

9 I O M A
709 DIAGNOSTIC ENGINEERING I/O INSTRUCTION MODIFICATION SUBROUTINE

A. PURPOSE OF ROUTINE

1. THIS SUBROUTINE ALLOWS A DIAGNOSTIC TEST TO BE WRITTEN WITH A MINIMUM NUMBER OF CHANNELS AND UNITS CALLED OUT, AND BY USING THIS SUBROUTINE TO MODIFY THE ORIGINAL PROGRAM, THE OPERATOR CAN TEST A DESIRED NUMBER OF UNITS UP TO THE FULL COMPLEMENT OF THE INSTALLATION-- MAXIMUM OF THREE DSW

B. FUNCTION

1. 9IOM WILL EXAMINE EACH INSTRUCTION IN A SPECIFIED PROGRAM AREA, WILL CLASSIFY IT AS AN I/O OR NON-I/O, AND IF IT IS FOUND TO BE AN I/O INSTRUCTION WILL REPLACE IT WITH AN INSTRUCTION REFERRING TO THE NEXT TEST UNIT AND CHANNEL
2. THIS SUBROUTINE CAUSES THE MAIN PROGRAM TO HALT ENABLING THE OPERATOR TO ENTER KEYS WITH ONE OR MORE CONTROL WORDS SPECIFYING THE CHANNELS TO BE TESTED AND THE NUMBER OF UNITS ON EACH CHANNEL
3. THE TOTAL NUMBER OF UNITS ON ALL CHANNELS IS HELD IN SYMBOLIC LOCATION IOCT. THE NUMBER OF TAPE UNITS FOR EACH CHANNEL IS STORED -- CHANNEL A IN SYMBOLIC LOCATION CTRA, CHANNEL B IN CTRB, ETC.

C. RESTRICTION

1. EACH TIME THE SUBROUTINE IS ENTERED, IT WILL RAISE THE I/O INSTRUCTIONS IN ITS AREA ONE LEVEL OF UNIT AND/OR CHANNEL. AFTER ALL UNITS SPECIFIED IN CONTROL WORDS HAVE BEEN USED IN THE PROGRAM, THE NEXT ENTRY TO 9IOM WILL REPLACE THE I/O INSTRUCTIONS WITH THE FIRST UNIT CALLED BY CONTROL WORDS. THIS LOOPING ACTION WILL OCCUR AS LONG AS ENTRIES TO 9IOM ARE CONTINUED AND THE MAIN PROGRAM MUST INCLUDE A MEANS OF CONTROLLING THE NUMBER OF ENTRIES

D. USE

THERE ARE THREE ENTRIES TO 9IOM EACH WITH ITS OWN EXIT LINKAGE FROM THE MAIN PROGRAM, IN SYMBOLIC NOTATION, AS FOLLOWS

1. LINKAGE TO 9IOM FOR STOPS TO ENTER THE CONTROL WORDS FOR UNITS

TO BE TESTED

TSX IOC,4

THE RETURN ADDRESS FOR CONTINUATION OF THE PROGRAM WILL BE THE EXECUTION OF INSTRUCTIONS FOLLOWING THE TSX. SEE G. NORMAL STOPS FOR DETAILS OF STOPS TO ENTER KEYS.

2. LINKAGE TO 9IOM FOR MODIFYING AN AREA OF I/O INSTRUCTIONS

TSX CTX,4
HTR X,0,Y

3. LINKAGE TO 9IOM FOR RELOADING THE UNIT COUNT FROM THE CONTROL WORDS

TSX IOCNT,4

THE RETURN WILL BE THE EXECUTION OF INSTRUCTIONS FOLLOWING THE TSX.

E. STORAGE

1. 05500 - 06476 MAY BE RELOCATED

F. PROGRAM CONTROL

1. DECK 001 - 024 9IOM
2. NO SENSE SWITCHES USED IN 9IOM

G. NORMAL STOPS

THERE ARE THREE POSSIBLE NORMAL STOPS AT THE BEGINNING OF THE PROGRAM TO ENABLE THE OPERATOR TO KEY IN CONTROL WORDS INDICATING UNITS TO BE TESTED. SEE CONTROL WORD FORMAT FOR MAKE-UP OF WORD

1. 05517 FIRST STOP - ENTER KEYS CALLING FOR ALL UNITS TO BE TESTED ON CHANNEL A AND/OR B. INCLUDE TAG BITS AT THIS TIME FOR ALL DSU TO BE USED.

TAG 1 - DSU 1, CHANNELS A AND B

TAG 2 - DSU 2, CHANNELS C AND D

TAG 4 - DSU 3, CHANNELS E AND F

PRESS START TO CONTINUE.

2. 05533 IF FIRST STOP ABOVE INCLUDED A TAG BIT 2 ENTER KEYS HERE FOR ALL UNITS TO BE TESTED ON CHANNEL C AND/O D. WILL NOT STOP HERE IF NO TAG BIT 2 IN FIRST CONTROL WORD.

PRESS START TO CONTINUE.

3. 05540 IF FIRST STOP - 5517 - INCLUDED A TAG BIT 4 ENTER KEYS HERE FOR ALL UNITS TO BE TESTED ON CHANNEL E AND/O F. WILL NOT STOP HERE IF NO TAG BIT 4 IN FIRST CONTROL WORD.

PRESS START TO CONTINUE.

H. ERROR STOPS

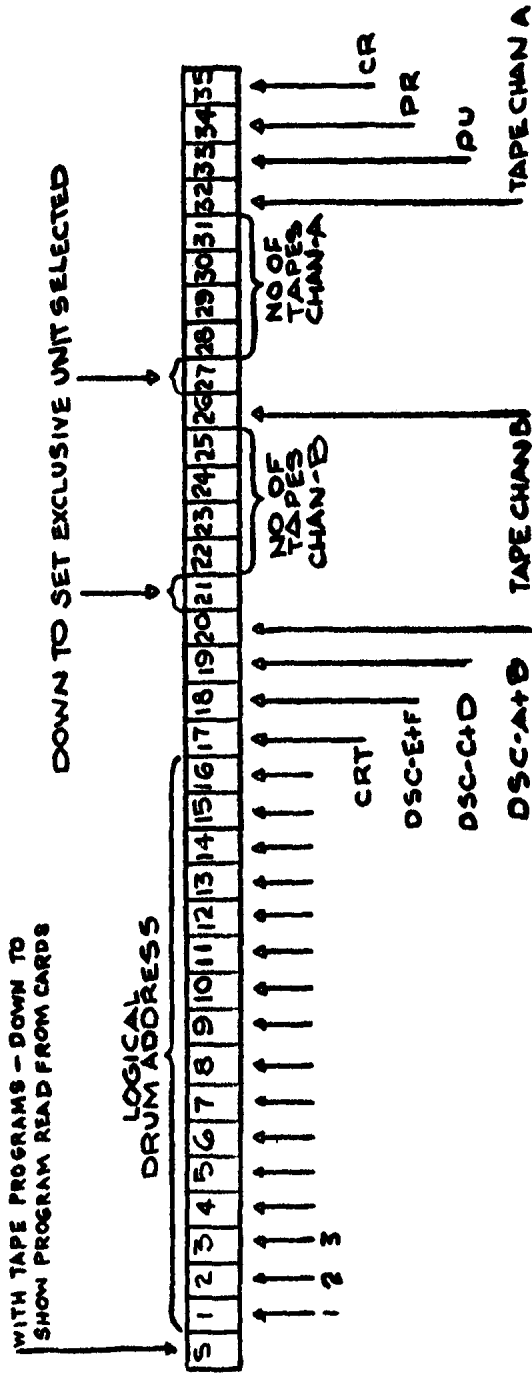
1. 05525 INDICATES CONTROL WORD ENTERED AT 05517 CONTAINED NO TAG BITS. ENTER ON KEYS CORRECTED FIRST CONTROL WORD AND PRESS START.
2. 05720 INDICATES THE LOCATION OF THE INSTRUCTION CURRENTLY BEING MODIFIED IS HIGHER THEN THE LAST ADDRESS GIVEN IN THE HTR INSTRUCTION OF THE ENTRY LINKAGE - SEE D2 USE. SHOULD NEVER REACH THIS ADDRESS. PRESSING START WILL CAUSE THE RETURN TO THE MAIN PROGRAM AND ITS CONTINUATION.

J. COMMENTS

1. PRIOR TO ASSEMBLY OF A TEST PROGRAM, PROPER ORIGN OR EQUAL CARDS SHOULD BE PREPARED FOR SYMBOLIC REFERENCES TO ADDRESSES IN 9IOM, AS FOLLOWS

CTRL1	DEC	2880
CTRL2		2881
CTRL3		2882
IOCT		2883
CTRA		2884
CTRB		2885
CTRC		2886
CTRD		2887
CTRE		2888
CTRF		2889
CTX		2890
IOCNT		2891
IOC		2892

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



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9 I O M A

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709 ROUTINE FOR MODIFICATION OF

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I-O INSTRUCTIONS

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                                05500      ORG 2880
05500 +0000000000000000      CTRL1  OCT +0      COUNT WORD FOR DS A+B
05501 +0000000000000000      CTRL2  OCT +0      COUNT WORD FOR DS C+D
05502 +0000000000000000      CTRL3  OCT +0      COUNT WORD FOR DS E+F
05503 +0000000000000000      IOCT   OCT +0      I-O COUNT
05504 +0000000000000000      CTRA   OCT +0      NUMBER OF UNITS - CHN A
05505 +0000000000000000      CTRE   OCT +0      NUMBER OF UNITS - CHN B
05506 +0000000000000000      CTRE   OCT +0      NUMBER OF UNITS - CHN C
05507 +0000000000000000      CTRE   OCT +0      NUMBER OF UNITS - CHN D
05510 +0000000000000000      CTRE   OCT +0      NUMBER OF UNITS - CHN E
05511 +0000000000000000      CTRE   OCT +0      NUMBER OF UNITS - CHN F
05512 0020 00 0 05611      CTX     TRA CTX1      TO MODIFY PROGRAM
05513 0020 00 0 05543      IOCNT  TRA IOC1      TO RELOAD I-O COUNT

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ENTER CONTROL WORDS FOTR CHANNELS AND UNITS

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05514 0600 00 0 05500      IOC     STZ CTRL1      CLEAR
05515 0600 00 0 05501      IOC     STZ CTRL2      CONTROL
05516 0600 00 0 05502      IOC     STZ CTRL3      WORDS.

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05517 0000 00 0 05520      HTR  *+1      ENTER KEYS WITH CONTROL
                                WORD FOR CHN A AND/OR B

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*

INCLUDE THE DATA SYSNC TO BE USED IN THE TAG

*

OF THE CONTROL WORD

*

NOTE - A TAG OF 1 WILL SPECIFY CHAN A AND/OR B

*

A TAG OF 2 WILL SPECIFY CHAN C AND/OR D

*

A TAG OF 4 WILL SPECIFY CHAN E AND/OR F

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IF 2 OR MORE DS ARE TO BE TESTED THE 1ST CONTROL

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WORD ENTERED IN THE KEYS SHOULD CONTIAN A MULTIPLE TAG

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05520 0760 00 0 00004      ENK     PLACE WORD
05521 -0130 00 0 00000      XCL     ENTERED ON KEYS
05522 0044 00 0 00000      PAI     IN INDICATORS
05523 0054 00 700000      DSC    RFT 0,7      DO WE HAVE A TAG BIT
05524 0020 00 0 05526      TRA    DSC1      YES

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05525 0000 00 0 05520      HTR  *-5      NO TAG BIT - RE-ENTER FIRST
                                CONTROL WORD SPECIFYING
                                OS IN TAG OF KEYS

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05526	0056	00	100000	DSC1	RNT 0,1	TEST FOR CHAN A AND/OR B
05527	0020	00	0 05531		TRA DSC2	NO
05530	0604	00	0 05500		STI CTRL1	CNTL WORD FOR A AND/OR B
05531	0056	00	200000	DSC2	RNT 0,2	TEST FOR CHAN C AND/OR D
05532	0020	00	0 05536		TRA DSC3	NO

05533	0000	00	0 05534		HTR *+1	SET CONT WORD IN KEYS FOR CHAN C AND/OR D
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05534	0760	00	0 00004		ENK	
05535	-0600	00	0 05501		STQ CTRL2	
05536	0056	00	400000	DSC3	RNT 0,4	TEST FOR CHAN E AND/OR F
05537	0020	00	0 05543		TRA *+4	NO

05540	0000	00	0 05541		HTR *+1	SET CONT WORD IN KEYS FOR CHAN E AND/OR F
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05541	0760	00	0 00004		ENK	
05542	-0600	00	0 05502		STQ CTRL3	

* ESTABLISH UNIT COUNT FROM CONTROL WORDS

05543	0600	00	0 05503	IOC1	STZ IOCT	CLEAR UNIT COUNT
05544	0634	00	4 06472		SXA ACCX,4	SAVE XRC
05545	0774	00	2 00003		AXT 3,2	L +3 IN XRB
05546	0774	00	1 00006		AXT 6,1	L +6 IN XRA
05547	0774	00	4 00002		AXT 2,4	L +2 IN XRC
05550	0500	00	4 06442		CLA FOUR+2,4	
05551	0621	00	0 05553		STA AB+1	
05552	-0500	00	2 05503	AB	CAL CTRL1+3,2	L CHANNEL CONTROL WORD
05553	0771	00	0 00004		ARS 4	
05554	0044	00	0 00000		PAI	
05555	-0320	00	0 06450		ANA KON2	L + 17 - CLEAR ACC TO COUNT
05556	0056	00	000020		RNT 20	CHECK FOR EXCLUSIVE BIT
05557	0020	00	0 05561		TRA *+2	NO
05560	0500	00	0 06444		CLA KON+2	YES - L + 1 FOR COUNT
05561	0601	00	1 05512		STO CTRA+6,1	SAVE CHN UNIT CONT
05562	0400	00	0 05503		ADD IOCT	
05563	0601	00	0 05503		STO IOCT	SAVE TOTAL UNIT COUNT
05564	2 00001	1	05565		TIX *+1,1,1,	
05565	2 00001	4	05550		TIX AB-2,4,1	
05566	2 00001	2	05547		TIX AB-3,2,1	
05567	0534	00	4 06472		LXA ACCX,4	RELOAD XRC

05570	0500	00	0 06440	CNT	CLA FOUR	L +4
05571	0734	00	2 00000		PAX 0,2	L ACC IN XRB
05572	0634	00	2 05576		SXA *+4,2	L XRB IN ADDRESS
05573	0774	00	1 00003		AXT 3,1	L +3 IN XRA
05574	0760	00	0 00000		CLM	

05575	0441	00	1	05503	LDI	CTRL3+1,1	
05576	0056	00	0	000000	RNT		CHECK NUMBER OF CARD MACHINES ON LINE
05577	0020	00	0	05601	TRA	*+2	NO
05600	0400	00	0	06444	ADD	KON+2	YES - L +1
05601	2	00001	1	05575	TIX	*-4,1,1	
05602	0340	00	0	05503	CAS	IOCT	
05603	0621	00	0	05503	STA	IOCT	
05604	0761	00	0	00000	NOP		
05605	0754	00	2	00000	PXA	0,2	L XRB IN ACC
05606	0771	00	0	00001	ARS	1	
05607	2	00001	2	05571	TIX	CNT+1,2,1	
05610	0020	00	4	00001	TRA	1,4	EXIT TO MAIN PROG

* MODIFY I-O INSTRUCTIONS

05611	0601	00	0	06472	CTX1	STO	ACCX	ACC CONTENTS
05612	0604	00	0	06466		STI	IND	SAVE INDICATORS
05613	0761	00	0	00000		NOP		
05614	0634	00	1	06474		SXA	ACCX+2,1	
05615	-0634	00	2	06474		SXD	ACCX+2,2	
05616	-0600	00	0	06475		STQ	ACCX+3	

* ESTABLISH PROGRAM AREA TO MODIFY

05617	0500	00	4	00001		CLA	1,4	L FIRST AND LAST ADDRESS PROGRAM AREA TO BE MODIFIED
05620	0621	00	0	05623		STA	CTRX	SAVE FIRST ADDRESS
05621	0771	00	0	00022		ARS	18	
05622	0621	00	0	06443		STA	KON+1	SAVE LAST ADDRESS

* IDENTIFY I-O INSTRUCTION

05623	-0500	00	0	00000	CTX	CAL	0	L CURRENT INSTRUCTION
05624	0761	00	0	00000		NOP		
05625	0602	00	0	06461		SLW	INST	SAVE CURRENT INSTRUCTION
05626	0044	00	0	00000		PAI		PLACE INST IN INDICATORS
05627	0621	00	0	06457		STA	ADDR	TEST INST IN I/O TABLE
05630	-0534	00	1	06442		LXD	KON,1	L +10
05631	0500	00	1	06440		CLA	OPTAB+8,1	
05632	0621	00	0	05634		STA	*+2	
05633	0625	00	0	05634		STT	*+1	
05634	-0056	00	0	000000		LNT	0	TEST FOR I/O INSTRUCTION
05635	0020	00	0	05642		TRA	*+5	
05636	-0054	00	3	00100		LFT	300100	
05637	0020	00	0	05642		TRA	*+3	
05640	-0056	00	0	077400		LNT	077400	
05641	0020	00	0	05664		TRA	OPR1	
05642	2	00001	1	05631		TIX	*-9,1,1	TEST FOR BCD WORD
05643	0056	00	2	06000		RNT	206000	

05644	0020	00	0	06300		TRA TRCX	
05645	0054	00		501700		RFT 501700	
05646	0020	00	0	06300		TRA TRCX	
05647	-0054	00		000077		LFT 77	
05650	0020	00	0	05652		TRA *+2	
05651	0020	00	0	06300		TRA TRCX	
05652	-0054	00		370000		LFT 370000	
05653	0020	00	0	05655		TRA *+2	
05654	0020	00	0	06300		TRA TRCX	
05655	-0054	00		007700		LFT 7700	
05656	0020	00	0	05660		TRA *+2	
05657	0020	00	0	06300		TRA TRCX	
05660	0604	00	0	06467		STI BCD	
05661	0534	00	1	05623		LXA CTRX,1	
05662	0634	00	1	06216		SXA BCDX,1	SAVE ADDRESS
05663	0020	00	0	05675		TRA FINE	
05664	0020	00	1	05675	OPR1	TRA *+9,1	
05665	0020	00	0	06000		TRA WTDX	BSFX
05666	0020	00	0	06011		TRA BTTX	ETTX
05667	0020	00	0	05767		TRA WTBX	REWX
05670	0020	00	0	05767		TRA WTBX	
05671	0020	00	0	05734		TRA WPRX	
05672	0020	00	0	05767		TRA WTBX	BRXX
05673	0020	00	0	05734		TRA WPRX	
05674	0020	00	0	05734		TRA WPRX	
05675	-0500	00	0	06454	FINE	CAL KON3+1	L +7000
05676	-0602	00	0	05771		ORS WTBX+2	
05677	-0602	00	0	06002		ORS WTDX+2	
05700	-0602	00	0	06013		ORS BTTX+2	
05701	-0602	00	0	05736		ORS WPRX+2	
05702	-0602	00	0	05747		ORS WPUX+2	
05703	-0602	00	0	05760		ORS RCDX+2	
05704	-0500	00	0	06455		CAL KON4	MASK 6220
05705	0320	00	0	05771		ANS WTBX+2	
05706	0320	00	0	06002		ANS WTDX+2	
05707	0320	00	0	06013		ANS BTTX+2	
05710	-0500	00	0	06456		CAL KON4+1	
05711	0320	00	0	05736		ANS WPRX+2	
05712	0320	00	0	05747		ANS WPUX+2	
05713	0320	00	0	05760		ANS RCDX+2	
05714	0500	00	0	05623		CLA CTRX	L CURRENT LOCATION IN PROGRAM
05715	0340	00	0	06443		CAS KON+1	LAST LOCATION IN PROG
05716	0020	00	0	05721		TRA *+3	
05717	0020	00	0	05724		TRA FIN	
05720	0000	00	0	05717		HTR *-1	EXIT
05721	0402	00	0	06444		SUB KON+2	L+1
05722	0621	00	0	05623		STA CTRX	
05723	0020	00	0	05623		TRA CTRX	
05724	0441	00	0	06466	FIN	LDI IND	
05725	0500	00	0	06473		CLA ACCX+1	RESTORE REGISTERS
05726	0560	00	0	06472		LDQ ACCX	ETC.
05727	0763	00	0	00043		LLS 35	

05730	0560	00	0	06475		LDQ	ACCX+3		
05731	0534	00	1	06474		LXA	ACCX+2,1		
05732	-0534	00	2	06474		LXD	ACCX+2,2		
05733	0020	00	4	00002		TRA	2,4		
05734	0534	00	1	06446	WPRX	LXA	KON+4,1	L +3	
05735	0534	00	2	05736		LXA	*+1,2		
05736	0056	00		005360		RNT	5360	TEST FOR PRINTER ADDR	
05737	0020	00	0	05741		TRA	*+2	NO	
05740	0020	00	0	06102		TRA	WPR		
05741	-0500	00	0	05736		CAL	WPRX+2		
05742	0402	00	0	06447		SUB	KON+5	L+ 2000	
05743	0621	00	0	05736		STA	WPRX+2		
05744	2 00001	1		05735		TIX	WPRX+1,1,1		
05745	0534	00	1	06446	WPUX	LXA	KON+4,1	L+3	
05746	0534	00	2	05747		LXA	*+1,2		
05747	0056	00		005340		RNT	5340	TEST FOR PUNCH ADDR	
05750	0020	00	0	05752		TRA	*+2		
05751	0020	00	0	06136		TRA	WPU		
05752	-0500	00	0	05747		CAL	WPUX+2		
05753	0402	00	0	06447		SUB	KON+5	L + 2000	
05754	0621	00	0	05747		STA	WPUX+2		
05755	2 00001	1		05746		TIX	WPUX+1,1,1		
05756	0534	00	1	06446	RCDX	LXA	KON+4,1	L+3	
05757	0534	00	2	05760		LXA	*+1,2		
05760	0056	00		005320		RNT	5320	TEST FOR READER ADDR	
05761	0020	00	0	05763		TRA	*+2		
05762	0020	00	0	06155		TRA	RCD	YES	
05763	-0500	00	0	05760		CAL	RCDX+2		
05764	0402	00	0	06447		SUB	KON+5		
05765	0621	00	0	05760		STA	RCDX+2		
05766	2 00001	1		05757		TIX	RCDX+1,1,1		
05767	0534	00	1	06442	WTBX	LXA	KON,1	L +6	
05770	0534	00	2	05771		LXA	*+1,2	PUT ADDR INTO XRB	
05771	0056	00		006220		RNT	6220	TEST FOR BINARY ADDR	
05772	0020	00	0	05774		TRA	*+2	NO	
05773	0020	00	0	06030		TRA	WTB	YES	
05774	-0500	00	0	05771		CAL	WTBX+2		
05775	0402	00	0	06445		SUB	KON+3	L 1000	
05776	0621	00	0	05771		STA	WTBX+2		
05777	2 00001	1		05770		TIX	WTBX+1,1,1		
06000	0534	00	1	06442	WTDX	LXA	KON,1	L+ 6	
06001	0534	00	2	06002		LXA	*+1,2		
06002	0056	00		006200		RNT	6200	TEST FOR BCD MODE	
06003	0020	00	0	06005		TRA	*+2		
06004	0020	00	0	06030		TRA	WTB		
06005	-0500	00	0	06002		CAL	WTDX+2		
06006	0402	00	0	06445		SUB	KON+3	L + 1000	
06007	0621	00	0	06002		STA	WTDX+2		
06010	2 00001	1		06001		TIX	WTDX+1,1,1		
06011	0534	00	1	06442	BTTX	LXA	KON,1	L+6	
06012	0534	00	2	06013		LXA	*+1,2		

06013	0056	00	006000		RNT 6000	CHECK BEGINNING OF TAPE
06014	0020	00	0 06016		TRA *+2	TEST + END OF TAPE TEST
06015	0020	00	0 06023		TRA BTT	
06016	-0500	00	0 06013		CAL BTTX+2	
06017	0402	00	0 06445		SUB KON+3	L +1000
06020	0621	00	0 06013		STA BTTX+2	
06021	2 00001	1	06012		TIX BTTX+1,1,1	
06022	0020	00	0 05675		TRA FINE	
06023	0500	00	0 06465	BTT	CLA CHX	
06024	0767	00	0 00011		ALS 9	
06025	0100	00	0 05675		TZE FINE	
06026	0621	00	0 06461		STA INST	
06027	0020	00	0 06174		TRA CHAN	
06030	0634	00	2 06451	WTB	SXA KON2+1,2	INITIAL ADDR INTO STOR
06031	0020	00	1 06040		TRA *+7,1	
06032	0020	00	0 06100		TRA WTBF	
06033	0020	00	0 06076		TRA WTBE	
06034	0020	00	0 06074		TRA WTBD	
06035	0020	00	0 06072		TRA WTBC	
06036	0020	00	0 06067		TRA WTBB	
06037	-0500	00	0 05500	WTBA	CAL CTRL1	L CONTROL WORD FOR CHN A+B
06040	0044	00	0 00000		PAI	PUT ACC IN INDICATORS
06041	0771	00	0 00004		ARS 4	
06042	-0320	00	0 06450		ANA KON2	L +17 - CLEAR TO UNIT
06043	0400	00	0 06451		ADD KON2+1	L INITIAL ADDR FOR CHN
06044	0340	00	0 06457		CAS ADDR	
06045	0020	00	0 06050		TRA *+3	OK - SET INSTRUCTION
06046	0020	00	0 06221		TRA EQU	EQUAL
06047	0020	00	0 06221		TRA EQU	CHECK FOR UNITS ON CHN B
06050	0056	00	000400		RNT 400	CHK FOR EXCLUSIVE UNIT BIT
06051	0020	00	0 06053		TRA *+2	NO - GO TO STEP UNIT
06052	0020	00	0 06055		TRA *+3	YES - GO TO SET EXCLU UNIT
06053	-0500	00	0 06461		CAL INST	L CURRENT INSTRUCTION
06054	0400	00	0 06444		ADD KON+2	L +1 - STEP UNIT
06055	3 00001	1	06062		TXH *+5,1,1	CHECK FOR CHANNEL A
06056	-0054	00	400000		LFT 400000	IS CHN A - CHECK FOR BIT SIGNIFYING PROGRAM READ FROM CARDS
06057	0020	00	0 06064		TRA *+5	BIT - ANY UNIT OK
06060	0044	00	0 00000		PAI	NO BIT - L NEW UNIT ADDR
06061	0054	00	000016		RFT 000016	TO CHECK FOR UNIT 1 WHICH MUST BE BLOCKED OUT
06062	0020	00	0 06064		TRA *+2	NOT UNIT 1
06063	0400	00	0 06444		ADD KON+2	IS UNIT 1 - L +1
06064	0621	00	0 06461		STA INST	
06065	0634	00	1 06465		SXA CHX,1	SAVE CHANNEL COUNT
06066	0020	00	0 06174		TRA CHAN	
06067	0500	00	0 05500	WTBB	CLA CTRL1	
06070	0771	00	0 00006		ARS 6	

06071	0020	00	0	06040		TRA	WTBA+1	
06072	0500	00	0	05501	WTBC	CLA	CTRL2	CONTROL WORD FOR DS C+D
06073	0020	00	0	06040		TRA	WTBA+1	
06074	0500	00	0	05501	WTBD	CLA	CTRL2	
06075	0020	00	0	06070		TRA	WTBB+1	
06076	0500	00	0	05502	WTBE	CLA	CTRL3	CONTROL WORD FOR DS E+F
06077	0020	00	0	06040		TRA	WTBA+1	
06100	0500	00	0	05502	WTBF	CLA	CTRL3	
06101	0020	00	0	06070		TRA	WTBB+1	
06102	0020	00	1	06106	WPR	TRA	*+4,1	
06103	0020	00	0	06125		TRA	WPRE	
06104	0020	00	0	06115		TRA	WPRC	
06105	0441	00	0	05501	WPRA	LDI	CTRL2	
06106	0056	00		200002		RNT	200002	
06107	0020	00	0	06115		TRA	WPRC	
06110	1	00002	1	06111		TXI	*+1,1,2	
06111	0500	00	0	06457		CLA	ADDR	
06112	-0320	00	0	06463		ANA	INST+2	L+1367
06113	0400	00	0	06447		ADD	KON+5	
06114	0020	00	0	06064		TRA	WTBB-3	
06115	0441	00	0	05502	WPRC	LDI	CTRL3	
06116	0056	00		400002		RNT	400002	
06117	0020	00	0	06125		TRA	WPRE	
06120	1	00003	1	06121		TXI	*+1,1,3	
06121	0500	00	0	06457		CLA	ADDR	
06122	-0320	00	0	06463		ANA	INST+2	L+1367
06123	0400	00	0	06464		ADD	INST+3	
06124	0020	00	0	06064		TRA	WTBB-3	
06125	0441	00	0	05500	WPRE	LDI	CTRL1	
06126	0056	00		100002		RNT	100002	
06127	0020	00	0	06133		TRA	*+4	
06130	-3	00003	1	06132		TXL	*+2,1,3	
06131	2	00001	1	06132		TIX	*+1,1,1	
06132	2	00001	1	06133		TIX	*+1,1,1	
06133	0500	00	0	06457		CLA	ADDR	
06134	-0320	00	0	06463		ANA	INST+2	
06135	0020	00	0	06064		TRA	WTBB-3	
06136	0020	00	1	06142	WPU	TRA	*+4,1	
06137	0020	00	0	06151		TRA	WPUE	
06140	0020	00	0	06145		TRA	WPUC	
06141	0441	00	0	05501	WPUA	LDI	CTRL2	
06142	0056	00		200004		RNT	200004	
06143	0020	00	0	06145		TRA	WPUC	
06144	0020	00	0	06110		TRA	WPRA+3	
06145	0441	00	0	05502	WPUC	LDI	CTRL3	
06146	0056	00		400004		RNT	400004	
06147	0020	00	0	06151		TRA	WPUE	
06150	0020	00	0	06120		TRA	WPRC+3	
06151	0441	00	0	05500	WPUE	LDI	CTRL1	
06152	0056	00		100004		RNT	100004	
06153	0020	00	0	06065		TRA	WTBB-2	
06154	0020	00	0	06130		TRA	WPRE+3	
06155	0020	00	1	06161	RCD	TRA	*+4,1	
06156	0020	00	0	06170		TRA	RCDE	
06157	0020	00	0	06164		TRA	RCDC	

06160	0441	00	0	05501	RCDA	LDI CTRL2	
06161	0056	00		200001		RNT 200001	
06162	0020	00	0	06164		TRA RCDC	
06163	0020	00	0	06110		TRA WPRA+3	
06164	0441	00	0	05502	RCDC	LDI CTRL3	
06165	0056	00		400001		RNT 400001	
06166	0020	00	0	06170		TRA RCDE	
06167	0020	00	0	06120		TRA WPRC+3	
06170	0441	00	0	05500	RCDE	LDI CTRL1	
06171	0056	00		100001		RNT 100001	
06172	0020	00	0	05675		TRA FINE	
06173	0020	00	0	06130		TRA WPRE+3	
06174	0500	00	0	05623	CHAN	CLA CTRX	
06175	0621	00	0	06177		STA *+2	
06176	0500	00	0	06461		CLA INST	INSTRUCTION
06177	0601	00	0	00000		STO 0	
06200	-0520	00	0	06467		NZT BCD	CHECK BCD WORD
06201	0020	00	0	05675		TRA FINE	CHECK NEXT WORD
06202	0441	00	0	06461		LDI INST	PLACE CURRENT INSTR IN INDS
06203	-0056	00		070000		LNT 070000	
06204	0020	00	0	05675		TRA FINE	
06205	-0500	00	0	06470		CAL BCD+1	
06206	0320	00	0	06467		ANS BCD	MASK
06207	0500	00	0	06465		CLA CHX	
06210	0767	00	0	00014		ALS 12	
06211	-0602	00	0	06467		ORS BCD	BCD WORD
06212	0500	00	0	06461		CLA INST	PRESENT I/O WORD
06213	-0320	00	0	06450		ANA KON2	L +17
06214	0100	00	0	05675		TZE FINE	
06215	-0501	00	0	06467		ORA BCD	OBTAIN UNIT NUMBER
06216	0602	00	0	00000	BCDX	SLW 0	
06217	0600	00	0	06467		STZ BCD	
06220	0020	00	0	05675		TRA FINE	
06221	0020	00	1	06230	EQU	TRA *+7,1	
06222	0020	00	0	06274		TRA CHB	
06223	0020	00	0	06270		TRA CHF	
06224	0020	00	0	06264		TRA CHE	
06225	0020	00	0	06260		TRA CHD	
06226	0020	00	0	06254		TRA CHC	
06227	0441	00	0	05500	CHA	LDI CTRL1	CONTROL WORD FOR DS A+B
06230	1 00001	1		06231		TXI *+1,1,1	
06231	0056	00		101000		RNT 101000	CHECK FOR DSC B + TAPE
06232	0020	00	0	06254		TRA CHC	NOT CHANNEL B
06233	0054	00		040000		RFT 40000	CHECK FOR EXCLUSIVE BIT FOR CHANNEL B,D,F
06234	0601	00	0	06471		STO BIT	SET CHK FOR EXCLU UNIT BIT
06235	0020	00	0	06240		TRA *+3	NO BIT - SET FOR UNIT 1
06236	0054	00		000400		RFT 400	CHECK FOR EXCLUSIVE BIT FOR CHANNEL A,C,E
06237	0601	00	0	06471		STO BIT	SET CHK FOR EXCLU UNIT BIT
06240	0754	00	2	00000		PXA 0,2	L CURRENT CHANNEL ADDRESS
06241	-0320	00	0	06462		ANA INST+1	L +200 - CLEAR TO CLASS

						AND MODE
06242	0601	00	0	06451	STO KON2+1	
06243	0754	00	1	00000	PXA 0,1	L CHANNEL COUNTER
06244	0767	00	0	00011	ALS 9	POSITION FOR ADDRESS
06245	0400	00	0	06451	ADD KON2+1	ADD CLASS AND MODE
06246	0734	00	2	00000	PAX 0,2	SAVE ADJUSTED CHN ADDRESS
06247	-0520	00	0	06471	NZT BIT	CHECK FOR EXCLU UNIT BIT
06250	0020	00	0	06054	TRA WTBB-11	NO - GO TO SET UNIT 1
06251	0601	00	0	06457	STO ADDR	SAVE NEW INITIAL ADDRESS
06252	0600	00	0	06471	STZ BIT	RESET EXCLU CHECK BIT
06253	0020	00	0	06030	TRA WTB	YES - GO TO SET EXCLU UNIT
06254	0441	00	0	05501	CHC LDI CTRL2	
06255	0056	00		200010	RNT 200010	CHECK FOR DSC C + TAPE
06256	1	00001	1	06260	TXI CHD,1,1	
06257	1	00001	1	06236	TXI CHA+7,1,1	
06260	0441	00	0	05501	CHD LDI CTRL2	
06261	0056	00		201000	RNT 201000	CHECK FOR DSC D + TAPE
06262	1	00001	1	06264	TXI CHE,1,1	
06263	1	00001	1	06233	TXI CHA+4,1,1	
06264	0441	00	0	05502	CHE LDI CTRL3	CONTROL 3
06265	0056	00		400010	RNT 400010	CHECK FOR DSC E + TAPE
06266	1	00001	1	06270	TXI CHF,1,1	
06267	1	00001	1	06236	TXI CHA+7,1,1	
06270	0441	00	0	05502	CHF LDI CTRL3	
06271	0056	00		401000	RNT 401000	CHECK FOR DSC F + TAPE
06272	1	00001	1	06274	TXI CHB,1,1	
06273	1	00001	1	06233	TXI CHA+4,1,1	
06274	0441	00	0	05500	CHB LDI CTRL1	
06275	0056	00		100010	RNT 100010	CHECK FOR DSC A + TAPE
06276	2	00005	1	06227	TIX CHA,1,5	
06277	2	00005	1	06236	TIX CHA+7,1,5	
06300	0534	00	1	06465	TRCX LXI CHX,1	CHANNEL TO BE TESTED
06301	-0056	00		064000	LNT 064000	
06302	0020	00	0	06306	TRA *+4	
06303	-0054	00		013000	LFT 013000	
06304	0020	00	0	06310	TRA *+4	
06305	0020	00	0	06406	TRA SCH	
06306	-0056	00		054000	LNT 054000	RESET LOAD INST
06307	0020	00	0	06313	TRA *+4	
06310	-0054	00		023000	LFT 023000	
06311	0020	00	0	06313	TRA *+2	NO
06312	0020	00	0	06374	TRA LCH	YES
06313	-0056	00		006000	LNT 006000	CHANNEL OPERATION
06314	0020	00	0	06320	TRA *+4	
06315	-0054	00		071000	LFT 71000	
06316	0020	00	0	06320	TRA *+2	

06317	0020	00	0	06362		TRA TCO	YES
06320	-0056	00	0	003000		LNT 003000	END OF FILE CONTROL
06321	0020	00	0	06325		TRA *+4	
06322	-0054	00	0	074000		LFT 074000	
06323	0020	00	0	06325		TRA *+2	NO
06324	0020	00	0	06352		TRA TEF	YES
06325	-0056	00	0	002000		LNT 002000	IS THIS A CONTROL
06326	0020	00	0	06333		TRA *+5	
06327	-0054	00	0	000600		LFT 600	
06330	-0054	00	0	375100		LFT 375100	
06331	0020	00	0	06333		TRA *+2	INSTRUCTION- NO
06332	0020	00	0	06342		TRA TRC	YES
06333	0020	00	0	05675		TRA FINE	
06334	-0056	00	0	000060	TRAN	LNT 000060	
06335	0020	00	0	06337		TRA *+2	
06336	-0501	00	0	06476		ORA K	L HTR 0,0,60
06337	0622	00	0	06461		STD INST	
06340	0630	00	0	06461		STP INST	
06341	0020	00	0	06174		TRA CHAN	
06342	-0500	00	1	06352	TRC	CAL *+8,1	
06343	0020	00	0	06334		TRA TRAN	
06344	-0026	00	0	00000		TRCF 0	
06345	0026	00	0	00000		TRCE 0	
06346	-0024	00	0	00000		TRCD 0	
06347	0024	00	0	00000		TRCC 0	
06350	-0022	00	0	00000		TRCB 0	INSTRUCTION
06351	0022	00	0	00000		TRCA 0	REDUNDANCY TAPE TEST
06352	-0500	00	1	06362	TEF	CAL *+8,1	
06353	0020	00	0	06334		TRA TRAN	
06354	-0032	00	0	00000		TEFF 0	
06355	0032	00	0	00000		TEFE 0	
06356	-0031	00	0	00000		TEFD 0	
06357	0031	00	0	00000		TEFC 0	
06360	-0030	00	0	00000		TEFB 0	INSTRUCTION
06361	0030	00	0	00000		TEFA 0	END OF FILE TEST
06362	-0500	00	1	06374	TCO	CAL *+10,1	L CHN IN OPN INSTRUCTION
06363	-0054	00	0	400000		LFT 400000	CHK IF CHN NOT IN OPN REQ,0
06364	-0501	00	0	06452		ORA KON2+2	YES - SET SIGN MINUS
06365	0020	00	0	06334		TRA TRAN	NO - GO TO SET INST
06366	0065	00	0	00000		TCOF 0	
06367	0064	00	0	00000		TCOE 0	
06370	0063	00	0	00000		TCOD 0	
06371	0062	00	0	00000		TCOC 0	
06372	0061	00	0	00000		TCOB 0	
06373	0060	00	0	00000		TCOA 0	

06374	-0056	00	054400	LCH	LNT 054400	IS THIS A LOAD CHAN INST
06375	0020	00	0 06420		TRA RCH	
06376	-0500	00	1 06406		CAL *+8,1	
06377	0020	00	0 06334		TRA TRAN	

06400	-0546	00	0 00000		LCHF	
06401	0546	00	0 00000		LCHE	
06402	-0545	00	0 00000		LCHD	
06403	0545	00	0 00000		LCHC	
06404	-0544	00	0 00000		LCHB	
06405	0544	00	0 00000		LCHA	

06406	-0054	00	300000	SCH	LFT 300000	
06407	0020	00	0 05675		TRA FINE	
06410	-0500	00	1 06420		CAL *+8,1	
06411	0020	00	0 06334		TRA TRAN	

06412	-0642	00	0 00000		SCHF	
06413	0642	00	0 00000		SCHE	
06414	-0641	00	0 00000		SCHD	
06415	0641	00	0 00000		SCHC	
06416	-0640	00	0 00000		SCHB	
06417	0640	00	0 00000		SCHA	

06420	-0500	00	1 06430	RCH	CAL *+8,1	
06421	0020	00	0 06334		TRA TRAN	

06422	-0542	00	0 00000		RCHF	
06423	0542	00	0 00000		RCHE	
06424	-0541	00	0 00000		RCHD	
06425	0541	00	0 00000		RCHC	
06426	-0540	00	0 00000		RCHB	
06427	0540	00	0 00000		RCHA	

06430	+0000000476400			OPTAB	OCT 476400	BACKSPACE FILE
06431	+0000000476000				OCT 476000	END OF TAPE TEST
06432	+0000000077200				OCT 077200	
06433	+0000000077000				OCT 077000	WRITE END OF FILE
06434	+0000000076600				OCT 076600	WRITE SELECT
06435	+0000000076400				OCT 076400	BACKSPACE RECORD
06436	+0000000076200				OCT 076200	READ SELECT
06437	+0000000076000				OCT 076000	BEGINNING OF TAPE TEST

COSNTANT

06440	+00000000000004			FOUR	OCT +4	
06441	+00000000000012			TEN	OCT +12	

06442	0000	10	0 00006	KON	HTR 6,0,8	
06443	-0500	00	0 00000		CAL 0	L LAST ADDR OF PROGRAM

06444	+0000000000001		OCT	+1	
06445	+000000001000		OCT	1000	
06446	+0000000000003		OCT	3	
06447	+000000002000		OCT	2000	
06450	+000000000017	KON2	OCT	+17	
06451	0000 00 0 00000		HTR	0	INITIAL ADDR OF UNIT
06452	-0000000000000		OCT	-0	
06453	0 00000 0 00030	KON3	PZE	24	
06454	+0000000007000		OCT	+7000	
06455	0056 00 006220	KON4	RNT	6220	
06456	0056 00 005367		RNT	5367	
06457	0000 00 0 00000	ADDR	HTR	0	
06460	0000 00 0 05623		HTR	CTR	
06461	0 00000 0 00000	INST	PZE	0	
06462	+0000000000221		OCT	221	
06463	+000000001367		OCT	1367	
06464	+000000004000		OCT	4000	
06465	+0000000000000	CHX	OCT	0	
06466	+0000000000000	IND	OCT		
06467	0 00000 0 00000	BCD	PZE	0	
06470	-377777707700		OCT	777777707700	
06471	+0000000000000	BIT	OCT	0	
06472	+0000000000000	ACCX	OCT	0	
06473	+0000000000000		OCT		
06474	+0000000000000		OCT	0	
06475	+0000000000000		OCT	0	
06476	0000 60 0 00000	K	HTR	0,0,48	
	00000		END		

EOF*