

## 9DRS A

### DROP READY AND TEST READY STATUS SPECIAL FEATURE TEST - E. C. 298680

#### A. PURPOSE OF TEST

The purpose of this program is to test two new instructions.

1. Drop ready status -- DRS -- operation code 0775.
2. Test Ready Status -- TRS -- Operation Code -0775. This instruction should skip one instruction if the unit is ready, and will take the next instruction if drive is not ready.

Both these instruction have to do only with ready in tape drives.

#### B. METHOD OF TEST

1. The program uses 9IOM to determine which drives are to be tested. Any drives to be tested must be in ready status at start of program.
2. Program tests transfer ready - TRS - with drives in ready status.
3. Ready status is then dropped on all drives by the use of drop ready instruction - DRS.
4. Test ready status - TRS - is tested with drives out of ready.
5. A normal stop will occur at 00130. At this time the operator must reset and press start button on all drives being tested, and then depress start button on console.
6. All tapes selected will be written, to prove that the trigger in the drive was reset by pushing the tape drive start button.
7. Ready status is dropped during rewind. A normal stop will occur at 00236. At this stop the operator must reset and press start on all drives selected, and then press start on console.

#### C. AREA OF MACHINE REQUIRED

1. Any number of tape drives on any channels,  
MF, CF, CR, PR, DS.
2. Storage Locations 00030-00632-9DRS  
05500-06476-9IOM

#### D. PROGRAM CONTROL

1. 9IOM-Selection of tape units on any channels will be with the keys.  
See Enclosed Selection Diagram.
2. Sense Switch Control
  - SSW 1 UP - Do not repeat section
  - SSW 1 DN - Repeat section of test-on error
  - SSW 2 UP - Test switch 3
  - SSW 2 DN - Test Switch 1 - Bypass error
  - SSW 3 UP - Print error
  - SSW 3 DN - Halt on error
  - SSW 4 - Not used
  - SSW 5 - Up test switch 6
  - SSW 5 DN - Loop in initail units, without halt in 9IOM
  - SSW 6 UP - Call in next program
  - SSW 6 ON - Repeat test, going back to 9IOM

#### E. NORMAL STOPS

1. 00130 - Push start on all tape drives being tested, then press start on console.
2. 00236 - Push start on all tape drives being tested, then press start on console.
3. 05517 - 9IOM, to enter selection for channels A + B.
4. 05533 - 9IOM, to enter selection for channels C + D.
5. 05540 - 9IOM, to enter selection fro channel E + F.

#### F. ERROR STOPS

1. 00345 - Halt on error with swith =3 down. Press start on console to continue test.
2. 05525 - 9IOM, no tag keys thrown down on halt at 05517. Throw down tag keys and press start.

#### G. PRINT ROUTINE

1. The standatd diagnostic print routine - 9DEPR - is not used. The routine which is used gives one line of print per error.

#### SAMPLE ERROR PRINT

ERROR ADDR 00053 - TRSA 1 - FAILED

The error address will indicate the error exit in the program, and TRSA 1 will indicate that the transfer ready status instruction failed on channel A tape unit 1.

The - DRS - instruction will print in the same manner, on error.

## H. COMMENTS

1. The DRS instruction is performed, and TRS is tested immediately afterwards, therefore, it is impossible for the program to tell which instruction failed, because TRS is used to see that DRS did drop ready in the drive.

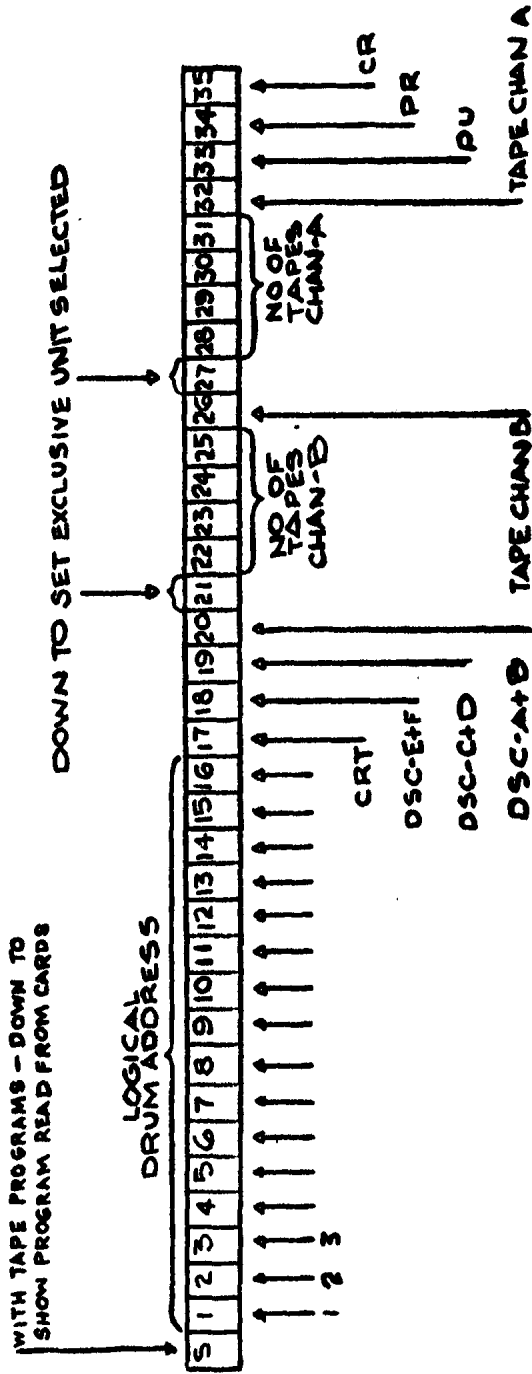
A DRS printout will occur on error, but it will be necessary to note whether the particular tape drive, involved, is in ready status, to determine which instruction failed - DRS or TRS. (Loc. 00117)

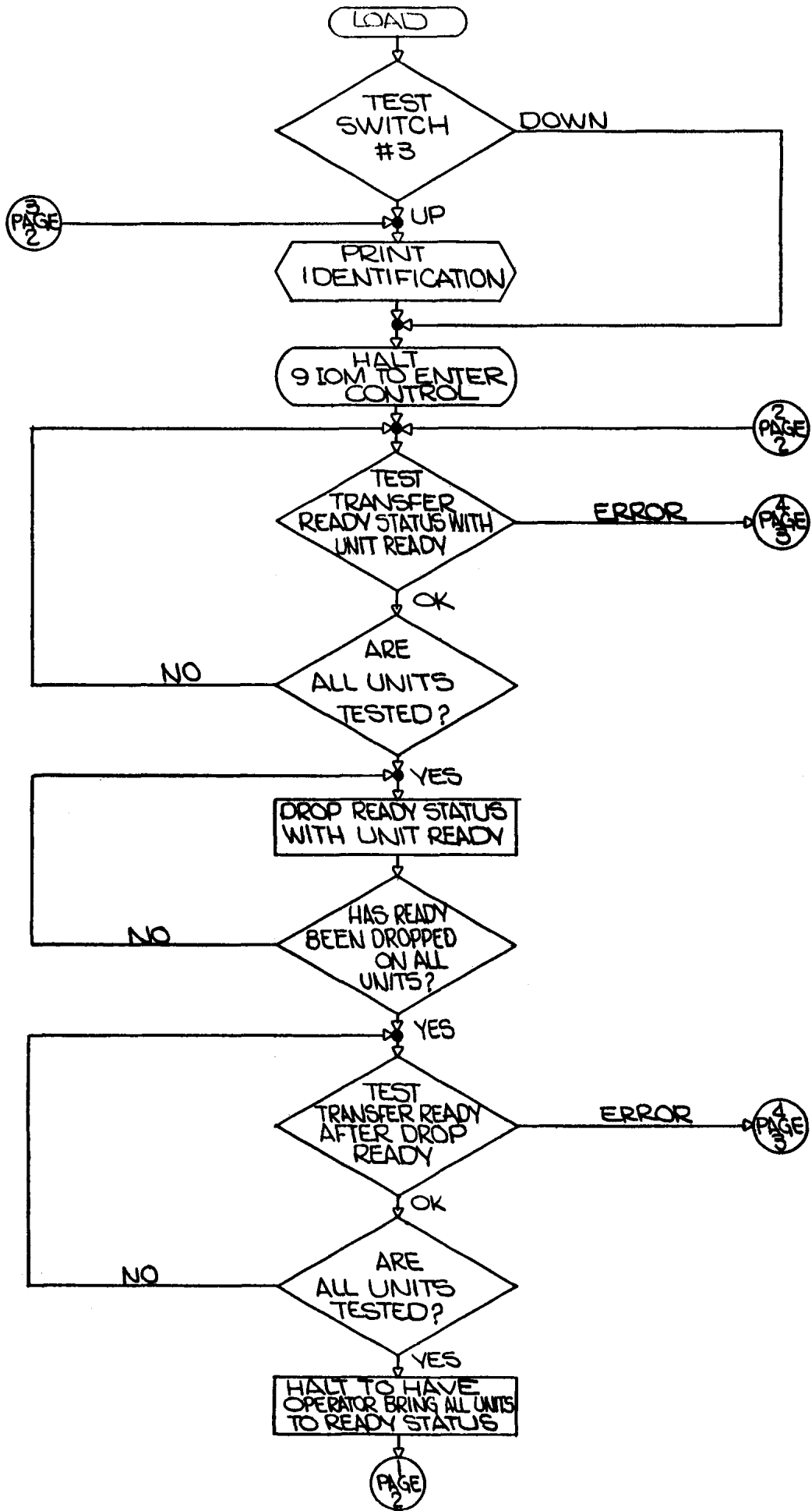
2. 9IOM has been altered, to take care of the two new instructions.
3. DRS will be given while the tape is writing to make sure DRS will not operate until the drive has finished writing.
4. DRS will be given while the tape is rewinding to make sure DRS will not allow the drive to come back to ready after rewind.
5. Tape drive 1 on channel A will be tested last.

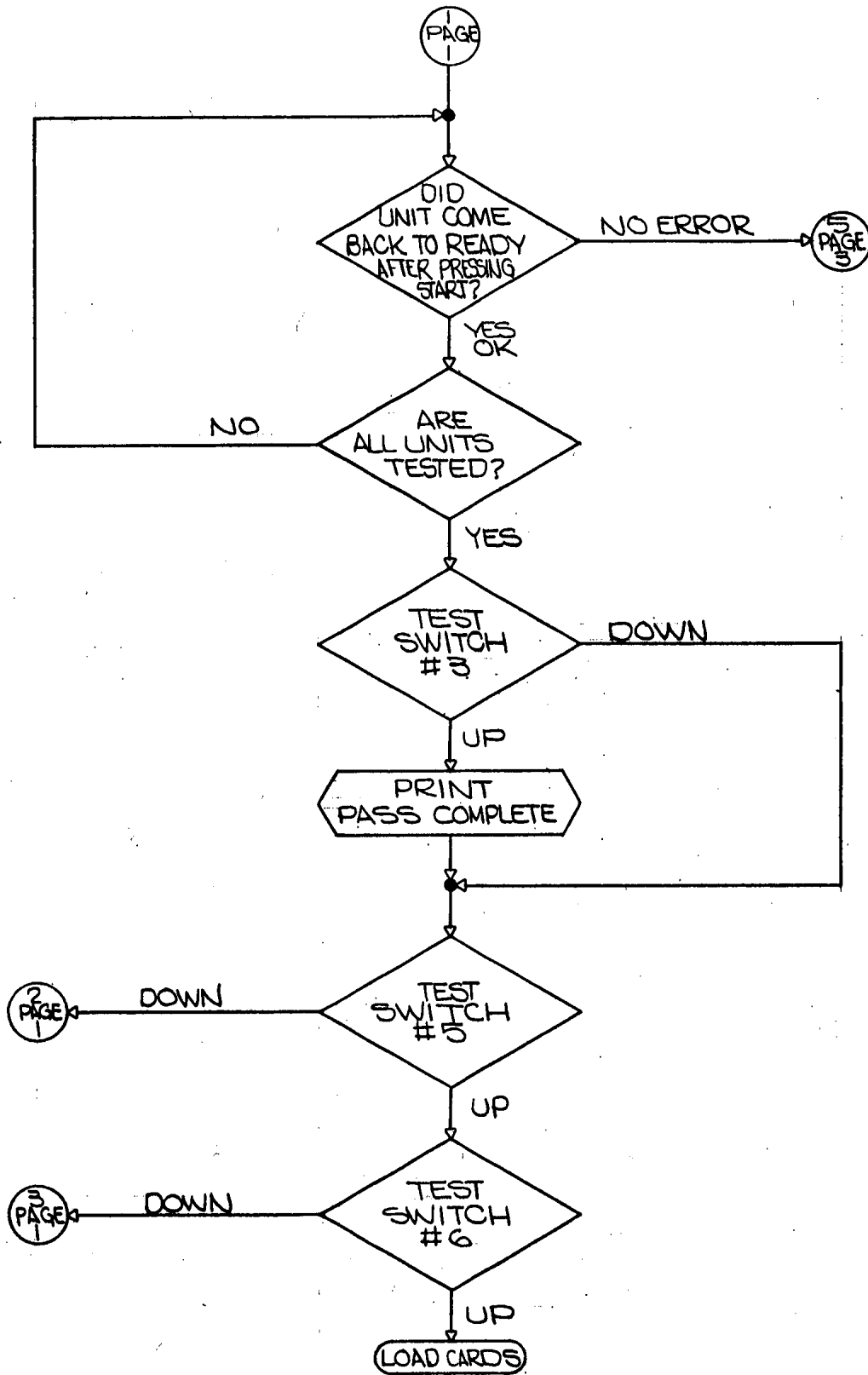
I/O SELECTION FORMAT FOR CONTROL OF  
I/O PROGRAMS  
(TO BE ENTERED INTO KEYS)

BIT	
S	WITH TAPE PROGRAMS - DOWN TO SHOW PROGRAM READ FROM CARDS
1-16	DRUM ADDRESS
17	CRT
18	DSC-E+F
19	DSC-C+D
20	DSC-A+B
21	DOWN TO SET EXCLUSIVE UNIT SELECT
22-25	NO OF TAPES CHAN-B
26	TAPE CHAN B
27	DOWN TO SET EXCLUSIVE UNIT SELECT
28-31	NO OF TAPES CHAN-A
32	TAPE CHAN A
33	PU
34	PR
35	CR

# I/O SELECTION FORMAT FOR CONTROL OF I/O PROGRAMS (TO BE ENTERED INTO KEYS)







9DRS1A

\*PROGRAM TO TEST--DROP READY STATUS---AND---TEST READY STATUS

00030           ORG 24

\*ENTER I/O SELECTION FOR ALL UNITS TO BE TESTED.

\*THIS PROGRAM MUST HAVE ENTERED INTO KEYS, IN  
\*THE NORMAL 9IOM FORMAT, THE UNITS TO BE  
\*TESTED.--SEE 9IOM FOR SELECTION FORMAT

00030 0500 00 0 00430           CLA RESET  
00031 0601 00 0 00000           STO 0  
00032 0020 00 0 00313           TRA PRINT-3    TO PRINT IDENTIFICATION  
  
00033 0074 00 4 05514 BEGIN   TSX IOC,4        TO ENTER I/O SELECTION  
  
00034 0500 00 0 05500           CLA CTRL1       BRING IN FIRST  
00035 -0120 00 0 00037          TMI \*+2        TEST FOR PROGRAM ON TAPE  
00036 -0625 00 0 00414          STL SWTCH       S KEY IS UP-YES CALL TAPE  
00037 0020 00 0 00437           TRA COUNT  
  
00040 0074 00 4 05512           TSX CTX,4       TO MODIFY THE PROGRAM  
00041 0000 53 0 00042           HTR \*+1,0,\*+10  
00042 0020 00 0 00044           TRA \*+2

\*TEST TRS WITH TAPES IN READY STATUS

00043 666322216001           BCD    BCD 1WTBA 1    DUMMY BCD  
  
00044 0766 00 0 01221           WTBA 1  
00045 0540 00 0 00433           RCHA CNTRL     IOCD-WC 2  
00046 0060 00 0 00046           TCOA \*         WAIT FOR END OPN  
00047 0772 00 0 01201           REWA 1  
00050 0774 00 1 00043           AXT BCD,1  
00051 -0775 00 0 01201           TRSA 1         TEST READY STATUS CHAN X  
00052 0020 00 0 00056           TRA \*+4        TAPE NOT READY-OK  
00053 0074 00 2 00331           TSX ERROR,2    TAPE READY DURING REWIND  
00054 635162006000           BCD 1TRS0 0  
00055 0020 00 0 00044           TRA \*-9        REPEAT  
  
00056 0500 00 0 00416           CLA IOCNT       COUNT OF TOTAL UNITS  
00057 0402 00 0 00417           SUB ONE        L+1  
00060 0601 00 0 00416           STO IOCNT       RESTORE COUNT  
00061 -0100 00 0 00040          TNZ BCD-3       RETURN FOR NEXT UNIT  
  
00062 0500 00 0 05503           CLA IOCT       BRING IN COUNT  
00063 0601 00 0 00416           STO IOCNT       RESTORE  
  
00064 0074 00 4 05512           TSX CTX,4       TO MODIFY PROGRAM  
00065 0000 75 0 00065           HTR \*,0,\*+8  
00066 0020 00 0 00070           TRA \*+2



\*THIS SECTION WILL TRY TO DROP READY WITH CHANNEL IN OPN.  
\*DRS SHOULD NOT OPERATE UNTIL CHANNEL IS NOT IN OPERATION.

00067	666322216001		BCD 1WTBA 1	
00070	0766 00 0 01221	WTB	WTBA 1	SELECT TAPE
00071	0540 00 0 00433		RCHA CNTRL	WRITE TWO WORDS
00072	0775 00 0 01201		DRSA 1	DROP READY-AFTER SELECT TO SEE IF DROP READY WILL OPERATE BEFORE WRITE OPERATION IS FINISHED.
00073	0774 00 1 00067		AXT WTB-1,1	
00074	-0775 00 0 01201		TRSA 1	TEST-TRS AFTER DRS
00075	0020 00 0 00101		TRA *+4	NO IN OPN-OK
00076	0074 00 2 00331		TSX ERROR,2	TAPE DRIVE SHOULD NOT BE IN READY STATUS
00077	635162466000		BCD 1TRSO 0	
00100	0020 00 0 00070		TRA *-8	
00101	0500 00 0 00416		CLA IOCNT	COUNT OF TOTAL UNITS
00102	0402 00 0 00417		SUB ONE	L+1
00103	0601 00 0 00416		STO IOCNT	RESTORE COUNT
00104	-0100 00 0 00066		TNZ WTB-2	
00105	0500 00 0 05503		CLA IOCT	BRING IN COUNT
00106	0601 00 0 00416		STO IOCNT	RESTORE
00107	0074 00 4 05512		TSX CTX,4	TO MODIFY PROGRAM
00110	0001 15 0 00111		HTR *+1,0,*+5	
00111	0020 00 0 00114		TRA *+3	

\*TEST TRS WITH TAPE DRIVES NOT IN READY STATUS

00112	666322216001	BCD1	BCD 1WTBA 1	
00113	0766 00 0 01221		WTBA 1	
00114	0774 00 1 00112		AXT BCD1,1	
00115	-0775 00 0 01201		TRSA 1	TEST READY STATUS WITH UNIT NOT READY
00116	0020 00 0 00122		TRA *+4	
00117	0074 00 2 00331		TSX ERROR,2	OUT TO PRINT ERROR-MAY INDICATE DRS DID NOT DROP READY, OR TRS SAW UNIT IN READY STATUS. LOOK AT DRIVE INDICATED IN PRINT OUT. IF DRIVE IS IN READY DRS DID NOT OPERATE. IF DRIVE IS NOT IN READY STATUS, TRS DID NOT OPERATE PROPERLY.
00120	635162466000		BCD 1TRSO 0	
00121	0020 00 0 00114		TRA *-5	REPEAT
00122	0500 00 0 00416		CLA IOCNT	TOTAL UNIT COUNT
00123	0402 00 0 00417		SUB ONE	L+1
00124	0601 00 0 00416		STO IOCNT	RESTORE COUNT

00125	-0100	00	0	00107	TNZ	BCD1-3	
00126	0500	00	0	05503	CLA	IOCT	TOTAL UNIT COUNT
00127	0601	00	0	00416	STO	IOCNT	RESTORE
00130	0000	00	0	00131	HTR	*+1	AT THIS HALT --RESET AND PRESS START ON ALL DRIVES SELECTED I WILL WAIT.----- ARE ALL DRIVES IN READY STATUS-FINE,--NOW PRESS START BUTTON ON CONSOLE
00131	0074	00	4	05512	TSX	CTX,4	TO MODIFY PROGRAM
00132	0001	42	0	00132	HTR	*,0,*,+8	
00133	0020	00	0	00135	TRA	*+2	

\*READ TAPES TO CHECK FOR ALL INFORMATION BEING WRITTEN

00134	666322216001				BCD	1WTBA	1		
00135	0764	00	0	01201	WTB1	BSRA	1	BACKREM RECORD.	
00136	0762	00	0	01221		RTBA	1		
00137	0540	00	0	00434		RCHA	CNTL1	READ 2 WORDS	
00140	0060	00	0	00140		TCOA	*	WAIT FOR DSC	
00141	0774	00	1	00134		AXT	WTB1-1,1		
00142	0774	00	4	00002		AXT	2,4		
00143	0500	00	4	00437		CLA	RD2WD+2,4	WORD READ	
00144	0560	00	4	00427		LDQ	ONES+2,4	CORRECT WORD	
00145	0340	00	4	00427		CAS	ONES+2,4		
00146	0020	00	0	00150		TRA	*+2	ERROR	
00147	0020	00	0	00153		TRA	*+4		
00150	0074	00	2	00331		TSX	ERROR,2	ERROR HERE WILL INDICATE	
00151	245162006000					BCD	1DRS0	0	THAT DRS DROPPED READY ONE THE TRAP DRIVE BEFORE THE WRITE OPN WAS COMPLETED
00152	0020	00	0	00135		TRA	WTB1		
00153	2	00001	4	00143		TIX	*-8,4,1	COMPARE ALL WORDS	
00154	0500	00	0	00416		CLA	IOCNT	TOTAL UNIT COUNT	
00155	0402	00	0	00417		SUB	ONE	L+1	
00156	0601	00	0	00416		STO	IOCNT	RESTORE COUNT	
00157	-0100	00	0	00133		TNZ	WTB1-2		
00160	0500	00	0	05503		CLA	IOCT	TOTAL UNIT	
00161	0601	00	0	00416		STO	IOCNT		
00162	0074	00	4	05512		TSX	CTX,4	MODIFY PROGRAM	
00163	0001	76	0	00164		HTR	*+1,0,*,+11		
00164	0020	00	0	00166		TRA	*+2		

\*TEST TRS WITH CHANNEL IN OPERATION-TRS SHOULD HOLD UP MF.

00165	666322216001		BCD2	BCD 1WTBA 1	DUMMY BCD FOR 9IOM
00166	0060 00 0	00166		TCOA *	MAKE SURE CHANNEL IS
00167	0774 00 1	00165		AXT BCD2,1	NOT PRINTING
00170	0766 00 0	01221		WTBA 1	SELECT TAPE
00171	0540 00 0	00433		RCHA CNTRL	MOVE INFORMATION
00172	-0775 00 0	01201		TRSA 1	
00173	0000 00 0	00211		HTR ERR+3	THE PROGRAM SHOULD NEVER ARRIVE AT THIS POINT. TRS SHOULD DELAY UNTIL CHANNEL GOES OUT OF OPERATION THEN SHOW DRIVE IN READY STATUS.
00174	0060 00 0	00206		TCOA ERR	IF CHANNEL IS IN OPERATION THIS IS AN ERROR.
00175	0640 00 0	00423		SCHA SAVE2	CONTENTS OF CHANNEL
00176	0500 00 0	00426		CLA SAVE3	CORRECT CONTENTS OF CHANNEL IF WORD MOVED
00177	0340 00 0	00423		CAS SAVE2	
00200	0020 00 0	00202		TRA *+2	DID NOT MOVE WORD-ERROR
00201	0020 00 0	00211		TRA ERR+3	OK
00202	0074 00 2	00331		TSX ERROR,2	SCH COMPARISION AFTER
00203	635162006000			BCD 1TRS0 0	WRITE NOT CORRECT
00204	0020 00 0	00166		TRA BCD2+1	REPEAR
00205	0020 00 0	00211		TRA ERR+3	CONTINUE-OK
00206	0074 00 2	00331	ERR	TSX ERROR,2	ERROR
00207	635162466000			BCD 1TRS0 0	
00210	0020 00 0	00166		TRA BCD2+1	REPEAT
00211	0500 00 0	00416		CLA IOCNT	TOTAL UNIT COUNT
00212	0402 00 0	00417		SUB ONE	L+1
00213	0601 00 0	00416		STO IOCNT	RESTORE
00214	-0100 00 0	00162		TNZ BCD2-3	RETURN FOR NEXT UNIT
00215	0500 00 0	05503		CLA IOCT	
00216	0601 00 0	00416		STO IOCNT	RESTORE INITIAL COUNT
00217	0074 00 4	05512		TSX CTX,4	
00220	0002 30 0	00220		HTR *,0,*+8	
00221	0020 00 0	00223		TRA *+2	

\*TEST THAT DRS GIVEN DURING REWIND WILL NOT ALLOW

\*TAPE DRIVE TO COME BACK TO READY AFTER COMPLETION OF REWIND

00222	666322216001			BCD 1WTBA 1	
00223	0766 00 0	01221	REW	WTBA 1	
00224	0540 00 0	00433		RCHA CNTRL	IOCD-WC 2

00225	0060	00	0	00225	TCOA *	WAIT
00226	0772	00	0	01201	REWA 1	REWIND
00227	0775	00	0	01201	DRSA 1	DROP READY
						DROP READY SHOULD NOT ALLOW DRIVE TO COME BACK TO READY AFTER REWIND. IF ANY DRIVE READY STATUS, DRS DID NOT HOLD READY DOWN DURING REWIND.
00230	0500	00	0	00416	CLA IOCNT	TOTAL UNIT COUNT
00231	0402	00	0	00417	SUB ONE	L+1
00232	0601	00	0	00416	STO IOCNT	RESTORE
00233	-0100	00	0	00221	TNZ REW-2	RETURN FOR NEXT UNIT
00234	0500	00	0	05503	CLA IOCT	
00235	0601	00	0	00416	STO IOCNT	RESTORE INITIAL COUNT
00236	0000	00	0	00237	HTR *+1	AT THIS HALT RESET AND PRESS START ON ALL DRIVES SELECTED. IF ANY ARE IN READY STATUS, DRS DID NOT HOLD DOWN READY, AFTER REWIND
						PRESS START ON CONSOLE TO CONTINUE
00237	0760	00	0	00165	SWT 5	
00240	0020	00	0	00242	TRA *+2	
00241	0020	00	0	00262	TRA *+17	
00242	0500	00	0	00431	CLA REST	RESET CONSTANT
00243	0601	00	0	05500	STO CTRL1	RESET CONTROL FOR CHAN A
00244	0600	00	0	05501	STZ CTRL2	CLEAR CTRL2
00245	0600	00	0	05502	STZ CTRL3	CLEAR CTRL3
00246	0074	00	4	05512	TSX CTX, 4	OUT TO RESET PROGRAM
00247	0000	53	0	00041	HTR BCD-2, 0, BCD+8	
00250	0074	00	4	05512	TSX CTX, 4	
00251	0000	74	0	00067	HTR WTB-1, 0, WTB+4	
00252	0074	00	4	05512	TSX CTX, 4	
00253	0001	16	0	00111	HTR BCD1-1, 0, BCD1+4	
00254	0074	00	4	05512	TSX CTX, 4	
00255	0001	41	0	00134	HTR WTB1-1, 0, WTB1+4	
00256	0074	00	4	05512	TSX CTX, 4	
00257	0001	76	0	00164	HTR BCD2-1, 0, BCD2+9	
00260	0074	00	4	05512	TSX CTX, 4	
00261	0002	30	0	00222	HTR REW-1, 0, REW+5	
00262	0766	00	0	01361	WPRA	
00263	0760	00	0	01363	SPRA 3	
00264	0074	00	4	00443	TSX SPLAT+1, 4	
00265	0	00022	0	00005	PZE 5, 0, 18	
00266	472162626023				BCD 5PASS COMPLETE-ALL UNITS-9DRS1	
00267	464447432563					
00270	254021434360					

00271	644531636240				
00272	112451620160				
00273	0760 00 0 00165		SWT 5	IF SWITCH 5 IS DOWN PROGRAM WILL USE UNITS	
00274	0020 00 0 00276		TRA *+2	SELECTED, INITIALLY, WITHOUT	
00275	0020 00 0 00040		TRA BEGIN+5	ANOTHER HALT	
00276	0760 00 0 00166		SWT 6		
00277	0020 00 0 00301		TRA *+2		
00300	0020 00 0 00033		TRA BEGIN		
00301	0520 00 0 00414		ZET SWTCH	TEST FOR SIGN KEY	
00302	0020 00 0 00307		TRA CHNG		
00303	0762 00 0 01321	NPR	RCDA	CALL NEXT PROGRAM	
00304	0540 00 0 00312		RCHA CNP		
00305	0544 00 0 00000		LCHA 0		
00306	0020 00 0 00001		TRA 1		
00307	0500 00 0 00427	CHNG	CLA TPSEL	TAPE SELECT	
00310	0601 00 0 00303		STO NPR	CHANGE CARD SELECT	
00311	0020 00 0 00303		TRA NPR	CALL NEXT PROGRAM	
00312	-1 00003 0 00000	CNP	IOCT 0,0,3		
00313	0760 00 0 00163		SWT 3		
00314	0020 00 0 00316		TRA *+2		
00315	0020 00 0 00033		TRA BEGIN		
00316	0766 00 0 01361	PRINT	WPRA		
00317	0760 00 0 01363		SPRA 3		
00320	0074 00 4 00443		TSX SPLAT+1,4		
00321	0 00022 0 00006		PZE 6,0,18		
00322	454666604751		BCD 6NOW PREFORMING -9DRS1-	TRS, DRS TEST	
00323	252646514431				
00324	452760401124				
00325	516201406063				
00326	516273602451				
00327	626063256263				
00330	0020 00 0 00033		TRA BEGIN		
00331	0760 00 0 00162	ERROR	SWT 2	TEST SWITCH {2	
00332	0020 00 0 00336		TRA *+4	UP-TEST SWITCH {3	
00333	0760 00 0 00161		SWT 1	DOWN-IGNORE ERROR	
00334	0020 00 2 00003		TRA 3,2	UP-COUNTINUE PROGRAM	
00335	0020 00 2 00002		TRA 2,2	DOWN-LOOP IN SECTION AND UNIT NEW SELECTED	
00336	0760 00 0 00163		SWT 3	TEST SWITCH {4	
00337	0020 00 0 00347		TRA ERT	UP-PRINT	
00340	0634 00 2 00345		SXA HPR,2	STORE 2S COMP ERROR ADDR.	
00341	0634 00 2 00413		SXA SAVE4,2	SAVE XRBV	
00342	0535 00 2 00345		LAC HPR,2	PLACE CORRECT ADDR IN XR	
00343	0634 00 2 00345		SXA HPR,2	STORE CORRECT ADDR	
00344	0534 00 2 00413		LXA SAVE4,2	RESTORE XRB	

00345	0420	00	0	00000	HPR	HPR **	CORRECT ADDR WILL APPEAR IN SR
00346	0020	00	0	00333		TRA ERROR+2	RETURN
00347	-0500	00	2	00001	ERT	CAL 1,2	TO SET
00350	0602	00	0	00405		SLW TRS+3	
00351	0634	00	1	00352		SXA *+1,1	
00352	-0500	00	0	00000		CAL 0	UP BCD
00353	-0320	00	0	00415		ANA MASK	
00354	-0501	00	0	00405		ORA TRS+3	PRINT
00355	0602	00	0	00405		SLW TRS+3	IMAGE
00356	0754	00	2	00000		PXA 0,2	
00357	0634	00	2	00421		SXA SAVE,2	SAVE XRB
00360	0737	00	2	00000		PAC 0,2	COMPLEMENT TO XRB
00361	0754	00	2	00000		PXA 0,2	ORIGINAL ADDRESS IN ACC
00362	-0634	00	2	00422		SXD SAVE1,2	SAVE ORIGINAL ADDRESS
00363	0560	00	0	00422		LDQ SAVE1	
00364	-0773	00	0	00003		RQL 3	
00365	-0754	00	0	00000		PXD	
00366	0774	00	2	00005		AXT 5,2	SET UP
00367	0767	00	0	00003		ALS 3	
00370	-0763	00	0	00003		LGL 3	ERROR
00371	2	00001	2	00367		TIX *-2,2,1	ADDRESS
00372	0767	00	0	00006		ALS 6	
00373	0400	00	0	00420		ADD FRTY	ADD DASH
00374	0602	00	0	00404		SLW TRS+2	STORE IN BCD IMAGE
00375	0766	00	0	01361		WPRA	
00376	0760	00	0	01363		SPRA 3	
00377	0634	00	4	00424		SXA SAVE5,4	SAVE XRC
00400	0074	00	4	00443		TSX SPLAT+1,4	OUT TO PRINT ERROR
00401	0	00022	0	00006		PZE 6,0,18	
00402	602551514651				TRS	BCD 6 ERROR ADDR 00000-TRS0 0 FAILED	
00403	602124245160						
00404	000000000040						
00405	635162006000						
00406	602621314325						
00407	246060606060						
00410	0534	00	4	00424		LXA SAVE5,4	RESTORE XRC
00411	0534	00	2	00421		LXA SAVE,2	RESTORE XRB
00412	0020	00	0	00333		TRA ERROR+2	RETURN
00413	+000000000000				SAVE4	OCT 0	
00414	+000000000000				SWTCH	OCT 0	
00415	+000000770077				MASK	OCT 770077	
00416	+000000000000				IOCNT	OCT 0	
00417	+000000000001				ONE	OCT 1	
00420	+000000000040				FRTY	OCT 40	
00421	+000000000000				SAVE	OCT 0	
00422	+000000000000				SAVE1	OCT 0	
00423	+000000000000				SAVE2	OCT 0	
00424	+000000000000				SAVE5	OCT 0	
00425	-377777777777				ONES	OCT 777777777777	
00426	0004	34	0	00427	SAVE3	IOCD ONES+2,0,CNTRL+1	
00427	0766	00	0	01221	TPSEL	WTBA 1	
00430	0020	00	0	00030	RESET	TRA 24	

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00431 -000000100030 REST OCT 400000100030
00432 0000 00 0 00000 STOP IOCD
00433 0000 02 0 00425 CNTRL IOCD ONES,0,2
00434 0000 02 0 00435 CNTL1 IOCD RD2WD,0,2
          00435 RD2WD BSS 2

00437 0500 00 0 05503 COUNT CLA IOCT COUNT OF I/O UNITS
00440 0601 00 0 00416 STO IOCNT SAVE COUNT
00441 0020 00 0 00040 TRA BEGIN+5 RETURN
```

INDEXABLE BCD PRINT SUBROUTINE.

\*THIS SUBROUTINE USES THREE SYMBOLS, THEY ARE...

SPLAT, THE FIRST WORD OF THE ROUTINE

CI, USED FOR CARD IMAGE, 26 LOCATION

SUBET, THE CONTENTS OF XRC ARE STORED  
IN THE ADDRESS OF SUBET.

\*CONDITION OF THE ACC, MQ, AND ACC OVERFLOW

\*TRIGGER IS NOT GUARANTEED ON EXIT FROM THIS ROUTINE.

THE PRINTER ON CHANNEL A IS USED  
YOU MAY ENTER SPLAT+1 IF YOU HAVE  
ALREADY GIVEN WRIT SELECT.

THE RCHA INSTRUCTION IS AT SPLAT+60.

THERE IS NO CHANNEL DELAY IN THE  
SUBROUTINE, THEREFORE TAKE CARE NOT  
TO USE CI UNTIL AFTER 12 ROW-RIGHT  
HAS BEEN WRITTEN. FOR THIS REASON,  
YOU MUST GIVE WRS FOR EACH ENTRY  
OR ENTER AT SPLAT.

```
00442 0766 00 0 01361 SPLAT WPRA GET GOING
00443 0634 00 1 00537 SXA SPLAT+61,1
00444 0634 00 2 00540 SXA SPLAT+62,2
00445 0634 00 4 00630 SXA SUBET,4 SAVE ORIGINAL XRC.
00446 -0520 00 4 00001 NZT 1,4 IF CONTROL WORD ZERO.
```

\*5

```
00447 0020 00 4 00002 TRA 2,4 RETURN
```

```
00450 -0500 00 4 00001 CAL 1,4 GET NON-ZERO WORD
00451 0602 00 0 00567 SLW SPLAT+85 SAVE CONTROL WORD
00452 -0734 00 1 00000 PDX 0,1 TYPE WHEEL NO.
00453 -3 00000 1 00543 TXL SPLAT+65,1,0 IF DECR. ZERO, GET  
NEW CONTROL WORD
```

\*10

```
00454 -0634 00 4 00456 SXD *+2,4 GET EXIT ADDRESS
00455 0737 00 2 00000 PAC 0,2 BY ADDING TWOS COMP.
```

00456	1	00000	2	00457	TXI	*+1,2,0	OF N TO XRC.
00457	0634	00	2	00541	SXA	SPLAT+63,2	EXIT VALUE.
SET BIT INDEX TO STARTING WHEEL							
00460	0634	00	1	00463	SXA	*+3,1	FOR SHIFTING
*15							
00461	0774	00	3	00001	AXT	1,3	1 TO XRA AND XRB
00462	-0500	00	0	00564	CAL	SPLAT+82	BIT INDEX TO P
00463	-0765	00	1	00000	LGR	0,1	SHIFT TO STARTING POINT
00464	-0100	00	0	00467	TNZ	*+3	IF ACC IS ZERO, SET FOR
00465	-0600	00	0	00565	STQ	SPLAT+83	RIGHT ROW, AND MAKE
*20							
00466	1	00001	2	00470	TXI	*+2,2,1	XRB A DUECE
00467	0602	00	0	00565	SLW	SPLAT+83	OTHERWISE, LEFT ROW.
00470	0774	00	1	00032	AXT	26,1	
00471	0600	00	1	00630	STZ	CI+26,1	CLEAR CARD IMAGE
00472	2	00001	1	00471	TIX	*-1,1,1	
FORM CARD IMAGE.							
*25							
00473	2	00001	4	00474	TIX	*+1,4,1	ADDRESS OF FIRST WORD.
00474	0774	00	1	00006	AXT	6,1	CHARACTER COUNT.
00475	0560	00	4	00001	LDQ	1,4	GET THE WORD.
SOME PEOPLE NEVER DO, YOU KNOW							
00476	0634	00	1	00530	SXA	SPLAT+54,1	SAVE CHARACTER COUNT.
00477	-0754	00	0	00000	PXD		CLEAR ACC
*30							
00500	-0763	00	0	00002	LGL	2	ZONE
00501	0767	00	0	00001	ALS	1	TIMES 2
00502	0734	00	1	00000	PAX	0,1	
00503	0634	00	1	00517	SXA	SPLAT+45,1	FOR FUTURE REFERENCE.
00504	0760	00	0	00000	CLM		
*35							
00505	-0763	00	0	00004	LGL	4	DIGIT
00506	0767	00	0	00001	ALS	1	TIMES 2
00507	0602	00	0	00576	SLW	CI	TEMPO
00510	-0500	00	0	00565	CAL	SPLAT+83	BIT INDEX
00511	-0520	00	0	00576	NZT	CI	IS DIGIT ZERO.
*40							
00512	3	00000	1	00562	TXH	SPLAT+80,1,0	IS ZERO ZONE TOO.
00513	0534	00	1	00576	LXA	CI,1	OK, PROCEED
00514	3	00030	1	00522	TXH	SPLAT+48,1,24	CHECK FOR ILLEGAL
00515	3	00024	1	00560	TXH	SPLAT+78,1,20	SPECIAL CHARACTER.
00516	-0602	60	2	00576	ORS*	SPLAT+92,2	XRB PICKS LEFT OR RIGHT.
*45							



```
00517 0774 00 1 00000      AXT 0,1      ZONE AGAIN.
00520 -3 00000 1 00522      TXL *+2,1,0  NOTHING FOR ZERO ZONE
00521 -0602 60 2 00574      ORS* SPLAT+90,2 PLACE ZONE BIT.

                                COLUMN SET.

00522 0771 00 0 00001      ARS 1        SET BIT INDEX TO
00523 -0100 00 0 00527      TNZ *+4      NEXT COLUMN, IF ANY.

*50
00524 3 00001 2 00536      TXH SPLAT+60,2,1 IF BX ZERO,+XRB 1, STOP

00525 -0500 00 0 00564      CAL SPLAT+82 IF NOT, SET TO RIGHT
00526 1 00001 2 00527      TXI *+1,2,1  ROW AND PROCEED.
00527 0602 00 0 00565      SLW SPLAT+83 BX READY FOR NEXT COLUMN.
00530 0774 00 1 00000      AXT 0,1      MORE CHARACTERS.

*55
00531 2 00001 1 00476      TIX SPLAT+28,1,1 NEXT COLUMN
00532 0534 00 1 00567      LXA SPLAT+85,1 MORE WORDS MAYBE.
00533 -2 00001 1 00536      TNX *+3,1,1  IF NOT, STOP.
00534 0634 00 1 00567      SXA SPLAT+85,1 YUMMY, GO GET EM.
00535 1 00000 0 00473      TXI SPLAT+25

                                FIFTEEN MEN ON A DEAD MANS CHEST.

*60
00536 0540 00 0 00566      RCHA SPLAT+84 LET HER RIP
00537 0774 00 1 00000      AXT 0,1
00540 0774 00 2 00000      AXT 0,2
00541 0774 00 4 00000      AXT 0,4
00542 0020 00 4 00002      TRA 2,4      EXIT

                                GET NEW CONTROL WORD FROM SOMPLACE

*65
00543 0634 00 4 00541      SXA SPLAT+63,4 FOR EXIT
00544 0534 00 1 00537      LXA SPLAT+61,1 RESTORE XRA
00545 -0520 60 0 00567      NZT* SPLAT+85 IF CONTROL WORD ZERO
00546 0020 00 0 00537      TRA SPLAT+61 RETURN.
00547 -0500 00 0 00567      CAL SPLAT+85 OLD CONTROL WORD

*70
00550 0625 00 0 00551      STT *+1      BRING OUT INDEX
00551 -0634 00 0 00553      SXD *+2,0    REGISTER, IF ONE IS TAGED.
00552 0737 00 4 00000      PAC 0,4
00553 1 00000 4 00554      TXI *+1,4,0  GET EFFECTIVE ADDRESS.
00554 -0500 00 4 00000      CAL 0,4      NEW CONTROL WORD.

*75
00555 -0734 00 1 00000      PDX 0,1      TYPE WHEEL ID.
00556 0602 00 0 00567      SLW SPLAT+85
00557 1 00001 4 00460      TXI SPLAT+14,4,1 PROCEED
```

YOUR AN OLD SMOOTHY.

00560 -0602 60 2 00572           ORS\* SPLAT+88,2 PUT EIGHTH IN, TAKE  
00561  2 00020 1 00516           TIX SPLAT+44,1,16 16 OUTM, - GOOD BUSINESS

\*80

00562 -3 00004 1 00521           TXL SPLAT+47,1,4 IF NOT BLANK, SET ZONE.  
00563  0020 00 0 00522           TRA SPLAT+48       BLANK.

00564 -0 00000 0 00000           MZE                   FOR BIT INDEX.  
00565  0000 00 0 00000           HTR                   DYNAMIC BIT INDEX.  
00566  0000 30 0 00600           IOCD CI+2,,24       BUFFER COMMAND

\*85

00567  0000 00 0 00000           HTR                   SPECIAL SALON FOR  
  THE CONTROL WORD  
00570  0000 00 0 00603           HTR CI+5  
00571  0000 00 0 00602           HTR CI+4           BROW ADDRESSES  
00572  0000 00 1 00631           HTR CI+27,1  
00573  0000 00 1 00630           HTR CI+26,1       ZONE ROW ADDRESSES

\*90

00574  0000 00 1 00623           HTR CI+21,1  
00575  0000 00 1 00622           HTR CI+20,1       DIGIG ROW ADDRESSES

                  00576 CI       BSS 26  
                  00630 SUBET   BSS 1

TO WRITE PUNCH, USE TSX CRNCH,4.

00631  0766 00 0 01341   CRNCH   WPUA  
00632  0020 00 0 00443       TRA SPLAT+1

                  05514 IOC       EQU 2892  
                  05512 CTX       EQU 2890  
                  05503 IOCT      EQU 2883  
                  05500 CTRL1    EQU 2880  
                  05501 CTRL2    EQU 2881  
                  05502 CTRL3    EQU 2882  
                  00000           END

EOF\*