

ROTOCHEM 8K CROSSFIELD LOADER

USER INSTRUCTIONS

Provided by:

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GENERAL

The Rotochem 8K Crossfield Loader is written to reside in Field 1 of the PDP-8e or 8m computer. It is intended to be used primarily in the reproduction of Rotochem programs on MiniDek tape cartridges. IT MUST NOT BE USED TO READ OR RECORD TRACK FOUR CONSTANTS because the program always records from location 0 to 7577 in Field 0 and from location 2600 to 3777 in Field 1 onto a single track of the tape cartridge. When used to read tapes, the program always expects two files to appear on the same track of the tape and will fail if they are not found. The program accomplishes a crossfield record or read without operator intervention except to start the program. After each read or record, the program loops back to its start point ready for another operation. A zero accumulator at this point during a read indicates that the read operation was successful.

LOADING AND STARTING THE PROGRAM

The program resides in Field 1 from location 0 through location 525. The program has been written so that if the binary loader (DEC-08-LBAA-PM) is used to load the object program, it will automatically be loaded into Field 1. After loading the program, the operator should lift toggle switches 8 and 11, only, and press extended load address to change instruction and data fields to Field 1. The operator now has two options. If he wishes to read a tape, he should insert the desired tape cartridge into the MiniDek and turn the track select knob on the MiniDek to the track he wishes to read. The operator should then load address 200 and press clear and continue. The computer halts at location 200 in Field 1, awaiting operator confirmation as to what operation the operator wishes. If he again presses continue, the program will read the track selected on the tape cartridge into the indicated locations in Field 0 and Field 1 and will halt at location 200 in Field 1. At that time the accumulator will be zero if the read was successful. Pressing continue will cause a repeat of the read.

If the operator wishes to record the contents of core onto tape, he should follow the same instructions as for a read with two exceptions. First, the tape cartridge in the MiniDek must have a capacity of at least 4K and must have a write pin. In place of loading address 200 he should load address 300 and press clear and continue. The program automatically records from location 0 through location 7577 in Field 0 and from location 2600 through location 3777 in Field 1 onto the selected track of the tape cartridge. The program will then halt at

location 2000 awaiting the next operator command. If he presses continue he will read the tape. If he loads address 3000 and presses clear and continue, he will again record the same core locations as previously.

The crossfield loader will continue to loop back to location 2000 in Field 1 and halt after each operation. There is no need to be concerned with changing instruction or data fields until the operator has completely finished reproducing tapes.

TRACK FOUR CONSTANTS

Track four constants should be read from tape with the standard Tennecomp Read routine (TSI-1371-08-002B-PM) and recorded with the standard Record routine (TSI-1371-08-001B-PM).

SUGGESTED SEQUENCE FOR TAPE REPRODUCTION

1. Load Binary Loader into Field 0.
2. Use the Binary Loader to load the Crossfield Loader. (It will load to Field 1 without manual instructions from the operator.)
3. Use the Binary Loader to load the MiniDek Read routine into Field 1. (The operator must manually select Field 1 in this operation.)
4. Use the Binary Loader to load the MiniDek Record routine into Field 1. (The operator must manually select Field 1 in this operation.)
5. Read Track four constants from the master tape using the Read routine at 7600 in Field 1.
6. Record as many cartridges as necessary using the Record routine at 7700 in Field 1. Insure that the Track select knob is set at 4 and that the cartridge in the MiniDek has a write pin and is at least of 4K capacity. For each tape, record from location 3400 to location 4060.
7. Manually set instruction field and data field to Field 1.
8. Insert the Master Tape and select Track 1, 2 or 3.

9. Load 200 into the computer and press clear/continue. Press continue a second time. The crossfield loader will read the selected track into its proper location in Field 0 and Field 1. When the program halts a zero, accumulator indicates a successful read. If the accumulator is non-zero, press continue for a second attempt. Repeated failures indicate a bad master tape or a hardware failure.
10. Insert a fresh tape cartridge of at least 4K capacity with a write pin. Insure that the track select knob is unchanged from step 8.
11. Load address 300 and press clear and continue. The program will record the proper Field 0 and Field 1 core locations onto the tape and halt at 200.
12. Repeat steps 10 and 11 until the required tapes are copied. Then return to step 8 and repeat the procedure until all the Rotochem programs have been recorded on each tape.

USEFUL PROGRAM LOCATIONS

The program is set to record as follows:

<u>Location</u>	
74	Starting address in Field 0
76	Ending address in Field 0
65	Starting address in Field 1
66	Ending address in Field 1

/LOAD IN FIELD 1
 /READ/RECORD PROGRAM FOR 8 K PROGRAMS
 /RECORDS BETWEEN 0 AND 7577 IN FIELD 0
 /AND ALWAYS RECORDS FROM 2600 THROUGH 3777 IN FIELD 1
 /A READ EXPECTS TO READ TWO SEGMENTS, ONE TO FIELD 0 AND ONE TO FIEL

D 1

CBT1=6365 /CLEAR TRANSPORT 1 BEGINNING OF TAPE F
 LAG CLCR=6375 /CLEAR AND LOAD COMMAND REGISTER
 RWCF=6376 /TRANSFER READ BUFFER REGISTER TO ACCUM
 ULATOR AND CLEAR READ FLAG
 SRSR=6373 /READ STATUS REGISTER
 TMOF=6374 /TRANSFER ACCUMULATOR TO WRITE SHIFT RE
 GISTER AND CLEAR WRITE FLAG
 WEOR=6371 /WRITE END OF FILE MARK
 CGF=6364 /CLEAR GAP FLAG

FIELD 1
 *50
 0050 7600 NWADR, 7600
 0051 0200 ASTART, 0200
 0052 0003 RWNDM, 3
 0053 0004 P4, 4
 0054 0001 RDM, 1
 0055 0040 MRCNM, 40
 0056 0010 BOT1M, 10
 0057 0001 READM, 1
 0060 0002 WRITEM, 2
 0061 0000 IA, 0
 0062 0000 NWORDS, 0
 0063 0000 CHKSUM, 0
 0064 0000 MARGIN, 0
 0065 2600 HISTRT, 2600
 0066 3777 HISTP, 3777
 0067 7776 HICLK, -2
 0070 7776 KON, -2
 0071 7777 SKIP, -1
 0072 0000 GOHI, 0
 0073 7777 N1, -1
 0074 0000 RECLO, 0
 0075 0200 ARDREC, RDOREC
 0076 7577 RECHI, 7577
 0077 0400 AREAD, READ
 0100 0460 ADATHI, DATAHI
 0101 0500 AFIN, FINISH
 0102 0426 AREWIND, REWIND
 0103 0415 ARECRD, RECORD
 0104 0436 ALOKUP, LOOKUP
 0105 0321 AMMODE, WMODE
 0106 0206 ARMODE, RMODE

0107	0512	AERROR,	ERROR	
0110	0000	HOLD,	0	
			*0200	
0200	7402	RDOREC,	HLT	/PRESS CONT. TO READ, LA 300 TO RECORD
0201	0056	START,	AND BOT1M	/SPlice 1 BIT ON?
0202	7650		SNA CLA	
0203	4502		JMS I AREWIND	/NO, REWIND TAPE
0204	3063		DCA CHKSUM	
0205	3064		DCA MARGIN	
0206	6364	RMODE,	CGF	/CLEAR GAP FLAG
0207	1054		TAD RDM	/GET READY AND
0210	6375		CLCR	/LOAD READ MODE
0211	7200		CLA	
0212	4477		JMS I AREAD	/READ INITIAL ADDRESS
0213	3061		DCA IA	
0214	4477		JMS I AREAD	/READ NEGATIVE WORD COUNT
0215	3062		DCA NWORDS	
0216	1072	DATA,	TAD GOHI	/NONZERO GOHI MEANS HI CORE.
0217	7440		SZA	
0220	6211		CDF 10	
0221	7450		SNA	
0222	6201		CDF 00	
0223	7200		CLA	
0224	4477		JMS I AREAD	/READ DATA WORD
0225	3461		DCA I IA	
0226	1461		TAD I IA	
0227	1063		TAD CHKSUM	/ADD DATA WORD TO CHECKSUM
0230	3063		DCA CHKSUM	
0231	2061		ISZ IA	/INCREMENT LOCATION POINTER
0232	2062		ISZ NWORDS	/INCREMENT WORD COUNT
0233	5216		JMP DATA	
0234	4477		JMS I AREAD	/READ RECORDED CHECKSUM
0235	7041		CIA	/NEGATE RECORDED CHECKSUM
0236	1063		TAD CHKSUM	/ADD CALCULATED CHECKSUM
0237	1064		TAD MARGIN	/ADD MARGIN ERROR COUNTER
0240	7440		SZA	/WAS THERE A CHKSUM OE MARGIN ERROR?
0241	5507		JMP I AERROR	/RESET PARAMETERS AND HLT WITH CHKSUM+MARGIN
			IN ACC	
0242	2067		ISZ HICLK	/CHECK FOR TWO READS
0243	5500		JMP I ADATHI	/ONE TO GO
0244	5501		JMP I AFIN	/LAST READ, GO HOME
			*300	
			RECORD PROGRAM	
0300	7300		CLA CLL	
0301	2071		ISZ SKIP	

0302	7000	NOP		
0303	1074	TAD	RECLO	/GET INITIAL ADDRESS
0304	3061	DCA	IA	
0305	1076	TAD	RECHI	/GET FINAL ADDRESS
0306	7040	CMA		
0307	1061	TAD	IA	/CALCULATE NEGATIVE WORD COUNT
0310	3062	DCA	NWORDS	
0311	3063	DCA	CHKSUM	
0312	1071	TAD	SKIP	
0313	7640	SZA	CLA	
0314	5321	JMP	WMODE	
0315	6373	SRSR		/READ STATUS REGISTER
0316	0056	AND	DOTIM	/SPLICE 1 BIT ON?
0317	7650	SNA	CLA	
0320	4502	JMS	I AREWMD	/NO, REWIND TAPE
0321	7305	WMODE,	CLA CLL IAC	RAL
0322	6375	CLCR		/LOAD WRITE MODE
0323	7200	CLA		
0324	6373	SRSR		
0325	5324	JMP	.-1	
0326	0060	AND	WRITEM	
0327	7650	SNA	CLA	
0330	5324	JMP	.-4	
0331	1061	TAD	IA	
0332	4503	JMS	I ARECRD	
0333	1062	TAD	NWORDS	
0334	4503	JMS	I ARECRD	
0335	1072	TAD	GOHI	/GO HI OR LO
0336	7440	SZA		/LO
0337	6211	ODF	10	/IT'S HI
0340	7450	SNA		
0341	6201	ODF	00	
0342	7200	CLA		
0343	1461	DATA LP,	TAD I IA	
0344	4503	JMS	I ARECRD	
0345	1461	TAD	I IA	
0346	1063	TAD	CHKSUM	
0347	3063	DCA	CHKSUM	
0350	2061	ISZ	IA	
0351	2062	ISZ	NWORDS	
0352	5343	JMP	DATA LP	
0353	1063	TAD	CHKSUM	
0354	4503	JMS	I ARECRD	
0355	2067	ISZ	HICHK	/DONE HIGH WRITE YET?
0356	5504	JMP	I ALOKUP	/NO, DO IT
0357	5501	JMP	I AFIN	/YES, REWIND AND HLT AT START POINT

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#400
0400 0000 READ; 0 /TAPE READ ROUTINE
0401 6373 SRSR /SKIP ON STATUS CALL TRUE
0402 5201 JMP .-1 /KEEP LOOKING
0403 0057 AND READM /READ FLAG ON?
0404 7650 SNA CLA
0405 5201 JMP .-4 /NO
0406 6373 SRSR /YES, READ STATUS REGISTER
0407 7000 NOP
0410 0055 AND MRGNM /MARGIN ERROR ON?
0411 7640 SZA CLA
0412 2064 ISZ MARGIN /YES, INCREMENT COUNTER
0413 6376 RUCF /TRANSFER 12-BIT WORD
0414 5600 JMP I READ

/
0415 0000 RECORD; 0
0416 6374 TUCF
0417 7200 CLA
0420 6373 SRSR
0421 5220 JMP .-1
0422 0060 AND WRITEM
0423 7650 SNA CLA
0424 5220 JMP .-4
0425 5615 JMP I RECORD

/
0426 0000 REWIND; 0
0427 1052 TAD RWNDM
0430 6375 CLCR
0431 6373 SRSR
0432 5231 JMP .-1
0433 7200 CLA
0434 6365 CBOT1
0435 5626 JMP I REWIND

/
0436 6371 LOOKUP; WEOR /WRITE END OF FILE
0437 6373 SRSR
0440 5237 JMP .-1
0441 0053 AND P4
0442 7650 SNA CLA
0443 5237 JMP .-4
0444 6364 CGF /CLEAR GAP FLAG IF SET
0445 7300 CLA CLL
0446 1065 TAD HISTRT /STARTING ADDRESS IN FIELD 1
0447 3061 DCA IA
0450 1066 TAD HISTP /TOP ADDRESS IN FIELD 1
0451 7040 CMA
0452 1061 TAD IA /NEW NEGATIVE WORD COUNT
0453 3062 DCA NWORDS

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0454 3063          DCA      CHKSUM
0455 7001          IAC
0456 3072          DCA GOHI      /NON-ZERO GOHI MEANS HI CORE
0457 5505          JMP I ARMODE

/
0460 6211 DATAHI; CDF 10
0461 7300          CLA CLL
0462 3063          DCA      CHKSUM
0463 3064          DCA      MARGIN  /CHKSUM AND MARGIN ZEROED FOR 2ND READ
0464 7001          IAC
0465 3072          DCA      GOHI      /NONZERO GOHI SIGNALS HI CORE
0466 5505          JMP I ARMODE

/
                                *500
0500 4502 FINISH;  JMS I AREWND  /BACK TO START WITH PARAMETERS SET
0501 7300          CLA CLL
0502 1070          TAD      KON
0503 3067          DCA      HCHK
0504 1073          TAD N1
0505 3071          DCA SKIP
0506 3072          DCA GOHI
0507 3063          DCA      CHKSUM
0510 3064          DCA      MARGIN
0511 5475          JMP I ARDREC      /BACK TO START WITH PARAMETERS RESET

/
/
0512 3110 ERROR;  DCA HOLD      /SAVE THE CHKSUM+MARGIN IF NONZERO

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0513	4502	JMS I AREMND
0514	7300	CLA CLL
0515	1070	TAD KON
0516	3067	DCA HICHK
0517	1073	TAD N1
0520	3071	DCA SKIP
0521	3072	DCA GOHI
0522	3063	DCA CHKSUM
0523	3064	DCA MARGIN
0524	1110	TAD HOLD
0525	5475	JMP I ARDREC

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ADATHI	0100
AERROR	0107
AFIN	0101
ALOKUP	0104
ARDREC	0075
AREAD	0077
ARECRD	0103
AREMND	0102
ARMODE	0106
ASTART	0051
ANMODE	0105
BOT1M	0056
CBOT1	6365
CGF	6364
CHKSUM	0063
CLCR	6375
DATA	0216
DATAHI	0460
DATALP	0343
ERROR	0512
FINISH	0500
GOHI	0072
HICHK	0067
HISTP	0066
HISTR	0065
HOLD	0110
IA	0061
KON	0070
LOOKUP	0436
MARGIN	0064
MGRNM	0055
NMADR	0050
NWORDS	0062
N1	0073
P4	0053
RDM	0054

RDOREC	0200
READ	0400
READM	0057
RECHI	0076
RECLO	0074
RECORD	0415
REWIND	0426
RMODE	0206
RWCF	6376
RWNDM	0052
SKIP	0071
SRSR	6373
START	0201
TWCF	6374
WEOR	6371
WMODE	0321
WRITEM	0060

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