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Disk/Dectape Monitor for the TD8E

P. R. Bell
R. S. Dillon
B. E. Beasley

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DISK/DECTAPE MONITOR FOR THE TD8E

P. R. Bell, R. S. Dillon, and B. E. Beasley¹

Medical Instrumentation Group²

THE MOLECULAR ANATOMY (MAN) PROGRAM

OCTOBER 1975

¹Oak Ridge Associated Universities Undergraduate Research Trainee,
Summer 1975.

²Supported by the U. S. Energy Research and Development Administration.

Oak Ridge National Laboratory
Oak Ridge, Tennessee 37830
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DISSEMINATE FOR THE TROOP

H. E. Bell, W. E. Eiland, and S. E. Beasley

Medical Investigation Group

THE MEDICAL ANATOMY (M.A.) PROGRAM

OCTOBER 1973

Oak Ridge Associated Universities Research Triangle
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DISK/DECTAPE MONITOR FOR THE TD8E

P. R. Bell, R. S. Dillon,

and B. E. Beasley

ABSTRACT

An efficient and convenient monitor system to be used with the low cost TD8E DECTape unit has been developed by modifying the existing DEC 4K monitor system and several system programs. The system will operate in an 8K or larger PDP 8/E computer, will support two tape drives, and can load and save programs from all available memory. The operation is the same as in the usual TCO1/08 DECTape system.

INTRODUCTION

The familiar 4K Disk Monitor* has long been used on PDP-8 computers because of its efficient storage and convenience as a "users" monitor as opposed to a "programmers" monitor. The capability of the 4K Disk Monitor to call long segmented programs with one name as well as its efficient overlaying of program segments have kept it popular despite the advent of OS/8 with its lack of operator prompting and its long complex command strings.

The 4K Disk Monitor system has not been available on computers using the inexpensive TD8E DECTape. We have prepared a modification of the monitor builder, DEC-D8-SBAF* (1), which permits the building and operation of the Disk/DECTape monitor using the TD8E as the system device (2).

*These are programs of Digital Equipment Corporation and are available from them in their original form.

Equipment Requirement.--A PDP 8/E minicomputer with 8K or larger memory with one or two DECTape drives and a TD8E controller are required. The MI8E hardware bootstrap loader is a convenience, but is not required.

METHOD

A two page (256 word) TD8E routine (DEC-8E-UZTA) (3) located at 7400 in field 1 directly operates the TD8E. The Disk/DECTape monitor head located in the 7600 page of field 0 and on block 0 of the system tape has been modified to convert the 4K Disk monitor calls into the form required by the TD8E routine. The generalized I/O routine entry at 7642 and the HLT at 7606 have been retained. In this form the monitor system is called by loading the TD8E routine into field 1, reading block 0 of the tape into 7600, field 0, and starting at 7600. An additional program, TMOD, is provided that modifies the system from this standard 4K Disk Monitor format into one which is started by the same 27-word bootstrap that is used for the OS/8 monitor system using the TD8E. In this form the TD8E routine and the monitor head are located on the tape in blocks 35-37 and block 0 contains a more extensive bootstrap to load them. The present version of the monitor system supports tape units 0 and 1 and can save or load programs into fields 0 through 7.

A modification of PIP, the Peripheral Interchange Program (DEC-D8-PDAD-DF32 version) (4) has been made so that the TD8E can be operated with the program interrupt disabled (as is required). The 8K assembler PAL8 (DECUS 8-333) (5) was modified to prevent it from overwriting the TD8E routine. Program listings are given in the appendix.

OPERATION

The operation of the modified system follows the procedure described in the 4K Disk Monitor manual (DEC-08-ODSMA-A-D) (6) and the 1970 Introduction to Programming, Vol. I (7), except that the system device name is DØ: and programs must not be loaded on top of the TD8E routine in field 1. The system is started by loading a paper tape using the RIM loader in any field except field 1. The system tape must be on unit Ø, remote and write enabled. When the tape is loaded, the DECTape will start and the monitor will print a dot indicating it is ready to accept operator commands. The modified monitor tape must be started using the OS/8 12K system bootstrap (see DEC OS/8 Handbook (8), DEC-S8-OSHBA-A-D, pg 1-8 or Introduction to Programming, Vol. I, 1972, pg 9-9). This removes the need for loading the TD8E routine separately. The MI8E hardware bootstrap loader may be coded to issue this bootstrap which then may be used to start either OS/8 or Disk/DECTape monitors.

Forming the System Programs

The formation of the initial system from paper tape is simple if the computer has more than 8K of memory. The procedure for the first time is more laborious in 8K and will be discussed later.

The paper tapes required for forming the system are: Binary Loader (BIN), Builder, PIP, DT8A, PIPB, TMOD and the System Bootstrap. This last is a two-section tape, the first part is the self-starting binary loader and the second part, separated from the first by a stretch of 200 code leader/trailer, is the TD8E routine (3) assembled at 7400, field 1.

1. Toggle the RIM loader into field 2 or higher.
 2. Load the Binary loader (BIN) into the same field as the RIM loader.
 3. Use the BIN loader to load the builder, DEC-D8-SBAF-PB, into field 0.
 4. Overlay the builder with the DT8A tape using the BIN loader.
 5. Load the System Bootstrap tape into field 1 using the BIN loader.
- Start at the stretch of leader/trailer code in the middle of the tape so that the program will not be started as it would if loaded by RIM from the start of the tape.
6. Place a formatted DECtape on the tape drive, set it to REMOTE, UNIT 0 and WRITE ENABLED.
 7. Start the builder at location 2000 in field 0.
 8. Answer the questions, being sure to answer N to the RF08 and DF32 questions so that a tape system will be built. After the DF32 question has been answered the tape should start. After some tape excursions, a dot should be typed showing that the monitor has been built.
 9. Stop the computer and load PIP (DEC-D8-PDAD-PB) (4) using the BIN loader (not LOAD). Now overlay it with the tape PIPB using BIN.
 10. Start the computer at 7600 in field 0. In response to the monitor dot, the operator should type:

.SAVE PIPT!0-5177;10000 (CR)*

*Terms typed by the program are underlined, (CR) means typing the RETURN key.

11. Stop the computer again, load DECUS 8-333 with BIN, overlay with the PL8A tape, restart the computer as in step (10) and type:

.SAVE PAL8!0-5177,6600-7577;200 (CR).

.

12. Use the system to load EDIT (DEC-D8-ESAD-PB) (9) which does not need modification. Type:

.LOAD (CR)

* IN- T:(CR)

* ST= (CR) (put tape in reader)

↑ start reader

The computer will halt at the end of the code on the tape, set the reader to STOP, press CONTINUE, a second up arrow will be typed, type CTRL-P, the monitor will type a dot.

.SAVE EDIT!0-3377;2600 (CR)

.

The essential parts of the system are now present. Other programs can be loaded in the usual way or transferred by PIPT from any TD8E or non-TD8E DECTape (just don't try to run the non-TD8E tape as a system tape or use its PIP).

The user should now reload the builder, overlaying it as in steps 3 and 4. Restart the monitor at 7600 and save builder by:

.SAVE TBLD!0-7577;200 (CR).

This provides a reference copy of the builder on the system.

The builder is required to initialize a fresh DECTape before PIPT can be used to transfer programs to it. Of course the TD8E copy program may be used to copy the system tape onto any formatted tape and unwanted programs can be deleted from the new copy.

Forming System Programs on 8K Computer

The operations to be followed are the same through step 8, however, the monitor head overwrites the RIM and BIN loaders that must be in field 0. The following procedure is to be followed after step 8:

9(a) Stop the computer. Toggle in the RIM loader and load the BIN loader with it. Load PIP and overlay it as in 9. The computer is restarted at location 7767 in field 1, this being the bootstrap location. Now save PIPT as in 10. These same steps must be repeated for PAL8.

The easiest way of providing a system for any size PDP8/E is to copy a borrowed system tape or to build a system tape using TBLD from an existing system tape.

Modification of the System to Use the OS/8 Bootstrap

If the system is to be made so that the OS/8 27 word TD8E bootstrap can be used, operation must be suspended at the end of step 8 when a monitor has been built on the tape. At this point the RIM and BIN loader should be used to load the program TMOD. This program could also be gotten into core by mounting an existing system tape on unit 0 and loading the binary of TMOD with LOAD. The starting address should be specified as 7606 the HLT in the monitor head. After TMOD is in core the freshly prepared system tape should be on UNIT 0, WRITE ENABLED, and TMOD should be started at location 200 field 0. The tape will rock and a dot will be printed showing the monitor has been recalled. This tape may no longer be bootstrapped by the system bootstrap but must use the OS/8 27 word bootstrap. It may however be restarted at location 7600 as in step 9 after PIP and PIPB have been loaded.

This modification of the system tape poses a special trouble for those building a system for the first time from paper tape on an 8K system. At step 9 where step 9(a) would be substituted the bootstrap call in field 1 is still unchanged and if started at 17767 would recall block 0 of the tape which is now the wrong block. What is required is to change the number at 7772 in field 1 from its old value of 0 to a new value of 37 before restarting at location 7767 as instructed in step 9(a). This difficulty will not recur since the next time the system is bootstrapped the proper values will be loaded.

REFERENCES

1. Digital Equipment Corporation (DEC) 4K Disk Monitor Builder
DEC-D8-SBAF-PB.
2. An attempt to produce a TD8E system was made by M. Silverstein and
A. Reidel, DECUSCOPE 12, No. 2 (1973), but will not operate as
published and was restricted to one tape unit and to field 0. We
have based part of this work on his article and extended it to
units 0 and 1 and to all fields.
3. DEC TD8E DEctape routine DEC-8E-UZTA-PA assembled at location 7400
in field 1 for units 0, 1.
4. DEC Peripheral Interchange Program-DF32, DEC-D8-PDAD-PB.
5. DEC Users Society distributed program DECUS 8-333, 8-K PALD assembler.
6. DEC 4K Disk Monitor System
DEC-08-ODSMA-A-D.
7. Introduction to Programming, Vol. I, Digital Equipment Corporation,
1970. Later years issues do not apply to this system.
8. Digital Equipment Corporation.
DEC OS/8 Handbook, DEC-S8-OSHBA-A-D.
9. DEC Symbolic Disk Editor, DEC-D8-ESAD-PB.

APPENDIX A

DT8A

```

*5242
5242 7000 NOP /FORCE USE OF GENERALIZED I/O
/ASSEMBLE AT 2600
/RUNS AT 7600
ORIGIN=2600
SYSIO=ORIGIN+42
DTCODE=ORIGIN+151
/RESIDENT PAGE OF MONITOR (7600-7777 AND BLOCK 0)
/DECTAPE VERSION
/FUNCTION: SAVE CORE 7200-7577 IN SCRATCH
/ READS REST OF MONITOR INTO
/ CORE 7200-7577 JUMPS TO
/ MONITOR PAGE 2 (7400)
*ORIGIN
2600 0070 D0070, 70 /CONSTANT ACTS AS NOP
2601 4242 JMS SYSIO /SAVE CORE 7200-7377
2602 0005 5
2603 0005 5
2604 7200 7200
2605 0000 0
2606 7402 HLT
2607 4242 JMS SYSIO /SAVE CORE 7400-7577
2610 0005 5
2611 0006 6 /SCRATCH BLOCK 2
2612 7400 7400
2613 0000 0
2614 7402 HLT
2615 4242 JMS SYSIO /READ IN PAGE 1 OF SAVE
2616 0003 3
2617 0001 1
2620 7200 7200
2621 0000 DTCORE, 0
2622 7402 HLT
2623 4242 JMS SYSIO /READ IN MONITOR PAGE 2
2624 0003 3
2625 0002 2
2626 7400 DTSTRT, 7400
2627 0000 0
2630 7402 HLT
2631 5626 JMP I DTSTRT /ENTER MONITOR PAGE 2
2632 0000 DTHOLD, 0
2633 0000 DTLINK, 0
2634 0000 PLINK, 0
2635 0000 LNHOLD, 0
2636 7400 TD8E0, 7400
2637 7404 TD8E1, 7404 /**MUST FOLLOW TD8E0**
2640 4636 JMST8, JMS I TD8E0
2641 0700 P700, 700

```

/TDSE DECTAPE AS SYSTEM DEVICE

*ORIGIN+42

2642	0000	DTSYS,	0	/SYSTEM I/O
2643	7200	CLA		
2644	1642	TAD I	DTSYS	/GET FCN WORD
2645	2242	ISZ	DTSYS	
2646	3351	DCA	DTCODE	
2647	1351	TAD	DTCODE	/FIND FIELD BITS
2650	0200	AND	D0070	
2651	3332	DCA	ARG1	
2652	1344	TAD	PCDF	/SET TRANSFER FIELD CDF'S
2653	1332	TAD	ARG1	
2654	3304	DCA	XCDF	
2655	1304	TAD	XCDF	
2656	3337	DCA	XCDF1	
2657	1351	TAD	DTCODE	/MOVE WRITE BIT TO BIT 0
2660	7112	CLL	RTR	
2661	7012	RTR		/CLEAR JUNK
2662	0356	AND	D4000	
2663	1361	TAD	D0100	/WRITE/READ ONLY 1 BLOCK
2664	1332	TAD	ARG1	/ADD TO FIELD BITS
2665	3332	DCA	ARG1	
2666	1642	TAD I	DTSYS	/GET BLOCK
2667	2242	ISZ	DTSYS	
2670	3334	DCA	ARG3	
2671	1642	TAD I	DTSYS	/GET CORE ADDR
2672	2242	ISZ	DTSYS	/BUMP TO LINKWORD ADDR.
2673	3333	DCA	ARG2	
2674	1333	TAD	ARG2	/FORM ADDRESS OF 201TH WORD
2675	1360	TAD	D0200	
2676	3234	DCA	PLINK	
2677	1242	TAD	DTSYS	/SAVE LINK WORD ADDR
2700	3233	DCA	DTLINK	
2701	1642	TAD I	DTSYS	/GET LINK WORD
2702	2242	ISZ	DTSYS	/BUMP TO ERROR ADDRESS
2703	3235	DCA	LNHOLD	/SAVE LINK
2704	6201	XCDF,	CDF	0
2705	1634	TAD I	PLINK	/SAVE ENDANGERED WORD
2706	3232	DCA	DTHOLD	
2707	1235	TAD	LNHOLD	/PUT LINK WORD IN XFER FIELD
2710	3634	DCA I	PLINK	

2711	6201		CDF	0	/BACK TO FIELD 0
2712	1351		TAD	DTCODE	/IS THIS AN INDIRECT RETURN
2713	0357		AND	D1000	
2714	7650		SNA	CLA	
2715	5322		JMP	..+5	/NO
2716	1642		TAD I	DTSYS	/YES , ERROR HOLDS RETURN ADDR -1
2 717	3242		DCA	DTSYS	
2720	7040		CMA	.	/PREPARE TO DUMP LINK AT 7777
2721	3233		DCA	DTLINK	
2722	1240	DTTRY,	TAD	JMST8	/SET UNIT 0 ENTRY
2723	3331		DCA	..+6	
2724	1351		TAD	DTCODE	/GET UNIT CODE
2725	0241		AND	P700	/ANYTHING BUT 0 IS UNIT 1
2726	7640		SZA	CLA	
2727	2331		ISZ	..+2	/BUMP TO UNIT 1 ADDRESS
2730	6212		CIF	10	
2731	4636		JMS I	TD8E0	
2732	0000	ARG1,	0		/FUNCT
2733	0000	ARG2,	0		/CORE
2734	0000	ARG3,	0		/BLOCK
2735	7610		SKP CLA		/ERROR
2736	2242		ISZ	DTSYS	/OK, BUMP TO NORMAL RETURN
2737	6201	XCDF1,	CDF	0	/SET XFER FIELD
2740	1634		TAD I	PLINK	/SAVE LINK WORD
2741	3235		DCA	LNHOLD	
2742	1232		TAD	DTHOLD	/RESTORE ENDANGERED WORD
2743	3634		DCA I	PLINK	
2744	6201	PCDF,	CDF	0	/BACK TO 0
2745	1235		TAD	LNHOLD	/PUT AWAY LINK WORD (OR DUMP AT 7777)
2 746	3633		DCA I	DTLINK	
2747	5642		JMP I	DTSYS	
			*ORIGIN+156		
2756	4000	D4000,	4000		
2757	1000	D1000,	1000		
2760	0200	D0200,	200		
2761	0100	D0100,	100		

PIPB

/PATCH CHANGES INTERRUPT VERSION OF
 /DECTAPE I/O TO NON-INTERRUPT CALL
 /TO GENERALIZED I/O IN LAST PAGE,
 /AND RETURNS AS IF INTERRUPT OCCURED

DCMA=6601

DTXA=6764

FIXTAB

/POINTERS TO LOCATIONS IN PIP

DTABSY=2000

CDIOX=2001

ERROR=2147

SKPZ=120

ZRET=53

TAC=3

LINK=4

SYSIO=121

A4=133

IDLE0=300

IDLEZ=72

ITIMER=5

IDLE=302

IDLE1=307

OUTDEV=155

INDEV=156

A3=17

A7=15

M3=136

BUFPTI=440

BUFSZ1=441

BUFSTI=151

IWAIT=153

OWAIT=154

BUFST0=152

BUFPT0=511

BUFSZ0=512

M200=123

/INTERRUPT SERVICE ROUTINE PATCHES

*213

0213 6601

DCMA /CLEAR DISK FLAG

*210

0210 6764

DTXA /CLEAR DECTAPE FLAG

/MODIFICATIONS TO OPERATING LEVEL ROUTINE

*IDLE+4

0306	5774	JMP I	IDLE5	/INPUT BUFFER EMPTY
		*IDLE1+4		
0313	5775	JMP I	IDLE6	/OUTPUT BUFFER FULL
		/FREE CORE MEMORY		
		*374		
0374	2203	IDLE5,	IDLE5A	
0375	2213	IDLE6,	IDLE6A	
		*2202		
2202	7402	HLT		/THERE IS NO DISK!!
2203	1156	IDLE5A,	TAD	INDEV
2204	7700	SMA	CLA	
2205	5472	JMP I	IDLEZ	/NON- FILE
2206	6002	IOF		/GENERATE INTERRUPT
2207	1072	TAD	IDLEZ	
2210	3000	DCA	0	/IWAIT WILL INDICATE
2211	3003	DCA	TAC	/IF READ DESIRED
2212	5453	JMP I	ZRET	
2213	1155	IDLE6A,	TAD	OUTDEV
2214	7700	SMA	CLA	
2215	5626	JMP I	IDLE1Z	/NON- FILE
2216	6002	IOF		
2217	1154	TAD	OWAIT	/FLAG TO START OUTPUT
2220	7001	IAC		
2221	3154	DCA	OWAIT	
2222	1226	TAD	IDLE1Z	
2223	3000	DCA	0	
2224	3003	DCA	TAC	
2225	5453	JMP I	ZRET	
2226	0307	IDLE1Z,	IDLE1	

```

*CDIOX
2001 0000 CDIOX, 0
2002 6002 IOF
2003 7000 NOP /FOR DEBUGGING
2004 7200 CLA
2005 3200 DCA DTABSY
2006 1601 TAD I CDIOX
2007 2201 ISZ CDIOX
2010 3235 DCA P8EFN /FUNCTION WORD
2011 1601 TAD I CDIOX
2012 2201 ISZ CDIOX
2013 3236 DCA P8EBL /BLOCK ADDRESS
2014 1601 TAD I CDIOX
2015 2201 ISZ CDIOX
2016 3237 DCA P8ECR /CORE ADDRESS
2017 1201 TAD CDIOX
2020 3311 DCA P8ELKA /ADDRESS OF LINK
2021 1711 TAD I P8ELKA /LINK
2022 2201 ISZ CDIOX
2023 3240 DCA P8ELK /CALLING LINK
2024 1120 TAD SKPZ
2025 3712 DCA I IDLEOZ
2026 3005 DCA ITIMER
2027 3003 DCA TAC
2030 3004 DCA LINK
2031 7000 NOP /FOR DEBUGGING
2032 7000 NOP
2033 7000 NOP
2034 4521 JMS I SYSIO
2035 0000 P8EFN, 0
2036 0000 P8EBL, 0
2037 0000 P8ECR, 0
2040 0000 P8ELK, 0
2041 5355 JMP ERROR+ 6
2042 7000 NOP
2043 7000 NOP
2044 7000 NOP /FOR DEBUGGING
2045 7200 CLA
2046 1235 TAD P8EFN /READ?
2047 0015 AND A7
2050 1136 TAD M3
2051 7640 SZA CLA
2052 5271 JMP P8EWRT
2053 1240 TAD P8ELK
2054 3711 DCA I P8ELKA /RETURN LINK
2055 7001 IAC
2056 3551 DCA I BUFSTI /MARK BUFFER FULL
2057 2151 ISZ BUFSTI /GET POINTER TO NEXT
2060 1551 TAD I BUFSTI /BUFFER
2061 3151 DCA BUFSTI /STORE POINTER (PERMAVENT)
2062 1151 TAD BUFSTI
2063 1017 TAD A3
2064 3705 DCA I BFPTI
2065 1123 TAD M200 /FIXED BUFFER SIZE=128 WORDS

```

2066	3706	DCA I	BFSZI	
2067	2153	ISZ	IWAIT	/SET FLAG FOR NEXT READ
2070	5601	JMP I	CDIOX	
2071	7240	P8EWRT, CLA CMA		
2072	3552	DCA I	BUFSTO	/MARK BUFFER TO BE EMPTY
2073	2152	ISZ	BUFSTO	
2074	1552	TAD I	BUFSTO	/GET POINTER TO NEXT
2075	3152	DCA	BUFSTO	/BUFFER HEADER
2076	1152	TAD	BUFSTO	/SETUP POINTER TO
2077	1017	TAD	A3	/BUFFER
2100	3707	DCA I	BFPTO	
2101	7040	CMA		
2102	1123	TAD	M200	/GET -201
2103	3710	DCA I	BFSZO	
2104	5601	JMP I	CDIOX	
2105	0440	BFPTI, BUFPTI		
2106	0441	BFSZI, BUFSZI		
2107	0511	BFPTO, BUFPTO		
2110	0512	BFSZO, BUFSZO		
2111	0000	P8ELKA, 0		
2112	0300	IDLEOZ, IDLEO		
		/SAVE TIME IN "TIME"		
		*5160		
5160	7000	NOP		
5161	7000	NOP		
5162	7000	NOP		
5163	7000	NOP		

PL8A

/DECUS 8-333 84 PALD PATCHES
/MODIFICATIONS TO LIMIT FIELD 1

BOT=6747

TOP=7403

/BLTO

*3722

3722	0000	BLTO,	0	
3723	2371		ISZ	BLTADR
3724	2372		ISZ	BLTAD2
3725	1771		TAD I	BLTADR
3726	6211		CDF	10
3727	3772		DCA I	BLTAD2
3730	6201		CDF	00
3731	2334		ISZ	BLTCNT
3732	5323		JMP	BLTO+1
3733	5722		JMP I	BLTO
3734	7150		BLTCNT,	BOT-7577

/3735-3770 USED

*3771

3771	6747		BLTADR,	BOT
3772	6547		BLTAD2,	BOT-200

/SDECOD

*4202

4202	1355		TAD	P7377
------	------	--	-----	-------

/4200-4354 USED

*4355

4355	7377		P7377,	7377
------	------	--	--------	------

*437

0437	1377		TAD	MTOP
------	------	--	-----	------

*577

0577	0575		MTOP,	-TOP+200
------	------	--	-------	----------

/SEARCH

*150

0150	7376		P7376,	7376
------	------	--	--------	------

TMOD

/PROGRAM TO CONVERT STANDARD FORMAT D/D MONITOR ON T08E TAPE PAL10 V142 22-

/PROGRAM TO CONVERT STANDARD FORMAT D/D MONITOR ON T08E TAP
 /START WITH OSR 12K BOOTSTRAP MUST BE USED ON TAPE JUST AFT
 /BUILDING BY TRLD BUT BEFORE ANY OTHER SYSTEM PROGRAMS ARE
 /WRITTEN ON THE TAPE. START PROGRAM WITH NEW TAPE ON UNIT
 *200

0200	0200	JMS I	SYSIO	/READ 1ST SAM BLK
0201	0003	3		
0202	0200	200		
0203	1400	1400		
0204	0000	0		
0205	7402	HLT		
0206	7001	IAC		/MARK BLOCKS 35,6,7 A MONITOR
0207	3654	DCA I	P1435	/FOR PROTECTION
0210	7001	IAC		
0211	3655	DCA I	P1436	
0212	7001	IAC		
0213	3656	DCA I	P1437	
0214	4657	JMS I	SYSIO	/REWRITE SAM 1
0215	0005	5		
0216	0200	200		
0217	1400	1400		
0220	0202	202		/LINK
0221	7402	HLT		
0222	4657	JMS I	SYSIO	/NOW WRITE IN THE T08E RTN
0223	0005	5		/AND MONITOR HEAD
0224	0035	35		
0225	0400	400		
0226	0000	0		
0227	7402	HLT		
0230	4657	JMS I	SYSIO	
0231	0005	5		
0232	0036	36		
0233	0600	600		
0234	0000	0		
0235	7402	HLT		
0236	4657	JMS I	SYSIO	
0237	0005	5		
0240	0037	37		
0241	1000	1000		
0242	0000	0		
0243	7402	HLT		
0244	4657	JMS I	SYSIO	/WRITE BOOT INTO BLK 0
0245	0005	5		
0246	0000	0		
0247	1200	1200		
0250	0000	0		
0251	7402	HLT		
0252	5653	JMP I	+1	/RESTART MONITOR
0253	7600	7600		
0254	1435	P1435,	1435	
0255	1436	P1436,	1436	
0256	1437	P1437,	1437	
0257	7642	SYSIO,	7642	

/PROGRAM TO CONVERT STANDARD FORMAT D/D MONITOR ON TDBF TAPE PAL10 V142 22-

/TDBF DECTAPE RTN.

0010	DRIVE=10	/UNITS 0 AND 1 SELECTED
0010	MFIELD=10	/AFIELD*10=MFIELD
0201	WDSBLK=201	/129 WORDS PER BLOCK
0400	*400	
	NOPUNCH	
7400	*7400	
	ENPUNCH	
7400 0000	DTA0, 0	/ENTRY POINT FROM UNIT 0
7401 7300	CLA CLL	/0 TO LINK
7402 5210	JMP DTA1X	
7403 1000	C1000, 1000	
7404 0000	DTA1, 0	/UNIT 2 ENTRY
7405 7320	CLA CLL CML	/1 TO LINK
7406 1204	TAD DTA1	
7407 3200	DCA DTA0	/PICK UP ARGS AT DTA0
7410 7010	DTA1X, RAR	
7411 3361	DCA UNIT	/LINK TO UNIT POSITION
7412 6214	RDF	
7413 1354	TAD C6203	/GET DATA FIELD AND SETUP RETURN
7414 3352	DCA LEAVF	
7415 1600	TAD I DTA0	/GET FUNCTION WORD
7416 6775	SOLD	/PUT FUNCTION INTO DATA REGISTER
7417 7112	CLL RTR	/AC STILL HAS FUNCTION. PUT # WORDS
		/BLOCK INTO LINK
7420 7630	SZL CLA	/KNOCK ONE OFF WDSBLK?
7421 7001	IAC	/YES
7422 1360	TAD MWORDS	
7423 3356	DCA WCOUNT	/STORE MASTER WORD COUNT
7424 2200	ISZ DTA0	/TO BUFFER
7425 1600	TAD I DTA0	
7426 3357	DCA RUFF	
7427 2200	ISZ DTA0	/TO BLOCK NUMBER
7430 1600	TAD I DTA0	
7431 3204	DCA BLOCK	
7432 2200	ISZ DTA0	/POINT TO ERROR EXIT
7433 6213	CIF CDF MFIELD	/TO ROUTINES DATA FIELD
7434 6777	SDRD	/GET FUNCTION INTO AC
7435 7104	CLL RAL	
7436 0307	AND CM200	/GET # PAGES TO XFER
7437 3364	DCA PGCT	
7440 6777	SDRD	
7441 0374	C374, AND C70	/GET FIELD FOR XFER
7442 1354	TAD C6203	/FORM CDF N
7443 3377	DCA XFIELD	/IF=0 AND DF=N AT XFER.
7444 7346	CLA CLL CMA RTL	
7445 3367	DCA TRYCNT	/3 ERROR TRIES
7446 1361	TAD UNIT	/TEST FOR SELECT ERROR
7447 6774	SOLC	
7450 6776	SDRC	
7451 0366	AND C100	
7452 7640	SZA CLA	
7453 5346	JMP FATAL-1	
7404	BLOCK=DTA1	

/PROGRAM TO CONVERT STANDARD FORMAT D/D MONITOR ON T08E TAPE PAL10 V142 22-

7454	6777	SDRD	/PUT FUNCT INTI YFUNCT IN SECOND PG
7455	3762	DCA T CXFUN	
7456	1356	TAD WCOUNT	
7457	3765	DCA T CXWCT	
7460	6777	SDRD	/GET MOTION BIT TO LINK
7461	7110	CLL RAP	
7462	5301	JMP GO	/AND START THE MOTION.
7463	6772	SDST	/ANY CHECKSUM ERRORS?
7464	7640	SZA CLA	/OR CHECKSUM ERRORS?
7465	5341	JMP TRY3	/PLEASE NOTE THAT THE LINK IS ALWAYS
			/SET AT RWCOM. GETCHK SETS IT.
			/NO ERROR..FINISHED XFER?
7466	1364	TAD PGCT	
7467	1307	TAD CM200	
7470	7450	SNA	
7471	5345	JMP EXIT	/ALL DONE. GET OUT
7472	3364	DCA PGCT	/NEW PAGE COUNT
7473	2204	ISZ BLOCK	/NEXT BLOCK TO XFER
7474	1356	TAD WCOUNT	/FORM NEXT BUFFER ADDRESS
7475	7041	CIA	
7476	1357	TAD RUFF	
7477	3357	DCA RUFF	
7500	7120	CLL CML	/FORCES MOTION FORWARD
7501	7232	CLA CML RTR	/LINK BECOMES MOTION BIT
7502	1203	TAD C1000	
7503	1361	TAD UNIT	/PUT IN 'GO' AND UNIT #
7504	6774	SDLC	/LOOK FOR BLOCK NO.
7505	4755	JMS T CRDQUD	/WAIT AT LEAST 6 LINES TO LOOK
7506	4755	JMS T CRDQUD	
7507	7600	CM200,	/COULD HAVE SAVED A LOC. HERE
7510	6771	SRCH,	
7511	5310	SDSS	
7512	6776	JMP .-1	/WAIT FOR SINGLE LINE FLAG
7513	7106	SDRC	
		CLL RTL	/DIRECTION TO LINK. INFO BITS
			/ARE SHIFTED.
7514	0241	AND C374	/ISOLATE MARK TRACK BITS
7515	1333	TAD M110	/IS IT END ZONE?
7516	7450	SNA	/THE LINK STAYS SAME THRU THIS
7517	5335	JMP ENDZ	
7520	1363	TAD M20	/CHECK FOR BLOCK MARK
7521	7640	SZA CLA	
7522	5310	JMP SRCH	

/PROGRAM TO CONVERT STANDARD FORMAT D/D MONITOR ON T08E TAPE PAL10 V142 22-

7523	6777	SORD	/GET THE BLOCK NUMBER
7524	7430	SZL	/IF WD ARE IN REVERSE, LOOK FOR 3
			/BLOCKS BEFORE TARGET BLOCK. THIS
			/ALLOWS TURNAROUND AND UP TO SPEED.
			/REVERSE
7525	1375	TAD C3	
7526	7040	CMA	
7527	1204	TAD BLOCK	
7530	7040	CMA	/IS IT RIGHT BLOCK?
7531	7450	SNA	
7532	5370	JMP FOUND	/YES..HOORAY!
7533	7670	M110, SZL SNA CLA	/NO, BUT ARE WE HEADED FOR IT?
			/ABOVE SNA IS SUPERFLUOUS.
7534	5310	JMP SRCH	/YES
7535	4776	END2, SDRC	/WE ARE IN THE END ZONE
7536	7106	CLL RTL	/DIRECTION TO LINK
7537	7630	SZL CLA	/ARE WE IN REVERSE?
7540	5301	JMP GO	/YES..TURN US AROUND
			/IF WE ARE IN THE END ZONE GOING FORWARD, IT IS AN ERROR
7541	2367	TRY3, ISZ TRYCNT	
7542	5301	JMP GO	/TRY 3 TIMES
7543	7300	CLL CLA	
7544	5347	JMP FATAL	/LINK OFF MEANS AC=4000 ON
7545	2200	EXIT, ISZ DTAD	
7546	7120	CLL CML	/AC=0 ON NORMAL RETURN
7547	1361	FATAL, TAD UNIT	
7550	6774	SDLC	/STOP THE UNIT
7551	7230	CLA CML RAR	
7552	7402	LEAVE, HLT	
7553	5600	JMP T DTAD	
7554	6203	C6203, 6203	
7555	7713	CRDQUAD, RDQUAD	
7556	0000	WCOUNT, 0	
7557	0000	RUFF, 0	
7560	7577	MWORDS, -WDSRLK	
7561	0000	UNIT, 0	
7562	7753	CXFUN, XFUNCT	
7563	7760	M20, -20	
7564	0000	PGCT, 0	
7565	7761	CXWCT, XWCT	
7566	0100	C100, 100	
7567	7775	TRYCNT, -3	
7570	7630	FOUND, SZL CLA	/RIGHT BLOCK. HOW ABOUT DIRECTION?
7571	5301	JMP GO	/WRONG..TURN AROUND
7572	1361	TAD UNIT	/PUT UNIT INTO LINK
7573	7104	CLL RAL	/AC IS NOW 0
7574	0070	C70, 70	/*****DON'T MOVE THIS!!!!*****
7575	0003	C3, 3	
7576	1357	TAD RUFF	/GET BUFFER ADDRESS
7577	7402	XFIELD, HLT	/INTO NEXT PAGE

/PROGRAM TO CONVERT STANDARD FORMAT D/D MONITOR ON T08E TAPE PAL10 V142 22-

7600	6212	CIF	MFIELD	
7601	3360	DCA	XBUFF	/SAVE ADDRESS
7602	7010	RAR		/NOW GET UNIT #
7603	3320	DCA	XUNIT	
7604	1361	TAD	XWCT	
7605	3357	DCA	WORDS	/WORD COUNTER
7606	6771	REVGRD,	SDSS	
7607	5206	JMP	.-1	/LOOK FOR REVERSE GUARD
7610	6776	SDRC		
7611	0241	AND	K77	
7612	1354	TAD	CM32	/IS IT REVERSE GUARD?
7613	7640	SZA	CLA	
7614	5206	JMP	REVGRD	/NO, KEEP LOOKING
7615	1353	TAD	XFUNCT	/GET FUNCTION READ OR WRITE
7616	7700	K7700,	SMA	CLA
7617	5254	JMP	READ	/NEG. IS WRITE
7620	6776	WRITE,	SDRC	
7621	0266	AND	C300	/CHECK FOR WRITE LOCK AND SELECT EF
7622	7120	CLL	CML	/LOCK OUT AND SELECT ARE AC 0 ERROR
7623	7640	SZA	CLA	
7624	5751	JMP	I CFATAL	/FATAL EPROR. LINK MUST BE ON
7625	4313	JMS	RDQUAD	/NO ONE EVER USES THIS WORD!
7626	7600	C7600,	7600	
7627	1355	TAD	C1400	
7630	1320	TAD	XUNIT	/INITIATE WRITE MORE
7631	6774	SOLC		
7632	7240	CLA	CMA	
7633	4304	JMS	WRQUAD	/PUT 77 IN REVERSE CHECKSUM
7634	7240	CLA	CMA	
7635	3356	DCA	CHKSUM	
7636	1760	WRLP,	TAD	I XBUFF
7637	4304	JMS	WRQUAD	/GLORY BE! THE ACTUAL WRITE!
7640	2360	ISZ	XBUFF	/BUMP CORE POINTER
7641	0077	K77,	77	/ABOVE MAY SKIP
7642	2357	ISZ	WORDS	/DONE THIS BLOCK?
7643	5236	JMP	WRLP	/NOT YET..LOOP A WHILE
7644	1353	TAD	XFUNCT	/IS THE OPERATION FOR WDSBLK PER BL
7645	7112	CLL	RTR	/IF NO, WRITE A 0 WORD
7646	7630	SZL	CLA	
7647	4304	JMS	WRQUAD	/WRITE A WORD OF 0
7650	4335	JMS	GETCHK	/DO THE CHECK SUM
7651	4304	JMS	WRQUAD	/WRITE FORWARD CHECKSUM
7652	4304	JMS	WRQUAD	/ALLOW CHECKSUM TO BE WRITTEN
7653	5752	JMP	I CRWCOM	

/PROGRAM TO CONVERT STANDARD FORMAT D/D MONITOR ON T08F TAPE PAL10 V142 22-

7654	4313	READ,	JMS RDQUAD	
7655	4313		JMS RDQUAD	
7656	4313		JMS RDQUAD	/SKIP CONTROL WORDS
7657	0241		AND K77	
7660	1216		TAD K7700	/TACK 7700 ONTO CHECKSUM.
7661	3356		DCA CHKSUM	/CHECKSUM ONLY LOW 6 BITS ANYWAY
7662	4313	RDLP,	JMS RDQUAD	
7663	4320		JMS EQUFUN	/COMPUT CHECKSUM AS WE GO
7664	3760		DCA Y XBUFF	/IT GETS CONDENSED LATER
7665	2360		ISZ XBUFF	
7666	0300	C300,	300	/PROTECTION
7667	2357		ISZ WORDS	/DONE THIS OP?
7670	5262		JMP RDLP	/NO SUCH LUCK
7671	1353		TAD XFUNCT	/IF OP WAS FOR WDSRLK-1, READ AND
7672	7112		CLL RTR	/CHECKSUM THE LAST TAPE WORD
7673	7620		SNL CLA	
7674	5277		JMP RDLP2	
7675	4313		JMS RDQUAD	/NOT NEEDED FOR WDSBLK/BLOCK
7676	4320		JMS EQUFUN	/CHECKSUM IT
7677	4313	RDLPP,	JMS RDQUAD	/READ CHECKSUM
7700	0216		AND K7700	
7701	4320		JMS EQUFUN	
7702	4335		JMS GETCHK	/GET SIX BIT CHECKSUM
7703	5752		JMP I CRWCOM	
7704	0000	WRQUAD, 0		/WRITE OUT A 12 BIT WORD
7705	4320		JMS EQUFUN	/ADD THIS TO CHECKSUM
7706	6773		SDSQ	/SKIP ON QUADLINE FLAG
7707	5306		JMP .-1	
7710	6775		SDLD	/LOAD DATA ONTO BUS
7711	7200		CLA	/SDLD DOESN'T CLEAR AC
7712	5704		JMP I WRQUAD	
7713	0000	RDQUAD, 0		/READ A 12 BIT WORD
7714	6773		SDSQ	
7715	5314		JMP .-1	
7716	6777		SDRD	/READ DATA
7717	5713		JMP I RDQUAD	

/PROGRAM TO CONVERT STANDARD FORMAT D/D MONITOR ON TD6E TAPE PAL10 V142 22-

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7720 0000      EQUFUN, 0      /COMPUTE EQUIVALENCE CHECKSUM
7721 7040      CMA
7722 3362      DCA EQUIMP     /ACTUALLY CHECKSUMS ON DECTAPE ARE
7723 1362      TAD EQUIMP     /EQUIVALENCE OF ALL WORDS IN A RECD
7724 0356      AND CHKSUM     /SIX BITS AT A TIME. BUT SINCE EQUI
7725 7041      CIA           /IS ASSOCIATIVE, WE CAN DO IT 12
7726 7104      CLL RAL       /BITS AT A TIME AND CONDENSE LATER.
7727 1362      TAD EQUIMP     /THIS ROUTINE USES THESE IDENTITIES
7730 1356      TAD CHKSUM     /A+B=(A.XOR.B)+2*(A.AND.B)
7731 3356      DCA CHKSUM     /A.EQU.B=.NOT.(A.XOR.B)+A.XOR.(.NOT
7732 1362      TAD EQUIMP     /A.EQU.B=(A+(.NOT.B))-2*(A.AND.(.NOT
7733 7040      CMA
7734 5720      JMP I EQUFUN

7735 0000      GETCHK, 0      /FORM 6 BIT CHECKSUM
7736 7200      CLA
7737 1356      TAD CHKSUM
7740 7040      CMA
7741 7106      CLL RTL
7742 7006      RTL
7743 7006      RTL
7744 4320      JMS EQUFUN
7745 7320      CLA CLL CML    /FORCES LINK ON AT RWCOM
7746 1356      TAD CHKSUM
7747 0216      AND K7700
7750 5735      JMP I GETCHK

7751 7547      CFATAL, FATAL
7752 7463      CRWCOM, RWCOM
7753 0000      XFUNC, 0
7754 7746      CM32, -32
7755 1400      C1400, 1400
7756 0000      CHKSUM, 0
7757 0000      WORDS, 0
7760 0000      XBUFF, 0
7761 0000      XWCT, 0
7762 0000      EQUIMP, 0
7763 0000      XUNIT=EQUFUN
7764 0000      0
7765 0000      0
7766 0000      0
7767 4777      JMS I DT0
7770 0102      0102
7771 7600      7600
7772 0037      37
7773 7402      HLT
7774 6203      CIF CDF 0
7775 5776      JMP I .+1
7776 7600      7600
7777 7400      DT0, 7400

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/PROGRAM TO CONVERT STANDARD FORMAT D/D MONITOR ON T08E TAPE PAL10 V142 22-

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/monitor head
/runs at 7600
/resident page of monitor (7400-7777 and block 0)
/dec tape version
/function: save core 7200-7577 in scratch
/reads rest of monitor into
/core 7200-7577 jumps to
/monitor page 2 (7400)

1000 *1000
NOPUNCH
7600 *7600
ENPUNCH
00070, 70 /constant acts as nop
7600 0070 JMS DTSYS /save core 7200-7377
7601 4242 5
7602 0005 5
7603 0005 5
7604 7200 7200
7605 0000 0
7606 7402 HLT
7607 4242 JMS DTSYS /save core 7400-7577
7610 0005 5
7611 0006 6 /scratch block 2
7612 7400 7400
7613 0000 0
7614 7402 HLT
7615 4242 JMS DTSYS /read in page 1 of save
7616 0003 3
7617 0001 1
7620 7200 7200
7621 0000 DTCORE, 0
7622 7402 HLT
7623 4242 JMS DTSYS /read in monitor page 2
7624 0003 3
7625 0002 2
7626 7400 DTSTRT, 7400
7627 0000 0
7630 7402 HLT
7631 5626 JMP I DTSTRT /enter monitor page 2
7632 0000 DTHOLD, 0
7633 0000 DTLINK, 0
7634 0000 PLINK, 0
7635 0000 LNHold, 0
7636 7400 TDAE0, 7400
7637 7404 T08E1, 7404 /**MUST FOLLOW T08E0**
7640 4636 JMST8, JMS I TDAE0
7641 0700 P700, 700

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/PROGRAM TO CONVERT STANDARD FORMAT D/D MONITOR ON TD8E TAPE PAL10 V142 22-

		/TD8E DECTAPE AS SYSTEM DEVICE		
7642	0000	DTSYS,	0	/SYSTEM I/O
7643	7200	CLA		
7644	1642	TAD I	DTSYS	/GET FCN WORD
7645	2242	ISZ	DTSYS	
7646	3351	DCA	DTCODE	
7647	1351	TAD	DTCODE	/FIND FIELD BITS
7650	0200	AND	D0070	
7651	3332	DCA	ARG1	
7652	1344	TAD	PCDF	/SET TRANSFER FIELD CDF'S
7653	1332	TAD	ARG1	
7654	3304	DCA	XCDF	
7655	1304	TAD	XCDF	
7656	3337	DCA	XCDF1	
7657	1351	TAD	DTCODE	/MOVE WRITE BIT TO BIT 0
7660	7112	CLL	RTR	
7661	7012	RTR		/CLEAR JUNK
7662	0350	AND	D4000	
7663	1353	TAD	D0100	/WRITE/READ ONLY 1 BLOCK
7664	1332	TAD	ARG1	/ADD TO FIELD BITS
7665	3332	DCA	ARG1	
7666	1642	TAD I	DTSYS	/GET BLOCK
7667	2242	ISZ	DTSYS	
7670	3334	DCA	ARG3	
7671	1642	TAD I	DTSYS	/GET CORE ADDR
7672	2242	ISZ	DTSYS	/BUMP TO LINKWORD ADDR.
7673	3333	DCA	ARG2	
7674	1333	TAD	ARG2	/FORM ADDRESS OF 201TH WORD
7675	1352	TAD	D0200	
7676	3234	DCA	PLINK	
7677	1242	TAD	DTSYS	/SAVE LINK WORD ADDR
7700	3233	DCA	DTLINK	
7701	1642	TAD I	DTSYS	/GET LINK WORD
7702	2242	ISZ	DTSYS	/BUMP TO ERROR ADDRESS
7703	3235	DCA	LNHOLD	/SAVE LINK
7704	6201	XCDF,	CDF	/POINT TO TRANSFER FIELD
7705	1634	TAD I	PLINK	/SAVE ENDANGERED WORD
7706	3232	DCA	DTHOLD	
7707	1235	TAD	LNHOLD	/PUT LINK WORD IN XFER FIELD
7710	3634	DCA I	PLINK	
7711	6201	CDF	0	/BACK TO FIELD 0
7712	1351	TAD	DTCODE	/IS THIS AN INDIRECT RETURN
7713	0356	AND	D1000	
7714	7650	SNA	CLA	
7715	5322	JMP	.+5	/NO
7716	1642	TAD I	DTSYS	/YES , ERROR HOLDS RETURN ADDR -1
7717	3242	DCA	DTSYS	
7720	7040	CMA		/PREPARE TO DUMP LINK AT 7777
7721	3233	DCA	DTLINK	

/PROGRAM TO CONVERT STANDARD FORMAT D/D MONITOR ON T08E TAPE PAL10 V142 22-

7722	1240	OTTRY,	TAD	JMSTA	/SET UNIT 0 ENTRY
7723	3331		DCA	.+6	
7724	1351		TAD	DTCODE	/GET UNIT CODE
7725	0241		AND	P700	/ANYTHING BUT 0 IS UNIT 1
7726	7640		SZA	CLA	
7727	2331		ISZ	.+2	/BUMP TO UNIT 1 ADDRESS
7730	6212		CIF	10	
7731	4636		JMS I	T08E0	
7732	0000	ARG1,			/FUNCT
7733	0000	ARG2,			/CORE
7734	0000	ARG3,			/BLOCK
7735	7610		SKP CLA		/ERROR
7736	2242		ISZ	DTSYS	/OK, BUMP TO NORMAL RETURN
7737	6201	XCDF1,	COF		/SET XFER FIELD
7740	1634		TAD I	PLINK	/SAVE LINK WORD
7741	3235		DCA	LNHOLD	
7742	1232		TAD	DTHOLD	/RESTORE ENDANGERED WORD
7743	3634		DCA I	PLINK	
7744	6201	PCDF,	COF		/BACK TO 0
7745	1235		TAD	LNHOLD	/PUT AWAY LINK WORD (OR DUMP AT 777
7746	3633		DCA I	DTLINK	
7747	5642		JMP I	DTSYS	
7750	4000	D4000,	4000		
7751	0000	DTCODE,			
7752	0200	D0200,	200		
7753	0100	D0100,	100		
7754	0000				/WC
7755	0000				/CA
7756	1000	D1000,	1000		

/PROGRAM TO CONVERT STANDARD FORMAT D/D MONITOR ON T08E TAPE PAL10 V102 22-

/T08E DISK/DECTAPE BOOTSTRAP TO USE STANDARD 30 WORD 12K B/
/ASSEMBLED AT 7400, LOADED INTO 1220 INITIALLY, LOADS INTO
/7400 VIA BOOTSTRAP.

/READS IN FLD 1 PART FROM BLOCKS 35,36 THEN STARTS FLD1
/BOOTSTRAP WHICH READS MONITOR HEAD FROM BLOCK 37

1220	*1220			
	NOPUNCH			
7400	*7400			
	ENPUNCH			
6771		SDSS=6771		
6772		SDST=6772		
6773		SDSQ=6773		
6774		SDLC=6774		
6775		SDLD=6775		
6776		SDRC=6776		
6777		SDRD=6777		
7400	1246	TBOOT, TAD	K7600	/128 WORDS/PAGE
7401	3244	DCA	TWCT	/WAIT FOR A BLOCK MARK
7402	6771	SDSS		
7403	5202	JMP	.-1	
7404	6776	SDRC		
7405	0233	AND	T77	
7406	1251	TAD	M26	/IS IT A BLOCKMARK?
7407	7640	SZA CLA		
7410	5202	JMP	TBOOT+2	/NO
7411	6777	SDRD		/GET BLOCK NO
7412	1253	TBLKNO, TAD	M35	/NEED BLOCKS 35,36
7413	7640	SZA CLA		
7414	5202	JMP	TBOOT+2	/NO
7415	6771	TRGRD, SDSS		
7416	5215	JMP	.-1	
7417	6776	SDRC		/LOOK FOR REV. GUARD WORD
7420	0233	AND	T77	
7421	1252	TAD	M32	
7422	7640	SZA CLA		
7423	5215	JMP	TRGRD	/NOT YET
7424	4255	JMS	TRGD	/SKIP CONTROL WORDS
7425	4255	JMS	TRGD	
7426	4255	JMS	TRGD	
7427	6211	CDF	10	/LOAD TO FLD 1
7430	4255	TREAD, JMS	TRGD	/GFT DATA WORDS
7431	3645	DCA I	PTR	
7432	2245	ISZ	PTR	
7433	0077	T77,	77	/NOP
7434	2244	ISZ	TWCT	/FINISHED BLOCK?
7435	5230	JMP	TREAD	/NO
7436	2212	ISZ	TBLKNO	/YES, DO NEXT BLOCK
7437	2250	ISZ	M2	/DONE BOTH BLOCKS?
7440	5200	JMP	TBOOT	/NO
7441	6774	SDLC		/DONE STOP TARE
7442	6213	CIF CDF	10	
7443	5647	JMP I	K7767	/GO READ MONITOR HEAD

/PROGRAM TO CONVERT STANDARD FORMAT D/D MONITOR ON TD8E TAPE PAL10 V142 22-

7444	7600	TWCT,	7600	
7445	7400	PTR,	7400	/1ST LOCATION FOR TD8E RTN
7446	7600	K7600,	7600	
7447	7767	K7767,	7767	
7450	7776	M2,	-2	
7451	7752	M26,	-26	
7452	7746	M32,	-32	
7453	7743	M35,	-35	
7454	7742	M36,	-36	/MUST FOLLOW M35
7455	0000	TRQD,	0	/READ A WORD
7456	6773	SDSQ		
7457	5256	JMP	.-1	
7460	6777	SDRD		
7461	5655	JMP I	TRQD	

APPENDIX B

This is the missing appendix H of the DEC 4K Disk Monitor System manual.

A system program (i.e. one that was saved by SAVE NAME!...) may be called from a running program by:

1. Placing the name of the program to be called in locations 7400 and 7401.

Example: * 7400

NA /EACH SIXBIT IS THE 8 BIT ASCII

ME /CHARACTER-240

2. Executing a call to the system I/O:

```
JMS I SYSIO
3
10 /FOR DISK, 13 FOR DECTAPE
7200
0
HLT / ERROR
JMP I      .+1
7201
SYSIO, 7642
```

This is the appendix B of the DFC AX Disk Monitor system.

name:

A system program is a one that was named by NAME NAME.

be called from a running program by

1. Loading the name of the program to be called in the name field.

and 1901.

Example: * 1901

NA MACHINE SYSTEM IS THE 3 BIT AREA

MT CHARACTER-000

2. Loading a name to the system (1901)

was 1 1901

1901 FOR NAME IS FOR NAME

1901

1

MT V ERROR

1901

1901

SYSTEM, 1901

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