

# BITS, BYTES & PIXELS

VOLUME 7-8-9

JULY, AUGUST, SEPTEMBER 1986



## COMMENTARY.....

We hope that you have been asking the question "Where have you been Bits, Bytes & Pixels?" That would suggest that we have been missed. In truth we have been out of publication for the months of July and August not by accident but by design. We reasoned that since this was vacation time the editors deserved a vacation and by George we took one. We are now back with some tall tales to tell and ready for the hacking season to begin with gusto.

This issue is, therefore, a jumbo size and contains all of the things you have missed during the summer.

We hope that you had a good summer and that you, too are ready to begin a stimulating year. We have a great idea; You can make it more stimulating by contributing some tips and programs to your newsletter. Will you do this?

## OCTOBER MEETING...

We have invited Jim Peterson the clever author of "Tips From The Tiger Cub" to speak to our club at the regular meeting on October 18 at the usual time and the usual place. Jim is one of the reasons that the 99/4A lives on and this should be an interesting meeting.

Our usual place is 3rd floor Galvin Hall on the Lima OSU Campus at 9030. Bring a friend or even an enemy (if you have one or the other). Seriously this would be a good meeting to introduce someone to the value of a user group.

## NEWS....

WE noticed an advertisement credited to Quality 99 Software that effective June 4, 1986 Tex Comp of Branada Hills CA is no longer an authorized dealer of Quality 99 Software products. Accordingly quality 99 will no longer provide support or service on products purchased from them after that date.

Be advised.....

## DUES...

If your dues are due do what you should do and drop a for them. To enjoy all the splendid benefits of this club's library you must be a dues paying member.

## USEFUL INFORMATION...

Every now and again there is offered for sale a device that purports to clean your disk drive. A recent article in the Penn-Ohio Users Group News Letter offers some advice. These devices contain abrasives and each usage wears the surface of the read-write head. The writer suggests that instead of a preventative maintenance measure these cleaners should only be used as a last resort.

If you should have to clean, here is a useful program that will take advantage of the error message and keep the disk running until you stop it.

```
110 CALL CLEAR
120 PRINT "WORKING!":GOTO 120
130 PRINT "HOLD FUNCTION/4 TO STOP":
140 ON ERROR GOTO 160
150 RUN "DSK1.ZZZ"
160 GOTO 140
```

CHICAGO 1986...

THE 3RD CHICAGO TI-99/4A USERS GROUP COMPUTER FAIRE WILL BE HELD IN CHICAGO NOVEMBER 2, 1986 See Charlie for details



NEW PROGRAMS.....

If you have come into possession of a new piece of software or have developed one yourself maybe you'd like to share your impressions with the user group. Let us know and we will schedule on the monthly program.

FROM THE GRAPEVINE

Star SG10 and later models continue to have fewer service problems than the Star Gemini 10X. Common service problems with the Gemini include form feed motors and the print head position sensor, both of which may be sort of expensive. These problems have not yet been encountered in SG10's and later models. The only service problem encountered with these later printers is replacement of the "logic board". If the printer seems to operate properly but won't accept input from the computer the logic board needs replaced.

Source: Mike, the Star service technician at Midwest Microperipherals, St. Paris OH.

The old HOME COMPUTER MAGAZINE ceased accepting advertising as part of the settlement of some litigation against it. Magazines are required to annually published a statement detailing circulation. H.C.J. did not do this and provided potential advertisers with artificially inflated circulation figures. Several major advertisers found out and collectively took H.C.J. to court. Source: Guy S. Romano of the Amnion Helpline.

Notice to HOME COMPUTER MAGAZINE subscribers:

If you think your long term subscription to 99er MAGAZINE, or to HOME COMPUTER MAGAZINE was improperly terminated when the magazine changed its name recently, YOU MAY BE ABLE TO DO SOMETHING ABOUT IT.

Send a letter of complaint indicating how many issues are left in your subscription and how much money you paid. Send your letter to:

District Attorney's Office  
Consumer Affairs  
400 Lane County Court House  
Eugene OR 97401

The DA's office will send a copy of your letter to the folks at what is now called HOME COMPUTING JOURNAL an ask them to tell the DA's office how each case is going to be resolved. In an Aug 6 phone conversation, a spokesperson at the consumer affairs section said that they knew of some people who had received a settlement from H.C.J.



\*\*\*\*\*  
\*  
\*  
\* BITS,BYTES & PIXELS \*  
\*  
\* Published by Lima \*  
\*  
\* 99/4A User Group \*  
\*  
\* Hal Sehnert Editor \*  
\* Charles Good Tech. \*  
\* Editor \*  
\*  
\* Material contained herein \*  
\* may be copied by any user \*  
\* group as long as credit \*  
\* is given to source. \*  
\* Address:2225 High Ridge \*  
\* Lima,Oh 45805 \*  
\*  
\* Published Monthly \*  
\*\*\*\*\*

(EDITOR'S NOTE: The following should be read by those who are already using FUNLWRITER and by those who might consider using it. This article answers some of the questions about FUNLWRITER that are not made completely clear in the FUNLWRITER documentation, such as: How does one calculate the K values in the FW LOAD program? How do you know if your ASSM2 file has already been modified to run out of FW? What does RESET do before it QUIT's? How should one save a source file in DFBO format to disk from the E/A editor? The author is a member of the Front Rangers User Group in Colorado. We taken his article from the July 86 issue of Micropendium and have added our own editorial notes.)

A REVIEW OF FUNLWRITER 3.3 by Joe Nuvolini  
303-596-6938

PERFORMANCE.....A+  
EASE OF USE.....A+  
DOCUMENTATION...A  
VALUE.....A+  
FINAL GRADE.....A+

I recently received an exceptional Fairware disk from two gentlemen in the Hunter Valley 99 User Group in New South Wales, Australia. Their names are Will and Tony McGovern and the disk contained version 3.3 of FUNLWRITER which, according to an earlier letter I received from Tony, will be the definitive version of this program. (ED. NOTE: Not all copies of FW v3.3 are alike. The FW authors continue to make small updates. The date on the documentation can tell which of two FW v3.3 disks is the most recent.)

This is by far the most versatile program I have seen for the 99/4A. It allows you to use TI-Writer(TIW) and the Editor Assembler(E/A) without their respective modules. The program autoloads from Extended Basic(XB) and will also load from the TI-Writer, Editor Assembler, or Mini-Memory modules. The disk contains TI-Writer, the Editor Assembler, Disk Manager 1000 ver 3.1 (a FREEMWARE program of the Ottawa User's Group), a sector editor, an a FORTH loader. You can also load your assembly programs without the use of any modules except Extended Basic. To run the disk you need the console, 32K memory, the disk controller and drive. It also helps to have a second disk drive and a printer.

There is a file called -READ ME- and six FWD0C files that should all be printed using the TIW Formatter and, more important, read before you begin. When you're done with that copy the FUNLWRITER disk so you have a working copy and put the back-up away in a safe place.

Before running the program examine the LOAD program by LISTING it. Line 120 allows you to set the primary and alternate screen colors. Lines 130 and 140 set the default options for the PF option of the Editor(130) and the Formatter(140). Lines 160 through 190 allow you to enter the names of programs you want on the User's List option while lines 240 through 280 are the load commands for these options. You can set a value for K in line 210 that will be the default for the drive number that appears on the screen with DSK. DO NOT RESEQUENCE the LOAD program or you will destroy it. The FWD0C/LOAD file explains how to set up the User's List options and the various methods of loading FUNLWRITER.

Now select a method and let's load the program. The first thing you'll see is the title screen followed by the first menu (ED. NOTE: If you get tired of the title screen, press any key to go immediately to the first menu) with three selections: 1-TI-WRITER, 2-EDIT/ASSM, and 3-USER'S LIST. We'll cover option three, User's list, later in this review. If you select option 1 or 2 you arrive at the central menu, which has 6 selections. They are 1-EDITOR, 2-FORMATTER or ASSEMBLER, 3-DM1000, 4-UTILITY, 5-SWITCH, and 6-RESET. Selecting SWITCH changes option 2 to ASSEMBLER, c-COMPILER and back to FORMATTER so that you can switch between these functions. (ED. NOTE: Later versions of FW v3.3 also cycle through MODEM (your favorite terminal emulation program), DISK EDITOR (DISKO, a public domain sector editor), and USER LIST with the SWITCH option. From this menu, USER LIST only accesses user selected assembly language programs, not XB programs.) I might mention here that the files C99B through C99E will load REL2 of the c-Compiler by Clint Pulley. It loads from this menu using files C99B through E. This is the preferred method of entry. It may also be loaded from the program file loader, discussed later, by entering C99C at the filename prompt. You must have the rest of Clint Pulley's small-c files for this option to be of any use to the user. Pressing RESET places the current filename you have been working on into the mailbox so that if you leave TIW or E/A and to to another FUNLWRITER function, say DM1000, and then return to TIW, when you select the EDITOR or FORMATTER that filename will be there for you to load or print. After selecting RESET the option six name changes to QUIT and pressing that option returns you to the Master Title Screen. We'll discuss option 4, UTILITY after we finish our discussion of TIW and E/A.

NEXT PAGE PLEASE

If you select option 1-TI-WRITER from the first menu you then can select the EDITOR or FORMATTER from the central menu. The EDITOR functions like the TIW editor with the three following improvements:

1. If the loader can find a filename in the mailbox it writes it into the LF/PF buffer, which otherwise shows DSKx when called up with x being the default disk drive set in the LOAD program.

2. The quit function remains disabled at all times while in the EDITOR.

3. The show directory(SD) function is an assembly routine that allows single key paging through the files. Fractured files are indicated by an asterisk after the file length.

The FORMATTER is the same as TIW with the following improvements:

1. There is now a Quick Directory(QD) function here from any menu in the program. To access it you enter FCTN 7 (AID). It operates in the same way as the SD function in the EDITOR.

2. The FORMATTER will automatically display the last file used when it can find one. If no name is present then DSKx appears.

3. The FCTN 9 (BACK) key allows you to return to the FUNLWRITER central menu.

If you need to reload either the EDITOR or FORMATTER immediately after exiting them they do not need to reload from disk.

If you select the EDITOR when ASSEMBLER or c-COMPILER is in the second position of the central menu, a modified version of the TIW EDITOR is loaded which is suitable for use as a source code editor. Word wrap is disabled, E/A tab defaults are set, and no final tab record is written to disk. To write a DFBO file to disk you use the PF option using F DSKx.FILENAME as described in the TIW manual. The source Editor loads CHARA2 which is slightly different than the CHARA1 file that is loaded by the TIW Editor. This acts as a reminder to let you know which editor you are in.

The ASSEMBLER has some enhancements added. The filenames are visible on the screen while it is executing. You can use AID to give you QD, allowing you to check the filename on the disk. If a filename is found in the mailbox it is written as the source code filename and the object code is the same name with the last two characters removed. Also, R is automatically entered in the Options field of the ASSEMBLER as a default value.

UTILITY option 4 on the central menu, brings you an assortment of assembly file loaders called the Program Load Environment(PLE). This menu displays five options on the screen, but has a total of 8 options, the last three of which are entered in the blind. Option 1 is for loading TIW utility files like Dragonslayer's Spellchecker. Option 2 sets up a GPL environment for loading other self-contained program image files; while option 3 is the E/A "RUN PROGRAM FILE" function. It should be noted here that the program file loaders will support cassette files by entering "CSI" (see E/A manual for more information on this function). Option 4 is the E/A "LOAD AND RUN" function and handles object files, compressed or not, and even displays the DEF table so you don't have to remember the program execution name if the program does not auto start. Option 5 is RE-ENTER (1-3) and it allows immediate re-entry to a program without reloading it, assuming it is re-entertainable. The invisible options (6,7, 8) allow other object code loadin options, but in the interest of brevity I will not go into them here. Information on these options can be found in the FNDQC-EASM file. Entering FCTN 9 from this menu returns you to the central menu.

Now we'll discuss the USER'S LIST, option 3 on the first menu. This menu has 9 options. The first 8 options can be user defined although the LOAD program comes set to run the Myarc disk manager as option 6, the sector editor DISKO as option 7, and a TI-FORTH loader as option 8. Option 9 is BACK and it will return you to the FUNLWRITER title screen. This menu is set in the LOAD program, as are the loaders. You can run XB programs as well as E/A program or object files from the USER LIST menu if the corresponding files are placed on the FUNLWRITER disk. (ED. NOTE: the predefined options 6-8 can, if not needed, be replaced with your own options.) The XB programs are called by a RUN "DSKx.FILENAME" statement. The E/A files are loaded using a CALL LINK("UTILA",FILENAME,K). The numeric parameter K is the same as would be entered from the PLE discussed earlier, ie. 3 for an E/A program file and 4 for a "LOAD AND RUN" DFBO object code file. I find this part of the program particularly useful as you can put your favorite utility programs on the FUNLWRITER disk and have them available. In addition to TIW and E/A I have Masscopy, Fast Term, 4A/Talk, PRBASE, DM1000, DISKO, the Ti-FORTH loader, and a program called Recall all available through FUNLWRITER. I rarely take it out of drive #1. I should mention that I am using a double sided disk to hold all that. You will be somewhat restricted as to what you can put on a single sided disk with the FUNLWRITER files. (ED. NOTE: Single sided drive users might consider using FW version 3.2 since this version leaves more room than v3.3 for USER LIST files.

The main thing you loose with v3.2 is the ability to load FW from modules other than the XB module. You also loose the ability to do a QD from other places besides the EDITOR.)

There are several other files supplied with FUNLWRITER that deserve mention here. FNSAVE utility is for use with E/A to allow SAVING of any program loaded as an object file by FUNLWRITER into low memory. UPATCH is a patch that creates a file called UTIL1 once you have your screen color and printer defaults set in the LOAD program. UTIL1 is used to re-enter FUNLWRITER from several areas such as upon exiting DM1000. APATCH file is used to modify the ASSM2 file from your original E/A disk to work with FUNLWRITER. The ASSM2 file so created is 22 sectors long, 2 sectors longer than the original. It appears that the authors have already done this on the disk provided. FNRMM is for use with the Mini-Memory module to load the UTIL1 file into high memory.

A word here about Fairware... Will and Tony have set no price for this program but merely say "I can suggest only that you judge the program on its own intrinsic merits, perhaps measuring its worth by how much you use it as compared to other "fairware" or commercial programs that you use." I might suggest you do what our users group, the Front Rangers, did. We collected donations from the members of our users group who wanted the program and sent one international money order from the club to the authors. Be sure to include two disks when ordering your copy unless you have double sided capability as the DOC files are over 200 sectors long. Also be sure to enclose a couple of dollars postage as mail to and from Australia is not cheap! This is truly a fine piece of software. Let's make sure the authors are adequately compensated for their work. (ED. NOTE: The FW authors will NOT send FW directly to the United States unless a 'significant vote of confidence' is also included. Your disk and your postage paid return mailer are, by themselves, not enough. FW is available from user groups and from the Free Access Library 415-753-5581 at little or no cost.)



GRAM KRACKER - First Impressions

I recently received my Gram Kracker, six weeks after I sent my money. This six week delay is due to the fact that the only money Miller Graphics has tied up in inventory is invested in circuit boards. When your money is received the chips are purchased and your GK is then built and tested. This procedure makes it unlikely that Millers Graphics will ever have financial problems due to money tied up in unsold inventory. Another "advantage" of the six week delay is that personal checks cause no additional shipping delay.

Many of you are aware that the GK can dump almost any module, including EXTENDED BASIC, to disk or tape. These modules can then be loaded and run via the GK. Yes, you DO NEED the GK to run these disk or tape module files. The only modules that won't work are those designed to work with the MBX system, including those for which this system is only "recommended". The procedure for dumping modules is quite simple, and is prompted with clear on screen instructions. No hardware beyond the GK is required.

Any module or alternate operating system loaded into the GK stays there because of a battery backup. It is possible to have the TI-Writer module, E/A module, and a third module of your choice, such as EXTENDED BASIC, all resident in the GK at the same time and immediately available as soon as the console is turned on. Or, you can have as many as 9 TI BASIC programs instantly available from a power up menu. HOWEVER,, the battery backed up memory can be messed up every time your turn OFF the console unless you do the following. First move the lefthand switch to the "GK Off" position. Then turn off the console.

At powerup it seems to make no difference whether you turn on the console first or move the lefthand switch to the "Normal" position first. This information is NOT in the GK operators manual. It took me a long time to figure out this procedure.

The GRAM KRACKER has a gold plated connection that plugs into the module port of the console. These gold plated connectors make very good electrical contact. When EXTENDED BASIC is downloaded from disk into the GK it works properly every time the console is turned on (if the procedure in the above paragraph is followed). You no longer have to worry about your EXTENDED BASIC module locking up the computer. This tendency of EXTENDED BASIC to lock up due to poor electrical contact to the XB module has been a very major problem to users of the TI99/4A. The GK provides an almost permanent solution to this problem. Another permanent solution, hard wiring the XB chip into the console, will be described in a future issue of this newsletter.

A very significant feature of the GK is its ability to change ANYTHING stored in memory ANYWHERE in the TI99/4A system. All ROM or GRAM memory in the console or in any of the cartridges are now RAM and GRAM. All memory is totally transparent. There is no limit to what you can do depending upon your programming abilities. The GK operators manual is full of suggestions for changing text, screen colors, etc. The utility disk that comes with GK contains files that provide an additional means of customizing certain modules and the console operating system.

My own system is a good example of the customization possible with the GK. When the console is turned on the powerup routine bypasses the color bar title screen (see p. 43 of operators manual) and produces the following menu:

CHARLIE'S TI99/4A  
COMPUTER

PRESS

1. FOR TI BASIC
2. FOR XBASIC/TI-WRITER
3. FOR EDITOR ASSEMBLER

The menu is in normal sized capital letters, not the extra large letters normally in the menu that follows the color bar title screen. The normal sized letters were installed via the NEWCHARS file on the GK utility disk. I searched GROM/GRAM 0 for the words TEXAS INSTRUMENTS HOME COMPUTER and typed over these words with my own title (CHARLIE'S...etc). It was easy! I then searched GRAM 3 for the words TI EXTENDED BASIC and typed over these words to make the powerup menu read XBASIC/TI-WRITER.

Because I have the E/A module as part of the startup menu, if I push 1 for TI BASIC, I automatically have available all the extra CALLS that the E/A adds to TI BASIC. These include CALL LOAD, CALL PEEK, and CALL CHARPAT, CALL PEEKV, CALL POKEV, and CALL LINK.

I have FUNLWRITER, a version of TI-Writer, and other commonly used programs on my HORIZON RAMDISK, which is configured as DSK3. When I press 2 on the powerup menu for XBASIC/TI-WRITER, my computer automatically searches for and loads a program called LOAD on DSK3 (not DSK1). I used the GK memory editor and searched in ASCII that part of the GK where EXTENDED BASIC resides until I found "DSK1.LOAD". I changed this to "DSK3".

My  
 DSK3.LOAD program produces the  
 following menu:  
 BOOT LOAD PROG. IN DSK(1-3)?  
 FUNLWRITER IS IN DSK3

Press 1, 2, or 3,  
 or SPACE to abort

In addition to autobooting DSK3.LOAD, my EXTENDED BASIC is modified in other ways. If I press the space bar immediately after selecting XBASIC/II-WRITER the computer bypasses the autoloading routine and immediately gives me the "READY" and flashing cursor (see disk I-11 of the Free Access Library for instructions on how to do this). All zeros are slashed (see GK manual p.42). Several extra CALL's have been added to my EXTENDED BASIC using the "XBCALLS" program that comes on the GK utility disk. The most useful of these is CALL CAT("DSK1.") which puts a disk catalog on the screen without disturbing the program already in memory. Also useful is CALL CLOCK which puts a 24 hour clock in the upper right corner of the screen. This digital clock is not affected by scrolling, NEW, or DISPLAY AT. You can get rid of it with CALL CLKOFF.

The GK has spoiled me. It and my HORIZON RAMDISK have made my system very easy to use with almost instant access to a variety of useful programs upon powerup. I leave the GK plugged in all the time, saving wear on my module port. If I need to use a command module and don't want to load it from disk, I can plug the module directly onto the GK. For me, the \$193 price of a fully configured GK, including shipping, is money well spent.

CHARLES GOOD

-----  
 70 ! For use with HORIZON RAM DISK as DSK3. and GRAM KRACKER.

80 ! Change DSK1.LOAD to DSK3.LOAD after EXTENDED BASIC is loaded into KRACKER. Put the program on RAMDISK using the name LOAD.

90 CALL CLEAR

100 DISPLAY AT(10,1):"BOOT LOAD PROG. IN DSK(1-3)?"

110 DISPLAY AT(12,4):"FUNLWRITER IS IN DSK3."

120 DISPLAY AT(16,6):"Press 1, 2, or 3," : " or SPACE to abort"

130 CALL KEY(O,K,S)

140 IF S=0 THEN 130

150 IF K=49 THEN RUN "DSK1.LOAD"

155 IF K=32 THEN CALL CLEAR :  
 : END

160 IF K=50 THEN RUN "DSK2.LOAD"

170 RUN "DSK3.FW" ! "LOAD" program from FUNLWRITER disk is renamed "FW"

#### EDITORS NOTE:

*Maybe you missed the features "Brain Teasers" and "Miscellany" in this issue. These were not errors of omission; they were errors of commission. He had such an abundance of material we were afraid this would look like a Sunday issue of the "New York Times" and with postage of similar proportions.*

30. Editor

## ERROR CODES

Standard "I/O ERROR" codes issued  
in TI BASIC or EXTENDED BASIC

FIRST NUMBER	SECOND NUMBER
0 OPEN	0 Device Not Found
1 CLOSE	1 Write Protected
2 INPUT	2 Bad Open Attribute
3 PRINT	3 Invalid I/O Command
4 RESTORE	4 Out Of Space
5 OLD	5 Reading Past EOF
6 SAVE	6 Device Error
7 DELETE	7 File/Data Mismatch
9 EOF	

RS232 Card "I/O ERROR" codes  
in TI BASIC or EXTENDED BASIC

OPEN	00 Device Can't Be Opened
	02 Software Switch Error
	06 Hardware Error
INPUT	24 INTERNAL Data Too Large For Buffer Space.
	26 "CLEAR" Pressed, or Hard- ware Error
PRINT	36 Same as 26.
OLD	50 Can't Find Program On Specified Device
	52 Can't Use Software Switch With OLD.
	54 Program Too Large To Load.
	56 Same as 26
SAVE	60 Can't SAVE To Specified Device
	62 Same as 02, or Can't Use Software Switch with SAVE
	66 Same as 26.
MISC	43 73 83 93 Illegal Command.

### TI-WRITER ERROR CODES

0	Disk not initialized, or disk system not turned on.
6	TI-Writer Program disk not in drive, upside down, or drive not on.
7	TI-Writer Program disk not in drive 1.
00	Error in use of LF, PF, or SF
02	Can't find textfile on disk.
04	Disk is full.
06	PF canceled with FCTN 4, or no disk in drive, or drive door open
07	Invalid file name (too long, has period)
15	Invalid drive # or device name.

EDITOR/ASSEMBLER or MINI MEMORY error  
codes issued during loading or execution  
of an assembly language program.

I/O ERROR	0 Bad device name
	1 Write protected
	2 Bad OPEN attribute.
	3 Illegal operation.
	4 Out of space on device.
	5 Read past EOF or non- existing RELATIVE record.
	6 Hard Device error.
	7 File error

---

ERROR CODE	8 Memory Full
	9 Incorrect Statement
	A Illegal Tag
	B Checksum Error
	C Duplicate definition
	D Unresolved Reference
	E Incorrect Statement
	F Program Not Found
10	Incorrect Statement, or Illegal Tag
11	Bad Name, or Checksum error
12	Can't Continue, or unresolved reference
13	Bad Value
14	Number Too Big
15	String-Number Mismatch
16	Bad Argument
17	Bad Subscript
18	Name Conflict
19	Can't Do That
1A	Bad Line Number
1B	For-Next Error
1C	I/O Error
1D	File Error
1E	Input Error
1F	Data Error
20	Line Too Long
21	Memory Full
22	Syntax Error
23	Numeric Overflow
24	Unrecognized Character
25	String Truncated

### EXTENDED BASIC

Number re- turned by CALL ERR	
10	Numeric Overflow
14	Syntax Error
16	Illegal After Subprogram
17	Unmatched Quotes
19	Name Too Long
20	Unrecognized Character
24	String-Number Mismatch
25	Option Base Error
28	Improperly Used Name
36	Image Error
39	Memory Full
40	Stack Overflow
43	NEXT Without FOR
44	FOR-NEXT Error
47	Must Be In Subprogram
48	Recursive Subprogram CALL
49	Missing SUBEND
51	RETURN Without GOSUB
54	String Truncated
56	Speech String Too Long
57	Bad Subscript
60	Line Not Found
61	Bad Line Number
62	Line Too Long
67	Can't Continue
69	Command Illegal In Program
70	Only Legal In A Program
74	Bad Argument
78	No Program Present
79	Bad Value
81	Incorrect Argument List
83	Input Error
84	Data Error
97	Protection Violation
109	File Error
130	I/O Error
135	Subprogram Not Found

### DM II "DISK ERROR" meanings

FIRST NUMBER	SECOND NUMBER
1 Other	1 Record Not Found
2 Seek or	2 Cyclic Redundancy Step
3 Input	3 Lost Data
4 Print	4 Write Protected
	5 Write Fault
	6 No Disk In Drive
	7 Invalid Input Parameters
9 Compre- hensive	9 Comprehensive Test Test