POINT 4 DATA CORPORATION
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June 1, 1980

NEW USER DOCUMENTATION FOR IRIS 7.4

Please check that you have all the components of 7.4, viz.

1. IRIS on disc or papertape (labeled 7.4)
2. Product list (6 pages) itemizing these IRIS component products
3. One or more Front End Packages (listing and obj. papertape of SOV, BZUP, and DDCOPY) specific to your LU/O disc controller and drive
4. SysGen Log (4 pages)
5. Technical Memo "Using EXTRAPORT" (1 page)
6. "IRIS 7.3 Installation Manual" (8 pages)
7. MEMORANDUM: "IRIS R7.3 Modification Release" (2 pages)
8. Manager Manual Addenda (1 page)
9. User Manual Addenda (1 page)
10. Peripherals Handbook
11. 7.30A Cover letter (5 pages)
12. EXERCISER BASIC program listing
13. Manager Manual Addenda #2 (3 pages)
14. Technical Memo "Software Received on Disc Pack"
15. Manager Manual Addenda #3 (11 pages)
16. User Manual Addenda #2 (5 pages)

ANY REFERENCES, IN THIS DOCUMENTATION, TO IRIS R7.3 ARE APPLICABLE TO IRIS R7.4.

** PRODUCT LIST **

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FILE	NAME	RELEASE	ASM DATE	TYPE	REV DATE	GROUP
1	REX	7.4	06-02-78	OBJECT	05-07-80	1
2	SYSGEN	7.4	06-02-78	OBJECT	05-07-80	1
3	DBUG	UTIL	06-02-78	OBJECT	06-02-78	1
4	DISCSUBS (#1)	7.4	06-01-77	OBJECT	05-07-80	1
5	SCOPE	7.4	02-07-80	OBJECT	02-07-80	1
6	BYE	7.4	02-07-80	OBJECT	02-07-80	1
7	DSP	7.4	04-25-78	OBJECT	07-18-79	1
8	CONFIG	7.4	05-02-80	OBJECT	05-02-80	1
38	BLOCKCOPY	7.4	05-02-80	OBJECT	05-02-80	1
39	CHANGE	7.4	01-26-78	OBJECT	01-26-80	1
40	CLEANUP	7.4	12-12-78	OBJECT	01-26-80	1
41	CONVERT	7.4	06-10-77	OBJECT	01-26-80	1
2	COPY	7.4	06-10-77	OBJECT	07-18-79	1
44	INSTALL	7.4	02-09-78	OBJECT	07-18-79	1
45	KILL	7.4	05-02-77	OBJECT	05-02-77	1
46	MAIL	7.4	05-02-77	OBJECT	05-02-77	1
47	MESSAGES	7.4	06-01-77	OBJECT	02-16-78	1
48	PORT	7.4	05-10-78	OBJECT	07-23-78	1
49	PROTECT	7.4	04-16-80	OBJECT	04-16-80	1
50	QUERY	7.4	05-02-77	OBJECT	07-28-78	1
51	REHASH	7.4	05-31-78	OBJECT	05-31-78	1
52	REMOVE	7.4	05-02-77	OBJECT	05-31-78	1
53	SAVE	7.4	04-17-80	OBJECT	04-22-80	1
54	SHUTDOWN	7.4	04-19-77	OBJECT	07-18-79	1
55	VERIFY	7.4	04-17-80	OBJECT	04-17-80	1
	LIBR	7.4	06-01-77	OBJECT	01-26-80	1

FILE	NAME	RELEASE	ASM DATE	TYPE	REV DATE	GROUP
43	FORMAT	7.4	05-02-77	OBJECT	05-02-77	2
59	RUNMAT	7.4	04-14-80	OBJECT	04-14-80	2
60	BASIC	7.4	04-15-80	OBJECT	05-31-80	2
61	RUN	7.4	04-11-80	OBJECT	04-11-80	2
62	DISCSUBS (#2)	7.4	07-25-78	OBJECT	05-07-80	2
67	ACCOUNTLIST	UTIL	07-21-76	TEXT	07-21-76	2
68	BASICTEST	DIAG	01-05-77	TEXT	01-05-77	2
69	BUILDXF	UTIL	07-10-76	TEXT	05-25-77	2
70	EXERCISER	UTIL	06-14-79	TEXT	06-14-79	2
71	EXTRAPORT	UTIL	03-31-78	TEXT	09-22-78	2
72	GUIDE	UTIL	01-24-79	TEXT	07-18-79	2
73	GUIDE.LPT	7.4	01-24-79	TEXT	07-18-79	2
4	GUIDE.LU	UTIL	01-24-79	TEXT	07-18-79	2
75	GUIDE.BLOCKCPY	UTIL	01-24-79	TEXT	07-18-79	2
76	LPT DIAG	7.4	03-21-80	TEXT	05-07-80	2
77	LPT DIAG 2	7.4	03-21-80	TEXT	03-21-80	2
78	LPT DIAG 3	7.4	03-21-80	TEXT	03-21-80	2
79	LPT DIAG 4	7.4	03-21-80	TEXT	03-21-80	2
80	MTUTL	7.4	--------	TEXT	--------	2
81	RETRY	UTIL	05-10-77	TEXT	05-10-77	2
82	SETTIME	UTIL	--------	TEXT	--------	2
83	UTILITY	UTIL	07-30-73	TEXT	01-31-77	2

FILE NO.	NAME	RELEASE	ASM DATE	TYPE	REV DATE	GROUP
57	ASSEMBLE	7.4	06-10-77	OBJECT	01-26-80	4
58	EDIT	7.4	06-08-77	OBJECT	01-26-80	4
63	DISCSUBS (#3)	7.4	06-13-77	OBJECT	05-07-80	4
64	DEFINITIONS	7.4	04-29-78	TEXT	04-29-78	4
65	PZ	7.4	01-23-78	TEXT	01-23-78	4
66	SYMBOLS	7.4	05-02-77	TEXT	05-02-77	4

FILE NO.	NAME	RELEASE	ASM DATE	TYPE	REV DATE	GROUP
	$RTC	7.4	05-03-77	OBJECT	05-03-77	12
10	$MMUX	7.4	04-14-80	OBJECT	04-14-80	12
11	$DGMX	7.4	01-07-78	OBJECT	01-07-78	12
12	$PHA	7.4	06-10-77	OBJECT	01-10-80	12
13	$TTY(50.51)	7.4	01-20-79	OBJECT	01-20-79	12
14	$PTR	7.4	05-06-77	OBJECT	05-06-77	12
15	$PTP	7.4	05-05-77	OBJECT	05-05-77	12
16	$PTM	7.4	05-05-77	OBJECT	05-05-77	12
17	$DEC	7.4	01-26-78	OBJECT	01-26-78	12
18	$DAU	7.4	02-14-78	OBJECT	01-26-80	12
19	$LPT(M)	7.4	01-22-79	OBJECT	01-26-80	12
20	$LPT(P)	7.4	01-25-79	OBJECT	07-18-79	12
`1	LPTDIAGDRIVER	7.4	03-21-80	OBJECT	05-07-80	12
22	$MTA0	7.4	02-28-79	OBJECT	02-28-79	12
23	$MTAS	7.4	02-28-79	OBJECT	02-28-79	12
24	TERMS	7.4	09-25-79	OBJECT	01-10-80	12
25	TERM (ADM1)	7.4	03-15-79	OBJECT	03-15-79	12
26	TERM (ADM2)	7.4	01-22-79	OBJECT	01-22-79	12
27	TERM (ADM3)	7.4	01-04-79	OBJECT	01-04-79	12
28	TERM (B100)	7.4	06-14-79	OBJECT	06-14-79	12
29	TERM (DGC)	7.4	06-11-79	OBJECT	06-11-79	12
30	TERM (DM 1520)	7.4	03-05-79	OBJECT	03-05-79	12
31	TERM (DM 1521)	7.4	03-05-79	OBJECT	03-05-79	12
32	TERM HASL 2000	7.4	05-21-79	OBJECT	05-21-79	12
33	TERM HASL 1500	7.4	01-24-80	OBJECT	01-24-80	12
`4	TERM TV 912	7.4	01-30-80	OBJECT	01-30-80	12
35	TERMINET	7.4	12-26-77	OBJECT	12-26-77	12
36	TERM ACT 5	7.4	01-29-80	OBJECT	01-29-80	12
37	TERM ADDS 25	7.4	02-25-80	OBJECT	02-25-80	12

FILE NO.	NAME	RELEASE	ASM DATE	TYPE	REV DATE	GROUP
/	BINARY LOADER	UTIL	--------	OBJECT	--------	14
98	AUTOLOADER	UTIL	--------	OBJECT	--------	14

FILE NO.	NAME	RELEASE	ASM DATE	TYPE	REV DATE	GROUP
84	MICRO-N-DP	DIAG	08-28-75	OBJECT	08-28-75	16
85	MUX(300)DP	DIAG	11-08-75	OBJECT	11-08-75	16
86	MUX(310)DP	DIAG	06-27-79	OBJECT	06-27-79	16

I R I S 7 . 4 S Y S G E N L O G

Company Name _____ Date _____

Address _____ Name #1 _____

City, State _____ Name #2 _____

Telephone (_____)_____-_____ IRIS Revision_____

Performed by _____ At _____

Disc controller: _____ Disc drive: _____

Refer to Section 2 of the IRIS Manager Reference Manual for detailed information on the System Generation (SysGen) procedure. Where there are differences, this log supersedes the manual.

=========> Run hardware diagnostics (initial when run):

_____ CPU Exerciser
_____ Power Fail Auto Restart Test
_____ Memory Address Test (all memory)
_____ Memory Checkerboard Test (all memory)
_____ Disc Reliability Test
_____ POINT 4 Multiplexer Test (including Q-Test)

NOTE: If using an MIGHTY MUX with T-option enabled, set the master terminalto baud rate 9600.

=========> Use the POINT 4 binary loader (described in an Appendix of the IRIS Manager Reference Manual) to load the following into core:

Filename	Type	Asm Date	Pun Date	Comments
REX	-	_____	_____	(TEX for R4)_____
SYSGEN	-	_____	_____	_____
DBUG	-	_____	_____	_____
BZUP	-	_____	_____	(expect 73077 halt)_____
SOV	-	_____	_____	_____

=========> RESET and START at LSYSL if it doesn't start by itself. (LSYSL = 26000 for R4, 34000 for R7.2 & later releases).

DISCSUBS #1	-	_____	_____	_____
SCOPE	33400	_____	_____	_____
BYE	33400	_____	_____	_____
DSP	77400	_____	_____	_____

=======> Set all CPU switches down and press CTRL C.
The system will come up in a minimum configuration IPL with the message "NO CONFIG FILE".

Log on as "MANAGER" and use PLOAD to load the following tapes in the order listed:

CONFIG	77001			
$RTC	77001			(note #1)
'UX	77001			($EDSB or $EDSBA for R4)
MX	77001			
$rHA	77001			
$TTY	77001			
$PTR	36			
$PTP	36			
$PTM	36			
$DEC	77001			(note #2)
$DAU	77001			(note #3)
LPTM	36			
LPTP	36			
$LPT	36			(note #4)
LPTDIAGDRIVER	36			
$MTAO	36			
$MTAS	77001			
$TERMS	77001			
$TERMADM1	77001			
$TERMADM2	77001			
$TERMADM3	77001			
$TERMB100	77001			
$TERMDGC	77001			
$TERMDM1520	77001			
$TERMDM1521	77001			
$TERMH2000	77001			
$TERMH1500	77001			
'RMTV912	77001			
.RMINET	77001			
$TERMACT5	77001			
$TERMADDS25	77001			
$TERM._____	77001			
BLOCKCOPY	77003			
CHANGE	33401			
CLEANUP	77401			
CONVERT	77401			
COPY	33401			
DDCOPY	77003			(note #5)
FORMAT	33401			
INSTALL	33401			(note #6)
KILL	33401			
MAIL	33401			
MESSAGES	77001			
PORT	33401			
PROTECT	33401			
QUERY	33401			
REHASH	77401			
REMOVE	33401			
SAVE	33401			

==========> CONTINUED ON NEXT PAGE.

es:

.1. LOAD as RTC (without $) if $MMUX and MIGHTY MUX are on the system.
#2. LOAD as DEC (without $) if a POINT 4 micro-n is in the computer.
#3. LOAD as DAU (without $) if there is not a POINT 4 board micro-n.
#4. Reload a second copy of the LPT driver for your system as $LPT.
#5. LOAD DISCUTILITY if controller is POINT 4 LOTUS 700
#6. For R4, write in as INSTALL, INSTALL.DIVA, or INSTALL.T50

CONTINUED FROM PREVIOUS PAGE

SHUTDOWN	33403	_____	_____	_____
VERIFY	33401	_____	_____	_____
[illegible]R	33401	_____	_____	_____
[illegible]EMBLE	33401	_____	_____	(Filename ASM optional)_____
[illegible]IT	33401	_____	_____	_____
RUNMAT	33402	_____	_____	_____
BASIC	33702	_____	_____	_____
RUN	33602	_____	_____	_____

==========> Use DSP to make any necessary modifications to the CONFIG file and to set all multiplexer and peripheral driver attributes as required.
Hit CTRL C to return to SCOPE and run SHUTDOWN.
Then, do a regular IPL to enable the CONFIG file and drivers.
You will not be able to continue the SysGen unless the CARRY light is flashing exactly once per second after you log on. (This indicates that the system clock is going.)
Enter DSP with X as the password, type FDISCSUBS c/r (c/r = return key), and then load the following with the R command:

DISCSUBS #2	-	_____	_____	_____
DISCSUBS #3	-	_____	_____	_____

==========> Press CTRL C to return to SCOPE and run SHUTDOWN.
Do a reglar IPL. Then enter BASIC and press c/r twice to link up BASIC, RUN, and RUNMAT.
(For R4, follow this by typing CTRL C RUNMAT c/r.)
Type SIZE to check the size of the BASIC program area.
Then load the following:

==========> (for text files: COPY filename*T=$PTR)

DEFS	TEXT	_____	_____	_____
PZ	TEXT	_____	_____	_____
SYMBOLS	TEXT	_____	_____	_____

==========> (For BASIC files: enter BASIC, type NEW c/r, LOAD $PTR c/r, CRTL C and SAVE filename.)

ACCOUNTLIST	BASIC	_____	_____	_____
BASICTEST	BASIC	_____	_____	(Also DUMP to BT.)_____
BUILDXF	BASIC	_____	_____	_____
EXERCISER	BASIC	_____	_____	_____
EXTRAPORT	BASIC	_____	_____	_____
GUIDE	BASIC	_____	_____	_____
GUIDE.LPT	BASIC	_____	_____	_____
GUIDE.LU	BASIC	_____	_____	_____
GUIDE.BLOCKCPY	BASIC	_____	_____	_____
LPTDIAG	BASIC	_____	_____	_____
LPTDIAG2	BASIC	_____	_____	_____
[illegible]DIAG3	BASIC	_____	_____	_____
[illegible]DIAG4	BASIC	_____	_____	_____
MIUTL	BASIC	_____	_____	_____
RETRY	BASIC	_____	_____	_____
SETTIME	BASIC	_____	_____	_____
UTILITY	BASIC	_____	_____	_____

=========> (For these stand_alone binary files: COPY filename*A=$PTR)

DISCDIAG	77003	_____	_____	(not supplied by POINT 4)_____
DISCFORMAT	77003	_____	_____	(obtain from controller vendor)
MICRONDIAG	77003	_____	_____	_____
300DP	77003	_____	_____	_____
X310DP	77003	_____	_____	_____

=========> FORMAT the USERID file as D2,S14, then use UTILITY (see "Account Utility Program" in the IRIS Manager Reference Manual) to set up the ACCOUNTS as desired.

*** NOW BACKUP THE SYSTEM PACK ***

MANUALS RECEIVED

Quan.	Revision	Date	Description
_____	1017-___	_____	IRIS User Reference Manual
_____	1018-___	_____	IRIS Manager Reference Manual
_____	1015-___	_____	Mighty Mux User's Manual
_____	1028-___	_____	EDSI Multiplexer Diagnostics
_____	1025-___	_____	Micro-N Programming Manual
_____	_____-___	_____	_____
_____	_____-___	_____	_____
_____	_____-___	_____	_____
_____	_____-___	_____	_____
___	_____-___	_____	_____
___	_____-___	_____	_____
_____	_____-___	_____	_____
_____	_____-___	_____	_____

TECHNICAL MEMO

March 31, 1978

TO : ALL IRIS R7.3 Users
FROM : Leon Remus
SUBJECT: Using EXTRAPORT

EXTRAPORT is a BASIC program that assigns other programs to run on Phantom Ports if you are logged onto the Manager account (see User's Manual pg. 1-10 "How to Use a Phantom Port").

To use this program, type in EXTRAPORT. Your terminal will respond with "!" or "ALL PHANTOM PORTS ARE BUSY ! ! !". If all ports are busy, it is best to wait for a few minutes and try again. If the response was "!", then input the desired command.

Example:

```
#EXTRAPORT (return)
!LIBR @^[$LPT] (return)
```

program will find a vacant Phantom Port and send the command string it. Then, EXTRAPORT will check the status of the port that was selected and will respond with a message accordingly.

Example:

```
LIBR IS RUNNING ON PORT 1
        or
LIBR FAILED ! ! !
```

If the command fails, this means there was some error in the command string. To see the error message, enter the same command directly on your terminal.

All Phantom Ports on your R7.3 system are automatically found by EXTRAPORT so there is no need to change any constant in EXTRAPORT before running this program on any IRIS R7.3 system.

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IRIS 7.3 INSTALLATION MANUAL

TO: IRIS USERS' TECHNICAL STAFF DATE: December 12, 1978
D/78:JC:0110

FROM: IRIS CUSTOMER SUPPORT

RE: INSTALLATION & USE OF IRIS 7.3

1. Enclosed is a copy of the new Sysgen Log to be used when you sysgen IRIS 7.3. Please note that this differs from (supersedes) the procedure described in Section 2 of the IRIS 7.3 Manager Reference Manual.

2. After an IRIS 7.3 Sysgen, there is a special procedure necessary to use Logical Units from IRIS 7.2. Immediately, after installing the unit under IRIS 7.3 for the first time, REHASH must be run. REHASH will ask for Logical Unit number to be rehashed. If you do many file creates and deletes on any Logical Unit under IRIS 7.3, REHASH can be run periodically for better performance.

3. After the IRIS 7.3 Sysgen, please note the following warning. One of the enhancements to IRIS under 7.3 is the buffer pool which reduces disc transfers of frequently used blocks. Because of this feature, it is mandatory that SHUTDOWN be run any time there is to be an interruption of normal IRIS timesharing for any reason. NEVER just hit STOP on the computer.

4. Under IRIS 7.3, any halt without a SHUTDOWN is a serious problem: the buffer pool may still contain data which needs to be written to disc. We have provided a manual routine which will allow you to flush the buffer pool and correctly update your disc in case the system goes down. This routine is completely described in Appendix A, "Manual Buffer Pool Flush."

5. IRIS 7.3 corrects a serious problem which existed under IRIS 7.2. The problem was that if INSTALL encountered an error condition in any file header, it would delete that file without warning. The solution for this problem under 7.3 is described in Section 6.4 of the IRIS 7.3 Manager Reference Manual.

6. Since authorizing the release of IRIS 7.3, five problems have come to light during our extended and continuing Quality Control exercise. These problems were reviewed and it was decided not to hold up release on their behalf. All five problems are under investigation and SCO's will be issued to correct them as solutions are reached. They are listed below for your information and to allow you to avoid them during the short time that they exist.

   a. You cannot copy an extended file to the line printer (results in a Trap).

   b. In a BASIC program, the user must be careful that only numeric characters be input into a numeric variable. This will be corrected.

   c. COPY $PTP=$PTR does not work correctly.

   d. Do not punch paper tapes using DSP punch commands.

   e. DSP cannot search properly with a terminating address of 177777. The value 177776 should be used instead until this is corrected.

   It will be the policy of EDS to alert you to known problems whenever they are encountered even if a solution is not immediately forthcoming. To this end, we will be launching in the New Year, a Technical Notes Bulletin with problems, solutions, general information, applications tips, etc. This will be a totally separate document from the EDS Newsletter and will be oriented towards the technical reader.

7. The following items are not ready at the time of IRIS 7.3 release. They should be available subsequently.

   a. Magtape driver

   b. DCC Mux driver

   c. Cassette tape unit

   d. $MTI

8. Any time INSTALL AND CLEAR is run under IRIS 7.3, REHASH must also be run.

APPENDIX A

MANUAL BUFFER POOL FLUSH

Under IRIS, 7.3, if the RUN light goes out for any reason other than a SHUTDOWN use this procedure to flush the buffers.

1. Check that the following octal contents are correct in memory:

Location	Octal Contents
7576	6705
7577	6266
7600	102520
7601	60377
7602	102400
7603	42773
7604	102000
7605	62077
7606	6771
7607	63077

2. If the contents are correct, RESET and START at 7600.

3. If the computer now halts with 63077, at location 7607 or 7610, then the manual buffer pool flush has completed successfully. The system is now ready to re-IPL.

4. If the contents of the above locations are not correct, or if the system does not reach a correct 63077 halt, then data may have been irrecoverably lost. Any file accessed since the last IPL may end up randomly missing some of the information which was supposed to have been written to it. You may have to depend on your most recent backups to restore data files to a known good condition.

APPENDIX B
CLEANUP

Cleanup has been "cleaned up" and there now are working versions for both 7.2 and 7.3!

In addition, the following improvements have been made:

1. The shuffling algorithm in phase 17 has been changed resulting in much faster RUN times (up to 14 times faster).

2. As the files are cleaned up, the phase # and filenames are printed on the terminal. This provides valuable information should problems arise. To suppress the printing of the filenames change location 200 in CLEANUP to a ZERO.

3. After cleaning up Logical Unit 0, an automatic IPL will not occur. Instead, the following message will be printed and the system will halt with a 63077 in the data lights:

"END OF CLEANUP-WHEN SYSTEM HALTS, RE-IPL"

APPENDIX C
TERMINAL CONTROL USER INSTRUCTIONS

1. BASIC I/O: The user may incorporate various terminal control functions into his PRINT, PRINT #, and INPUT statements. In some instances, alternative constructions are given for the control functions. The user should consult the documentation on his particular PORT TYPE to determine which constructions he may use.

1.1 Control of Video Attributes

The user may include various codes (see Section 1.9) in his PRINT and PRINT # statements to control the action of his terminal. For example, to print a blinking error message (on a CRT capable of blinking) the user might do:

```
PRINT 'BB'"ERROR  !"'EB'
```

and the message within the double quotes would be printed and would blink. More than one two-letter code may be included within a single pair of single quotes.

1.2 Protected Fields and Format Mode

One feature of some CRT's is the "protected field." These are sections of the CRT screen specified by the user with 'BP' and 'EP' codes to be write protected. This means that any attempt by an operator to type over these fields will be unsuccessful. Often the user has the option of selectively clearing only the unprotected sections of a screen with a 'CU' code. To make the protected fields operational, the terminal must first be set in "format mode" by sending an 'FM' code to the terminal in a PRINT statement.

1.3 Cursor Positioning For Output

The user may have a statement of the form:

```
PRINT   @X,Y; list;  {@X2, Y2;  list2 . . .}
```
[1]

where X is an arithmetic expression representing the column number to position to starting with zero and increasing towards the right (as with the TAB function), Y is an arithmetic expression representing the row number starting with zero and increasing towards the bottom, and "list" is any expression list. As many positionings as desired can be implemented in one statement. If Y is omitted, the cursor will be positioned to column X on the current line. The ";" terminating the list may be omitted if desired.

1 {. . .} signifies enclosed

1.4 Alternative Method For Controlling Video Attributes

On some CRT's (the Beehive B800 is the only CRT in this category at this time), the control of video attributes is done with a four-field command as follows:

```
PRINT @X,Y,T,N; . . .
```

where X and Y are positions on the screen as previously defined and where T represents the attributes to be set in a field N characters long beginning at X,Y. The value of T may be constructed as T = "sum over desired attributes" where the attribute values are 8 for blinking, 4 for reverse video, 2 for dimmed intensity and 1 for write protection. This command doesn't change the position of the cursor.

NOTE: No provision has been made for reading back video attributes that have been set up. This capability, implemented on some CRT's, is used for diagnostic purposes only and must be done at the machine level (i.e., assembly language), not BASIC.

1.5 Cursor Positioning For Input

```
INPUT @X,Y; "prompt" list
```

will position the cursor at X,Y, then output the "prompt" message, and finally accept input into the given "list" of variables. Multiple positionings and prompts are possible in one statement.

1.6 Setting The Length of An Input Field (B800 only)

A three-field construct may be used with the INPUT statement as:

```
INPUT @X,Y,L; . . .
```

which will use the next L characters following the position X,Y for input into the next variable of the statement. It is up to the CRT to generate an EOM code to terminate the input.

1.7 Reading Cursor Position

```
INPUT 'RD' X, Y
```

will return the current cursor coordinates into the variables X and Y. If the variables X or Y are missing, a syntax error will be given at runtime.

1.8 Block input from CRT: (not implemented until nodal input buffer)

```
INPUT 'BT' A$
```

will input into A$ from CRT memory, from current cursor position to next ETX code. Note that the user's I/O buffer must be large enough to hold the entire A$ at one time. Also, if there are any EOM codes (typically Carriage Return, octal 015) in the input string, they will terminate the data put into A$. The rest of the input may then be read with subsequent INPUT statements from the I/O buffer (without using the 'BT').

1.9 TERMINAL CONTROL CODES

Following is a list of all control codes that are planned to be implemented on some terminals. Those marked with a "*" are in a standard minimal subset that have a reasonable expectation of working on any CRT-type terminal for which the system has been implemented. Any others may be implemented for certain terminals which have such capabilities.

@	*	position cursor
RD		read cursor position
CS	*	clear screen
CU		clear unprotected fields
CL		clear from cursor to end of line (unprotected)
CE		clear from cursor to end of screen (unprotected)
MH	*	move cursor home
MU	*	move cursor up
MD	*	move cursor down
ML	*	move cursor left
MR	*	move cursor right
LF		line feed
CR		carriage return, (includes linefeed)
VT		vertical tab
FF		form feed
RB	*	ring bell
BB		begin blink
EB		end blink
BR		begin reverse video
ER		end reverse video
BD		begin dimmed intensity
ED		end dimming
BP		begin write protect
EP		end write protect
BU		begin underline
EU		end underline

1.9 TERMINAL CONTROL CODES (CONTINUED)

BX	begin expanded print
EX	end expanded print
FM	enter format mode (enable write protect)
FX	exit format mode (disable write protect)
LK	lock keyboard
UK	unlock keyboard
BT	begin transmission from CRT memory
ET	ETX code terminating CRT transmission
MP	use memory pointer instead of cursor in next positioning

*Included in standard minimal subset

2. BASIC String Assignment

LET A$(A1,A2) = B$(B1,B2) TO T$(T1,T2):B {,C$. . .}[1]

moves the designated part of B$ into A$ (subscripts optional) until either string ends or until the terminating character T$(T1,T1) is encountered. The optional variable B is set to 0 if T$(T1,T1) was not encountered, or to the byte position in B$ following T$(T1,T1) if it was. (Note that this may = B2+1). Additional string elements (including "TO" forms) may follow, separated by commas.

2.1 The user may now put an integer n between backslashes into literals where 0 n 200 without having the most significant bit (msb) set automatically. If n=0 however, the msb is still set automatically.

3. PORT: To select a desired terminal-dependent translation routine, the user types,

PORT TYPE n

where n is the code for the desired terminal type. The manager must have activiated the corresponding terminal driver by giving it a name starting with "$" so that SIR brings it into core. Otherwise an error message is given.

PORT TYPE	n
LSI ADM-3A	3
TERMINET	5

JC:SCM:es

---

1 {. . .} signifies enclosed items are optional.

M E M O R A N D U M

TO: TO ALL IRIS R7.3 USERS

DATE: January 25, 1979
J/79:SCM:0149

FROM: STEVEN C. MORITSUGU

SUBJECT: IRIS R7.3 MODIFICATION RELEASE

Along with your IRIS 7.3 system, you are also receiving several new products that I take great pleasure in describing to you now.

1. "Universal" CONFIG file. There used to be a different CONFIC for each type of disc and combining several discs on the same system was a major undertaking. That is all past! The new CONFIG is one standard product for all the discs that we support. Along with your CONFIG file is included a manual called the "CONFIG LAYOUT," giving all the important parameters for every disc IRIS supports. There is also a BASIC program called GUIDE. When you run the option for logical units, it shows you all the DSP commands you need to change or add to your disc configuration.

2. "Universal" BLOCKCOPY. Systems programmers will find this a valuable utility since it can copy selected portions of any disc to any other kind of disc. Again, GUIDE will describe BLOCKCOPY more fully and show you how to set it up. This is not the "universal - interactive - failsafe" DDCOPY, but the definite precursor of it.

3. "Universal" $LPT. One line printer driver LPTM handles all printers going through the EDS mux. Again, the GUIDE program will show you every specific DSP command you need to set up for any line printer (well-almost any). This driver also handles VFU, plot mode, back spacing, etc., by a new feature. For example,

```
 5    OPEN   #0, "$LPT"
10    PRINT  #0,1;"\216\\37\\207\"
```

Record 1 means pass all 8 bits as data, not as text (i.e., no auto LF after CR). Since BASIC now allows you to zero the eighth bit, then any possible 8 bit sequence can now be sent from a BASIC program to your printer. Consult your specific hardware manuals on how to use the VFU, plot mode, etc. LPTP will be the universal printer driver through programmed i/o on device code 17. LPTD will be through the DG 4060 mux. They will have the same options available as does LPTM.

4. Also, for those users with semiconductor memory who felt uneasy about 7.3's buffer pool in core, we have added an optional CONFIG file setting which is described in the enclosed addenda to our 7.3 manuals. With the setting called NDP, any extra danger of buffer pool is completely eliminated and much of the benefit still remains.

5. The limitation that, if you use the MCT, then it must be the swapping disc, has been removed.

6. Many of these enhancements require the new BYE, REX, and SYSGEN paper tapes which are enclosed. We advise that you do a new sysgen from papertape.

7. NOTE: MBUS is now 20600. Please set this value in INFO in CONFIG for all 7.3 systems.

8. R7.2 and R7.3 processors and drivers are different. Check that you do not load the wrong rev level papertapes by mistake.

Manager Manual Addenda

Corrections for IRIS 7.3 Manager Reference Manual
EDS 1018-11 5 SEP 78

Pg. 2-12; Paragraph starting "606 (Not currently used).": Replace this with the following: "606 NDPF No Dirty Page Flag. If set non-zero, some of the performance advantage of the buffer pool will be lost. However, by forcing all block writes directly to disc, the reliability of data on the disc is assured, even if memory is cleared."

Pg. 2-13; Paragraph starting "610 TOPW TOP Word of ...": Insert at end of paragraph: "Do not set TOPW above 77777 unless your CPU and all disc controllers on your system correctly use a 16-bit memory address."

Pg. 2-24; Paragragh starting "3) Select a suitable ..."; Line 4 starting "and do an IPL ...": Replace this line by the following: "Also change the LBSA cell as described on 2-10. Note that MBUS for 7.3 currently is 20600. SHUTDOWN the system and do an IPL to make these values effective."

2-28; Paragraph starting "11 Same as mode 10 ...": Replace this whole paragraph by the following: "11 Same as mode 10, but log-on is allowed if any entry in the whole table both matches and allows log-on. In all other modes, scan stops with the first match."

Pg. 4-4; Paragraph starting "8) Do an IPL by ...": Replace the first sentence by the following: "8) Exit from DSP, SHUTDOWN the system, and do a new IPL."

Pg. 4-5; Paragraph 1 starting "4.6 How to Replace SCOPE, ..."; Sentence in line 4 starting: "To do this, RESET and ...": Replace this whole sentence by the following: "To do this, exit from PLOAD by CTRL C, SHUTDOWN the system, and do a new IPL."

Pg. A6-6; Paragraph 1 starting "$ALU (DCC ALU ...": Add the following line at the end, just before the line starting "TTY or TTY50 ...": "Remember to set the total number of ports in the word just before ATRIB."

Pg. A6-6; Paragragh starting "$PHA (Phantom ...": Insert at the end: "Set the PCW word to 2000. Also, do not change the word just before ATRIB."

User Manual Addenda

Corrections for IRIS 7.3 User Reference Manual
EDS 1017-11 5 SEP 78

Pg. 1-11; BASIC program starting "400 LET D= ..."; Line 4 starting "430 IF SPC(D+24) ...": Replace this line by "430 IF SPC(D+30)<>1024 GOTO 450 ! PCW. = 36".

IRIS R7.4 PERIPHERALS HANDBOOK

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Section 2: TERMINAL CONTROL

SECTION 1

DISC SPECIFICATIONS

PLEASE NOTE:

1. All values and calculations are in octal.

2. You may need to patch our standard CONFIG driver for your particular disc driver density parameters. Check your disc specification sheet.

3. Several drivers share the same code and have the same LUFIX or BZUP addresses. For example, setting up for an MCT TDC-802 on T80 means there is no longer a driver for the MCT TDC-802 on T50.

```
ASM ,@$LPT,-X74DEFSPZ,10/R74CONFIG.USA
MAY  5, 1980  13:57:25

;  "CONFIG" == CONFIGURATION FILE FOR "IRIS" R7.4
;  UNIVERSAL - HANDLES ANY EDSI SUPPORTED DISC

            12          .RDX 10

             5 MONTH = 5
             2 DAY   = 2
          3674 YEAR  = 1980

;                    All Rights Reserved
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;  prior written permission of Educational Data Systems


;  SYSTEM CONFIGURATION DATE (HOURS AFTER 1-1-76)
        113470 SDATE = YEAR-1976*12+MONTH-1*31+DAY-1*24

            10          .RDX 8


             0 .LOC  0          ;BLOCK 1 -- (NOT USED)

       0     0        0


           400 .LOC  400        ;BLOCK 2 -- GENERAL INFORMATION

     400  35200        35200    ;LOCATION OF BSA (LBSA) *
     401  14400        14400    ;PARTITION SIZE (PSIZ = NUMBER OF WORDS) *
     402      1        1        ;NUMBER OF LOWER CORE PARTITIONS
     403      0        0        ;NUMBER OF PARTITIONS IN UPPER CORE
     404      0        0        ;NUMBER OF LOCKABLE PARTITIONS
     405      0        0        ;MAXIMUM TERMINAL TYPE NUMBER (MTTN)

                               ;    *   LBSA >= 31400          PSIZ <= LBSA-MBUS
                               ;        MBUS IS IN INFO TABLE (SEE NEXT PAGE)
```

```
                600 .LOC   INFO    ;SYSTEM INFORMATION TABLE

      600 113470           SDATE   ;SYSTEM CREATION DATE (HOURS AFTER 1-1-76)
      601 102000           102000  ;AVERAGE CPU SPEED (INSTRUCTIONS PER MSEC) *
      602      1           1       ;MAXIMUM # INSTALLED LOGICAL UNITS
      603     12           12      ;NUMBER OF DATA CHANNELS PER PORT
      604  65740           65740   ;LOCATION OF PORT CONTROL AREA
      605      1           1       ;TOTAL NUMBER OF ACTIVE PORTS (SET BY SIR)
      606      1           1       ;NO DIRTY PAGE FLAG
      607  20600           20600   ;MINIMUM BEGINNING OF USER STORAGE (MBUS)
      610  77777           77777   ;TOP WORD OF CORE TO BE USED
      611   1004           1004    ;AUXILIARY BUFFER SIZE (NUMBER OF WORDS)
      612      0           0       ;MAG TAPE BUFFER SIZE (NUMBER OF WORDS)
      613      4           4       ;NUMBER OF EXTRA CHARACTER QUEUE NODES
      614    100           100     ;MINIMUM NUMBER OF FREE NODES
      615     30           30      ;NUMBER OF SIGNAL BUFFER NODES
      616    140           140     ;MAXIMUM NUMBER OF DISCSUBS
      617  12003           12003   ;COEFFICIENTS FOR TIME SLICE CALCULATION
      620    454           454     ;COEFFICIENTS FOR TIMESHARING SCHEDULER
      621 177777           177777  ;COEFFICIENTS FOR PARTITION VALUATION
      622 177777           177777  ;COEFFICIENTS FOR PARTITION VALUATION

;       * SUBTRACT 100000 IF NOT NOVA 3 CPU

               1000 .LOC   1000    ;BLOCK 3 -- CORE-RESIDENT DISCSUB LIST

     1000      1           ALLOC&777
     1001      3           FFILE&777
     1002      7           CIA&777
     1003     15           ACNTL&777
     1004     22           OPEN&777
     1005     26           CLOSE&777
     1006     27           CLEAR&777
     1007     30           GETRR&777
     1010     33           READI&777
     1011     36           READC&777
     1012     40           CHARGE&777
     1013     41           SYSCO&777
     1014     46           SPECI&777
     1015     57           LINKP&777
     1016     60           DIREC&777
     1017     61           SEARC&777
     1020     62           SHUFF&777
     1021     63           DEKEY&777
     1022     67           AFSET&777
     1023     70           SIGPA&777
     1024 177777           -1        ;INSERT 71 HERE IF USING MAG TAPE
     1025     72           MTASK&777
     1026     73           MRFHD&777
     1027     74           MRFIL&777
     1030     75           MTFPE&777
     1031     77           MTAPA&777
     1032 177777           -1
```

```
          1400        .LOC   1400      ;BLOCK 4, DISC DRIVER TABLE


    1400        1 1       ;REAL CORE ADDRESS OF LUFIX SET UP BY "SIR"
    1401        0 0       ;VIRTUAL CORE ADDRESS OF SYSTEM DISC DRIVER
    1402        0 0       ;VIRTUAL CORE ADDRESS OF BZUP DISC DRIVER
    1403        1 1       ;# OF PARTITIONS FOR THIS DRIVER

    1404        0 0       ;ADDRESS OF LUVAR SET UP BY "SIR"
    1405        0 0       ;MIN PRIV, OR FIRST ACCOUNT FOR INSTALLING
    1406        0 0       ;LAST ACCOUNT NUMBER FOR INSTALLING
    1407        0 0       ;NUMBER OF CYLINDERS FOR THIS LUVAR
    1410        0 0       ;PARTITIONING INFORMATION AS IN LUVAR
    1411        0 0       ;(PART+1)
    1412        0 0       ;MINIMUM BLOCK COUNT (MUST BE >= 2)
    1413        0 0       ;(SPARE)


;  PARTITION 0.0 IS A DUMMY ENTRY
;  LU/0 IS SET UP BY SDVAR IN SOV AT SYSGEN TIME

    1414 177777         -1       ;TERMINATOR


                        ;  BLOCKS 5 - 37  --DISC DRIVERS
                        ;  BLOCKS 40 - 200--SYSTEM HISTORY (NOT YET USED)


                    .END   ;  R7.4 UNIVERSAL "CONFIG"
```

DISC SPECIFICATION

entry # 1

DISC ID	CONTROLLER	DRIVE
DG10MB	DG 4234 Type	DIABLO 44 Type

DEVICE CODE = 33

PART = D*40000 + P*1000

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 2024

BZUP address = 2703

	R4	R7+
LRT	20	14
LRC	40	30

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	MAX NO. ALLOWED ON OTHER LU'S
CYLINDERS	626	626	626

Some drives allow 630 cyl.

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes (No)

But some lookalikes do.

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
	--- NONE ---	

date: 5/5/80

DISC SPECIFICATION

entry # 2

DISC ID	CONTROLLER	DRIVE
SI10MB	SI 3045	DIABLO 44 Type

DEVICE CODE = 40

PART = 100 + D*400 + D*10 + P*100000

PART1 = S*30

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 3024

BZUP address = 3303

	R4-	R7+
LRT	14	14
LRC	30	30

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	MAX NO. ALLOWED ON OTHER LU'S
CYLINDERS	630	630	630

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes (No)

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
----	NONE	----

date: 5/5/80

DISC SPECIFICATION

entry # 3

DISC ID	CONTROLLER	DRIVE
DG4019	DG 4019	DG 6001/6005

DEVICE CODE = 20

PART = 0

PART1 = 0

WHERE D = DRIVE UNIT
S = STARTING CYL
P = PLATTER

LUFIX address = 2264

BZUP address = 2333

	R4	R7+
LRT	10	10
LRC	1000	1000

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	1	1	1

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes (No)

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
----	NONE	----

date: 5/5/80

DISC SPECIFICATION

entry # 4

DISC ID	CONTROLLER	DRIVE
AMMEGA	AMPEX MEGASTORE	---

DEVICE CODE = 20

PART = S * 1000 (each module is 2 cyl)

PART1 = 0

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 2264

BZUP address = 2333

	R4	R7+
LRT	10	10
LRC	1000	1000

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	20	20	20

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes (No)

Note: Use BLOCKCOPY as DDCOPY

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
---	NONE	---

date: 5/5/80

DISC SPECIFICATION

entry # 5

DISC ID	CONTROLLER	DRIVE
DCC446	DCC 116446	DIABLO 44 Type

DEVICE CODE = 30

PART = D*20000 + P*10000

PART1 = S*20

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 3424

BZUP address = 10021

	R4	R7+
LRT	20	14
LRC	40	30

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	626	626	626

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
----	NONE	----

date: 5/5/80

DISC SPECIFICATION

entry # 6

DISC ID	CONTROLLER	DRIVE
MC.T50	MCT TDC-802	CALCOMP T50

DEVICE CODE = 36

PART = 100000 + D

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 4024

BZUP address = 4703

	R4	R7+
LRT	13	13
LRC	156	156

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	1457	451	1123

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? (Yes) No

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
----	NONE	----

date: 5/5/80

DISC SPECIFICATION

entry # 7

DISC ID	CONTROLLER	DRIVE
MC.T25	MCT TDC-802	CALCOMP T25

DEVICE CODE = 36

PART = 100000 + D

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 4024

BZUP address = 4703

	R4	R7+
LRT	13	13
LRC	156	156

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	626	451	626

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? (Yes) No

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
----	NONE	----

date: 5/5/80

DISC SPECIFICATION

entry # 8

DISC ID	CONTROLLER	DRIVE
MC.T80	MCT TDC-802	CALCOMP T80

DEVICE CODE = 36

PART = 100000 + D

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 4024

BZUP address = 4703

	R4	R7+
LRT	20	20
LRC	240	240

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	1457	314	631

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? (Yes) No

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
4017	13	20
4020	12	12
4021	13	20
4022	156	240
4207	431	443
4222	22	34
4223	26	40
4224	13	20
4613	22	34
4615	431	443
4620	26	40
4622	156	240

date: 5/5/80

DISC SPECIFICATION

entry # 9

DISC ID	CONTROLLER	DRIVE
MCT200	MCT TDC-802	CALCOMP T200

DEVICE CODE = 36

PART = 100000 + D

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 4024

BZUP address = 4703

	R4	R7+
LRT	13	13
LRC	642	642

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	1457	116	234

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? (Yes) No

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
4017	13	13
4020	12	46
4021	13	13
4022	156	642
4207	431	431
4222	22	22
4223	26	26
4224	13	13
4613	22	22
4615	431	431
4620	26	26
4622	156	642

date: 5/5/80

DISC SPECIFICATION

entry # 10

DISC ID	CONTROLLER	DRIVE
MCT300	MCT TDC-802	CALCOMP T300

DEVICE CODE = 36

PART = 100000 + D

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 4024

BZUP address = 4703

	R4-	R7+
LRT	20	20
LRC	1140	1140

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	1457	65	153

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? (Yes) No

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
4017	13	20
4020	12	46
4021	13	20
4022	156	1140
4207	431	443
4222	22	34
4223	26	40
4224	13	20
4613	22	34
4615	431	443
4620	26	40
4622	156	1140

date: 5/5/80

DISC SPECIFICATION

entry # 11

DISC ID	CONTROLLER	DRIVE
BA3170	BALL 3170	DIABLO 44 Type

DEVICE CODE = 40

PART = 40000 + P*10000 + D*1000 + S

PART1 = 0

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 3624

BZUP address = 3723

	R4-	R7+
LRT	20	16
LRC	40	34

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	626	626	626

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes (No)

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
----	NONE	----

date: 5/5/80

DISC SPECIFICATION

entry # 12

DISC ID	CONTROLLER	DRIVE
MC9.40	MCT SMC-902	AMPEX 940

DEVICE CODE = 36

PART = 100000 + D

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 10424

BZUP address = 11703

	R4	R7+
LRT	13	13
LRC	245	245

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	633	306	615

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? (Yes) No

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes No (?)

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
----	NONE	----

date: 5/5/80

DISC SPECIFICATION

entry # 13

DISC ID	CONTROLLER	DRIVE
MC9.80	MCT SMC-902	AMPEX 980

DEVICE CODE = 36

PART = 100000 + D

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 10424

BZUP address = 11703

	R4	R7+
LRT	13	13
LRC	245	245

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	1467	306	615

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? (Yes) No

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes No (?)

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
----	NONE	----

date: 5/5/80

DISC SPECIFICATION

entry # 14

DISC ID	CONTROLLER	DRIVE
MC9CMD	MCT SMC-902	CDC 9448 CMD

DEVICE CODE = 36

PART = (100000 if on fixed surface) + D*100 + P

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

The fixed has 1, 3, or 5 surfaces (P is 0-4)

LUFIX address = 5024

BZUP address = 6303

	R4	R7+
LRT	13	13
LRC	41	41

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	1450	1450	1450

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? (Yes) No

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes No (?)

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
----	NONE	----

date: 5/5/80

DISC SPECIFICATION

entry # 15

DISC ID	CONTROLLER	DRIVE
BABD50	BALL 3255	BD 50

DEVICE CODE = 50

PART = D (up to 7)

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 12024

BZUP address = 12703

	R4	R7+
LRT	7	7
LRC	151	151

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	1457	470	1160

IF LU/O, DOES IT REQUIRE AT LEAST 32K WORDS? (Yes) No

DOES IT ALLOW MEMORY EXPANSION ABOVE 32K WORDS? Yes No (?)

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
----	NONE	----

date: 5/5/80

DISC SPECIFICATION

entry # 16

DISC ID	CONTROLLER	DRIVE
BA3150	BALL 3150	DIABLO 30 Type

DEVICE CODE = 40

PART = D*20000 + (S)*40

PART1 = 0

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 2424

BZUP address = 2533

	R4-	R7+
LRT	34	34
LRC	16	34

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	313	313	313

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? (Yes) No

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes No (?)

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
----	NONE	---

date: 5/5/80

DISC SPECIFICATION

entry # 17

DISC ID	CONTROLLER	DRIVE
TF3380	TELEFILE DC-16-C	CALCOMP T80

DEVICE CODE = 33

PART = D

PART1 = 60000 + S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 13024

BZUP address = 13303

	R4	R7+
LRT	20	20
LRC	240	240

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	1457	314	631

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
13017	13	20
13021	13	20
13022	156	240

date: 5/5/80

DISC SPECIFICATION

entry # 18

DISC ID	CONTROLLER	DRIVE
TF3350	TELEFILE DC-16-C	CALCOMP T50

DEVICE CODE = 33

PART = D

PART1 = 60000 + S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 13024

BZUP address = 13303

	R4	R7+
LRT	13	13
LRC	156	156

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	1457	451	1123

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
----	NONE	----

date: 5/5/80

DISC SPECIFICATION

entry # 19

DISC ID	CONTROLLER	DRIVE
AE3100	AED 3100P	PERTEC FD400 (FLOPPY)

DEVICE CODE = 33

PART = D * 40000

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 14024

BZUP address = 14207

	R4	R7+
LRT	10	10
LRC	10	10

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	115	115	115

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes No (?)

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
14017	20	10
14021	20	10
14022	20	10
14071	17	7
14262	17	7

date: 5/5/80

DISC SPECIFICATION

entry # 20

DISC ID	CONTROLLER	DRIVE
AE6200	AED 6200 LP	PERTEC FD910 (FLOPPY)

DEVICE CODE = 33

PART = D * 40000

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 14024

BZUP address = 14207

	R4	R7+
LRT	20	20
LRC	20	20

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	115	115	115

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes No (?)

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
----	NONE	----

date: 5/5/80

DISC SPECIFICATION

entry # 21

DISC ID	CONTROLLER	DRIVE
SI4050	SI 9500 "KAHILI"	CDC 9760 (40 MB)

DEVICE CODE = 50

PART = D * 2000

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 11154

BZUP address = 11303

	R4	R7*
LBT	20	20
LBC	240	240

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	MAX NO. ALLOWED ON OTHER LU'S
CYLINDERS	633	314	631

IF LU/O, DOES IT REQUIRE AT LEAST 32K WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE 32K WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
----	NONE	----

date: 5/5/80

DISC SPECIFICATION

entry # 22

DISC ID	CONTROLLER	DRIVE
DGFL33	DG FLOPPY	DG 6030

DEVICE CODE = 33

PART = D * 40000

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 2024

BZUP address = 2703

	R4	R7+
LRT	10	10
LRC	10	10

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	115	115	115

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes (No)

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
2017	14	10
2020	2	1
2021	14	10
2022	30	10
2023	100533	101033
2634	14	10

date: 5/5/80

DISC SPECIFICATION

entry # 23

DISC ID	CONTROLLER	DRIVE
DG1040	DG 4234 Type	DIABLO 44 Type

DEVICE CODE = 40

PART = D*40000 + P*1000

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 15024

BZUP address = 15703

	R4	R7+
LRT	20	14
LRC	40	30

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	626	626	626

Some drives allow 630 cyl.

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes (No)

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
	NONE	

date: 5/5/80

DISC SPECIFICATION

entry # 24

DISC ID	CONTROLLER	DRIVE
DGFL40	DG FLOPPY	DG 6030

DEVICE CODE = 40

PART = D * 40000

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 15024

BZUP address = 15703

	R4	R7+
LRT	10	10
LRC	10	10

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	115	115	115

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes (No)

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
15017	14	10
15020	2	1
15021	14	10
15022	30	10
15023	100540	101040
15634	14	10

date: 5/5/80

DISC SPECIFICATION

entry # 25

DISC ID	CONTROLLER	DRIVE
SI8050	SI 9500 "KAHILI"	CDC 9762 (80 MB)

DEVICE CODE = 50

PART = D * 2000

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 11154

BZUP address = 11303

	R4	R7+
LRT	20	20
LRC	240	240

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	1467	314	631

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
---	NONE	---

date: 5/5/80

DISC SPECIFICATION

entry # 26

DISC ID	CONTROLLER	DRIVE
DG20MB	DG 6070	DG 6070 Series

DEVICE CODE = 33

PART = D*40000 + P*2000

PART1 = 's

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 34024

BZUP address = 34463

	R4	R7+
LRT	X	14
LRC	X	60

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	626	626	626

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes (No)

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
---	NONE	---

date: 5/5/80

DISC SPECIFICATION

entry # 27

DISC ID	CONTROLLER	DRIVE
AE6240	AED 6200LP	PERTEC FD510

DEVICE CODE = 40

PART = D * 40000

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 34624

BZUP address = 35007

	R4	R7+
LRT	20	20
LRC	20	20

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	115	115	115

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes No (?)

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
---	NONE	---

date: 5/5/80

DISC SPECIFICATION

entry # 28

DISC ID	CONTROLLER	DRIVE
AE3140	AED 3100P	PERTEC FD400

DEVICE CODE = 40

PART = D * 40000

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 34624

BZUP address = 35007

	R4	R7+
LRT	10	10
LRC	10	10

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	MAX NO. ALLOWED ON OTHER LU'S
CYLINDERS	115	115	115

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes No (?)

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
34617	20	10
34621	20	10
34622	20	10
34671	17	7
35062	17	7

date: 5/5/80

DISC SPECIFICATION

entry # 29

DISC ID	CONTROLLER	DRIVE
S12CMD	MCT SMC12	CDC 9448

DEVICE CODE = 60

PART = 400*P + D + (100000 if fixed)

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

The fixed disc has 1, 3, or 5 surfaces (0 - 4)

LUFIX address = 35424

BZUP address = 35303

	R4	R7+
LRT	X	20
LRC	X	40

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	1450	1450	1450

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
---	NONE	---

date: 5/5/80

DISC SPECIFICATION

entry # 30

DISC ID	CONTROLLER	DRIVE
S12S80	MCT SMC12	CDC 9762

DEVICE CODE = 60

PART = D

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 36024

BZUP address = 35703

	R4	R7+
LRT	X	20
LRC	X	240

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	1450	314	630

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? (Yes) No

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
---	NONE	---

date: 5/5/80

DISC SPECIFICATION

entry # 31

DISC ID	CONTROLLER	DRIVE
SI05MB	SI 3015	DIABLO 31

DEVICE CODE = 40

PART = 100 + D*40000 + D*400 + P*20000

PART1 = S*30

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 5624

BZUP address = 3203

	R4	R7+
LRT	14	14
LRC	30	30

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	313	313	313

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
---	NONE	---

date: 5/5/80

DISC SPECIFICATION

entry # 32

DISC ID	CONTROLLER	DRIVE
DG2533	DG 4046	DG 4047

DEVICE CODE = 33

PART = D * 40000

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 2024

BZUP address = 2703

	R4	R7+
LRT	20	14
LRC	40	30

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	313	313	313

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? Yes (No)

But some lookalikes do.

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
	NONE	

date: 5/5/80

DISC SPECIFICATION

entry # 33

DISC ID	CONTROLLER	DRIVE
SI8073	SI 9500 "KAHILI"	CDC 9762 (80 MB)

DEVICE CODE = 73

PART = D * 2000

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 6424

BZUP address = 6553

	R4	R7+
LRT	20	20
LRC	240	240

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	1467	314	631

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? Yes (No)

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
---	NONE	---

date: 5/5/80

DISC SPECIFICATION

entry # 34

DISC ID	CONTROLLER	DRIVE
MC9F50	MCT SMC-902	FUJITSU 50 MB

DEVICE CODE = 36

PART = 100000 + D

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 7024

BZUP address = 15523

	R4	R7+
LRT	X	14
LRC	X	154

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	1457	457	1136

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? (Yes , No

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
	NONE	

date: 5/5/80

DISC SPECIFICATION

entry # 35

DISC ID	CONTROLLER	DRIVE
QUECMD	QUENTIN N6010	CDC 9448

DEVICE CODE = 27

PART = 10*P + D + (200 if fixed disc)

PART1 = S + (40000 if fixed disc)

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

The fixed disc has 1, 3, or 5 surfaces (0 - 4)

LUFIX address = 40074

BZUP address = 13614

	R4	R7+
LRT	X	20
LRC	X	40

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	1450	1450	1450

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? (Yes) No

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN RE!PL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
----	NONE	----

date: 5/5/80

DISC SPECIFICATION

entry # 36

DISC ID	CONTROLLER	DRIVE
EDSCMD	POINT 4 700	CDC 9448

DEVICE CODE = 27

PART = 10*P + D + (100000 if fixed disc)

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

The fixed disc has 1, 3, or 5 surfaces (0 - 4)

LUFIX address = 36224

BZUP address = 7744

	R4	R7+
LRT	X	20
LRC	X	40

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	1450	1450	1450

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? (Yes) No

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
----	NONE	----

date: 5/5/80

DISC SPECIFICATION

entry # 37

DISC ID	CONTROLLER	DRIVE
EDS080	POINT 4 700	OKIDATA 80 MB

DEVICE CODE = 27

PART = D

PART1 = S

WHERE D = DRIVE UNIT #
S = STARTING CYL #
P = PLATTER #

LUFIX address = 37154

BZUP address = 10314

	R4	R7+
LRT	X	20
LRC	X	600

	TOTAL ON DISC	MAX NO. ALLOWED ON LU/O	OTHER LU'S
CYLINDERS	523	125	252

IF LU/O, DOES IT REQUIRE AT LEAST **32K** WORDS? (Yes) No

DOES IT ALLOW MEMORY EXPANSION ABOVE **32K** WORDS? (Yes) No

Set Up Parameters

FOR THIS DISC, USE DSP TO ENTER THESE NEW CONTENTS IN CONFIG. THEN REIPL.

CONFIG ADDRESS	OLD CONTENTS	NEW CONTENTS
----	NONE	----

date: 5/5/80

SECTION II

TERMINAL CONTROL

DEFINITIONS OF TERMINAL CONTROL MNEMONICS

```
ET =3     ;ETX code
RB =7     ;ring bell
ML =10    ;move left
LF =12    ;line feed
VT =13    ;vertical tab
FF =14    ;form feed
CR =15    ;carriage return
MH =17    ;move home
CS =20    ;clear screen
MR =40    ;move right
RD =41    ;read cursor position
CU =43    ;clear unprotected
CL =44    ;clear to end of line (unprotected)
CE =45    ;clear to end of screen (unprotected)
MD =52    ;move down
MU =53    ;move up
BB =60    ;begin blink
EB =61    ;end blink
BR =62    ;begin reverse video
ER =63    ;end reverse video
BD =64    ;begin dimming
ED =65    ;end dimming
BP =66    ;begin write protect
EP =67    ;end write protect
BU =70    ;begin underline
EU =71    ;end underline
BX =72    ;begin expanded print
EX =73    ;end expanded print
FM =74    ;enter format mode
FX =75    ;exit format mode
LK =76    ;lock keyboard
UK =77    ;unlock keyboard
BT =100   ;begin transmission from CRT memory
MP =101   ;use memory pointer instead of cursor
          ;  for next positioning.
AT =177   ;"@" -- start of multi-byte sequence
          ;  (usually a cursor positioning request)
          ;  which is terminated by a 377 code.
```

TERMINAL CONTROL

entry# 1

TERMINAL	TERMINAL TRANS. MODULE
ADDS REGENT 25	TERMADDS25

Terminal Type Code	17
Port Type	15

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
ET	No	No
RB	Yes	Yes
ML	Yes	Yes
LF	Yes	Yes
VT	Yes	Yes
FF	No	No
CR	Yes	Yes
MH	Yes	Yes
CS	Yes	Yes
MR	Yes	Yes
RD	No	No
CU	No	No
CL	Yes	Yes
CE	Yes	Yes
MD	Yes	Yes
MU	Yes	Yes
BB	No	No
EB	No	No

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
BR	No	No
ER	No	No
BD	No	No
ED	No	No
BP	No	No
EP	No	No
BU	No	No
EU	No	No
BX	No	No
EX	No	No
FM	No	No
FX	No	No
LK	Yes	Yes
UK	Yes	Yes
BT	No	No
MP	No	No
@	Yes	Yes

date: 5/5/80

TERMINAL CONTROL

entry# 2

TERMINAL	TERMINAL TRANS. MODULE
BEEHIVE 100	TERMB100

Terminal Type Code	12
Port Type	10

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
ET	Yes	No
RB	Yes	Yes
ML	Yes	Yes
LF	Yes	Yes
VT	No	No
FF	No	No
CR	Yes	Yes
MH	Yes	Yes
CS	Yes	Yes
MR	Yes	Yes
RD	No	No
CU	Yes	Yes
CL	Yes	Yes
CE	Yes	Yes
MD	Yes	Yes
MU	Yes	Yes
BB	Yes	Yes
EB	Yes	Yes

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
BR	No	No
ER	No	No
BD	Yes	Yes
ED	Yes	Yes
BP	Yes	Yes
EP	Yes	Yes
BU	No	No
EU	No	No
BX	No	No
EX	No	No
FM	Yes	Yes
FX	Yes	Yes
LK	Yes	Yes
UK	Yes	Yes
BT	Yes	No
MP	No	No
@	Yes	Yes

date: 5/5/80

TERMINAL CONTROL

entry# 3

TERMINAL	TERMINAL TRANS. MODULE
DATA GENERAL 6052/6053	TERMDGC

Terminal Type Code: 13

Port Type: 11

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
ET	No	No
RB	Yes	Yes
ML	Yes	Yes
LF	Yes	No
VT	No	No
FF	No	No
CR	Yes	Yes
MH	Yes	Yes
CS	Yes	Yes
MR	Yes	Yes
RD	Yes	No
CU	No	No
CL	Yes	Yes
CE	No	Yes
MD	Yes	Yes
MU	Yes	Yes
BB	Yes	Yes
EB	Yes	Yes

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
BR	NO	No
ER	No	No
BD	Yes *	Yes
ED	Yes *	Yes
BP	No	No
EP	No	No
BU	Yes *	Yes
EU	Yes *	Yes
BX	No	No
EX	No	No
FM	No	No
FX	No	No
LK	No	No
UK	No	No
BT	No	No
MP	No	No
@	Yes	Yes

* Enhanced Terminal

date: 5/5/80

TERMINAL CONTROL

entry# 4

TERMINAL	TERMINAL TRANS. MODULE
DATA MEDIA ELITE 1520A	TERMDM1520

Terminal Type Code	6
Port Type	6

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
ET	No	No
RB	Yes	Yes
ML	Yes	Yes
LF	Yes	Yes
VT	No	No
FF	No	No
CR	Yes	Yes
MH	Yes	Yes
CS	Yes	Yes
MR	Yes	Yes
RD	No	No
CU	No	No
CL	Yes	Yes
CE	Yes	Yes
MD	Yes	Yes
MU	Yes	Yes
BB	No	No
EB	No	No

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
BR	No	No
ER	No	No
BD	No	No
ED	No	No
BP	No	No
EP	No	No
BU	No	No
EU	No	No
BX	No	No
EX	No	No
FM	No	No
FX	No	No
LK	No	No
UK	No	No
BT	No	No
MP	No	No
@	Yes	Yes

date: 5/5/80

TERMINAL CONTROL

entry# 5

TERMINAL	TERMINAL TRANS. MODULE
DATA MEDIA ELITE 1521A	TERMDM1521

Terminal Type Code	7
Port Type	7

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
ET	No	No
RB	Yes	Yes
ML	Yes	Yes
LF	Yes	Yes
VT	No	No
FF	No	No
CR	Yes	Yes
MH	Yes	Yes
CS	Yes	Yes
MR	Yes	Yes
RD	No	No
CU	No	Yes
CL	Yes	Yes
CE	Yes	Yes
MD	Yes	Yes
MU	Yes	Yes
BB	No	No
EB	No	No

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
BR	No	No
ER	No	No
BD	Yes	Yes
ED	Yes	Yes
BP	Yes	Yes
EP	Yes	Yes
BU	No	No
EU	No	No
BX	No	No
EX	No	No
FM	No	No
FX	No	No
LK	No	No
UK	No	No
BT	No	No
MP	No	No
@	Yes	Yes

date: 5/5/80

TERMINAL CONTROL

entry# 6

TERMINAL	TERMINAL TRANS. MODULE
GE TERMINET	TERMINET

Terminal Type Code: 5

Port Type: 5

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
ET		
RB		
ML		
LF		
VT	Yes	No *
FF	Yes	No *
CR		
MH		
CS		
MR		
RD		
CU		
CL		
CE		
MD		
MU		
BB		
EB		

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
BR		
ER		
BD		
ED		
BP		
EP		
BU		
EU		
BX		
EX		
FM		
FX		
LK		
UK		
BT		
MP		
@		

* This module provides delays only for vertical tab and form feed. Do not use the above mnemonics at this port.

date: 5/5/80

TERMINAL CONTROL

entry# 7

TERMINAL	TERMINAL TRANS. MODULE
HAZELTINE 1500	TERMH1500

Terminal Type Code	14
Port Type	12

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
ET	No	No
RB	Yes	Yes
ML	Yes	Yes
LF	Yes	Yes
VT	No	No
FF	No	No
CR	Yes	Yes
MH	Yes	Yes
CS	Yes	Yes
MR	Yes	Yes
RD	Yes	No
CU	Yes	Yes
CL	Yes	Yes
CE	Yes	Yes
MD	Yes	Yes
MU	Yes	Yes
BB	No	No
EB	No	No

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
BR	No	No
ER	No	No
BD	Yes	Yes
ED	Yes	Yes
BP	Yes	Yes
EP	Yes	Yes
BU	No	No
EU	No	No
BX	No	No
EX	No	No
FM	No	No
FX	No	No
LK	Yes	Yes
UK	Yes	Yes
BT	No	No
MP	No	No
@	Yes	Yes

date: 5/5/80

TERMINAL CONTROL

entry# 8

TERMINAL	TERMINAL TRANS. MODULE
HAZELTINE 2000	TERMH2000

Terminal Type Code	11
Port Type	9

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
ET	No	No
RB	Yes	Yes
ML	Yes	Yes
LF	No	No
VT	No	No
FF	No	No
CR	Yes	Yes
MH	Yes	Yes
CS	Yes	Yes
MR	No	No
RD	No	No
CU	Yes	Yes
CL	No	No
CE	No	No
MD	No	No
MU	No	No
BB	No	No
EB	No	No

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
BR	No	No
ER	No	No
BD	Yes	Yes
ED	Yes	Yes
BP	Yes	Yes
EP	Yes	Yes
BU	No	No
EU	No	No
BX	No	No
EX	No	No
FM	No	No
FX	No	No
LK	No	No
UK	No	No
BT	Yes	No
MP	No	No
@	Yes	Yes

date: 5/5/80

TERMINAL CONTROL

entry# 9

TERMINAL	TERMINAL TRANS. MODULE
LSI ADM-1A	TERMADM1

Terminal Type Code: 1

Port Type: 1

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
ET	No	No
RB	Yes	Yes
ML	Yes	Yes
LF	Yes	Yes
VT	No	No
FF	No	No
CR	Yes	Yes
MH	Yes	Yes
CS	Yes	Yes
MR	Yes	Yes
RD	Yes	No
CU	Yes	Yes
CL	Yes *	Yes
CE	Yes *	Yes
MD	Yes	Yes
MU	Yes	Yes
BB	No	No
EB	No	No

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
BR	No	No
ER	No	No
BD	Yes	Yes
ED	Yes	Yes
BP	Yes	Yes
EP	Yes	Yes
BU	No	No
EU	No	No
BX	No	No
EX	No	No
FM	Yes	Yes
FX	Yes	Yes
LK	Yes	Yes
UK	Yes	Yes
BT	Yes	No
MP	No	No
@	Yes	Yes

* optional edit package

date: 5/5/80

TERMINAL CONTROL

entry# 10

TERMINAL	TERMINAL TRANS. MODULE
LSI ADM-2	TERMADM2

Terminal Type Code	2
Port Type	2

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
ET	No	No
RB	Yes	Yes
ML	Yes	Yes
LF	Yes	Yes
VT	No	No
FF	No	No
CR	Yes	Yes
MH	Yes	Yes
CS	Yes	Yes
MR	Yes	Yes
RD	Yes	No
CU	Yes	Yes
CL	Yes	Yes
CE	Yes	Yes
MD	Yes	Yes
MU	Yes	Yes
BB	Yes	Yes
EB	Yes	Yes

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
BR	No	No
ER	No	No
BD	Yes	Yes
ED	Yes	Yes
BP	Yes	Yes
EP	Yes	Yes
BU	No	No
EU	No	No
BX	No	No
EX	No	No
FM	Yes	Yes
FX	Yes	Yes
LK	Yes	Yes
UK	Yes	Yes
BT	Yes	No
MP	No	No
@	Yes	Yes

date: 5/5/80

TERMINAL CONTROL

entry# 11

TERMINAL	TERMINAL TRANS. MODULE
LSI ADM-3A	TERMADM3

Terminal Type Code	3
Port Type	3

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
ET	Yes	No
RB	Yes	Yes
ML	Yes	Yes
LF	Yes	Yes
VT	No	No
FF	No	No
CR	Yes	Yes
MH	Yes	Yes
CS	Yes	Yes
MR	Yes	Yes
RD	No	No
CU	No	No
CL	No	No
CE	No	No
MD	Yes	Yes
MU	Yes	Yes
BB	No	No
EB	No	No

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
BR	No	No
ER	No	No
BD	No	No
ED	No	No
BP	No	No
EP	No	No
BU	No	No
EU	No	No
BX	No	No
EX	No	No
FM	No	No
FX	No	No
LK	Yes	Yes
UK	Yes	Yes
BT	No	No
MP	No	No
@	Yes	Yes

date: 5/5/80

TERMINAL CONTROL

entry# 12

TERMINAL	TERMINAL TRANS. MODULE
MICRO-TERM ACT-V	TERMACT5

Terminal Type Code 15

Port Type 13

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
ET	No	No
RB	Yes	Yes
ML	Yes	Yes
LF	Yes	Yes
VT	No	No
FF	No	No
CR	Yes	Yes
MH	Yes	Yes
CS	Yes	Yes
MR	Yes	Yes
RD	Yes	No
CU	Yes	Yes
CL	Yes	Yes
CE	Yes	Yes
MD	Yes	Yes
MU	Yes	Yes
BB	No	No
EB	No	No

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
BR	No	No
ER	No	No
BD	Yes	Yes
ED	Yes	Yes
BP	Yes	Yes
EP	Yes	Yes
BU	Yes	Yes
EU	No	No
BX	No	No
EX	No	No
FM	Yes	Yes
FX	Yes	Yes
LK	No	No
UK	No	No
BT	Yes	No
MP	No	No
@	Yes	Yes

date: 5/5/80

TERMINAL CONTROL

entry# 13

TERMINAL	TERMINAL TRANS. MODULE
SOROC IQ 120	TERMADM1

Terminal Type Code	1
Port Type	1

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
ET	No	No
RB	Yes	Yes
ML	Yes	Yes
LF	Yes	Yes
VT	No	No
FF	No	No
CR	Yes	Yes
MH	Yes	Yes
CS	Yes	Yes
MR	Yes	Yes
RD	Yes	No
CU	Yes	Yes
CL	Yes	Yes
CE	Yes	Yes
MD	Yes	Yes
MU	Yes	Yes
BB	No	No
EB	No	No

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
BR	No	No
ER	No	No
BD	Yes	Yes
ED	Yes	Yes
BP	Yes	Yes
EP	Yes	Yes
BU	No	No
EU	No	No
BX	No	No
EX	No	No
FM	Yes	Yes
FX	Yes	Yes
LK	Yes	Yes
UK	Yes	Yes
BT	Yes	No
MP	No	No
@	Yes	Yes

date: 5/5/80

TERMINAL CONTROL

entry# 14

TERMINAL	TERMINAL TRANS. MODULE
TELEVIDEO 912	TERMTV912

Terminal Type Code	16
Port Type	14

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
ET		No
RB	Yes	Yes
ML	Yes	Yes
LF	Yes	Yes
VT	Yes	Yes
FF	No	No
CR	Yes	Yes
MH	Yes	Yes
CS	Yes	Yes
MR	Yes	Yes
RD	Yes	No
CU	Yes	Yes
CL	Yes	Yes
CE	Yes	Yes
MD	Yes	Yes
MU	Yes	Yes
BB	Yes	Yes
EB	Yes	Yes

TERMINAL FUNCTIONS AVAILABLE		
FUNCTION	ON TERMINAL	IN MODULE
BR	Yes	Yes
ER	Yes	Yes
BD	Yes	Yes
ED	Yes	Yes
BP	Yes	Yes
EP	Yes	Yes
BU	Yes	Yes
EU	Yes	Yes
BX	No	No
EX	No	No
FM	Yes	Yes
FX	Yes	Yes
LK	Yes	Yes
UK	Yes	Yes
BT	Yes	No
MP	No	No
@	Yes	Yes

date: 5/5/80

7.3.0A Cover Letter
6/15/79
7:79:SCM:0344

From: Steve Moritsugu
EDSI Director of Customer Support

Topics:
A) SCO Numbering
B) 7.3.0A Installation
C) EXERCISER
D) EDSI POINT 4 Computer
E) Buffer Pool
F) Status of 7.3

A.) SCO NUMBERING

First, what is an SCO? At EDSI, our customer support department helps our users solve any problems they encounter using IRIS. Periodically, we send these solutions to all the IRIS users currently on subscription service. This collection of patches is carefully selected, tested, and released as an SCO ("software change order"). Each patch sheet has a description of the problem it solves, and so some users are tempted to pick and choose among the updates and only enter part of the SCO. Please enter the complete SCO because:

1.) It is hard for us to help you solve new problems if you are not running our standard software with all released patches.

2.) Each succeeding SCO will assume that the previous SCO is already entered.

Each digit and letter in 7.3.0A has a meaning.

7.3 tells us which major release of IRIS is being used.

.0 says there have been no SCO's for 7.3 where papertape was required.

A says this is the first, intermediate "paper-tape optional" release for IRIS 7.3.0. Papertapes are included but it is not required that they be used.

Since many of our users do not have easy access to papertape, we will try to make most updates able to be entered through the keyboard. If the next SCO is also an intermediate "paper-tape optional release," its number will be 7.3.0B. If it includes papertapes which must be read in, then its number will be 7.3.1.

For those users who do many SysGens from papertape, you may order a set of 7.3.0A papertapes which replace just those 7.3 products affected by SCO 7.3.0A.

B) 7.3.0A Installation

1.) Back up your system and data

2.) Use BASIC to enter GBLK 73-01
GBLK 73-02
GLPT 73-01
GUID 73-01
GULU 73-01

3.) Enter DSP and do not exit it until all the rest of the updates have been entered. Remember to check the old contents first. Important - if the old contents do not agree, something is wrong. Make sure you are using a standard version of IRIS 7.3 as supplied by EDSI.

4.) Exit DSP, SHUTDOWN and do a new IPL.

5.) If you are using $LPTP, do not use the lineprinter until you run GUIDE, set up $LPTP under 7.3.0A, and do a new IPL to make those changes active.

6.) Now your IRIS system has been upgraded to the supported level 7.3.0A.

C.) EXERCISER

A new BASIC program is included as both papertape and listing. It is a very simple, convenient test of CPU, core, and disc which can be run while other users are running. It will print instructions when you run it. EXERCISER will run forever, until aborted by control-C or until it finds any error. It cannot pin-point the problem as CPU, core, or disc, but it can detect subtle (but serious), intermittent hardware problems at a very early stage. EDSI recommends you leave it running regularly overnight and over weekends.

D.) EDSI POINT 4 Computer

Everyone at EDSI is excited about the success of our new product, the POINT 4 Computer. It is so much faster than any other computer running IRIS that it has revealed IRIS software errors in timing and sequence of events which only show up at such high execution speeds.

SCO 7.3.0A contains the updates to IRIS 7.3 necessary to run on the POINT 4 computer. In addition, to use the EDSI Micro-N, to speed up BASIC arithmetic, on the POINT 4 computer requires the new version of $DAU which has been included with SCO 7.3.0A on papertape.

E.) BUFFER POOL

Two problems are corrected in SCO 7.3.0A which had caused some users to lack confidence in 7.3's buffer pool.

1. SHUTDOWN, without naming a stand-alone file to load, did not flush the core buffer pool back to disc. Then, on a new IPL, some of the recent file updates would mysteriously be missing.

2. Many users thought the NDPF, "No Dirty Page Flag," was in effect as a default condition. Thus, they encountered missing file updates since they did not manually flush the bufferpool after a system crash.

With SCO 7.3.0A, the buffer pool is totally secure. The following definitions are included to help understand NDPF and the trade-off between performance and security.

EXTRANEOUS DISC READS: Often a record is read and updated several times. If the record is in a disc block read into the buffer-pool, then each successive read gets the core copy and does not have to read from disc. All disc reads except the initial one are then extraneous and are eliminated by the buffer pool.

EXTRANEOUS DISC WRITES: Similarly, all disc writes, except the last one, are extraneous and can be eliminated by updating just the core copy in the bufferpool so that the block is only written once, after all updates are done.

DIRTY PAGE: Any block which has been updated in core but not written to disc is a dirty page. The system flushes dirty pages to disc if it is idle. However, if it is busy, the most used blocks may stay dirty for several hours or more,

MANUAL BUFFERPOOL FLUSH: This was described in 7.3 Installation Manual, Appendix A . It writes all dirty pages to disc, assuming core is intact. If the manual flush does not get a good halt, there is no way to predict what information was lost. Even operations completed several hours ago may be incomplete on disc. Losing the bufferpool with NDPF=0 is a serious problem. Files may have to be restored from a back up and all the updates reentered.

NDPF (No Dirty Page Flag): cell 606 in CONFIG.

0 in NDPF means the flag is not set. This gives maximal speed performance as all extraneous reads and writes are eliminated. If there is a system crash, the buffer pool must be flushed manually.

1 or any non-zero value in NDPF sets the flag. It forces all writes to disc. Extraneous disc reads are eliminated but not extraneous disc writes. If there is a system crash, there is no need to manually flush the bufferpool: the information is already on disc. This gives all the security that 7.2 had plus half the advantage of buffer pool.

F.) STATUS OF 7.3

7.3 is in wide use and considerably out-performs 7.2 with 64K words memory. The only areas still unresolved in 7.3 are:

1.) DSP breakpoints
2.) A PRINT statement must be separated from a matrix operation by a SIGNAL 3,0. (This does not include MAT READ or MAT WRITE.)

A component list for both SCO 7.3.0A and 7.3 as originally shipped are included to show everything so far released for IRIS 7.3.

```
10 DIM L$[20]
20 DIM A$[100],B$[100]
30 LET A$="HAVE COMPLETED THROUGH BLOCK ###### OF WRITE OUT PHASE "
40 LET B$="HAVE COMPLETED THROUGH BLOCK ###### OF READ BACK AND VERIFY PHASE"
50 DIM 4%,A[63],B[63]
60 PRINT "\215\THIS CORE AND DISC EXERCISER PROGRAM WAS NOT DESIGNED TO BE A"
   PRINT "REPLACEMENT FOR A COMPREHENSIVE STAND-ALONE RELIABILITY PROGRAM."
   PRINT "RATHER, IT IS A CONVENIENT TOOL WHICH CAN BE RUN USING LIVE"
   PRINT "DATA PACKS, WITHOUT HAVING TO ASK EVERYONE ELSE TO LOG OFF."
100 PRINT "EDS ADVISES YOU RUN IT OVERNIGHT OR OVER WEEKENDS.  ANY ERROR"
110 PRINT "FOUND IN CORE OR ON DISC WILL ABORT THE PROGRAM AND PRINT"
120 PRINT "AN ERROR MESSAGE."
130 LET N=1
140 PRINT "\215\\215\"
150 PRINT "CHOOSE THE # OF BLOCKS TO BE USED BY THIS EXERCISER."
160 PRINT "THE # SHOULD BE GREATER THAN THE # OF BLOCKS IN THE BUFFER"
170 PRINT "POOL, IF POSSIBLE.  (TO DETERMINE # OF BLOCKS IN THE BUFFER"
180 PRINT "POOL, USE DSP TO DUMP LOCATION 664 IN CORE. REF: 7.3 MANAGER"
190 PRINT "MANUAL PG. A5-2. CONVERT THE # FOUND THERE FROM OCTAL TO DECIMAL.)"
200 PRINT "MAKE SURE THAT THE CHOSEN BLOCK COUNT DOES NOT EXCEED THE # OF"
210 PRINT "BLOCKS AVAILABLE TO THIS ACCOUNT ON THE SELECTED LOGICAL UNIT."
220 INPUT "ENTER # OF BLOCKS TO USE : "C
230 PRINT
240 INPUT "ENTER LOGICAL UNIT # TO USE : "L
250 LET L$=L
260 LET L$=L$[2, LEN L$-1]
280 PRINT "\215\\215\\215\"
290 SIGNAL 3,0
295 LET L$=L$,"/EXERCISERFILE!"
300 BUILD #0,L$
310 MAT  WRITE #0,0;A
   CLOSE #0
   OPEN #0,L$
340 PRINT "\215\"
350 FOR J=1 TO C
360   LET P=J*.98765432101234*N
370   FOR I=0 TO 63
380     LET A[I]=P
390   NEXT I
400   IF  FRA (J/15)<>0 GOTO  430
410   IF N<>1 SIGNAL 3,40
420   PRINT  USING A$;J ! TO OVERLAP EDS MUX VS DISC
430   MAT  WRITE #0,J;A
440 NEXT J
450 FOR K=1 TO C
460   LET M=K*.98765432101234*N
470   MAT  READ #0,K;B
480   FOR I=0 TO 63
490     IF B[I]<>M GOTO 630
500   NEXT I
510   IF  FRA (K/15)<>0 GOTO  540
520   IF N<>1 SIGNAL 3,40
530   PRINT  USING B$;K ! TO OVERLAP EDS MUX VS DISC
540 NEXT K
550 PRINT "\215\\215\"
560 PRINT "EDS CORE AND DISC EXERCISER (VERSION 1)"
570 PRINT "WITH # OF BLOCKS IN TEST = "C
   PRINT "PASS #",N,"COMPLETED OK.  (NO ERRORS)"
   PRINT "PRESS CONTROL C TO ABORT.  THEN KILL EXERCISERFILE."
600 LET N=N+1
610 SIGNAL 3,100
620 GOTO  340
630 PRINT "\215\\215\ERROR!   DATA READ BACK FROM DISC IS NOT WHAT WAS WRITTEN.
640 PRINT "\215\THIS IS A MAJOR HARDWARE FLAW.  EDS RECOMMENDS YOU SUSPEND"
650 PRINT "ALL CRITICAL SYSTEM USAGE UNTIL CPU, MEMORY, OR DISC DIAGNOSTICS"
```

```
**************************************
*                                    *
*                EDS                 *
*         EXERCISER PROGRAM          *
*                FOR                 *
*           DISC  &  CORE            *
*                                    *
**************************************
```

6/15/79

MANAGER MANUAL ADDENDA #2

Corrections for IRIS 7.3 Manager Reference Manual

EDS 1018-11 5 Sept. 78

Pg. 2-3; Paragraph starting "4) A real time clock."; Delete this paragraph. Insert the following:

4) A real time clock. This may be supplied by a standard Real Time Clock (with device code 14, supplying interrupts at 10 Hz) or any EDSI multiplexer.

Pg. 8-10; Eighth line on page: "8.8 More on INSTALL"; insert after this line the following paragraph:

"Note: The following section discusses logical unit formatting, not disc formatting. INSTALL assumes that a stand-alone format program, which must be supplied by the disc controller vendor (not EDSI), has already been run."

Pg. 8-11; Last sentence in first paragraph ending: "a new (empty) Logical Unit." ; insert after this sentence the following: "REHASH must be the first thing you run on the Logical Unit which you have just INSTALL AND CLEARed."

Pg. A1-14; Last sentence on page starting: "Return is non-skip...";insert after this sentence the following: "(see also READ CONTIGUOUS)."

Pg. A1-20; Sentence in Line 7 from bottom of page starting: "Note: for toggle,...": insert before this sentence the following: "FLAG-CHANGE disables interrupts and returns with interrupts enabled."

Pg. A6-1; insert at bottom of page: "The following are not currently supported under IRIS:

card readers
papertape through multiplexer port"

Pg. A6-4; insert at bottom of page:
"Note: An interactive port on the Mighty-Mux is always assumed to be ready to receive characters. If it is desired to slave a printer, cassette, or floppy through a CRT, enough delays must be put at the end of line and a low enough baud rate used to prevent loss of characters."

Insert this section after pg. 8-16. This supersedes CONVERT memo of 17 April 1977.

8.15 How to CONVERT an R4 Logical Unit to R7.3.

Any IRIS user updating a system from R4.3 to R7.3, or for that matter from any IRIS or revision R7.0 or earlier to any revision R7.1 or later, must convert each Logical Unit before using it under the newer system. This is because all Real Disc Addresses are sequential starting with R7.1. A CONVERT processor is supplied by EDS to perform this conversion. To update to IRIS R7.1 or R7.3 or later, follow these steps carefully:

1. Back up all Logical Units.

2. If files on the old Logical Unit zero are to be carried forward, than either:

    a) INSTALL a copy of it under the old system, changing its Logical Unit number to any unused non-zero unit number, or

    b) COPY all files to be carried forward to a different Logical Unit.

3. DUMP all BASIC program to text files, and KILL the SAVEd version of all BASIC programs.

4. Do a SysGen of the new IRIS on a scratch pack. It is strongly recommended that Logical Unit zero be only large enough for the system itself and that all user and application files be on other Logical Units; this is to make it easier to do later updates.

5. Be sure that the old disc address conversion constants are in the new CONFIG file in word 7 of each partition table entry in the form LRC*100+LRT where LRC is the Logical-to-Real Cylinder conversion factor, LRT is the Logical-to-Real Track conversion factor, and 100 is an octal constant. For example, if LRC was 40 and LRT was 20 on the old system, then enter 4020 octal in location 1423 of CONFIG for partition 0.1, in location 1433 for partition 0.2, etc. The old values of LRT and LRC are given in the red 7.3 CONFIG LAYOUT book. GUIDE will help you set up the Logical Unit tables in CONFIG for this conversion.

6. Mount an old Logical Unit, and give a system command of the form

```
# CONVERT d.p
```

    where d.p is the partition as defined for INSTALL. DO NOT INSTALL THE UNIT BEFORE CONVERSION! If a "conversion not needed" message is printed, this is because the conversion constants were already such that the Real Disc Addresses were sequential, and conversion is not required. That is, conversion is required if the new 7.3 LRT and LRC do not equal the old R4 LRT and LRC.

7. The unit will be converted to the new disc addressing method. It should take about three times as long to convert as it takes to INSTALL the same unit. Repeat step 6 for each old Logical Unit.

The Logical Units may now be INSTALLED as normal R7.3 logical units. If the old LRT and LRC do not equal the new LRT and LRC, then the conversion will prevent the Logical Unit from being used under R4 ever again. Only if "conversion not needed," is a Logical Unit usable under either R4 or R7.3 interchangeably. Beware: Do not try a second time to convert a Logical Unit which has already been converted to 7.3 once. This will turn most of the file data to garbage.

Also, if for any reason, CONVERT fails to run to completion, then the Logical Unit is lost and must be restored from the back up.

After the Logical Unit is CONVERTed, it must then be INSTALLed and REHASHed to run under 7.3. (see 8.16 below)

8.16 How to REHASH a Logical Unit:

1. CHANGE any filename on that logical unit so that it does not start with a "$" (esp. if this was LU/0).

2. Backup the logical unit.

3. Log onto the manager account.

4. INSTALL the logical unit.

5. Make sure that there are enough available blocks and that the manager is allotted enough blocks to build a temporary file on that logical unit the size of its INDEX.

6. Enter the system command

REHASH

which will ask

LOGICAL UNIT TO REHASH?

7. If REHASH traps or abnormally terminates, do not use that logical unit any more. Restore it from the back up and REHASH again.

8. REHASH can be run periodically to speed up all OPEN and CLOSE operations on files on that logical unit, (esp. if files are often created and deleted).

9. REHASH must be run
   a) after INSTALL AND CLEAR
   b) after CONVERT
   c) if the logical unit was created under R7.2 or R4.

TECH MEMO

FROM: Steve Moritsugu DATE: March 2, 1979
M:79:SCM:0203

RE: SOFTWARE RECEIVED ON DISC PACK

To any user who receives software (programs, data, IRIS, etc.) on a disc pack, I would like to recommend that the procedures in this memo be followed.

The problems, which we hope to prevent by this memo, can result in telephone calls to us such as:

> "I'd like to report a problem with the disc you sent me. It worked fine the first couple of times we used it, but today it has been giving me trap messages and often now, it won't even IPL."

The reason for this problem is that the pack was formatted and the data was written on another system and not on your own. Possible differences in drive tolerance, head alignment and temperature response make it impossible to guarantee that the data will be usable at all sites. In most cases, you will have no trouble with the pack sent. The procedure given here is to assure that problems do not develop later.

PROCEDURE:

1. Get a scratch pack which has been formatted in your system.

2. Feel the outside temperature of the disc we sent. If it is noticeably cooler or warmer than your own discs, let it sit with your discs until the temperature adjusts.

3. Bring DDCOPY into core (or any disc-to-disc copy program). If you have no other discs or papertapes to accomplish this, you may have to IPL our pack as a last resort. If so, use it only to SHUTDOWN to DDCOPY.

4. Copy our pack to your formatted scratch pack.

5. Put our pack away in a safe place as a back-up of the original software sent. Never use it except to make new copies from it.

MANAGER MANUAL ADDENDA
#3

Corrections and additions for the IRIS Manager Manager Addenda

Change
Ch. 1.3, Page 1-4, paragraph 3

Reads: ", an Accounts file whose header is in Real Disc Address three, and a DMAP"

Should Be: ", an Accounts file whose header is in Real Disc Address three, and whose first block is in Real Disc Address five, and a DMAP"

Manager Manual Addenda
#3

Corrections and Additions for the IRIS Manager Reference MANUAL
EDS 1018-11 5 Sept. 78

Change
Ch. 2.4.1, Page 2-13, paragraph 1

Reads: "Any core available above 77777
Octal will be used only for user partitions."

Change to: "Any core available above 77777 octal
will be used only for user partitions and
Buffer Pooling."

MANAGER MANUAL ADDENDA
#3

Corrections and Additions for the Manager Reference Manual
EDS 1018-11 5 Sept. 78

Change
Ch 3.2, Page 3-6, Paragraph 1

Reads: "(SGR, SGE, SLS, SLE, SEQ, SNE, SKZ, SNZ, SSP, SSN, SGZ, SZN, SKE, and SKO)"

Should Be: "(SGR, SGE, SLS, SLE, SEQ, SNE, SKZ, SNZ, SSP, SSN, SGZ, SNP, SKE and SKO)"

MANAGER MANUAL ADDENDA
#3

Corrections and additions for the IRIS Manager Reference Manual
EDS 1018-11 5 Sept. 78

Addition
Ch. 4.1, Page 4-2

Insert after paragraph 2, "If PLOAD prints RDR OK?"

PLOAD (with type 77003) or COPY (filename *A) can be used to load stand-alone papertape diagnostics under IRIS. See section 8.4 to run them. Some papertapes, if not supplied by Point 4 Data Corporation, may use a punch format which will prevent them from being loaded under IRIS even though they can be loaded by our binary loader.

MANAGER MANUAL ADDENDA
#3

Corrections and additions for the IRIS Manager Reference Manual
EDS 1018-11 5 Sept. 78

Change
Page 10.3, Paragraph 2

Reads: "Discsub numbers 120 through 127 octal have been set aside for customers to assign to subroutines for their own use only."

Change to: "Discsub numbers 130 through 137 octal are reserved for customer use."

Change
Page 11-25, Paragraph 5

Reads: If A0 = 0 then nothing is stored in the IO buffer."

Change to: "If A0 = -2 then nothing is stored in the IO buffer."

Addition
CH 8. 10, Page 8-12

The system manager can declare a port type by giving the command

PORT p TYPE n

Where p is a logical system port number and n is the port type of an active terminal translation module. Refer to the IRIS Peripherals Handbook to find the port type. An invalid port number, inactive module, or inactive $TERMS system driver will give an error message.

MANAGER MANUAL ADDENDA
#3

Corrections and additions for the IRIS Manager Reference Manual
EDS 1018-11 5 Sept. 78

Addition
CH 10.4, Page 10-7

Beginning with IRIS R7.4, the following BASIC call numbers are in use or reserved:

1
3
22
24
80 - 99

Addition
CH 10.2, Page 10-4

The IRIS 7.4 DISCSUBS file has two reserved areas. They are;

Loc. 40400 - 41777 reserved for future IRIS use

Loc. 42000 - 43777 reserved for customer use

Please use the area starting at location 42000 to add your discsubs. If you need more room, append blocks starting at location 44000. Remember, after appending a block to DISCSUBS you must run CLEANUP.

MANAGER MANUAL ADDENDA
#3

Corrections and additions for the IRIS Manager Reference Manual
EDS 1018-11 5 Sept. 78

Change
Ch 11.8, Page 11-19, paragraph 2

Reads: "NSECT indicates the number of sectors (number of blocks per track), not to exceed 16 (octal 20) sectors. NTRK indicates the number of tracks per clinder (number

Should be: "NSECT indicates the number of sectors (number of blocks per track), not to exceed 16 (octal 20) sectors. The minimum value is six. NTRK indicates the number of tracks per cylinder (number

Change
Ch 11.8, Page 11-19, paragraph 2

Reads: "Discs having more than 16 sectors must be specified otherwise;

Should be: "Discs having more than 16 sectors, or less than 6 sectors, must be specified otherwise;

MANAGER MANUAL ADDENDA
#3

Corrections and additions for the IRIS Manager Reference Manual
EDS 1018-11 5 Sept. 78

Addition
Ch. 11.10, Page 11-23

Add to paragraph 2, "Each terminal..."

"Terminal Type Codes 120 through 144 are reserved for customer use."

MANAGER MANUAL ADDENDA
#3

Changes and additions for the Manager Reference Manual
EDS 1018-11 5 Sept. 78

Change
Ch. 11.10, Page 11-25, paragraph 2

Reads: "If the search fails, an "↑" is output instead of the Byte.

Should be: "If the search fails, a null, ASCII 200, is output instead of the Byte.

Change
Ch. 11.10, Page 11-25, paragraph 2

Reads: "If the search succeeds, the action depends on the value of the P-Bit. If P=0, the 7 Bit TRANS is output with the high order eighth bit unconditionally set."

Should be: "If the search succeeds, action depends on the value of the P-Bit and the E-Bit.

E (0 or 1)	P	
	1	Jump to procedure starting at offset = (TRANS + E*200) from table entry where match is found.
1	0	Store TRANS in output buffer
0	0	Store terminal's ESC Code in output buffer followed by TRANS

If P=0, the 7-Bit TRANS is output with the high-order eighth Bit unconditionally set."

MANAGER MANUAL ADDENDA
#3

Corrections and additions for the IRIS Manager Reference Manual
EDS 1018-11 5 Sept. 78

Addition
11.11 How to Install a Terminal Translation Module

The system manager activates a terminal translation module as follows:

Obtain the terminal translation module file name for the terminal from the IRIS Peripherals Handbook.

Enable the selected terminal translation module as a dollar sign file, TYPE 77001.

Enable the system driver $TERMS as a dollar sign file.

A terminal translation module, including the ability to use its corresponding basic terminal control mnemonics, is active at a port when the port is linked to it. To have the system automatically link one or more ports at IPL:

Obtain the module's terminal type code (TTC) from the IRIS Peripherals Handbook.

Locate each port's RDE cell in the Port's Device Driver File. Refer to Section 11.1, "Interactive and Peripheral Device Drivers", if necessary.

Use DSP to store the TTC in the lower right hand byte of each selected port's RDE cell.
(Note: The upper left hand byte is reserved by the system for the port's return delay. This delay is still valid after storing a TTC.)

Shutdown and RE-IPL the system.

To link or change linkage between a port and a terminal translation module after an IPL.

Obtain the module's port type from the IRIS Peripherals Handbook.

From any account, declare a port type. I.E.

PORT TYPE n

See the IRIS User Manual, Section 1.4.

The System Manager can direct a port declaration to any interactive port using the port command:

PORT p TYPE n

See the IRIS Manager Manual Section 8.10.

You cannot pass characters less than 200 octal directly to your screen with a terminal translation module linked to your port. Declaring

PORT TYPE 0

Removes linkage and allows characters to pass as they are. All ports are type zero until linked to an enabled module.

Terminal translation modules are reentrant and shared by all ports linked to them. Therefore, link any number of ports to a single module.

The system accepts up to 15 enabled dollar sign modules. Each enabled module must have a unique terminal type code (TTC).

USER MANUAL ADDENDA
#2

Corrections and additions for the IRIS User Reference Manual
EDS 1017-11 5 Sept. 78

CH 1.4, Page 1-5
Addition

PORT TYPE n

Links the active terminal translation module whose port type is n to the port where the command is given. Refer to the IRIS Peripherals Handbook to find the correct port type. Declaring the port type of an inactive module, or inactive $TERMS system driver, will give an error message.

USER MANUAL ADDENDA
#2

Corrections and additions for the IRIS User Reference Manual
EDS 1017-11 5 Sept. 78

Addition
Ch. 2.9, pg. 2-11

At top of page, insert

For stand-alone programs, see Manager Manual Section 4.1.

USER MANUAL ADDENDA
#2

Corrections and additions for the IRIS User Reference Manual
EDS 1017-11 5 Sept. 78

Addition
6.13 New features of OEM BASIC

Introduction

OEM BASIC has become the standard BASIC on all IRIS systems since 7.4. It was previously released only on a limited basis. It provides a means for protection of proprietary applications by OEM's. This protection is effected by removal of the ability to LIST or DUMP PROTECTed BASIC programs. Programs SAVEd under old BASIC are fully upward compatible to OEM BASIC. BASIC programs are protected by using a new processor, PROTECT. A new processor, VERIFY, is provided to aid in the mainenance of BASIC programs.

Compatibility

Old SAVEd BASIC files (file type 2) are fully upward compatible with OEM BASIC. However, OEM BASIC is NOT downward compatible; it uses a different BASIC program format than that for old BASIC. OEM BASIC knows about the format differences between itself and old BASIC and is therefore able to run programs that have the old SAVEd BASIC format. Old BASIC, however, does not know of these format differences and consequently cannot run programs SAVEd or PROTECTed in OEM format. This in itself is a mild form of protection in that OEM BASIC programs cannot be run under an old BASIC system. NOTE: Trying to run an OEM BASIC program on an old BASIC system may cause the system to crash. Consequently, old BASIC and OEM BASIC should not be co-resident on the same system. Transporting unPROTECTed programs from an OEM BASIC system to an old BASIC system must be done by doing a DUMP of the programs under OEM BASIC and then a LOAD of the program's text under old BASIC.

Protection of Programs

To PROTECT programs, the PROTECT processor is used. PROTECT changes the program to a non-listable form. PROTECT is used in exactly the same way that SAVE is. EXAMPLE:

```
#BASIC
100 PRINT "THIS WILL BE SAVED IN PROTECTED FORM."
\       [control-C]
#PROTECT BROWNMOTIE
```

The program shown is SAVEd in PROTECTed form under the filename "BROWNMOTIE". The "!" and "<>" options that are available when using SAVE are also available with PROTECT. Once PROTECTed, a program cannot be unPROTECTed. So, don't PROTECT your only copy of the program. PROTECT first makes the program unlistable, then automatically tries to SAVE it in that format. If the SAVE part fails (e.g., filename already in use), then just SAVE it with a correct filename.

Lines may be entered or modified or a text file containing lines may be LOADed into PROTECTed programs just as into non-protected programs. These changes may be reSAVED but the whole program will still remain PROTECTed. A "DELETE" with no arguments or a "NEW" will clear the program area and exit from list protect mode.

Check Codes

The processors SAVE, PROTECT, and VERIFY that are provided with OEM BASIC all display a Check Code upon completion. Any change to the BASIC program will randomly change the program's Check Code. The sole function of the VERIFY processor is to display this code. The purpose of the code is to detect if any program changes have been made, authorized or not, since the last Check Code was recorded by the programmer. This is very useful when patches are put into a PROTECTed program to verify that they were correctly done. It may also be used to detect if a customer has done some unauthorized modification of a program.

Some early versions of OEM BASIC did not generate or store a consistent checksum. That problem does not exist in 7.4 and later releases. Note that the checksum depends on the order in which the lines are entered. For two programs to have the same checksum, all lines and patches must be entered in the same sequence.