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NUMBER 3
1980

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Write the Best FIND & REPLACE Option and win \$50.00! Write the Best Enhancement Package and Win \$100!

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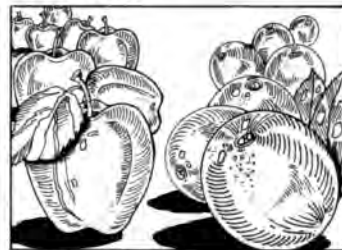
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☐ SUPER ISOLATOR PROTECTS YOUR APPLE

Lock out the influence of Air Conditioners, Humidifiers, and other Appliances which foul up your Apple line voltage.

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EDITORIAL

First of all, THANK YOU! Your letters and NIBBLE's growing readership have confirmed the basic concept and purpose of the magazine, that there is always a demand for Quality. Our growth over the past months has been explosive — and it continues to be.

We have begun to attract some of the top Apple programmers in the country as Contributing Editors to NIBBLE, and we expect, and insist, that our Quality Standards be upheld.

This issue of NIBBLE centers on Text Processing and it includes the full and COMPLETE PROGRAM for a line-oriented Apple Text Processor called T.O.U.G.H. (Text Outputter, Updater, and Generalized Handler).

Your Apple II or Apple II Plus is a potent Text Processor. I've heard a lot of people poo-poo the 40-character screen display as inappropriate and un-useable for Text Work. I'll admit that an 80-character line is a lot neater, but as you'll find with the T.O.U.G.H. System, 40-characters can be handled nicely and easily with underscoring of the line to be typed. Also, if you really must have 80-characters, you can! The 80-character screen DOUBLEVISION was reviewed in our last issue. In addition, M & R Enterprises' Sup'rTerminal provides for 80 column Apple screen display.

Text processing is a rich and provocative subject when you start anticipating and trying to optimize Human Factors in making a system easy-to-learn and easy-to-use. Then you begin to discover "niceties" which you always used to take for granted — such as page-centering, margin-justification, editing, upper-lower case printing, blank space fill-in — now become fascinating programming challenges.

The T.O.U.G.H. Text Processor has been programmed entirely in Applesoft II to make the learning process easier. By the time you've finished (or "started" — depending on your perspective), you should be equipped to do all sorts of fancy tricks with your Apple.

As is our practice with the featured articles in NIBBLE, we'll show you how to Use the programs, how to Customize them, and how the programming techniques can be applied to Your Own Programming!

*"Text Processing
is a rich and provocative
subject when you start
anticipating and trying
to optimize Human Factors
in making a system
easy-to-learn and
easy-to-use"*

We will also continue the policy of offering the principal programs in each issue on diskette at a reasonable "Introductory Price" for 90-days after the publication of the issue. This price will normally be in a range of \$11.95-18.95 during the 90-day period and will usually be slightly above our cost. This feature is targeted to make it easy to get operational with NIBBLE programs if you choose not to key them into your own system. After all, TIME is your most precious and perishable asset.

This issue also makes extensive use of the IDS 440 Printer from Integral Data Systems. We'll show you how to use the upper-lower case and the normal-enhanced printing fonts of the Paper Tiger. The Graphics section contains the complete code to exercise the High Resolution Graphics option capability of the printer. Now, you'll be able to dump your Hi-Res screen directly to hard-copy!

Apple SIMON is featured in the Games section, and it represents a Low Resolution adaptation of the popular electronic game. It uses the Low Resolution Shapewriter which was featured in our last issue in order to provide very fast shape-drawing in Lo-Res graphics. It's as much fun to play on the screen as it is in the "box" version, and it includes a number of additional scoring features to hold and challenge your interest.

Alan Floeter's REM REMOVER is featured in Tips and Techniques section. It is a clever program package for automatically deleting REM Statements from your Programs. You will probably want to use it with your memory limited programs (once they're debugged) to increase their data capacity. T.O.U.G.H. would be a good place to use it as well.

Rick Connolly, Chuck Hartley, and R.M. Mottola have excellent articles in the TIPS AND TECHNIQUES section. Rick gives excellent guidance for IMPROVING THE MULTIPLE ARRAY SORT. Chuck's article and program will keep you away from those pesky Disk Full messages. And R.M. has developed a fast Assembly Language Screen Printer Dump for you.

Les Schmeltz reviews the MICROTEK MT-80 Printer in this issue and his review, taken together with several articles on the IDS 440 Paper Tiger Printer will give you two good buying alternatives.

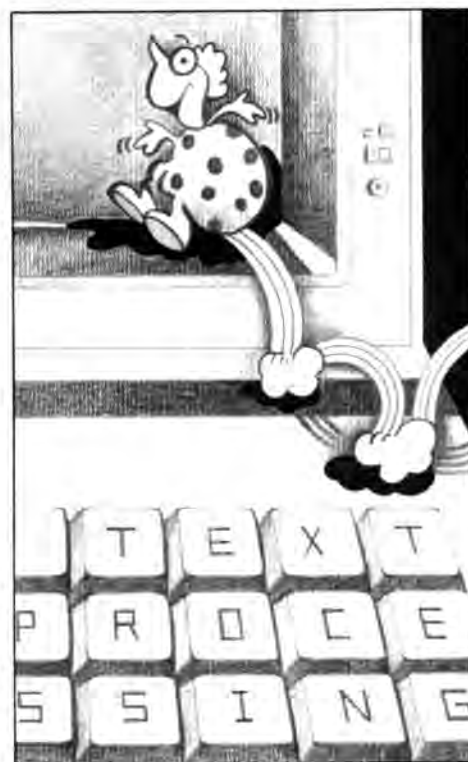
With this issue, we begin a regular Software Review section in NIBBLE. Michael Weinstock will edit the section and you will find a review of the Dakin 5 Programming Aids written by Michael.

I am particularly pleased to welcome Alan Floeter, Rick Connolly, and Les Schmeltz as Contributing Editors to NIBBLE. This means you can count on seeing more of their work in NIBBLE. I am also pleased to see a growing number of author articles. We are anxious to have more people become Contributing Editors and you can look for additional appointments in the next issue.

Finally, we're starting a new contest to find the best FIND & REPLACE option for T.O.U.G.H.! There's also a grand prize for the best overall enhancement package to T.O.U.G.H. Have fun, and Win!

Once more, I want to say THANK YOU for your encouragement, your support, and your interest in NIBBLE!

Mike Harvey



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LETTERS

Dear NIBBLE People,

Please enter my subscription at once! Your first issue was the best piece of APPLE-supporting written material I have seen. I am looking forward to more. If you can produce half of the what you have promised (with the same quality as the January/February issue), it will be great.

The TRAC program is nifty. I modified the YEAR-TO-DATE SPENDING ANALYSIS to print the data in two halves; first half on top, second half (with a repeat of the account names and column headers) on the bottom of one page. This accommodates my 96 column printer and it wasn't very difficult. If you ever are considering updates to TRAC, I would like you to consider:

1) Add some means of bad data correction. I entered the wrong account number on one check and it is messing up my monthly averages.

2) In order to get good utilization as an aid in bank statement reconciliation, I have used one of the accounts for checks written to Credit Card companies. Now, of course, the results from the year-to-date analysis and TREND analysis double count these expenses (once from credit card file and once from check file). Short of adding significant programming to keep track of current balances, an option to eliminate an account(s) from the totals would be nice.

3) No doubt you already have been told several times about the missing parens at the end of the TREND ANALYSIS subroutine. The only other typo I found was in line 2210 where "SWT" should be "SW".

4) You might also mention some of the restrictions on variable size (can only delete 24 records at a time; add 100 at a time) that can cause the program to crash. I think it would be easy to make those parts of the program fail-safe by checking the value of the sequence counter.

5) One last small item. I think the user must have entered data in both the check and card files before the trend and year-to-date routines will work.

Enclosed find a check for \$15.00. I wish you great success and hope you will stay with APPLE longer than this year.

Sincerely,

Charles W. Eliason III
Peoria, Illinois

ED, Thank you for your generous words and for your subscription. Your letter was a particularly good summary of some of the requests of our readers for modification options. On the basis of your letter and the calls and letters of our other readers, we are publishing an ERRATA/ENHANCEMENTS section which corrects errors found in the printing of NIBBLE #1 and #2.

The ERRATA/ENHANCEMENTS section also contains suggested program changes to answer your other requests.

Let me also answer your question about the continued focus of NIBBLE on the Apple. Our reader response has been so strong on the

subject that we have decided to keep NIBBLE totally Apple-oriented.

If, in the future, we choose to provide similar coverage of other systems, we will do it in a separate, stand-alone edition. So you can have the confidence that NIBBLE will continue to serve the needs of Apple owners for a long time to come.

Dear NIBBLE

I was disappointed in your issue No. 2, I wanted to use the program STAR ATTACK, but found it was written in Integer Basic, I have an Apple Plus with Applesoft.

Can the program be changed to run in Applesoft? Would the machine language portion be the same. I would appreciate any help you can give.

I like your magazine very much. The TRAC program is excellent. I did have trouble with SPACEMAZE.

Sincerely,

Robert W. Darr
Fairfax, Virginia

Ed, Don't be disappointed. STAR ATTACK can be modified to run under APPLESOFT. Here are the principal changes which have to be made:

1. The TAB statements which are in Integer Basic have to be changed to PRINT TAB () Applesoft statements.

2. The RND statements (such as line 2072) have to be changed to the Applesoft format, i.e. $XX = RND(1) * 250$ etc.

3. INPUT statements, (such as line 3008) have to be changed to insert a semicolon ';' between the string and the variable (instead of Integer Basic's comma).

4. Any multiple IF statements (on a single line) such as line 4020, need to be broken up and placed so that only one IF statement is on a single line.

In addition, to run Star Attack or Airsea Battle in Applesoft, you will have to relocate the AS II program. The December 1979 issue of Micro shows how to do this. The instructions (equivalent to Integer Basic LOMEM: 4096) to type in to protect the Assembly Language are:

CALL —151 (Enter the Monitor)

*1000: 00 00 00

*67: 01 10

CTRL B, (Or the return to Basic for your system)

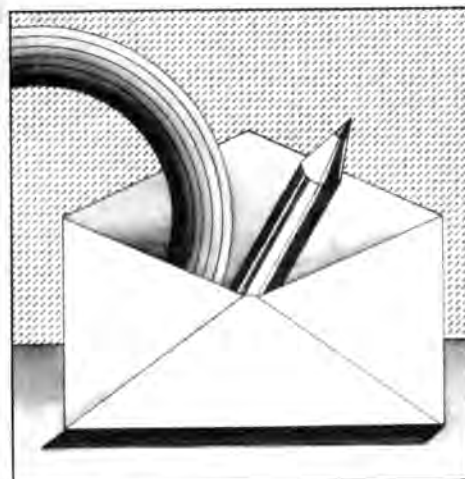
NEW

LOAD (The Star Attack Basic Program will now load beginning at \$1001 — 4096 decimal)

I believe these changes will do the trick. The Assembly Language code does not need any modification.

If, after making the changes, you get a syntax error in running the program, it should be readily correctable from the manual.

Thanks very much for your letter and your generous words on NIBBLE! Let me know if we can be of further help.



Mike,

It is a rare privilege to enclose my check in the amount of \$15.00 for a year's subscription to your magazine. The first issue (Jan.-Feb.) with 'Trac' completely documented was the best of the so called computer books.

I do not want to miss a single issue, therefore I request my first copy to be the (Mar.-Apr.) issue. As I have an Apple computer, the attention given to it in your first year of publication is greatly appreciated.

There is one point of major weakness in the "TRAC" system that I believe needs attention; i.e. no apparent provision has been made for inclusion of income inputs. I have four other "HM Management" systems in the mill.

My 'APPLE' at this writing is celebrating it's 90 day age.

Wilbur T. Felkey
Godfrey, Illinois

ED, Thanks for your letter and your subscription. I'm glad that TRAC is finding a useful place in your program library.

While TRAC was not written to provide a complete 'Income Statement' it should be fairly easy to add INCOME ACCOUNTS to the account list. Page 15 of NIBBLE #1 will show you how to changeladd Account Names. Then the subroutine on Lines 4390-92 can be modified to ADD to the Balances for some account numbers, and to SUBTRACT from the balances for others. The variable WK(X,1) is the Account Number being processed, so you could write:

```
4391 IF WK(X,1) = (Your Acct #) THEN
    BAL(WK(X,1),WK(X,2)) =
```

```
    BAL(WK(X,1),WK(X,2)) +
    WK(X,3): REM ADD TO BAL
```

```
4392 IF WK(X,1) = (Your Acct #) THEN
    BAL(WK(X,1),WK(X,2)) =
```

```
    BAL(WK(X,1),WK(X,2)) -
    WK(X,3): REM SUBTRACT
```

```
4393 NEXT X: RETURN
```

With the ability to add and subtract account numbers of your own choosing, you should be able to customize TRAC to handle your income categories.



GET T.O.U.G.H. WITH TEXT

After years of fiddling with snowy solutions, blowing them dry, and inserting flaky correction paper and other things into error-ridden copy, the prospect of authoring complex programming articles was grim. With Text Processing as the obvious answer, T.O.U.G.H. came beeping into existence.

T.O.U.G.H. is an acronym for **Text Out-putter, Updater, & Generalized Handler**. It runs on the Apple II Plus or Apple II with Applesoft in ROM (or with the Apple Language System) and the Disk II. It can run on a 32K Apple, although, if you have a Disk II, you probably already have 48K. With the full system you can contain more than 200 lines (6 pages double-spaced) in memory at the same time.

T.O.U.G.H. should run on any Centronics-Compatible Printer which uses the Apple Parallel Printer Card. It should also run with Serial Printers (since each line of text is pre-formatted into a single print string). Using a Serial Printer may require changes in the control codes which turn your printer ON and OFF.

The T.O.U.G.H. printer controls are in lines 1215-1221 and 1248-1250.

T.O.U.G.H. is a line-oriented text processor with the following major features:

1. UPPER AND LOWER CASE PRINTING

(With capital letters shown in 'Inverse' on the screen). Individual letters can be capitalized, or a "Shift Lock" control can print all capital letters.

2. BLANK SPACE FORMATTING:

(Which overcomes the Apple II's annoying tendency to ignore blanks and "close in" words with more than one space between them). This is really valuable for typing Tables, Report Headings, etc.

3. RIGHT MARGIN JUSTIFICATION:

(Which includes automatic overflow and hyphenation). This feature is implemented in

such a way that it "fills in the blanks" on alternative lines, first from left-to-right and then from right-to-left. This overcomes the deficiency of most text processors which produce "Light Text" to the left side of the page by filling-in using only one direction.

4. AUTOMATIC PAGE CENTERING:

(Which, with a few simple guidelines, can automatically recognize and compensate for the wide variety of character sizes offered by the 440 Printer).

5. SINGLE KEY CONTROL CHARACTERS:

(Which are included for those functions most frequently used, i.e. Capital Letters, Backspace, Justified Line, and Unjustified Line). Other controls are simple, easy and fast to use.

6. AUTOMATIC PAGE NUMBERING:

(Which begins numbering with page 2 on a page overflow).

7. IN-LINE EDITING OPTIONS:

(Which allow "Current Text" to be Reviewed and Printed in the middle of a typing session and then allow the typing to be resumed where it left off).

8. COMPREHENSIVE EDITING:

(Which allows blocks of text to be Deleted, Erased, or Retyped. It will also automatically open up and Insert a specified block of blank lines for entering new text into the body of the text you are typing. Additional Options exist for Paragraph Move, Single-Line or Multi-Line Edit, and Line Erase).

9. AUTOMATIC SAVE TO DISK:

(Which creates a text file and then makes it available for later use). The disk file will be set up with variable length records to make efficient use of the Disk space.

10. AUTOMATIC WORD BACKSPACING:

(Which backspaces all the way to the beginning of a word for retyping). This option, through repeated use of the Left Arrow Key, can be used to successively back up to the first letter of each word in the sentence.

11. APPEND TEXT:

(Which will read the file from Disk and then position the system to pick up where the old text left off). Also contained in this option is the ability to start a new paragraph at that point.

12. INDENT FORMATTING:

(Which allows individual lines to be indented by a predetermined number of spaces).

13. MULTIPLE TYPE FONTS AND SIZES:

(Which are selected from the keyboard and are under program control).

14. VARIABLE LINE LENGTHS:

(Which are specified at the start of a typing session, and set up the screen with "Under-score" equal to the line length — as a typing guide). In addition, the system will prompt when nearing the end of a line by "beeping" during the entering of the last seven characters of a line.

15. SELF-PROMPTING:

(Which positions ALL of the Control Characters at the top of the screen as a ready Reference for the user). In like fashion, the Editing Options menu gives all the prompts for Editing at the top of the screen.

16. MULTIPLE PRINTING FORMAT OPTIONS:

(Which give user control over Line Numbering, Single vs. Double Spacing, Page Centering, Printing Line Numbers, Page Numbering, and Type Font Selection.

With this set of options and features, T.O.U.G.H. rivals systems costing \$40-100 a copy. For those readers who have fumed over the Apple II's apparent inability to print commas, quotation marks, and colons in text processing, T.O.U.G.H. has it beaten. In the first few generations of T.O.U.G.H. it was frustrating to have to substitute multiple "periods" for commas, and I used three periods for a comma. But those days are gone forever.

continued on next page

T.O.U.G.H.

by Mike Harvey

USING T.O.U.G.H.

After loading the program, type RUN and the screen will display:

T.O.U.G.H.

- 1 = TYPE TEXT AND STORE ON DISK
- 2 = READ DISK AND PRINT
- 3 = READ DISK & EDIT/DELETE/
INSERT TEXT
- 4 = ADD SENTENCE(S) TO TEXT

ENTER YOUR SELECTION: 1

Since you'll initially be typing in text press "1". The display will respond with instructions on the length of the print line to be used. These examples assume you are using 9½ inch wide pinfeed paper (which strips to 8½ by 11 sheets). The reason for this "set up" is to anticipate the type and size of font to be used in the final printing. The IDS print styles vary considerably in the width of character which can be printed.

CAUTION: Do not set the line length wider than the maximum capacity of your printer.

The screen will then display:

T.O.U.G.H.

THE 'TEXT OUTPUTTER, UPDATER, AND GENERALIZED FORMATTER (T.O.U.G.H.) IS A SYSTEM FOR MANAGING TEXT OF ALL TYPES. IN OPERATION WITH THE APPLE II AND THE IDS 440 PRINTER, IT CAN HANDLE 4 DIFFERENT PRINT SIZES AS WELL AS WIDE 'ENHANCED' PRINTING.

THE SYSTEM IS GENERALLY SELF-PROMPTING.

TO COMPENSATE FOR THE DIFFERENCES IN PRINT SIZES . . . WHICH BECOMES ESPECIALLY IMPORTANT IN AUTOMATIC TEXT CENTERING, USE THE FOLLOWING GUIDELINES:

DECIDE WHICH SIZE TO USE FOR FINAL TEXT PRINTING. THEN USE THE TABLE ON THE NEXT PAGE TO DECIDE ON THE LINE LENGTH.

HIT RETURN KEY TO GO TO THE NEXT PAGE

At this point, we'll hit the Return Key. The screen will display:

TABLE OF LINE LENGTHS

DECIDE ON PRINT SIZE (8.3, 10, 12, 16.5 CHARACTERS/INCH). THEN DECIDE ON NORMAL OR ENHANCED PRINTING. THEN TRY TO MAKE YOUR LINE LENGTH EQUAL TO OR LESS THAN THE LINE LENGTH SHOWN BELOW:

PRINT SIZE	LINE LENGTHS	
	NORMAL	ENHANCED
8.3 CHAR/INCH	60	30
10 CHAR/INCH	70	40
12 CHAR/INCH	85	45
16.5 CHAR/INCH	115	60

SPECIFY LINE LENGTH: 42

of CHARACTERS TO INDENT FOR TAB: 5

HIT RETURN KEY TO BEGIN



When you hit the "Return" Key, the system will set up to begin accepting text. The various "Control Characters" will be continuously displayed for reference during the text entry. The screen will now display:

LEFT ARROW = BACKSPACE
RIGHT ARROW = LINE, NO JUSTIFY
RETURN KEY = LINE, JUSTIFY
'>' KEY = LINE, INDENT
'@' KEY = END, WRITE DISK
'ESC' KEY = CAPITAL LETTER
CTL 'G' (BELL) = IN LINE OPTIONS
CTL 'S' = SHIFT LOCK CAPS
TYPE SPACE AFTER LAST WORD IN EACH LINE

ENTER TEXT..LINE #1

The screen will then display 42 underscore characters (the line length we specified above) and the cursor will position itself over the first underscore character.

If you'll count the number of underscore characters, you'll discover that there are exactly 42 spaces provided (the number we specified earlier). Notice that we overflowed the 40-character width of the screen. That's not a problem. The system will simply 'wrap-around', whatever the line length specification is. When the final result is printed, it will all be straightened out into a single line.

Entering text is then simply a matter of "Filling in the Blanks". If you're touch-typing text without looking at the screen, the system will politely "Beep" for each of the last seven characters in the line (to let you know you're near the end).

When you near the end of a line, you'll hit either the RETURN Key (to produce text which is right-margin justified), the RIGHT-ARROW Key (to produce the line as it appears on the screen without margin justification), or the '>' Key to Indent the line by 5 spaces (which we specified at the beginning of the session).

THE TEXT CONTROL OPTIONS

The LEFT ARROW controls Backspacing. By hitting this key, the cursor will backup to the first letter of the "previous" word. Note that one of the "conventions" of T.O.U.G.H., requires that an INTERVENING SPACE be typed after each complete word. It also requires that same INTERVENING SPACE be typed at the end of a sentence — in order to complete the word or sentence. If you don't type in the extra space, nothing will be damaged, you'll simply lose the word you were typing and the cursor will go the first letter of the "previous" word — a little more typing but no damage. If you leave out the space at the end of a sentence, the system will drop the last word in the sentence just typed. T.O.U.G.H. needs the space to

know that a complete word has been typed. You'll find it becomes second nature to type the space after using the system for awhile.

The RIGHT ARROW Key (after typing the intervening space at the end of a sentence) will store the sentence without justifying it to the right margin. This is useful for the short sentences at the end of the paragraph, special formatting, printing tables, and other special work.

The RETURN Key stores the sentence and, at the same time, it will fill in "spaces" (alternately from left-to-right and from right-to-left) to justify the text to the right margin of the page. You'll find that you become quickly accustomed to using the little finger of each hand to control these keys.

The RIGHT CARAT Key is formed by holding down CTRL and pressing the ',' Key. This will Indent the line you have just typed by the number of spaces specified at the start of the session.

The '@' Key will end the session and put the text into a Disk file. This file is called "TFILE". It is important to remember this because multiple pages of text can be stored away by using the Apple's RENAME option in D.O.S. This RENAME option would assign a new name to TFILE so that a new TFILE can be created. If you fail to rename the TFILE and then use the program again, when you write the new text out to Disk it will write over the previously stored text.

The CTRL 'G' Key will clear the screen and display the IN LINE OPTIONS to allow for interrupting the typing to Print, Edit, or Review what has been typed.

The IN LINE OPTIONS, which we will discuss shortly, allow you to return to typing where you left off, after you have done whatever editing is required.

The CTRL S Key locks the system into printing all capital letters. These appear as Black Characters on a White background WHILE YOU'RE TYPING THEM IN. If you want to review them later, they will appear as standard Apple characters, i.e. no distinction between small letters and capital letters. However, the capital letter "codes" remain in force and will print upper and lower case to the printer. The CTRL S acts much the same as the Shift Lock Key on a typewriter. Shift Lock can be released by typing the CTRL S command again. This returns the system to typing small letters.

IN LINE OPTIONS

If, while typing text, you decide to review, print, edit, or change what you've been typing, the In-Line Options will do it.

First, type CTRL G (BELL). The screen window will clear and will then display:

EDITING OPTIONS LIST

- | | |
|------------------------|--------------------|
| 1 = Review Text | 6 = Insert Line(s) |
| 2 = Retype 1 Line | 7 = P'Graph Shift |
| 3 = Retype Multi-Lines | 8 = Find & Replace |
| 4 = Delete Line(s) | 9 = Print Text |
| 5 = Erase Line(s) | 10 = Resume Typing |

ENTER SELECTION: (Enter 1-10 & Return)

If you try to enter a selection other than 1-10, the system will reject it and ask you to try again.

IMPORTANT NOTE: Be sure to Press RETURN after each entry/selection.

REVIEWING TEXT

The Text Review Option, when selected, will then ask whether you want to review ALL of the Lines or Selectively review some of the lines. If you selectively review, the system will then ask for a Starting and Ending Line Number for you to examine. T.O.U.G.H. will then page through your text and display it. Don't be alarmed if it prints out a couple lines more than the ending line number you asked for. It prints to the end of the page in which your ending line number is contained.

Selective review of lines of text is particularly convenient when you have a long narrative in the system and don't want to page through the whole thing to get to the most recent few lines.

RETYPE/EDITING LINES

T.O.U.G.H. Editing takes place by selecting and retyping lines which are retrieved and displayed on the screen. These are recalled by line number. After retrieving the line, the system will ask: IS THIS THE LINE YOU WANT TO EDIT?. If you answer 'Y', the system will recreate the familiar underscore characters under the old line in order for you to retype the lines.

If you answer 'N', this is not the line you wanted, it will cycle back and ask you to enter a new line number to retype.

You will usually elect the RETYPE MULTI-LINES Option when you are working with a draft printed copy and simply want to re-do a paragraph or collection of lines. In electing this option, the system will ask you to enter a STARTING LINE # and then to enter an ENDING LINE #. Having done this, T.O.U.G.H. will give you the underscore characters for the 1st line. After retyping it, T.O.U.G.H. will underscore for the 2nd line, and so on until the end of the block.

After selecting and then executing any option, the system will ask for the next selection by displaying:

ENTER SELECTION:

You can then go on to the next.

DELETING LINES

The DELETE LINE(S) Option does just that. It removes the line and the line number from the text and then renumbers all of the other lines to fill in the hole. When you elect this option, the system will display:

DELETE FROM LINE #? (Enter the Starting line number).

TO LINE #? (Enter the last line # you want to Delete + 1).

If you want to delete only 1 line, just type the same line number as the starting and ending line. Let me say again, though, that if you want to delete a "block" of lines, then type in the starting line number and the last line number PLUS 1. The lines affected by Delete and Erase go up to but do not include the "TO LINE #" number. For example, typing in Delete from Line # 5 to line #10 will delete lines 5,6,7,8, and 9 (but not 10). The same rule holds for Erasing lines or Inserting lines in the body of the text.

ERASING LINES

While the Delete Option totally removes the line and throws it away forever, Erase simply removes the text from the line and leaves a blank line number remaining. Erase, leaves all

the original line numbers intact. It literally "erases" the line without deleting it.

Erase is particularly useful when you're typing from a printed draft copy of your text and simply want to blank out and re-do a section.

INSERTING LINES

If you have selected the Insert Option, you'll be operating just as you were with delete and erase, except that now you are ADDING empty line numbers to the body of the text. In this case, the other lines will be renumbered and "opened up" to make room for the new ones. This is a handy option for filling in important information which was inadvertently left out in the original typing.

First, you would use Insert to open up the block of empty line numbers. Then you would use the RETYPE MULTI-LINES Option to enter the new text. A number of the editing options can be used together in different combinations to accomplish a variety of editing tasks.

Remember: When you specify a "Block" of lines for Delete, Erase, or Insert, always enter an ending line number which is 1 greater than the highest (ending) line number you want to affect.

Also remember that when you Insert Lines you will renumber and change all of the lines which are above the block you are inserting. For that reason, it's a good idea to do all your editing from the end of your text, forward. That is, start at the highest line number you want to edit, then the next highest, and so on down to the point where you want to insert lines. Then you won't have to worry about losing track of the "high" line numbers.

PARAGRAPH SHIFT

Option 7, Paragraph Shift, allows you to automatically reposition whole paragraphs to a different place in the text. The system asks for the following:

SOURCE PARAGRAPH STARTING LINE: 25

SOURCE PARAGRAPH ENDING LINE: 30

DESTINATION PARAGRAPH STARTING LINE: 5

In the example above, we shifted the paragraph beginning with line #25 and ending with line #30 to a position beginning with line #5. You can shift paragraphs both forward (higher line numbers) and backward (lower line numbers).

Here's what happens. A space is opened at the destination point — the place where you want the paragraph to be placed. The paragraph is then moved into that position. The place where the paragraph used to be is then deleted and the gap is closed up. All of the line numbers are properly adjusted for the move — automatically.

FIND AND REPLACE

Big news! There is no Find & Replace Option in T.O.U.G.H. This is our latest contest — to write a good FIND & REPLACE option and submit it as an entry in the contest. This will involve a short routine to enter the word being replaced, the word(s) being used as a replacement, and then whatever options you can think up to enhance the control of the function. The award in the contest is a Texas Instruments Programmer Calculator (or \$50.00) to the best entry! Send your entries to NIBBLE! Further details of the contest are in the contest article in this issue.

PRINTING TEXT

The T.O.U.G.H. system has a variety of self-explanatory options which you can specify when printing text. When you request the PRINT TEXT option the screen will display:

AUTO PAGE NUMBER ON OVERFLOW?

Y OR N:

CENTER TEXT ON PAGE?

Y OR N:

SINGLE OR DOUBLE SPACING?

Y OR N:

PRINT LINE #'S?

Y OR N:

SPECIFY PRINT DENSITY

(CHAR/INCH)

1 = 8 2 = 10 3 = 12 4 = 16 (CH/INCH):

"ENHANCED" OR "NORMAL" MODE?

Y OR N:

Here is where your planning at the beginning of the session will pay off. The system will automatically compensate for different type sizes in centering the text on the page (if you've allowed for a line length which can physically BE centered).

T.O.U.G.H. will also automatically switch the page numbering on overflow to accommodate single and double spacing between lines. (NOTE: The program is set to recognize overflow at 28 or 58 lines, depending on whether it is double or single spaced. This is to handle an 11-inch long sheet of paper. It can be changed by changing the MOD variable in the print routine — line 1206.)

The Print Line #'s option will automatically print a sequence number at the beginning of each line printed. This is very valuable for doing draft editing and then using the In Line Options to clean up a final copy for final printing.

When you have entered the final answer to the request for Enhanced or Normal printing, the printer routine will take over and print the text according to your instructions.

As the printer nears the end of the text, the screen will display:

END OF PRINTING

ANOTHER COPY? Y OR N: Y

If you enter "Y" (as we have done in the example above) the printer will reproduce your printed text a second time, using all of the format specifications which you entered. If, on the other hand, you want to reprint the report but THIS TIME you want to CHANGE some of the specifications (such as printing first with Line #'s and then printing again WITHOUT Line #'s), you can do it by answering "N" — No extra copy. Then the system will do what it always does and ask you to:

ENTER SELECTION: 9

Here, we re-selected the Print Text option and we get another chance to specify new printing directions. By re-selecting the Print Text option several times, you can play around with the capabilities of the printer routine and test its versatility.

continued on next page

It is here that you may get an error — particularly if you try to print an enhanced version of a line which is simply too long to be accommodated on the printer with the line length you have specified. Don't despair. Your text is not lost.

THIS IS IMPORTANT: You can recover from almost every error encountered by typing GOTO 1300 and pressing the Return Key. This is known as a "Soft Re-entry" into the system. It will display the options list and let you reenter typing, editing, or whatever. It's handy to remember this and almost inevitable that you'll use it.

When you have finished all the editing and want to resume typing, simply type in as follows:

ENTER SELECTION: 10

This restores the list of control key references at the top of the screen and sets you back to the line number where you were before.

After a little practice, you find that the In Line Options are easy to use and very powerful in helping you re-enter your editing instructions.

OTHER MAJOR OPTIONS

At the beginning of your typing session, there are three other options (Remember we have been working with the first option in the following list:

T.O.U.G.H.

- 1 = TYPE TEXT AND STORE ON DISK
 - 2 = READ DISK AND PRINT
 - 3 = READ DISK & EDIT/DELETE/INSERT TEXT
 - 4 = ADD SENTENCE(S) TO TEXT
- ENTER YOUR SELECTION:**

These options assume that you have saved a block of text out on the Disk as a TFILE (by pressing the '@' Key at the end of your last typing session). Now, you want to get at that text to do something with it. All three of the remaining major options will automatically read in the TFILE from Disk in order for you to work with it.

Option 2 — READ DISK AND PRINT — reads the Disk and automatically switches the system into specifying the Print Directions (using the same specifications described above).

Option 3 — READ DISK & EDIT/DELETE/INSERT TEXT — again, reads the Disk. This time, it switches the system to the In-Line Options list where you can Print, Insert, Review, Erase, Delete, Retype, Insert, or Shift text before resuming your typing.

Option 4 — ADD SENTENCE(S) TO TEXT — will likewise read the Disk. When all the text has been read in, the screen will display:

REVIEW TEXT? Y OR N: Y

Here, we wanted to review the TFILE before resuming the typing.

After the review is complete, the screen displays:

BEGIN NEW PARAGRAPH? Y OR N: Y

Typing in 'Y' will add a blank line at the end of the text which has just been read. Then it will set up the system with the appropriate number of underscore characters that match the text file which already exists. Finally, it will position the system to accept new text at the point where you left off — at the end of the last session. T.O.U.G.H. will display a new updated line number and, with the underscore characters in place, you'll be "off to the spaces", filling in the blanks.

SUMMARY

There you have it. T.O.U.G.H. is a powerful adjunct to your Apple system. It is written to accommodate up to 200 full length lines in memory — with a 48K system. It may hold more lines if they are shorter — see the companion articles on customizing T.O.U.G.H. to accomplish this.

Now is the time to GET T.O.U.G.H. with Text.

Note: If you can't stand the thought of typing in all of the code for T.O.U.G.H., \$14.95 (plus \$1.50 shipping and handling) will bring you your own diskette with T.O.U.G.H., Paper Tiger Graphics, and Apple Simon, from Micro-SPARC, Inc., P.O. Box 325, Lincoln, Mass. 01773).

CUSTOMIZING YOUR OWN T.O.U.G.H.

The Text Outputter, Updater, & Generalized Handler (T.O.U.G.H.) is tough on text and easy on the user. You can customize it easily and in a variety of ways, you can make it your own.

TEXT SYSTEM CAPACITY TUNING

On a 48K Apple II system, T.O.U.G.H. can easily contain up to 200 lines of 100-120 characters. If you have shorter lines, you can customize T.O.U.G.H. by giving yourself more lines of typing. In the DIM Statement on Line # 10000, the A\$(90) variable specifies the maximum number of words which can be contained in a line. The system considers each empty "space" in a line as a "word". That's why we need 90 of them to accommodate typing Tables, Charts, Return Addresses on letters, and the like.

The L\$(200) Dimension saves space for the lines of text. If your lines are always shorter than 100 characters, you can DIMension more of them. As a rough guideline, there are 24000 memory positions available for text. As such, you could have approximately 300, 80 character lines as an example.

For systems smaller than 48K, the DIM statement can be reduced accordingly. A 32K system would leave approximately 8000 characters for storing text — 100 lines of 80 characters each, for example.

Another feature you may want to customize is the number of characters of "Beeping" which take place at the end of a line. In T.O.U.G.H. you specify the length of the line you're going to use each time. The system begins beeping when you are 7 characters from the end of a line. You can change this value in Line # 290 by changing '7' (which is subtracted from SL — your Selected Length of the line) to some other value.

YOUR OWN CONTROL CODES

The most flexible customization is, however, your ability to specify your own "Control Codes" from the Keyboard in order to exercise your own custom subroutines.

The T.O.U.G.H. Control Code handling is illustrated in lines 104-265 of the program. T.O.U.G.H. uses the GET K\$ statement to read characters directly from the keyboard without having to press RETURN. In using this statement, the system can also read Control Characters, sense them, and then execute appropriate subroutines, the key in starting your customization is to select characters which you are not likely to use in your normal typing. These are characters which can be used as SINGLE KEY control codes. The ESC Key is a good example. The Right and Left Arrows are other examples and, as a matter of fact, these are used in the system to trigger special functions.

Here's HOW to set up a custom control.

1. **Select a Control Code. Pick the '<' Key as an example. It is not used by T.O.U.G.H.**
2. **Look on page 138-9 of the Applesoft manual to find out its ASCII code. The code for '<' is 60 (ASCII Decimal).**
3. **Insert a line somewhere in the range of 171-179 which reads:**
17X IF K\$ = CHR\$(60) THEN GOSUB 2000
4. **Write your subroutine beginning on line 2000 to do something with the text.**

In T.O.U.G.H., the key variables defining text, work this way.

K\$ is the character which has just been typed in. The system tests to see if K\$ is a control code, small letter, capital letter, or a space.

The variable LL is a running count of the number of characters you have already typed into the current text line.

The variable FL is a running count (0-40) of the cursor position in the current physical line you are typing. LL and FL are used for backspacing.

The variable S\$ is a simple space. It is used for spacing between words.

The variable X\$ is a "work space" where words are built. Characters (K\$) are added into the work space X\$ (see Concatenation in your Applesoft manual) until a "space" is detected. Then the work space X\$ is assigned as a full-fledged WORD to the variable A\$(N).

The variable A\$(N) builds a list of words in the line currently being typed. Each entry, A\$(1), A\$(2), etc. is a complete word, ending in a "space".

At the end of a line (signified by sensing K\$ as a RETURN Key or a Right Arrow or a Right Carat Key — CHR\$(13), CHR\$(21), or CHR\$(62)), all of the words — A\$(N) — which have been assembled are formed into a full line. The full line is the variable L\$(N), where line #1 is L\$(1), line #2 is L\$(2), and so forth.

Consider the following example. When T.O.U.G.H. senses the end of a Right-Margin-Justified line, K\$ is CHR\$(13) — the RETURN Key. This is done in line 200 of the program. When this happens, the system goes to a routine at line 800 called "End of Line

Spacing". This routine fills in blank spaces between words until the physical line has been pushed out to the right margin. If the line is long i.e. longer than the line width you specified at the beginning of the session, T.O.U.G.H. will hyphenate the last word in the line and put the remainder of the word into the next line.

When all of this has been done, the full line will be built (line 860 of the program) by adding the words successively to the line being built. This is done by adding each word, A\$(N), to the current line, L\$(I). This is called concatenation and essentially it adds text in one String to the text in another String (see page 21 of your Applesoft manual).

Now that you know the variables for Characters, Words, and Lines, you can perform your own text management.

SPECIAL CONTROL CHARACTER EXAMPLE

Let's say, for example, that you want to use a character which is not available on the Apple Keyboard to control your IDS printer. One such character is CHR\$(28). This is a character which causes the Printer to switch to printing 8.3 characters per inch. It is a CTRL\ (Backslash) and there is no Apple key to do this. You could type in the following statement:

```
171 IF K$ = CHR$(60) THEN K$ = CHR$(28)
```

Having done this, every time you type the '<' Key, the system will produce the special control character ASCII 28 and the Printer will switch into printing at 8.3 characters per inch. The article: "T.O.U.G.H. PLUS IDS = POWER" in this issue will give you some other customization ideas.

TWO CHARACTER CONTROL CODES

When you have run out of candidates for single character control codes, you still have options. Many of the CTRL + Letter codes remain, such as CTRL P, CTRL Q, etc. and all you have to do to use them is look up their ASCII code equivalents and then test when K\$ is assigned that value.

Another technique is to use the ESC Key together with some other character. Be careful though, since T.O.U.G.H. is structured to sense the ESC Key already and then to assign the NEXT TYPED CHARACTER as a Capital Letter.

The safest approach is to stick with the CTRL characters to trigger your special subroutines.

Let us know what ideas you come up with. Our other readers will be interested and we'll consider publishing the better ones.

TIPS ON USING T.O.U.G.H.

The feature article on the T.O.U.G.H. text processor describes the fundamentals of how to use it and how its features will enhance your text preparation. This article will describe some of the subtle features which will make your editing easier.

EDITING

An obvious, but sometimes overlooked, practice in text editing is to make a DRAFT COPY of your text before committing to the final copy. T.O.U.G.H. makes this very easy by allowing you to specify that LINE NUMBERS be printed for your draft copy. Since the system allows you to print a copy and then return to the options list for further editing (or to resume typing), you can make a rough copy, edit the text on the screen right away, and then print the final.

All of the editing in T.O.U.G.H. is by Line Number. This means that your "numbered draft" is a valuable reference for retyping deleting, erasing, and inserting lines. It is also an aid to moving paragraphs around in the text.

Inserting and Deleting lines will obviously change the line numbers of the surrounding text. For example, if you have four lines of text and you delete Line #2, the system will obliterate line 2 and will renumber the other lines, i.e. Line 3 will move to Line 2; Line 4 will move to Line 3, and the old Line 4 will disappear.

In like fashion, using the same example of four lines of text, if you insert a new line in between lines 2 and 3, the following will result. A blank line will be created for line 3. The old line 3 will become line 4 and the old line 4 will become line 5.

Using your numbered draft copy — which, we'll assume has several editing changes throughout the text — if your first edit is to insert 5 lines at the beginning of the text, then all of the remaining line numbers in your text will increase by 5 and it will be hard to reference them for the remainder of your editing. The solution is simple: Work from the Back, Forward. In other words, work from the highest line number, backward to the beginning of your text. By doing this, when you get to the point of having to insert or delete lines, you won't care about their renumbering because you will have already made whatever changes are appropriate.

USING DIFFERENT TYPE SIZE

At the end of every printing job, you will be asked if you want another copy. Typing 'Y' will generate one. But what if you want to switch from the small 12 characters per inch to the larger, 10 characters per inch? You may want to switch to Enhanced printing — or any of the options. It's easy, Simply type 'N' in answer to the prompt for another copy. Then reselect the printer option once again and retype the directions for printing in the new format.

SPEED TOUCH TYPING

The T.O.U.G.H. system lets you speed-type without looking at the screen. You can copy text using touch-typing (and any line length you have specified). Just listen for the beep which signals that you are within 7 characters of the end of your line. Then hit the Return Key or the Right Arrow Key after you finish typing the current word. If you are using right-margin justification and you overflow the line, the word will be automatically hyphenated (with the balance of the word shifted to the next line). You can edit any poorly hyphenated words later.

USING THE IDS ENHANCED PRINTING

The IDS 440 printer has an enhanced print type (illustrated in the Comprehensive Example). Whenever you use it, bear in mind that it effectively DOUBLES the width of the character size you are using. The 10 character per inch size all of a sudden become 5 characters per inch. This holds true for the other type sizes as well. Plan your spacing accordingly if you are using Enhanced Characters within a right-margin justified line. A suggestion is to try to save your use of enhanced printing for the last (unjustified) line in a paragraph. Then you won't have to worry about the effects of the wide characters on the appearance of your line.

(The control of the features of the IDS 440 printer is treated in detail in the article: "T.O.U.G.H. PLUS IDS = POWER" in this issue).

With these tips, your use of T.O.U.G.H. will be smooth and effective. As you discover more "tricks", we'd like to hear about them at NIBBLE.

T.O.U.G.H. PLUS IDS = POWER

The structure of the T.O.U.G.H. text processor allows it to use almost all of the special control features of the versatile IDS 440 Printer. The printer allows printing at 8.3, 10, 12, or 16.5 characters per inch. It also allows a "Normal" and "Enhanced" type Font in combination with the different sizes. Working together with the Apple and T.O.U.G.H., the 440 Printer allows unusual flexibility in composing interesting and striking text material.

EXPANDED PRINTING IN ACTION

With FOUR different type Sizes and TWO type Fonts, you're set up to produce bold and interesting text. One of the particularly appealing combinations is to use 16.5 characters/inch with the Enhanced print mode. As it turns out, this produces character spacing roughly equal to 8.3 characters/inch (acceptable typing) and it produces bold, good-looking copy.

Another application would use the large (8.3 characters/inch) and the Enhanced Mode to produce Slide materials for Overhead Projection or other Presentation Materials.

Still another application uses interspersed Enhanced printing (with normal text) for Report Titles, Chapter Headings, and text Highlighting.

The Forms Skip option (Type in: CTRL L to cause a forms skip) is particularly valuable when you are nearing the bottom of a page (Line 59, 118, or 177 in single-spacing — or line 29, 58, or 87 in double-spacing), and you now want to begin typing in a Chart or Table of information. You don't want the Table to be "split" between two pages, (as it will if you let the normal Page Overflow take effect). Inserting a Forms Skip at that point (the last line before skipping) will trigger the skip before printing your Table, and your Table will stay together, intact, on the next page.

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CONTROLLED EXPANDED PRINTING

Four out of the five control features discussed in this article are illustrated in Example 1.

These are:

Normal Printing

Enhanced Printing

10 Character/Inch Printing

12 Character/Inch Printing

A fifth feature, Automatic Forms Skip, will also be discussed.

Controlling the IDS printer is simply a matter of inserting appropriate Control Characters to turn the features ON and OFF.

Any character which can be typed in from the Apple Keyboard can be used. In the example, we have used the T.O.U.G.H. Options List to select printing at 10 characters per inch. When you want to shift to 12 characters/inch, type CTRL Shift N, then space, and everything you type from that point will print at 12 char/inch. Simple? Right.

Be careful though. In the example, when we indent spaces, the spaces are computed at 10 characters/inch for the first line. In the second line of printing, we are fully operational at 12 char/inch and will only indent 5 small spaces. The second line was positioned properly by spacing in EIGHT characters to compensate for the difference in type sizes.

To restore the text to 10 char/inch, we turned off the 12 character switch AT THE END of the 12 char/inch line. This is done by typing, CTRL Shift M, the control code for 10 char/inch, then a space, and finally a carriage return (Return or Right Arrow — in T.O.U.G.H.).

Switching back and forth from Normal to Enhanced Printing is done similarly. Typing in CTRL A and a space, turns on the Enhanced Printing at the beginning of a line. Typing in CTRL B and a space, at the END of the Enhanced Printing shuts it off.

Letting the Enhanced printing continue over to a new line (using Indent) expands the width of the indent spaces and so you'll use only half as many spaces to align the text on the second line.

One of the handiest controls in the 440 Printer is its Forms Skip ability. This is triggered by typing a CTRL L as the First character in a new line. When the printer hits that line, it will skip to the top of the next page. Easy.

The reason that switching between 8.3 and 16.5 char/inch is difficult is simply because the Apple has no direct key which will create the required control codes ASCII 28 and ASCII 31. T.O.U.G.H. could be customized to accomplish this (see the article: "CUSTOMIZE YOUR OWN T.O.U.G.H." in this issue).

Using techniques described in the IDS User Manual, you can even intersperse graphics with text.

In summary, with T.O.U.G.H. and the IDS 440, you have an excellent team. If you choose to further customize T.O.U.G.H., there's almost nothing they can't do, working together.

EXAMPLE ONE

In this Demonstration of Printing Flexibility we'll use different type sizes and styles, all under program/text control. (This is printed at 10 characters/inch). Now, let's switch to:

12 Characters/inch Printing
and print two lines.

Now we have switched back. Now we can print using:

Enhanced Printing!

And switch back. This is done by inserting special IDS 440 control codes in your Text.

Finally, let's switch to 12 characters per inch and then use:

Enhanced Printing !

And switch back again.

COMPREHENSIVE EXAMPLE

This tests the T.O.U.G.H. text processor. The line above is 60 characters long. With T.O.U.G.H. you specify your own line lengths -- any lengths! Now, hit the Right Arrow.

By hitting the Right Arrow, we suppressed the right margin justification, stored the line of text, and spaced to the next line. By hitting the Return Key, we then caused the system to space to a new paragraph.

We did it again. Now we'll test the left to right and right-to-left space fill in:

Test the space fill-in for a typed line of T.O.U.G.H.
Test the space fill-in for a typed line of T.O.U.G.H.
Test the space fill-in for a typed line of T.O.U.G.H.

You can see the alternating left-to-right and right-to-left in action. Now we're in a new paragraph! Let's try the indenting option!

This line is Indented 10 spaces.
So is this one.
And this one.

The number of spaces to Indent is specified at the start of a typing session.

Now, we'll demonstrate the automatic line-overflow to a continuation on the next line. When you overflow the screen linelength, hyphenation takes place automatically. This

is triggered by the length of the line you specify at the start of a typing session.

Hyphenation is somewhat "arbitrary" since T.O.U.G.H. doesn't have a table of hyphenation rules. But it WILL keep the text neat and crisp whatever you do.

Using the In-Line Options, you can interrupt typing to Print Insert, Delete, Erase and Retype Lines. You can also move Paragraphs around in the text, and review what you have typed so far. Then the system will let you resume typing where you left off!

You can even intersperse "Enhanced Characters", as we just demonstrated above.

T.O.U.G.H. uses the ESC Key to type in individual capital letters. The system can also be "Shift-Locked" into typing ALL CAPITAL LETTERS.

When it comes to printing, the system lets you set up your own custom printing with the following options:

AUTO PAGE NUMBER ON OVERFLOW? Y OR N;
CENTER TEXT ON PAGE? Y OR N;
SINGLE OR DOUBLE SPACING? S OR D
PRINT LINE #'S? Y OR N;
SPECIFY PRINT DENSITY (CHAR/INCH)
1=8 2=10 3=12 4=16 (CH/INCH);
"ENHANCED" OR "NORMAL" MODE? E OR N;

When you have typed in the answer to the final question, the system will take over and do all of the printing.

This example demonstrates only a few of the T.O.U.G.H. features. You'll find it a useful and powerful tool.

Get T.O.U.G.H. with Text!

T.O.U.G.H. SYSTEM LISTING

APPLESOFT II, 32-48K Apple II DISK SYSTEM

```
1 ONERR GOTO 11000
2 PRINT " ": PRINT " "
3 REM *****
4 REM ** T.O.U.G.H. SYSTEM **
5 REM ** MICRO-SPARC, INC. **
6 REM ** P.O. BOX 325 **
7 REM ** LINCOLN, MASS 01773 **
8 REM ** COPYRIGHT (C) 1980 **
9 REM *****
10 REM RUNS ON 32-48K APPLE II OR APPLE II PLUS, APPLESOFT
    II (ROM), DISK II, PARALLEL OR SERIAL PRINTER
    (WITH PRTR CTRL CHANGES IN LINES 1215-1220, 1248-1250)
16 GOSUB 10000: GOTO 50
18 CALL - 396
19 IF SL < 40 THEN PZ = 12: GOTO 22
20 IF SL > 39 AND SL < 80 THEN PZ = 6: GOTO 22
21 PZ = 4
22 IF R2 < > I THEN PZ = 4
23 FOR ZZ = R1 TO R2 STEP PZ
24 FOR X = ZZ TO ZZ + PZ: PRINT X;" ";
25 FOR XX = 1 TO LEN (L$(X)):M$ = MID$ (L$(X),XX,1)
```

Listing continued on page 47

PROGRAMS FOR THE



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GRAPHICS

Apple II "PAPER TIGER" Graphics

by Mike Harvey

The new Integral Data Systems 440 Printer, the "Paper Tiger", is a powerful adjunct to the Apple II system. Printing upper and lower case characters is super, with 4 different type sizes and enhanced or normal type styles. The graphics feature, however, is outstanding!

This set of program, will take the page 1 graphics (bytes 8192 to 16384) and convert and print them on Paper Tigers equipped with the Graphic Printing option.

The routine from line 100 to 120 uses the subroutine from 75 to compute a table of HIGH ORDER BYTE ADDRESSES for the page 1 graphics. Lines 150-160, working with the subroutine at line 50-60, build a table of LOW ORDER BYTE ADDRESSES for the graphics page. (Darrell G. Smith's article 'Apple II High Resolution Graphics' in the September 1979 issue of KILBAUD explains the memory organization. These routines build the complete table which is shown on page 104 of the magazine).

The job of converting from the Apple to the "Paper Tiger" is not trivial. The Apple's memory is organized in a convoluted array of bits and bytes across the screen. These must be taken and rotated so they can be printed. For example, in the Apple format, a graphics block, 6 lines deep, would be addressed this way:

SCREEN IMAGE FORMAT

BYTE	BIT	7	6	5	4	3	2	1	0
8192		□	□	■	□	□	■	■	■
9216		□	□	□	□	□	□	□	□
10240		□	□	□	□	□	□	□	□
11264		□	□	□	□	□	□	□	□
12288		□	□	□	□	□	□	□	□
13312		□	□	□	□	□	□	□	□

The Apple High Resolution graphics would print bits 7 through 0, exactly as shown, on the SCREEN. This would be 8 bits across and 6 lines deep for an Apple II Plus. (It would use only 7 bits across, on older standard Apple II systems.)

The IDS 440, however, wants to take 6 bits in each horizontal byte and print them VERTICALLY! In other words, it wants to take the first byte and do this with it:

PRINTER IMAGE FORMAT

BYTE 8192	BIT	7	6	5	4	3	2	1	0
	BIT 0	■	□	□	□	□	□	□	□
	BIT 1	□	□	□	□	□	□	□	□
	BIT 2	■	□	□	□	□	□	□	□
	BIT 3	□	□	□	□	□	□	□	□
	BIT 4	□	□	□	□	□	□	□	□
	BIT 5	■	□	□	□	□	□	□	□

Correcting this, means taking groups of 6 Apple II bytes, and reformatting the bits as shown in Example Number 1. The routine from line 190 to 245 does this. It 'POKE's in a starting address of 17000 (hex \$4268 ... decimal equivalent 104 = low 66 = high) into a base working register. Then it successively gets groups of 6 "Apple bytes" and shifts their bits into 7 "IDS bytes" for printing. These IDS bytes are strung out in a working area from memory locations 17000 to 25920 (a LONG string).

After all the bytes are shifted, the system 'PEEK's at them in groups of 280 and then prints a line for each group. Remember that the standard Apple hires graphics is 280 positions wide. The IDS 440 is really taking 280 bytes and printing 6 bits from Byte one, VERTICALLY ... 6 bits from Byte two ... and so on. More accurately, the printer is printing 6 graphics lines in one sweep of the print head. The program keeps stepping through the work area until the entire page is printed.

A word is in order about line 1021. Since the IDS printer literally prints bits, all the characters (bit configurations) printed must have high order ASCII bits removed by using a CHR\$ equivalent. For example, the digit '8' has a hex code \$38 when PEEKed and CHR\$ (8) will deliver the desired hex \$8 to print. But hex \$8 going to the screen triggers a CTL H (left arrow) action. Other characters will trigger codes between hex \$0 and hex \$3F. When you do this, quite innocent letters and digits all of a sudden become CONTROL CODES! Line 1021 skips over CHR\$ 3 because it is the key control code which controls the printer. It skips over CHR\$ 9 (CTL I) because I have used the command PRINT "CTL I 120 N" in line 1007 to suppress screen printing and with it, all of the other obnoxious control codes while the picture is being printed. If you're adventurous, just put a straight PRINT CHR\$ (X); in line 1021 (and delete line 1022 and line 1007). All sorts of strange things will happen to the screen (and the printer)!

continued on next page

EXAMPLE NO. 1

APPLE BYTES

DEC.	HEX	SEQ	7	6	5	4	3	2	1	0
8192	\$2000	0	X							●
9216	\$2400	1	X							
10240	\$2800	2	X							●
11264	\$2C00	3	X							
12288	\$3000	4	X							
13312	\$3400	5	X	●	●	●	●	●	●	●

"X" NOT USED

IDS PRINTER BYTES

							
BIT	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0	7 6 5 4 3 2 1 0
BYTE	17000	17001	17002	17003	17004	17005	17006

PRINTS AS

BYTE 17000

BIT	0	1	2	3	4	5	6	7
	□	□	□	□	□	□	□	□

BIT	0	1	2	3	4	5	6	7
	□	□	□	□	□	□	□	□

BIT	0	1	2	3	4	5	6	7
	□	□	□	□	□	□	□	□

BIT	0	1	2	3	4	5	6	7
	□	□	□	□	□	□	□	□

BIT	0	1	2	3	4	5	6	7
	□	□	□	□	□	□	□	□

BIT	0	1	2	3	4	5	6	7
	□	□	□	□	□	□	□	□

BIT	0	1	2	3	4	5	6	7
	□	□	□	□	□	□	□	□

BIT	0	1	2	3	4	5	6	7
	□	□	□	□	□	□	□	□

BIT	0	1	2	3	4	5	6	7
	□	□	□	□	□	□	□	□

BIT	0	1	2	3	4	5	6	7
	□	□	□	□	□	□	□	□

SCREEN IMAGE

PRINTER IMAGE

BYTES 17000-17006

BIT	0	1	2	3	4	5	6	7
	□	□	□	□	□	□	□	□
	□	□	□	□	□	□	□	□
	□	□	□	□	□	□	□	□
	□	□	□	□	□	□	□	□
	□	□	□	□	□	□	□	□
	□	□	□	□	□	□	□	□
	□	□	□	□	□	□	□	□

"X" NOT USED

Schematic for shifting HI - Res Page 1
Screen Bit Format To Printer
Format For The IDS 440.

One final word. Line 13 gives the user the option of printing an "Inverse" or "Negative" image of the graphics screen. This is done by running an EOR mask against the graphics screen to convert all 1 bits to 0 and vice versa.

The new "Paper Tiger" is compact, lightweight, and has a number of improvements over the IDS 125 and 225 printers. Higher reliability, Stepper Motor resolution, On-Board Diagnostics, are but a few. Furthermore, the paper path will accommodate 9½ inch wide paper — 8½ inch wide with perforated tractor feed holes. It's perfect for text processing with 8½ x 11 sheets.

The Apple II and the "Paper Tiger" are quite a team!

NOTE: The Apple/Paper Tiger Graphics Programs, Apple Simon and the T.O.U.G.H. Text Processor are available on diskette for \$14.95 plus \$1.50 for shipping and handling from: MICRO-SPARC, Inc., P.O. Box 325, Lincoln, Mass. 01373

Instruction For Using Hi-Res Screen Dump

1. Type in Basic program and save on disk under 'GR PRINT'

2. Type the hex Codes (beginning with AD00) directly into memory (beginning at \$6D0.)

BSAVE GR MACH LANG, A\$6D60,L\$100
Or, to save on Tape, use: *6D60.6E60W

3. To USE the programs:

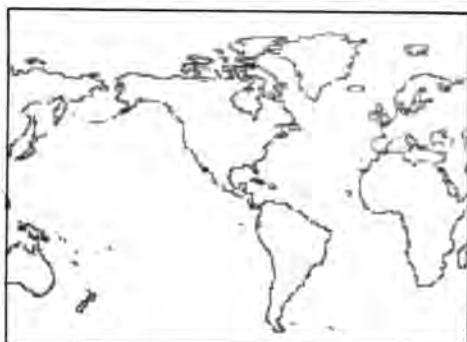
A. Load or create a picture in Hires graphics Page 1.

B. Type in BLOAD GR MACH LANG.
Or, with Tape, Type in *6D60.6E60R

C. Type in LOMEM: 29000

D. Type in LOAD GR PRINT

E. Type in RUN and you're off to the pictures!



APPLE II "PAPER TIGER" Graphics Listing

APPLESOFT II, 32K Apple II
IDS 440 PRINTER WITH GRAPHICS OPTION

```

0 PRINT " "; PRINT " "
1 REM *****
2 REM ** APPLE/IDS 440 HIRES **
3 REM ** GRAPHICS PRINT **
4 REM ** COPYRIGHT (C) 1980 BY **
5 REM ** MICRO-SPARC INC. **
6 REM ** P.O. BOX 325 **
7 REM ** LINCOLN, MA 01773 **
8 REM *****
9 REM ** REQUIRES 32K APPLE, APPLESOFT ROM, IDS 440
    WITH GRAPHICS OPTION **
10 DIM H(200),L(200)
11 CALL - 936: PRINT "APPLE II/IDS 440 HIRES SCREEN
    DUMP": PRINT : PRINT "BE SURE YOU HAVE A GRAPHICS
    PICTURE IN": PRINT "PAGE 1 OF THE HIRES AREA (81
    92-16384)
12 PRINT "IF NOT, START OVER AND PUT ONE THERE.": PRINT
    : PRINT "BLOAD 'GR MACH LANG'": PRINT "THEN SET L
    OMEM TO 29000": PRINT "THEN LOAD 'GR PRINT'"
13 PRINT : INVERSE : INPUT "INVERT BLACK/WHITE IMAGE?
    Y OR N":A$
14 IF A$ = "Y" THEN FLASH : PRINT "INVERTING": NORMAL
    : CALL 28116
15 CALL - 936: PRINT "SETTING UP TO PRINT":
16 GOTO 100
50 FOR R = 1 TO 8
52 IF FL = 0 THEN FL = 1:X = A: GOTO 56
54 IF FL = 1 THEN FL = 0:X = B
56 FOR S = 1 TO 8
58 N = N + 1:L(N) = X
60 NEXT S: NEXT R: RETURN
75 FOR R = 1 TO 2
77 FOR X = Y TO Z STEP 4
79 N = N + 1:H(N) = X
81 NEXT X: NEXT R: RETURN
100 N = 0: FOR M = 1 TO 3
105 FOR Y = 32 TO 35
110 Z = Y + 28: GOSUB 75
115 NEXT Y
120 NEXT M
150 N = 0:A = 0:B = 128: GOSUB 50
155 A = 40:B = 168: GOSUB 50
160 A = 80:B = 208: GOSUB 50
180 C$ = CHR$(3):K$ = CHR$(11):B$ = CHR$(2):PR$ = CHR$(30)
190 POKE 250,104: POKE 251,66
200 FOR X = 1 TO 192 STEP 6
205 POKE 6,L(X): POKE 7,H(X)
210 POKE 8,L(X + 1): POKE 9,H(X + 1)
215 POKE 23,L(X + 2): POKE 24,H(X + 2)
220 POKE 25,L(X + 3): POKE 26,H(X + 3)
230 POKE 27,L(X + 4): POKE 28,H(X + 4)
235 POKE 29,L(X + 5): POKE 30,H(X + 5)
240 CALL 28000
245 NEXT X

```

```

400 POKE 54,0: POKE 55,193
1007 PRINT "": REM CTRL I 120N
1008 PRINT B$: CHR$ (30): PRINT C$: CHR$ (30):C$:K$
1010 FOR N = 17000 TO 25920 STEP 280
1015 FOR I = 0 TO 279
1020 X = PEEK (N + I)
1021 IF X < > 3 AND X < > 9 THEN PRINT CHR$ (X):;
      GOTO 1025
1022 PRINT CHR$ (1);
1025 NEXT I: PRINT C$:K$
1030 NEXT N
1035 PRINT C$:B$
1037 PRINT "": REM CTRL I 40N
1040 POKE 54,240: POKE 55,253
1050 PRINT "END": END

```



APPLE/IDS 440 HI-RES
GRAPHIC PRINTING
ASSEMBLY LANGUAGE
COPYRIGHT © 1980 BY
MICRO-SPARC, INC.
P.O. BOX 325
LINCOLN, MA. 01773

```

1100 .OR $6D60
6D60- A0 00 1105 STRT LDY #$0
6D62- B1 1D 1110 READ LDA ($1D),Y
6D64- 20 89 6D 1115 JSR LOOP
6D67- B1 1B 1120 LDA ($1B),Y
6D69- 20 89 6D 1125 JSR LOOP
6D6C- B1 19 1130 LDA ($19),Y
6D6E- 20 89 6D 1135 JSR LOOP
6D71- B1 17 1140 LDA ($17),Y
6D73- 20 89 6D 1145 JSR LOOP
6D76- B1 08 1150 LDA ($8),Y
6D78- 20 89 6D 1155 JSR LOOP
6D7B- B1 06 1160 LDA ($6),Y
6D7D- 20 89 6D 1165 JSR LOOP
6D80- 20 A6 6D 1170 JSR MEM
6D83- C8 1175 INY
6D84- C0 28 1180 CPY #$28
6D86- D0 DA 1185 BNE READ
6D88- 60 1190 RTS
6D89- 4A 1300 LOOP LSR
6D8A- 2E 56 6D 1315 ROL $6D56
6D8D- 4A 1320 LSR
6D8E- 2E 55 6D 1325 ROL $6D55
6D91- 4A 1330 LSR
6D92- 2E 54 6D 1335 ROL $6D54
6D95- 4A 1340 LSR
6D96- 2E 53 6D 1345 ROL $6D53
6D99- 4A 1350 LSR
6D9A- 2E 52 6D 1355 ROL $6D52
6D9D- 4A 1360 LSR
6D9E- 2E 51 6D 1365 ROL $6D51
6DA1- 4A 1370 LSR
6DA2- 2E 50 6D 1375 ROL $6D50
6DA5- 60 1380 RTS

```

```

6DA6- 8C 40 6D 1500 MEM STY $6D40
6DA9- A0 06 1505 LDY #$6
6DAB- A2 00 1507 LDX #$0
6DAD- BD 50 6D 1510 NXT LDA $6D50,X
6DB0- 91 FA 1515 STA ($FA),Y
6DB2- 88 1520 DEY
6DB3- E8 1522 INX
6DB4- 10 F7 1525 BPL NXT
6DB6- A5 FA 1530 LDA $FA
6DB8- 18 1535 CLC
6DB9- 69 07 1540 ADC #$07
6DBB- 85 FA 1545 STA $FA
6DBD- C9 07 1550 CMP #$07
6DBF- 90 03 1552 BCC ADHI
6DC1- 4C C6 6D 1555 JMP RSET
6DC4- E6 FB 1560 ADHI INC $FB
6DC6- A9 00 1565 RSET LDA #$0
6DC8- A2 07 1570 LDX #$7
6DCA- 9D 50 6D 1575 AGN STA $6D50,X
6DCD- CA 1580 DEX
6DCE- 10 FA 1585 BPL AGN
6DD0- AC 40 6D 1590 LDY $6D40
6DD3- 60 1595 RTS
6DD4- A9 00 1700 INVR LDA #$0
6DD6- 85 FA 1705 STA $FA
6DD8- A9 40 1710 LDA #$40
6DDA- 85 FB 1715 STA $FB
6DDC- A9 FF 1720 LDA $FF
6DDE- 85 09 1725 STA $9
6DE0- A2 20 1730 LDX #$20
6DE2- A0 00 1735 LDY #$0
6DE4- B1 FA 1740 NEXT LDA ($FA),Y
6DE6- 45 09 1745 EOR $9
6DE8- 91 FA 1750 STA ($FA),Y
6DEA- 88 1755 DEY
6DEB- D0 F7 1760 BNE NEXT
6DED- C6 FB 1765 NBLK DEC $FB
6DEF- CA 1770 DEX
6DF0- 10 F2 1775 BPL NEXT
6DF2- 60 1780 RTS

```

SERIOUS READING



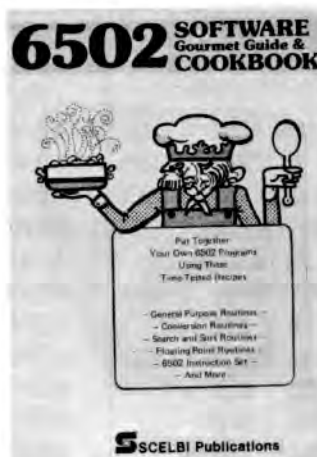
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SYSTEMS TIPS AND TECHNIQUES

Machine Language Screen Dump

by R.M. Mottola
Cyborg Corp.
342 Western Ave.
Boston, Mass. 02135

How often have you wanted to print something on the printer after you have seen it on the screen? In most cases, that requires you to look at all of your data, program, etc. once on the screen, and then go back, turn on the printer, and go through it again. There is a much more elegant method, using a screen dump routine. When called, it will print just what is on the screen, nothing more.

The following machine language program is an enhanced screen dump routine for the Apple II computer using the Apple Parallel Printer Interface Card in slot #1. Unlike similar routines written in Basic, this machine language routine can keep up with the fastest printers. It also contains some useful enhancements. They are:

1. Outputs in true ASCII, even if screen characters are inverse or flashing.
2. The routine is defeatable. Each time it is called, it checks a memory location to see if the ENABLE flag is set. If not, it just returns.
3. The printing window is adjustable. Just as you can define the scrolling window on the Apple II screen, you can define a section of the screen that you want printed.
4. Optional graphics character-plot mode. This printer driver has the provision to print the LORES graphics screen and four lines of text on the bottom. In this mode, any black area of the screen will be blank on the printer and any colored area will be represented with the character "X". This mode is ideal for printing bar graphs, etc.

HOW TO USE IT

This screen dump routine lives on the unused part of page three of memory starting at location \$300. However, it is both directly movable and completely relocatable. To use it, (assuming you have saved the object code on disk as a binary file) BLOAD the routine at address \$300. Before calling the routine, you must first set the print parameters. Please note that these parameters need only be set once; they will remain intact until you change them or power is turned off.

The parameters are:

PRFLG (\$6) — This is the enable flag or printer flag. Setting it to a zero (0) will disable the operation of the screen dump routine. Setting it to a one (1) will allow normal operation of the routine. From Basic, you can set the flag with a Poke statement, such as: POKE 6, 1.

WINTOP (\$7) — This location must contain the vertical line that you wish to be the first line printed. For normal, full screen operation, set this location to the top line of the screen, which is zero (0). Remember that, just like the scrolling window, the vertical lines range from 0-23, not 1-24.

WINBOT (\$8) — The value in this memory location will tell the screen dump routine what vertical line to print last. Like the previous parameter, this location must contain a value in the range of 0-23. Also, make sure that the value in this location is greater than that in the Window Top location. Otherwise, strange things will happen. For normal, full screen operation, this location should be set to twenty three (23). Again, a POKE 8, 23 from Basic will work just fine.

PRFN (\$9) — This byte contains the printer function flag. If a zero (0) is found in this location, the screen dump routine will expect to see LORES graphics on the screen, and it will output an "X" on the printer anywhere a color is plotted on the screen. It will also print the bottom four lines of text usually present in the normal LORES mode. If a one (1) is put in this location, the screen printer routine expects to see all text on the screen and will output it in true, high-order-bit-clear, ASCII.

Once the printer parameters are set, a CALL 768 from Basic or a JSR \$300 from assembly language will dump the screen onto the printer. Since all of the defined printer parameters are located in zero page memory locations not normally used by Basic, and since the routine itself is also located in an unreserved block of memory, the routine will only have to be loaded and "set-up" once. Once in memory, it will not be affected by the subsequent loading and running of Basic programs.

MODIFYING THE CODE

There are two modifications that you may want to make to the code to custom configure it to your system. The first is changing the slot number that the printer card is in. The routine was written to drive a printer with Parallel Printer Interface Card in slot #1. If you want to modify it for another slot, just change the reference in line #32 (PROUT) from \$C102 to \$CX02 where X = the desired slot number. Thus, if we want to locate our card in slot #3, line #32 should read:

PROUT EQU \$C302

The second common modification involves Line Feeds on Carriage Returns. The Parallel Printer Interface Card will normally issue a Line Feed every time it gets a Carriage Return. However, some printers will also do this, creating double spaced output. If this is a problem, change the Immediate value in line #53 to a zero (0). The new line #53 should read:

LDA #\$0

Of course, many other modifications and options could be made, but these two should be all you need to get your screen dump routine up and running. Load it in, fire it up, and add elegant printer output to your programs.

Listing on page 40

FREE? Disk Sectors

by Chuck Hartley
Sensible Software
P.O. Box 2395
Dearborn, Michigan 48123

Have you ever run a program which asks endless questions, only to have the program die with a "DISK FULL" error as the program attempted to save your data to disk? This problem can be avoided by calling the FREE utility from the basic program to determine if there are enough sectors left on the disk to store the data. If there isn't adequate space, the user can be advised to insert a new disk (without crashing the program).

FREE? IS A 65 (\$41) BYTE PROGRAM that loads into memory addresses \$380-\$3C1. A CALL 919 from Basic will cause FREE? to interrogate the disk and store the number of free sectors in memory locations 917 and 918 (decimal). This number can be transferred to a variable in your basic program with the statement: "FREESECT = PEEK(917) + 256*PEEK(918)".

FREE? as shown is configured for a 48k RAM system with MAXFILES set equal to 3. The HIMEM pointer should be reduced by 256 bytes before using FREE? as FREE? uses this portion of memory to interrogate the disk. This can be accomplished by a HIMEM:-27390 command.

FREE? when called, reads the disk Volume Table Of Contents (VTOC) from track 17, sector 0, and counts the number of "free" sectors remaining on the disk.

Listing on page 38



continued on next page

APPLESOFT REM REMOVER OR "Now You See It, Now You Don't"

By: Alan D. Floeter
Software Experience
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Milwaukee, Wis. 53216

A well-documented program is a very rare and wonderful sight for the code-weary programmer. And a major part of good documentation is inserting comments into the program. In BASIC, this is done using the REM command.

Unfortunately, using REM's increase the size of the BASIC program, and decreases the speed of execution to some degree. In fact, for every letter in a REM statement, the program is one byte longer, plus a few more bytes for the overhead of the line number and REM token itself.

Keeping two versions of your programs — one with comments for development use and one without comments for the production version — is a useful idea, but either you type two versions of the program into your computer, or you end up attempting to remove unwanted REM's in your documented program. Not to mention the problem of keeping two programs up to date with any modifications.

Removing REM's is tedious at best, and can cause errors to creep into the program when retyping or recopying lines is done. It is for these reasons that I decided to write an Applesoft REM Remover Routine.

A brief explanation of the method Applesoft uses to store BASIC statements into memory is necessary to understand how a REM remover would work. When you enter a line in Applesoft BASIC, the APPLE II does not just store the actual letters for each command in memory. Instead it represents legal commands with a code, or token. This method saves memory space and decreases execution time. In addition to the tokenized command, the line number of the present line and the location of the next sequential line are also stored for each line. The line ends with a binary zero (0).

A REM has the token of a hex B2. Other Applesoft tokens for commands are listed in the Applesoft BASIC Programming Reference Manual on page 121. The ASCII characters comprising the comment immediately follow the token. An example of a typical REM line in memory is shown below.

```
ADDR L ADDR H LINE # L LINE # H B2
20 43 4F 4D 4D 45 4E 54 00.
```

ADDR L	represent the low order of the address of the next sequential statement in memory.
ADDR H	represents the high order of the address of the next sequential statement in memory.
LINE # L	represents the low order of the binary line number.
LINE # H	represents the high order of the binary line number.
B2	REM token
20-54	ASCII representation of comment (in this example "COMMENT").
00	represents end of the line.

If you listed the line, it might look like

```
192 REM COMMENT
```

A REM statement on the same line as another command, for instance

```
192 X = 0:REM COMMENT
```

would be stored as follows:

```
ADDR L ADDR H LINE # L LINE # H 58
D0 30 3A B2 20 43 4F 4D 4D 45 4E 54 00.
```

(58-30)	represents the ASCII "X=0"
3A	represents the ASCII ":"

To find a REM statement in memory, a program would look for a hex B2, starting immediately after the line number, or after a colon. Once a REM has been found, it can be disposed of quite easily. To get rid of a REM on a line with another command, all that would be necessary is to substitute a binary zero (0) — meaning end of line for Applesoft — in place of

the colon before the REM token and then pack the rest of the program down after that point. If a REM is on a line all by itself, the whole line can be deleted and the rest of the program packed down in place of that line. One important thing to remember though, is when moving the lines in Applesoft the next line pointers in front of each line are absolute. When a line is moved in memory, the pointer to that line must also reflect that movement.

The program I wrote to remove REM's from an Applesoft program gets rid of any REM's on a line, and if the REM is the only command on a line, the whole line is deleted. Realizing that many programmers like to GOTO or GOSUB to REM lines, I designed the program with this in mind. **By simply changing the first instruction, LDX #0, to LDX #1, lines with only REM's on them will be shortened to have no characters following the REM, thus leaving the line number intact.**

The program is relocatable, meaning that it can be stored and executed at any memory location. I have selected starting address location of hex 6000, (decimal 24576) since this leaves lots of room for any Applesoft program. The program works for any size system (with the program relocated into lower memory), with or without disk, cassette Applesoft or ROM card Applesoft.

To load the REM remover, type the opcodes into your APPLE. If you are jumping to REM statements and you want the program only to shorten those REM's, change the second opcode (at hex location 6001) to a 1.

To record on disk, enter

```
BSAVE program name,A$6000,L$100
```

To save on cassette, enter

```
*6000.60FFW
```

To execute this program, load in your Applesoft program first. For a disk, enter

```
BRUN program name
```

For cassette, from monitor enter

```
*6000.60FFR
```

Then from Applesoft,

```
CALL 24576
```

(using the correct memory location if you have changed it.)

Your program is now REM-less.

In terms of memory savings, on a medium sized program, I found removing all REM's saved about 1200 bytes of memory (more than 1K). Quite a savings, especially if your system is memory bound.

By modifying the program slightly, the program could be used to search Applesoft program memory for a certain other token and delete all lines with that token. I have used the REM remover to get rid of lines with ONERR statements. Anyone who works with Applesoft knows that the ONERR command is a handy little creature that causes nothing but trouble during debugging. I simply changed the token the REM remover looks for from a hex B2 to a hex A5 (token for ONERR), and PRESTO! No more ONERR's! The location to change is hex 601F (when the origin is 6000 hex).

Now with the REM remover, you can document your program and still have memory left over for execution.

Listing on page 35



SUPER-TEXT™

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You can be a Whiz with a Top Score!

Apple SIMON is a colorful, musical game of concentration. It's simple enough for your kids to play and yet a challenge — to become a SIMON "Whiz".

Apple SIMON is played in 5 rounds, that is you have 5 chances to GOOF UP and still continue playing while your score builds up. Like the popular SIMON game, your Apple will flash a random sequence of colorful Pie-Shapes. Your challenge is to accurately repeat the sequence by typing the corresponding numbers of the sequence on the keyboard. There are 3 versions of the game which can be selected: SLOW, FAST, and VERY FAST!

The Apple will start with 1 number, let's say, the number "4", flashing the number 4 Pie Slice on the screen and sounding the special number 4 tone. You type in "4" when it's YOUR TURN. The program then flashes two numbers and you repeat them. On subsequent turns, it produces three numbers, then four, five, six and so on.

After each Goof Up, it lets you know where you stand in your rapidly building score. At the end of 5 rounds, the game is over and the system unmercifully evaluates your score.

It carries the Previous High Score forward from game to game as a target to shoot at. In between the Apple's turn and your turn, the screen surrounding the Pie Shapes gradually fills with a rainbow of random colors!

It's deceptively simple — but try to get a score over 35 to be a Whiz!

HOW APPLE SIMON WORKS

Apple SIMON is in Integer Basic and runs on a 16K Apple system. The four shapes are stored in their own shape tables and are activated by an Apple Low Resolution Shape-Writer. (Note: The Apple Lo-Res Shape-Writer was described in detail in the March issue of NIBBLE. It is reprinted as part of Apple SIMON in case you haven't yet gotten the March Issue).

On each turn, the program steps through the current number of flashes (counted in the "Z Variable") assigning random numbers between 1 and 4 to the variable A(N), and flashing the pie shapes. This is done in the routine 1505-1535. Then it's your turn and your entries are made in lines 1610-1650. When one of your entries doesn't match its corresponding A(N), it's a "Goof Up" and you start over.

Apple is the registered trademark of Apple Computer Co.

APPLE SIMON

by Mike Harvey

To load the programs, first type in the Machine Language for the Shape-Writer into memory \$800-871. Then type in the Shape Tables (there are four of them). Having done this, save them as a BLOCK by typing in B SAVE SIMONSHAPES, A\$800, L\$200 for Disk systems, or * 800.9F8W for Tape systems. BLOAD SIMONSHAPES or * 800.9F8R will bring them back for later use.

Now type in the Basic program which drives the overall game and then save it on tape or disk.

IMPORTANT: Since the Assembly Language resides in memory Hex 800-9F8, you need to type in LOMEM:4096 before reloading the Basic and Assembly Language. Also, be sure your system has already been switched to Integer Basic BEFORE typing in the LOMEM statement. Applesoft doesn't recognize LOMEM the way Integer does. See the ERRATA section of this issue.

You may want to consider "playing around" with Apple SIMON and customizing it.

Be a Whiz! Just do what Apple Simon Says!

CUSTOMIZING APPLE SIMON

Make it Your Very Own!

Apple SIMON is a game of concentration played at the keyboard of your Apple II. Here are some suggestions for changing and customizing it for special, novel use.

RUN SIMON FROM YOUR JOYSTICK!

Instead of sitting at the Keyboard, you can run it from the game controls by using a combination of the Paddle Controls and Switches to "key in" your answers to the SIMON number sequence. This is particularly convenient if you have wired Joysticks into your system.

Let's say you have Paddle 1 and Paddle 2 and Switches 0 and 1 wired in the same Joystick. You could write a little routine which uses a Paddle value LESS THAN 75 or GREATER THAN 175 to get the 1-4 different values needed for Apple SIMON. Then, with the Joystick positioned where you want it, you could hit Switch 0 to have the system accept your entry.

This could be done with the following kind of Loop.

```
1610 P1 = PDL(1) * 250/250: REM DELAY
1611 P2 = PDL(2) * 250/250: REM DELAY
1612 IF PEEK (-16287) <= 127 THEN
1613   1610
1613 IF P1 < 75 THEN B(N) = 177
1614 IF P1 > 175 THEN B(N) = 178
1615 IF P2 < 75 THEN B(N) = 179
1616 IF P2 > 175 THEN B(N) = 180
```

And so on. The system will keep reading the paddles until you press the Switch. Then it will accept whatever value you have put into the paddles, test it, and assign a number which can be decoded by the lines 1620-1640 of the program.

Be careful though, this code makes it possible to sense that TWO NUMBERS have been typed in at the same time. Try to figure out how to isolate 1 number per entry. It can be done!

PUT "RETURN" UNDER SWITCH CONTROL!

Using the same techniques described above, you can use Switch #1 to go from Round to Round of the game.

PLAY MUSIC AS PART OF SCORING!

You have a little Tone Routine the program. It is POKE'd into memory in lines 12 and 15 of the program. The pitch is changed by POKING the Pitch into location 10, the Duration onto location 11, and CALLING the tone routine with a CALL 12 statement. You can experiment with this to produce music to accompany a big win!

CHANGE THE SCORING!

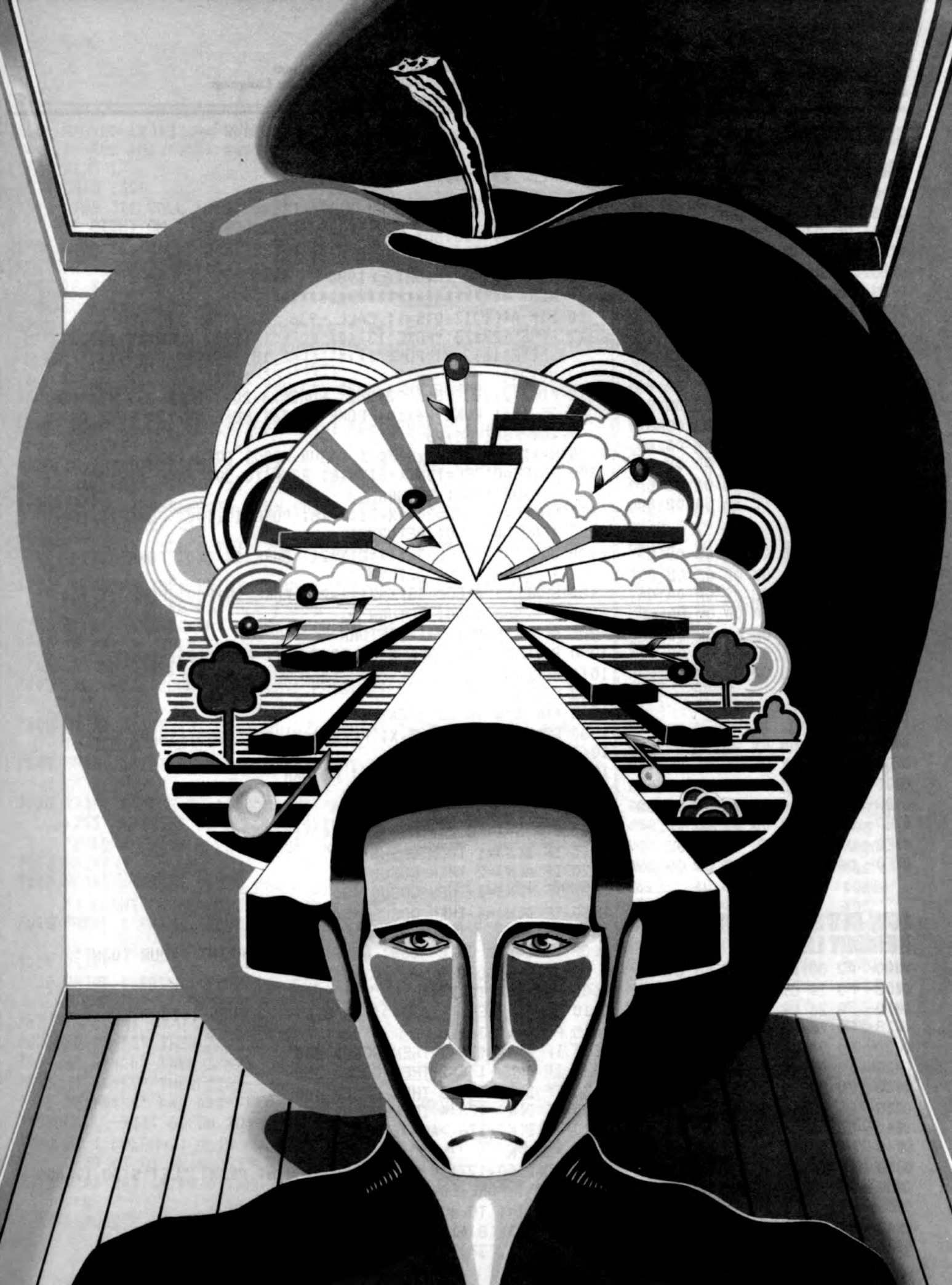
You can do this by changing the values in line 1710-1730. The Final Score is contained in the variable FS, and by increasing or decreasing it, you can make SIMON easier or harder to win!

In short, there are a lot of little experiments you can do in fooling around with SIMON. You can also create different shapes using the Low Resolution Shape-Writer from the March issue.

CUSTOMIZE!

Don't-let-a-thing-evade-your-eyes!

Note: Apple Simon, the T.O.U.G.H., Text Processor and the Graphics Printing Programs are available on Diskette for \$14.95 plus 1.50 for shipping and handling from: Micro-SPARC, Inc., P.O. Box 325, Lincoln, Mass. 01773.



APPLE-SIMON LISTING

(See your Apple Reference Manual
for instructions on typing Machine Language
directly into memory)

APPLE SIMON SHAPES

Pie Slice 1

```
0900- 0C 0A 0A 03 0A 0A 0A 03
0908- 0A 03 0A 03 0A 03 0A 0C
0910- 0C 03 0A 0C 0C 0B 0B 0B
0918- 0B 0B 0B 0B 0B 0B 0B 0D
0920- 0D 0D 0D 0D 0D 0D 0D 0D
0928- 01 01 03 03 03 03 03 0A
0930- 0C 0C 0D 0A 0A 0A 0A 0D
0938- 00
```

Pie Slice 2

```
0940- 0C 0A 0A 0A 0A 0A 0A 0A
0948- 0A 0A 0A 0C 0C 02 0C 0C
0950- 0C 02 0C 02 0C 02 0C 02
0958- 0C 0B 0B 02 0C 0B 0B 0D
0960- 0D 0D 0D 0D 0D 0D 0D 0D
0968- 01 01 03 03 03 0A 0D 0D
0970- 0A 0A 0C 0C 0A 0A 0D 0D
```

Pie Slice 3

```
0980- 0C 0B 0B 03 0B 0B 0B 03
0988- 0B 03 0B 03 0B 03 0B 0C
0990- 0C 02 0C 0C 0C 0A 0A 0A
0998- 0A 0A 0A 0A 0A 0A 0A 0D
09A0- 0D 0D 0D 0D 0D 0D 0D 0D
09A8- 02 02 03 03 03 0C 0C 0C
09B0- 0B 0B 0D 02 0C 0B 0D 0D
09B8- 00
```

Pie Slice 4

```
09C0- 0C 0B 0B 0B 0B 0B 0B 0B
09C8- 0B 0B 0B 0C 0C 01 0C 0C
09D0- 0C 01 0C 01 0C 01 0C 01
09D8- 0C 0A 0A 03 0A 0A 0A 0D
09E0- 0D 0D 0D 0D 0D 0D 0D 0D
09E8- 02 03 03 0B 0B 0B 0C 0C
09F0- 0A 0A 0B 0B 0B 0B 00 00
```

LOW-RES SHAPEWRITER MEMORY LISTING

```
0800- A2 00 BD 30 09 E8 C9 01
0808- F0 24 C9 02 F0 25 C9 03
0810- F0 26 C9 04 F0 27 C9 0A
0818- F0 28 C9 0B F0 29 C9 0C
0820- F0 2A C9 0D F0 2B C9 00
0828- F0 03 4C 02 08 60 C6 96
0830- 90 90 00 E0 06 4C 56 08
0838- E6 05 4C 56 08 C6 05 4C
0840- 56 08 C6 06 4C 64 08 E6
0848- 06 4C 64 08 E6 05 4C 64
0850- 08 C6 05 4C 64 08 A9 00
0858- 85 30 A4 05 A5 06 20 00
0860- F8 4C 02 08 A5 08 85 30
0868- A4 05 A5 06 20 00 F8 4C
0870- 02 08
```

INTEGER BASIC 16K Apple

```
0 PRINT ""
1 REM *****
2 REM ** APPLE-SIMON **
3 REM ** MICRO-SPARC, INC. **
4 REM ** P.O.BOX 325 **
5 REM ** LINCOLN, MASS 01773 **
6 REM ** COPYRIGHT © 1980 **
7 REM *****
10 DIM A$(1):Z=0:R=1: CALL -936
12 POKE 12,173: POKE 13,48: POKE 14,192: POKE 15,136:
   POKE 16,208: POKE 17,4: POKE 18,198: POKE 19,11: POKE
   20,240
15 POKE 21,8: POKE 22,202: POKE 23,208: POKE 24,246: POKE
   25,166: POKE 26,10: POKE 27,76: POKE 28,12: POKE 29
   ,0: POKE 30,96
20 N=1: DIM A(30),B(30): GOSUB 7000: GOTO 1500
300 SHAPE=0:COL=136:X=8:Y=18: POKE 10,50: POKE 11,100:
   GOSUB 1000: RETURN
350 SHAPE=64:COL=204:X=21:Y=18: POKE 10,100: POKE 11,100
   : GOSUB 1000: RETURN
400 SHAPE=128:COL=255:X=8:Y=21: POKE 10,150: POKE 11,100
   : GOSUB 1000: RETURN
450 SHAPE=192:COL=68:X=21:Y=21: POKE 10,200: POKE 11,100
   : GOSUB 1000: RETURN
500 A(N)= RND (4)+1: RETURN
1000 POKE 8,COL: POKE 5,X: POKE 6,Y: POKE 2051,SHAPE
1010 CALL 2048
1012 CALL 12
1015 FOR I=1 TO ZZ: NEXT I
1030 POKE 8,0: POKE 5,X: POKE 6,Y: POKE 2051,SHAPE
1040 CALL 2048
1045 FOR I=1 TO ZZ: NEXT I: RETURN
1499 Z=0
1500 Z=Z+1
1505 FOR N=1 TO Z:A(N)= RND (4)+1
1515 IF A(N)=1 THEN GOSUB 300
1520 IF A(N)=2 THEN GOSUB 350
1525 IF A(N)=3 THEN GOSUB 400
1530 IF A(N)=4 THEN GOSUB 450
1535 NEXT N
1600 VTAB 21: CALL -868: POKE 50,127: PRINT "YOUR TURN!"
   : POKE 50,255
1605 FOR N=1 TO Z
1610 B(N)= PEEK (-16384): IF B(N)<128 THEN 1610
1615 POKE -16388,0
1620 IF B(N)-176=1 THEN GOSUB 300
1625 IF B(N)-176=2 THEN GOSUB 350
1630 IF B(N)-176=3 THEN GOSUB 400
1635 IF B(N)-176=4 THEN GOSUB 450
1640 IF B(N)-176>A(N) THEN 1700
1650 NEXT N
1655 POKE 50,127: VTAB 21: CALL -868: PRINT "LET'S DO IT AGA
   IN!": POKE 50,255
1657 FOR I=1 TO 40: COLOR= RND (17)
1658 A= RND (8)+1:B= RND (37)+1: PLOT A,B
1659 A= RND (37)+1:B= RND (7)+1: PLOT A,B
```

```

1660 A= RND (6)+33:B= RND (38)+1: PLOT A,B
1661 A= RND (38)+1:B= RND (7)+32: PLOT A,B
1663 NEXT I
1665 GOTO 1500
1700 VTAB 21: CALL -868: PRINT "GOOF UP!! YOU GOT ";Z-1
      ;" RIGHT ON THIS ROUND!";FS=FS+Z-1
1701 VTAB 22: CALL -868: PRINT "YOUR SCORE IS ";FS;" FOR "
      ;R;" ROUND(S)!";R=R+1
1703 IF R<6 THEN 1705
1704 GOTO 1710
1705 INPUT "HIT RETURN TO CONTINUE.",X$: CALL -936: VTAB
      23: IF PS>0 THEN PRINT "PREVIOUS HIGH SCORE =" ;PS;
      : VTAB 20: PRINT : GOTO 1499
1710 IF FS<=14 THEN PRINT "YUCKY SCORE! NEED MORE PRACTICE!"
      :
1715 IF FS>14 AND FS<19 THEN PRINT "FAIR SCORE BUT COULD BE
      BETTER!"
1720 IF FS>18 AND FS<25 THEN PRINT "VERY GOOD SCORE. TRY FOR
      THE TOP!"
1725 IF FS>24 AND FS<35 THEN PRINT "EXCELLENT! TRY FOR A WHI
      Z FIRST CLASS!"
1730 IF FS>34 THEN PRINT "YOU'RE A WHIZ - FIRST CLASS!!!!!!!"
      :
1732 IF FS>PS THEN PRINT "YOU'VE BEATEN THE PREVIOUS SCORE O
      F ";PS: IF FS>PS THEN PS=FS
1735 INPUT "TRY AGAIN? ENTER Y OR N: ",A$
1740 IF A$="N" THEN END
1760 GR :FS=0:R=1
7000 CALL -936: FOR I=0 TO 39: PRINT "*" ; NEXT I: PRINT

7005 PRINT : TAB 13: POKE 50,127: PRINT "APPLE-SIMON": POKE
      50,255
7010 PRINT : TAB 5: PRINT "COPYRIGHT 1980 BY MICRO-SPARC, IN
      C"
7015 PRINT : POKE 50,127: PRINT "APPLE-SIMON"; POKE 50
      ,255: PRINT " IS MODELED AFTER THE GAME": PRINT : PRINT
      "SIMON! I WILL FLASH NUMBERS AND SOUNDS."
7016 PRINT
7017 PRINT : PRINT "THEN YOU NEED TO TRY TO TYPE IN THE SAME
      ": PRINT "NUMBERS IN THE SAME ORDER..."
7018 PRINT : PRINT "SOUNDS SIMPLE? WELL... M A Y B E!"

7019 PRINT
7020 PRINT : PRINT "TYPE 'S' FOR SLOW, 'F' FOR FAST, OR"
      : PRINT "'V' FOR THE VERY FAST GAME";
7022 INPUT A$
7025 IF A$="S" THEN ZZ=300
7030 IF A$="F" THEN ZZ=75
7031 IF A$="V" THEN ZZ=1
7035 IF A$="S" AND A$="F" AND A$="V" THEN 7020
7037 CALL -936: GOSUB 7040: GOTO 1499
7040 GR : COLOR=7: HLINE 0,39 AT 0: HLINE 0,39 AT 39: VLINE
      0,39 AT 0: VLINE 0,39 AT 39
7045 VTAB 24: IF PS>0 THEN PRINT "PREVIOUS HIGH SCORE ="
      :PS
7050 RETURN

```

LOW-RES SHAPEWRITER ASSEMBLY LANGUAGE

```

0800- A2 00 LDX #$00
0802- B0 30 09 LDA $0930,X
0805- E8 INX
0806- C9 01 CMP #$01
0808- F0 24 BEQ $082E
080A- C9 02 CMP #$02
080C- F0 25 BEQ $0833
080E- C9 03 CMP #$03
0810- F0 26 BEQ $0838
0812- C9 04 CMP #$04
0814- F0 27 BEQ $083D
0816- C9 0A CMP #$0A
0818- F0 28 BEQ $0842
081A- C9 0B CMP #$0B
081C- F0 29 BEQ $0847
081E- C9 0C CMP #$0C
0820- F0 2A BEQ $084C
0822- C9 0D CMP #$0D
0824- F0 2B BEQ $0851
0826- C9 00 CMP #$00
0828- F0 03 BEQ $082D
082A- 4C 02 08 JMP $0802
082D- 60 RTS
082E- C6 96 DEC $96
0830- 90 90 BCC $07C2
0832- 00 BRK
0833- E0 06 CPX #$06
0835- 4C 56 08 JMP $0856
0838- E6 05 INC $05
083A- 4C 56 08 JMP $0856
083D- C6 05 DEC $05
083F- 4C 56 08 JMP $0856
0842- C6 06 DEC $06
0844- 4C 64 08 JMP $0864
0847- E6 06 INC $06
0849- 4C 64 08 JMP $0864
084C- E6 05 INC $05
084E- 4C 64 08 JMP $0864
0851- C6 05 DEC $05
0853- 4C 64 08 JMP $0864
0856- A9 00 LDA #$00
0858- 85 30 STA $30
085A- A4 05 LDY $05
085C- A5 06 LDA $06
085E- 20 00 F8 JSR $F800
0861- 4C 02 08 JMP $0802
0864- A5 08 LDA $08
0866- 85 30 STA $30
0868- A4 05 LDY $05
086A- A5 06 LDA $06
086C- 20 00 F8 JSR $F800
086F- 4C 02 08 JMP $0802

```

Santa Paravia and Fiumaccio

A broken tile, a rusty sword, the timeworn remnants of a medieval tapestry: Nothing sparks the imagination more than these fragile reminders of another place, another time, another way of life . . . nothing, that is, save the prospect of living it.

That's why Santa Paravia and Fiumaccio is fast becoming a national fad among avid computer gamers and computer professionals alike. Why not get in on the fun today?

This superb simulation casts up to six lords and ladies as competitors in a race for the rule of their respective 15th century Italian city-states.

Each player begins with 1,000 Florins, a small parcel of land, a suitable complement of serfs, and a prewritten obituary and time of death. Life was short back then, so you'd better move quickly . . . from this point on you're on your own.

HARVEST

The winter ended, the grain steward reports the minimum grain amount necessary to feed your people; depending on how much of your reserves were eaten by rats, you may need to purchase additional grain. Underfeeding will cause many serfs to die, and will also severely lower the birth rate. If you fared the winter well, you may be in a position to sell surplus grain or to overfeed your people, which will cause a higher birth rate and attract serfs from less fortunate neighboring towns—something you should consider if you plan to purchase additional land for farming.

You can also speculate in land and grain at this time. The price may vary from year to year, but an average increase is certain.

TAXES

You must now decide the levels of taxation for your community. As in real life, the consequences of your decisions are far-reaching: Set the customs tax too high, and businesses will suffer; a high income tax won't sit well with the wealthy; and an overburdening sales tax has got to cut down receipts at your markets. Experiment, and you're sure to find a policy that will work well with your present economy—but changes will surely be needed as your community grows.

You've also got to decide a policy for justice. Will you be very fair (costs money, but is great for the economy) or outrageous (taking bribes, selling justice to the highest bidder)? A lenient stance will attract more serfs, while outrageous justice will soon have them fleeing to more pleasant surroundings.



MAP PHASE

The computer will now draw a detailed map of your area. From this map you will be able to determine the adequacy of your defenses, the ratio of workers to acreage, the number of woolen mills and market places, and the size of your castle and cathedral.

PUBLIC WORKS

Your treasury laden with the fruits of a year's labor, you can now purchase a woolen mill or two, or invest in more market places. Maybe you'll decide to increase the size of your castle. If you feel that more clergy support might hasten your rise to the throne, build another wing on your cathedral. If your land area has grown quickly, this might be the time to arm another unit of serfs for your regions' defense. Your computer will now look back at what you've accomplished in the last year, and decide if you merit a higher title.

OBITUARY

At this point, the computer will check to see if you've reached "the fullness of time." If so, it will print the year and cause of your death, and your highest rank obtained. Although the computer will no longer offer your turn, the statistics of your reign will be kept in the comparison table until the game's end. Since it's whoever reaches the throne first, or achieves the highest title before death who wins . . . you could still wind up the winner. In any case, you're sure to end the game a little wiser—and chomping at the bit to play again.

It requires the Apple 48K and Applesoft in ROM.
Order No. 0174A \$9.95.

TO ORDER:

Look for these programs at the dealer nearest you. If your store does not stock Instant Software, send your order with payment to: Instant Software Inc. Order Dept. Peterborough, N.H. 03458 (Add \$1.00 for handling) or call toll-free 1-800-258-5473 (VISA, MasterCard and American Express accepted).

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NEW HAMPSHIRE 03458
603-924-7296

SOFTWARE REVIEW — INSIDE AND OUT

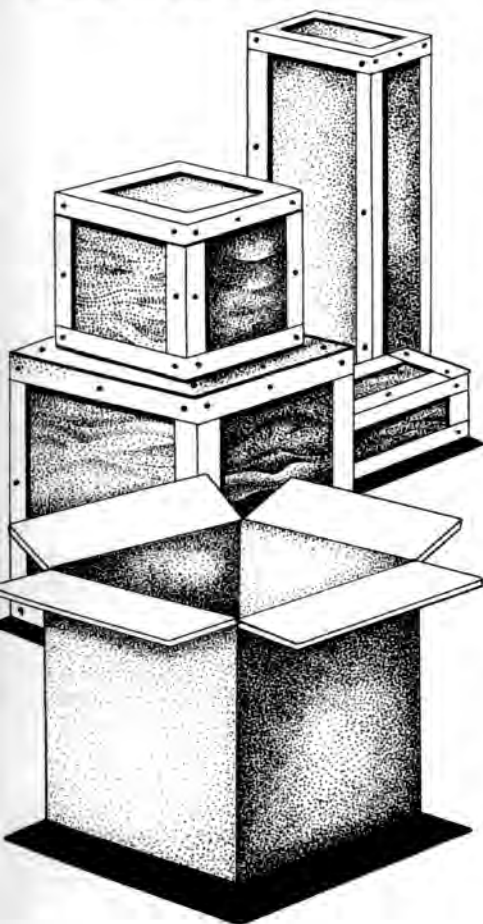
Reviewing The Latest Packages

NIBBLE REVIEW PHILOSOPHY

With a virtual explosion of new software products for the Apple we are initiating this new section to review both good ones and bad ones. With that statement, we are inviting controversy. No author or company likes to have a product receive a poor review and we fully recognize the responsibility which that places on us for objective evaluation of performance, utility, documentation, price, and other important criteria. We also recognize that you, our readers, have different needs and that an unsuitable product for one person may have high value for another.

Our objective is to be of service and to let you know what you're buying before you plunk down your hard-earned cash for a new package. Please let us know what you think and also share your experiences with us and the NIBBLE readership. We also encourage authors of commercial packages to submit programs for review by sending them to NIBBLE, P.O. BOX 325, Lincoln, Mass. 01773 marked Attention: Software Review.

With that introduction, let's take an Inside-Out look at the first Package.



DAKIN 5 Programming Aids 1 And 2

By Michael D. Weinstock
64 Pinedale Rd.
Hauppauge, L.I., N.Y. 11787

Author:
DAKIN5 CORPORATION
P.O. BOX 21187
DENVER, CO 80221
(303) 426-6090

System:
APPLE II (48K), DISK, PRINTER

Language:
Assembler, Applesoft II

Price:
\$39.95 for PA 1, \$49.95 for PA2

DAKIN5 Corporation is the author of the Controller program, the financial package marketed by Apple. As such they have impressive credentials and a reputation to uphold. These Programming Aids packages certainly live up to my expectations. PA 1 consists of a series of seven programs:

1) **The Lister** — prints Basic programs using the full line capacity of the printer. No more are we restricted to a 40 column listing. The program is configured for an Apple interface card. If you are using another, you MAY have to contact Dakin5 for some easy patches.

2) **The Peeker** — displays or prints records from a text file. Now it is easy to look (peek) into a random access text file to see the data stored within. Just be sure you know the record length of the data.

3) **The Cruncher** — removes REM statements and compresses code in Applesoft programs. This program reduced a long mail list program I wrote from 18785 bytes down to 16173 bytes — a saving of over 2K bytes. Compressed programs will usually run much faster and more efficiently. It has a built in geiger-counter sound effect to tell you that your program is being compressed.

4) **The Text File Copy** — copies a text file from one diskette to another.

5) **The Prompter** — data entry subroutine that handles both numeric and string data. Data entry in both PA 1 and PA 2 utilize this subroutine. You will want to incorporate this routine in some of your programs since it is very professionally done and well formatted.

6) **The Calculator** — addition/subtraction assembler routine with 20 place accuracy. Again, this subroutine can be incorporated into your own programs.

7) **The Diskette Copy** — formats an output disk, copies and verifies each track copied (requires 2 disk drives). Unlike other copy programs, this one will verify the data in each sector to insure that you got a good copy. Because of this verification, the copy program may take up to 5 minutes for a diskette. This may seem like a long time, but you are assured of an accurate, verified copy.

PA 2 consists of another seven programs:

1) **The Screen Printer** — permits the contents of the screen to be sent to your printer at any time the cursor is visible. By pressing CTRL-Z you can print intermediate results of a program at any time.

2) **The Array Editor** — a simple word processor that allows you to create, modify, print, and save data to a sequential text file. You can use this program to compose short letters or to enter data into a text file for use by another program.

3) **The Copier** — will copy any individual file from one diskette to another. The only information you need is the name of the file to be copied; the program does the rest.

4) **The Patcher** — permits you to examine any sector on the diskette. It presents the data in an organized manner: the first half of the sector (128 bytes) is displayed with the ASCII equivalent alongside. Pressing RETURN will display the second half of the sector. You can change any byte at will and write the changes back to the diskette. This program can help identify control characters in a file name or can enable you to enter 'illegal' characters in a file name. There are many uses for this program but a word of caution. It is possible to completely foul up a diskette if you do not know what you are doing. Experience speaks!

5) **The Line Cross Reference** — an excellent utility that produces a list of all referenced lines in an Applesoft program. By using this program you can see all references to GO SUBs, GO TOs, etc.

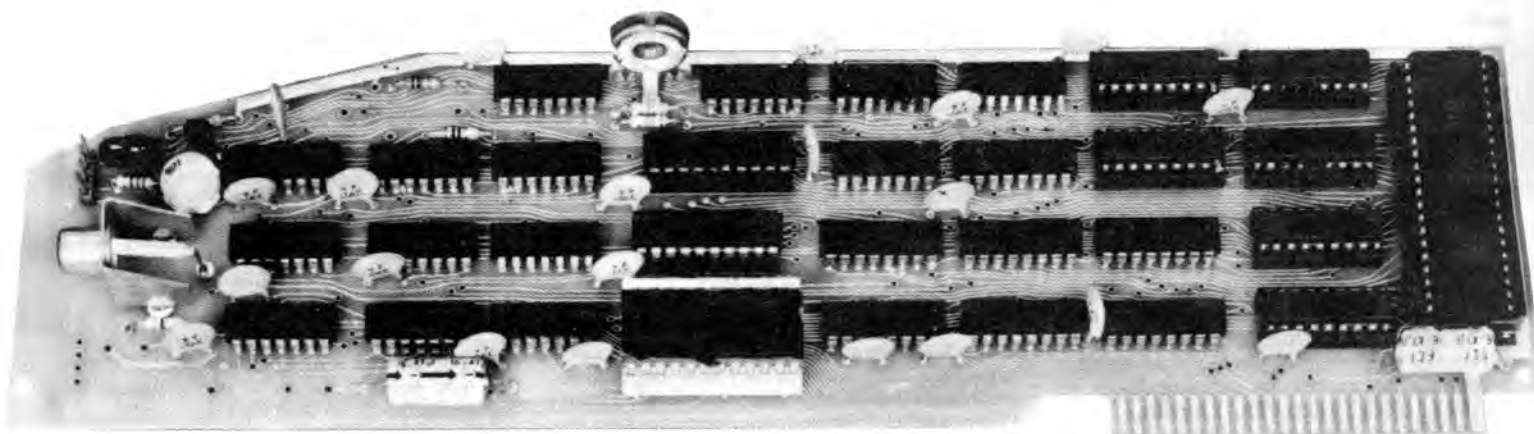
6) **The Variable Cross Reference** — another extremely useful program that lists all variables in an Applesoft program and the lines on which they are referenced.

7) **The Calculator II** — a multiplication/division subroutine that handles arithmetic to 20 place accuracy. This subroutine can be inserted into your own programs to increase their speed and accuracy.

In general, I found the documentation easy to read and understand. One point of interest is that these DAKIN5 programs do not allow two disk drives to be connected to two different slots. They fear an excessive strain on the power supply.

I consider most of the DAKIN5 programs to be a valuable aid to my programming chores. Some of the programs on this diskette will be used more than others, but these 14 programs make up an excellent package of utilities.

SUP'R'TERMINAL™



SUP'R'TERMINAL IS AN 80 COLUMN BY 24 LINE PLUG-IN
COMPATIBLE BOARD FOR THE APPLE II COMPUTER

SPECIFICATIONS

- 80 Columns by 24 lines, upper and lower case; all 128 ASCII characters.
- Upper and Lower case data entry using the APPLE II keyboard.
- Includes an Upper and Lower case 5x8 dot matrix ASCII character set, and inverse alpha characters.
- Character set can be user definable
- Includes VBC™ (video balance circuit) which enables the use of displaying 80 columns on an inexpensive 8 MHz CRT monitor
- Shift Lock Feature
- Works with APPLE PASCAL and APPLE BASIC
- Incorporates PASCAL and BASIC control characters
- ALL monitor-type escapes are valid
- Follows protocols of PASCAL and BASIC operating systems
- Compatible with ALL APPLE II peripherals.
- Effective baud rate greater than 10,000; fast scrolling and clearing
- Synchronous operation with APPLE II
- Can be used with APPLE II communication interface board to act as self contained terminal for time-sharing or other applications.

PATENT PENDING

M&R ENTERPRISES

P.O. BOX 61011, Sunnyvale, CA 94088

PRODUCT NEWS AND VIEWS

The MIKROTEK MT-80: A User's Review

by Leslie R. Schmeltz
3224 Magnolia Cr.
Bettendorf, IA. 52722

I had not owned my Apple II very long before the need for a hard copy device became quite evident. Although I resisted as long as possible, the thought of having to debug another program by listing a few lines at a time on the video display sent me looking for a printer.

Since my primary use for a printer at that time was program listing and documentation, anything that would produce hard copy seemed acceptable. I acquired a Teletype (TM) ASR-33, interfaced it through the game paddle port as per the instructions in the Apple II Reference Manual and produced good quality program listings.

Although it was a little slow and a lot noisy, the 33 suited my purposes very well for quite a while. You may well consider the 33 if your prime purpose in wanting a printer is to produce listings and an occasional letter to Aunt Gert. Many ASR and KSR-33 units are available in the used market at very attractive prices.

After adding the 33, I acquired additional memory and a Disk II for my Apple. With this additional capability, the prospect of using my system for word processing and additional printing applications intrigued me. Obviously, a new printer would be needed to accomplish these additional tasks.

Selection Criteria

Once I had decided that a new printer was necessary, some criteria for judging the features of units on the market were needed. After some soul searching, the following factors emerged as priorities in my selection process:

1. Upper And Lower Case Capability. Since word processing was one of my intended uses, all caps would be totally unacceptable. Variable size print fonts would be a nice addition to this capability, but not mandatory.
2. Good Print Quality. For my application, print quality emerged as one of the most important considerations.
3. Forms Handling Capability. Having spent considerable time measuring, cutting or folding rolled print-outs from the 33, I was interested in a unit that would spew forth easily separated sheets. For any volume of printing, the form feed emerges as considerably more convenient than single sheet or roll feed.
4. Speed. This can be a very relative consideration. If the speed is accomplished at the expense of print quality, you will have to decide whether your volume of printing justifies the extra speed. On the other hand, almost every printer I was considering was much faster than the Teletype (TM) being replaced.
5. Relatively Quiet. If you have spent any amount of time near a 33 running at full tilt, quietness becomes an important consideration.



Since much of my work is done late at night when the family is asleep, silence is indeed golden.

6. Easily Interfaced To My Apple. I was not interested in anything that required exotic hardware or software to function.

7. Cost Under \$1000. This does not seem to be an unreasonable requirement since the market at that price is fairly broad. In my case, it was also a practical necessity.

8. Use Plain Paper. Since much of my intended application involved letters and manuscripts, the prospect of having to photo copy every sheet or submitting silver paper was unappealing.

9. Reasonable Serviceability. This pretty much eliminates the units that have to be returned to the factory for every little adjustment.

Surveying The Market

There are many attractive printers priced under \$1000 in today's market. Offerings from Centronics, Anadex, Okidata, Integral Data Systems and many other manufacturers easily met or exceeded my selection criteria. In addition to new units, many reconditioned Selectric based or matrix printers fell within my price range.

Choosing a unit from the many available became an exercise in separating good from better. There is plenty of room to make an error in selection and still come up with a very adequate printer.

Choosing The MIKROTEK

The MT-80 is available with two interface configurations, MT-80P (Parallel) — \$795.00 and MT-80S (Serial RS232C) — \$895.00. The MT-80P seemed to satisfy my selection criteria very well at a reasonable price. Since the paral-

lel version input data and interface control signals are designed to be Centronics compatible, interfacing the printer to my Apple II with the Parallel Centronics card was a cinch.

MICROTEK offers a rather unique 30 day Buy Back guarantee. Buyers of their printer, if dissatisfied for any reason, may return it within 30 days for a full refund of the purchase price.

I was especially impressed with the print quality and speed of this particular unit. In addition to the 30 day buy-back mentioned earlier, the MICROTEK literature mentions a full one year warranty (more on that later).

Advertised Features

Many of the advertised features of the MT-80 series are similar to other printers in the same price class. Rather than quoting verbatim from the advertising literature, I will just mention those features that seemed important to me:

1. Character Format. Three fonts are available; 9 x 7 (10 characters per inch), 10 x 7 (5 characters per inch) and 7 x 7 (15 characters per inch). These fonts are either hardware or software selectable and can be intermixed on the same line. The full 96 character ASCII set plus a square similar to that used on a questionnaire are standard.
2. Paper Feed. Prints on pin feed paper in widths up to 9.5". Paper can be fed from either the bottom or rear of the unit and is advanced by a ratchet and solenoid arrangement. Provisions for form handling and vertical tabbing in software are included.
3. Speed. Print speed is quoted at 125 CPS, with a 70 LPM sustained throughput for full lines in the bidirectional mode. Changing to the unidirectional mode reduces throughput by 50%, but insures optimum vertical alignment of columns.

continued on next page

Figure 1. Holding the T.O.F button down while powering up the printer produces a test pattern showing all three character fonts. Similarly, the L.F depressed while powering up produces the H pattern used to align vertical dot position.

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN O PQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN O PQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN O PQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~

Memory. 220 bytes of FIFO buffer storage (lines) are standard in the MT-80 series. Memory expansion seems quite reasonable at \$2.00 for 2K and \$80.00 for 4K.

Self-Test. When the unit is powered up, a self-test program which exercises the controller (085A) and the contents of both ROM and RAM is automatically executed. If an error is detected, an attempt is made to print a message indicating the nature of the problem. Vertical alignment (adjustable) and all three character fonts can be checked by holding down either the F. or T.O.F. switches during power up.

Impressions

My first impression of the MT-80 was the sturdy construction. At 22 pounds, it is not exactly a lightweight but seems stout enough to take a beating. Lifting the cover, accomplished by depressing two latches on either side near the front of the unit, reveals a substantial looking mechanism.

The print quality is very readable in the 5 and 15 CPI modes, as you can see in Figure 1. If you happen to be a lawyer wanting to put fine print on a contract, the 15 CPI mode is just what you need! MICROTEK suggests the 15 CPI print mode is useful for printing multiple columns of numbers, although I have had no occasion to do so. Lack of descenders on the lower case characters inhibits readability a bit, but few printers in this price category offer this feature.

Interfacing the unit to my Apple was a simple process — plug the Centronics card in the computer and the printer into the card. Once I remembered to turn off the video display for printing lines wider than 40 characters, all worked as advertised.

Compared to my old ASR-33, the MT-80P actually races across the page. The printing process itself is very quiet and efficient. One fly in the ointment here though, the ratchet and pinoid paper advance seems rather noisy. Perhaps it is the nature of the system, but I can't help but think a little sound insulation in that area of the printer would do wonders to reduce noise level.

Although I have not worn out the ribbon received with the printer, purple just was not my first color choice. The MICROTEK literature gives Addressograph Multigraph part numbers for both black (116-2386-966) and purple (116-2386-366) ribbons. A phone call to the local office of A M International (new name Addressograph Multigraph) informed me they did not stock parts, but I should call their regional office in Chicago. A call to the Chicago office put me in touch with A M Office Supply, the parts branch of said company. Several phone calls back and forth finally

proved productive and the part number ribbons were located, minimum order quantity one dozen. In defense of A M, this particular ribbon has only recently been added to their line so some of the field representatives may not yet be informed of its existence. Once the confusion was resolved, their service was great.

Just prior to press time, I learned that a black ribbon may be specified when ordering the printer. MICROTEK also stocks ribbons at \$2.95 each, no minimum order.

I had a question on the warranty offered on the MT-80 series. Advertising literature mentions a full one year warranty, but the manual excepts the printhead and offers a 90 day warranty on that. This article was submitted to MICROTEK for their comments. According to Daniel R. Obed, Director of Marketing for MICROTEK, "The printhead is warranted for 100,000,000 characters which, in some commercial applications, could take place in less than three months. Average cost of printhead replacement (out of warranty) is only \$90.00". Free parts, labor and transportation back to the customer for any malfunction during the warranty period are included.

As long as we're nit picking, a couple of minor gripes might as well be noted here. My unit sits on a table top and is back fed. This leads to two complications — the input plug and cord are very close to the paper slot causing the paper to occasionally tangle itself around same. A small detachable shield for the plug might solve the problem handily. Secondly, a basket for catching the paper coming out the top would solve the problem of the print tangling in the paper supply. I hope this will be offered as an option in the near future.

Summary

In summary, the MT-80 has a lot to offer at a very reasonable price. My experience using it in all kinds of printing applications has been very positive. My preference leans toward equipment that can be set up, tested, and then depended upon to operate consistently day after day. I have a feeling the MT-80 is just such a unit.

Addenda

Further information on the MT-80 series may be obtained from MICROTEK, Inc. 9514 Chesapeake Drive, San Diego, CA 92123.

If you have a problem locating ribbons, perhaps the Chicago office of A M may be able to help. Their address: A M Office Supplies 443 N. Wabash Ave. Chicago, IL 60611 (312-527-2025).

— Apple is a TM of Apple Computers, Inc.
— Teletype is a TM of Teletype Corporation.

SUPER ISOLATOR Protects Your Apple



Electronic Specialists' SUPER ISOLATOR (model ISO-3) was designed to clear up micro-processor problems in interference prone industrial, office, or home environments. Such locations have often been plagued with unexplained crashes or memory loss.

This company has traced these problems to a combination of printer-disk-processor interaction, power line electrical hash, and power line spikes. Spikes and hash are generated by motors on start and stop, furnaces, air conditioners, and other electrical devices. Even factory time clocks have been found guilty in some instances.

The SUPER ISOLATOR, with dual balanced Pi filters and 2000 amp 8/20 microsecond spike suppressors, greatly alleviates the aggravation of unexplained crashes and glitches. Processor and peripherals can be isolated from each other as well as from the AC power line.

Damages to a system by high voltage spikes (lightning or large machinery) can be controlled by the SUPER ISOLATOR. This protection is very important for expensive systems.

The SUPER ISOLATOR, with three individually filter isolated standard 3-prong sockets, is available for \$79.95 (plus shipping). For additional information, contact:

ELECTRONIC SPECIALISTS, INC.
171 South Main St.
Natick, MA 01760

QUALITY

THAT'S WHAT SEPARATES THIS PRINTER FROM THE TOYS



MICROTEK MT-80

SOLID VALUE FOR YOUR DOLLAR

The market is flooded with low-cost printers that look and last more like toys.

The Microtek MT-80, our versatile alphanumeric line printer, has a high quality print mechanism that gives you solid value for your dollar. It has been designed with a superior brain resulting in more advanced features and more dependable performance. Our printer is so reliable that we offer you an incredible 365 days warranty.

We stand behind every printer we make because we build quality into each one. So stop tinkering with toys and get serious. Demand 100% value by specifying the MT-80.

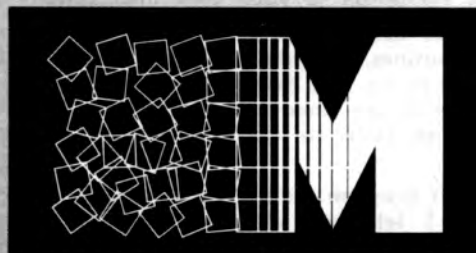
OUR UNIT PRICE

\$795 Parallel

\$895 Serial (RS-232C)

LOADED WITH INNOVATIONS

- 40, 80 or 120 columns (software selectable)
- Non-thermal paper, pin feed
- 125 CPS, 70 lines per minute
- 9 x 7 dot matrix
- Vertical format unit
- 96-character ASCII (upper and lower case)
- Adjustable forms width to 9½"
- Parallel and serial (RS-232C) interfaces available



MICROTEK Inc.

For more information contact:
MICROTEK, Inc.,
9514 Chesapeake Drive,
San Diego, CA 92123
Tel.(714)278-0633
TWX 910-335-1269

Figure 1. Holding the T.O.F button down while powering up the printer produces a test pattern showing all three character fonts. Similarly, the L.F depressed while powering up produces the H pattern used to align vertical dot position.

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~0

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~0

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~0

4. Memory. 220 bytes of FIFO buffer storage (2 lines) are standard in the MT-80 series. Memory expansion seems quite reasonable at \$42.00 for 2K and \$80.00 for 4K.

5. Self-Test. When the unit is powered up, a self-test program which exercises the controller (8085A) and the contents of both ROM and RAM is automatically executed. If an error is detected, an attempt is made to print a message indicating the nature of the problem. Vertical alignment (adjustable) and all three character sets can be checked by holding down either the L.F. or T.O.F. switches during power up.

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The print quality is very readable in the 5 and 10 CPI modes, as you can see in Figure 1. If you happen to be a lawyer wanting to put fine print in a contract, the 15 CPI mode is just what you need! MICROTEK suggests the 15 CPI print size is useful for printing multiple columns of numbers, although I have had no occasion to do so. Lack of descenders on the lower case characters inhibits readability a bit, but few printers in this price category offer this feature.

Interfacing the unit to my Apple was a simple process — plug the Centronics card in to the computer and the printer into the card. Once I remembered to turn off the video display for printing lines wider than 40 characters, all worked as advertised.

Compared to my old ASR-33, the MT-80P virtually races across the page. The printing process itself is very quiet and efficient. One fly in the ointment here though, the ratchet and solenoid paper advance seems rather noisy. Perhaps it is the nature of the system, but I can't help but think a little sound insulation in that area of the printer would do wonders to reduce the noise level.

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As long as we're nit picking, a couple of minor gripes might as well be noted here. My unit sits on a table top and is back fed. This leads to two complications — the input plug and cord are very close to the paper slot causing the paper to occasionally tangle itself around same. A small detachable shield for the plug might solve the problem handily. Secondly, a basket for catching the paper coming out the top would solve the problem of the print tangling in the paper supply. I hope this will be offered as an option in the near future.

Summary

In summary, the MT-80 has a lot to offer at a very reasonable price. My experience using it in all kinds of printing applications has been very positive. My preference leans toward equipment that can be set up, tested, and then depended upon to operate consistently day after day. I have a feeling the MT-80 is just such a unit.

Addenda

Further information on the MT-80 series may be obtained from MICROTEK, Inc. 9514 Chesapeake Drive, San Diego, CA 92123.

If you have a problem locating ribbons, perhaps the Chicago office of A M may be able to help. Their address: A M Office Supplies 443 N. Wabash Ave. Chicago, IL 60611 (312-527-2025).

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Electronic Specialists' SUPER ISOLATOR (model ISO-3) was designed to clear up micro-processor problems in interference prone industrial, office, or home environments. Such locations have often been plagued with unexplained crashes or memory loss.

This company has traced these problems to a combination of printer-disk-processor interaction, power line electrical hash, and power line spikes. Spikes and hash are generated by motors on start and stop, furnaces, air conditioners, and other electrical devices. Even factory time clocks have been found guilty in some instances.

The SUPER ISOLATOR, with dual balanced Pi filters and 2000 amp 8/20 microsecond spike suppressors, greatly alleviates the aggravation of unexplained crashes and glitches. Processor and peripherals can be isolated from each other as well as from the AC power line.

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The SUPER ISOLATOR, with three individually filter isolated standard 3-prong sockets, is available for \$79.95 (plus shipping). For additional information, contact.

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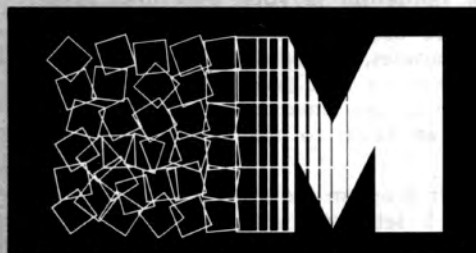
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9514 Chesapeake Drive,
San Diego, CA 92123
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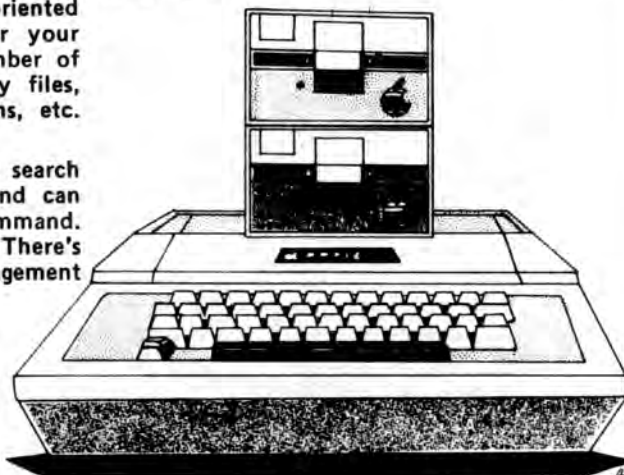
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APPLESOFT REM REMOVER

Listing

```

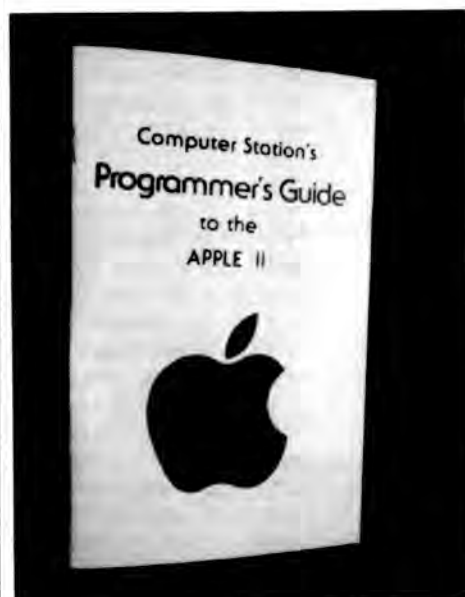
3      ; GET RID OF REMS IN APPLESOFT
5      ; COPYRIGHT 1980 BY THE SOFTWARE EXPERIENCE
7      ; WRITTEN BY AL FLOETER
10     ; IF X=0, PROGRAM GETS RID OF ENTIRE LINE IF IT IS A REM
11     ; IF X#0, PROGRAM LEAVES LINE NUMBER AND SINGLE REM
13     ; CODE IS RELOCATABLE
16     IND     EQU $FC
17     PIND    EQU $FE
18     YSAV    EQU $FB
19     TEMP    EQU $FA
20     BEGN    EQU $67
21     PEND    EQU $AF
22     LOM     EQU $69
25     ORG     $6000
28     6000    A2 00      LDX #0          ; 0 MEANS GET RID OF WHOLE LINE
29     6002    A5 67      LDA BEGN
30     6004    85 FC      STA IND          ; START OF APPLESOFT
31     6006    A5 68      LDA BEGN+1
32     6008    85 FD      STA IND+1
33     600A    A0 00      GOON  LDY #0
34     600C    B1 FC      LDA (IND),Y      ; GET NEXT LINE ADDRESS
35     600E    48         PHA              ; SAVE IT
36     600F    C8         INY
37     6010    B1 FC      LDA (IND),Y
38     6012    D0 02      BNE GOTO         ; IF ZERO, END
39     6014    68         PLA
40     6015    60         RTS              ; DONE
42     6016    48         GOTO  PHA        ; SAVE HI ORDER
43     6017    C8         INY
44     6018    C8         INY
45     6019    C8         INCS            ; LOOK FOR TOKEN
46     601A    B1 FC      LDA (IND),Y      ; GET TOKEN
47     601C    F0 56      BEQ NEXT         ; END OF LINE?
48     601E    C9 B2      CMP #$B2        ; REM?
49     6020    D0 F7      BNE INCS         ; NO
50     6022    C0 04      CPY #4          ; REM LINE ONLY?
51     6024    F0 05      BEQ CLOS        ; YES
52     6026    88         DEY              ; GET RID OF COLON BEFORE IT TOO
53     6027    C0 04      CPY #4          ; NOW REM LINE ONLY?
54     6029    D0 06      BNE NOD          ; NO
55     602B    8A         CLOS  TXA        ; GET RID OF LINE IF 0
56     602C    85 FB      STA YSAV        ; SAVE START
57     602E    F0 03      BEQ NNOD
58     6030    C8         INY              ; LEAVE AT LEAST REM THERE
59     6031    84 FB      NOD   STY YSAV   ; SAVE THIS START
60     6033    88         NNOD  DEY
61     6034    C8         KLOK  INY        ; NEXT
62     6035    B1 FC      LDA (IND),Y      ; END OF LINE?
63     6037    D0 FB      BNE KLOK        ; NO
64     6039    38         SEC              ; CARRY FOR SUBTRACT
65     603A    98         TYA              ; PRESENT POSITION FOR END OF LINE
66     603B    48         PHA              ; SAVE A
67     603C    A4 FB      LDY YSAV        ; PREVIOUS POSITION
68     603E    D0 04      BNE ZER         ; IF START, SUBTRACT ONE MORE
69     6040    C6 FB      DEC YSAV        ; 1 LESS
70     6042    30 04      BMI NOZ         ; DONT ZERO IF WHOLE LINE
71     6044    A9 00      ZER   LDA #0

```

continued on next page

72	6046	91 FC		STA (IND),Y	;0 FOR END OF LINE
73	6048	68	NOZ	PLA	;A BACK
74	6049	E5 FB		SBC YSAV	;GET LENGTH
75	604B	85 FB		STA YSAV	;SAVE IT
76	604D	A5 FC		LDA IND	
77	604F	85 FE		STA PIND	
78	6051	A5 FD		LDA IND+1	
79	6053	85 FF		STA PIND+1	
80	6055	A0 01		LDY #1	
81	6057	B1 FE	KEEP	LDA (PIND),Y	;CHANGE ADDRESS POINTERS
82	6059	F0 1E		BEQ ZMOR	;END
83	605B	48		PHA	;SAVE HI ORDER
84	605C	88		DEY	
85	605D	B1 FE		LDA (PIND),Y	;LO ORDER
86	605F	48		PHA	;SAVE IT TOO
87	6060	38		SEC	
88	6061	E5 FB		SBC YSAV	;BACK IT OFF
89	6063	91 FE		STA (PIND),Y	;NEW LO ORDER
90	6065	C8		INY	
91	6066	B1 FE		LDA (PIND),Y	;HI,ORDER
92	6068	E9 00		SBC #0	;IF OVERFLOW
93	606A	91 FE		STA (PIND),Y	;NEW HI ORDER
94	606C	68		PLA	
95	606D	85 FE		STA PIND	
96	606F	68		PLA	
97	6070	85 FF		STA PIND+1	;NEXT LINE
98	6072	B0 E3		BCS KEEP	;CARRY SET HERE
99					
100	6074	18	NEXT	CLC	
101	6075	90 5A		BCC NEX2	;FOR RELOCATABLE
103	6077	90 91	KEE	BCC GOON	
104					
105	6079	68	ZMOR	PLA	
106	607A	68		PLA	;OLD NEXT ADDRESS OF LINE
107	607B	18		CLC	
108	607C	A0 00		LDY #0	
109	607E	B1 FC		LDA (IND),Y	
110	6080	48		PHA	;SAVE LO ORDER
111	6081	85 FA		STA TEMP	;SAVE FOR LATER
112	6083	65 FB		ADC YSAV	;TO OLD NEXT LINE
113	6085	85 FE		STA PIND	
114	6087	C8		INY	
115	6088	B1 FC		LDA (IND),Y	
116	608A	85 FD		STA IND+1	;SAVE HI ORDER
117	608C	48		PHA	;SAVE HI ORDER
118	608D	69 00		ADC #0	
119	608F	85 FF		STA PIND+1	
120	6091	A5 FA		LDA TEMP	;GET LO ORDER
121	6093	85 FC		STA IND	;SAVE IT HERE
122	6095	88		DEY	
123	6096	B1 FE	OK	LDA (PIND),Y	;MOVE DOWN EVERYBODY!!
124	6098	91 FC		STA (IND),Y	
125	609A	E6 FC		INC IND	
126	609C	D0 02		BNE ,+4	
127	609E	E6 FD		INC IND+1	
128	60A0	E6 FE		INC PIND	

129	60A2	D0 02	BNE ,+4	
130	60A4	E6 FF	INC PIND+1	;NEXT LOCATION
131	60A6	A5 FF	LDA PIND+1	
132	60A8	C5 B0	CMP PEND+1	;END OF APPLESOFT?
133	60AA	90 EA	BCC OK	;NO
134	60AC	A5 FE	LDA PIND	
135	60AE	C5 AF	CMP PEND	;LO ORDER END?
136	60B0	90 E4	BCC OK	;NO
137	60B2	A5 AF	LDA PEND	
138	60B4	E5 FB	SBC YSAV	;CHANGE END
139	60B6	85 AF	STA PEND	;NEW END
140	60B8	85 69	STA LOM	;LOMEM TOO
141	60BA	A5 B0	LDA PEND+1	
142	60BC	E9 00	SBC #0	;HI ORDER
143	60BE	85 B0	STA PEND+1	
144	60C0	85 6A	STA LOM+1	
145	60C2	E6 69	INC LOM	
146	60C4	D0 02	BNE ,+4	
147	60C6	E6 6A	INC LOM+1	;LOMEM 1 PAST END
148	60C8	98	TYA	;Y=0
149	60C9	91 FC	STA (IND),Y	;END OF PROGRAM HAS 0'S
150	60CB	C8	INY	
151	60CC	91 FC	STA (IND),Y	
152	60CE	C8	INY	
153	60CF	91 FC	STA (IND),Y	
154	60D1	68 NEX2	PLA	
155	60D2	85 FD	STA IND+1	;NEXT LINE TO LOOK AT
156	60D4	68	PLA	
157	60D5	85 FC	STA IND	
158	60D7	18	CLC	
159	60D8	90 9D	BCC KEE	



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FREE? Disk Sectors Listing

```

0800      1      ; <FREE?>
0800      2      ; 1/6/80
0800      4      ; "FREE?" IS A
0800      5      ; "BASIC CALL-ABLE" SUBROUTINE
0800      6      ; TO REPORT #FREE DISK SECTORS.
0800      8      ; "FREE?" MAY BE COPIED AS LONG
0800      9      ; AS THIS PARAGRAPH IS INCLUDED
0800     10      ; IN THE SOURCE LISTING OF ALL
0800     11      ; COPIES. "FREE?" IS A CREATION
0800     12      ; OF <SENSIBLE SOFTWARE>.
0800     14      ; "FREE?" RESIDES IN MEMORY
0800     15      ; LOCATIONS $380 TO $3C0.
0800     16      ; AFTER "FREE?" HAS BEEN
0800     17      ; LOADED FROM DISK, SET
0800     18      ; MAXFILES=3, AND HIMEM:-27392
0800     19      ; THE BASIC CALL IS THEN:
0800     21      ;      >CALL 919
0800     22      ;      >FREESECTORS= PEEK(917)+
0800     23      ;      256*PEEK(918)
0800     25      ; "FREE?" WILL WORK WITH EITHER
0800     26      ; BASIC LANGUAGE IN RAM OR ROM.
0380     28      ORG $380
0380     29      OBJ $800
0380     31      ;DEFINE DISK CONSTANTS
0380 01     32      IOB      HEX 01
0381 60     33      SLOT    HEX 60
0382 01     34      DRIV     HEX 01
0383 00     35      VOL      HEX 00
0384 11     36      TRAK     HEX 11
0385 00     37      SECT     HEX 00
0386 9103   38      ADR      DIBP
0388 0095   39      DPTR     ADR DBUFFR
038A 0000   40      UNUSED   HEX 0000
038C 01     41      DCMD     HEX 01
038D 00     42      STAT     HEX 00
038E 00     43      FNDVOL    HEX 00
038F 60     44      LSLDTA    HEX 60
0390 01     45      LDRIVA    HEX 01
0391 0001EF 46      DIBP     HEX 0001EFD8
0394 08
0395 0000   47      FREE     HEX 0000
0397       49      RWTS      EQU $3D9
0397       50      DBUFFR    EQU $9500
0397       53      ; <FREE SECTOR ALGORITHM>
0397       55      ;READ DISK VTOC SECTOR
0397 A903   56      CHECK     LDA /IOB
0399 A080   57              LDY #IOB
039B 20D903 58              USP RWTS
039E       59      ;ZERO COUNT
039E A200   60              LDX 00
03A0 8E9503 61              STX FREE
03A3 8E9603 62              STX FREE+$1
03A6       63      ;COUNT FREE SECTORS
03A6 A038   64              LDY 38
03A8 B90095 65      LOOP1    LDA DBUFFR,Y
03AB A208   66              LDX 08
03AD 0A     67      LOOP2    ASL
03AF 9008   68              BCC USED
03B0 EE9503 69              INC FREE
03B3 D003   70              BNE USED
03B5 EE9603 71              INC FREE+$1
03B8 0A     72      USED     DEX
03B9 D0F2   73              BNE LOOP2
03BB 08     74              INY
03BC 00C4   75              CPY 0C4
03BE 90E8   76              BLT LOOP1
03C0 60     77              RTS
03C1 00     79      END=     BRK
                                80      END
INT
>CALL -155
*380<800.841M
*380.3C0
0380- 01 60 01 00 11 00 91 03
0388- 00 95 00 00 01 00 00 60
0390- 01 00 01 EF D8 00 00 A9
0398- 03 A0 80 20 D9 03 A2 00
03A0- 8E 95 03 8E 96 03 A0 38
03A8- B9 00 95 A2 08 0A 90 08
03B0- EE 95 03 D0 03 EE 96 03
03B8- 0A D0 F2 C8 C0 C4 90 E8
03C0- 60
*^
*^
*UNLOCK FREE?.OBJ 00 01 EF D8 00
*SAVE FREE?.OBJ,A$380,L$41 00 01 EF D8 00
*^
*3D05
>LOAD FREE?
>LIST
10 HIMEM:-27392
30 RUN 100
100 PRINT "MON CIO"
200 PRINT "LOAD FREE?.OBJ"
250 CALL 919
260 PRINT "CATALOG"
300 FREE= PEEK (917)+256* PEEK (918)
400 PRINT "SECTORS: ";FREE;" FREE, ";
410 PRINT 403-FREE;" USED"
420 INPUT "NEXT DISK?";A$: GOTO 250

```

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☐ LIST FILE DIRECTORIES ☐ DELETE AND REPACK ☐ SORT A FILE

CIF — PRINTING OPTIONS

- ☐ SCREEN OR PRINTER ☐ PRINT DENSITY 12 OR 16.5 CHAR/INCH

CIF — ARITHMETIC OPTIONS

	SELECT COLS.	SELECT ROWS	SELECT FIELDS	SELECT +/-	SELECT COMPARE
<input type="checkbox"/> TOTALS BY COLUMN	X				
<input type="checkbox"/> TOTALS BY ROW		X		X	
<input type="checkbox"/> AVERAGES BY COLUMN	X				
<input type="checkbox"/> EACH LINE ITEM % OF TOTAL	X				
<input type="checkbox"/> SUBTOTALS AND GRAND TOTALS	X		X		X
<input type="checkbox"/> MULTIPLY TWO COLUMNS	X				
<input type="checkbox"/> TOTALS BY ROW AND COLUMN	X	X		X	
<input type="checkbox"/> TOTALS AND MULTIPLY TWO COLS.	X		X		
<input type="checkbox"/> COL SUBTOTALS & TOTALS BY ROW	X		X	X	X

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Machine Language Screen Dump Listing

```

0800      1      ; *****
0800      2      ; *
0800      3      ; * APPLE II MACHINE *
0800      4      ; * LANGUAGE UTILITIES *
0800      5      ; *
0800      6      ; * CYBORG CORPORATION *
0800      7      ; * BOSTON, MASS. *
0800      8      ; *
0800      9      ; * R. M. MOTTOLA *
0800     10      ; *
0800     11      ; *****
0800     12      ;
0800     13      ;
0800     14      ; *****
0800     15      ; *
0800     16      ; * SCREEN DUMP-S *
0800     17      ; *
0800     18      ; *****
0800     19      ;
0800     20      ;
0800     21      PRFLG EPZ $6
0800     22      WINTOP EPZ $7
0800     23      WINBOT EPZ $8
0800     24      PRFN EPZ $9
0800     25      BASL EPZ $28
0800     26      COUNTL EPZ $4C
0800     27      COUNTH EPZ $4D
0800     28      MSTRT EQU $5F9
0800     29      MODE EQU $679
0800     30      ESCHAR EQU $6F9
0800     31      FLAGS EQU $779
0800     32      PROUT EQU $C102
0800     33      BASCAL EQU $FBC1
0800     34      ;
0300     35      ORG $300
0300     36      OBJ $800
0300     37      ;
0300     38      ; MACHINE SCREEN DUMP ROUTINE
0300     39      ; DUMPS SELECTED WINDOW OF TEXT
0300     40      ; PAGE #1 TO APPLE PARALLEL
0300     41      ; PRINTER INTERFACE CARD IN SLOT
0300     42      ; NUMBER 1.
0300     43      ;
0300 A506     44      PRTR LDA PRFLG
0302 D001     45      BNE PRTR2A
0304 60      46      RTS
0305 A928     47      PRTR2A LDA #$28
0307 8DF905  48      STA MSTRT
030A A900     49      PRTR2B LDA #$0
030C 8D7906  50      STA MODE
030F A989     51      PRTR2C LDA #$89
0311 8DF906  52      STA ESCHAR
0314 A901     53      PRTR2D LDA #$1
0316 8D7907  54      STA FLAGS
0319 A507     55      LDA WINTOP
031B 854C     56      STA COUNTL
031D 20C1FB  57      PRTR4 JSR BASCAL

```

```

0320 A000     58      LDY #$0
0322 B128     59      PRTR5 LDA (BASL),Y
0324 A609     60      LDX PRFN
0326 D010     61      BNE PRTR7
0328 A64C     62      LDX COUNTL
032A E014     63      CPX #$14
032C 100A     64      BPL PRTR7
032E C900     65      CMP #$0
0330 D004     66      BNE PRTR6
0332 A9A0     67      LDA #$A0
0334 D002     68      BNE PRTR7
0336 A958     69      PRTR6 LDA #$58
0338 297F     70      PRTR7 AND #$7F
033A 0940     71      ORA #$40
033C 2A      72      ROL
033D 2A      73      ROL
033E 08      74      PHP
033F 6A      75      ROR
0340 6A      76      ROR
0341 28      77      PLP
0342 1002     78      BPL PRTR8
0344 29BF     79      AND #$BF
0346 2002C1  80      PRTR8 JSR PROUT
0349 C8      81      INY
034A C028     82      CPY #$28
034C D0D4     83      BNE PRTR5
034E A98D     84      LDA #$8D
0350 2002C1  85      JSR PROUT
0353 E64C     86      INC COUNTL
0355 A54C     87      LDA COUNTL
0357 C508     88      CMP WINBOT
0359 30C2     89      BMI PRTR4
035B F0C0     90      BEQ PRTR4
035D 60      91      RTS
035E      92      ;
035E      93      ;
035E      94      END      END
***** END OF ASSEMBLY

*****
*
* SYMBOL TABLE -- V 1.0 *
*
*****

LABEL. LOC. LABEL. LOC. LABEL. LOC.
PRFLG 0006 WINTOP 0007 WINBOT 0008
PRFN 0009 BASL 0028 COUNTL 004C
COUNTH 004D MSTRT 05F9 MODE 0679
ESCHAR 06F9 FLAGS 0779 PROUT C102
BASCAL FBC1 PRTR 0300 PRTR2A 0305
PRTR2B 030A PRTR2C 030F PRTR2D 0314
PRTR4 031D PRTR5 0322 PRTR6 0336
PRTR7 0338 PRTR8 0346 END 035E

```

LETTERS

Mike:

I just got my hands on the first issue of NIBBLE and think it is great. Having an APPLE II and always looking for software your magazine just fits the bill.

I don't want to miss an issue so please find enclosed my check for \$15.00 for eight issues. Look forward to the next issue so I can continue to learn as I put new items into my APPLE II.

Hope we can see some learning type articles from you in the future. Learning how to do more with the disc and learning more about the use of machine language routines as well as the high level language approaches.

I hope to get more acquainted with the computer world as I go along so I can write a few articles. I have written for Amateur Radio Publications and Popular Electronics, but don't feel quite up to having something to contribute to the computer world yet. Need to learn some more, but then I might be able to come up with something looking from the beginners standpoint — and that's where I am at.

You have a great start look for good things to come from NIBBLE. I hope one of those future articles will be a home security/energy management type article for the apple.

Robert L. Ruyle
Lincoln, Nebraska

ED: I appreciated your letter. By now, you will have seen the extensive coverage of "Applied" Assembly Language programming in NIBBLE #2. This issue also contains a number of tips and techniques for charging up your Apple with Assembly Language and the Disk II.

I'd like very much to review your work for potential publication when you're ready.

You raise an interesting and important subject in Home Security and Energy Management. Would you and our other readers consider this a request and invitation to submit articles/programs on the subject?

Dear Mike:

Below is the review which was published in "From the Core", the newsletter of the Carolina Apple Core.

As you can see I was very impressed by Nibble. Keep it up.

Alec Whittaker
Carolina Apple Core

"FROM THE CORE" NEWSLETTER REVIEW

By Alec Whittaker

I had already completed the column for this month when I received a review copy of 'Nibble'. That column described a publication which I couldn't recommend but 'Nibble' is a welcome addition to the World of Apple and it is much more enjoyable to write of a magazine that I would like to bring to the attention of CAC members.

'Nibble' is published eight times a year by MICRO-SOFTWARE PUBLISHING AND RESEARCH COMPANY INC., P.O. Box 325, Lincoln, Mass. 01773 at an annual subscription rate of \$15.00.

The first issue, January/February 1980, is 40 pages in length, of which about 35% is advertising. It is bound with stiff covers and attractively laid out with the appearance of a professional commercial magazine.

'Nibble' describes itself as "The Reference for Personal Computing" and as the name implies is mostly made up of short articles and references. But 'Nibble' does include two major programs. TRAC is a system for personal expense Trend Reporting and Space Maze is — as if you couldn't guess — a game.

But, to me, the most important, interesting, and valuable article is the Construction Project which is a regular feature of 'Nibble'.

Most of us are familiar with the modification to early Apples which will add Blue and Orange to the available Hi-Res colors. But many of us are too squeamish to use an Exacto knife and perform the surgery involved in cutting printed circuit tracks on our Apples. This article gives a straight-forward and clearly illustrated explanation of how to perform this operation without making a cut... and that, to me, is worth the subscription price.

I am going to pay 'Nibble' the ultimate reviewer's accolade:

I am mailing my subscription in.

ED: Thank you! We will do our very best to "Keep it Up" and, as you'll see elsewhere in this column, we have decided to keep NIBBLE completely and totally Apple-oriented.



Dear Mike

Enclosed please find my subscription to Nibble, beginning with the March 1980 issue.

I have never written letters to the editor, but your magazine truly has given me a great deal of pleasure. But even more, as a six week owner of an Apple II, I feel that I see some sunlight in my fog of confusion and frustration. Club newsletters, magazines, and manuals, as well as textbooks on programming have overwhelmed me with good information, but have nowhere been as informative as your magazine. Congratulations on a good job, which I know can only improve with time.

Robert Margid, M.D.
West Covina, CA

ED: Thank you! It's good to know that we're able to help.

NIBBLE ERRATA AND ENHANCEMENTS

Nothing is quite so irritating as a program Bug, and unhappily, we've had our share so far in NIBBLE. While most of them are obvious and you've probably already corrected them, we will publish a complete list of the ones identified.

First, a note on why it has taken till issue #3 to publish the Errata on Issue #1. It normally takes 5-10 days for NIBBLE to reach you. As it happens, in February the mails were swamped with bulk mail for the Presidential Primaries and some subscribers did not receive NIBBLE for nearly 4 weeks.

In any case, with 2 weeks for the mail, 1 week for our readers to type in a program and elect to write in, and 1 week for the mail and administration to surface the letter here, we are already in printing for the next issue. So, our publication of bug-fixes will typically lag by 1 issue. Please bear with us. We'll try very hard to do better.

Here's the list:

TRAC

1. LINE 2210 "SW1" should be "SW"
2. LINE 4340 "M" should be "MT"
3. LINES 4276-4280 The expressions being POKE'd into memory 36 should be enclosed in parentheses. While the absence of parentheses should not affect the result, good form should have dictated consistency with the other format lines (ex. LINE 4262).
4. DIVIDE BY ZERO ERROR occurs in LINE 4217 for the TREND ANALYSIS if no previous months data have been entered for either Checks or Credit Cards. Line 4217 tries to compute the percentage of totals and if no previous months have been entered the variable TL(MT-1) will be zero (producing a divide by zero). This can be corrected by putting the first part of line 4217 into a new line 4216. Then line 4217 can be entered as follows:

```
4217 IF TL(MT-1) > 0 THEN PC(X,2) =  
      INT( (BAL(X,MT-1)*100)/TL(MT-1) )
```

5. SERIAL PRINTER: TRAC will not work with a serial printer as written. If you want the serial printer routines, please send a self-addressed stamped envelope and we'll send them immediately.

6. 80 COLUMN PRINTERS: As written, TRAC will not work properly with 80 column printers. The following modifications will allow 80 column printing:

TRAC Modification For 80 Column Parallel Printers

1. All reports EXCEPT the 12 Month Expense Spread will run on 80 column printers without reformatting. The only change which needs to be made is to reduce the "=" and "-" report format lines to 80 columns. Change the following lines to read:

```
FOR X=1 TO 80 (etc.)
```

```
Lines: 4234 and 4272
```

2. To print the 12 month spread report (Year-to-Date Spending Profile), you will need to break it up into two 6 month segments. To print the first 6 months, the program line changes are:

```
4348 PRINT  
4350 FOR X=1 TO 80: PRINT  
      "-";NEXTX  
4356 FOR N=1 TO 6: IF BAL(X,N)=0  
      THEN 4362  
4366 FOR X=1 TO 80: PRINT  
      "-";NEXTX: PRINT  
4370 FOR X=1 TO 6
```

To print the last six months, insert the following:

```
4380 GOTO 5000  
5000 PRINT" "; REM CTRL1 40N  
5005 PR#0  
5010 PRINT" SKIP TO NEW SHEET OF  
      PAPER AND THEN"  
5030 INPUT" HIT RETURN TO PRINT  
      LAST 6 MONTHS";XX$  
5040 PR#1  
5045 PRINT" "; REM CTRL1 80N  
5050 PRINTTAB(XN) MO$(7);:  
      PRINTTAB(XN) MO$(8);:  
      PRINTTAB(XN) MO$(9);:  
      PRINTTAB(XN) MO$(10);:  
      PRINTTAB(XN) MO$(11);:  
      PRINTTAB(XN) MO$(12)  
5060 FORX=1 TO 80: PRINT"=";:  
      NEXTX:PRINT  
5070 FORX=1 TO 24  
5075 FOR N=7 TO 12: IF BAL(X,N)= 0  
      THEN 5200  
5080 P=BAL(X,N):GOSUB4295  
5085 B=9:  
      POKE36,(((N-7)*9)+B-C-1):  
      PRINTBAL(X,N);  
5090 TL(N)=TL(N)+BAL(X,N)  
5200 NEXTN: PRINT  
5205 NEXT X  
5201 FOR X=1 TO 80:  
      PRINT"=";NEXTX:PRINT  
5215 FOR X=7 TO 12: P=TL(X):  
      GOSUB 4295  
5230 B= 9: POKE 36,  
      (((X-7)*9)+B-C-1): PRINT TL(X);  
5240 NEXT X: PRINT  
5245 GOTO 4395
```

A set of program changes to adapt TRAC to Serial Printers is available by sending a self-addressed, stamped envelope to Micro-SPARC. The changes consist of three print routines which "Pre-Format" the print lines so that you're able to print a single string 'W\$' for each report line.

TRAC Enhancements List

DIRECT EDITING OF A RECORD: The following program changes will allow you to directly enter new data or correct bad data for a specified RECORD #:

```
217 IF W$(1,1)="EDIT" THEN IS=1:  
      INPUT "RECORD # TO EDIT?";I:  
      W$(IS,1)="" : GOTO204  
258 IF IS > 0 THEN X=I: GOSUB 1050:  
      I=IS: IS=0: GOTO 204  
1052 IF IS > 0 THEN 1080: REM DIRECT  
      EDIT  
1097 IF IS > 0 THEN RETURN
```

With these changes, you can proceed as if you are ADDING records to either of the files. Then, instead of typing 'End' or 'Redo' as normal commands, type 'EDIT' as the Account Number. TRAC will ask for the specific Record Number, allow you to reenter the record (out of sequence), and will then update the disk with the new correct data. Then the original sequence will be restored.

ELIMINATE SELECTED ACCOUNTS FROM YTD TOTALS:

In cases where you have set up a separate Account # for Checks paid to credit card companies there are two approaches to managing the situation:

1. As TRAC is written, you would examine your credit card bill (from the company) and then DELETE each credit card item covered by the bill. In this case, you would skip over entering the check paid to the credit card company.
2. The other alternative, entering a check for the credit card company payment can be handled by skipping EITHER the addition of the CHECK amount or the CREDIT CARD amount into the year-to-date totals. Personally, I would vote for skipping the check amount, but either alternative is equally easy. The program changes are:

```
4391 IF F$="CHECK #" AND WK(X,1)=  
      (YOUR SELECTED ACCOUNT  
      NUMBER) THEN 4393  
4392 BAL(WK(X,1),WK(X,2))=BAL  
      (WK(X,1),WK(X,2))  
      + WK(X,3)  
4393 NEXT X: RETURN
```

These changes will skip over the adding of check balances into year-to-date totals for the account number(s) you have designated.

EXPANDING THE VARIABLE SIZE:

The number of transactions which can be contained at a single file can be expanded by enlarging the DIMensions of W\$ in line 10510.

Printer Controls

Some confusion has arisen over the use of printer controls in NIBBLE programs. The printers used for NIBBLE testing are Parallel printers (Centronics and Integral Data Systems 440). They use the Apple Parallel Card. When the print commands print in a program listing, they don't show up. For example, when a program listing contains:

```
100 PRINT" (CTRL)I 90N" :REM CTRL I 90N
```

It appears in the listing as:

```
100 PRINT " " : REM CTRL I 90N
```

So, when there is a strange looking PRINT " " command with a REM statement, the REM will define what should be typed in.

AIRSEA BATTLE

1. Use of ASC as a Variable: Several readers have pointed out, correctly, that ASC is a command and should not be used as a variable. The reason it works is that ASC by itself, can be a variable. ASC with parentheses, e.g. ASC (A\$) is the ASCII command. It's a confusion and we'll try to be more careful, but it should not hurt the program execution.

2. Page 21 of NIBBLE #2 has a typographical error in the second column (third paragraph from the bottom). The BSAVE instruction should read:

```
BSAVE AIRSEA MACH LANG, A$800, L$200
```

SPACE MAZE

1. LINE 267 should read:

```
267 IF TM<=0 THEN CALL-936: FLASH  
:  
PRINTTAB(10) "OUT OF FUEL";:  
PRINTTAB(10) " ":GOTO 4000
```

2. Hard to control SPACE MAZE with two paddles: You can slow it down and remove the "Acceleration Effect" by making the following changes:

```
210 IF PDL(2)>=150 THEN HV=1  
220 IF PDL(2)<= 75 THEN HV=-1  
230 IF PDL(1)>=150 THEN VV=1  
240 IF PDL(1)<= 75 THEN VV=-1
```

This will cause the dot to move only one space at a time.

Loading Integer Basic With Assembly Language

Several readers were repeatedly bombing out with both AIRSEA BATTLE and STAR ATTACK and were getting error halts in Assembly Language.

Here's what was happening: Both programs use Assembly Language routines stored in \$800 (Hex). The LOMEM:4096 instruction in the loading process is designed to protect that memory segment. IF however, your Apple is currently in Applesoft while you type in the LOMEM: 4096, the memory protection doesn't work. LOMEM: does different things in Applesoft and Integer Basic.

In Applesoft, LOMEM: protects memory for the storage of Variables. Applesoft programs normally go into a fixed location.

In Integer Basic, LOMEM: allows you to protect the location of your Program! (This is what we do with STAR ATTACK and AIRSEA BATTLE).

As it turns out, a number of our readers have BOOT (Hello) Programs written in Applesoft. They would Boot the system and then try to load the program WITH THE SYSTEM STILL IN APPLESOFT. The LOMEM: 4096 would not protect memory correctly.

The solution is either to rewrite the BOOT program in Integer (easiest in the long run), or at least to SWITCH TO INTEGER BASIC BEFORE TYPING IN THE LOMEM INSTRUCTION. An even better way is to AUTO LOMEM and LOAD (later on this page).

Star Attack

1. Add a Line 16 to STAR ATTACK Basic 16
POKE 17226,0

This will reset the Hit Flag prior to the initial testing. In some Apples the absence of this initialization causes an error.

2. Line 4020 has Line 4030 running in right behind it. Start a new line with 4030 in the Basic program (pg. 30).

3. Page 16: Two references to COO as the Hi Res address were printed as alphabetic "O" when they should have zeros "0".

4. Page 16: In the Loading instructions the LOMEM should be set at 4096 (not 4000).

5. Page 15: In paragraph 1, column 2, there is a false reference to a non-existent line 28 in the STAR ATTACK Basic program.

6. Page 16: As a clarification, the BSAVE STAR A/L, A\$4000,L\$FFF saves BOTH the Shapes and the Assembly Language as a BLOCK.

Entering Memory Listings

Please read the Apple Reference manual on how to enter Machine Language DIRECTLY into memory. The Apple Monitor PRINTS memory listings showing a DASH (—) between the memory address and the contents of the address. In Entering programs directly into memory, you need to type a COLON (:) after the memory address before typing in the data (Not a dash).

Dual Joysticks

The little program in NIBBLE #2 (page 13) for testing the operation of your Joysticks was badly printed. Although the errors were probably obvious, here's a corrected copy of the routine:

```
5 P0 = PDL (0) * 50/50  
10 P1 = PDL (1) * 50/50  
20 P2 = PDL (2) * 50/50 : P3 = PDL * 50/50  
30 S0 = PEEK(-16287) : S1 = PEEK  
(-16286)  
40 S2 = PEEK(-16285)  
50 VTAB 23: CALL - 868: PRINT "P0 =  
": PO;  
60 PRINT "P1 = "; P1; " P2 = "; P2; " P3  
= "; P3;  
70 PRINT "S0 = "; S0; " S1 = "; S1; " S2  
= "; S2  
80 GOTO 5
```

AUTO LOMEM and MACHINE LANGUAGE LOAD

You can automatically set LOMEM:4096 in Star Attack and Airsea Battle by entering Line 0 as:

```
0 POKE 204, 0: POKE 205, 16:  
POKE 74, 0: POKE 75, 16
```

You can automatically Load the Shapes and Machine Language from Disk by entering Lines 1 and 2 as:

```
1 D$ = " ": REM CTRL D  
2 PRINT D$: "BLOAD AIRSEA MACH  
LANG"
```

for example. Remember that D\$ is a CTRL D (created by holding the CTRL and D key down at the same time).

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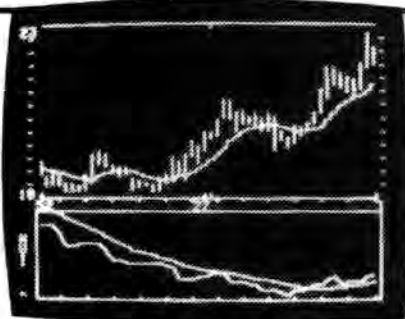
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NIBBLE CONTEST

Make T.O.U.G.H. Easier And Win!

The T.O.U.G.H. Test Processor in this issue has intentionally omitted a "Find and Replace" Option in its editing list. There are, in addition, all kinds of enhancements possible for T.O.U.G.H.

We're having a contest! With 2 PRIZES! The first, is a T.I. Programmer Calculator for the best implementation of FIND & REPLACE in T.O.U.G.H. Alternatively, the winner may select \$50.00 cash!

The second is a \$100 Prize for the best overall enhancement package to T.O.U.G.H.!

Here are the contest rules:

1. All entries must be received by September 1, 1980.
2. All entries should have the following:
 - A. A program listing printed with a new dark ribbon.
 - B. An appropriate Article describing the enhancement(s) and how they work.
 - C. A tape or disk cassette containing the program IF the program exceeds 1 page in Length. (Also, please send a self-addressed stamped envelope for the return of your cassette if you want it back).

In addition to the information contained in this issue (about T.O.U.G.H.), here are some things which will help you get started.

As T.O.U.G.H. is currently written, the FIND & REPLACE Option should reside in lines 1600-1699. If you need more space, you can rewrite line 1330 to direct the system to a line other than 1600 (by changing the 8th entry in the statement to some other address).

T.O.U.G.H. text is built from characters. Characters are assembled (concatenated) into words (The array A\$(N)). A word is defined as a collection of characters in which the LAST CHARACTER is a 'Blank Space'. In other

words, each WORD is defined by a SPACE at the end of a word.

Whenever an end-of-line control is executed (by hitting Return, Right Arrow, or Right Carat), the words which have been assembled are spaced accordingly (with right-margin justification if requested) and assembled — concatenated — into a sentence. The sentences are contained in the array L\$(N), where N is the Line Number.

In reading text back from Disk, whole sentences are built. Finding a particular string will therefore require breaking the sentences apart into their component words again — or simply looking for String Matches. Be careful of punctuation, since a comma or other character right after a word is considered as part of the word.

The routines for producing appropriate word-spacing within a line (including automatic hyphenation) are contained in the 800-900 program lines. Here, the extra spaces between words — for right margin justification — are added in alternately left-to-right and right-to-left on successive lines.

In reading and writing Disk, the key control variables which are stored in Record #0 are:

I = The number of lines to Text
SL = The specified line length
TB = The number of indent Tab characters specified

These variables are keys to the line control throughout the program.

The contest does not preclude the use of Assembly Language routines to speed up the process of finding and replacing words. As a matter of fact, one interesting approach would be to put an Assembly Language interface into the Read Disk routines to process (Every Character of Every Line must be accessed using the GET instruction, in order to read in the illegal control codes, and it is a slow process reading text back from Disk).

This should be an interesting challenge and the article on CUSTOMIZING T.O.U.G.H. (in this issue) should be of additional help.

Have Fun! Let's NIBBLE at it together.

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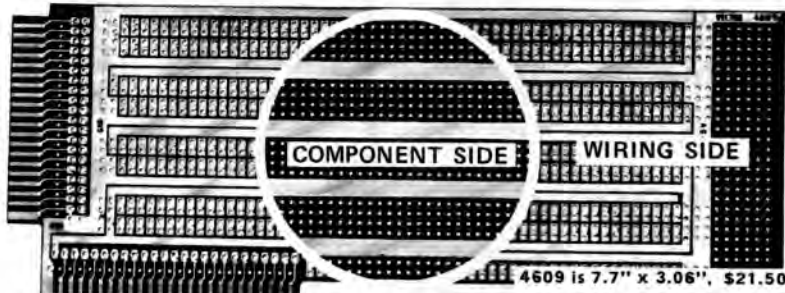
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T.O.U.G.H. SYSTEM LISTING

```

26 IF M$ > CHR$(96) AND M$ < CHR$(123) THEN M = ASC(M$) - 32; M$ = CHR$(M)
30 PRINT M$; NEXT XX: PRINT : NEXT X: PRINT "HIT ANY KEY TO CONTINUE ": GET ZZ$
31 HOME
32 NEXT ZZ
35 RETURN
40 PRINT CHR$(12): POKE 36,SL - 10: PRINT "PAGE ";PG: PRINT :PG = PG + 1:PK = PK + 2: RETURN

50 HOME : TEXT : NORMAL : VTAB 10: FOR X = 0 TO 39: PRINT "*"; NEXT X: PRINT : VTAB 12:
  PRINT TAB(15)"T.O.U.G.H."
51 VTAB 14: PRINT "1= TYPE TEXT AND STORE ON DISK": PRINT "2= READ DISK AND PRINT": PRINT
  "3= READ DISK & EDIT/DELETE/INSERT TEXT"
52 PRINT "4= ADD SENTENCE(S) TO TEXT": VTAB 20: FOR X = 0 TO 39: PRINT "*"; NEXT X: PRINT

53 INVERSE : INPUT "ENTER YOUR SELECTION";V: NORMAL
54 IF V < 1 OR V > 4 THEN PRINT "INVALID ENTRY..TRY AGAIN": GOTO 53
60 IF V = 1 THEN GOSUB 10023
65 IF V = 2 OR V = 3 OR V = 4 THEN FLASH : PRINT "READING DISK": NORMAL : GOTO 600
91 TEXT : HOME : FOR X = 0 TO 39: PRINT "*"; NEXT X: PRINT : PRINT "LEFT ARROW","= BACK
  SPACE": PRINT "RIGHT ARROW","= LINE, NO JUSTIFY"
92 PRINT "RETURN KEY","= LINE, JUSTIFY": PRINT "'>' KEY","= LINE, INDENT": PRINT "'@' KE
  Y","= END, AND WRITE DISK"
93 PRINT "'ESC' KEY","= CAPITAL LETTER": PRINT "CTL 'G' (BELL)","= IN LINE OPTIONS": PRINT
  "CTL 'S'","= SHIFT LOCK CAP'S"
94 INVERSE : PRINT "TYPE SPACE AFTER LAST WORD IN EACH LINE": NORMAL : FOR X = 0 TO 39: PRINT
  "*"; NEXT X: PRINT
95 POKE 34, PEEK(37): INVERSE : PRINT "ENTER TEXT., LINE # ";I: NORMAL : FOR KK = 1 TO
  SL - 1: PRINT CHR$(95); NEXT KK: PRINT
96 IF SL < 40 THEN CC = PEEK(37): VTAB CC
98 IF SL > = 40 AND SL < 80 THEN CC = PEEK(37) - 1: VTAB CC
100 IF SL > = 80 THEN CC = PEEK(37) - 2: VTAB CC
104 N = N + 1
105 GET K$: IF UC = 1 THEN INVERSE : PRINT K$: NORMAL : GOTO 120
110 PRINT K$;
120 IF K$ = CHR$(27) THEN UC = 1: GOTO 105: REM ESC KEY
121 IF K$ = CHR$(19) AND XS = 1 THEN XS = 0: GOTO 130: REM CTRL S
122 IF K$ = CHR$(19) AND XS = 0 THEN XS = 1
130 IF UC = 0 AND K$ > CHR$(64) AND K$ < CHR$(91) THEN H = ASC(K$) + 32: K$ = CHR$(
  H): REM TEST FOR ALPHA CHARACTER AND CONVERT TO LOWER-CASE
140 IF UC = 1 THEN UC = 0
145 IF XS = 1 THEN UC = 1
150 IF K$ = CHR$(8) AND N = 1 AND LL = 0 THEN PRINT "":X$ = "": GOTO 105: REM LEFT A
  ROW BACKSPACE
151 IF K$ = CHR$(8) AND RIGHT$(X$,1) < > "" AND N = 1 THEN HTAB 1:X$ = "":LL = 0:F
  L = 0: GOTO 105
160 IF K$ = CHR$(8) AND LL > = 40 THEN 900
170 IF K$ = CHR$(8) THEN N = N - 1:FL = FL - (LEN(X$) + LEN(A$(N))):LL = LL - (LEN
  (X$) + LEN(A$(N))): HTAB FL + 1:X$ = "": GOTO 105
180 IF K$ = "@" THEN 500: REM '@' KEY TO TRIGGER DISK SAVE
190 IF FL = 40 THEN FL = 0
200 IF K$ = CHR$(13) THEN 800: REM RETURN KEY TO TRIGGER END OF LINE SPACING
210 IF K$ = CHR$(21) THEN A$(N) = X$:X$ = "": GOTO 950: REM RIGHT ARROW TRIGGERS UNJU
  STIFIED END-OF-LINE
220 IF K$ = CHR$(62) THEN A$(N) = X$:X$ = "":K$ = "": GOTO 1100: REM ">" KEY TRIGGERS
  INDENT
230 REM *** BUILD IN SPACES BETWEEN WORDS AND SENTENCES ***

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240 IF K$ = " " AND X$ < > "" THEN A$(N) = X$ + S$:X$ = "":LL = LL + 1:FL = FL + 1: GOTO
104
250 IF K$ = " " AND X$ = "" THEN A$(N) = CHR$(32):X$ = "":LL = LL + 1:FL = FL + 1: GOTO
104
260 IF K$ = CHR$(7) THEN 1300: REM CTRL G GETS THE EDIT OPTIONS LIST
265 IF K$ = CHR$(19) THEN 290: REM CTRL S LOCKS/UNLOCKS CAPITAL LETTERS
270 X$ = X$ + K$:LL = LL + 1
280 FL = FL + 1
290 IF LL > = SL - 7 THEN PRINT CHR$(7): REM END OF LINE BEEPER
295 GOTO 105
300 REM SET UP TEXT ENTRY SCREEN FORMAT SUBROUTINE
302 IF MU = 2 OR MU = 3 OR V = 3 THEN PRINT Z: GOTO 305
303 PRINT I
305 FOR KK = 1 TO SL - 1: PRINT CHR$(95): NEXT KK: PRINT
310 IF SL < 40 THEN CC = PEEK(37): VTAB CC
315 IF SL > = 40 AND SL < 80 THEN CC = PEEK(37) - 1: VTAB CC
320 IF SL > = 80 THEN CC = PEEK(37) - 2: VTAB CC
325 RETURN
500 REM ** WRITE **
502 PRINT D$;"OPENTFILE"
505 PRINT D$;"WRITETFILE"
510 PRINT I - 1
512 PRINT SL
513 PRINT TB
515 FOR X = 1 TO I - 1
520 PRINT L$(X)
525 NEXT X
530 PRINT D$;"CLOSETFILE"
535 IF RV$ = "B" THEN RETURN: REM RETURN TO CALL FROM LINE 1067
540 PRINT "END": END
600 X = 0: REM *** READ DISK FILE ***
602 PRINT D$;"OPEN TFILE"
605 PRINT D$;"READTFILE"
610 INPUT I
612 INPUT SL
614 INPUT TB
625 X = X + 1
627 IF X = I + 1 THEN 655
630 GET B$
635 IF B$ = CHR$(13) THEN 625
640 L$(X) = L$(X) + B$
650 GOTO 630
655 PRINT RT$:D$;"CLOSETFILE"
700 REM *** OPTION BRANCH AFTER READING DISK ***
701 IF V = 1 THEN DMV = 1: INPUT "PRINT TO PRINTER? Y OR N":XX$: IF XX$ = "Y" THEN 1200
702 IF V = 3 THEN I = I + 1: GOTO 1300
703 IF V = 4 THEN 710
705 GOTO 1200
709 REM *** ADD DATA ***
710 INVERSE: INPUT "REVIEW TEXT? Y OR N":RV$: NORMAL
712 IF RV$ = "Y" THEN GOSUB 18
715 I = I + 1:N = 0:LL = 0:FL = 0:TT = 0
717 INVERSE: INPUT "BEGIN NEW PARAGRAPH? Y OR N":NP$: NORMAL
718 IF NP$ < > "Y" THEN 725
719 PRINT "BEGIN ENTERING TEXT...": PRINT
720 L$(I) = "":I = I + 1: PRINT CHR$(13): GOTO 730: REM INSERT EXTRA PARAGRAPH SPACE
725 PRINT "BEGIN ENTERING TEXT"
727 PRINT I
730 GOSUB 300
750 GOTO 104

```

continued on next page

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```

799 REM **** END OF LINE SPACING ****
800 IF N < = 1 AND FL < = 1 THEN 864
805 A$(N) = X$: FOR X = 1 TO N: TT = TT + LEN (A$(X)): NEXT X
810 LI = SL - TT
812 IF LI < 0 THEN WK$ = RIGHT$ (A$(N - 1), ABS (LI) + 1): LE = LEN (A$(N - 1)) - ABS
(LI) - 1: A$(N - 1) = LEFT$ (A$(N - 1), LE) + "-": GOTO 860
815 IF LI < N - 2 AND AF = 1 THEN DMY = 1: FOR X = 1 TO LI + 1: A$(X) = A$(X) + S$: NEXT
X: AF = 0: GOTO 860
817 IF LI < N - 2 AND AF = 0 THEN DMY = 1: FOR X = N - 2 TO ((N - 2) - LI) STEP - 1: A$(
X) = A$(X) + S$: NEXT X: AF = 1: GOTO 860
820 REM ** # OF FILL SPACES NEEDED > THAN # OF WORDS... MULTIPLE PASSES **
822 IF N < 3 THEN N = 3
825 ZZ = INT (LI / (N - 2))
830 YY = LI - (ZZ * (N - 2))
832 FOR M = 1 TO ZZ
835 FOR X = 1 TO N - 2
840 A$(X) = A$(X) + S$
845 NEXT X: NEXT M
847 IF YY = 0 THEN A$(N - 3) = A$(N - 3) + S$: GOTO 860
850 IF FA = 1 THEN DMY = 1: FOR X = 1 TO YY + 1: A$(X) = A$(X) + S$: NEXT X: FA = 0: GOTO 860
855 IF FA = 0 THEN DMY = 1: FOR X = N - 2 TO ((N - 2) - YY) STEP - 1: A$(X) = A$(X) + S$
: NEXT X: FA = 1
860 FOR X = 1 TO N - 1: L$(I) = L$(I) + A$(X): A$(X) = "": NEXT X
862 IF MU > 0 THEN RETURN
864 I = I + 1
865 GOSUB 300
875 N = 1: LL = 0
880 X$ = ""
889 TT = 0: FL = 0
890 IF V = 3 THEN RETURN
892 IF MU > 0 THEN RETURN
893 IF WK$ > "" THEN DMY = 1: FOR MM = 1 TO LEN (WK$): M$ = MID$ (WK$, MM, 1): M = ASC (M
$) - 32: M$ = CHR$ (M): PRINT M$: NEXT MM: PRINT S$: LE = LEN (WK$)
894 IF WK$ > "" THEN FL = LE: LLL = LE: A$(N) = WK$: N = N + 1: WK$ = ""
895 GOTO 105
900 REM ** BACKSPACE WITHIN AND BETWEEN LINES **
901 IF LL = 40 OR LL = 80 THEN GT = 1: REM GATE FOR BACKSPACE TAB BETWEEN LINES NO OVERFLOW
902 IF LL < = 79 AND LL - ( LEN (X$) + LEN (A$(N - 1))) < 40 THEN 915
904 IF LL > = 80 AND LL < = 119 AND LL - ( LEN (X$) + LEN (A$(N - 1))) < 80 THEN 915
906 IF LL > = 120 AND LL < = 132 AND LL - ( LEN (X$) + LEN (A$(N - 1))) < 120 THEN 91
5
908 GOTO 170: REM RETURN WITH NO HIT
915 LL = LL - ( LEN (X$) + LEN (A$(N - 1)))
917 CS = PEEK (37)
918 IF GT = 1 THEN GT = 0: VTAB CS + 1: GOTO 921
919 VTAB CS
921 FL = LL - ( INT (LL / 40) * 40)
923 HTAB FL + 1
925 N = N - 1: X$ = ""
930 GOTO 105
949 REM **** NEW PGH WITH RIGHT ARROW ****
950 FOR X = 1 TO N - 1: L$(I) = L$(I) + A$(X): A$(X) = "": NEXT X
955 PRINT CHR$ (13)
957 IF MU > 0 THEN RETURN
961 GOTO 864
1000 REM ** EDITING ROUTINES **
1009 INVERSE :II = I: INPUT "ENTER LINE # TO RETYPE "; Z: PRINT "IS THIS THE LINE YOU WAN
T TO EDIT?": NORMAL
1010 PRINT "LINE "; Z: FOR XX = 1 TO LEN (L$(Z)): M$ = MID$ (L$(Z), XX, 1): IF M$ > CHR$
(96) AND M$ < CHR$ (123) THEN M = ASC (M$) - 32: M$ = CHR$ (M)

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continued on next page



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1011 PRINT M$;: NEXT XX: PRINT : INVERSE : INPUT "Y OR N?";LL$: NORMAL : IF LL$ = "N" THEN
1009
1012 PRINT : PRINT "RETYPE THE LINE"
1020 GOSUB 300
1025 L$(Z) = ""
1030 I = Z:N = 1:LL = 0:FL = 0:TT = 0: GOTO 105
1057 IF MU > 0 THEN RETURN
1058 INVERSE : INPUT "ADD NEW TEXT? Y OR N?";RV$: NORMAL
1059 IF RV$ = "Y" THEN V = 4:I = I - 1: GOTO 710
1060 INVERSE : PRINT "WRITE TO DISK OR PRINTER OR BOTH?": INPUT "'D' OR 'P' OR 'B'";RV$:
NORMAL
1065 IF RV$ = "D" THEN 500
1066 IF MU > 0 THEN RETURN
1067 IF RV$ = "B" THEN GOSUB 500
1070 GOTO 1200
1075 INVERSE : INPUT "DELETE OR ERASE LINE(S)? D OR E? ";DE$
1076 IF MU = 5 THEN DE$ = "ERASE"
1077 IF MU = 4 THEN DE$ = "DELETE"
1078 PRINT DE$;" FROM LINE #?";: INPUT ML: INPUT "TO LINE #?";EL:NL = EL - ML: IF NL < =
0 THEN NL = 1: NORMAL
1079 IF MU = 5 THEN DMY = 1: FOR X = ML TO ML + NL - 1:L$(X) = "": NEXT X: RETURN
1081 FOR X = ML TO I - NL:L$(X) = L$(X + NL): NEXT X:I = I - NL: FOR X = I + 1 TO I + NL
:L$(X) = "": NEXT X
1082 RETURN
1085 REM **** INSERT A LINE ****
1087 INVERSE : INPUT "INSERT FROM LINE #";ML: INPUT "TO LINE #";EL:NL = EL - ML: IF NL <
= 0 THEN NL = 1: NORMAL
1089 FOR X = (I + NL) TO (ML + NL) STEP - 1:L$(X) = L$(X - NL): NEXT X
1091 FOR X = ML TO ML + NL - 1:L$(X) = "": NEXT X:I = I + NL
1092 RETURN
1100 REM ** SPACING FOR TAB INDENT **
1102 FOR X = 1 TO TB:L$(I) = L$(I) + S$: NEXT X
1105 FOR X = 1 TO N - 1:L$(I) = L$(I) + A$(X):A$(X) = "": NEXT X
1110 FL = 0:N = 1:LL = 0:TT = 0
1120 PRINT CHR$(13)
1125 IF V = 3 THEN RETURN
1126 IF MU > 0 THEN RETURN
1130 GOTO 864
1200 REM *** PRINT ROUTINE ***
1202 INVERSE
1203 INPUT "AUTO PAGE NUMBER ON OVERFLOW? Y OR N";PO$
1205 INPUT "CENTER TEXT ON PAGE? Y OR N?";RV$
1206 INPUT "SINGLE OR DOUBLE SPACING? S OR D? ";SC$:MOD = 58: IF SC$ = "D" THEN MOD = 28
1207 INPUT "PRINT LINE #'S? Y OR N ";II$: PRINT "SPECIFY PRINT DENSITY (CHAR/INCH)": INPUT
"1=8 2=10 3=12 4=16 CH/INCH ";CI
1208 IF CI = 1 THEN CI$ = CHR$(28):CP = 72:WS = 5
1209 IF CI = 2 THEN CI$ = CHR$(29):CP = 85:WS = 6
1210 IF CI = 3 THEN CI$ = CHR$(30):CP = 102:WS = 7
1211 IF CI = 4 THEN CI$ = CHR$(31):CP = 140:WS = 10
1212 INPUT "ENHANCED OR NORMAL MODE? E OR N? ";XX$
1213 IF XX$ = "E" THEN EN = 1:CP = INT (CP / 2):WS = WS * 2: GOTO 1215
1214 EN = 2
1215 POKE 54,0: POKE 55,193: REM TURN ON PRINTER
1220 PRINT "": REM PRINT "CTRL I (MAX PRINT WIDTH OF YOUR PRINTER) N" .. FOR EXAMPLE:
PRINT " CTRL I 80N" FOR 80 COL. PRINTER
1221 PRINT CI$: CHR$(EN);
1224 CTR = 1
1225 IF RV$ = "Y" THEN CTR = INT (((CP - SL) / 2) - WS)
1226 IF CTR < 1 THEN CTR = 1

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1227 PK = 0
1228 PG = 2
1229 IF II$ < > "Y" THEN 1235
1230 FOR X = 1 TO I: PK = PK + 1: IF PO$ < > "Y" THEN 1232
1231 SP = INT ((PK / MOD - INT (PK / MOD)) * MOD + .05) * SGN (PK / MOD): IF SP = 0 THEN
    GOSUB 40
1232 HTAB CTR: PRINT X; ".": L$(X): IF SC$ = "D" THEN PRINT
1233 NEXT X: GOTO 1248
1235 FOR X = 1 TO I
1236 PK = PK + 1: IF PO$ < > "Y" THEN 1239
1237 SP = INT ((PK / MOD - INT (PK / MOD)) * MOD + .05) * SGN (PK / MOD): IF SP = 0 THEN
    GOSUB 40
1239 HTAB CTR: PRINT L$(X): IF SC$ = "D" THEN PRINT
1240 NEXT X
1248 PRINT "": REM PRINT "CTRLI 40N" TO RESET PRINT LINE TO 40 CHARACTERS TO PREPARE F
    OR SHUTTING OFF PRINTER
1250 POKE 54,240: POKE 55,253: REM SHUT OFF PRINTER
1255 HOME: PRINT "END OF PRINTING": INVERSE: INPUT "ANOTHER COPY? Y OR N ": ZZ$: NORMAL
    : IF ZZ$ = "Y" THEN 1213
1257 IF MU = 9 THEN RETURN
1260 END
1300 TEXT: HOME: FOR ZA = 0 TO 39: PRINT "*":: NEXT ZA: PRINT " ** EDITING OPTIONS L
    IST *"
1302 V = 0: REM ERASE POINTER
1305 PRINT "1= REVIEW TEXT": PRINT TAB( 23)"6= INSERT LINE(S)": PRINT "2= RETYPE 1 LIN
    E": PRINT TAB( 23)"7= P'GRAPH SHIFT"
1307 PRINT "3= RETYPE MULTI-LINES": PRINT TAB( 23)"8= FIND & REPLACE": PRINT "4= DELET
    E LINE(S)": PRINT TAB( 23)"9= PRINT TEXT"
1309 PRINT "5= ERASE LINE(S)": HTAB 22: PRINT "10=": INVERSE: PRINT " RESUME TYPING":
    NORMAL
1317 FOR ZA = 0 TO 39: PRINT "*":: NEXT ZA: PRINT
1318 POKE 34, PEEK (37)
1319 IX = I
1320 INVERSE: INPUT "ENTER SELECTION ": MU: NORMAL
1322 IF MU < 0 OR MU > 10 THEN PRINT "INVALID ENTRY.. TRY AGAIN": GOTO 1320
1325 IF MU = 1 THEN RV$ = "Y"
1327 IF MU = 10 THEN 1342
1330 ON MU GOSUB 1700,1009,1500,1076,1076,1087,1400,1600,1200
1331 DE$ = ""
1332 IF MU = 1 OR MU = 2 OR MU = 3 OR MU = 9 OR V = 3 THEN I = IX
1335 GOTO 1319
1340 IF XX$ = "Y" THEN 1319
1342 I = I - 1
1343 MU = 20: REM TRIGGERS RETURN BUT NO ACTION
1345 GOSUB 864
1346 L$(I) = ""
1347 MU = 0: N = N - 1: V = 1: GOTO 91: REM RESET EDIT POINTERS. RETURN TO TYPING.
1400 REM PARAGRAPH SHIFT
1405 INVERSE: INPUT "SOURCE PARAGRAPH STARTING LINE ": S1: INPUT "SOURCE PARAGRAPH ENDIN
    G LINE ": S2
1410 INPUT "DESTINATION PARAGRAPH STARTING LINE ": D1: NORMAL
1411 NL = S2 - S1 + 1: DD = 0: T1 = S1: T2 = S2: T3 = D1
1412 IF S2 < D1 THEN NL = T3 - T2 + 1: S1 = T2 + 1: S2 = T3 + 1: D1 = T1: REM ASCENDING MO
    VE CONVERSION
1415 IF NL < = 0 THEN NL = 1
1420 ML = D1: MU = 6: GOSUB 1089: MU = 7: REM INSERT DESTINATION LINES
1425 FOR X = 0 TO NL - 1: REM COPY INTO DESTINATION
1426 L$(D1 + X) = L$(S1 + NL + X): REM DESCENDING MOVE ALGORITHM
1429 NEXT X
1430 ML = S1 + NL: MU = 4: GOSUB 1081: MU = 7: REM DELETE SOURCE LINES

```

continued on next page

```

1435 RETURN
1500 REM RETYPE MULTI LINES
1505 INVERSE : INPUT "ENTER STARTING LINE # TO RETYPE ";Q1
1510 INPUT "ENTER THE ENDING LINE # TO RETYPE ";Q2: NORMAL
1515 FOR QQ = Q1 TO Q2:Z = QQ: GOSUB 1012: NEXT QQ
1520 RETURN
1600 INVERSE : PRINT "** ENTER THE NIBBLE CONTEST! **":
1605 PRINT : PRINT "WRITE THE 'FIND & REPLACE OPTION FOR": PRINT "T.O.U.G.H.": PRINT : PRINT
"SEE CONTEST DETAILS IN THE JUNE NIBBLE"
1610 PRINT : NORMAL : PRINT "NOW, BACK TO BUSINESS": RETURN
1700 REM REVIEW LINES
1705 INVERSE : INPUT "REVIEW (1) ALL LINES OR (2) SELECTIVE?";RP: NORMAL
1710 IF RP < 1 OR RP > 2 THEN PRINT "ERROR..TRY AGAIN": GOTO 1705
1715 IF RP = 1 THEN R1 = 1:R2 = 1: GOSUB 18: RETURN : REM ** ALL LINES **
1720 INVERSE : INPUT "ENTER STARTING LINE # TO REVIEW";R1: INPUT "ENTER ENDING LINE # TO
REVIEW";R2: NORMAL : GOSUB 18: RETURN : REM ** SELECTIVE REVIEW **
10000 DIM A$(90),L$(200)
10001 X$ = ""
10005 D$ = CHR$(4):RT$ = CHR$(13)
10008 U$ = CHR$(27)
10010 MOD = 60
10012 EN = 2
10015 I = 1:LL = 0:FL = 0
10020 PRINT D$;"NOMONI,O,C"
10021 N = 0:S$ = " ": RETURN
10023 HOME
10025 FOR ZA = 0 TO 39: PRINT "*";: NEXT ZA: PRINT : HTAB 13: INVERSE : PRINT "** T.O.U.
G.H.**": NORMAL
10027 HTAB 4: INVERSE : PRINT "COPYRIGHT 1980 - MICRO-SPARC, INC.": NORMAL
10029 PRINT "THE 'TEXT OUTPUTER, UPDATER, AND": PRINT "GENERALIZED FORMATTER (T.O.U.G.H.
) IS": PRINT "A SYSTEM FOR MANAGING TEXT OF ALL"
10031 PRINT "TYPES. IN OPERATION WITH THE APPLE II": PRINT "AND THE IDS 440 PRINTER, IT
CAN HANDLE": PRINT "4 DIFFERENT PRINT SIZES AS WELL AS WIDE"
10033 PRINT "'ENHANCED' PRINTING.": PRINT : PRINT "THE SYSTEM IS GENERALLY SELF-PROMPTIN
G.": PRINT : PRINT "TO COMPENSATE FOR THE DIFFERENCES IN "
10035 PRINT "PRINT SIZES...WHICH BECOMES ESPECIALLY": PRINT "IMPORTANT IN AUTOMATIC TEXT
CENTERING.": PRINT "USE THE FOLLOWING GUIDELINES:"
10037 PRINT "DECIDE WHICH SIZE TO USE FOR FINAL TEXT": PRINT "PRINTING. THEN USE THE TA
BLE ON THE": PRINT "NEXT PAGE TO DECIDE ON THE LINE LENGTH"
10039 PRINT : INPUT "HIT RETURN KEY TO GO TO NEXT PAGE";XX$
10041 HOME : HTAB 9: PRINT "** TABLE OF LINE LENGTHS **": PRINT : PRINT "DECIDE ON PRINT
SIZE (8.3, 10, 12, 16.5": PRINT "CHARACTERS/INCH). THEN DECIDE ON NORMAL"
10043 PRINT "OR ENHANCED PRINTING. THEN TRY TO MAKE": PRINT "YOUR LINE LENGTH EQUAL TO 0
R LESS THAN": PRINT "THE LINE LENGTH SHOWN BELOW:"
10045 PRINT : HTAB 18: PRINT "LINE LENGTHS": PRINT "PRINT SIZE      NORMAL      ENHANCED"
10046 FOR ZA = 0 TO 39: PRINT CHR$(95);: NEXT ZA: PRINT
10047 PRINT "8.3 CHAR/INCH      60      30"
10048 PRINT "10 CHAR/INCH      70      40"
10049 PRINT "12 CHAR/INCH      85      45"
10050 PRINT "16.5 CHAR/INCH 115      60"
10052 PRINT : INVERSE : INPUT "SPECIFY LINE LENGTH ";SL
10053 INPUT "# OF CHARACTERS TO INDENT FOR TAB ";TB
10060 SL = SL + 1
10065 INPUT "HIT RETURN KEY TO BEGIN ";XX$: NORMAL : RETURN
11000 PRINT "": PR# 0: PRINT : REM PRINT " IS PRINT"CTRL I 40N"
11005 PRINT "ERROR #"; PEEK (222);" IN LINE #"; PEEK (218) + PEEK (219) * 256
11010 PRINT "IF YOU HAVE BEEN ALREADY TYPING IN TEXT": PRINT "YOU CAN RECOVER IT BY ENTE
RING.": PRINT : PRINT "      GOTO 1300 (RETURN)": END

```

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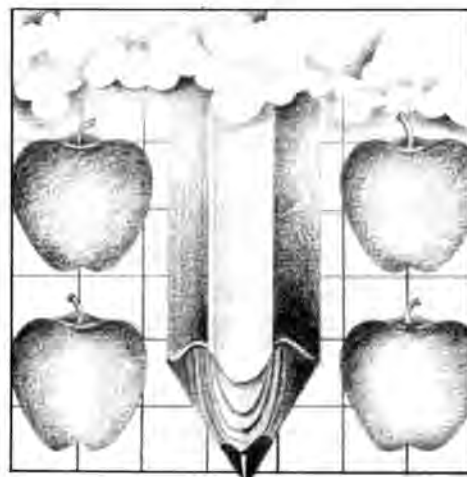
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```
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3. THE CRUNCHER
4. THE TEXT FILE COPY
5. THE PROMPTER
6. THE CALCULATOR
7. THE DISKETTE COPY
8. CHANGE TODAY'S DATE
ENTER YOUR SELECTION ->
```

```
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2. THE ARRAY EDITOR
3. THE COPIER
4. THE PATCHER
5. THE LINE CROSS REFERENCE
6. THE VARIABLE CROSS REFERENCE
7. THE CALCULATOR II
8. CHANGE TODAY'S DATE
ENTER YOUR SELECTION ->
```

The Cruncher removes REM statements and compresses code in Applesoft programs. The Prompter is a powerful data entry subroutine that can handle both string and numeric data. Options include using commas, decimal points, and leading zeros with right-justified numerics. A maximum field length can be specified to prevent overflow in both numeric and alphanumeric fields. The Diskette Copy formats an output disk, copies each track, and verifies that the output matches the input. PLUS FOUR MORE UTILITIES TO AID YOUR OWN PROGRAMMING. Suggested Retail Price for Dakin5 Programming Aids is \$39.95.

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by W. L. Passauer

The Data Factory allows you to manage large amounts of alpha/numeric information such as INVENTORIES, MAILING LISTS, (FOR PRINTING MAILING LABELS), ACCOUNTS RECEIVABLE, ACCOUNTS PAYABLE, BUDGETS, RECIPES, APPOINTMENT CALENDARS, WORK LISTS, SHOPPING LISTS, LIBRARY FILES, ADDRESSES, GENERAL INFORMATION, ETC. FOR BUSINESS OR HOME. The Data Factory is constructed of nine (9) Modules. Only the module being used is loaded into memory for manipulating data rather than the entire program, thus saving most of memory for manipulating data rather than program storage.

The program allows an almost unlimited amount of flexibility in manipulating and displaying data to a Monitor or Printer. Every attempt has been made to make the program easy to operate for anyone with little or no computer experience. The program is error protected and uses plain English prompts for ease of operation.

The program is called Universal because it will handle many different kinds of data files. Below is a partial list of the features found in The Data Factory. The use of this program is limited only by the imagination.

- Written in Applesoft Basic and machine code—User modified
- Uses the new DOS 3.2.1
- Enter ANY CHARACTER as Data (Commas, quotation marks etc.)
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- Search for items falling within certain Numerical or Data values
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- Three variations of Totalling (Adding) up a numeric field
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- Construct a new file combining other files
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- Delete Print-out Formats
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- Search for MANY different items at one time
- Search using record numbers or data
- Level Search—Search up to 20 levels (Fields) deep for search accuracy
- Perform all Routines on any field of data
- Total, Average or Count a field
- Change part of a line (Record) of Data
- Delete an entire Data File
- Copy a single Data File to another diskette
- Delete fields, add fields; change field length and locations in file and append other Data files to original file even if field lengths and positions don't match
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- List all or part of your Data File with or without record numbers, or number your lines
- Program split into nine modules for maximum memory efficiency

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With or without Printer

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For Voltage Across Series Capacitors
Total Inductance (up to 10 inductors)
Voltage Regulation

Capacitive Reactance
Inductive Reactance
Impedance and Phase Angle for Resistance & Inductance in Series
Impedance and Phase Angle for Resistance & Capacitance in Series
Impedance and Phase Angle for Inductance & Capacitance in Series
Impedance and Phase Angle for Resistance & Inductance in Parallel
Impedance and Phase Angle for Resistance, Inductance, &
Capacitance in Series
Impedance and Phase Angle for Inductance & Capacitance in Parallel
Impedance and Phase Angle for Resistance, Inductance &
Capacitance in Parallel
Impedance and Phase Angle for Inductance & Series Resistance in
Parallel with Resistance
Impedance and Phase Angle for Inductance & Series Resistance in
Parallel with Capacitance
Impedance and Phase Angle for Capacitance & Series Resistance in
Parallel with Inductance & Series Resistance

Mutual Inductance
Coupled Inductance of Inductance in Parallel (with Fields Aiding)
Coupled Inductance of Inductance in Parallel (with Fields Opposing)
Coupled Inductance of Inductance in Series (with Fields Aiding)
Coupled Inductance of Inductance in Series (with Fields Opposing)
Coupling Coefficient for 2 Inductively Coupled Coils
Energy Stored in an Inductor
Q of a Coil where Resistance & Inductance are in Series
Q of a Capacitor where Resistance & Capacitance are in Series
Q of a Capacitor where Resistance & Capacitance are in Parallel
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Admittance of a Series Circuit
Susceptance of a Series Circuit
Power Factor
Average, RMS, Peak, & Peak-Peak Conversions
Time Constants (on charge or discharge)
Transformer Formulas

Constant - K Lowpass T - Section Filter
Constant - K Lowpass L - Section Filter

Constant - K Lowpass PI - Section Filter
Constant - K Highpass T - Section Filter
Constant - K Highpass L - Section Filter
Constant - K Highpass PI - Section Filter
Constant - K Bandpass Filter
Constant - K Bandreject Filter
Series M - Derived Lowpass T - Section Filter
Series M - Derived Lowpass L - Section Filter
Series M - Derived Lowpass PI - Section Filter
Series M - Derived Highpass T - Section Filter
Series M - Derived Highpass L - Section Filter
Series M - Derived Highpass PI - Section Filter
Shunt M - Derived Lowpass T - Section Filter
Shunt M - Derived Lowpass L - Section Filter
Shunt M - Derived Lowpass PI - Section Filter
Shunt M - Derived Highpass T - Section Filter
Shunt M - Derived Highpass L - Section Filter
Shunt M - Derived Highpass PI - Section Filter

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Gain of an Amplifier Stage

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Voltage Gain
Output Resistance
Power Gain
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Beta (Current Gain of the Common-Emitter Configuration)
To find (Alpha) with Beta given, or to find (Beta) with Alpha given

Impedance of a Coaxial Line
Attenuation of a Coaxial Line
Impedance of a Parallel Conductor
Percent of Amplitude Modulation
Side Band Power of an A-M Carrier
Total Radiated Power
Percent of Modulation in an F-M Carrier
Modulation Index of an F-M Carrier
Number of Decibels corresponding to a given power ratio
Number of Decibels corresponding to a given voltage or current when the
impedances across which the signals are being measured are equal.
Number of Decibels corresponding to a given voltage or current when the
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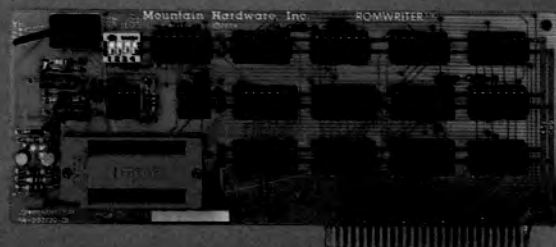
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