 8800,

HEMI 6800 AND THE CURS 6552/5-100 MPU. THE "FLOPPY I/O" IS

AVAILABLE IN KIT FORM ($169.95) AND ASSEMBLED ($199.95).

TRACE ELECTRONICS Inc., 570 W DeKalb Pike, King of Prussia, Penna 19406
...of CP/M FILE TRANSFER VIA CUTS TAPE, MICROPOLIS DISKS AND CENTRAL DATA REPORT

Dear Stan,

I am currently using CP/M on Micropolis from Lifeboat Associates and have successfully traded diskettes with a friend who uses the version of Computer Parts of New Jersey. Note however that many of the utility programs available from the Micropolis group to dump file directories and even to keep track on the file control blocks and do not work with these Micropolis versions as they are released. One problem is that they assume 2 K sectors per track and a certain sequence of sectors usage which is different from the Micropolis version. To set this type of access the use of the micro table described in CP/M's Altgraph Guide and this interface cannot quite follow the published standard in this detail. Another difference is that the unit of storage allocation (the block) has to be 2K instead of 1K. An extent of still 15K - only half the disk allocation plan 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 manuals. 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 MDOG because the manual for MDOG Version 3 (4 is cut, but I don't have it) wasn't always enough for the more sophisticated routines it provided. I also found it difficult to find the combination of MDOG routines to accomplish my tasks (interface Tiny-E).

My first package of software written in CP/M should be of interest to all users of SOLIDS and CUTER because it provides CP/M file transfer between CP/M systems with any disk system using QIC2 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, FILETAPE and TAPEINDEX, and a merged segment file. The TAPEINDEX 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 the boot block.

These programs don't care what is in the files and there is no length limit so the tape blocks are chained. I provide baffering in 8K blocks. The CP/M file name is also in the tape block. TAPEINDEX will not overwrite an existing file.

I think SOLIDS/CUTER is already available in 15K and Micropolis in 16K. You may pass this tape around. I have not 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 others or eventually publish it.

I will also provide cassettes to PROTEUS readers for $5 as described above and SOL 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 most information instructions as well - a cut trace and 0 jumpers. Supposedly applies to Micropolis and Thimber Toys Disk Jockey. Their latest ads seem to offer a new version of this interface.

I also use DYNAMICS's 15K dynamic card without need for modification.

(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.)

Dick Eisenhower
THE DISKTAPE AND TAPEDISK COMMANDS PROVIDE A METHOD OF EXCHANGING CP/M FILES BETWEEN SYSTEMS WITH INCOMPATIBLE DISK SYSTEMS, SUCH AS BETWEEN "A" AND VARIOUS "B" SYSTEMS.

THE MEDIUM OF EXCHANGE IS CUTS FORMAT CASSETTE TAPE, WHICH CAN BE READ AND WRITTEN BY SYSTEMS USING PROCEDURE TECHNOLOGY'S SOLOS OR TAPE DISK MONITORS.

THE TAPES ALSO PROVIDE INEXPENSIVE BACKUP FILES.

THE DISKTAPE AND TAPEDISK COMMANDS WILL RUN ON ANY CP/M SYSTEM OF 13K OR MORE. WITH THE SOLOS OR TAPE DISK MONITOR AT CHK, AND THE STANDARD CP/M TPA AT 100K, ETC.

EACH COMMAND HAS ONLY ONE REFERENCE TO SOLOS/CUTEN.

SOON, STANDARD CUTEN ORIGINS AREN'T A DISASTER.

DISKTAPE UNP

WILL COPY A CP/M FILE OF ANY SIZE, TYPE AND CONTENT TO THE CASSETTE IN TAPE UNIT 1 AT 100K BAUD.

DATA IS UP TO 8K PER TAPE BLOCK, AND IS RECORDED IN THE TAPE BLOCK BY 16 BYTES OF INFO ABOUT THE FILE. TAPE BLOCKS ALL HAVE SOLOS/CUTEN.

FILE NAME OF "CP/M", THE ORIGINAL DISK FILE.

NAME IS IN THE INTERNAL HEADER. EACH TAPE BLOCK ALSO HAS A ONE LETTER BLOCK IDENTIFIER WITHIN FILE.

THE FIRST BLOCK OF A FILE IS "A", THE LAST BLOCK "Z". THE LETTER ONLY IS.

ALSO COPIED INTO THE TYPE FIELD OF THE SOLOS/CUTEN TAPE HEADER TO AID IN TAPE POSITIONING.

TAPE DISK

HAS NO ARGUMENTS. IT READS TAPE AND COPIES FILES INTO THE CURRENT LOGGED IN DISK UNTIL IT ENCOUNTERS A FILE NAMED "END". THIS FILE CAN BE WRITTEN ON THE TAPE BY:

SAVE A END

DISTAPE END

CERTAIN ERRORS WILL AVOID TAPE DISK; OTHERS ALERT YOU TO MIDDLE 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 TAPE DISK FROM THE TAPE AS FOLLOWS:

1. LOAD CP/M THEN RESET THE COMPUTER TO GET IO, SOLOS OR CUTEN.

2. POSITION THE TAPE TO HEAD TAPE DISK.COM. (YOU WANT THE NAME VIA "CA" OR "GET")

3. ENTER THE NAME VIA "CA" OR "GET".

4. THE SOLOS/CUTEN FILE WILL BE "A", INDICATING THE FIRST BLOCK OF A CP/M FILE.

5. GET CP/M FILE.

THE WILL LOAD THE TAPE BLOCK WITH THE HEADER FROM "A" AND THE DATA (THE CP/M FILE) FROM "B" UP. THE HEADER CONTAINS THE CP/M FILE NAME WITHOUT THE PERIOD IN "B"

4. POSITION THE TAPE TO HEAD ALL THE FILES YOU WANT TO TRANSFER TO DISK. PROBABLY AHEAD OF TAPE DISK.COM AGAIN.

5. EXIT.

THIS WILL MOVE FILES TO DISK UNTIL A FILE NAMED "END" IS READ.

EXAMPLES:

- A:DISKTAPE STUFF.COM
- A:DISKTAPE STUFF.ASM
- A:DISKTAPE ANYNAME.XXX
- A:DISKTAPE ANYNAME.TYP
- A:TAPE DISK
- B:TAPE DISK

LETTER

JUNE 14, 1979

DEAR SIR:

AS YOU CAN SEE IM THE PROUD OWNER OF A PRINTER. I DECIDED ON THE TEXAS INSTRUMENTS 810 TO SUBMIT. 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 3 WEEKS LATER THAN STATED. AT LEAST I DID RECEIVE IT WITHIN 4 WEEKS.

I REMEMBER THE HOW HARD IT WAS FOR ME TO PROVIDE 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 A UP TO DATE CATALOG OF THE MATERIAL OF ALL MY TAPES SIMPLE BECAUSE I TAPER DOWN AND DID CAT'S OF ALL OF THEM. BOUND TOGETHER THE PAGES AND CREATED A TAPE FILE DIRECTORY. I BELIEVE TEN CENT PER PAGE TO A REASONABLE CHARGE! MINIMUM FEE $2.00. TAPES SENT TO ME MUST BE ON CASETTE TAPE IN THE 1200 BAUD CUTS FORMAT BECAUSE THIS IS THE ONLY FILE 1 OF THAT I HAVE. NORMALLY 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 & READER'S REACTIONS.

INCIDENTLY, CARLING THE SOL-20 SERIAL PORT TO THE TI 810 WAS NO PROBLEM OF CAGE AND I COULD NOT HAVE DONE IT WITHOUT THE HELP OF CLUE MEMBERS DON SCHUMIT, MIKE KUNTZ, AND DAVID PETERSON. ANYONE INTERESTED IN INTERFACING THE TI 810 TO A SOL CAN CONTACT ME AT:

ROBERT H. MEERINK
C/O NATIONAL SHARED DATA CORP.
P.O. BOX 3896
EVANSVILLE, INDIANA 47737

ROBERT W. MEERINK

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
ITEST FOR PRINTER READY
JNZ CAB4
LOOP UNTIL READY
JMP C0A
READY, JUMP TO SOLOS SERIAL OUTPUT

I CANNOT FIND THE ALS-8 APPLICATION NOTES ANYWHERE. FROCH TECH SAYS THEY NO LONGER CAN GET THEM AND THERE WILL BE NO MORE IN THE FUTURE. THEY ARE NO LONGER INTERESTED IN THE HIRE MARKET. I WOULD LIKE 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 SOLUS AND PROGRAMS... YOU HAVE MADE LIFE WITH A SOL MUCH MORE PLEASANT... PLEASE KEEP UP THE GOOD WORK AND DON'T EVER QUIT.

ROBERT W. MEERINK
LOADING AND SAVING MICROFOPIS BASIC PROGRAMS
FROM/ON SOLUS BYTE-MODE CASSETTES
By Melvin R. Dalton

INTRODUCTION
Two program sets are provided for SOLUS users who also have one or more MICROFOPIS Mod 1/II drives. All programs assume you are using MICROFOPIS FDS vs 4.0 (1978). The cassette files are in SOLUS byte mode and contain only ASCII characters from 0 to 7FH except that line terminator with a single CD 06 sequence (i.e., CR/LF).

The primary programs are in MICROFOPIS BASIC. They call assembly language routines to open and/or close the cassette files. These routines also switch the MICROFOPIS console input output drivers to SOLUS 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 MICROFOPIS FDS 4.0
The EDL-20 configuration of FDS 4.0 as supplied by MICROFOPIS does NOT support programmed or SOLUS command changes to the pseudo port assignments. A simple change to the RFS module will solve this problem. First boot your MODS system into operation. Next, execute the following exactly as listed:

ENTR 612
CE 1F CO CA 1B 06 47 FE 80 CA 04 CO A7 C9
ENTR 430
CD 19 CO A7 C9

Save the modified version of the RFS module on disk using the procedures of paragraphs 2.1.4 of the MICROFOPIS user manual. Now MOD1, MICROFUT will respond to the correct pseudo port. Furthermore, the MODE SELECT key will edit MICROFOPIS and put you in SOLUS command mode. An EX 427 will put you back in MODS or BASIC.

PREPARING THE PROGRAMS FOR USE
For the two BASIC programs, use the following procedure:
1. Call MICROFOPIS 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 "RFSAVE" to save program on drive 0.
5. Enter program 2 as line zero.
6. Same as 3 above
7. Do a SAVE "RFSAVE" to save program on drive 0.

For the two assembly language programs, use the following procedure:
1. Call MICROFOPIS LINEDIT.
2. Enter the list of EQU's called SOLEQU.
3. Save equates under the file name SOLEQU.
4. Clear the LINEDIT buffer and then enter program 3.
5. Save program 3 in source text form under file name "SSAVEF"
6. Test assemble "SSAVEF" for errors only and correct any if any.
7. Repeat 4.5.6.0. for program 4 using file name "CLOADA"
8. Assemble "CLOADA" into object code file "CLOADA"
9. Assemble "CLOADA" into object code file "CLOADB"

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 "SSAVEF".
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 CLEAR.
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 SOLUS (i.e., G). Execute an ASR or EX 427 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 FILE XXXXX/LOADED.
   The / saved the file name you save was six or more characters long and was truncated to five before use.
2. ALREADY OPEN. Appears if SOLUS detects file open when program attempts to open it for use.
3. ALREADY CLOSED. Appears if SOLUS detects file closed when program attempts to close it after use.
4. READ ERROR. Appears if SOLUS detects parity, CRC, or interrupted reading during tape reading process.
5. WRITE ERROR. Appears if SOLUS detects error during tape write operations.
6. All MICROFOPIS BASIC or MODS error messages have the meanings assigned them in the user manual.

HERE ARE THE SOLUS EQUATES TO BE SAVED UNDER THE NAME "SOLEQU"

<table>
<thead>
<tr>
<th>0000</th>
<th>NILIST</th>
</tr>
</thead>
<tbody>
<tr>
<td>0010</td>
<td>IPORT</td>
</tr>
<tr>
<td>0020</td>
<td>OPORT</td>
</tr>
<tr>
<td>0030</td>
<td>UIMPORT</td>
</tr>
<tr>
<td>0040</td>
<td>UEXPORT</td>
</tr>
<tr>
<td>0050</td>
<td>USAVE</td>
</tr>
<tr>
<td>0060</td>
<td>FCB11</td>
</tr>
<tr>
<td>0070</td>
<td>FCB12</td>
</tr>
<tr>
<td>0080</td>
<td>FBUF1</td>
</tr>
<tr>
<td>0090</td>
<td>FBUF2</td>
</tr>
<tr>
<td>0100</td>
<td>ECRLEN</td>
</tr>
<tr>
<td>0110</td>
<td>CR/LF</td>
</tr>
<tr>
<td>0120</td>
<td>START</td>
</tr>
<tr>
<td>0130</td>
<td>INIT</td>
</tr>
<tr>
<td>0140</td>
<td>RETKN</td>
</tr>
<tr>
<td>0150</td>
<td>FORPN</td>
</tr>
<tr>
<td>0160</td>
<td>FCLS</td>
</tr>
<tr>
<td>0170</td>
<td>EDDYT</td>
</tr>
<tr>
<td>0180</td>
<td>WRKTY</td>
</tr>
<tr>
<td>0190</td>
<td>KDBLX</td>
</tr>
</tbody>
</table>
0200 WRLLK EQU $0016H
0210 SUI HI EQU $0019H
0220 ADUT EQU $001CH
0230 SHIF EQU $001FH
0240 AINP EQU $0022H
0250 ADUT EQU $002BH
0260 MHEAD EQU $001CH
0270 DHEAD EQU $002CH
0280 LIST

PROGRAM 1

Q DEF FAA=16RCA54: DEF FAB=16RCB15: LOAD 'CSAVEBA': INPUT 'DOL-20 CASSETTE FILE NAME (5 CHAR) SHR: A=FAA(84H) LIST 1-6552H
C$=FAB1: PRINT ASLEFT$(C$,-5)IC8: STOP

PROGRAM 2

Q DEF FAA=16RCA54: LOAD 'CLOGA3A': INPUT 'DOL-20 CASSETTE FILE NAME (5 CHAR) SHR: A=FAA(84H) LIST 1-6552H
C$=FAB1: PRINT ASLEFT$(C$,-5)IC8: STOP

PROGRAM 3

0000 # ROUTINE FOR WRITING FROM MICROPOLIS BASIC
0000 # TO DOL-20 BYTE-WISE CASSETTE basic
0000 # COPYRIGHT ASSIGNED TO PROTEUS
0000 # TAB 8/13/22
0000 # LINK 'SOLERU'
0000 # RESULT EQU $100H
0000 # ARGH EQU $000H
0000 # ORG UPORT
0000 # ORG THEAD
0000 # ORG UHAVE
0000 # CALL HERE FOR BASIC FUNCTION "FAA"
0000 # AND OPEN FILE "A", RETURN
0000 # WITH START OF COMPLETION MESSAGE
0000 # 2A BC 04 OPEN LHL ARG1 IPOINT TO ARG1
0000 # INX H
0000 # MOV A,M IGET ARG1 LENGTH
0000 # MOV B,A SET LENGTH OF MOVE
0000 # SUI 6 MUST BE <S
0000 # CP LENERR TRUNCATE IF NEEDED
0000 # INX H IPOINT TO 1ST BYTE OF ARG1
0000 # LXI D,THEAD IPOINT TO SOLOS FILE MEADE R

CAC4 7E MOVE MOV A,M IGEBYTE
CAC5 12 STAX D ISTORE BYTE
CAC6 23 INX H
CAC7 13 IN X D
CAC8 05 BCR 8
CAC9 C2 C4 CA JANZ MOV E IRT, TILL DONE
CAC0 C1 DB CA LXI H,##12 IRECT FOR STACK
CAC1 EA CS CB CALL FOPEN FOPEN FILE
CAC2 0F 07 CB LXI H,THEAD IPOINT TO HEADER
CAC3 3E 01 MPU A,$1 IPOINT TO FILE 
CAC4 CB 07 CB CALL FOPEN FOPEN FILE
CAC5 21 3C CB LXI H,EHRSP IPOINT TO ERROR MESSAGE
CAC6 0A 46 CB MPU A,##1 Felpad OUTPUT MESSAGE IF ERROR
CAC7 F1 06 CB FOP E ISTACK TO ORIGINAL STATE
CAC8 21 28 CB LXI H,FAA IPOINT TO FAA MESSAGE
CAC9 02 CD 62 CB CALL RESHES IPUT MESSAGE IN BUFFER
CAC0 3E 03 MPU A,##1 ISET OUTPUT TO 3
CAC1 3E 02 STA OPORT ISET WRITE TAPE TYPE
CAC2 3F 22 CB STA THEAD IINSERT TYPE IN HEADER
CAC3 19 RET
CAC4 00 CALL HERE FOR PSEUDO PORT 3 WITH BYTE IN "B"
CAC5 00 NULLS ARE STRIPED & ONLY ONE CPLF AT
CAC6 00 END OF PROGRAM IS ALLOWED
CAC7 7B WRITE MOV A,B BYTE IN "A" FOR TEST
CAC8 1A AMA A ISET FLAGS
CAC9 61 DF CS CB ISKIP NULLS
CAC0 2C 20 SUI 20H ICHECK IF "CR" OR "LF"
CAC1 F2 05 CB JF WRITE1 INORMAL CHAR, PROCESSING
CAC2 BA 61 CB LDA FLAG GET CPLF FLAG
CAC3 3C IME A ICOUNT
CAC4 32 61 CB STA FLAG ISAVE CPLF FLAG
CAC5 07 03 MPU 3 IMODE MORE THAN 2 ALLOWED
CAC6 0F 00 JMP IF 1 IN MUL
CAC7 0C CS 09 CB WRITE1 JMPI WRITE2 ICONTINUE IF NOT
CAC8 05 DF CS CB WRITE1 JSR A IREADER
CAC9 32 61 CB STA FLAG IZERO CPLF FLAG
CAC0 3E 01 WRITE1 MPU A,$1 IPOINT TO FILE 1
CAC1 BD 10 CB CALL READ IPUT BYTE ON TAPE
CAC2 21 40 CB LXI H,EHRSP IPOINT TO ERROR MESSAGE
CAC3 4E 06 CB MPU A,##1 IPOINT TO CRC5
CAC4 16 C9 RET
CAC5 0B CALL HERE FOR BASIC FUNCTION "FAB"
CAC6 0B CLOSES CFILE & IRETURNS
CAC7 0B WITH REST OF COMPLETION MESSAGE
CAC8 3E 01 CLOSE MPU A,$1 IPOINT TO FILE 1
CAC9 BD 0A CB CALL FOLD ICLOSE FILE
CAC0 21 53 CB LXI H,EMECL IPOINT TO ERROR MESSAGE
CAC1 3A 4E CB MPU A,##1 IGET ERROR MESSAGE IF ERROR
CAC2 20 33 CB LXI H,FAA IPOINT TO FAA MESSAGE
CAC3 3F 62 CB CALL RESHES IPUT MESSAGE IN BUFFER
CAC4 0A XRA A
CAC5 32 07 CB STA OPORT IOUTPUT TO CRT
CAC6 0A CV RET
CAC7 0A MESSAGES
CAC8 RB 28 08 DB FAB DP 3-40,5
CAC9 CB 0F 04 CB DTH 'FILE'
CAC0 31 45 A0
CAC1 33 08 09 FAB DB 3-40,4
CAC2 36 20 53 41 MOU DTH 'SAVER'
CAC3 56 45 C4
CAC4 41 44 52 ERRSP DTH 'ALREADY OPEN'
CAC5 45 41 44 (continued)
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 "file" to all other SOL users who have been suffering with the problem.

AS IS:

SOL 5-100 BUS

EXPANDORAM BOARD

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:

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
Stroodsburg, PA, 18360

ANOTHER LETTER ON EXPANDORAM PROBLEM

I recently read about a PROVEBUS reader that had problems with the S.D. S.A.L.E.S "EXPANDORAM" dynamic memory board when used in the SOL. With a very slight modification, I have used the EXPANDORAM 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 EXPANDORAM. The drawing below best describes the changes:

PD7 72

ORIGINAL CIRCUIT

PD7 72

CIRCUIT MODIFICATIONS FOR SOL

Delete Q1, R6, C19, CR2, and R5.

The EXPANDORAM runs extremely cool in the SOL, even with a full complement of memory. However, as indicated by S.D. S.A.L.E.S., the memory is not designed for 24h 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-DIN environment.

Sincerely,

Bill Jones
5'1 Easy Street
Marion, OH 43302

CC S.D. SALES CO.
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 16525)

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:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>P/N</th>
<th>QTY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>707050</td>
<td>1</td>
<td>CAP, 7,300 Microfarad; Alum. electrolytic, 50V</td>
</tr>
<tr>
<td>2</td>
<td>723021</td>
<td>1</td>
<td>1A FUSE, SLO-BLO (Model 2)</td>
</tr>
<tr>
<td>3</td>
<td>723022</td>
<td>1</td>
<td>6.25A FUSE, SLO-BLO (Model 2 and 4)</td>
</tr>
<tr>
<td>4</td>
<td>723016</td>
<td>1</td>
<td>2A FUSE, SLO-BLO (Model 4)</td>
</tr>
<tr>
<td>5</td>
<td>732001</td>
<td>1</td>
<td>LABEL, Fuse, pair, 1A, 6.25A (Model 2)</td>
</tr>
<tr>
<td>6</td>
<td>732002</td>
<td>1</td>
<td>LABEL, Fuse, pair, 2A, 6.25A (Model 4)</td>
</tr>
</tbody>
</table>

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)
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 the PCB just above CB. (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.


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 "3.2A SB."

2) Apply the label that reads "6.25 A 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:

<table>
<thead>
<tr>
<th>Component</th>
<th>Power Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sol-20</td>
<td>1.5A</td>
</tr>
<tr>
<td>Helios II Model 2</td>
<td>0.8A</td>
</tr>
<tr>
<td>Helios II Model 4</td>
<td>1.4A</td>
</tr>
<tr>
<td>TV/Monitor</td>
<td>0.4A</td>
</tr>
<tr>
<td>SolPrinter 2 &amp; 2E</td>
<td>1.7A</td>
</tr>
<tr>
<td>SolPrinter 3</td>
<td>2.6A</td>
</tr>
</tbody>
</table>

CLASSIFIED ADS

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 R. Randolph, 586 Shades Crest Rd., Birmingham, AL 35226.

INFO WANTED: I was wondering if anyone has hooked up the Heath Trainer--in-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, Marcellus, AR 72102 (501) 699-1491 (collect).

FOR SALE: We have a good stock of D.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 order of five or more packages (any mix) ordered and shipped together. We accept BRS, Master Charge, personal checks as well as shipping C.O.D. We also have some kits and assembled boards in stock (TMM, 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 16BRA and Dynabyte 32K static boards, leaving three free slots. Panasonic FT-872 TV/Monitor and two Panasonic recorders. MEGA Beta-1 random access digital tape unit (expandable to four drives), 500 bytes/sec., 500K on 300 ft. digital tape, working parallel interface plug into SOL connector. Selectric-based terminal operates at 15 bytes/sec., and includes ASCII and dpl depends of extra ribbon, plus cables and driving software. Software includes: Electric Pencil Version 5B (which was used to produce this ad); BASIC Interpreter Software Technology Music System including No Software, Digital Debugging System (DOS); GAMESTOP'S 1, 2, 3, and 2; KITKATT; 9900 CHESS. Patches for Beta-1 may be included in some of the above (presently working on these!). All original manuals are included. All SOLUS/POWER newsletter end of 1979. PT's ACCESS, all issues they produced, as well as ASCII user group stuff. HA many audio cassettes, some with programs recorded. Total cost $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 Osadar, 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.

CHAPTERS

SASKATCHEWAN (CANADA), Regina
Contact Bob Stek, 19 Mayfield Road, Regina, Saskatchewan, CANADA S4V 0B7, (306) 523-7184.
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 only one I mentioned last time. But the manufacturer, Thinker Toys, has told me that it was designed for the Persci drive and they don't have the time to work with us on adapting it. So that's out.

Microcom'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 Riley, the former head of marketing for FTC. Humm...)

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 294 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 FTOS 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.
A Call to Arms
(or where do we go from here?)
by Joe Maguire

PROTEUS/NEWS
AN INDEPENDENT NEWSLETTER FOR OWNERS AND USERS OF PROCESSOR TECHNOLOGY CORPORATION COMPUTERS
VOLUME 2, NUMBER 5
PUBLISHED BIMONTHLY BY PROTEUS, 1690 WOODSIDE ROAD, SUITE 219, REDWOOD CITY, CA 94061, USA
SINGLE ISSUE $2 (US)

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 equipment, maybe some portions of PTDS, on a limited use basis. This means that you can use it for your own information but you cannot sell it. To use 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 pool 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

GET is in financial trouble and their computer software division 8/2 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 GET's remaining inventory, so you can get them from Hobby World. Sol BASIC is $34.95, Clinic and Breathe 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.

Also interesting electronics gravestones: 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: 2400 S. Helen St., Oakland, California; mailing address: 621 Sandalwood Isle, Alameda, CA 94501, telephone 415-523-2371), is known for his "PC parts 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 information 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, Kingstown; Ten-Ton'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 tech from PerSci.

Earl Dunham (one of our members) has given high recommendations for John Mock's "bits and bytes computer store" 6790 S. Fullerton Ave., 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.

Fisch-Freitas Company was formed by former IMSAI employees to do service and repairs on IMSAI and PerSci equipment. They'll service the drive in the Helios, but not the controller. A number of people know I have used Fisch-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 $98 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)
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 contacted the store's owner and offered to purchase the store's entire inventory for a ridiculous price. The store owner,唬led by the offer, had agreed to sell the entire store to the group for a fraction of its actual value. Before the deal was completed, the group realized their mistake and went to the police, but it was too late. The store owner had disappeared with all the money.

The management of PTC was furious. They issued the order that henceforth, a potential new dealer had to meet a strict set of qualifications. The list 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 signed contract. As I'll explain in a moment, this last requirement was the straw that broke the camel's back.

Unrelated to the above incident, PTC had become concerned that dealers were not ordering their Solos with memory. This stemmed from the dealers' experience with the 16KFA board. The early attempt to ship this board suffered from an almost 100% failure rate. The company felt that the problems had been solved (they weren't) and insisted that the dealer purchase at least one memory board with each Solo. One dealer explained to me how he handled this situation.

As soon as I received a shipment of Solos, I would immediately open the box to check the memory boards to make sure they weren't breaks in the chips in the box. Then I'd replace it with a brand which I knew worked. The Solo was selling well so that I felt it was worth my own time and resources. (The customer wouldn't return it, so the 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 editor 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 in advance of the quarter. In addition, he had to commit himself for something like $35,000 worth of products (dealer cost) to order the entire quarter's worth of products. This was ordered to be purchased from each category - no exceptions. One of the categories was memory, but that wasn't the worst of it. The number of Solos left was very low. The first batch would be shipped out from the software category he had to order a minimum of 100 items. An elementary calculation showed that he must sell more than 300 Solos just to break even. When 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 $25,000 worth of business a month. PTC in effect forced me to commit half of my sales to their products, something I couldn't support. In addition, this business is highly sensitive to new products. PTC wanted me to order on a basis of the two months in advance. If a hot new product comes out, the next quarter, 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 competitors. This news was bad news for the MITS dealer that the Altair would no longer be sold in 'hobbyist stores' but would be marketed in the manner of DEC, Data General and other major suppliers.

Another friend, who was a MITS dealer, now saw his chance to affiliate with PTC something he had been unofficially 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 and was granted their requirements for a new dealer to complete. My friend was so incensed by this attitude (he had been a life time the last MITS dealers in the US) 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 and 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 hobbiest 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 been posted for 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 can continue, perhaps in the software area, we just don’t know yet. We have 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 VGM (of the VGM series: Left/Right/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, the Sol 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 PET/VTOS software will be shifted over to work with the soft sectored format. At worst, present owners of Helios may have to buy another controller such as the Tarbell to take advantage of further releases of PET/VTOS.

In the final analysis, it was Processor Technology’s restrictive dealer policy which caused their demise. Management thought it laborious and manufacturing cost and market conditions but their competitors faced 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 is the dealer’s advertising 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 more apt to buy. 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 lemonade and a product not being able to find a marketing director the caliber of Mike Markula of Apple. All in all, it was an exciting whirlwind existence. After the dust has settled for awhile, it will interesting to watch the second time around.

PERSPECTIVE MODULE CHANGE NOTICE

An old memo discovered in the PIC junk may still be relevant to some other personality modules. Latest December 23, 1977: PM 270K 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 and R2 from 1/4W 100 ohm to 1/2W 1/2 ohm, 5% tolerance resistors.

July 22, 1979

USING HEATH H44 PRINTER with SOL

by Richard Greenlaw

* CM-1 1/8 for SOL-20 with TTL and/or Heath H44 Printer.

* By Richard Greenlaw

* 21 Columbia St.

* Solana Del Sol, CA 92073

* 714/479-0720

* July 22, 1979

* This document was printed on the H44 printer in the narrow character mode.

* The following CM-1 1/8 interface routines for SOL-20 implement the following special features:

* 1. The character delete feature gives a true backspace.

* 2. The character echo feature permits characters which display as a single character.

* 3. A conversion cable is described which allows using the Heath H44 printer to be connected to the SOL-20.

* 4. The console routines and stack handling are based on the routines are described in the Heath H44 manual provided by Lifeboat Associates for the SOL.

* This console constitutes the I/O area of the CM-1 on Microcosm version of CM-1 or Lifeboat Associates.

* For more details on how to set them up, see the CM-1 GEB-85.

* EIA 232 Eiais

* The Heath H44 printer cannot be directly connected to the SOL RS-232 because both the SOL and the H44 think they are the terminal side of the interface and both transmit on the same lead. Etc. The null modem cable provides the same transmission of leads as a pair of modems connected via a communications line.

* An adapter is used and a female EIBS connector is connected as follows:

* 1 SOL male connector end to H44 female connector end

* 2. transmit 5 receive

* 3. receive 3 transmit

* 4. clear-to-send 7 request-to-send

* 5. data set ready 20 data terminal ready

* 6. signal ground 7 signal ground

* The Heath H44 sends its data signal on pin 20. When it appears as a zero signal 1 for input port B1 it is not accepted by the H44 from a non-return to zero TTY.

* The TTY output routine simply calls BOUT in SOLS since the TTY can not wait as fast as the UART will accept data at 110 baud.

* The H44 output routine assumes the baud rate is set much higher than the printer can keep up with. Modified on the printer buffer to keep the printer from running off the SOL stream (when the buffer is full or when it can’t accept data because it is actually printing). This circuit is an interrupt request-to-facsimile circuit which is a zero pin 6 of input port B1 when more data should be sent. Because this indicator is the reverse of

(continued)
PROGRAMMING QUICKIES
By Lewis Moseley, Jr.

PTCo Extended Basic shares an unusual set of string operators with M$ 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:

<table>
<thead>
<tr>
<th>Microsoft</th>
<th>PTCO</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIGHTS(A$, x)</td>
<td>A$(x)</td>
</tr>
<tr>
<td>LEFTS(A$, x)</td>
<td>A$(1,x)</td>
</tr>
<tr>
<td>MIDS(A$, x, y)</td>
<td>A$(x,y)</td>
</tr>
</tbody>
</table>

******************************************************************************

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. Let's 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 had my share 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 35 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 relocator. It is by Dr. Thomas McGhee, 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.
7/21/79

---

LIST

10000 REM - ADDRESS LABEL PRINTER
10100 REM - ADDRESS LABEL PRINTER, JR.
10200 REM - 2576 GLENDALE CT, NE
10300 REM - CONYERS, GA. 30008
10400 REM
10500 REM - PRINTS NOW SET UP FOR LABLES 6 LINES LONG,
10600 REM - THAT $S, 6 LINE FEEDS TAKE YOU FROM LINE 1 OF
10700 REM - ONE LABEL TO LINE 1 OF THE NEXT.
10800 REM
10900 DIM A$(30), B$(30), C$(30), D$(30), E$(30)
11000 PRINT "HEX"
11100 PRINT "LABEL WRITER"
11200 PRINT
11300 PRINT
11400 REM - MY PRINTER USES PSEUDOPORT 3 - CUSTOM DRIVER
11500 REM - IF YOURS DOESN'T, DELETE THE NEXT 6 LINES
11600 IF PEEK(51202)<0 AND PEEK(51203)<0 THEN 10220
11700 PRINT "CUSTOM OUTPUT ROUTINE NOT READY"
11800 PRINT "LOAD FROM TAPE OR INITIALIZER"
11900 PRINT
12000 PRINT
12100 PRINT
12200 REM - SELECT FUNCTION
12300 INPUT (1,0) M$RETURN, M$MAILING, E$END. WHICH? $A$, $S$
12400 IF A$="A" THEN 10240
12500 INPUT (2,0) MHOW MANY LABLES? $X
12600 IF A$="R" THEN 10200
12700 IF A$="W" THEN 10450
12800 GOTO 10230
12900 REM
13000 REM - PRINT LABELS WITH MY ADDRESS ON THEM
13100 SET OP=3
13200 FOR I=1 TO X
13300 PRINT "LHM J M LEWIS MOSELEY, JR."
13400 PRINT "LHM MM 2576 GLENDALE CT NE"
13500 PRINT "LHM MM CONYERS, GA. 30008"
13600 PRINT "LHM MM LLL"
13700 PRINT
13800 PRINT
13900 NEXT I
14000 SET OP=0
14100 GOTO 10100
14200 REM
14300 REM - READ DATA FROM KEYBOARD, THEN PRINT
14400 REM - THIS LINE LETS YOU JUDGE THE LENGTH OF THE ADDRESSES
14500 REM - BE SURE THEY WILL FIT THE LABEL
14600 PRINT "LENGTH GUAGES: 12345678901234567890123456"
14700 PRINT "NOW GET UP TO 5 LINES OF ADDRESS"
14800 INPUT (26,0) LINE 1: *,S
14900 INPUT (26,0) LINE 2: *,S
1500 INPUT (26,0) LINE 3: *,S
1510 INPUT (26,0) LINE 4: *,S
1520 INPUT (26,0) LINE 5: *,S
1530 REM - NOW PRINT THE ADDRESS STRINGS, EVEN THE EMPTY
1540 REM - STRINGS, WHICH ACT LIKE SIMPLE <CR>, <LF>', S
1550 REM - THE LAST PRINT STATEMENT JUMPS THE GAP BETWEEN LABELS
1560 SET OP=2
15700 FOR I=1 TO X
15800 PRINT A$
15900 PRINT B$
16000 PRINT C$
16100 PRINT D$
16200 PRINT E$
16300 PRINT
16400 NEXT I
16500 SET OP=0
16600 GOTO 10100
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 disk 1200 baud, and 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 AL8-8 assembler. The user may modify the programs any way he wants. The only restriction we place is that the programs provided are 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 ripped off, there remains no incentive for our going to the effort of writing these programs and preparing the documentation. We hope to make enough money from our various endeavors 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 incorporate them into your existing BIOS with ease. They provide the I/O utilities in a way that will make SOL users very happy: Deletions result in a visual backspace. ANY SOL program can use the current disk device AT ANY TIME, even in the middle of performing a listing! Input and Output devices #3 and #4 are called up using a control key followed by I or O and the port number. In addition, version 1 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 S can log it in), and also as output device number 4 (This means output devices may be called up in the range #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 (EPS-11). This is the version that supports RUN/LOAD 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 having to do 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.

PRICING: $18 for all the above on a single disk, plus documentation. Note: 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 to do this is done included with tape versions. (All versions cost $18).

STATE version desired?
SEND CHECK OR MONEY ORDER TO:
Fr. Thomas McGahee
282 Union Ave.
Paterson, N.J. 07502

NOTE: requires SOLOS ROM

THE MODIFIER: UTILITIES FOR THE SOL COMPUTER

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, 1200 baud. Distillation of version is set to load and run starting at $1200, and ends at $9656. The program is self-relocatable anywhere in memory. Manual contains over 100 pages of documentation. A handy reference table of all commands is included, as well as information on how to relocate the program, and information on how to customize the program.

THE MODIFIER includes the following utilities, all of which are accessed by means of custom commands:

MODIFY: Lists all available commands, gives relocation information for the program, and 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 where the string is given and the section of code is shown in CONTEXT.

MEMORY allows the user to see any page of memory via a window in 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 enter ASCII text and most control codes (including CR and LF) directly into memory as a string of typed characters. The user may optionally append a terminator in the range @ to FF to the entered text at the moment.

FILL MEMORY allows the user to fill any portion of memory with any value from @0 to FF.

MOVE allows the user to move sections of memory from one place to another. (Two movers are included: one moves 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 asks if relocating is correct. 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 AL8-8 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!)

AL8-8 ASSEMBLER is an 8-bit assembler, that allows you to make the entry of more than half the information that the RELOCATOR normally asks for. This is used primarily when relocating programs that need 8$ 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 $18.
ASSEMBLY LISTING includes cassette file for AL8-8 for $18.

If both are ordered at the same time, price is $16.

SEND CHECK OR MONEY ORDER TO:
Fr. Thomas McGahee
282 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 (U185).
      3) No clock to CPU (XTAL, U77, 98, 91, 92, 184).
      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, 78, 71).
   C> Bad MUX or MUX decode logic (U36, 65, 66, 78, 769).

10) Keyboard output continuously displayed:

   A> Keyboard flag logic (U53, 54, 78, 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, U106, 189).
   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 (U118).

   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 (83).

(continued)
14) Will not write to cassette:
   A> Bad UART (U59).
   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, FW81).
      NOTE 1: Check reference voltages on U2.
      NOTE 2: Check values of all discrete components.
   B> Ripple on +5V (FW81, U2-reference voltages).
   C> No +12V (U1, D3, C5, FW82).
   D> Ripple on +12V (C5, FW82).
   E> No -12V (U3, D4, C4, FW82).
   F> Ripple on -12V (C4, FW82).
   G> No + or -16V Unregulated (FW82).
      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, 18).
   C) Bad decode logic (U16, 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 K2C circuit.
      1) No amplification (Q2, 4, 7).
      2) No PKD signal (Q3, 4, U16, 16, 20, 26, 27).
      (continued)
2) Character continually repeated:
   A) Strobe line held low (U18, 11).
   B) Repeat oscillator malfunctioning (U3, C3, R4, 5).
   C) Addressable 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'd accept work shipped to them, but I suggest you call first. That's Fischer-Freitas Company, Microcomputer Sales and Service, 916 - 4th Ave, 614g 14th Street, San Mateo, California. Telephone: (415) 635-7615 or 635-7616. (Their line 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-16 system as well as the PerSci drive. The rectifier bridge for +6V is rated at 35 amps, and by adding a few components to the regulator board and a transformer you can get the +/16 supply. A single PerSci drive requires 2.4 amps max from +5V and 2.0 amps max from +6V (56.88 watts for line + 1.6 duty). So it looks like there is about 4.2 amps draw on the +6V secondary of the Helios transformer, leaving plenty for an S-16 bus. Does anyone know how much current the existing Helios transformer can really handle at +6V? The Helios was designed to contain a complete S-16 computer system in a single box, and I wonder if we can do it this easily. Wameco makes a V-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 rails of the power supply, get a suitable controller board, and be ready to fly with multi-megabytes and 8" floppy disks. Maybe we could get someone from PTC who still has PTDS's source code to put the new controller's drive software into PTDS the way they had planned to do, but there's always CP/M 2.3 to rely upon.

Lew Mosley has sent praise about The Stockroom, 29W Southway Dr, Memphis TN 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.

BELIOS NOTES

Contributed by Joe Maguire

ATTRIBUTE DEFECT

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 PTDS. To do the dirty work, proceed as follows:

PTDS 1.5 Enter a NOP (80) at memory address A890
PTDS 1.4 Enter a NOP (80) at memory address A8B1
To restore, ENTER a 1B Hex at the above address.

After the NOP has been ENTERed, proceed with the normal REAN command of PTDS. Even previously changed protected files can now have all their attributes removed. (With PTDS 1.4 the warning message will be displayed but the attributes will be changed anyway) Good luck with this but BE CAREFUL!

PTDS 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. (PTDS 1.5 Rev. C) 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 PTDS 1.5. After some probing I discovered that PTDS 1.5, on bootup, checks to see if it is working with Solos, Cutievor or something else. If it determines a "something else" it rewrites the I/O routines to those of an Altair or Imail. Because of one byte that PTDS checks, Extended Solos falls into the latter category. There are several solutions:

PTDS checks the bytes at CB00, CB01, CB04 and CB07 to see if they agree with Solos or Cutievor. The byte at CB07 is the one out of sync in Extended Solos. PTDS 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 (BCC8) during a coldstart boot of PTDS. It is possible, using the attribute defeat info given above, to patch RESIDENT (that's the file which contains PTDS) 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 of C. Itoh is one of the world's largest import/export conglomerates. Judging from the general press 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 dropped their feet so badly on it that it never materialized. Oh well!
Perform following changes:

1. Cut the trace between U130 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 U32 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,SYS=10,F=77 CR CR space space twice

Programming Quickies
by Lewis Naseby, 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無い 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 SOLIDOS/CUTER reads the last line again, and executes it. Simple, but a time-saver for two finger typists, like me.

Santa Claus
North Pole
August 29, 1979

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 Qiblo, Hangman, 8000 Chess into NorthStar GO files. If I just LP then at CM and make them GO files, my screen just flickers and wipes memory. I have to LP game 0, CP 0004, 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 INTS line which the Music System uses.
4. A SLS for CP/M on NorthStar which would be like Joe Nagel's customized NorthStar SLS 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 BINIT routine from their DOSING package to run correctly on the SOL.
9. A patch to get CP/M for Halits, but how about a relocatable modified version of PDXES 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 386 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.

One last request, Santa. Please see if there is anything you can do for the ailing/having deceased? ProTechNews. There are an awful lot of us who would love to see PT resurrected. Let's see... if 10,000 SOL owners each contributed $5, no strings attached.....

I am also sending a copy of this letter to PROTECH 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 PROTECH 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

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 "hash" 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, 271b Main Street, Hatfield, Mass 01744. (617) 655-1234.
THE HELIOS PARAMETER SCANNER
Larry McDavid

The Parameter Scanner is a powerful PTODS routine that allows user-written programs to access parameters entered to the Command Interpreter (CI). This article explains the uses 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 PTODS 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 PTODS 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 copied the PTODES to obtain the system label values, such as PSY.

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 GETVA subroutine.

Still in Figure 1, we now return to line 205. It is assumed the user-program required one parameter (e., 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 ":/.

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 PTODS 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 NDDEL 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.

![Figure 1. Extraction of a single "value" parameter.](image)

![Figure 2. Extraction of two "value" and one optional "name" parameters.](image)

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 11-1, I found the cursor jumping around distracting. I think adding the following improves the game:
405 SET CM=#

A question for readers:

I tried using my AOL 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 WIM 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 1/2/30 "horizontal, 1/48 vert. spacing with BASIC?"

(ED. NG1E: The PICO 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 EBASIC
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. O. Box 350
New York, New York 10040

REMARKS: Allow 4 to 6 weeks delivery

PROGRAM NAME: T.D.Q. Appointment CATEGORY: Business Application Scheduling
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 Appointment 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 EBASIC
RESTRICTIONS:

DOCUMENTATION: Tape Data Query package required

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. 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 EBASIC
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. O. Box 350
New York, New York 10040

REMARKS: Allow 4 to 6 weeks delivery

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 EBASIC
RESTRICTIONS:

DOCUMENTATION: Tape Data Query package required

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. O. Box 350
New York, New York 10040

REMARKS: Allow 4 to 6 weeks delivery
PROGRAM NAME: T.D.Q. Accounts
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
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. O. Box 350
New York, New York 10040
REMARKS: Allow 4 to 6 weeks delivery

PROGRAM NAME: T.D.Q. Order
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
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. O. Box 350
New York, New York 10040
REMARKS: Allow 4 to 6 weeks delivery

PROGRAM NAME: T.D.Q. 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. O. Box 350
New York, New York 10040
REMARKS: Allow 4 to 6 weeks delivery

PROGRAM NAME: T.D.Q. Inventory
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. O. Box 350
New York, New York 10040
REMARKS: Allow 4 to 6 weeks delivery
PROGRAM NAME: O&A PACKAGE  CATEGORY: BUSINESS
DESCRIPTION: The Osborne and Associates business package consists of three modules: Payroll with cost accounting, accounts payable/receivable, and general ledger. Originally developed and sold for Wang systems, the programs have been adapted to many other systems. Extensively documented and debugged. The programs can operate separately or coordinated with each other. Programs are delivered in source form so you can modify. MINIMUM HARDWARE REQUIRED: 40K, a Helseline 1500 terminal, and any 132-column printer with form-feed control. Can be modified.
SOFTWARE REQUIRED: CP/M and CBASIC (Available from Lifeboat Associates, 164 W. 33rd St., New York, NY 10024)
RESTRICTIONS: Modifications will be necessary for other hardware.
DOCUMENTATION: User's manual and technical information available in books sold by Osborne & Associates dealers and by mail.
MEDIA: Micropolis, Northstar, Helios disks.
DATE CURRENT VERSION RELEASED: November 1, 1978
WARRANTY: One year limited warranty.
PRICE: One-time purchase fee available to dealers and consultants.
ORDER FROM: Local dealer or write to David Price
3901 Victoria Lane
Midlothian, VA 23113
REMKS: Write for current pricing information and name of nearest dealer.

PROGRAM NAME: BSCII  CATEGORY: Business
DESCRIPTION: General Ledger, Payroll, Inventory Control, Accounts Payable, Accounts Receivable, featuring complete report generation, password protection, record access in less than one second. "Menu" selection of functions, and a unique structured data entry utility. The SCREEN MAPPING allows rapid data entry with testing for errors in data type that can invalidate data base integrity.
MINIMUM HARDWARE REQUIRED: Sol III-A, Printer
SOFTWARE REQUIRED: All included in BSCII package.
RESTRICTIONS: Configured for 2 drive Helios only at this time.
DOCUMENTATION: Complete user's manual plus menu system.
MEDIA: Helios diskettes.
DATE CURRENT VERSION RELEASED: November 1, 1978
WARRANTY: One Year
ORDER FROM: See your local Processor Technology dealer.
REMKS: Dealer's inquiries invited.
Contact:
Bennett-Stiles Computer
P.O. Box 31023
Raleigh, N.C. 27612
or phone 919-781-0003 for further information.

PROGRAM NAME: ACCOUNTS RECEIVABLE  CATEGORY: BUSINESS
DESCRIPTION: Use cassette data files to keep track of customer list with address, present balance, high balance to date, date of last payment, date of last charge, due date, past due date, and year-to-date total. The functions available are update, report, search, and enter new records.
MINIMUM HARDWARE REQUIRED: Sol-20/SOLOS, 20K RAM, two recorders
SOFTWARE REQUIRED: Extended Cassette BASIC
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: $25.00 Order number EC-007.
Add 3% for freight and handling.
Add 3% 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: DIRECT REDUCTION LOAN  CATEGORY: BUSINESS
DESCRIPTION: This provides a fully amortized schedule for any direct reduction loan. You may select a complete list, or list only a single period of interest. An additional listing has been provided—total interest paid during the life of the loan.
MINIMUM HARDWARE REQUIRED: Sol-20 with 12K 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-006.
Add 3% for freight and handling.
Add 3% 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: CMS  
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 accounts.

DOCUMENTATION: Files can be expanded by multiple disks.

Date Current Version was Released: 7-30-76

WARRANTY: 6 months

PRICE: $395. Quantity discounts available.

ORDER FROM: Computer Products of America
633-B West Katella Avenue
Orange, Ca. 92667

REMARKS:

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PROGRAM NAME: AROI - Accounts Receivable
CATEGORY: Business

DESCRIPTION: Handles both Balance Forward and Open End accounts, Automatic and/or manual service charge 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, 3X, 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: 7-30-76

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:

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PROGRAM NAME: IC01 - Inventory Control
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 MTM, sold YTD, last sale, last order, 5 prices, 3 costs, and unit of measure.

MINIMUM HARDWARE REQUIRED: Printer, 3X, CRT, 2 disk drives.

SOFTWARE REQUIRED: CP/M, CBASIC, and QSORT

RESTRICTIONS:

DOCUMENTATION: Complete, easily understood user's manual.

MEDIA: Single or Double Density Diskette

DATE CURRENT VERSION WAS RELEASED: 7-30-76

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:

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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 CUPS 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

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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 EKBASIC

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. O. Box 350
New York, New York 10040

REMARKS: Allow 4 to 6 weeks delivery

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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), object's 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: 5K RAM plus RAM for BASIC
SOFTWARE REQUIRED: Minimal subset BASIC (no trig functions)

REMARKS:
ORDER FROM: Sublogic
Box V
Savoy, IL 61874
(217) 367-0299

REMARKS: Input coordinate values $2,000. Output automatically scaled to display device.

DOCUMENTATION: 55 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: $35 (340 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 8080/880 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
Auto Mode Subcommands.

MINIMUM HARDWARE REQUIRED: 32K ram, disk drive
SOFTWARE REQUIRED: CP/M or TRS80C operating system
RESTRICTIONS: None
DOCUMENTATION: 50-page user's guide
MEDIA: floppy disk	DATE CURRENT VERSION WAS RELEASED: January, 1979
WARRANTY: $120
ORDER FROM: Microsoft
10800 NE Eighth, Suite 819
Bellevue, WA 98004

REMARKS:

PROGRAM NAME: WORD-STAR CATEGORY: WORD PROCESSOR
DESCRIPTION: Totally integrated on-screen text composition capabilities
on par with $15,000-25,000 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: 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) used with TEX-MASTER.
RESTRICTIONS: None
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: 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

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, taking 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 are in the works. This application software has been in process since 1978.

MINIMUM HARDWARE REQUIRED: ¾ bus, CP/M, monitor, Standard or Diablo Printer, 16K memory, and disk operating system.

SOFTWARE REQUIRED: CP/M Disk Operating System.

RESTRICTIONS: Must use a video interface board and monitor.

DOCUMENTATION: An excellent 58 page user's manual that is simple to read and written with the turnkey user in mind.

MEDIA: 8" softsector diskette, 5½" mini diskette, or Micropolis mini diskette.

DATE CURRENT VERSION WAS RELEASED: March 1978

WARRANTY: Software support

PRICE: Standard Printer $225.00 Diablo Printer $275.00

ORDER FROM: MICHAEL SHAFER SOFTWARE, INC.
1255 VISTA SUPERBA DRIVE
GLENDALE, CA 91205

REMARKS: All orders are shipped from stock. Orders are prepaid or COD. All Pencils can be upgraded, here's how: send in the original media, '72 upgrade charge plus the price difference between the old and new versions and include $5 for shipping and handling. You will receive new media and new documentation.

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PROGRAM NAME: THE ELECTRIC PENCIL
CATEGORY: WORD PROCESSING SYSTEM

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 PTDS.

MINIMUM HARDWARE REQUIRED: SOL Computer system, video monitor, Standard or Diablo 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 Soreq 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 $225.00 Diablo Printer $300.00

ORDER FROM: MICHAEL SHAFER SOFTWARE, INC.
1255 VISTA SUPERBA DRIVE
GLENDALE, CA 91205

REMARKS: All orders are shipped from stock. Orders are prepaid or COD.
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 EC BASIC

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: M. Geller Computer Systems
Dept. 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 EC BASIC

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: M. Geller Computer Systems
Dept. 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: S0L/CUTS cassette, paper tape, Poly 88 tape, RC 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 MICROWARE LIMITED
27 Firstbrooke Rd.,
Toronto, Ontario, CANADA M6E 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 3FF.
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 available for TRS-80, etc.
DATE CURRENT VERSION WAS RELEASED: Version 1.1--Feb. 1979

WARRANTY:
PRICE: Cassette $20, diskette $25.
ORDER FROM: Quality Software
10551 Odessa Avenue
Sepulveda, CA 91343

**PROGRAM NAME: AMAIN**

**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 CTS 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 MasterCharge: send card #, expiration date.

**ORDER FROM:** COMPUTER PORT

926 N. Collins

Arlington, TX 76011

(817) 469-1502

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**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 CTS 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 MasterCharge: send card #, expiration date.

**ORDER FROM:** COMPUTER PORT

926 N. Collins

Arlington, TX 76011

(817) 469-1502

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**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 code.

**RESTRICTIONS:**

**DOCUMENTATION:** Instruction manual included.

**MEDIA:** 1200 baud CTS 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 MasterCharge: send card #, expiration date.

**ORDER FROM:** COMPUTER PORT

926 N. Collins

Arlington, TX 76011

(817) 469-1502

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**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 CTS 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 MasterCharge: send card #, expiration date.

**ORDER FROM:** COMPUTER PORT

926 N. Collins

Arlington, TX 76011

(817) 469-1502

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PROGRAM NAME: SOFTPAC #1  CATEGORY: GAMES

DESCRIPTION: Four games written in BASIC/5. These are WAR, CRAPS, BLACKJACK, and STAR. STAR is a star trek 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 CTSU 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 MasterCharge: send card #, expiration date.

ORDER FROM: COMPUTER PORT
            926 N. Collins
            Arlington, TX 76011
            (817) 469-1502

PROGRAM NAME: Moppy  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 $1.00 additional. Listing
          available separately for $3.00 for those who like to type.

MINIMUM HARDWARE REQUIRED: 32K ram 2000>,N*MSD-Sngl density, SOL
SOFTWARE REQUIRED: Res 4 BASIC, DOS, SOLOS

RESTRICTIONS: DOCUMENTATION: 15 page manual/optional 10 page commented listing

MEDIA: North Star Mindisk
DATE CURRENT VERSION WAS RELEASED: 11-78
WARRANTY: Damaged media replaced first 2 wks if returned w/orig pk mtl
PRICE: $25.00/diskette; $10.00/source listing; $20.00/both; $4.00/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 12K to run without comments/36-40K with.

PROGRAM NAME: SAM750 Adventure  CATEGORY: Game

DESCRIPTION: The text data base and the interrelationship tables for the
          game of Adventure originated by Willif Crowther. Data base is upper/lower case.
          Preliminary SAM750 language control script is also provided as a guide and learning tool to implementing the game fully using this language.

MINIMUM HARDWARE REQUIRED: 25K CPM system.
SOFTWARE REQUIRED: SAM750 language interpreter with CPM interface.

RESTRICTIONS: Credit to original authors.

DOCUMENTATION: SAM750 Language manual.

MEDIA: CPM Diskettes.

DATE CURRENT VERSION RELEASED: October 1978.

WARRANTY: You will probably get lost.

PRICE: $15.00 for diskette.

ORDER FROM: SAM750 Inc., PO Box 257, R1, Pennington, NJ 08534, USA.

REMARKS: This is NOT a truly functional game - so do not expect to just run it.

PROGRAM NAME: GAMENUG  CATEGORY: Recreational

DESCRIPTION: Chess program and video games including target, pattern,
            life and asteroids cellular under Micropolis W90S

MINIMUM HARDWARE REQUIRED: 16K including system, CRT
SOFTWARE REQUIRED: Micropolis W90S (W9S) 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: $35.00, add $.25 for postage. Orders must be prepaid
ORDER FROM: KALWIN BLUNDER
            KEREN YALDEU CENTER, Inc.
            P.O. Box 619
            Jeruasalem, 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 EBBASIC/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-005.
Add 3% if ordering by mail for freight and handling.
Add 5% sales tax for Texas residents.
Visa and MasterCharge 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: 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 MasterCharge: send card #, expiration date.

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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, freestanding unit with a big, wonderfully noise-free busboard equipped with 19 deluxe 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 an expansion bus and connector, efficiently 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 EQUILON™ mainframe computer components and EQUINOX 100™ computer). The SOLUTION™ is available now as a completely assembled, burned-in, and tested unit backed by a 1-year guarantee. It will work perfectly with your SOL or we will refund your money in full.

The introductory price of The SOLUTION™ Expander System is only $295 (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) 347-8612, 10 AM to 10 PM Pacific Time.
Since Processor Technology has gone out of business, Proteus has become more than a hobbyist club. To ensure that all of our tasks are performed well, we have split up the responsibilities.

Lewie 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. Lewie 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
Lewie Moseley, Jr.
2576 Veterans Court #2
Conyers, GA 30098

Also effective immediately, Tony Severs is handling the Helios disk library. He has edited a new diskette #4, which is listed in this issue. Orders for #4 and future diskettes should be sent direct to Tony, although orders for #4 through #6 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 nighthoot 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 Severs
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 Severs, who has ample experience in microcomputing, sales, and newsletter editing. Mail for the newsletter should still be addressed to the Proteus address, as always. Proteus will continue to handle 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
1669 Woodside Road, Suite 219
Redwood City, CA 94061

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 Canadian firm that produced it, and 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 Cremenco 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 (i.e., Zorkwriter and CoCo). 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 could 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 Basic 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 50 items to be stored in each record 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. You can use this to produce personalized Thank You 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. Processes, by any MailMaster internally to each track of their inventory items. You can think of MailMaster as a computerized filing-card system with report generation built in. Not just Name and Helios, you can store up to 147 entries (names with associated data per list-disk, opening up the number of items and their length. On average, you may access up to 5455 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 about two seconds.

MailMaster will let you maintain a list (create, add, delete, change, print reports) and produce reports in the form of printed or printed custom forms letters from WordWizard documents. You can obtain a printed record of all updates made to the list as you work with it. Each account can be recorded from the computer. As with all of the programs in this section, 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 on the screen. Once you've defined (items named, mailing label formats described, etc.) the program can easily be used by a secretary or other non-computer-trained person to work with just a small amount of instruction.

MailMaster and all of the programs described below require a full 4K system and will run on a 2- or 4-slot Helios with Sol.

MailSort is a supplement to MailMaster. MailSort will let you produce reports or labels in order of name or by "Zip code". MailSort can be any character and can reach 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. To 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, distributed system, or as independent programs. 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 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 14K accounts can be defined freely by the user to describe the general ledger of the company. Account codes, in the following categories (department, revenue center) can be defined. A history of the balances for each of the last 4 years can be stored and reported as desired. Financial reporting and audit detection is performed automatically. Lists 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 reports are 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 provide you with the special reports you may need.

The Financial Reporting module allows you to define any number of accounts. Using WordWizard, you can describe a code in the format and content of the accounts, computed from any of the accounts in the General Ledger (department, revenue center). 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. The A/R module can store up to 34K active customer accounts on one data disk. On a 2-slot Helios system, you can maintain a list of customer accounts on 1 disk, with all of the programs, the search for any account is very rapid due to the in-memory-sequential access method used. (I spoke with a user of the system written by a firm named AccPac. He complained that her system took several minutes to update a single account with a new transaction; evidently that system must update several accounts by reading through the file sequentially. AccPac is much more sophisticated than that.)

A/R allows you to enter invoices, cash receipts, and adjustments. It can be set up so that you can access an account by the account name, salesperson, or account code, if you are a service-oriented company. A salesperson can record (or delete) new accounts or edit existing ones. The program can be used in conjunction with mailing lists or for mailing labels. An accurate listing of account balances is provided: balance forward and open-item. Each account can be designated as an open-item, or balance-forward type.

Financial Reporting provides a summary of your company's financial status. Statements are produced at intervals you select. You can design the format of your statements to fit almost any form of a wide variety. You can provide for detailed remittance coupons if you desire. As with General Ledger, the forms of reports are designed to fit the needs of your company. 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 customer invoices, etc. Checks can be printed and remittance advice coupons can be produced. The formats of checks and remittance advice are designed using WordWizard to fit those specifications. The company name and address is taken from the company profile data on the disk, rather than embedded in the program itself. The program can be used to do any type of business, although some businesses or divisions you control (or any various clients of your bookkeeping service). You can have a list of checks printed, or be issued instead of the checks, if that isn't appropriate. The program allows you to enter a payment to a specified future date or to make partial payments.
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 AcPac 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 AcPac modules. Programs for creating and manipulating the indexed-sequential files used by AcPac are provided. A turn-key utility for sorting files from FORTRAN programs is supplied in a format 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 size-business of providing data processing and word processing services to local clients, you should consider these programs.

The programs have not been abandoned. The film 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 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 displays, 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 to accommodate the versatility of these programs 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.

<table>
<thead>
<tr>
<th>PROGRAM NAME</th>
<th>LIST PRICE</th>
<th>PRICED PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>WordWizard word processor</td>
<td>$250</td>
<td>$250</td>
</tr>
<tr>
<td>MailMaster manager</td>
<td>$250</td>
<td>$250</td>
</tr>
<tr>
<td>MailSort adjacent to MailMaster</td>
<td>$150</td>
<td>$150</td>
</tr>
<tr>
<td>Package deal—all three above</td>
<td>$850</td>
<td>$850</td>
</tr>
<tr>
<td>AccPac General Ledger &amp; Financial Reporting</td>
<td>$600</td>
<td>$500</td>
</tr>
<tr>
<td>AccPac Accounts Receivable</td>
<td>$650</td>
<td>$550</td>
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<tr>
<td>AccPac Accounts Payable</td>
<td>$550</td>
<td>$450</td>
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<tr>
<td>Package deal—all AccPac</td>
<td>$1800</td>
<td>$1800</td>
</tr>
<tr>
<td>The works—all 6 above</td>
<td>$2650</td>
<td>$1995</td>
</tr>
<tr>
<td>Programmer's Package</td>
<td>$550</td>
<td>$250</td>
</tr>
</tbody>
</table>

Manuals may be purchased separately for each of the above programs for $5 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.

CONTENTS OF H-4 DISKETTE

TERM'S
TERM'S is a program to make the Sol-28 a dumb terminal with half-duplex options.

TERM'S is a program similar to TERM'S with the addition of a routine that allows you to send 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 and copy them into your program. With (PROCESS) you can edit and save these programs on Helios.

FCHECK
A file checking command very similar to the DCHECK command on PTOOOL 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 ARE ON THE SYSTEM DEFAULT DISK, SO BEFORE USING THE SYSTEM, COPY THE FILE INTO YOUR SYSTEM DISK—NOTICE THEY ARE INFO PROTECTED.

ACNTS8
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; RPT.CNF; RPT.NAME; RPT.1; RPT.2; ADDITION; RPT.QUAL; ERR1; ERR2; JOURNAL; M.KALLPF; M.KALLJ; M.KALLJF; M.NAME7; RPT.NUM; RPT.MTR. (MAKE SURE ALL PROGRAMS ARE IN SLOT 8 AND A DATA DISK IS PLACED IN SLOT 1.) (NOTE: MAKE SURE THE PROGRAM MENU IS RENAMED TO MENU)

PHONE'S
Converts phone numbers to words using the correlation of numbers to letters shown on the telephone dial. This is a BASIC program which takes a seven-digit phone number and converts it into a seven-character word according to the lettering 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-TEXT
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-TEXT" 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, 2646 Union Avenue, San Jose, CA 95125.
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 US1: Update your WordWizard diskette to version 4.6, 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 3.1, mod 2, correcting errors in previous releases.

Proteus item US5: Update your AccPac Accounts Payable to version 1.6, mod 2.


Proteus item US7: Update your AccPac Financial Reporting system to version 1.1, mod 2.

PROPRIETARY SOFTWARE


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/P, A/R, 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 Sol28-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 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 Disk Library 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 TOG

Lewis Moseley, our new cassette librarian, has announced a new feature: he will accept programs on 8" 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/CU6S cassettes.

In our first issue of 1986, 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 members 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, 1551 Business Center Drive, Northridge, CA 91324. Ask for membership in the "Computer Club Alliance".

CATALOG CONTINUED

HELLOS DISK LIBRARY. Programs donated by members.


LOCAL GROUPS OF SOL OWNERS

Fort Wayne, Indiana: Contact Don Slane, 7220 Miahqueen Ct., Fort Wayne, Indiana 46815.

Washington, DC: wants to meet other Sol owners. Ray Miller, 10534 Layton Hall Dr. #411, Fairfax, VA 2203.

Other areas have been listed in past issues. See especially, Volume 1, number 4 (June 1978).
DEAR Stan,

I PROMISED A PERSONAL REPORT AND OBSERVATION ON THE "LIFEBOAT" ASSOC. VERSION OF CP/M FOR HELIUS 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 SAY A LITTLE GROUNDWORK FIRST. ONE MIGHT RIGHTEOUSLY ASK: WHY CP/M? WHEN CP/M IS A SUPERIOR DOS AND AT BASIC AND FORTRAN ARE QUITE ADEQUATE. TRUE, BUT WE ARE BUSINESS PEOPLE, NOT PROGRAMMERS AND ALTHOUGH WE CAN DO QUITE WELL ON MINOR PROJECTIONS, WE DO NOT HAVE THE TIME OR SKILL TO WRITE THE EXTENSIVE APPLICATION SOFTWARE THAT WE WANT FOR OUR BUSINESS NEEDS. WE HAVE WAITED MORE THAN A YEAR AND A HALF FOR CP/M SOFTWARE. WE HERE SURE WOULD COME FROM SOMEWHERE BUT, ALAS, IT HAS NOT AND IS NOT LIKELY TO SOON APPARE.

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 BASIC-2, NAD, GSORT, TEC 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 HANDLED WITH "TEN". 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-AF SUPPLIES THEIRS WITH SELECTOR (AN UNCOMMON THING). WE SAW A SMALL GAMBOL INVESTMENT-WISE BUT IT HAS WORKED OUT O.K.


THE USUAL NEXT STEP IS TO PRODUCE FROM THE MAIN DATA-BASE ANY SUBSETS DESIRED IF AT ALL AND TO SELECT THEM 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 WHEN "SELECT" DOES THE ACTUAL SORTING AND SELECTION.

REPORTS ARE THE FINAL MAIN PROGRAM AND NEARLY ANY TYPE OF REPORT, CONSOLE OR PRINT CPY, OF ANY COMBINATION OF ITEMS WITHIN RECORDS IN ANY SEQUENCE OF ITEMS. SEQUENTIAL REPORT 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 REPORT. THE LITTLE BIT ONE MUST RECALL IS LOGICAL AND SOON BECOMES REFLEXIVE.

IN ALL, CONSIDERING THE NOMINAL COST AND THE FACT THAT THE SOURCE-CODE IS SUPPLIED MAKING THE ALTERTATION OF THE SYSTEM POSSIBLE, SELECTOR SEEMS TO ME TO BE ONE OF THE BEST BUYS AVAILABLE. SELECTOR-III IS $255.00 AND SELECTOR-III £2.00 THE MOST RECENT VERSION WHICH HANDLES AND PRINTS (AND INCORPORATES) ITS IMPROVEMENTS OVER BASIC IS $245.00. 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 COMPUTING. THE ATTEMPT TO MASTER COMPUTING IS ALWAYS FRESH AND THE POSSIBILITIES EXPAND EXPONENTIALLY. SINCE WE HAVE NOT REACHED THAT GOAL, EVERYTHING ELSE HAS COME TO SEEM JUST SO MUCH TRIVIAL. WE HAVE GROWN PERSONALLY AND SEE THE MANDATE ONLY TO USE SO DIFFERENTIALLY SINCE WE REMAIN ON THE FRAMEWORK TO WHICH OUR COCHALLENGES CAN NOT 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 THINGS JUST GROW AND GROW, 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 WHICH IS DIFFERENT ABOUT PRINTING, ETC) I TALKED WITH THEM BY PHONE, EXPLAINED THE THING, AND, IN ABOUT TWO WEEKS THEY SENT ME A TAILOR-MADE DRIVER, QUITE RELEVENTIVE IN FUNCTION AND IT WORKED WONDERS. THEY DIDN'T CHARGE ME A THING. THAT IS WORTH REPORTING I THINK.

EARL DUNHAM
241 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 keys, the escape key, and the shift lock. We suggest 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 plastic 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 manufacturers: Keyboard Corp., Bldg. 14, Spokane Industrial Park, Spokane, WA 99216. (509) 926-8686.
PROGRAMMED INSTRUCTION: STATE CAPITALS
(Sorry, we lost author's name, Author, who are you?)

5 PRINT CHR(11)
10 PRINT "THIS IS A DEMONSTRATION OF CAT PROGRAMMED 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!"
70 PRINT "PRINT "PLEASE GIVE ME 77.54 SECONDS TO ESTABLISH A RANDOM"
80 PRINT "PRESENTATION OF THE 50 STATES."
90 CLS
100 DIM B(1,50), S(20), C(20), W(20), N(25)
110 LET Z=90
120 LET Z=240
130 LET C=INTR(K$0,RND(0)+1)
140 FOR X=1 TO 50
150 IF B[1,X]=C THEN GOTO 130
160 NEXT X
170 LET B[1,2]=C
180 IF Z<30 THEN GOTO 120
190 PRINT CHR(11)
195 PRINT PRINT PRINT PRINT PRINT
200 INPUT "HELLO, MY NAME IS 'SOL', WHAT'S YOURS?", N$ 210 PRINT CHR(11)
220 FOR F=1 TO 50
780 PRINT "PRINT "PRINT "OUT OF 50 STATE CAPITALS,"
790 PRINT "YOU GOT "N$1" CORRECT AND "N$2" WRONG."
800 PRINT "PRINT "PRINT "INPUT "N$3" WANT TO TRY AGAIN? (Y-N)*" N$
810 PRINT "PRINT PRIN
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:


MEDIA: 8" CP/M standard disk; mini-disk available for surcharge $20
DATE CURRENT VERSION WAS RELEASED: 9-78
WARRANTY: If damaged media replaced first 2 wks if retnd w/ori pk mtl
PRICE: $40.00
ORDER FROM: Microcomputer Resources, Inc
3000 Medical Park Drive, Suite 108
Tampa, FL 33612
(813) 977-5940

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
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: MAILBOX  CATEGORY: BUSINESS

DESCRIPTION: MAILBOX is a 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: FDOS 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 Master Charge: send card #, expiration date.

ORDER FROM: COMPUTER PORT
926 N. Collins
Arlington, TX 76011
(817) 469-1502
PROGRAM NAME: MLD1  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, 3X, 2 disk drives.
SOFTWARE REQUIRED: CP/M, CBASIC, QBasic
RESTRICITONS:
DOCUMENTATION: Complete, easily understood user's manual.

PROGRAM NAME: T.D.Q. 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:
SOS/CUTER; PTC ECGSAS
RESTRICTIONS:
DOCUMENTATION: User's manual and reference card

PROGRAM NAME: CDI  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, 3X, CRT, 2 disk drives
SOFTWARE REQUIRED: CP/M, CBASIC, QBasic
RESTRICITONS:
DOCUMENTATION: Complete, easily understood user's manual.

PROGRAM NAME: T.D.Q. Utilities CATEGORY: Data Management System
DESCRIPTION: The T.D.Q. Utilities 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:
SOS/CUTER; PTC ECGSAS
RESTRICTIONS:
DOCUMENTATION: User's Manual and reference card

MEDIA: Single or Double Density Diskette
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: 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 EBCPAC
RESTRICTIONS:
  DOCUMENTATION: Operation's Reference Card
  MEDIA: SOLOS/CUTER cassette
  DATE CURRENT VERSION WAS RELEASED: January, 1979
  WARRANTY: 10 day exchange; 90 day repair/return; 6 month notify
  PRICE: $13.00/prepaid
ORDER FROM: H. Geller Computer Systems
  Dept. P. O. Box 350
  New York, New York 10040
REMARKS: Allow 4 to 6 weeks delivery

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 EBCPAC
RESTRICTIONS:
  DOCUMENTATION: Operation's reference card
  MEDIA: SOLOS/CUTER cassette
  DATE CURRENT VERSION WAS RELEASED: January, 1979
  WARRANTY: 10 day exchange; 90 day repair/return; 6 month notify
  PRICE: $20.00/prepaid; Subject tapes - $6.00 each/pre
ORDER FROM: H. Geller Computer Systems
  Dept. 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

PROGRAM NAME: T.D.Q. Report CATEGORY: Data Management System
Generator
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, T.D.Q 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 EBCPAC
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/return; 6 month notify
PRICE: $40.00/prepaid
ORDER FROM: H. Geller Computer Systems
  Dept. 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.
REMARKS:
  DOCUMENTATION: Instruction manual included.
MEDIA: 1200 baud CUTER 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 $4 for freight and handling.
  Add $8 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

EDUCATION

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 EBCPAC
RESTRICTIONS:
  DOCUMENTATION: Operation's Reference Card
  MEDIA: SOLOS/CUTER cassette
  DATE CURRENT VERSION WAS RELEASED: January, 1979
  WARRANTY: 10 day exchange; 90 day repair/return; 6 month notify
  PRICE: $13.00/prepaid
ORDER FROM: H. Geller Computer Systems
  Dept. P. O. Box 350
  New York, New York 10040
REMARKS: Allow 4 to 6 weeks delivery
<table>
<thead>
<tr>
<th>PROGRAM NAME: MACRO-80</th>
<th>CATEGORY: Assembler</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESCRIPTION: Relocatable macro assembler for 8080/880 microcomputers. Fast and powerful. Supports 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 880 opcodes, and supports comment blocks, variable input radix, titles and subtitles, listing controls and conditional pseudo-ops. Loader and cross reference facility included.</td>
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</tr>
<tr>
<td>MINIMUM HARDWARE REQUIRED: 48K ram and disk drives</td>
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<tr>
<td>SOFTWARE REQUIRED: CP/M or ISIS-II operating system</td>
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</tbody>
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<table>
<thead>
<tr>
<th>PROGRAM NAME: COBOL-80</th>
<th>CATEGORY: Compiler</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESCRIPTION: COBOL compiler for 8080/880/8885 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).</td>
<td></td>
</tr>
<tr>
<td>MINIMUM HARDWARE REQUIRED: 48K ram and disk drives</td>
<td></td>
</tr>
<tr>
<td>SOFTWARE REQUIRED: CP/M or ISIS-II operating system</td>
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</table>

<table>
<thead>
<tr>
<th>PROGRAM NAME: FORTRAN-80</th>
<th>CATEGORY: Compiler</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESCRIPTION: FORTRAN for 8080/880 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).</td>
<td></td>
</tr>
<tr>
<td>SOFTWARE REQUIRED: CP/M, ISIS-II, TEKDOOS, or TRSDOS operating system</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>PROGRAM NAME: BASIC-80</th>
<th>CATEGORY: Interpreter</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESCRIPTION: BASIC interpreter for 8080/880 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.</td>
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<tr>
<td>SOFTWARE REQUIRED: Disk version requires 20K ram &amp; floppy disk drive</td>
<td></td>
</tr>
</tbody>
</table>

| DOCUMENTATION: 55-page manual included |
| DATE CURRENT VERSION WAS RELEASED: March, 1979 |
| PRICE: $200.00 |
| ORDER FROM: Microsoft 10800 NE Eighth, Suite 819 Bellevue, WA 98004 |

| DOCUMENTATION: 175-page manual in 3-ring binder |
| DATE CURRENT VERSION WAS RELEASED: January 31, 1979 |
| PRICE: $750.00 |
| ORDER FROM: Microsoft 10800 NE Eighth, Suite 819 Bellevue, WA 98004 |

| DOCUMENTATION: 175-page manual in 3-ring binder |
| DATE CURRENT VERSION WAS RELEASED: March 15, 1979 |
| PRICE: $350 (TRS-80 version, $350) |
| ORDER FROM: Microsoft 10800 NE Eighth, Suite 819 Bellevue, WA 98004 |

| DOCUMENTATION: 8" floppy disks (non-disk versions-paper tape) |
| DATE CURRENT VERSION WAS RELEASED: 5-30-79 |
| PRICE: $150 (8K), $250 (Extended), $350 (Disk) |
| ORDER FROM: Microsoft 10800 NE Eighth Suite 819 Bellevue, WA 98004 |
**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 132767 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 8080/80-80 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, CUTF, MITS cassette, HELIOS, paper t.  
**PRICE:** 8 CP/M or Hellos $30; Helios, CUTF, MITS, paper tape $20; T'bell $10  
**ORDER FROM:**  
ERIC T. MUeller  
Britten House  
Roosevelt, NJ 08555  
Computer Consultants  
101 Volney St.  
South Houston, TX 77587  
**REMARKS:**

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**PROGRAM NAME:** PILOT  
**CATEGORY:** Computer Assisted Instruction (CAI) language  
**DESCRIPTION:** The Micropl 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.  
**MINIMUM HARDWARE REQUIRED:** 8080/8080 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 HELIOS II disk.  
**DATE CURRENT VERSION WAS RELEASED:** Nov 1, 1978  
**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, TURAN (UCSD PASCAL), and SWPPC 6800/6809 versions of Micropl COMMON PILO. Courseware available from Micropl. New courseware is solicited (royalties offered).

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**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:** $94 for object, $25 additional for listing or source on disk  
**ORDER FROM:** Tarbell Electronics  
905 Dovlen Place Suite B  
Carson, Calif 90746  
**REMARKS:**

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**PROGRAM NAME:** CP/M conversion  
**CATEGORY:** Programming Language Aid for PTC EC BASIC  
**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 CUTF 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 EC BASIC which this program patches.  
**RESTRICTIONS:**  
**DOCUMENTATION:** User's manual  
**MEDIA:** 1200 baud Sol/CUTF 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:**
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 CP/M 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 8K for 8080 or 6800, plus 3K for disk and extra functions; keyboard, output device - upper and lower case full BASICi character set desirable.

SOFTWARE REQUIRED: Input and output drivers plus CP/M 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 CP/M interface with SAM76 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: CP/M standard and North Star, Paper Tape, PULtahmic Cassette, and TDL/ZIPAN SME.

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; CP/M diskettes - $15.00 Tape or cassettes $10 (with additional info).

ORDER FROM: SAM76 Inc., Box 257 - RRI, Pennington N.J. 08534, USA. Phone (698)-1646 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: 280 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 160 280 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: 280 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, character identifiers, hex constants only.

DOCUMENTATION: 40 pages of manual and complete listing of tables.

MEDIA: Single density diskette (5 inch, North Star hard sectored)

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 included.

PRODUCT: MERCO DATA PROCESSING, 9 WALNUT STREET, AUTHENFORD, NEW JERSEY 07070

REMARKS: None.

PROGRAM NAME: SAM76 Graphics CATEGORY: Plotter

DESCRIPTION: Graphics extension to the SAM76 language interpreter with a set of the vector list 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 CALLCOMP 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 CP/M 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 programs.

MEDIA: CP/M diskettes

DATE CURRENT VERSION WAS RELEASED: March 1978

WARRANTY: Good looking graphics.

PRICE: $15.00 for diskette.

ORDER FROM: SAM76 Inc., PO Box 257, RRI, 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 interpreting 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, MELIOS/PDGOS 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 Owner's Manual (350+ pp). Separate manuals for each operating system (150+ pp).

**MEDIA:** SOLOS/CUTER-cassette, MELIOS-diskette, NORTHSTAR-diskette.

**DATE CURRENT VERSION WAS RELEASED:** Sept. 1, 1978

**WARRANTY:** 30 day exchange - 1 yr. notification. Subject to change.

**PRICE:**

**ELECTRON Computers Inc. P.O.Box 866, 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, pizzana fish game, upper and lower case mode. Source for TINY-C and custom interface on request - write for quot

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**PROGRAM NAME:** DISAM

**CATEGORY:** PROGRAMMING AID

**DESCRIPTION:** 8000 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 $S, custom commands under SOLOS/CUTER.

**MINIMUM HARDWARE REQUIRED:** RAM DAA-PF7C plus stack and SOLOS/CUTER or my command interpreter. Or set source files and readable. SOFTWARE REQUIRED: SOLOS/CUTER or optional command interpreter. Memory files work with ALS-8, Software 1, Microcosm MDOs, assemblers.

**DOCUMENTATION:** You must supply it around data and tables if you want perfect results in disassembly. Doesn't build DB, WA etc.

**DATE CURRENT VERSION WAS RELEASED:** 3/27/78

**PRICE:** $8 assembled as stated, $8 special origin, $6 source 20K file, $8 source in 3 parts. (not currently available)

**ORDER FROM:** Richard Greenlaw
251 Colony Ct.
Gahanna, Ohio 43230

**REMARKS:**
No credit cards. Check 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.

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**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

**MINIMUM HARDWARE REQUIRED:** 32K BEGINNING AT 2000 HEX

**SOFTWARE REQUIRED:** NORTH STAR DOG 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:** 9/24/79

**WARRANTY:** NONE

**PRICE:** $99.00

**ORDER FROM:** MINI BUSINESS SYSTEMS
P.O. Box 15387
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 12 CHARACTERS, THEN THE 'LIST' AND 'EDIT' FUNCTION OF NORTH STAR BASIC WILL NO LONGER WORK CORRECTLY.

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**PROGRAM NAME:** WPILOT

**CATEGORY:** Educational

**DESCRIPTION:** WPILOT is the original Dobb's Pilot adapted to work under Microsoft MDOs and is compatible with lineedit and ALS-8 files format.

**MINIMUM HARDWARE REQUIRED:** 24K including system

**SOFTWARE REQUIRED:** Microsoft MDOs (MDS), Version 3.0

**RESTRICTIONS:**

- DOCUMENTATION: Complete, including instruction guide and Pilot programming guide.

**MEDIA:** Microsoft 5" double density

**DATE CURRENT VERSION WAS RELEASED:** November 1978

**WARRANTY:** 90 days repair/replace

**PRICE:** $395, -- Add $2,-- for postage. Orders must be prepaid.

**ORDER FROM:** KALMAN BLOCHER
KOREN VADEO CENTER, INC.
P.O.Box 819 Jerusalem ISRAEL

**REMARKS:**
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 0000H. 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 CUPS 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 MasterCharge: 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 2-80 object code and produces assembly listing format output or source code for storage, edit & reassembly. Generates TDL Bronco. 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, CHTER, NO DOS or CM required.
SOFTWARE REQUIRED: Standalone, if generating list output. Appropriate I/O interfaces provided by user
RESTRICTIONS: Generates TDL Bronco. Not necessarily a limitation, if good macro-assembler is available.
DOCUMENTATION: Provided both in paper and machine readable form.

MEDIA: CHTER 1200 baud cassette, North Star, or CM(9" or mini) floppy diskettes.
DATE CURRENT VERSION WAS RELEASED: April 1978
WARRANTY: 30 day media warranty. Agreement enclosed.
PRICE: Nextt Star (2000H)-$40, CM versions (100H)-$50, CHTER or No DOS versions- $55
ORDER FROM: Alphabet 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.

REMTEAS: 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 is cleared 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-ASSEMBLER  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 as 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 CUPS 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 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: MODEM  CATEGORY: Operating System

DESCRIPTION: MODEM is an assembly-language program designed to provide telephone-line interface to HELIOS PTDOS. This program, with the D. C. Hayes 80-103 5-100 buss modem, provides remote-terminal operation of the HELIOS system. Automatic answer, sign-on message, and local system operation from the remote terminal are provided. Local-control console 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 5-100 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 92805

REMTEAS: Various PTDOS system-global parameters are changed. Optional nulls 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. MODEM runs unchanged on any HELIOS system but many patch provisions are included for user customization. MODEM 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 FU712

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 FROM
DATE CURRENT VERSION WAS RELEASED: JULY 4, 1978
WARRANTY: 90 Day
PRICE: $150.00 + $2.00 Shipping
ORDER FROM:
Computer Mart Ltd.,
1243 Bayview Avenue, Toronto, Ontario CANADA MAG 3B5

REMARKS: CP/M, CBASIC MUST BE PURCHASED SEPARATELY FROM
DIGITAL RESEARCH CORP., OR COMPUTER MART LTD.
DELIVERY 2 WEEKS

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 PDOS 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.
5. Display operators logged.
6. Operator code generator.

MINIMUM HARDWARE REQUIRED: Sol System III or IV, 48K RAM,
cassette tape recorder.
SOFTWARE REQUIRED: PDOS and Extended Disk BASIC.
DOCUMENTATION: Instruction manual included.
MEDIA: 1200 baud CTSU 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 SC-019
$250.00 (custom version) contact store for details.
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: CP/M
CATEGORY: Operating System
DESCRIPTION: CP/M provides a full disk operating systems for
floppy disk systems. Includes assembler, editor, BASIC-I,
directory, file manager, 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
350 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.)
MISCELLANEOUS UTILITIES

PROGRAM NAME: PTDS UTILITIES
CATEGORY: UTILITY

DESCRIPTION: This is a collection of useful PTDS files, including Din-assm-Dier, Byte-Finder, ASCII dump from memory, assorted drivers (including source code), drivers with title/date/pagination, tape duplicator, tape rewrites, 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: PTDS 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 MasterCharge: send card #, expiration date.

ORDER FROM: COMPUTER PORT
926 N. Collins
Arlington, TX 76011
(817) 469-1502

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PROGRAM NAME: ALS-8 UTILITIES
CATEGORY: Utility

DESCRIPTION: The ALS-8 mas 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 CTS 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 MasterCharge: 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.

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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: 12K
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.
INPUT-OUTPUT DRIVERS

PROGRAM NAME: DOS-SOLOS 10#1  CATEGORY: I0 Driver

DESCRIPTION: N=SOLOS interface. Ties cursor keys to N= editor; VDM
speed control & start-stop; Emulate swaps output device; dirctory
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: 1-77

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 10#2  CATEGORY: IO driver

DESCRIPTION: Tape IO system. Tape output in 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 10#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

17
PROGRAM NAME: DOS-SOLOS 104
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* MDD-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 1046
CATEGORY: IO driver

DESCRIPTION: similar to DOS-SOLOS 1042, except that data is placed on tape in straight ASCII (IBMPC 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* MDD-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: HEL01
CATEGORY: Operating System

DESCRIPTION: HEL01 is an operating-software package consisting of five standalone assembly-language programs designed to run under HELIOS PT00S. Included are: a device-driver file for the Tarbell Cassette Interface for tape/disk operations; CLOAD 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 PT00S.

SOFTWARE REQUIRED: HELIOS PT00S.

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
Anahiem, CA 92805

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. HEL01 is furnished on a formatted HELIOS data-diskette which may be copied or used for other purposes.
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 or irregular in pronunciation.

DOCUMENTATION: User's manual, including assembled, annotated source code.

MEDIA: SOL/CUTER 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.
Champaign, IL 61820

REMARKS: Also available: 8080 talking terminal interface software, complete talking terminal for the blind, ASCII to phonetic device, custom programming. MANUALS AND PROGRAMS ARE AVAILABLE FREE TO NON-PROFIT INSTITUTIONS FOR USE IN TALKING TERMINALS FOR THE HANICAPPED. Prof. Peter B. Maggs, Univ. of Ill. College of Law.

PROGRAM NAME: UNIVERSAL GRAPHICS INTERPRETER | CATEGORY: Engineering, Education, Science

DESCRIPTION: Universal Graphics Interpreter is a graphics driver for Cromemco Dazzler, Vector Graphic Hi-Res Display board, Matrix 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, alphanumericics, and more. Control commands include selectable origin, cursor control for moving images, and more.

MINIMUM HARDWARE REQUIRED: 8080 or 280 processor, S-100 bus computer, graphic display, 5K memory.

SOFTWARE REQUIRED: none

RESTRICTIONS: coordinate values restricted to ±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: 1 year notify

PRICE: $35 except Alt-512 is $50

ORDER FROM: Sublogic
Box Y
Savoy, IL 61874
(217) 367-0999

REMARKS: Specify display board and media

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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:

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1690 WOODSIDE HIGHWAY, SUITE 219
REDWOOD CITY, CALIFORNIA 94061

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D79 *** D80 ***

UPDATE SERVICES. Send your original diskette to us for updating to more recent revision level.

CASSETTE LIBRARY (DONATED PROGRAMS). Order directly from Lewis Moseley Jr., Proteus Cassette Librarian, 2576 Glendale Court NE, Conyers, GA 30013.

HELLOS LIBRARY DISKETTES (DONATED PROGRAMS). After December 31, 1979, order these diskettes from Tony Severa, Helios Librarian, 311 Highland Avenue, Vacaville, CA 95688.

PREREGISTRATIONS. Price after the slash is for manual if ordered without the software, creatable to the software price if purchased later.

PROTEUS/NEWS SUBSCRIPTIONS AND BACK-ISSUES.

*Each donated program or file gives one discount credit toward purchase of a library cassette or diskette. Library cassettes are $10 plus a discount credit. Library diskettes are $15 plus a discount credit.

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