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DECUS NO.	8-291
TITLE	TAPE TO MEMORY COMPARITOR (6-CHANNEL)
AUTHOR	T. D. Brenig-Jones
COMPANY	Digital Equipment Co., Ltd. Reading, England
DATE	July 15 1969
SOURCE LANGUAGE	PAL III

TAPE TO MEMORY COMPARITOR (6-CHANNEL)

This program compares the contents of a 6-channel binary format tape with those of core memory, and prints any differences detected.   Currently uses the high-speed reader, and occupies locations 7400-7577.

Start Address	7400
Error Stop	7412
End-Run Stop	7437

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*7400
/TAPE-MEMORY COMPARITOR (6-CHANNEL)
START,      CLA CLL
            RFC                 /INITIALIZE H-READER
            TLS                 /INITIALIZE PRINTER
            TAD RADDR
            DCA READWD          /SET READ WORD SUBR. RETURN ADDRESS
BEGIN,      JMS READCH          /READ ONE CHAR.
            JMP .-1             /LEADER/TRAILER EXIT
            JMP READWD+4        /ORIGIN EXIT
            SNA                 /DATA EXIT - BLANK?
            JMP BEGIN           /YES-IGNORE
RERROR,     HLT                 /ERROR HALT
            JMP START           /RESTART
NORIG,      TAD WORD
            DCA CLC             /RESET ORIGIN
REDATA,     JMS READWD          /READ DATA
            JMP NORIG           /ORIGIN EXIT
            TAD WORD            /DATA EXIT
CONT,       DCA HOLD            /STORE WORD JUST READ
            JMS READWD          /READ NEXT WORD
            NOP                 /ORIGIN EXIT
            TAD HOLD            /DATA EXIT-FETCH LAST WORD
            CIA                 /NEGATE LAST WORD
            TAD I CLC           /ADD LOCATION CONTENTS
            SZA CLA             /SAME?
            JMP CERROR          /NO-COMPARE ERROR
RETURN,     TAD ORIGIN
            SZA CLA             /ORIGIN?
            JMP NORIG           /YES
            ISZ CLC             /UPDATE LOC'N COUNTER
            TAD WORD            /FETCH WORD JUST READ
            JMP CONT            /CONTINUE
STOPR,      HLT                 /STOP RUN
            JMP START           /RESTART
READWD,     REDATA+1            /READ 12-BIT WORD SUBR.
            DCA ORIGIN          /CLEAR ORIGIN IND.
            JMS READCH          /READ ONE CHARACTER
            JMP STOPR           /LEADER/TRAILER - STOP RUN
            ISZ ORIGIN          /ORIGIN
            CLL RTL;RTL         /DATA-ROTATE 4 LEFT
            DCA WORD            /STORE 4 M.S. BITS
            JMS READCH          /READ NEXT CHARACTER
            JMP RERROR          /L/T EXIT
            JMP RERROR          /ORIGIN EXIT
            TAD WORD            /DATA EXIT
            RTL;RTL             /ROTATE 4 LEFT
            DCA WORD            /STORE 8 M.S. BITS
            JMS READCH          /READ NEXT CHARACTER
            JMP RERROR          /L/T EXIT
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                JMP RERROR          /ORIGIN EXIT
                TAD WORD            /DATA EXIT
                DCA WORD            /STORE 12-BIT WORD
                SNL CLL             /ORIGIN?
                ISZ READWD          /NO-ADD 1 TO EXIT
                JMP I READWD        /EXIT SUBR.
CERROR,         TAD CR              /COMPARE ERROR
                JMS TYPE            /PRINT CR
                TAD LF
                JMS TYPE            /PRINT LF
                TAD CLC
                JMS OUTP            /PRINT ADDRESS
                JMS SPACES
                TAD I CLC
                JMS OUTP            /PRINT ADDRESS CONTENTS
                JMS SPACES
                TAD HOLD
                JMS OUTP            /PRINT TAPE WORD
                JMP RETURN          /RETURN TO MAIN PROGRAM
READCH,         Ø                   /READ CHARACTER SUBR.
                RSF                 /READER READY?
                JMP .-1             /NO-TRY AGAIN
                RFC RRB             /READ CHARACTER
                AND MASK77          /REMOVE ALL BUT 6 L.S. BITS
                DCA OUTP            /STORE CHARACTER
                TAD OUTP
                AND MASK4Ø
                SZA CLA             /LEADER TRAILER?
                JMP I READCH        /YES-EXIT 1
                ISZ READCH          /SET FOR EXIT 2
                TAD OUTP
                AND MASK2Ø
                SNA CLA             /ORIGIN?
                ISZ READCH          /NO-SET FOR EXIT 3
                TAD OUTP
                JMP I READCH        /EXIT SUBR.
OUTP,           Ø                   /PRINT OCTAL CONTENTS SUBR.
                RAL                 /ALLOW FOR LINK
                DCA READCH          /HOLD WORD
                TAD MIN4
                DCA SPACES          /SET COUNT OF 4
OUTNO,          TAD READCH
                RTL;RAL             /ROTATE 3 LEFT
                DCA READCH          /HOLD WORD
                TAD READCH
                AND MASK            /REMOVE ALL BUT 3 L.S. BITS
                TAD ASCOD           /CONVERT NO. TO ASCII CODE
                JMS TYPE            /PRINT ONE DIGIT
                ISZ SPACES          /ALL 4 DIGITS PRINTED?
                JMP OUTNO           /NO-CONTINUE
                JMP I OUTP          /EXIT SUBR.
```

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SPACES,     Ø                   /PRINT SPACES SUBR.
            TAD SPACE
            JMS TYPE            /PRINT ONE SPACE
            TAD SPACE
            JMS TYPE            /PRINT ONE SPACE
            JMP I SPACES        /EXIT SUBR.
TYPE,       Ø                   /PRINT SUBR.
            TSF                 /PRINTER READY?
            JMP .-1             /NO-TRY AGAIN
            TLS                 /PRINT CHAR.
            CLA
            JMP I TYPE          /EXIT SUBR.
HOLD,       Ø
CLC,        Ø
ORIGIN,     Ø
WORD,       Ø
SPACE,      24Ø
CR,         215
LF,         212
MASK,       7
MASK4Ø,     4Ø
MASK2Ø,     2Ø
MASK77,     77
MIN4,       -4
ASCOD,      26Ø
RADDR,      REDATA+1
$
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                    *7400
                    /TAPE-MEMORY COMPARITOR (6-CHANNEL)
7400   7300   START,      CLA CLL
7401   6014               RFC               /INITIALIZE H-READER
7402   6046               TLS               /INITIALIZE PRINTER
7403   1377               TAD RADDR
7404   3241               DCA READWD        /SET READ WORD SUBR. RETURN ADDRESS
7405   4305   BEGIN,      JMS READCH        /READ ONE CHAR.
7406   5205               JMP .-1           /LEADER/TRAILER EXIT
7407   5245               JMP READWD+4      /ORIGIN EXIT
7410   7450               SNA               /DATA EXIT - BLANK?
7411   5205               JMP BEGIN         /YES-IGNORE
7412   7402   RERROR,     HLT               /ERROR HALT
7413   5200               JMP START         /RESTART
7414   1365   NORIG,      TAD WORD
7415   3363               DCA CLC           /RESET ORIGIN
7416   4241   REDATA,     JMS READWD        /READ DATA
7417   5214               JMP NORIG         /ORIGIN EXIT
7420   1365               TAD WORD          /DATA EXIT
7421   3362   CONT,       DCA HOLD          /STORE WORD JUST READ
7422   4241               JMS READWD        /READ NEXT WORD
7423   7000               NOP               /ORIGIN EXIT
7424   1362               TAD HOLD          /DATA EXIT-FETCH LAST WORD
7425   7041               CIA               /NEGATE LAST WORD
7426   1763               TAD I CLC         /ADD LOCATION CONTENTS
7427   7640               SZA CLA           /SAME?
7430   5270               JMP CERROR        /NO-COMPARE ERROR
7431   1364   RETURN,     TAD ORIGIN
7432   7640               SZA CLA           /ORIGIN ?
7433   5214               JMP NORIG         /YES
7434   2363               ISZ CLC           /UPDATE LOC'N COUNTER
7435   1365               TAD WORD          /FETCH WORD JUST READ
7436   5221               JMP CONT          /CONTINUE
7437   7402   STOPR,      HLT               /STOP RUN
7440   5200               JMP START         /RESTART
7441   7417   READWD,     REDATA+1          /READ 12-BIT WORD SUBR.
7442   3364               DCA ORIGIN        /CLEAR ORIGIN IND.
7443   4305               JMS READCH        /READ ONE CHARACTER
7444   5237               JMP STOPR         /LEADER/TRAILER - STOP RUN
7445   2364               ISZ ORIGIN        /ORIGIN
7446   7106               CLL RTL;
7447   7006   RTL         /DATA-ROTATE 4 LEFT
7450   3365               DCA WORD          /STORE 4 M.S. BITS
7451   4305               JMS READCH        /READ NEXT CHARACTER
7452   5212               JMP RERROR        /L/T EXIT
7453   5212               JMP RERROR        /ORIGIN EXIT
7454   1365               TAD WORD          /DATA EXIT
7455   7006               RTL;
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7456	7006	RTL	/ROTATE 4 LEFT
7457	3365	DCA WORD	/STORE 8 M.S. BITS
7460	4305	JMS READCH	/READ NEXT CHARACTER
7461	5212	JMP RERROR	/L/T EXIT
7462	5212	JMP RERROR	/ORIGIN EXIT
7463	1365	TAD WORD	/DATA EXIT
7464	3365	DCA WORD	/STORE 12-BIT WORD
7465	7520	SNL CLL	/ORIGIN?
7466	2241	ISZ READWD	/NO-ADD 1 TO EXIT
7467	5641	JMP I READWD	/EXIT SUBR.
7470	1367	CERROR, TAD CR	/COMPARE ERROR
7471	4354	JMS TYPE	/PRINT CR
7472	1370	TAD LF	
7473	4354	JMS TYPE	/PRINT LF
7474	1363	TAD CLC	
7475	4326	JMS OUTP	/PRINT ADDRESS
7476	4346	JMS SPACES	
7477	1763	TAD I CLC	
7500	4326	JMS OUTP	/PRINT ADDRESS CONTENTS
7501	4346	JMS SPACES	
7502	1362	TAD HOLD	
7503	4326	JMS OUTP	/PRINT TAPE WORD
7504	5231	JMP RETURN	/RETURN TO MAIN PROGRAM
7505	0000	READCH, 0	/READ CHARACTER SUBR.
7506	6011	RSF	/READER READY?
7507	5306	JMP .-1	/NO-TRY AGAIN
7510	6016	RFC RRB	/READ CHARACTER
7511	0374	AND MASK77	/REMOVE ALL BUT 6 L.S. BITS
7512	3326	DCA OUTP	/STORE CHARACTER
7513	1326	TAD OUTP	
7514	0372	AND MASK40	
7515	7640	SZA CLA	/LEADER TRAILER?
7516	5705	JMP I READCH	/YES-EXIT 1
7517	2305	ISZ READCH	/SET FOR EXIT 2
7520	1326	TAD OUTP	
7521	0373	AND MASK20	
7522	7650	SNA CLA	/ORIGIN?
7523	2305	ISZ READCH	/NO-SET FOR EXIT 3
7524	1326	TAD OUTP	
7525	5705	JMP I READCH	/EXIT SUBR.
7526	0000	OUTP, 0	/PRINT OCTAL CONTENTS SUBR.
7527	7004	RAL	/ALLOW FOR LINK
7530	3305	DCA READCH	/HOLD WORD
7531	1375	TAD MIN4	
7532	3346	DCA SPACES	/SET COUNT OF 4
7533	1305	OUTNO, TAD READCH	
7534	7006	RTL;	

7535	7004	RAL		/ROTATE 3 LEFT
7536	3305		DCA READCH	/HOLD WORD
7537	1305		TAD READCH	
7540	0371		AND MASK	/REMOVE ALL BUT 3 L.S. BITS
7541	1376		TAD ASCOD	/CONVERT NO. TO ASCII CODE
7542	4354		JMS TYPE	/PRINT ONE DIGIT
7543	2346		ISZ SPACES	/ALL 4 DIGITS PRINTED?
7544	5333		JMP OUTNO	/NO-CONTINUE
7545	5726		JMP I OUTP	/EXIT SUBR.
7546	0000	SPACES,	0	/PRINT SPACES SUBR.
7547	1366		TAD SPACE	
7550	4354		JMS TYPE	/PRINT ONE SPACE
7551	1366		TAD SPACE	
7552	4354		JMS TYPE	/PRINT ONE SPACE
7553	5746		JMP I SPACES	/EXIT SUBR.
7554	0000	TYPE,	0	/PRINT SUBR.
7555	6041		TSF	/PRINTER READY?
7556	5355		JMP .-1	/NO-TRY AGAIN
7557	6046		TLS	/PRINT CHAR.
7560	7200		CLA	
7561	5754		JMP I TYPE	/EXIT SUBR.
7562	0000	HOLD,	0	
7563	0000	CLC,	0	
7564	0000	ORIGIN,	0	
7565	0000	WORD,	0	
7566	0240	SPACE,	240	
7567	0215	CR,	215	
7570	0212	LF,	212	
7571	0007	MASK,	7	
7572	0040	MASK40,	40	
7573	0020	MASK20,	20	
7574	0077	MASK77,	77	
7575	7774	MIN4,	-4	
7576	0260	ASCOD,	260	
7577	7417	RADDR,	REDATA+1	

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