

BITS, BYTES & PIXELS

LIMA 99/4A USERS GROUP



JUNE 1996--Volume 12, #6

THANK YOU
from Charles Good

As I write this I have my "Jim Peterson Achievement Award 1996, Community Achievement Winner" plaque sitting in front of me. I am truly honored. Thank you, TI community, for this honor. I have been a 99/4A user since 1982. I have been using a Geneve for about 2 years. Even though I have a fast IBM compatible with 16MB of ram sitting right next to my Geneve, I still use the Geneve and my 99/4A system for routine computing, including creating the Lima newsletter, writing this article, and writing my Micropendium column. I am familiar with and comfortable using the TI systems. The only thing I personally use my IBM for is internet web surfing. I intend to keep using my TI systems for a long time.

The recent Cleveland MUG Conference was a really enjoyable event. There was excellent attendance (I suspect well over 100), lots of free good food both Friday and Saturday evenings, and lots of neat stuff to see and purchase. The show was extra special to me for two reasons. 1- I was presented with the Peterson Award, and 2- I witnessed the first ever showing of a long lost TI cartridge program that I had a small part in discovering. Mike Wright demonstrated ET AND HIS ADVENTURES ON LAND, a 1983 command module program that previously existed only as GPL source code in the author's closet. As readers of this newsletter in the fall of 1995 may remember, I bumped into a fellow on the internet named Hank Mishkoff. It turned out that Hank wrote a number of TI command modules, some never released. He sent the long forgotten source code of the never completed Adventures on Land module to me, I sent it to Mike Wright, and Mike got the code to work on his PC99 product. That was a real thrill for me.

Additional details of the Cleveland MUG conference will be available in the Cleveland groups' newsletter. There were 6 hours of video tape made, and the Lima group has purchased a set of these videos. When received, they will be made available to our members.

***DONE**

to Ted A Stringfellow
115 Booth Circle
Ocean Springs MS 39564

from Charles S Stringer
243 Columbus Drive
Decatur IL 62526

4 March 1996

Dear Ted:

Your letter and articles in BB&P for January reassure me that there are at least a few kindred souls left in the TI community--ones who enjoy the TI for the sheer fun of fooling around.

I think that people who get into computing by buying a battleship PC miss a lot of the fun we've had in making do with a little canoe, scheming from time to time to add something we've heard about, then learning how to use it. You can't get hurt in the wallet by owning a TI.

You mention that you know of no practical use for the Mark and Free Sector functions of Birdwell's DSKU. I enclose a file (PRBTIP2) which describes a use for the 'Free Sector' function. It was devised to circumvent a sudden inability to copy PRBASE data disks in the usual way.

If you're familiar with PRBASE v2.0, you know that the data disk format is entirely different from that of most disks. Sectors 0-9 are used to record the definitions of data fields, parameters for printing reports and labels, data-field names, etc. Sectors 10-359 contain data records, one set per sector. DSKU's 'Copy Sectors' works fine for copying sectors 1-359, but in doing so it records entries for the VIB usually stored in sector '0'. But because this sector must contain other information needed by the program, one must copy this sector LAST, and then correct it at byte >3B (which is altered in the act of copying) by the use of 'Free Sector 0'.

When one thinks about it, you realize that sector '0' couldn't be copied without it. I don't know of an application of 'Mark Sector', but I suspect that it's been used to devise file protections.

Incidentally, the problem with PRBASE copies was finally traced to the use of a 'widget' which contained, besides XBASIC, a 'SuperCart' or a 'Minimemory' cartridge. This caused flaws in several work-horse programs:

--FNLWEB text files were sometimes scrambled;

--MASSCOPY screens suffered from missing characters to the point of being unusable;

--John Johnson's PRBUTL/BAS (the utility usually used to copy PRBASE data disks) gave erratic results, usually failing after copying a few records.

I'm sending a copy of this disk to Charley Good, so that he can be informed.

***DONE**

C H A L I B U T M Z P P O G Y A R A T N A M H P S
 O S E S K A T E O O O P A L E Y E E K I P A S O H
 L T M R T G V W R L A C S R B O A N U T D H S M A
 D U A E R J C G A H R R R Q R Z C F U D A E A P D
 F R T R L I Y I Y P K L O O A O B M O R E J B A M
 I G F S P T N F E A P O V C A M T C K L T G T N Q
 S E H Y T O Q G E V O R E D K K K F O J M H O O S
 H O P R O J N I L X Y T U T S F E F I U Z Y L U B
 W N R E D S N A P P E R O T U H I R X S W V N A K
 H Z K D L M L W S S A B A E S B W S Z G H F R L I
 I R I N E R O C A B L A N I Q X K J H G I R F E F
 T Q D U Y A R G N I T S F A L E H I Z S A A N K X
 E S W O R D F I S H Q T D S L M H R H C W J Y J G
 F V O L V E R A P M A T E F A V K S U R I V W V I
 I B A F F C N I D C Q P U L H I T D I F I D W B Q
 S Z I J O R Y H M B G J Y D H S A U U F H G H A R
 H Q N I H P L O D P Y X M X I S I X O I K L C D M
 T I B O N K R L L L U F I H H P I F W R L A U F H
 S C A R P T E E W N K O L S S E X F E K T J E W S
 R E D W X R R N P O H C G I T B A W G U T A A W I
 R I J Y E E O X T I Q N O F F I H C O N L V E A F
 P W B K K M T U I R R Y Z L E O C O E N I B F S G
 Y N C C L O O G F E J T M I L V R D L S N Y D C N
 Z A I A P R O P S H M X S A I O E A O P A I L N I
 M P S S T O V K R Y H W T S T O P V S O R O M F K

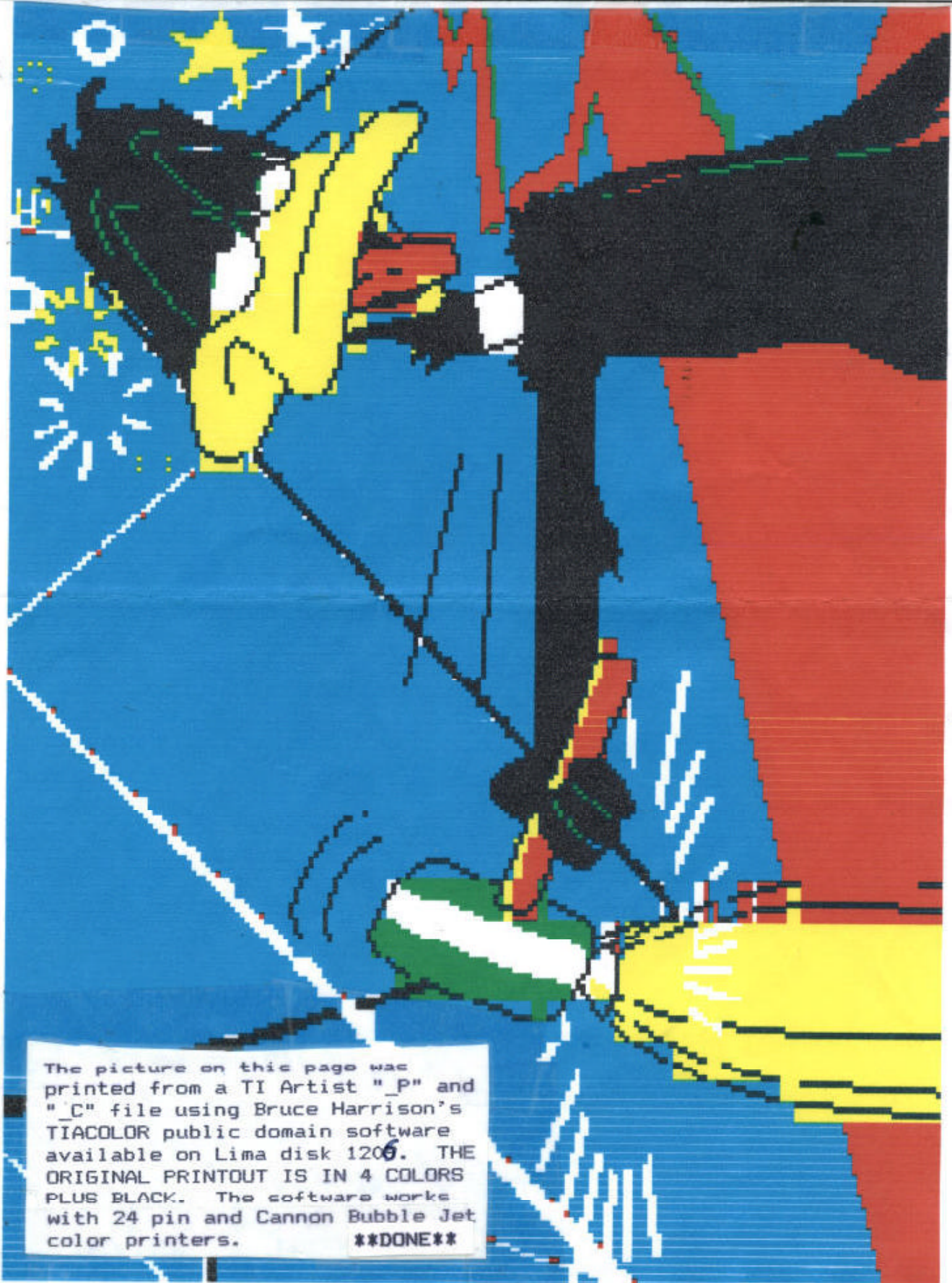
FIND THESE 53 WORDS IN THE PUZZLE ABOVE.

ALBACORE	EEL	MANTARAY	POLLOCK	SHAD	SUNFISH
BARRACUDA	FLOUNDER	MINNOW	POMPANO	SHARK	SWORDFISH
BASS	FLYINGFISH	MORAYEEL	PORGY	SKATE	TARPON
BLUEFISH	GOLDFISH	OPAH	REDSNAPPER	SMELT	TILEFISH
CARP	HADDOCK	OPALEYE	ROCKFISH	SOLE	TROUT
CATFISH	HALIBUT	PARROTFISH	SAILFISH	SPOT	TUNA
COD	HERRING	PERCH	SALMON	STINGRAY	WEAKFISH
CROAKER	KINGFISH	PICKEREL	SEABASS	STRIPER	WHITEFISH
DOLPHIN	MACKEREL	PIKE	SEATROUT	STURGEON	

MADE USING THE FILE DSK1.FISH

The above is made from Bruce Harrison's WORD SEARCH software.
 This public domain software is reviewed in the May/June 1996
 issue of Micropendium and is available on Lima disk 1197
 together with a whole bunch of predefined word lists. You
 can also make your own word lists. The software makes
 puzzles like that shown from such word lists.

***DONE**



The picture on this page was printed from a TI Artist "_P" and "_C" file using Bruce Harrison's TIACOLOR public domain software available on Lima disk 1206. THE ORIGINAL PRINTOUT IS IN 4 COLORS PLUS BLACK. The software works with 24 pin and Cannon Bubble Jet color printers. ****DONE****

HOW TO COPY PRBase DATA DISKS BY BIRDWELL'S DISK-UTILITIES PROGRAM

- 1) Load DSKU
- 2) Press ENTER to call up main menu, then select '4) Sector Utilities'.
- 3) From the sub-menu select '3) Copy Sectors'. Put the source disk in Drive 1 and the target disk in Drive 2.
- 4) Set starting and ending sector values at >1 and >167 if using a single-sided data disk, or >1 and >2CF if double sided. Press ENTER twice to start the copying.
- 5) When copying is finished, use Fctn-9 to return to the 'Sector Utilities' sub-menu.
- 6) Select '1) Edit Sector', then enter '1' and '0' to call up the contents of sector 0 of the source disk.
- 7) To write this sector to the target disk, use 'Ctrl-W', and change the drive number to '2'. Accept the default value of the sector number ('0') and press ENTER again.
- 8) Use Fctn-9 to return to 'Sector Utilities' sub-menu.
- 9) Select '5) Free Sector', then enter '2' to select the target disk, then press ENTER. (This marks sector 0 as 'free', thereby correcting an error in the contents of byte >38 of that sector which was introduced by the act of writing to sector '0'.)
- 10) Use Fctn-4 to return to the main menu. Select '3) Disk Utilities'.
- 11) Choose '4) Compare Disks', enter drive numbers and set starting sector to '>0'; then set ending sector as the value used in step 4 above. Press ENTER and adjust the output device option from 'P' to 'S'; press ENTER again to begin the compare operation.
- 12) When the disk drives stop, verify that no sector is reported as unequal.
- 13) Use Fctn-4 to return to the main program-menu; select '6 Exit' and press ENTER to return to the system menu.

Charles S Stringer
243 Columbus Drive
Decatur IL 62526

DONE

THINGS THAT HAVE COME AND GONE AND SOME THAT NEVER WERE article by Bill Gaskill June 1996

This month we'll finish up our discussion/tutorial on the Navarone Data Base Management System and how you can get the most out of it for your money.

SUBFILES:

If you had intended to create a subfile rather than sorting the file, the only thing different that would have been required was an entry in the STRING prompt and the entry of an E or an N in the parameters prompt.

To create a subfile, you must enter a search parameter in the STRING variable that will be found in the field that is being sorted on. For example, assume that you wished to create a subfile of all records that contained the phrase REVIEW-HARDWARE in the TYPE field. TYPE is the second field in the file so you would enter 2 as the sort selection field and then 31 and 22 as the beginning field position and LENGTH of the sort field. You would enter the phrase REVIEW-HARDWARE in the STRING prompt and then an E at the E/N prompt to tell the sort program that it is to sort only those records that are EQUAL to REVIEW-HARDWARE in the TYPE field.

The resulting file would then need to be RUN through the SETUP program to generate a SETUP file as per the instructions in the SORTING DATA paragraphs above.

PRINTING REPORTS:

To print a report enter the report generator by pressing 4 from the DBMS menu. When prompted for the SETUP file name, which is the name of the report definition, enter DSK1.INDEXRPT1 and then press <ENTER>. Next, press Fctn 5 (BEGIN) and then type in DSK1.INDEX at the DATA FILE prompt. The default printer configuration of PIO. appears. Alter it to fit your printer if needed, press <ENTER> to accept it if it fits your system, or erase it and press <ENTER> if you wish to print the file to screen rather than to a printer. In this case we will actually generate a printed report, so after taking care of the printer name, press <ENTER> and answer the remaining prompts.

At the;

Last line of page header

enter a 01 and then press <ENTER>. At the;

Last line of record form

enter a 02 and then press <ENTER>. Press <ENTER> through

NEXT PAGE

the remaining prompts for suppression of detail and pauses between pages (unless you are not using continuous feed paper) and the report printing process will begin.

The LAST LINE... prompts are somewhat confusing to the new user. What they allow is control over header inclusion in the report and spacing between lines printed on the report. Thus, if you entered a zero at the ...PAGE HEADER prompt the field names would not appear in the report. If you entered 03 at the ...RECORD FORM prompt each record would have one blank space printed between it and the last record.

The Navarone report generation system also supports other advanced features besides the cut and paste layout capabilities. Among the neatest are the ability to imbed printer control codes in a report definition and the ability to define break fields that, when coupled with the detail suppression option, can count the number of occurrences of a break field in the file. Consult the system manual for more detail on these options.

HORIZON RAM DISK:

The Horizon Ram Disk may be used both as a program disk and/or as a data file storage disk. If it is to be used as a program disk, you must configure it as DSK1. DBMS treats it exactly as it does a mechanical floppy.

HARD DISK USAGE:

DBMS supports the Myarc HFDC for both program access and data file storage. The programs found on the DBMS system disk must be copied to the DSK1 emulation subdirectory for system programs access. Data file storage capabilities may be created in any subdirectory on your hard disk, as long as the WDS1., subdirectory name and then the file name, when combined into one string of characters, do not exceed 15 spaces. For example;

WDS1.DBMS.FILES

is acceptable because it is 15 or fewer characters in length. But,;

WDS1.DBMS.FILENAME

would not work because it exceeds the 15 character combined path and filename limitation.

FUNCTION KEYS:

FCTN 1: Erases a data input block in the DBM SETUP screen editor.

FCTN 2: Inserts a data input block space in the DBM SETUP screen editor.

FCTN 4: Halts reports printing process in the DBM REPORTS program. Deletes the current record in the DBM ENTRY program.

FCTN 5: Begins entry of a new record in the DBM ENTRY program. Begins the printing process in the DBM REPORTS program.

FCTN 6: Accesses the key field information screen in the DBM SETUP program. Accesses the field length definition screen in the DBM REPORTS program. Also used the same as the <ENTER> key when using indexed method for data access in the DBM ENTRY program.

FCTN 7: Displays a help window at the base of the screen in the DBM ENTRY program. Accesses the report format editor in the DBM REPORTS program.

FCTN 8: Accesses the first sequential record in the DBM ENTRY program.

FCTN 9: Backs up one screen from the current screen in almost all situations, in any DBM program. FCTN =: Quits the current program.

EXTENDED BASIC DATA ACCESS:

Because DBMS data files are created in standard 99/4A Display/Fixed format, they may easily be accessed in an Extended Basic environment. This means that data can be manipulated outside of the DBMS environment so that features not provided by DBMS can be created for further manipulation of data. For example, the Extended Basic program listed below may be used to display the contents of the sample data base we have created.

```

1 !DBMS file access routine
100 CALL CLEAR :: R=2
110 OPEN #1:"DSK1.INDEX",INP
UT ,DISPLAY ,FIXED 172
120 LINPUT #1:B$ :: DISPLAY
AT(R,1):B$ :: R=R+4 :: IF R
>18 THEN R=2
130 IF EOF(1)THEN 160 ELSE 1
40
140 CALL HCHAR(23,2,80,1)::
DISPLAY AT(23,1):"ress any k
ey to resume scrol" :: CALL
HCHAR(23,31,108,1)
150 CALL KEY(0,K,S):: IF S=0
THEN 150 ELSE 120
160 CLOSE #1
    
```

Other programs may be created that can be used to merge two or more data files into a single file, create subfiles from a main file, convert data to TI-WRITER format and more.

```

1 'DRMS file merge utility
100 CALL CLEAR
110 DISPLAY AT(5,1):"First f
ile:": "Merge file:": "Sav
e file as:": "Correct? (Y/N
):"
120 ACCEPT AT(5,12)BEEP SIZE
(15):IN1$
130 ACCEPT AT(7,12)BEEP SIZE
(15):IN2$
140 ACCEPT AT(9,14)BEEP SIZE
(15):ON$
150 ACCEPT AT(11,16)BEEP:YN$
:: IF YN$<>"Y" THEN 110
160 IF IN1$=ON$ THEN 250
170 IF IN2$=ON$ THEN 250
180 OPEN #1:ON$,UPDATE,DISPL
AY ,FIXED 172 :: OPEN #2:IN1
$,INPUT ,DISPLAY ,FIXED 172
:: DISPLAY AT(22,1):" " : "Rea
ding from:":IN1$
190 LINPUT #2:A$ :: PRINT #1
:A$ :: Y=Y+1 :: DISPLAY AT(2
2,1):"Records merged:":Y
200 IF EOF(2)THEN CLOSE #2 E
LSE 190

```

HOME COMPUTER MAGAZINE'S 'NO ADVERTISING' POLICY:

The following text comes from the September 1984 issue of Home Computer Digest. It is the announcement by Gary Kaplan et al concerning HCM's move to emulate Mad Magazine.

The publication you are now holding is a bonus for subscribers to Home Computer Magazine. It will be mailed to you approximately nine times per year. We hope you'll find it both enjoyable and useful.

The adjoining press release (see below) explains the reason for this extra magazine--keeping you informed of mail order product availability while allowing us an ad-free environment in our main publication. I'd like to share with you--our valued subscribers--some of the behind the scenes events which lead to the unprecedented publishing move described in the press release.

First, as many of you know, a massive shake-out has been taking place in the computer industry. Hardware and software companies--and magazines--have been "biting the dust" at an alarming rate. In today's highly competitive marketplace, the number of firms who sell enough product to be able to pay for magazine advertising has rapidly been dwindling. What often appears to be a healthy dose of paid advertising in a computer magazine is often just an overextension of credit. Many of the advertisers have trouble paying; some are forced to go bankrupt and never do pay. In effect, the thousands of

advertisers the computer magazine industry once had now numbers in the hundreds.

Fortunately, Home Computer Magazine is not dependent upon advertising sales to "stay alive". That's because, unlike most other computer magazines, we (1) sell almost all copies we place on the newsstands, (2) haven't spent huge sums of money on promotions to obtain subscribers, and (3) will be able to further amortize our magazine front-end costs over a new spin-off product line debuting this fall.

The rest of the industry will probably regard Home Computer Magazine as being slightly "mad" for turning away ad dollars, but "What, Me Worry?"--MAD Magazine has prospered for over 30 years without outside advertising! We too, are confident that this unorthodox move will actually assure our survivability and bring greater financial success. The new "uncluttered" magazine format will allow us to further distinguish ourselves from the rest of the pack by giving both our present readers, and the hundreds of thousands more future readers, a computer magazine value unequalled anywhere. In the vernacular of the day, "more beef and less bun" nourishes profitable growth.

It might interest you to know that all advertisers in this Digest have pre-paid their ads--thus giving us (and we hope you too) some additional assurance of their viability as ongoing businesses. Because these advertisers are now only reaching our subscribers (and not our newsstand purchasers), we ask that you do them (and us) a favor by showing the Digest to others who would benefit from seeing it--and letting them know that they can get their own personal copies by subscribing to Home Computer Magazine.

Our staff here is very proud to be pioneers in the computer publishing industry--especially when others are retreating or falling by the wayside. Without you, our loyal subscribers, the successful journey we've had over the years wouldn't have been possible. I'd therefore like to once again thank each of you for your past, present and future support.

Gary M. Kaplan
Publisher

THE PRESS RELEASE:

FOR IMMEDIATE RELEASE

COMPUTER MAGAZINE MAKES UNPRECEDENTED MOVE

Emerald Valley Publishing Co. announced today that beginning with its September 1984 issue, Home Computer Magazine will no longer carry outside advertising.

NEXT PAGE

According to publisher Gary M. Kaplan, "We want Home Computer Magazine to stand out and be recognized as the best publication in its field. By removing the advertising content from the magazine, we have the editorial and artistic freedom to produce a truly unique publication that will set the standard for editorial quality, integrity, and readability for the entire industry."

The new magazine format will allow each article to be presented in its entirety without being interrupted by distracting advertising material. It will also prevent articles from being broken by intervening editorial material resulting from a less-than-flexible layout required to accommodate the needs of advertisers.

"We have thoroughly analyzed the financial considerations of this unprecedented move," Kaplan continued. "Our profitability projection has yielded very favorable results and undoubtedly reflects the current magazine's uncommon strengths: its extremely high sell-through percentage on newsstands; its large, inexpensively acquired subscriber base; and its companion ON DISK Revue (tm), a spin-off software line recently introduced at the Summer Consumer Electronics Show, slated for retail distribution this fall."

Subscribers to Home Computer Magazine will also be kept abreast of additional product availability through a separately mailed, 32-page publication called Home Computer Digest (tm). This supplementary publication will be mailed approximately nine times per year and will contain mail-order advertising plus limited editorial material geared to readers who purchase products by mail.

** Although Kaplan's announcement states that Home Computer Digest would be mailed nine times per year, beginning (I assume) with the September 1984 issue, I've only seen September 1984, November/December 1984, and February 1984 issues. Does anyone else out there in the TI Community have other issues of Home Computer Digest? If so, I have two "extra" September 1984 issues and two "extra" November/December 1984 issues that I would trade 1-for-1 for other issues I don't have. If that is not possible, but you do have other issues, please write me at Bill Gaskill 2310 Cypress Ct Grand Junction, CO 81506 or call me at 970-242-8842 and we can discuss other possible arrangements such as my purchasing your copies etc.

WHATEVER HAPPENED TO:

- Seagull Software Box 611 Keyport, WA 98345. They offered 99/4A software such as Coin Management System, Disk Library System, Saving Sort, Teaching Time and Trivia back in November 1984, but seemed to have disappeared after that. I ran across an ad for their products in the November/December

1984 Home Computer Digest, but don't recall seeing it anywhere else? Anyone have more info on the firm?

WANTED:

I would like to add the following items to my collection of original TI-99/4 and 4A products. If you have any of the items listed below, and they are in new, or near new condition, with original documentation, labeling, and original packaging, please contact me. But PLEASE call before you send anything, unless you are sending it as a gift.

- AVERAGE BEAR WRITER by DataBioTics

- DCEB Word Processor by DC Software Writers Box 335651 Northglenn, CO 80233.

- PAGewriter 99 by VMC Software

- MICROPAL Extended BASIC cartridge. I'll either buy yours, or trade you for an original Texas Instruments Extended BASIC cartridge.

- MINI-EDITOR for Mini Memory cartridge by Amerisoft

- TIProcessor II and/or TIProcessor III that was offered by TISOFT out of New York City in 1984.

DONE

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LOADERS, MODULAR PROGRAMMING, LINKAGES, AND OVERLAYS.
by Merle Vogt

PART I. LOADERS.

IN THESE PAPERS I WILL DISCUSS A LOT OF MATERIAL THAT I HAVE NEVER SEEN COVERED BY ANYONE IN AN ORGANIZED MANNER. THE INFORMATION EXISTS IN DRIBBLETS IN MANY PUBLICATIONS BUT HAS NEVER BEEN ALL PULLED TOGETHER.

IN THIS PART I, I WILL EXAMINE "LOADERS". THESE ARE PROGRAMS WHICH TAKE "OBJECT" PROGRAM CODE, (MODULES), AND LOAD THAT CODE INTO RAM MAKING IT INTO EXECUTABLE PROGRAMS.

THE FIRST CONFUSION FACTOR ABOUT 99 / 4A LOADERS IS THAT THERE ARE THREE OF THE MISERABLE THINGS IN THE SYSTEM, AND NONE WORK QUITE LIKE THE OTHERS. THIS NUISANCE HAS NEVER BEEN POINTED OUT IN ANY PUBLICATION THAT I EVER SAW. BUT, IT IS IMPORTANT BECAUSE YOU PLAN AHEAD, STARTING BACK IN THE "SOURCE" CODE WHEN YOU CREATE PROGRAM CODE, SO AS TO BE COMPATIBLE WITH WHICH "LOADER" YOU EXPECT TO USE WHEN YOU FINALLY GET TO THE LOAD PHASE OF THE JOB.

NOW, FIRST, I WANT TO EXPLAIN IN DETAIL THE INFAMOUS "REF / DEF" TABLE, AS IT IS NAMED. TO BE ABSOLUTELY PRECISE IT CONTAINS ONLY DEF'S (DEFINITIONS). A DEF IS THE DEFINITION OF A NAME, (ALSO CALLED "SYMBOL" IN THE MANUALS), AND THE ADDRESS WHERE THAT NAMED ITEM IS LOCATED IN MEMORY. THE NAMED ITEM CAN BE EITHER A PROGRAM ENTRY, (START) ADDRESS OR A DATA ITEM. NAMES ARE 6 BYTES, ALPHA/NUMERIC. ADDRESSES ARE 2 BYTES, HEX. SO A DEF ENTRY IN THE REF / DEF TABLE IS ALWAYS 8 BYTES LONG. THE FIRST CONFUSING FACTOR, AS I HAD ALLUDED TO, IS THAT ALL THREE LOADERS HAVE THE REF / DEF TABLE AT DIFFERENT LOCATIONS IN MEMORY. SO WHEN YOU MUST DEBUG A BOMBED PROGRAM YOU MUST KNOW WHERE TO LOOK FOR THE REF / DEF TABLE TO FIND THE DEF'S.

THE NEXT FACTOR IS THAT DEF'S ARE CREATED IN SEVERAL WAYS. SOME OF THE LOADERS HAND YOU A PART OF THE TABLE CONTAINING A NUMBER OF PREFABRICATED DEF'S. THESE DEFINE THE NAMES AND ADDRESSES OF DATA ITEMS AND "UTILITY" PROGRAM ROUTINES THAT YOU CAN USE IN YOUR PROGRAM, AS NEEDED. FURTHER, YOU MUST CREATE SOME DEF'S IN YOUR ASSEMBLY CODE TO MAKE IT EXECUTABLE. THE LOADER PUTS THESE INTO THE REF / DEF TABLE FOR YOU. NOW, LETS DISCUSS REF, (REFERENCE). CONSIDER THAT YOU WANT TO USE ONE OF THE UTILITY PROGRAMS FROM YOUR PROGRAM. YOU MUST CODE A REF TO TELL LOADER THE NAME OF THE REQUIRED ROUTINE. FOR EXAMPLE, TO USE A UTILITY NAMED "VMBW" YOU MUST PUT, AT THE FIRST PART OF YOUR CODE, THIS STATEMENT:

```
XXX      REF      VMBW
```

THEN, IN YOUR INSTRUCTIONS YOU CAN EXECUTE VMBW BY CODING:

```
ZZZ      BLWP @VMBW
```

NOW NOTE CAREFULLY, ON LINE ZZZ VMBW IS A SYMBOL. WHEN THE ASSEMBLER SEES THE SYMBOL IT LOOKS BACK TO SEE IF YOU PUT

IN A REF, IF NOT POW!! IF OK IT PUTS A HOLE, (= 0000) IN THE CODE. IT DOES NOT LOOK INTO THE REF / DEF TABLE SINCE NONE YET EXISTS. WHEN YOU LOAD THE PROGRAM THE LOADER SEES YOUR REF TO VMBW AND PULLS THE ADDRESS OUT OF THE DEF IN THE REF / DEF TABLE AND FILLS THE HOLE, MAKING THE CODE EXECUTABLE.

LOOK IN THE E / A MANUAL, PAGES 246 THRU 258, AND PAGE 265. THE UTILITY AND DATA ITEMS ARE SHOWN. ADDRESSES OF THE DATA ITEMS ARE SHOWN, THOSE OF UTILITIES ARE NOT. THAT IS NOT CRITICAL SINCE THE LOADER CAN FIND THEM, GIVEN THE NAME SYMBOL OF THE UTILITY.

SECTION 1.1. EDITOR / ASSEMBLER LOADER.

THIS ONE COMES OUT OF THE E / A "GROM". IT IS ITSELF LOADED INTO LOW EXPANSION RAM, AT AREA >2000 THRU >2676, BY A STEP IN THE "INITIALIZATION" PHASE WHICH IS INVOKED BY THE E / A MENU ITEM "3", "LOAD AND RUN". ONLY THEN IS LOADER EXECUTABLE. HOWEVER THE INITIALIZATION PHASE DOES MORE. LOOK AT E / A MANUAL, PAGE 247. HERE THE UTILITY SUBROUTINES ARE INTRODUCED::: NAMED "VS8W", "VMBW", "KSCAN", "VSBR", ETC. THE CODE OF THESE IS LOADED INTO LOW RAM SO THAT YOU MAY ACCESS THEM FROM YOUR PROGRAM, IF YOU NEED THEM. LASTLY, THE INITIALIZATION PHASE LOADS THE REF / DEF TABLE, PLACING IT INTO LOW RAM AT LOCATIONS >3F38 THRU >3FFF. IN HERE ARE THE NAMES, AND ADDRESSES OF ALL THE UTILITIES AND SOME OTHER DATA ITEMS, WHICH MAY BE NEEDED. WHEN THE LOADER RUNS IT LOOKS HERE TO EXTRACT THE ACTUAL ADDRESS FOR EACH OCCURENCE WHERE YOU HAVE CODED A SYMBOL NAME, "VMBW", "KSCAN", ETC.

WHEN THE ABOVE INITIALIZATION IS DONE THEN THE LOADER STARTS RUNNING, AND STARTS WORKING ON YOUR MODULES. IT WILL PROMPT YOU FOR "FILE NAME". YOU TYPE IN THE OBJECT MODULE NAME, USK1.FIRSTOBJT <ENTER>. IF THAT ONE DIGESTS OK THEN IT ASKS FOR ANOTHER MODULE NAME. IF "FIRST" WAS AUTO-START, "RUN" IS IMMEDIATE AND YOU DO NOT GET TO ENTER ANY MORE MODULE NAMES. ANYHOW, WHEN YOU HAVE LOADED ALL THE MODULES YOU NEED, DO A BLANK <ENTER> (NO FILE NAME) THIS BRINGS THE PROMPT "PROGRAM NAME?". NOW TYPE IN THE NAME OF THE "FIRST" PROGRAM AND THE SYSTEM WILL TRY TO RUN YOUR PROGRAM.

NOTE::: THE LOADER BEGINS PLACING YOUR CODE INTO RAM AT >A000, THRU >FD7. IF YOU USE UP ALL THAT SPACE THEN THE LOADER WILL START PLACING CODE AT >2676 THRU 3FXX.

CAUTION::: WHILE THE LOADER HAS BEEN POURING YOUR CODE INTO HIGHER RAM IT HAS ALSO BEEN PLUGGING ALL OF YOUR DEF'S INTO THE REF / DEF TABLE IN LOW RAM. IT STARTS PLACING THEM AT ADDRESS >3F30, PROCEEDING DOWNWARD TO LOWER ADDRESSES >3F2B, >3F20, >3F18, >3F10, ETC, AS DEMANDED BY YOUR MODULES. SO I RECOMMEND THAT YOU AVOID TRYING TO JAM MUCH CODE INTO LOW RAM SPACE.

Continued in the next
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