IBM

Field Engineering Education
Supplementary Course Material

SYSTEM/360
Model 25 Microprogram Listing
1401/1460 Emulator - *E40

PREFACE

This publication contains a listing of the 1401/
1460 emulator microprogram, *Engineering
change level and features present do not relate
to any specific system, limiting the use of this
listing to the classroom.

The listing shown is actual and has not been
altered in content in any way.

Routines are in alphabetical sequence as shown
in the listing index.

*And is meant for use in the System/360 Model
25 DPS/1400 Emulation Course 13217.

Preliminary Edition

MACHINE TYPE   MODEL   CORE LOAD   *E40   MES/FCSI #

MASTER CONTROL   MACHINE STATUS

EC # 128211   SUM CHECK # 763A   ** SEE *E60 BCHK **   DATE PREPARED 11/08/68

FEATURES PRESENT

2539228 DSOP1400

FEATURES NOT PRESENT

2542055 MEM24K   2528681 STERLING

ADDR   WORD   SEQUENCE NO.   LABEL   NEXTSEQ   NEXTLABEL STATEMENT   COMMENTS

		*E40 001	T		1400	COMPATIBILITY	
		*E40 002	*		BCPL	RESIDENT CONTROL LOAD	
		*E40 003	*		BDIA		
		*E40 004	*		IAAA	USERS INITIALIZATION PROCEEDURE	
		*E40 005	*		IBCH	BRANCH CHARACTER EQUAL OR ON INDICATOR	
		*E40 006	*		ICLR	CLEAR,CLEAR AND BRANCH	
		*E40 007	*		ICMP	COMPARE	
		*E40 008	*		ICOM	COMMON ROUTINES	
		*E40 009	*		ICTD	CONVERT ADDRESS TO DECIMAL	
		*E40 010	*		ICYC	I-CYCLES	
		*E40 011	*		ICYD	AUX STORAGE-2-OP CODE AND BIAS TABLE	
		*E40 012	*		IDIS	STOP ROUTINE	
		*E40 013	*		IERR	A AND B INVALID ADDRESS CHECH	
		*E40 014	*		IMAD	MODIFY ADDRESS	
		*E40 015	*		IMEM	MEMORY SCAN	
		*E40 016	*		IMRC	MOVE RECORD	
		*E40 017	*		IMVZ	MOVE ZONE OR DIGIT OPS	
		*E40 018	*		INDX	INDEXING	
		*E40 019	*		INIZ	ADD BIAS AND MISC. INITIALIZING CONSTANTS	
		*E40 020	*		INRU	SOFT STOP,I/O AND CONSOLE REQUEST	
		*E40 021	*		INTP	SENSE SWITCH,TAPE DENSITY AND START RESET	
		*E40 022	*		IOCM	MOVE OR LOAD I/O UNIT ADDRESS	
		*E40 023	*		IPLS	IPL START RESET	
		*E40 025	*		IADD	ADD SUBTR.	
		*E40 026	*		IDVD	1400 DIVIDE	
		*E40 027	*		IMVE	MOVE AND LOAD OPS	
		*E40 028	*		IMPY	1400 MULTIPLY	
		*E40 029	*		IMZS	MOVE WITH ZERO SUPPRESS	
		*E40 030	*		IEDT	EDIT OP	
		*E40 031	*		IRAD	RESET ADD AND SUBTRACT	
		*E40 042	*		IREG	STORE AND RESTORE REGISTERS	
		*E40 043	*		IRST	SYSTEM RESET	
		*E40 044	*		ISAB	STORE A OR B STAR	
		*E40 045	*		ISIC	SET IC	
		*E40 046	*		ISTP	INSTRUCTION STEP	
		*E40 047	*		ISWM	CLEAR OR SET WORD MARKS	
		*E40 048	*		ITRP	MACHINE CHECK AND STORAGE WRAP TRAP ROUTINES	
		*E40 049	*		IUBR	UNCONDITIONAL BRANCH	
		*E40 050	*		IZWM	BRANCH ON ZONE,WORD MARKS OR TEST BIT	
		*E40 051	*		JCHL	1401 TAPE SELECTOR CHANNEL	
		*E40 052	*		JDTA	1401 TAPE READ AND WRITE DATA LOOPS	
		*E40 053	*		JEND	1401 TAPE ENDING ROUTINE AND RDR-PUNCH REQ-IN	
		*E40 054	*		JODE	1401 TAPE OP CODE, D-MODIFIER DECODE	
		*E40 055	*		JTPE	1401 TAPE D-MODIFIER-UNIT ADDRESS VERIFICATION	
		*E40 056	*		JTYP	TYPWRITER ROUTINES	
		*E40 057	*		JYPE	DISPLAY	
		*E40 059	*		KAAA	START FILE	
		*E40 060	*		KAAF	SEARCH ID	
		*E40 061	*		KAAH	MAIN STATUS	
		*E40 062	*		KAAN	UNUSUAL STATUS	
		*E40 063	*		KAAQ	END CONDITIONS	
		*E40 064	*		KBBB	XFER COMMAND DECODE	
		*E40 065	*		KBBC	DECREMENT SECTOR	

ADDR   WORD SEQUENCE NO.   LABEL   NEXTSEQ   NEXTLABEL   STATEMENT   COMMENTS

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        *E40 066    *                                KBBD        CONVERT BINARY COUNT FIELD TO CM6
        *E40 067    *                                KBBE        SEEK OP
        *E40 068    *                                KBBG        DEVICE END
        *E40 069    *                                KBBH        INCREMENT BINARY DCF
        *E40 070    *                                KEND        RESTORE STARS
        *E40 072    *                                LOPD        READ AND PUNCH OP
        *E40 073    *                                LREQ        READ RESET
        *E40 074    *                                LRTR        READER TRAP
        *E40 075    *                                LPTR        NATIVE PUNCH TRAP
        *E40 076    *                                LXFR        READER XFER-ROW IMAGE TO COL-BIN FORM
        *E40 077    *                                LSSO        STACKER SELECT COMMAND
        *E40 078    *                                LRXF        TRANSFER DATA AUX TO MAIN STORAGE
        *E40 079    *                                LRDR        READ ENDING
        *E40 080    *                                LPXF        PUNCH TRANSFER-EBCDIC TO ROW FORM
        *E40 081    *                                LPSU        PUNCH OR PFR SET-UP
        *E40 082    *                                LPCH        PUNCH ENDING ROUTINES
        *E40 083    *                                LPCB        TRANSFER EBCDIC DATA TO COLUMN BINARY
        *E40 084    *                                LERR        BRANCH AND PUNCH ERROR ROUTINE
        *E40 085    *                                MAAA        1442 MODIFIER DECODE AND INITIAL SELECTION
        *E40 086    *                                MBBB        1442 READ CMND AND STATUS DECODE
        *E40 087    *                                MDDD        1442 SENSE CMND AND STATUS DECODE
        *E40 088    *                                MJJJ        1443 MODIFIER DECODE AND INITIAL SELECTION
        *E40 089    *                                MKKK        1443 PRINT CMND AND STATUS DECODE
        *E40 090    *                                MLLL        1443 DATA LOOP
        *E40 091    *                                MMMM        1443 SENSE STATUS DECODE
        *E40 092    *                                MNNN        1443 BRANCH ON BUSY
        *E40 093    *                                MPPP        1443 FORMS OP DECODE
        *E40 094    *                                MQQQ        1443 BRANCH ON ERROR
        *E40 095    *                                MPRT        1403 PRINTER
        *E40 096    *                                MZZZ        AUX STORE TABLE LOAD
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BCPL DESCRIPTIVE TEXT

THE BCPL ROUTINE IS NORMALLY RESIDENT IN CONTROL STORAGE,
AND IS USED TO LOAD THE INITIAL RECORD OF EITHER THE CHANNEL
OR NATIVE BOOTSTRAP ROUTINES.
     IF THE BCPL ROUTINE HAS BEEN ALTERED, THE APPROPRIATE
HANDLOAD INFORMATION MUST BE ENTERED TO BE SURE OF CORRECT
CSL OPERATION.

            ***   SWITCH SETTINGS FOR CSL   ***
            SWITCHS
             A,B = CC   CSL FROM CHANNEL
             A,B = DD   CSL FROM NATIVE 2560
             A,B = EE   CSL FROM NATIVE 2540
             A,B = FF   CSL FROM NATIVE 2311

            SWITCHES C,D   SET TO ACTUAL UNIT ADDRESS

             PROCEDURE   FOR   PUNCHING CSL CARDS

COLUMNS
1-2   CONTAIN STARTING ADDRESS TO BE LOADED
3   CONTAINS CODE INFORMATION
             HEX 80 = DATA IS FOR PROGRAM STORAGE
             HEX 40 = LAST CSL CARD OF DECK
             HEX 20 = DATA IS FOR AUXILIARY STORAGE
             HEX 10 = DATA IS FOR CONTROL STORAGE
4   CONTAINS THE NUMBER OF HALFWORDS TO BE LOADED
5-68   CONTAIN THE DATA
69-72   OPTIONAL, CAN BE USED FOR ANY INFORMATION.
73-77   *NNN9 WHERE N IS THE CORE LOAD ID.
78-80   XXX 3 DIGIT NUMBER INDICATING SEQ. OF PATCHES.
*** WARNING- DO NOT PUNCH CARDS TO LOAD INTO AUX MODULE 1,3,4

****

RESTRICTIONS WHEN PUNCHING CSL CARDS

COLS 1-2   ALL ADDRESSES SHOULD BE EVEN.
           CONTROL STORAGE - THESE ADDRESSES SHOULD BE IN
                 THE RANGE OF 0000-3FFE ONLY.
           AUXILIARY STORAGE- THE 2ND HEX CHARACTER IN
                 COLUMN 1 SHOULD BE A ZERO.
           PROGRAM STORAGE - THE ADDRESS MUST BE IN THE
                 RANGE OF THE SYSTEM.
COL 3   CODED INFORMATION
COL 4   COUNT FIELD - IF A COUNT OF 0 IS INDICATED, 257
                 HALFWORDS WILL BE LOADED.

COLS 5-68 DATA FIELD   - CAN BE ANYTHING
COLS 69-80   SEE ABOVE.
                             NOT USED BY THE CSL.
***   WHEN LOADING A FULL DECK WITH REPLACE CARDS, THE
      REPLACE CARDS SHOULD GO JUST BEFORE THE END CARD.
***   WHEN LOADING ONLY REPLACE CARDS, IT IS NECESSARY TO
      PUT THE CONTROL STORAGE CARDS (NORMALLY 4) FOR
      MODULE 01XX IN THE DECK.
      ORDER OF THE CARDS IS - BOOTSTRAP CARDS, CONTROL
      STORAGE CARDS FOR MODULE 01XX, REPLACE CARDS, END CARD.

****

** EXAMPLE OF PUNCHING AND LOADING A REPLACE CARD **

     ASSUME THAT THE DEVICE ADDRESS FOR THE 1403 ON THE
BURST CHANNEL NEEDED TO BE CHANGED TO -0A-.
     THE STANDARD ADDRESS FOR THE 1403 ON THE BURST CHANNEL
IS -0E- AND IS LOCATED IN AUXILIARY STORAGE MODULE 0, AT
ADDRESS -87-.
     THE CARD TO CHANGE THIS WOULD BE PUNCHED IN THE
FOLLOWING MANNER--
     COL 1   (HEX 00)   THIS ADDRESSES MODULE 0.
     COL 2   (HEX 86)   ALTHOUGH THE CHANGE IS FOR ADDRESS
                         87, THE HEX ADDRESS REPRESENTED BY
                         COLUMN 2 MUST BE EVEN.
     COL 3   (HEX 20)   THIS INDICATES INFORMATION IS FOR
                         AUXILIARY STORAGE.
     COL 4   (HEX 01)   THIS INDICATES ONE HALFWORD TO BE
                         LOADED.

     COL 5   (HEX 0D)   THIS REPRESENTS THE DEVICE ADDRESS
                         OF THE 2540 PUNCH THAT MUST BE
                         RELOADED BECAUSE OF THE ADDRESSING
                         RESTRICTION IMPOSED BY COLUMN 2.
     COL 6   (HEX 0A)   THIS REPRESENTS THE DEVICE ADDRESS
     COL 69-72 (0086)   TO INDICATE START ADDR OF PATCH.
     COL 73-77 (*E609)   INDICATES PATCH IS FOR *E60 CORE LD.
     COL 78-80 (001)   INDICATES 1ST PATCH TO DECK
                         REPLACING THE STANDARD ADDRESS FOR
                         THE 1403 ON THE BURST CHANNEL.
     A CSL MUST BE PERFORMED TO LOAD THIS RECONFIGURATION CARD
INTO THE SYSTEM. THE RECONFIGURATION CARD MUST PRECEED THE
END CARD, AND MUST BE PRESENT IN THAT POSITION FOR ALL
CSLS USING THAT PARTICULAR CORE LOAD DECK.
***   EACH TIME A NEW EC LEVEL DECK IS RECIEVED, ALL RECONFIG-
      URATION CARDS IN THE DECK BEING REPLACED MUST BE REMOVED
      AND INSERTED IN THE NEW DECK IN FRONT OF THE END CARD.

PUNCHED CARD CODES

HEX	PUNCHES	HEX	PUNCHES	HEX	PUNCHES	HEX	PUNCHES	HEX	PUNCHES	HEX	PUNCHES	HEX	PUNCHES
00	T-0-9-8-1	25	0-9-5	4A	T-8-2	6F	0-8-7	94	T-E-4	B9	T-E-0-9	DE	T-E-9-8-6
01	T-9-1	26	0-9-6	4B	T-8-3	70	T-E-0	95	T-E-5	BA	T-E-0-8-2	DF	T-E-9-8-7
02	T-9-2	27	0-9-7	4C	T-8-4	71	T-E-0-9-1	96	T-E-6	BB	T-E-0-8-3	E0	0-8-2
03	T-9-3	28	0-9-8	4D	T-8-5	72	T-E-0-9-2	97	T-E-7	BC	T-E-0-8-4	E1	E-0-9-1
04	T-9-4	29	0-9-8-1	4E	T-8-6	73	T-E-0-9-3	98	T-E-8	BD	T-E-0-8-5	E2	0-2
05	T-9-5	2A	0-9-8-2	4F	T-8-7	74	T-E-0-9-4	99	T-E-9	BE	T-E-0-8-6	E3	0-3
06	T-9-6	2B	0-9-8-3	50	T	75	T-E-0-9-5	9A	T-E-8-2	BF	T-E-0-8-7	E4	0-4
07	T-9-7	2C	0-9-8-4	51	T-E-9-1	76	T-E-0-9-6	9B	T-E-8-3	C0	T-0	E5	0-5
08	T-9-8	2D	0-9-8-5	52	T-E-9-2	77	T-E-0-9-7	9C	T-E-8-4	C1	T-1	E6	0-6
09	T-9-8-1	2E	0-9-8-6	53	T-E-9-3	78	T-E-0-9-8	9D	T-E-8-5	C2	T-2	E7	0-7
0A	T-9-8-2	2F	0-9-8-7	54	T-E-9-4	79	8-1	9E	T-E-8-6	C3	T-3	E8	0-8
0B	T-9-8-3	30	T-E-0-9-8-1	55	T-E-9-5	7A	8-2	9F	T-E-8-7	C4	T-4	E9	0-9
0C	T-9-8-4	31	9-1	56	T-E-9-6	7B	8-3	A0	E-0-8-1	C5	T-5	EA	E-0-9-8-2
0D	T-9-8-5	32	9-2	57	T-E-9-7	7C	8-4	A1	E-0-1	C6	T-6	EB	E-0-9-8-3
0E	T-9-8-6	33	9-3	58	T-E-9-8	7D	8-5	A2	E-0-2	C7	T-7	EC	E-0-9-8-4
0F	T-9-8-7	34	9-4	59	E-8-1	7E	8-6	A3	E-0-3	C8	T-8	ED	E-0-9-8-5
10	T-E-9-8-1	35	9-5	5A	E-8-2	7F	8-7	A4	E-0-4	C9	T-9	EE	E-0-9-8-6
11	E-9-1	36	9-6	5B	E-8-3	80	T-0-8-1	A5	E-0-5	CA	T-0-9-8-2	EF	E-0-9-8-7
12	E-9-2	37	9-7	5C	E-8-4	81	T-0-1	A6	E-0-6	CB	T-0-9-8-3	F0	0
13	E-9-3	38	9-8	5D	E-8-5	82	T-0-2	A7	E-0-7	CC	T-0-9-8-4	F1	1
14	E-9-4	39	9-8-1	5E	E-8-6	83	T-0-3	A8	E-0-8	CD	T-0-9-8-5	F2	2
15	E-9-5	3A	9-8-2	5F	E-8-7	84	T-0-4	A9	E-0-9	CE	T-0-9-8-6	F3	3
16	E-9-6	3B	9-8-3	60	E	85	T-0-5	AA	E-0-8-2	CF	T-0-9-8-7	F4	4
17	E-9-7	3C	9-8-4	61	0-1	86	T-0-6	AB	E-0-8-3	D0	E-0	F5	5
18	E-9-8	3D	9-8-5	62	E-0-9-2	87	T-0-7	AC	E-0-8-4	D1	E-1	F6	6
19	E-9-8-1	3E	9-8-6	63	E-0-9-3	88	T-0-8	AD	E-0-8-5	D2	E-2	F7	7
1A	E-9-8-2	3F	9-8-7	64	E-0-9-4	89	T-0-9	AE	E-0-8-6	D3	E-3	F8	8
1B	E-9-8-3	40	NONE	65	E-0-9-5	8A	T-0-8-2	AF	E-0-8-7	D4	E-4	F9	9
1C	E-9-8-4	41	T-0-9-1	66	E-0-9-6	8B	T-0-8-3	B0	T-E-0-8-1	D5	E-5	FA	T-E-0-9-8-2
1D	E-9-8-5	42	T-0-9-2	67	E-0-9-7	8C	T-0-8-4	B1	T-E-0-1	D6	E-6	FB	T-E-0-9-8-3
1E	E-9-8-6	43	T-0-9-3	68	E-0-9-8	8D	T-0-8-5	B2	T-E-0-2	D7	E-7	FC	T-E-0-9-8-4
1F	E-9-8-7	44	T-0-9-4	69	0-8-1	8E	T-0-8-6	B3	T-E-0-3	D8	E-8	FD	T-E-0-9-8-5
20	E-0-9-8-1	45	T-0-9-5	6A	T-E	8F	T-0-8-7	B4	T-E-0-4	D9	E-9	FE	T-E-0-9-8-6
21	0-9-1	46	T-0-9-6	6B	0-8-3	90	T-E-8-1	B5	T-E-0-5	DA	T-E-9-8-2	FF	T-E-0-9-8-7
22	0-9-2	47	T-0-9-7	6C	0-8-4	91	T-E-1	B6	T-E-0-6	DB	T-E-9-8-3		
23	0-9-3	48	T-0-9-8	6D	0-8-5	92	T-E-2	B7	T-E-0-7	DC	T-E-9-8-4		
24	0-9-4	49	T-8-1	6E	0-8-6	93	T-E-3	B8	T-E-0-8	DD	T-E-9-8-5		

***   HANDLOAD ROUTINE FOR NATIVE 2540   ***   ***   HANDLOAD ROUTINE FOR CHANNEL   ***

ADDR	WORD	STATEMENT	COMMENT	ADDR	WORD	STATEMENT	COMMENT
0010	3210	SET MMSK K=81	BLOCK TRAPS	0010	3210	SET MMSK K=81	BLOCK TRAPS
0012	2610	SET BC K=01	SET LOGOUT LATCH	0012	2610	SET BC K=01	SET LOGOUT LATCH
0014	2C07	P0=0	ZERO OUT SWITCH	0014	2C07	P0=0	ZERO OUT SWITCH
0016	2413	G0=0$K01	START SETUP OF ADDR 0100	0016	2413	G0=0$K01	START SETUP OF ADDR 0100
0018	8062	BR	BRANCH TO LOCATION 0062	0018	51AF	TO=SWCD	SWCD EQUAL DEVICE ADDR.
				001A	802C	BR	BRANCH TO LOCATION 002C
0062	2406	SET MODE K=30	SET 2540 MODE				
0064	2617	D0=0$K11	BUILD AUXILIARY	002C	2486	SET MODE K=38	SET CHANNEL MODE,CPU ZONE
0066	2783	D1=0$K08	STORAGE ADDRESS	002E	2507	G1=0	FINISH SETUP OF ADDR 0100
0068	3775	D1=D1$K70	FOR COMPARING	0030	2B08	SET GA K=40	SET SERVICE OUT
006A	2507	G1=0	FINISH SETUP OF ADDR 0100	0032	C9B3	BR IF GT4=1	BRANCH ON OP IN
006C	4066	U=D	SAVE COMPARE ADDRESS	0034	4FAF	GB/OUT=TO	SEND DEVICE ADDRESS OUT
006E	5EEF	H0=RPS	READ 2540 STATUS	0036	2B04	SET GA K=20	RAISE ADDRESS OUT
0070	DE6E	BR IF H01=0	BACK ONE WORD IF NO DATA	0038	2B44	SET GA K=24	AND SELECT OUT
0072	5B3F	V1=RP1	GET READ BRUSH 1 DATA	003A	C9BA	BR IF GT4=0	WAIT FOR OP IN
0074	6348	STB V1 CS,G+1	PUT DATA IN CONTROL STOR	003C	2B40	SET GA K=04	RESET ADDRESS OUT
0076	736A	STB V1 AS,D-1	PUT DATA IN COMP TABLE	003E	CDBE	BR IF GT0=0	WAIT FOR ADDRESS IN
0078	F0EE	BR IF LZNZ	GO WAIT FOR MORE DATA	0040	2B23	T1=0$K02	BUILD READ COMMAND
007A	161B	D0=D0□K01	INVERT FIRST TIME SWITCH	0042	4FBF	GB/OUT=T1	SEND OUT READ COMMAND
007C	F0E7	BR IF LZ=0	BRANCH BACK IF FIRST TIME	0044	2B42	SET GA K=14	RAISE COMMAND OUT
007E	8100	BR	BRANCH TO BOOTSTRAP	0046	FDC6	BR IF GT3=0	WAIT HERE FOR STATUS
				0048	5FBF	T1=GB/IN	READ STATUS
				004A	C4CA	BR IF ZNZ	LOOP HERE IF INVALID STAT
				004C	2B48	SET GA K=44	SET SERVICE OUT
				004E	FDCF	BR IF GT3=1	WAIT FOR
				0050	EDCE	BR IF GT2=0	DATA
				0052	5FFF	H1=GB/IN	GET DATA BYTE
				0054	F05B	BR IF G07=1	BR IF BOOTSTRAP READING
				0056	7F48	STB H1 AS,G+1	NOT BOOT INFO,STOR IN AUX
				0058	F05C	BR IF G07=0	UNCONDITIONAL BRANCH
				005A	6F48	STB H1 CS,G+1	PUT BOOT IN CNTRL STORAGE
				005C	0550	Z=G1□K50	CHECK IF ALL DATA IN,
				005E	C4CC	BR IF ZNZ	IF NOT, GET MORE.
				0060	8100	BR	BRANCH TO BOOTSTRAP

***   HANDLOAD ROUTINE FOR 2311   ***

ADDR	WORD	STATEMENT	COMMENT
0010	3210	SET MMSK K=81	BLOCK TRAPS
0012	2610	SET BC K=01	SET LOGOUT LATCH
0014	2C07	P0=0	ZERO OUT SWITCH
0016	8076	BR	BRANCH TO LOCATION 0076
0076	2490	SET MODE K=09	SET 2311 MODE
0078	2813	I0=0$K01	SET I-REG
007A	2907	I1=0	TO 0100
007C	4A86	T=I	MOVE 0100 TO T-REGISTER
007E	2F15	H1=0$K10	
0080	2EX5	H0=0$KX0	SET UP MODULE SELECT * NOTE *
0082	2D23	P1=0$K02	SET UP RETURN BIT (BIT 6)
0084	4D9F	FF0=I1	SEND ZERO TO FILE FLAGS OUT
0086	0E08	RST FIB K=40	ISSUE INITIAL RESET
0088	0E04	RST FIB K=20	ISSUE COLD-START RESET
008A	49EF	MS=H0	LOAD MODULE SELECT REGISTER
008C	4EDF	FB0=P1	SEND RETURN TO FILE BUS OUT
008E	4BFF	TGR0=H1	MOVE CONTROL BIT TO TAG REG
0090	2E63	H0=0$K06	SET UP FILE OP, COUNT
0092	3E15	H0=H0$K10	OF ONE, DATA READ
0094	4FEF	FOP=H0	MOVE OP TO FILE OP REGISTER
0096	2E43	H0=0$K04	SET UP SELECT HEAD
0098	E598	BR IF DASI2=0	BR TO ITSELF IF NO GATED ATT.
009A	4EEF	FB0=H0	MOVE 04 TO FILE BUS OUT
009C	4BFF	TGR0=H1	MOVE CNTRL BIT TO TAG REG OUT
009E	3D00	SET FIA K=80	SET GO LATCH
00A0	E5A1	BR IF DASI2=1	BR TO ITSELF IF GATED ATTEN.
00A2	1D00	RST FIA K=80	RESET TRAP LATCH
00A4	50EF	H0=TGRI	GET TAG REGISTER IN
00A6	CA25	BR IF H04=1	BR BACK ONE WORD IF NO TRAP
00A8	C1A9	BR IF DASI4=1	LOOP ON ITSELF IF ERROR
00AA	810A	BR TO 010A	BR TO BOOTSTRAP

* NOTE *   THE   X   IN THE CONTROL WORD HAS THE
FOLLOWING SIGNIFICANCE-

```
X=8  SELECT DRIVE NUMBER 0
X=4  SELECT DRIVE NUMBER 1
X=2  SELECT DRIVE NUMBER 2
X=1  SELECT DRIVE NUMBER 3
```

***   HANDLOAD ROUTINE FOR 2560   ***

ADDR	WORD	STATEMENT	COMMENT
0010	3210	SET MMSK K=81	BLOCK ALL TRAPS
0012	2610	SET BC K=01	SET LOGOUT LATCH
0014	2C07	P0=0	ZERO HANDLOAD FLAG REGISTER
0016	2413	G0=0$K01	BUILD HIGH HALF CS ADDR. 0100
0018	80AC	BR	BR TO 00AC
00AC	240E	SET MODE K=70	PUT IN MOD/20, 2560 MODE
00AE	2F04	SET MFA K=20	SELECT SEC FEED (NOTE 2)
00B0	2507	G1=0	LOW HALF CS ADDR. G=0100
00B2	5FDF	P1=MFD8	
00B4	DAB8	BR IF MFT5=0	BR TO 00B8 IF NPRO REQ
00B6	ED33	BR IF P12=1	BR IF NOT READY
00B8	2F10	SET MFA K=01	SET READ EX.
00BA	DAC6	BR IF MFT5=0	CHECK NPRO
00BC	CAB9	BR IF MFT4=1	BR ON NO DATA AVAIL
00BE	58FF	H1=MFR1	READ 1/2 BYTE
00C0	5AEF	H0=MFR2	READ THE OTHER 1/2
00C2	4EF3	H1=H0XH+H1L	PUT TWO 1/2 BYTES TOGETHER
00C4	6F48	STB H1 CS,G+1	STORE THEM
00C6	2B14	SET MFC K=21	RST NPRO, AND RD. EX.
00C8	055D	Z=G1□K50	CHECK FOR 80 BYTES
00CA	C4B4	BR IF ZNZ	IF NOT 80, GO TO 00B4
00CC	8100	BR	BR TO BOOTSTRAP ADDR 0100

NOTE 2 -   IN ORDER TO USE THE PRIMARY FEED,
REPLACE THIS WORD WITH 2F80. THE START
KEY MUST BE PRESSED AT THE END TO
COMPLETE THE CSL (LAST CARD).

```
*************************
*                       *
* FOR BOOTSTRAP         *
* INFORMATION, REFER    *
* TO THE AKXXX LOGIC    *
* PAGES.                *
*************************
```

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		BCPL 001	T		CSL	RESIDENT ROUTINE	
		BCPL 002	ATABLE	ADDR=0000			
0000	8000	BCPL 003	LOCKON	003	LOCKON	BR	
0002	0BAD	BCPL 004	C			XCTL'0BAD0BAD0BAD0BAD0BAD0BAD'	
000E	80AC	BCPL 005	N2560	087	RD2560	BR	
		BCPL 006	*			THE FOLLOWING WORD	
		BCPL 007	*			IS THE FIRST WORD	
		BCPL 008	*			OF THE CSL TRAP	
0010	3210	BCPL 009				SET MMSK K=81	BLOCK ALL TRAPS
0012	2610	BCPL 010				SET BC K=01	SET LOG OUT LATCH
0014	50CF	BCPL 011				PO=SWAB	READ
0016	51AF	BCPL 012				TO=SWCD	SWITCHES
0018	2413	BCPL 013				GO=0$K01	SET UP C S ADDRESS
001A	0CCF	BCPL 014				Z=PO¤KCC	CHECK FOR
001C	C4AD	BCPL 015		023	CHANEL	BR IF Z=0	CHANNEL
001E	0CDF	BCPL 016				Z=PO¤KDD	CHECK FOR
0020	C48F	BCPL 017		005	N2560	BR IF Z=0	2560
0022	0CEF	BCPL 018				Z=PO¤KEE	CHECK FOR
0024	C4E3	BCPL 019		050	N2540	BR IF Z=0	2540
0026	0CFF	BCPL 020				Z=PO¤KFF	CHECK FOR
0028	C4A8	BCPL 021	SWIERR	021	SWIERR	BR IF ZNZ	2311
002A	80DE	BCPL 022		106	FILE	BR	
002C	2486	BCPL 023	CHANEL			SET MODE K=38	CHAN PUT IN CHANNEL MODE
002E	2507	BCPL 024	AGAIN			G1=0	CHAN CS ADDRESS
0030	2B08	BCPL 025				SET GA K=40	CHAN
0032	C9B3	BCPL 026	OPIN	026	OPIN	BR IF GT4=1	CHAN BR ON OP IN
0034	4FAF	BCPL 027				GB/OUT=TO	CHAN SEND OUT DEVICE ADDRESS
0036	2B04	BCPL 028				SET GA K=20	CHAN RAISE ADDR.
0038	2B44	BCPL 029				SET GA K=24	CHAN AND SEL OUT
003A	C9BA	BCPL 030	OPINOT	030	OPINOT	BR IF GT4=0	CHAN WAIT FOR OP IN
003C	2B40	BCPL 031				SET GA K=04	CHAN RESET ADDR. OUT
003E	CDBE	BCPL 032	ADDIN	032	ADDIN	BR IF GT0=0	CHAN WAIT FOR ADDR IN
0040	2B23	BCPL 033				T1=0$K02	CHAN BUILD READ CMND
0042	4FBF	BCPL 034				GB/OUT=T1	CHAN SEND OUT THE CMND
0044	2B42	BCPL 035				SET GA K=14	CHAN RAISE COMMAND OUT
0046	FDC6	BCPL 036	STATUS	036	STATUS	BR IF GT3=0	CHAN WAIT FOR STATUS
0048	5FBF	BCPL 037				T1=GB/IN	CHAN READ STATUS
004A	C4CA	BCPL 038	ERRORA	038	ERRORA	BR IF ZNZ	CHAN LOOP INVALID INITIAL STATS
004C	2B48	BCPL 039	STATC			SET GA K=44	CHAN SET SERVICE OUT
004E	FDCF	BCPL 040	STATB	040	STATB	BR IF GT3=1	CHAN STATUS LOOP
0050	EDCE	BCPL 041		040	STATB	BR IF GT2=0	CHAN SERVICE LOOP
0052	5FFF	BCPL 042				H1=GB/IN	CHAN GET DATA
0054	F05B	BCPL 043		046	FIRSTC	BR IF G07=1	CHAN FIRST TIME BOOTSTRAP
0056	7F48	BCPL 044				STB H1 AS,G+1	CHAN NOT 1ST PUT IN AUX
0058	F05C	BCPL 045		047	DECREM	BR IF G07=0	CHAN UNCONDIT BRANCH
005A	6F48	BCPL 046	FIRSTC			STB H1 CS,G+1	CHAN 1ST TIME PUT IN C S
005C	055D	BCPL 047	DECREM			Z=G1¤K50	CHAN CHECK IF ALL
005E	C4CC	BCPL 048		039	STATC	BR IF ZNZ	CHAN BYTES XFERED
0060	8100	BCPL 049	C			XCTL'8100'	CHAN GO TO BOOTSTRAP
0062	2406	BCPL 050	N2540			SET MODE K=30	2540 PUT IN 2540 MODE
0064	2617	BCPL 051				DO=0$K11	2540 BUILD COMPARE
0066	2783	BCPL 052	CYCLE			D1=0$K08	2540 ADDRESS WHERE CARD
0068	3775	BCPL 053				D1=D1$K70	2540 IMAGE IS STORED

ADDR	WORD	SEQUENCE NO.	LABEL		NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
006A	2507	BCPL 054					G1=0	2540 ZERO REG FOR CONTROL ADDR.
006C	4066	BCPL 055					U=D	2540 SAVE COMPARE ADDRESS
006E	5EEF	BCPL 056	DATAIN				HO=RPS	2540 WAIT FOR
0070	DE6E	BCPL 057			056	DATAIN	BR IF HO1=0	2540 DATA AVAILIBLE
0072	5B3F	BCPL 058					V1=RP1	2540 READ 1ST BRUSH DATA
0074	6348	BCPL 059					STB V1 CS,G+1	2540 -STORE IN CONTROL STORE
0076	736A	BCPL 060					STB V1 AS,D-1	2540 -STORE IN AUX COMPARE TBLE
0078	F0EE	BCPL 061			056	DATAIN	BR IF LZNZ	2540 STAY IN DATA LOOP FOR 1 CD
007A	161B	BCPL 062					DO=DO¤KO1	2540 INVERT FLAG
007C	F0E7	BCPL 063			052	CYCLE	BR IF LZ=0	2540 CHECK FOR 2ND TRAP CYCLE
007E	8100	BCPL 064	C				XCTL'8100'	2540 GO TO BOOTSTRAP
0080	6EE3	BCPL 065	MOD	0			HO=HO+HO	2311 BUILD
0082	6EE3	BCPL 066	MOD	1			HO=HO+HO	2311 MODULE
0084	6EE3	BCPL 067	MOD	2			HO=HO+HO	2311 NUMBER
0086	0E08	BCPL 068	MOD	3			RST FIB K=40	2311 COLD START RESET
0088	0E04	BCPL 069					RST FIB K=20	2311 COLD START RESET
008A	49EF	BCPL 070					MS=HO	2311 SELECT MODULE
008C	4EDF	BCPL 071					FBO=P1	2311 SET RETURN TO ZERO P1=02
008E	4BFF	BCPL 072					TGRO=H1	2311 SET CONTROL H1=10
0090	2E63	BCPL 073					HO=0$K06	2311 SET READ
0092	3E15	BCPL 074					HO=HO$K10	2311
0094	4FEF	BCPL 075					FOP=HO	2311 DATA OP
0096	2E43	BCPL 076					HO=0$K04	2311 START HEAD SELECT
0098	E598	BCPL 077	WAITFL		077	WAITFL	BR IF DASI2=0	WAIT FOR END
009A	4EEF	BCPL 078					FBO=HO	2311 HEAD
009C	4BFF	BCPL 079					TGRO=H1	2311 SELECT
009E	3D00	BCPL 080					SET FIA K=80	2311 GO
00A0	E5A1	BCPL 081	WAIENA		081	WAIENA	BR IF DASI2=1	2311 WAIT FOR
00A2	1D00	BCPL 082					RST FIA K=80	2311 RESET TRAP REQ
00A4	50EF	BCPL 083	WAIENB				HO=TGRI	2311 WAIT FOR FILE
00A6	CA25	BCPL 084			083	WAIENB	BR IF HO4=1	2311 TRAP REQUEST
00A8	C1A9	BCPL 085	ER		085	ER	BR IF DASI4=1	2311 ERROR LOOP
00AA	810A	BCPL 086	C				XCTL'810A'	2311 GO TO BOOTSTRAP
00AC	240E	BCPL 087	RD2560				SET MODE K=70	2560 PUT IN 20,2560 MODE
00AE	2507	BCPL 088					G1=0	2560
00B0	2F04	BCPL 089					SET MFA K=20	2560 SELECT SEC FEED
00B2	5FDF	BCPL 090	K5RDY				P1=MFD8	2560 CALL IN FOR RDY CHK
00B4	DAB8	BCPL 091	K6NPO		093	FEED	BR IF MFT5=0	2560 BR IF NPRO REQ
00B6	ED33	BCPL 092			090	K5RDY	BR IF P12=1	2560 BR IF NOT RDY
00B8	2F10	BCPL 093	FEED				SET MFA K=01	2560 SET READ EXECUT
00BA	DAC6	BCPL 094			100	NDIT	BR IF MFT5=0	2560 BRANCH IF NPRO
00BC	CAB9	BCPL 095			093	FEED	BR IF MFT4=1	2560 BRANCH IF NO DATA
00BE	58FF	BCPL 096					H1=MFR1	READ 1 / 2 BYTE
00C0	5AEF	BCPL 097					HO=MFR2	READ OTHER HALF
00C2	4EF3	BCPL 098					H1=HOXH+H1L	PUT THEM TOGETHER
00C4	6F48	BCPL 099					STB H1 CS,G+1	2560 STORE DATA IN C S
00C6	2B14	BCPL 100	NDIT				SET MFC K=21	2560 RST RD EX AND NPRO
00C8	055D	BCPL 101					Z=G1¤K50	2560
00CA	C4B4	BCPL 102			091	K6NPO	BR IF ZNZ	2560 NOT DONE BRANCH
00CC	8100	BCPL 103	C				XCTL'8100'	2560 GO TO BOOTSTRAP
00CE	FFFF	BCPL 104	C				XCTL'FFFFFFFFFFFFFFFFFFFFFFFFFFFFF'	
00DC	FFFF	BCPL 105	C				XCTL'FFFF'	
00DE	2B07	BCPL 106	FILE				T1=0	2311 CORRECT PARITY

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS	
00E0	6A02	BCPL 107				STH T DC,88	2311	SAVE MODULE
00E2	2490	BCPL 108				SET MODE K=09	2311	SET FILE MODE ZONE
00E4	2813	BCPL 109				I0=0$K01	2311	BUILD COUNT AND
00E6	2907	BCPL 110				I1=0	2311	CONTROL STORAGE
00E8	4A86	BCPL 111				T=I	2311	ADDRESS
00EA	4C02	BCPL 112				RDH P DC,88	2311	RETRIEVE MODULE
00EC	2F15	BCPL 113				H1=0$K10	2311	CONSTANTS FOR
00EE	5FE9	BCPL 114				H0=H1	2311	SELECTION
00F0	2D23	BCPL 115				P1=0$K02	2311	
00F2	4D9F	BCPL 116				FF0=I1	2311	
00F4	8811	BCPL 117		065	MOD N	N=P0 BITS67	2311	
00F6	54E8	BCPL 118	OVRLAY			RDH G AS,H+2	END	OVERLAY AUX 1000
00F8	6488	BCPL 119				STH G CS,I+2	END	INTO CONTROL
00FA	FA76	BCPL 120		118	OVRLAY	BR IF H07=0	END	0100
00FC	0608	BCPL 121				RST BC K=40	END	RESET CSL LIGHT
00FE	88FE	BCPL 122	C			XCTL'88FE'	END	BRANCH TO 08FE
		BCPL 123	AEND					

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********************************
* CROSS REFERENCE FOR CSECT BCPL *
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BCPL 003	BCPL 003	
BCPL 005	BCPL 017	
BCPL 021	BCPL 021	
BCPL 023	BCPL 015	
BCPL 026	BCPL 026	
BCPL 030	BCPL 030	
BCPL 032	BCPL 032	
BCPL 036	BCPL 036	
BCPL 038	BCPL 038	
BCPL 039	BCPL 048	
BCPL 040	BCPL 040	BCPL 041
BCPL 046	BCPL 043	
BCPL 047	BCPL 045	
BCPL 050	BCPL 019	
BCPL 052	BCPL 063	
BCPL 056	BCPL 057	BCPL 061
BCPL 065	BCPL 117	
BCPL 077	BCPL 077	
BCPL 081	BCPL 081	
BCPL 083	BCPL 084	
BCPL 085	BCPL 085	
BCPL 087	BCPL 005	
BCPL 090	BCPL 092	
BCPL 091	BCPL 102	
BCPL 093	BCPL 091	BCPL 095
BCPL 100	BCPL 094	
BCPL 106	BCPL 022	
BCPL 118	BCPL 120	

BDIA DESCRIPTIVE TEXT

THE RESIDENT MICRODIAGNOSTIC -BDIA- IS ENTERED WHEN
   1. THE SYSTEM RESET KEY IS RELEASED
      (TRAP TO ADDRESS 0240)
   2. THE LOAD KEY IS RELEASED
      (TRAP TO ADDRESS 0240)
   3. THE CONTROL STORAGE LOAD ROUTINE -BCPL- IS
      FINISHED LOADING A CSL DECK.
      (BRANCH TO LABEL * VERSON *)

THE -BDIA- ROUTINE TESTS THE CPU HARDWARE NEEDED TO
PERFORM A CONTROL STORAGE LOAD OPERATION. NO I/O DEVICE
OR ATTACHMENT CIRCUITS ARE TESTED.

THE TESTS PERFORMED BY THE -BDIA- ROUTINE ARE -
   BRANCHING TEST
   ALU TEST
   MODE REGISTER SET/RST TEST
   STORAGE TEST
   X LINE ADDRESSING TEST
   LOCAL STORAGE SET/RST TEST
   ALU ERROR DETECTION TEST
   STORAGE DATA, CONTROL WORD, STORAGE ADDRESS TEST
   A AND B REGISTER PARITY DETECTION TEST

ERRORS ARE INDICATED BY
   1. A ONE WORD BRANCH LOOP
   2. A STOP WORD
   3. A BRANCH TEST STOP FAILURE

A ONE WORD BRANCH LOOP IS IDENTIFIED BY THE SYSTEM
LIGHT ON AND THE MANUAL LIGHT OFF. THE CLOCK WILL RUN BUT
THE MICROPROGRAM DOES NOT PROGRESS.

A STOP WORD (MOVE/ARITH-WORD TYPE 3) CAUSES THE CLOCK
TO STOP, THE CLOCK STOP LIGHT IS ON, THE SYSTEM LIGHT IS
OFF, THE MANUAL LIGHT IS ON, AND THE ADDRESS DISPLAYED IS
THE ADDRESS OF THE CONTROL WORD FOLLOWING THE STOP WORD.

A BRANCH TEST STOP FAILURE IS CAUSED BY A BRANCH ON
CONDITION WORD OR RETURN WORD FAILING TO REACH A WORD THAT
SETS THE DR-REGISTER. DR BIT 7 IS SET PRIOR TO EACH
OF THE BRANCH TESTS, AND THE BRANCH OR RETURN MUST POINT
TO A SET OF THE DR-REGISTER. THE FAILURE IS INDICATED
BY THE CLOCK OFF, THE CLOCK STOP LIGHT IS ON, SYSTEM LIGHT
OFF, MANUAL LIGHT ON, AND, THE ADDRESS OF THE NEXT
SEQUENTIAL WORD FOLLOWING THE WORD REACHED IN ERROR,
DISPLAYED IN THE CONSOLE LIGHTS.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		BDIA 001	T		BDIA	BASIC DIAGNOSTIC	
		BDIA 002	ATABLE	ADDR=08FE			
08FE	AAFA	BDIA 004	VERSON	INIZ 002	BEGIN	BR	GO INITIALIZE AUX STORE.
		BDIA 012	AEND				
		BDIA 013	ATABLE	ADDR=0240			
		BDIA 014	*				DEPRESSION OF THE SYSTEM RESET
		BDIA 015	*				BUTTON OR LOAD BUTTON WILL CAUSE
		BDIA 016	*				A HARDWARE TRAP TO ADDRESS 0240.
		BDIA 017	*				
0240	2810	BDIA 018	START			SET DR K=01	SET DR-7. DR 7 IS USED IN
		BDIA 019	*				CHECKING THE BRANCHING FUNCTIONS
		BDIA 020	*				OF THE MOD 25. A DIAG BR LATCH
		BDIA 021	*				IS SET EVERYTIME A MOD 25 BRANCH
		BDIA 022	*				OR RETURN FUNCTION IS EXECUTED
		BDIA 023	*				AND DR 7 IS ON. IF THE NEXT
		BDIA 024	*				MICROINSTRUCTION AFTER THE BR
		BDIA 025	*				OR RETURN DOES NOT ISSUE A SET
		BDIA 026	*				TO THE DR REG, A HARD STOP WILL
		BDIA 027	*				OCCUR AT THE COMPLETION OF THAT
		BDIA 028	*				MACHINE CYCLE.
		BDIA 029	*				

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
0242	3210	BDIA 030				SET MMSK K=81	SET SYSTEM RESET PRIORITY
		BDIA 031	*				BIT(MMSK-8).
		BDIA 032	*				
		BDIA 033	*				THE FIRST WORD OF THE TRAP SETS
		BDIA 034	*				THE DIAG BR LATCH TO INSURE A
		BDIA 035	*				MACHINE STOP IF AN ERRONEOUS
		BDIA 036	*				BRANCH STATEMENT IS EXECUTED
		BDIA 037	*				THE SECOND WORD OF THE TRAP SETS
		BDIA 038	*				MMSK 8 TO PREVENT FURTHER TRAPS
		BDIA 039	*				FOR THE SAME SYST RST/LOAD TRAP
		BDIA 040	*				REQUEST. AS A RESULT OF THE
		BDIA 041	*				DELAYED SETTING OF MMSK 8, THE
		BDIA 042	*				TRAP WILL OCCUR TWICE FOR EACH
		BDIA 043	*				SYSTEM RST/LOAD TRAP REQUEST.
		BDIA 044	*				THEREFORE, THE FIRST TWO WORDS
		BDIA 045	*				WILL BE EXECUTED TWICE BEFORE
		BDIA 046	*				THE FOLLOWING WORD IS EXECUTED.
		BDIA 047	*				
0244	2400	BDIA 048				SET MODE K=00	
		BDIA 049	*				STORAGE ZONE 4.
		BDIA 050	*			***	
		BDIA 051	*			BRANCHING TEST.	
		BDIA 052	*			***	
0246	F8CB	BDIA 053		056	BCDR7	BR IF DR BIT7=1	BR TO 024A IF DR-7 IS ON
0248	B7C9	BDIA 054		122	DR7OFF N	N=BAH	DR 7 SHOULD BE ON. BRANCH ON
		BDIA 055	*				BA HIGH FOR BETTER RESOLUTION.
024A	2810	BDIA 056	BCDR7			SET DR K=01	SET DR-7 TO CONTINUE BR TESTS.
024C	25F3	BDIA 057				G1=0$KOF	ATTEMPT TO SET G1 REG = 00001111
		BDIA 058	*				IF A STOP OCCURS AT THE ADDRESS
		BDIA 059	*				OF THE NEXT WORD, G1 WAS SET
		BDIA 060	*				WRONG OR THE BRANCH TEST FAILED.
024E	C54F	BDIA 061	BCG1ON	061	BCG1ON	BR IF G1 BIT0=1	G10=0 SHOULD NOT BRANCH.
0250	2810	BDIA 062				SET DR K=01	SET DR-7 TO CONTINUE BR TESTS.
		BDIA 063	*				IF A STOP OCCURS AT THE ADDRESS
		BDIA 064	*				OF THE NEXT WORD, G1 WAS SET
		BDIA 065	*				WRONG OR THE BRANCH TEST FAILED.
0252	D553	BDIA 066	BCG11N	066	BCG11N	BR IF G1 BIT1=1	G11=0 SHOULD NOT BRANCH
0254	2810	BDIA 067				SET DR K=01	SET DR-7 TO CONTINUE BR TESTS.
		BDIA 068	*				IF A STOP OCCURS AT THE NEXT
		BDIA 069	*				SEQUENTIAL WORD FOLLOWING THIS
		BDIA 070	*				BRANCH, G1 WAS SET WRONG OR THE
		BDIA 071	*				BRANCH TEST FAILED.
0256	E53C	BDIA 072		075	BCG12Y	BR IF G1 BIT2=0	G12=0 SHOULD BRANCH TO ADR 023C
		BDIA 073	AEND				
		BDIA 074	ATABLE	ADDR=023C			
023C	2810	BDIA 075	BCG12Y			SET DR K=01	SET DR-7 TO CONTINUE BR TESTS.
		BDIA 076	*				IF A STOP OCCURS AT THE NEXT
		BDIA 077	*				SEQUENTIAL WORD FOLLOWING THIS
		BDIA 078	*				BRANCH, G1 WAS SET WRONG OR THE
		BDIA 079	*				BRANCH TEST FAILED.
023E	F56C	BDIA 080		083	BCG13Y	BR IF G1 BIT3=0	G13=0 SHOULD BRANCH TO ADR 026C
		BDIA 081	AEND				
		BDIA 082	ATABLE	ADDR=026C			

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
026C	2810	BDIA 083	BCG13Y			SET DR K=01	SET DR-7 TO CONTINUE BR TESTS.
026E	9FFC	BDIA 084		087	UB1FFC	BR	UNCONDITIONAL BRANCH TO ADR 1FFC
		BDIA 085	AEND				
		BDIA 086	ATABLE	ADDR=1FFC			
1FFC	2810	BDIA 087	UB1FFC			SET DR K=01	SET DR-7 TO CONTINUE BR TESTS.
1FFE	D57F	BDIA 088	HCTRL			BR IF G1 BIT1=1	NO BRANCH
		BDIA 089	AEND				
		BDIA 090	ATABLE	ADDR=2000			
2000	2810	BDIA 091				SET DR K=01	SET DR-7 TO CONTINUE BR TESTS.
2002	25F5	BDIA 092				G1=0$KF0	ATTEMPT TO SET G1 REG = 11110000
		BDIA 093	*				IF A STOP OCCURS AT THE ADDRESS
		BDIA 094	*				OF THE NEXT WORD, G1 WAS SET
		BDIA 095	*				WRONG OR THE BRANCH TEST FAILED.
2004	E504	BDIA 096	BCG12N	096	BCG12N	BR IF G1 BIT2=0	G12=1 SHOULD NOT BRANCH
2006	2810	BDIA 097				SET DR K=01	SET DR-7 TO CONTINUE BR TESTS.
		BDIA 098	*				IF A STOP OCCURS AT THE ADDRESS
		BDIA 099	*				OF THE NEXT WORD, G1 WAS SET
		BDIA 100	*				WRONG OR THE BRANCH TEST FAILED.
2008	F5C8	BDIA 101	BCG13N	101	BCG13N	BR IF G1 BIT3=0	G13=1 SHOULD NOT BRANCH
200A	2810	BDIA 102				SET DR K=01	SET DR-7 TO CONTINUE BR TESTS.
200C	A040	BDIA 103		106	UB2040	BR	UNCONDITIONAL BRANCH TO ADR 2040
		BDIA 104	AEND				
		BDIA 105	ATABLE	ADDR=2040			
2040	2810	BDIA 106	UB2040			SET DR K=01	SET DR-7 TO CONTINUE BR TESTS.
		BDIA 107	*				IF A STOP OCCURS AT THE NEXT
		BDIA 108	*				SEQUENTIAL WORD FOLLOWING THIS
		BDIA 109	*				BRANCH, G1 WAS SET WRONG OR THE
		BDIA 110	*				BRANCH TEST FAILED.
2042	C55F	BDIA 111		114	BCG10Y	BR IF G1 BIT0=1	G10=1 SHOULD BRANCH TO ADR 205E
		BDIA 112	AEND				
		BDIA 113	ATABLE	ADDR=205E			
205E	2810	BDIA 114	BCG10Y			SET DR K=01	SET DR-7 TO CONTINUE BR TESTS.
		BDIA 115	*				IF A STOP OCCURS AT THE NEXT
		BDIA 116	*				SEQUENTIAL WORD FOLLOWING THIS
		BDIA 117	*				BRANCH, G1 WAS SET WRONG OR THE
		BDIA 118	*				BRANCH TEST FAILED.
2060	D57F	BDIA 119		125	BCG11Y	BR IF G1 BIT1=1	G11=1 SHOULD BRANCH TO ADR 207E
		BDIA 120	AEND				
		BDIA 121	ATABLE	ADDR=0440			
0440	5007	BDIA 122	DR7OFF 0			STOP	CPU MODE AND DR 7 OFF.
		BDIA 123	AEND				
		BDIA 124	ATABLE	ADDR=207E			
207E	2800	BDIA 125	BCG11Y			SET DR K=00	THIS COMPLETES BDIA BRANCHING
		BDIA 126	*				TESTS.
		BDIA 127	*			**	
		BDIA 128	*			ALU TEST —MANY OF THE WORDS IN THIS TEST CAUSE ALU ERRORS IF THE CKT	
		BDIA 129	*			BEING TESTED FAILS AND THEREFORE DO NOT HAVE TO BE TESTED BY BR WDS	
		BDIA 130	*			**	
2080	3E09	BDIA 131				H0=0-K00	**FF=00-00 WITH NO CARRY
2082	C483	BDIA 132	DC0ER	132	DC0ER	BR IF Z=0	CHK FOR DYN BIT 0 BEING OFF.
2084	FC85	BDIA 133	DC7ER	133	DC7ER	BR IF LZ=0	CHK FOR DYN BIT 7 BEING OFF.
2086	E087	BDIA 134	DC6ER	134	DC6ER	BR IF HZ=0	CHK FOR DYN BIT 6 BEING OFF.
2088	F489	BDIA 135	ACONER	135	ACONER	BR IF AC=1	CHK FOR DYN BIT 3 BEING OFF

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
208A	6EE5	BDIA 136				HO=HO$HO	**FF=FF$FF
208C	A0DA	BDIA 137		195	CK4FF	BAL	**BRANCH TO CHECK HO FOR FF
208E	2E0D	BDIA 138				HO=HO+K00	**FF=FF+00
		BDIA 139	*				IF A STOP OCCURS AT THE ADDRESS
		BDIA 140	*				OF THE WORD BELOW, THE CHECK FOR
		BDIA 141	*				FF HAS FAILED.
2090	A0DA	BDIA 142		195	CK4FF	BAL	
2092	7EE1	BDIA 143				HO=HO-HO+1	**00=FF-FF+1 WITH A CARRY
		BDIA 144	*				IF A STOP OCCURS AT THE ADDRESS
		BDIA 145	*				OF THE WORD BELOW, THE CHECK FOR
		BDIA 146	*				FF HAS FAILED.
2094	F494	BDIA 147	NOACER	147	NOACER	BR IF AC=0	**SHOULD HAVE DYN 3 BIT ON
2096	7EE1	BDIA 148				HO=HO-HO+1	**00=00-00+1
2098	6EE3	BDIA 149				HO=HO+HO	**00=00+00
209A	2E5F	BDIA 150				HO=HO+K55	**55=00+55
209C	6EE3	BDIA 151				HO=HO+HO	**AA=55+55
209E	6EE9	BDIA 152				HOC=HO+HO+1	**55=AA+AA+1
20A0	0E5F	BDIA 153				Z=HO¤K55	**00=55¤55
20A2	C4A2	BDIA 154	WT3ER1	154	WT3ER1	BR IF ZNZ	**HO SHOULD BE 55 AND DYN BIT0=1
20A4	2E87	BDIA 155				HO=0$K88	**88=00$88
20A6	3E27	BDIA 156				HO=HO$K22	**AA=88$22
20A8	2EEF	BDIA 157				HO=HO+KEE	**98=AA+EE
20AA	2E77	BDIA 158				HO=0$K77	**77=00$77
20AC	1E87	BDIA 159				HO=HO*-K88	**77=77*-88
20AE	1EB7	BDIA 160				HO=HO*-KBB	**44=77*-BB
20B0	2EF7	BDIA 161				HO=0$KFF	**FF=00$FF
20B2	0E11	BDIA 162				Z=HO+K01	**00=FF+01
20B4	F0B4	BDIA 163	DC7ERR	163	DC7ERR	BR IF LZNZ	CHK FOR DYN BIT 7 BEING ON.
20B6	E0B6	BDIA 164	DC6ERR	164	DC6ERR	BR IF HZNZ	CHK FOR DYN BIT 6 BEING ON.
20B8	1EFB	BDIA 165				HO=HO¤KOF	**F0=FF¤0F
20BA	A0E2	BDIA 166		201	CK4FO	BAL	**BR TO CHECK HO FOR FO
20BC	1EF3	BDIA 167				HO=HO*-KOF	**F0=F0*-0F
		BDIA 168	*				IF A STOP OCCURS AT THE ADDRESS
		BDIA 169	*				OF THE WORD BELOW, THE CHECK FOR
		BDIA 170	*				FO HAS FAILED.
20BE	A0E2	BDIA 171		201	CK4FO	BAL	**BR TO CHECK HO FOR FO
20C0	3E15	BDIA 172				HO=HO$K10	**F0=F0$10
		BDIA 173	*				IF A STOP OCCURS AT THE ADDRESS
		BDIA 174	*				OF THE WORD BELOW, THE CHECK FOR
		BDIA 175	*				FO HAS FAILED.
20C2	A0E2	BDIA 176		201	CK4FO	BAL	**BR TO CHECK HO FOR FO
20C4	3E0D	BDIA 177				HO=HO-K00	**EF=F0-00
		BDIA 178	*				IF A STOP OCCURS AT THE ADDRESS
		BDIA 179	*				OF THE WORD BELOW, THE CHECK FOR
		BDIA 180	*				FO HAS FAILED.
20C6	2E1D	BDIA 181				HO=HO+K10	**FF=EF+10
20C8	2FF5	BDIA 182				H1=0$KFO	**F0=00+F0
20CA	A0DA	BDIA 183		195	CK4FF	BAL	**BR TO CHECK HO FOR FF
20CC	0FFD	BDIA 184				Z=H1¤KFO	**00=FO¤FO
		BDIA 185	*				IF A STOP OCCURS AT THE ADDRESS
		BDIA 186	*				OF THE WORD BELOW, THE CHECK FOR
		BDIA 187	*				FO HAS FAILED.
20CE	C4CE	BDIA 188	ALUER2	188	ALUER2	BR IF ZNZ	**H1 SHOULD BE FO AND DYN BIT 0=1

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
20D0	1FF5	BDIA 189				H1=H1*-KF0	**00=F0*-F0
20D2	C4D2	BDIA 190	ALUER3	190	ALUER3	BR IF ZNZ	**H1 SHOULD BE ZERO AND DYN BIT 0=1
20D4	2EF5	BDIA 191				H0=0$KF0	**F0=00$F0
20D6	A0E2	BDIA 192		201	CK4F0	BAL	**BR TO CHECK H0 FOR F0
20D8	A0E8	BDIA 193		207	MORTST	BR	**BR TO MODE REG SET/RESET TEST
		BDIA 194	*			**	
20DA	0EFF	BDIA 195	CK4FF			Z=H0¤KFF	H0 SHOULD BE FF
20DC	-C4E1	BDIA 196		198	ZISOK	BR IF Z=0	AND DYN BIT 0=1.
20DE	2810	BDIA 197	ANOTF0			SET DR K=01	SET DR 7 AND DO A RTN WHICH
20E0	128E	BDIA 198	ZISOK			RTN	WILL CAUSE A STOP WITH THE
		BDIA 199	*				ADDRESS OF THE BAL TO
		BDIA 200	*				THIS SUBROUTINE + 4.
20E2	0EFD	BDIA 201	CK4F0			Z=H0¤KF0	H0 SHOULD BE F0
20E4	C4DE	BDIA 202		197	ANOTF0	BR IF ZNZ	AND DYN BIT 0=1.
20E6	128E	BDIA 203				RTN	
		BDIA 204	*			***	
		BDIA 205	*			TEST MODE REG FOR SET/RESET	
		BDIA 206	*			***	
20E8	24F6	BDIA 207	MORTST			SET MODE K=3F	**SET LS AND EXT MODE TO 7
20EA	578F	BDIA 208				I0=BA	** GO=XIII XIII
20EC	1887	BDIA 209				I0=I0*-K88	** GO=77
20EE	087F	BDIA 210				Z=I0¤K77	
20F0	E0F0	BDIA 211	MDSTHI	211	MDSTHI	BR IF HZNZ	LOOP IF MODE REG 2-4 NOT ALL ON
20F2	F0F2	BDIA 212	MDSTLO	212	MDSTLO	BR IF LZNZ	LOOP IF MODE REG 5-7 NOT ALL ON
20F4	2400	BDIA 213				SET MODE K=00	**SET LS AND EXT MODE TO ZERO
20F6	574F	BDIA 214				GO=BA	**GO=X000X000
20F8	0487	BDIA 215				Z=GO*-K88	**Z=00
20FA	E0FA	BDIA 216	MDRTHI	216	MDRTHI	BR IF HZNZ	LOOP IF MODE REG 2-4 NOT ALL OFF
20FC	F0FC	BDIA 217	MDRTLO	217	MDRTLO	BR IF LZNZ	LOOP IF MODE REG 5-7 NOT ALL OFF
		BDIA 218	*			***	.
		BDIA 219	*			BEGIN STORAGE TEST	
		BDIA 220	*			***	
20FE	2EF7	BDIA 221				H0=0$KFF	
2100	2FF7	BDIA 222				H1=0$KFF	**H=FFFF
2102	6E02	BDIA 223				STH H DC,88	**CTRL ADDR 0388=FFFF
2104	2E05	BDIA 224				H0=0$K00	
2106	2F05	BDIA 225				H1=0$K00	**H=0000
2108	4E02	BDIA 226				RDH H DC,88	**READ CTRL STOR 0088 INTO H REG
210A	0FFF	BDIA 227				Z=H1¤KFF	**00=FF¤FF
210C	E08C	BDIA 228	DCR1ER	228	DCR1ER	BR IF HZNZ	LOOP IF H1 HIGH IS NOT F
210E	F08E	BDIA 229	DCR2ER	229	DCR2ER	BR IF LZNZ	LOOP IF H1 LOW IS NOT F
2110	1EFF	BDIA 230				H0=H0¤KFF	**00=FF¤FF H=00FF
2112	C492	BDIA 231	DCR0ER	231	DCR0ER	BR IF ZNZ	**SHOULD HAVE READ FF IN TO H0
2114	2E33	BDIA 232				H0=0$K03	
2116	2F87	BDIA 233				H1=0$K88	** H=0388
2118	6FE8	BDIA 234				STB H1 CS,H+1	** CTRL ADDR 0388=88FF H=0389
211A	6FEA	BDIA 235				STB H1 CS,H-1	** CTRL ADDR 0388=8889 H=0388
211C	44E8	BDIA 236				RDH G CS,H+2	** G=8889 H=038A
211E	2F13	BDIA 237				H1=0$K01	** H=0301
2120	048F	BDIA 238				Z=GO¤K88	**00=88¤88
2122	E0A2	BDIA 239	DCR3ER	239	DCR3ER	BR IF HZNZ	LOOP IF H1 HIGH IS NOT 8
2124	F0A4	BDIA 240	DCR4ER	240	DCR4ER	BR IF LZNZ	LOOP IF H1 LOW IS NOT 8
2126	257F	BDIA 241				G1=G1+K77	**00=89+77

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
2128	C4A8	BDIA 242	CSR1ER	242	CSR1ER	BR IF ZNZ	**SHOULD HAVE READ 89 IN TO G1
212A	2E05	BDIA 243				H0=0$K00	** H=0001
212C	55EA	BDIA 244				RDB G1 AS,H-1	**H=0000
212E	C4AE	BDIA 245	BMODER	245	BMODER	BR IF ZNZ	**ARITH MODIFIER OFF B REG FAILED IF BR
2130	2E45	BDIA 246				H0=0$K40	** H=4000
2132	3FE9	BDIA 247				H1=0-KE0	** H=401F
2134	25F7	BDIA 248	AUXSTT			G1=0$KFF	**G=88FF
2136	75E0	BDIA 249				STB G1 AS,H	**1ST PASS AUX ADDR 401E=XXFF H=401F
		BDIA 250	*				**2ND PASS AUX ADDR 401E=FFFF H=401E
2138	2505	BDIA 251				G1=0$K00	**G=8800
213A	55EA	BDIA 252				RDB G1 AS,H-1	**G=88FF AFTER 1ST PASS, H=401E
		BDIA 253	*				** AFTER 2ND PASS, H=401D
213C	05FF	BDIA 254				Z=G1□KFF	**00=FF□FF
213E	C4BE	BDIA 255	AUXERR	255	AUXERR	BR IF ZNZ	**SHOULD HAVE READ FF IN TO G1
2140	FB34	BDIA 256		248	AUXSTT	BR IF H1 BIT7=0	
2142	44E6	BDIA 257				G=H	** G=401D H=401D DBL BYTE MOD TEST
2144	044D	BDIA 258				Z=G0□K40	** 00=40□40
2146	C4C6	BDIA 259	DBMER0	259	DBMER0	BR IF ZNZ	** SHOULD HAVE MOVED 40 FROM H0 TO G0.
2148	75F1	BDIA 260				G1=G1-H1+1	** 00=1D-1D+1
214A	C4CA	BDIA 261	DBMER1	261	DBMER1	BR IF ZNZ	** SHOULD HAVE MOVED 1D FROM H1 TO G1
214C	C060	BDIA 262				RST S K=06	RESET S5 AND S6.
214E	88EC	BDIA 263		269	LSADDR	BR	**BR TO X LINE ADDRESSING TEST
		BDIA 264	AEND				
		BDIA 265	*			**	
		BDIA 266	*			X LINE ADDRESSING	
		BDIA 267	*			**	
		BDIA 268	ATABLE	ADDR=08EC			
08EC	D1ED	BDIA 269	LSADDR	269	LSADDR	BR IF S5=1	NO BR. CHECK S5 OFF.
08EE	E1EF	BDIA 270	CKS60F	270	CKS60F	BR IF S6=1	NO BR. CHECK S6 OFF.
08F0	2E87	BDIA 271				H0=0$K88	XXXK ADDRESSABLE 8A AND 8C
08F2	2F05	BDIA 272				H1=0$K00	X SET TO 8800 WHICH IS
08F4	6E12	BDIA 273				STH H DC,8A	X BR TO 0800
08F6	6E22	BDIA 274				STH H DC,8C	X
08F8	3EE9	BDIA 275				H0=0-KE0	0000 H SET TO 1F77. THIS IS THE
08FA	2F77	BDIA 276				H1=0$K77	0 INIT VALE REQ'D FOR A=0$KK
08FC	8802	BDIA 277		281	BEGMOD	BR	BR TO 0802
		BDIA 278	AEND				
		BDIA 279	ATABLE	ADDR=0800			
0800	4E02	BDIA 280	MODCWD			RDH H DC,88	XXXX MODIFY CTRL WD AT K88.
0802	2E1B	BDIA 281	BEGMOD			H0=H0+K01	X
0804	2F1D	BDIA 282				H1=H1+K10	X
0806	CA0D	BDIA 283		302	CKPASS	BR IF H0 BIT4=1	X BR AFTER 8TH PASS..
0808	6E02	BDIA 284				STH H DC,88	X
080A	8388	BDIA 285	C			XCTL'8388'	BR TO K ADDR 88 AT ADDR 0388.
		BDIA 286	*			FUNCTION PERFORMED BY CTRL WORDS IN K ADDR. CTRL STORAGE	
		BDIA 287	*			FIRST PASS SECOND PASS THIRD PASS FOURTH PASS	
		BDIA 288	*			88 2XX7 A=0$KK 88 0XXF Z=A□KK 88 4XX3 B=AXH+BL 88 0XXF Z=A□KK	
		BDIA 289	*			---------- ---------- ---------- ----------	
		BDIA 290	*			2087 U0=0$K88 008F Z=U0□88 4003 U0=U0XH+U0L 008F Z=U0□88	
		BDIA 291	*			2197 U1=0$K99 019F Z=U1□99 4113 U1=U1XH+U1L 019F Z=U1□99	
		BDIA 292	*			22A7 V0=0$KAA 02AF Z=V0□AA 4223 V0=V0XH+V0L 02AF Z=V0□AA	
		BDIA 293	*			23B7 V1=0$KBB 03BF Z=V1□BB 4333 V1=V1XH+V1L 03BF Z=V1□BB	
		BDIA 294	*			24C7 G0=0$KCC 04CF Z=G0□CC 4443 G0=G0XH+G0L 04CF Z=G0□CC	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		BDIA 295	*			25D7 G1=0$KDD 05DF Z=G1¤DD	4553 G1=G1XH+G1L 05DF Z=G1¤DD
		BDIA 296	*			26E7 D0=0$KEE 06EF Z=D0¤EE	4663 D0=D0XH+D0L 06EF Z=D0¤EE
		BDIA 297	*			27F7 D1=0$KFF 07FF Z=D1¤FF	4773 D1=D1XH+D1L 07FF Z=D1¤FF
		BDIA 298	*	8A	BR	8A BR IF ZNZ	8A BR 8A BR IF ZNZ
		BDIA 299	*			TO MODCWD. TO 038A.	TO MODCWD TO 038A
		BDIA 300	*	8C	BR	8C BR	8C BR 8C BR
		BDIA 301	*			TO MODCWD. TO MODCWD	TO MODCWD TO MODCWD
080C	E1A3	BDIA 302	CKPASS	313	PASS24	BR IF S6=1	CHECK PASS. BR AFTER 2ND OR 4TH.
080E	2020	BDIA 303				SET S6	S6=1 TO SAY NEXT PASS IS 2 OR 4.
0810	E190	BDIA 304	CKS6E1	304	CKS6E1	BR IF S6=0	CHECK SET OF S6
0812	2EC5	BDIA 305				H0=0$KC0	XXXX SET 8A TO C48A WHICH IS
0814	3E43	BDIA 306				H0=H0$K04	X BR IF ZNZ TO 038A
0816	2F85	BDIA 307				H1=0$K80	X
0818	3FA3	BDIA 308				H1=H1$K0A	X
081A	6E12	BDIA 309				STH H DC,8A	X
081C	2EF7	BDIA 310				H0=0$KFF	0000 H SET TO FF7F. THIS IS THE
081E	3F89	BDIA 311				H1=0-K80	0 INIT VALUE REQ'D FOR Z=A¤KK
0820	8802	BDIA 312		281	BEGMOD	BR	BR TO BEGIN MODIFIC OF CTRL WD.
0822	0020	BDIA 313	PASS24			RST S6	PASS 2 OR 4 JUST FINISHED. RESET
0824	E1A5	BDIA 314	CKS6E0	314	CKS6E0	BR IF S6=1	S6 TO INDICATE NEXT PASS IS 3RD.
0826	D1AC	BDIA 315		318	NOT4TH	BR IF S5=0	S5=1 INDICATES 4TH PASS COMP.
0828	0040	BDIA 316				RST S5	
082A	83D8	BDIA 317		331	LSSET	BR	BR TO LOCAL STOR SET/RESET TEST
082C	2040	BDIA 318	NOT4TH			SET S5	NEXT PASS IS THIRD
082E	D1AE	BDIA 319	CKS5E1	319	CKS5E1	BR IF S5=0	CK SET OF S5.
0830	4E22	BDIA 320				RDH H DC,8C	XXXX RESTORE 8A TO BR TO 0800
0832	6E12	BDIA 321				STH H DC,8A	X
0834	3EC9	BDIA 322				H0=0-KC0	0000 H SET TO 3FF3. THIS IS INIT
0836	5EF1	BDIA 323				H1=H0X	0 VALUE REQ'D FOR B=AXH+BL
0838	8802	BDIA 324		281	BEGMOD	BR	BR TO BEGIN MODIFIC OF CTRL WD.
		BDIA 325	AEND				
		BDIA 326	*				
		BDIA 327	*			***	
		BDIA 328	*			* LOCAL STORAGE SET/RESET ROUTINE..... ZONE ZERO	
		BDIA 329	*			***	
		BDIA 330	ATABLE	ADDR=03D8			
03D8	4812	BDIA 331	LSSET			RDH I DC,8A	I=C48A XXX K-ADDR BC IS SET TO
03DA	3935	BDIA 332				I1=I1$K30	I=C4BA X C4BC WHICH IS A
03DC	292B	BDIA 333				I1=I1+K02	I=C4BC X BR IF ZNZ
03DE	68E2	BDIA 334				STH I DC,BC	X TO ITSELF.
03E0	2A25	BDIA 335				T0=0$K20	XXXX T SET TO 20F7 WHICH IS
03E2	2BF5	BDIA 336				T1=0$KF0	X U0=0$KFF
03E4	3B73	BDIA 337				T1=T1$K07	X
03E6	2C25	BDIA 338				P0=0$K20	0000 P SET TO 201B WHICH IS
03E8	2D15	BDIA 339				P1=0$K10	0 U0=U0+K01
03EA	3DB3	BDIA 340				P1=P1$K0B	0
03EC	2E05	BDIA 341				H0=0$K00	XXXX H SET TO 0001 WHICH IS
03EE	2F13	BDIA 342				H1=0$K01	X Z=U0+K00
03F0	83D0	BDIA 343		355	STNWCW	BR	BR TO STORE THE THREE CONTROL
		BDIA 344	*				WORDS JUST BUILT IN T, P, AND H.
		BDIA 345	AEND				
		BDIA 346	ATABLE	ADDR=03C0			
03C0	C4C0	BDIA 347	NOTRST	347	NOTRST	BR IF ZNZ	CK THAT ALL BITS WERE RESET.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
03C2	4AC2	BDIA 348	RDOLCW			RDH T DC,B8	READ OLD CTRL WORDS.
03C4	4CD2	BDIA 349				RDH P DC,BA	READ OLD CTRL WORDS.
03C6	4EF2	BDIA 350				RDH H DC,BE	READ OLD CTRL WORDS.
03C8	2A1B	BDIA 351				TO=TO+K01	MODIFY CTRL WDS...INCREMENT X.
03CA	2C1B	BDIA 352				PO=PO+K01	MODIFY CTRL WDS...INCREMENT X.
03CC	2E1B	BDIA 353				HO=HO+K01	MODIFY CTRL WDS...INCREMENT X.
03CE	E0F2	BDIA 354		373	DYNCRT	BR IF HZNZ	BR IF SIXTEENTH PASS COMPLETED.
03D0	6AC2	BDIA 355	STNWCW			STH T DC,B8	STORE NEW CONTROL WORDS.
03D2	6CD2	BDIA 356				STH P DC,BA	STORE NEW CONTROL WORDS.
03D4	6EF2	BDIA 357				STH H DC,BE	STORE NEW CONTROL WORDS.
03D6	83B8	BDIA 358	C			XCTL'83B8'	BR TO K-ADDRESSABLE B8.
		BDIA 359	AEND				
		BDIA 360	*			**	
		BDIA 361	*			* THE 4 CONTROL WORDS BELOW WERE BUILT IN K-ADDRESSABLE CONTROL	
		BDIA 362	*			* STORAGE AND BRANCHED TO FROM THE WORD IMMEDIATLY ABOVE THESE COMENTS.	
		BDIA 363	*			* THIS IS DONE 16 DIFFERENT TIMES, WITH 'X' INCREMENTED EACH TIME TO	
		BDIA 364	*			* MODIFY THE FUNCTION OF THE WORDS.	
		BDIA 365	*			* K-ADDR B8...CTL STOR ADDR 03B8 EQUALS 2XF7 A=A$KFF	
		BDIA 366	*			* K-ADDR BA...CTL STOR ADDR 03BA EQUALS 2X1B A=A+K01	
		BDIA 367	*			* K-ADDR BC...CTL STOR ADDR 03BC EQUALS C4BC BR IF ZNZ TO ITSELF	
		BDIA 368	*			* K-ADDR BE...CTL STOR ADDR 03BE EQUALS 0X01 Z=A+K00	
		BDIA 369	*			*	
		BDIA 370	*			**	
		BDIA 371	ATABLE	ADDR=03F2			
		BDIA 372	*			**	
03F2	2505	BDIA 373	DYNCRT			G1=0$K00	**SET G1 TO ZERO AND THEN INCREMENT TO
03F4	251B	BDIA 374	ZINCR			G1=G1+K01	** OBTAIN ALL BIT COMBINATIONS ON Z BUS
03F6	F4FD	BDIA 375		381	ALUEDT	BR IF AC=1	**END OF TEST--BR TO ALU OE TEST
03F8	C4F4	BDIA 376		374	ZINCR	BR IF ZNZ	**BR BACK TO CHECK ALL Z BUSS BIT COMB
03FA	5007	BDIA 377				STOP	**DYN COND REG BIT 0 IS ON IN ERROR
		BDIA 378	*			**	
		BDIA 379	*			ALU ERROR DECTECTION TEST	
		BDIA 380	*			**	
03FC	2413	BDIA 381	ALUEDT			G0=0$K01	
03FE	883C	BDIA 382		386	ZEROG1	BR	
		BDIA 383	AEND				
		BDIA 384	ATABLE	ADDR=083A			
083A	6443	BDIA 385	CKALOE			G0=G0+G0	
083C	2505	BDIA 386	ZEROG1			G1=0$K00	
083E	7543	BDIA 387				G1=G1-G0	
0840	3808	BDIA 388				SET DR K=C0	**DISABLE STOP ON ERROR & FORCE PLUS
0842	050D	BDIA 389				Z=G1¤K00	** SIDE OF ALU A ENTRY CAUSING ALU CK
0844	3800	BDIA 390				SET DR K=80	
0846	DAC6	BDIA 391	ALCKER	391	ALCKER	BR IF MC BIT5=0	**ALU ERROR SHOULD HAVE SET MC 5
0848	1212	BDIA 392				RST MMSK K=91	
084A	2800	BDIA 393				SET DR K=00	
084C	C43A	BDIA 394		385	CKALOE	BR IF G0 BIT0=0	**BRANCH BACK TO CHECK EACH OE CKT
		BDIA 395	*			**	
		BDIA 396	*			STORAGE DATA,CONTROL WORD,STORAGE ADDRESS, A REG AND B REG	
		BDIA 397	*			PARITY DETECTION TEST----DC REG BITS 3,6 AND 7 MUST BE OFF	
		BDIA 398	*			**	
084E	2440	BDIA 399				SET MODE K=04	
0850	886E	BDIA 400		415	CKSTPC	BAL	**STORE ADDR OF CHECK DATA TO BE READ

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
0852	0E3F	BDIA 401				Z=HO□K33	**THIS ADDR CONTAINS 0E3F
0854	FED4	BDIA 402	ROCRCE	402	ROCRCE	BR IF MC3=0	**SHOULD HAVE RO CTRL WORD PARITY CHECK
0856	4E80	BDIA 403				RDH H CS,I	**H=0E3F WITH EVEN PARITY IN HO
0858	6E80	BDIA 404				STH H CS,I	**RESTORE CHECK DATA WITH GOOD PARITY
085A	FADA	BDIA 405	NOBPC	405	NOBPC	BR IF MC7=0	**SHOULD HAVE SET B REG PARITY CK LATCH
085C	0E3F	BDIA 406				Z=HO□K33	**SET A REG PARITY CK LT & RST DC3,6&7
085E	EADE	BDIA 407	NOAPC	407	NOAPC	BR IF MC6=0	**SHOULD HAVE SET A REG PARITY CK LATCH
0860	1212	BDIA 408				RST MMSK K=91	**RESET MC REG
0862	886E	BDIA 409		415	CKSTPC	BAL	**STORE ADDR OF CHECK DATA TO BE READ
0864	0F1F	BDIA 410				Z=H1□K11	**THIS ADDR CONTAINS 0F1F
0866	FEE6	BDIA 411	R1CRCE	411	R1CRCE	BR IF MC3=0	**SHOULD HAVE R1 CTRL WORD PARITY CHECK
0868	4E80	BDIA 412				RDH H CS,I	**H=0F1F WITH EVEN PARITY IN H1
086A	6E80	BDIA 413				STH H CS,I	**RESTORE CHECK DATA WITH GOOD PARITY
086C	02E2	BDIA 414				RTN H MMSK1=0	**CAUSE STOR ADDR CK--H1=1F WITH P BIT
086E	4E80	BDIA 415	CKSTPC			RDH H CS,I	**1ST LOOP H=0E3F,ON 2ND LOOP H=0F1F
0870	3804	BDIA 416				SET DR K=A0	**DISABLE STOP ON ERROR AND FORCE
0872	6E80	BDIA 417				STH H CS,I	** STORE BITS PO AND P1 TO MEMORY
0874	CAF4	BDIA 418	NOSDPC	418	NOSDPC	BR IF MC4=0	**SHOULD HAVE SET STOR DATA PARITY LT
0876	3800	BDIA 419				SET DR K=80	**RST FORCING OF STORE BITS PO AHD P1
0878	128E	BDIA 420				RTN	**RTN FOR ADDITIONAL TESTING & 2ND LOOP
		BDIA 421	AEND				
		BDIA 422	ATABLE		ADDR=0F1E		
0F1E	EE9E	BDIA 423	NOSTAC	423	NOSTAC	BR IF MC2=0	**SHOULD HAVE SET STORAGE ADDRESS CHECK
0F20	1212	BDIA 424				RST MMSK K=91	**RESET MC REG
0F22	5EFF	BDIA 425				H1=MC	**CHECK RESET OF MC REG
0F24	C4A4	BDIA 426	MCRSTE	426	MCRSTE	BR IF ZNZ	**MC REG SHOULD HAVE BEEN RESET
0F26	2800	BDIA 427				SET DR K=00	**ALLOW STOP ON ERROR
0F28	2020	BDIA 428				SET S6	
0F2A	9876	BDIA 434		IRST 004	STREST	BR	1400 SYSTEM RESET
		BDIA 438	AEND				

```
*********************************
* CROSS REFERENCE FOR CSECT BDIA *
*********************************
```

BDIA 018	INIZ 046
BDIA 056	BDIA 053
BDIA 061	BDIA 061
BDIA 066	BDIA 066
BDIA 075	BDIA 072
BDIA 083	BDIA 080
BDIA 087	BDIA 084
BDIA 096	BDIA 096
BDIA 101	BDIA 101
BDIA 106	BDIA 103
BDIA 114	BDIA 111
BDIA 122	BDIA 054
BDIA 125	BDIA 119
BDIA 132	BDIA 132
BDIA 133	BDIA 133
BDIA 134	BDIA 134
BDIA 135	BDIA 135
BDIA 147	BDIA 147
BDIA 154	BDIA 154
BDIA 163	BDIA 163

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                                  ***********************************
                                  * CROSS REFERENCE FOR CSECT BDIA *
                                  ***********************************
BDIA 164      BDIA 164
BDIA 188      BDIA 188
BDIA 190      BDIA 190
BDIA 195      BDIA 137    BDIA 142   BDIA 183
BDIA 197      BDIA 202
BDIA 198      BDIA 196
BDIA 201      BDIA 166    BDIA 171   BDIA 176   BDIA 192
BDIA 207      BDIA 193
BDIA 211      BDIA 211
BDIA 212      BDIA 212
BDIA 216      BDIA 216
BDIA 217      BDIA 217
BDIA 228      BDIA 228
BDIA 229      BDIA 229
BDIA 231      BDIA 231
BDIA 239      BDIA 239
BDIA 240      BDIA 240
BDIA 242      BDIA 242
BDIA 245      BDIA 245
BDIA 248      BDIA 256
BDIA 255      BDIA 255
BDIA 259      BDIA 259
BDIA 261      BDIA 261
BDIA 269      BDIA 263    BDIA 269
BDIA 270      BDIA 270
BDIA 281      BDIA 277    BDIA 312   BDIA 324
BDIA 302      BDIA 283
BDIA 304      BDIA 304
BDIA 313      BDIA 302
BDIA 314      BDIA 314
BDIA 318      BDIA 315
BDIA 319      BDIA 319
BDIA 331      BDIA 317
BDIA 347      BDIA 347
BDIA 355      BDIA 343
BDIA 373      BDIA 354
BDIA 374      BDIA 376
BDIA 381      BDIA 375
BDIA 385      BDIA 394
BDIA 386      BDIA 382
BDIA 391      BDIA 391
BDIA 402      BDIA 402
BDIA 405      BDIA 405
BDIA 407      BDIA 4C7
BDIA 411      BDIA 411
BDIA 415      BDIA 400    BDIA 409
BDIA 418      BDIA 418
BDIA 423      BDIA 423
BDIA 426      BDIA 426
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ADDR   WORD   SEQUENCE NO.   LABEL   NEXTSEQ   NEXTLABEL   STATEMENT   COMMENTS

```
            IAAA 001   T                                USERS INITIALIZATION PROCEEDURE      R.TAYLOR
            IAAA 002   *              ***********************************************************************
            IAAA 003   *                                                                                   *
            IAAA 004   *              1400   INITIALIZATION PROCEDURE                                       *
            IAAA 005   *                     DISREGARD SRL INITIALIZATION PROCEEDURE (FORM A24-3512-1)      *
            IAAA 006   *                                                                                   *
            IAAA 007   *              STEP 1 LOCATE THE OVERLAY CARD IN THE CSL DECK.THIS CARD IS PHYSICALLY*
            IAAA 008   *                     LOCATED AS THE THIRD CARD PRECEEDING THE END CARD .THIS CARD IS*
            IAAA 009   *                     BLANK IN COLS 5-68 AND HAS AN ADDRESS IN COLS 69-72(7040OR9040)*
            IAAA 010   *                                                                                   *
            IAAA 011   *              STEP 2 READ THE LIST OF CARD COLUMNS THAT MAY BE SUBJECT TO CHANGE.   *
            IAAA 012   *                     CONFIGURE ONLY THOSE COLUMNS THAT MUST BE VARIED AND PLACE THE *
            IAAA 013   *                     BYTE REPRESENTATION NEXT TO THE AFFECTED COLUMN IN THE SPACE   *
            IAAA 014   *                     PROVIDED.CARD PUNCHING SHOULD BE DONE AFTER ALL ASSIGNMENTS ARE*
            IAAA 015   *                     CHECKED AND LOGGED IN THE SPACE PROVIDED.                      *
            IAAA 016   *                                                                                   *
            IAAA 017   *              NOTE   IF AN ASSIGNMENT VALUE IS 40(BLANK), A SUBSTITUTION MUST BE    *
            IAAA 018   *                     MADE FOR THAT CARD COLUMN. THE 40 ASSIGNMENT IS POSSIBLE ONLY  *
            IAAA 019   *                     IN THE CARD COLUMNS LISTED.FOLLOW SUBSTITUTION CODE INSTRUCTION*
            IAAA 020   *                          CARD COLUMN(S)            SUBSTITUTE CODE                 *
            IAAA 021   *                          6-11                           60                        *
            IAAA 022   *                          13                             04                        *
            IAAA 023   *                          28                             CO                        *
            IAAA 024   *                          38,40,42,44                    44                        *
            IAAA 025   *                          45                             CO                        *
            IAAA 026   *                          60                             44                        *
            IAAA 027   *                          63,64    (A) ¤ 8 TAPES  TURN ON UNUSED BIT               *
            IAAA 028   *                                   (B) 8 TAPES   SINGLE 9 TRACK TAPE ADDRESS       *
            IAAA 029   *                                                 CANNOT BE  XX1                    *
            IAAA 030   *                                                                                   *
            IAAA 031   *              STEP 3 CONFIGURE THE OVERLAY CARD. LEAVE COLUMN BLANK IF NO CHANGE IS *
            IAAA 032   *                     REQUIRED.                                                      *
            IAAA 033   *              COL  ALTER TO MAS FUNCTION COMMENTS REGARDING ASSIGNMENT              *
            IAAA 034   *              ---  -------- --- -------- ----------------------------------------*
            IAAA 035   *               5            08 TAU ADDR.  ADDRESS IS LOW ORDER DIGIT                *
            IAAA 036   *               6            CO TAPE#1     HI DIGIT(C=9TK,0=200BPI,4=556BPI,8=800BPI*
            IAAA 037   *                               TAPE#1 LO DIGIT IS LOW ORDER OF SYSTEM ADDRESS(0TO7)*
            IAAA 038   *               7            C1 TAPE#2   HIGH AND LOW DIGITS,FOR MEANING SEE COL 6   *
            IAAA 039   *               8            C2 TAPE#3   SEE COL 6                                   *
            IAAA 040   *               9            C3 TAPE#4                                               *
            IAAA 041   *              10            C4 TAPE#5                                               *
            IAAA 042   *              11            C5 TAPE#6                                               *
            IAAA 043   *                                                                                   *
            IAAA 044   *              13            01(21IF 24K)   BIAS CONSTANT HI SEE FIG #1 FOR VALUES   *
            IAAA 045   *              14            80 BIAS CONSTANT LO MAS  ASSIGNS FOR 16K 1400 PROGRAM   *
            IAAA 046   *                                             RESIDING IN EITHER 16 OR 24K MEMORY*
            IAAA 047   *              28            04 MCS     LENGTH CODE   48 CHARACTER STANDARD SEE FIG#2 *
            IAAA 048   *                                                                                   *
            IAAA 049   *              33            8E PRT CTL  BIT 0 ON IF GREATER THAN 120 PRINT POSITION*
            IAAA 050   *                                          BITS 3-7  PRINTER CHANNEL ADDRESS (OE). NO *
            IAAA 051   *                                          NEED TO ALTER BITS3-7 IF NATIVE PRINTER   *
            IAAA 052   *              35            0A CHAN RD  CHANNEL READER ADDRESS SET FOR 0A.(1442)    *
            IAAA 053   *              36            00 2ND  RD  USERS OPTION                                *
```

ADDR   WORD SEQUENCE NO. LABEL   NEXTSEQ   NEXTLABEL STATEMENT   COMMENTS

```
            IAAA 054    *            37               00 DK MOD    DISK MODULE  ASSIGNMENT FOR 1400 DRIVE 1   *
            IAAA 055    *            38               81 DK 360    DISK ASSIGN   TO 360 ADDR. HI DIGIT 8,4,2,1 *
            IAAA 056    *                                          REFERS TO  NPL DRIVE 0,1,2,3 RESPECTIVELY  *
            IAAA 057    *                          ******         LO DIGIT HERE CONTROLS ALL FILE OPERATIONS *
            IAAA 058    *                          ******         BIT7=1 MODULE OVFL DETECT,BIT6=1 COMPARE    *
            IAAA 059    *                          ******         DISABLE ON . LO ORDER DIGIT 0 FOR DR 2-5    *
            IAAA 060    *            39               02 DK MOD    MODULAR ADDRESS ASSIGNED TO 1400 DRIVE  2  *
            IAAA 061    *            40               40 DK 360    DISK ASSIGN   TO 360 ADDR, SEE COL 38,LO=0 *
            IAAA 062    *            41               04 DK MOD    MODULAR ADDRESS ASSIGNED TO 1400 DRIVE 3   *
            IAAA 063    *            42               20 DK 360    DISK ASSIGN TO 360 ADDRESS,SEE COL38,LO=0  *
            IAAA 064    *            43               06 DK MOD    MODULAR ADDRESS ASSIGNED TO 1400 DRIVE 4   *
            IAAA 065    *            44               10 DK 360    DISK ASSIGN TO 360 ADDRESS,SEE COL38,LO=0  *
            IAAA 066    *            45               00 SEN SW    B-G ARE REPRESENTATIVE IN BITS 1 TO 6.     *
            IAAA 067    *                                          DEVICE EOF SETS BITS 0,7 ACCORDINGLY      *
            IAAA 068    *            47               80 1052 CTL   80= A TYPEHEAD,CO= H TYPEHEAD             *
            IAAA 069    *                                                                                    *
            IAAA 070    *            59               08 DK MOD    DO NOT ALTER UNLESS PROG PREVIOUSLY RAN    *
            IAAA 071    *            60               00 DK 360    WITH 5 DISK DRIVES. SEE SRL.               *
            IAAA 072    *            61               E8 1400 CTL   HI  ORDER BYTE  SEE FIG3 BELOW--BIT       *
            IAAA 073    *            62               00 1400 CTL   LOW ORDER BYTE  SEE FIG3 BELOW-SIGNIFCANT*
            IAAA 074    *            63               FF 9TK FLG    BITS 0-7 RESPECTIVELY ARE 360 TAPE DR 0-7*
            IAAA 075    *            64               00 PH2 ENC    PHASE ENCODED BITS 0-7 ARE USED TO        *
            IAAA 076    *                                          FURTHER DEFINE 360 ADDRESSED TAPE DRIVES  *
            IAAA 077    *                                          AS PHASE ENCODED IF THE TAPE IS ALSO 9TK  *
            IAAA 078    *            ****************************************************************************
            IAAA 079    *                                                                                    *
            IAAA 080    *            FIG1  BIAS CONSTANT TABLE          **FIG2 MCS      FIG3 HI 1400 CTL  *
            IAAA 081    *                * 16,384  24,576  32,768  49,152**BITO OFF      BITO I/O CHECK STP*
            IAAA 082    *            *1400******************************************  1 240CH     1 NOT USED      *
            IAAA 083    *            ************************************************  2 120CH     2 EX PRINT EDIT*
            IAAA 084    *              16K *  0180 * 2180 * 4180 * 8180 **  3 80 CH     3 PER/COMMA INV*
            IAAA 085    *            *******---------------------------------**  4 60 CH     4 COLUMN BINARY*
            IAAA 086    *              12K * 1120 * 3120 * 5120 * 9120 **  5 48 CH  ++ 5 NO PUNCH BUFR*
            IAAA 087    *            *******---------------------------------**  6 40 CH  ++ 6 MODEL G EMUL.*
            IAAA 088    *               8K * 20CO * 40CO * 60CO * AOCO **  7 16 CH  ++ 7 51 COL CARDS *
            IAAA 089    *            *******--------------------------------**++ E50 ONLY     LO 1400 CTL  *
            IAAA 090    *               4K *  3060 * 5060 * 7060 * B060 **1442         BITO ALT READ TAPE*
            IAAA 091    *            *******--------------------------------**EMULATION    1 NOT USED       *
            IAAA 092    *               2K *  3830 * 5830 * 7830 * B830 **ON NATIVE    2 TAPE ERASE     *
            IAAA 093    *            *******--------------------------------**2540         3 ALT 9 TK TAPE*
            IAAA 094    *             1.4K *  3A88 * 5A88 * 7A88 * BA88 **BIT          4 OFF           *
            IAAA 095    *            *******VALUES FOR HIGH MEMORY ADDRESS **5 RD AND PCH   5 CHANNEL PRINT*
            IAAA 096    *            *******MICROPROG CONTROLLED FROM BIAS **6 SEL ERR CD   6 STERLING(WT) *
            IAAA 097    *            *******   3F *    5F *   7F *   BF   **7 EMULATE SW   7 STERLING(WT) *
            IAAA 098    *            ****************************************************************************
            IAAA 099    *            STEP 4 REFER TO THE PUNCH CARD CODES GIVEN IN THE BCPL ROUTINE           *
            IAAA 100    *                                                                                    *
            IAAA 101    *            STEP 5 PUNCH THE TRANSLATED CHARACTER IN THE APPROPRIATE COLUMN OF       *
            IAAA 102    *                   OVERLAY CARD IF  YOUR  ASSIGNMENT DIFFERS FROM THE MAS ASSIGN     *
            IAAA 103    *                                                                                    *
            IAAA 104    *            STEP 6 PLACE OVERLAY CARD BACK INTO THE CSL DECK (EVEN IF ALTERATIONS    *
            IAAA 105    *                   HAVE NOT BEEN  MADE) AT ITS PREVIOUS LOCATION.                    *
            IAAA 106    *
```

ADDR   WORD SEQUENCE NO. LABEL   NEXTSEQ NEXTLABEL STATEMENT   COMMENTS

```
              IAAA 107    *              STEP 7  REMEMBER TO USE THE PREVIOUS OVERLAY CARD WHEN YOU RECEIVE      *
              IAAA 108    *                      FUTURE *E40 OR  *E50  CORE LOADS.                               *
              IAAA 109    *                                                                                     *
              IAAA 110    *              NOTE    WHEN CHANGING PHYSICAL MEMORY SIZES TO OR FROM 24K THE ADDRESS *
              IAAA 111    *                      MUST BE ALTERED IF THE OLD OVERLAY CARD IS TO BE USED.         *
              IAAA 112    *                      SIMPLY CHANGE COLUMN 1 TO THE PUNCH CODE FOR 70(NOT 24K) OR 90 *
              IAAA 113    *              ***********************************************************************
```

IADD DESCRIPTIVE TEXT

OBJECTIVES

ADD

THE DATA IN THE A-FIELD IS ADDED ALGEBRAICALLY TO THE DATA
IN THE B-FIELD. THE RESULT IS STORED IN THE B-FIELD.
    THE B-FIELD MUST HAVE A DEFINING WORD MARK. THIS WORD
MARK STOPS THE ADD OPERATION.
    IF THE A-FIELD IS LONGER THAN THE B-FIELD, THE HIGH
ORDER POSITIONS OF THE A-FIELD (THAT EXCEED THE B-FIELD
LENGTH) ARE NOT PROCESSED.

SUBTRACT

THE NUMERICAL DATA IN THE A-FIELD IS SUBTRACTED ALGEBRA-
ICALLY FROM THE NUMERICAL DATA IN THE B-FIELD. THE RESULT
IS STORED IN THE B-FIELD.
    A WORD MARK DEFINES THE B-FIELD. AN A-FIELD REQUIRES A
WORD MARK ONLY IF IT IS SHORTER THAN THE B-FIELD. IN THIS
CASE THE A-FIELD WORD MARK STOPS TRANSMISSION OF DATA.

NOTE   THE ADD INSTRUCTION WITH A-ADDRESS ONLY CAUSES
THE DATA IN THE A-FIELD TO BE ADDED TO ITSELF. THE
SINGLE ADDRESS SUBTRACT INSTRUCTION CAUSES THE DATA IN
THE A-FIELD TO BE SUBTRACTED FROM ITSELF. THE A-FIELDS
MUST HAVE DEFINING WORD MARKS.

ENTRY POINTS

SUBTOP

SUBTRACT OPERATIONS ENTER HERE FROM I-CYCLES.

ADDOP

ADD OPERATIONS ENTER HERE FROM I-CYCLES.

CORCH

SPECIAL CHARACTER LOOP. SPECIAL CHARACTERS ARE
CONVERTED TO NUMERICALLY SIGNIFICANT VALUES. THIS
IS REQUIRED, FOR EXAMPLE, BY 1400-SERIES ADDRESS
CHARACTERS THAT USE THE 8-PUNCH. THIS ROUTINE
IS USED BY IADD, IMAD, IDVD, AND IMPY.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IADD 001	T			ADD SUBTRACT ROUTINE KRAGER	
		IADD 002	*			SIGN ANALYSIS LOOP. SIGNS ARE CHECKED AND COMP IS TURNED ON IF	
		IADD 003	*			NECESSARY. FLAG BITS ARE SET TO INDICATE FIELD POLARITIES	
1702	3585	IADD 004	SUBTOP			G1=G1$K80	SET UP FOR SUBTRACT
1704	10EE	IADD 005	ADDOP			RST S K=FE	CLEAR S REGISTER
1706	571A	IADD 006				RDB D1 U-1	READ A FIELD
1708	C711	IADD 007		011	NOSPEC	BR IF D1 BIT0=1	BR IF NOT A SPECIAL CHAR
170A	57D9	IADD 008				P1=D1	
170C	8442	IADD 009		160	CORCHR	BAL	CORRECT CHARACTER
170E	5D79	IADD 010				D1=P1	
1710	E717	IADD 011	NOSPEC	014	APLUS	BR IF D1 BIT2=1	BR IF A CHAR IS PLUS
1712	F716	IADD 012		014	APLUS	BR IF D1 BIT3=0	BR IF A CHAR IS PLUS
1714	158D	IADD 013				G1=G1¤K80	A MINUS SET COMP ON
1716	5D30	IADD 014	APLUS			RDB P1 V+0	READ B FIELD
1718	CD1D	IADD 015		017	BNOSPC	BR IF P1 BIT0=1	BR IF NOT A SPECIAL CHAR
171A	8442	IADD 016		160	CORCHR	BAL	CORRECT CHARACTER
171C	ED25	IADD 017	BNOSPC	021	BPLUS	BR IF P1 BIT2=1	BR IF CHAR IS PLUS
171E	FD24	IADD 018		021	BPLUS	BR IF P1 BIT3=0	BR IF CHAR IS PLUS
1720	158D	IADD 019				G1=G1¤K80	B MINUS INVERT COMP BIT
1722	2040	IADD 020				SET S5	SET B FLD MINUS FLAG ON
1724	57AD	IADD 021	BPLUS			T0=D1L	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1726	5DFD	IADD 022				H1=P1L	
1728	C530	IADD 023		035	TRUADD	BR IF G1 BIT0=0	BR IF TRUE ADD
172A	3000	IADD 024				SET S0	SET COMP ADD CONTROL ON
172C	7222	IADD 030				STH V DA,8C	SAVE B STAR ADD
172E	A4DC	IADD 032		086	COMPAD	BR	GO DO COMP ADD
		IADD 033	*			TRUE ADD LOOP FOR UNITS POSITION OR ONE CHARACTER FIELDS. THE	
		IADD 034	*			ORIGIONAL B FIELD SIGN IS STORED OVER THE UNITS DIGIT.	
1730	3A95	IADD 035	TRUADD			T0=T0$K90	
1732	7FAF	IADD 036				H1C=H1∂T0+C	ADD NUMERIC BITS
1734	4DFB	IADD 037				H1=P1H+H1L	ADD ZONE BITS
1736	3FC5	IADD 038				H1=H1$KC0	
1738	0F1B	IADD 039				Z=H1¤K01	CK FOR POSSIBLE SLASH RSLT
173A	F0C2	IADD 040		044	NOSLSH	BR IF LZNZ	BR IF NOT SLASH
173C	0FED	IADD 041				Z=H1¤KE0	CK HIGH BITS
173E	E0C2	IADD 042		044	NOSLSH	BR IF HZNZ	BR IF NOT SLASH
1740	1F8D	IADD 043				H1=H1¤K80	CORRECT CHARACTER
1742	DD73	IADD 044	NOSLSH	078	OVFLOK	BR IF P1 BIT1=1	BR IF NO B FLD WM
1744	F5CC	IADD 045		058	ADWM	BR IF S3=0	BR IF NO OVERFLOW
1746	5A82	IADD 054				RDH T DA,A8	
1748	3B43	IADD 055				T1=T1$K04	SET OVERFLOW INDICATOR ON
174A	7A82	IADD 056				STH T DA,A8	
174C	1F45	IADD 058	ADWM			H1=H1*-K40	ADD WM TO CHAR
174E	7F3A	IADD 059				STB H1 V-1	STORE CHAR
1750	8D7C	IADD 060		ICYC 037	HISTRT	BR	
		IADD 061	*			MAIN DATA LOOP. ONLY NUMERIC DATA IS USED,ZONE BITS ARE DESTROYED.	
1752	571A	IADD 062	MAINLP			RDB D1 U-1	READ A FIELD
1754	C75D	IADD 063		067	AOK	BR IF D1 BIT0=1	BR IF NOT A SPECIAL CHAR
1756	57D9	IADD 064				P1=D1	
1758	8442	IADD 065		160	CORCHR	BAL	CORRECT CHARACTER
175A	5D79	IADD 066				D1=P1	
175C	5D30	IADD 067	AOK			RDB P1 V+0	READ B FIELD
175E	CD63	IADD 068		070	BOK	BR IF P1 BIT0=1	
1760	8442	IADD 069		160	CORCHR	BAL	
1762	47AD	IADD 070	BOK			T0=D1L+T0H	
1764	5DFD	IADD 071				H1=P1L	
1766	7FAF	IADD 072				H1C=H1∂T0+C	ADD NUMERICS
1768	DD71	IADD 073		077	CONTIN	BR IF P1 BIT1=1	BR IF NO B FLD WM
176A	C5EF	IADD 074		076	CKEND	BR IF S0=1	BR IF COMP ADD ON
176C	AA52	IADD 075		129	TRUEND	BR	
176E	AD60	IADD 076	CKEND	104	CMPEND	BR	
1770	3FF5	IADD 077	CONTIN			H1=H1$KF0	REMOVE ZONE BITS
1772	7F3A	IADD 078	OVFLOK			STB H1 V-1	STORE CHARACTER
1774	D753	IADD 079		062	MAINLP	BR IF D1 BIT1=1	BR IF NO A FLD WM
1776	E1DD	IADD 080		067	AOK	BR IF S6=1	
1778	2020	IADD 081				SET S6	SET A END FLAG
177A	27B5	IADD 082				D1=0$KB0	SET A REG TO 0
177C	975C	IADD 083		067	AOK	BR	
		IADD 084	*			COMPLIMENT ADD LOOP FOR UNITS POSITION OR ONE CHARACTER FIELDS.	
		IADD 085	*			A STANDARD PLUS OR MINUS SIGN IS INSERTED IN THIS POSITION.	
24DC	2002	IADD 086	COMPAD			SET S3	SET CARRY IN ON
24DE	7FAF	IADD 087				H1C=H1∂T0+C	ADD CHARACTER
24E0	5FFD	IADD 088				H1=H1L	SAVE NUMERIC BITS
24E2	D1E6	IADD 089		091	SETP	BR IF S5=0	BR IF B FIELD PLUS

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
24E4	3F15	IADD 090				H1=H1$K10	
24E6	3FC5	IADD 091	SETP			H1=H1$KC0	FORM STANDARD SIGN
24E8	DD6C	IADD 092		094	GOON	BR IF P1 BIT 1=0	BR IF B FLD WM
24EA	9772	IADD 093		078	OVFLOK	BR	
24EC	F5F0	IADD 094	GOON	096	RCMPU	BR IF S3=0	BR IF RECOMPLEMENT NEEDED
24EE	974C	IADD 095		058	ADWM	BR	
24F0	1F1D	IADD 096	RCMPU			H1=H1⌐K10	INVERT SIGN
24F2	5FB9	IADD 097				T1=H1	
24F4	2002	IADD 098				SET S3	FORCE CARRY IN
24F6	2F07	IADD 099				H1=0	
24F8	7FBF	IADD 100				H1C=H1∂T1+C	RECOMP CHAR
24FA	4BFB	IADD 101				H1=T1H+H1L	ADD SIGN
24FC	974C	IADD 102		058	ADWM	BR	
		IADD 103	*			COMPLIMENT ADD END ROUTINE	
2D60	3FB5	IADD 104	CMPEND			H1=H1$KB0	
2D62	7F3A	IADD 105				STB H1 V-1	STORE CHAR
2D64	F5E8	IADD 106		113	RECOMP	BR IF S3=0	
2D66	8D7C	IADD 107		ICYC 037	HISTRT	BR	
2D68	5222	IADD 113	RECOMP			RDH V DA,8C	READDRESS UNITS POSITION
2D6A	5530	IADD 115				RDB G1 V+0	READ B FIELD
2D6C	151D	IADD 116				G1=G1⌐K10	INVERT SIGN
2D6E	2002	IADD 117				SET S3	SET CARRY IN
2D70	2D07	IADD 118	NTDONE			P1=0	ZERO A FIELD
2D72	55BD	IADD 119				T1=G1L	
2D74	7DBF	IADD 120				P1C=P1∂T1+C	ADD NUMERICS
2D76	45DB	IADD 121				P1=G1H+P1L	ADD ORIGONAL ZONES
2D78	D57F	IADD 122		125	STND	BR IF G1 BIT 1=1	BR IF NO WM
2D7A	7D3A	IADD 123				STB P1 V-1	STORE LAST CHAR
2D7C	8D7C	IADD 124		ICYC 037	HISTRT	BR	RTN TO I CYCLES
2D7E	7D3A	IADD 125	STND			STB P1 V-1	STORE CHAR
2D80	5530	IADD 126				RDB G1 V+0	READ NEXT CHAR
2D82	AD70	IADD 127		118	NTDONE	BR	
		IADD 128	*			TRUE A DD END ROUTINE.	
2A52	4FDD	IADD 129	TRUEND			P1=H1L+P1H	ADD ORIGIONAL ZONE BITS
2A54	3D45	IADD 130				P1=P1$K40	INSURE 1 BIT ON
2A56	5FC0	IADD 131				RDB H1 AS,P	CONVERT TO BCD
2A58	F5E2	IADD 132		146	XAXA	BR IF S3=0	BR IF NO NUMERIC OVFLO
2A5A	2F1D	IADD 133				H1=H1+K10	ADD 1 TO B FLD ZONES
2A5C	5A82	IADD 142				RDH T DA,A8	ACCESS OVERFLOW BYTE
2A5E	3B43	IADD 143				T1=T1$K04	SET OVERFLOW BIT ON
2A60	7A82	IADD 144				STH T DA,A8	STORE BACK
2A62	E1F1	IADD 146	XAXA	153	SKIP	BR IF S6=1	BR IF A FLD HAS TERMINATED
2A64	5C49	IADD 147				G0=P0	
2A66	5759	IADD 148				G1=D1	
2A68	3545	IADD 149				G1=G1$K40	INSURE 1 BIT ON
2A6A	5540	IADD 150				RDB G1 AS,G	CONVERT TO BCD
2A6C	555B	IADD 151				G1=G1H	
2A6E	6F53	IADD 152				H1=H1+G1	ADD ZONES
2A70	1FC5	IADD 153	SKIP			H1=H1*-KC0	INSURE 0&1 BITS OFF
2A72	5CE9	IADD 154				H0=P0	
2A74	5DE0	IADD 155				RDB P1 AS,H	CONVERT TO NPL
2A76	1D45	IADD 156				P1=P1*-K40	ADD WM TO CHARACTER
2A78	7D3A	IADD 157				STB P1 V-1	STORE CHARACTER

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
2A7A	8D7C	IADD 158		ICYC 037	HISTRT	BR	
		IADD 159	*			SPECIAL CHARACTER LOOP.	
0442	0DF5	IADD 160	CORCHR			Z=P1*-KF0	
0444	F0D9	IADD 161		171	CKIT	BR IF LZ=0	BR IF CHAR NUMERIC BITS=0
0446	0DAB	IADD 162				Z=P1□K0A	
0448	F0D5	IADD 163		169	PGBLK	BR IF LZ=0	BR IF CHAR NUMERIC BITS 10
044A	0D1B	IADD 164				Z=P1□K01	TEST CHAR LOW BITS
044C	F0D1	IADD 165		167	ISE1	BR IF LZ=0	BR IF CHAR IS A /
044E	1D83	IADD 166	NOE1			P1=P1*-K08	REMOVE 4 BIT
0450	3D85	IADD 167	ISE1			P1=P1$K80	FORCE QUAD 3
0452	128E	IADD 168				RTN	
0454	1DF3	IADD 169	PGBLK			P1=P1*-K0F	REMOVE LOW 4 BITS
0456	F95C	IADD 170		173	THREE	BR IF P1 BIT7=0	BR UNCD
0458	ED61	IADD 171	CKIT	175	BOTH	BR IF P1 BIT2=1	
045A	FD64	IADD 172		177	BLANK	BR IF P1 BIT3=0	
045C	1D1D	IADD 173	THREE			P1=P1□K10	INVERT ZONE BITS
045E	FD50	IADD 174		167	ISE1	BR IF P1 BIT3=0	
0460	1D3D	IADD 175	BOTH			P1=P1□K30	INVERT ZONE BITS
0462	FD51	IADD 176		167	ISE1	BR IF P1 BIT3=1	
0464	3DB5	IADD 177	BLANK			P1=P1$KB0	
0466	128E	IADD 178				RTN	

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**********************************
* CROSS REFERENCE FOR CSECT IADD *
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```
IADD 004    ICYC 247
IADD 005    ICYC 246
IADD 011    IADD 007
IADD 014    IADD 011   IADD 012
IADD 017    IADD 015
IADD 021    IADD 017   IADD 018
IADD 035    IADD 023
IADD 044    IADD 040   IADD 042
IADD 058    IADD 045   IADD 095   IADD 102
IADD 062    IADD 079
IADD 067    IADD 063   IADD 080   IADD 083
IADD 070    IADD 068
IADD 076    IADD 074
IADD 077    IADD 073
IADD 078    IADD 044   IADD 093
IADD 086    IADD 032
IADD 091    IADD 089
IADD 094    IADD 092
IADD 096    IADD 094
IADD 104    IADD 076
IADD 113    IADD 106
IADD 118    IADD 127
IADD 125    IADD 122
IADD 129    IADD 075
IADD 146    IADD 132
IADD 153    IADD 146
IADD 160    IADD 009   IADD 016   IADD 065   IADD 069   IDVD 033   IDVD 047   IDVD 159   IMAD 013   IMAD 027   IMPY 030   IMPY 081   IMPY 096
IADD 167    IADD 165   IADD 174   IADD 176
IADD 169    IADD 163
```

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                                   **********************************
                                   * CROSS REFERENCE FOR CSECT IADD *
                                   **********************************
     IADD 171     IADD 161
     IADD 173     IADD 170
     IADD 175     IADD 171
     IADD 177     IADD 172
```

IBCH   DESCRIPTIVE   TEXT

OBJECTIVES

BRANCH IF INDICATOR ON

THE D-CHARACTER SPECIFIES THE INDICATOR TESTED. IF THE IN-
DICATOR IS ON THE NEXT INSTRUCTION IS TAKEN FROM THE
I-ADDRESS.

BRANCH INSTRUCTION

THIS INSTRUCTION ALWAYS CAUSES THE PROGRAM TO BRANCH TO THE
INSTRUCTION SPECIFIED BY THE I-ADDRESS WITHOUT TESTING FOR
SPECIFIC CONDITIONS. THIS BRANCH IS HANDLED BY THE IUBR   ENTRY POINT
ROUTINE.

BRANCH

BRANCH IF CHARACTER EQUAL

THIS IS THE EXCLUSIVE ENTRY POINT TO THIS ROUTINE.
ENTRY IS FROM ICYC FOR ALL BRANCH OPERATIONS AND
FROM THE A AND B INVALID ADDRESS CHECK ROUTINE FOR
ADDRESS CHECK ON BRANCH OPS.

THIS INSTRUCTION CAUSES THE SINGLE CHARACTER AT THE B-
ADDRESS TO BE COMPARED TO THE D-CHARACTER. IF IT HAS THE
SAME BIT CONFIGURATION AS THE D-CHARACTER, THE PROGRAM
BRANCHES TO THE I-ADDRESS.

ADDR	WORD	SEQUENCE NO.	LABEL		NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IBCH 001	T				BRANCH CHAR EQUAL OR ON INDICATOR.	KRAGER
134C	D250	IBCH 002	BRANCH		004	NOTUCD	BR IF DO BIT5=0	CK FOR UNCD BR
134E	9E72	IBCH 003	GOBR		IUBR 002	UNCDBR	BR	
1350	C663	IBCH 004	NOTUCD		013	I50P	BR IF DO BIT0=1	BR IF INDICATOR OP
1352	06F9	IBCH 005					Z=DO+KFO	TEST FOR INVD ADDR
1354	F4D8	IBCH 006			008	NOERR	BR IF AC=0	BR IF ADDR OK
1356	81DA	IBCH 007			IERR 036	CKAORB	BR	ERROR GO SET STOP CODE
1358	5F3A	IBCH 008	NOERR				RDB H1 V-1	READ B FIELD
135A	6F71	IBCH 009					H1=H1¤D1	COMPARE CHARACTERS
135C	0F45	IBCH 010					Z=H1*-K40	
135E	C4CF	IBCH 011			003	GOBR	BR IF Z=0	BR IF EQUAL
1360	8D7C	IBCH 012	IEND		ICYC 037	HISTRT	BR	
1362	5E82	IBCH 013	I50P				RDH H DA,A8	READ K8
1364	8747	IBCH 014			015	ZONE N	N=D1 BITS23	DECODE MODIFIER ZONES
1340	9320	IBCH 015	ZONE	0	040	ABZONE	BR	
1342	90C4	IBCH 016	ZONE	1	083	BONLY	BR	
1344	8307	IBCH 017	ZONE	2	024	AONLY N	N=D1L	
1346	079B	IBCH 018	ZONE	3			Z=D1¤K09	
1348	F0E6	IBCH 019			021	NOZONE	BR IF LZNZ	
134A	8900	IBCH 020			IOCM 042	DECODE	BR	BR ON CHANNEL 9
1366	07CB	IBCH 021	NOZONE				Z=D1¤K0C	
1368	F0E0	IBCH 022			012	IEND	BR IF LZNZ	
136A	8900	IBCH 023			IOCM 042	DECODE	BR	BR ON CHANNEL 12
1300	9098	IBCH 024	AONLY	0	061	DASH	BR	BR ON PRNTR ERROR ( )
1302	90A8	IBCH 025	AONLY	1	069	IIII	BR	BR ON UNEQUAL (/)
1304	90B0	IBCH 026	AONLY	2	073	KKKK	BR	BR EQUAL (S)

ADDR	WORD	SEQUENCE NO.	LABEL		NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1306	90AC	IBCH 027	AONLY	3	071	JJJJ	BR	BR LOW (T)
1308	90A4	IBCH 028	AONLY	4	067	HHHH	BR	BR HIGH (U)
130A	8104	IBCH 029	AONLY	5	110	RRRR	BR	BR FILE STATUS (V)
130C	8104	IBCH 030	AONLY	6	110	RRRR	BR	(W)
130E	8104	IBCH 031	AONLY	7	110	RRRR	BR	(X)
1310	8104	IBCH 032	AONLY	8	110	RRRR	BR	(Y)
1312	DB27	IBCH 033	AONLY	9	058	OVFLO	BR IF H1 BIT5=1	BR ON OVERFLOW (Z)
1314	8D7C	IBCH 034	AONLY	A	ICYC 037	HISTRT	BR	INVALID
1316	8D7C	IBCH 035	AONLY	B	ICYC 037	HISTRT	BR	INVALID
1318	8D7C	IBCH 036	AONLY	C	ICYC 037	HISTRT	BR	BR ON PROC CK (%)
131A	8D7C	IBCH 037	AONLY	D	ICYC 037	HISTRT	BR	INVALID
131C	810A	IBCH 038	AONLY	E	107	QQQQ	BR	BR FILE STATUS ( )
131E	8D7C	IBCH 039	AONLY	F	ICYC 037	HISTRT	BR	INVALID
1320	6DD3	IBCH 040	ABZONE				P1=P1+P1	SHIFT LEFT
1322	FD1F	IBCH 041			039	AONLY F	BR IF P1 BIT3=1	INVALID
1324	B971	IBCH 042			043	SSW N	N=P1L	BR ON SENSE SWITCHES
10E0	81D0	IBCH 043	SSW	0	121	RDRER	BR	BR ON READER ERROR
10E4	CE7E	IBCH 044	SSW	2	057	ABEND	BR IF HO BIT0=0	TEST BIT 0 EVEN SS A
10E6	9E72	IBCH 045			IUBR 002	UNCDBR	BR	
10E8	DE7E	IBCH 046	SSW	4	057	ABEND	BR IF HO BIT1=0	TEST BIT 1 EVEN SS B
10EA	9E72	IBCH 047			IUBR 002	UNCDBR	BR	
10EC	EE7E	IBCH 048	SSW	6	057	ABEND	BR IF HO BIT2=0	TEST BIT 2 EVEN SS C
10EE	9E72	IBCH 049			IUBR 002	UNCDBR	BR	
10F0	FE7E	IBCH 050	SSW	8	057	ABEND	BR IF HO BIT3=0	TEST BIT 3 EVEN SS D
10F2	9E72	IBCH 051			IUBR 002	UNCDBR	BR	
10F4	CA7E	IBCH 052	SSW	A	057	ABEND	BR IF HO BIT4=0	TEST BIT 4 EVEN SS E
10F6	9E72	IBCH 053			IUBR 002	UNCDBR	BR	
10F8	DA7E	IBCH 054	SSW	C	057	ABEND	BR IF HO BIT5=0	TEST BIT 5 EVEN SS F
10FA	9E72	IBCH 055	SSDONE		IUBR 002	UNCDBR	BR	
10FC	EA7B	IBCH 056	SSW	E	055	SSDONE	BR IF HO BIT6=1	BR SS G TEST BIT 6 EVEN
10FE	8D7C	IBCH 057	ABEND		ICYC 037	HISTRT	BR	
1326	1F43	IBCH 058	OVFLO				H1=H1*-K04	RESET OVERFLOW BIT
1328	7E82	IBCH 059					STH H DA,A8	RESTORE CONTROL BYTE
132A	9E72	IBCH 060			IUBR 002	UNCDBR	BR	
1098	C722	IBCH 061	DASH		066	AEND	BR IF D1 BIT0=0	BR IF MODIFIER A DASH
109A	8890	IBCH 062			IOCM 039	PTRER	BR	BR ON PRINTER ERROR
109C	2D95	IBCH 063	TPBUSY				P1=0$K90	SET P TO 0094
109E	3D43	IBCH 064					P1=P1$K04	FOR READ OUT OF O STAR
10A0	52C0	IBCH 065					RDH V AS,P	PUT O * IN B *
10A2	8D7C	IBCH 066	AEND		ICYC 037	HISTRT	BR	
10A4	CF22	IBCH 067	HHHH		066	AEND	BR IF H1 BIT0=0	TEST BIT 0 ODD
10A6	9E72	IBCH 068			IUBR 002	UNCDBR	BR	
10A8	DF22	IBCH 069	IIII		066	AEND	BR IF H1 BIT1=0	TEST BIT 1 ODD
10AA	9E72	IBCH 070			IUBR 002	UNCDBR	BR	
10AC	EF22	IBCH 071	JJJJ		066	AEND	BR IF H1 BIT2=0	TEST BIT 2 ODD
10AE	9E72	IBCH 072			IUBR 002	UNCDBR	BR	
10B0	FF22	IBCH 073	KKKK		066	AEND	BR IF H1 BIT3=0	TEST BIT 3 ODD
10B2	9E72	IBCH 074			IUBR 002	UNCDBR	BR	
10B4	CB22	IBCH 075	LLLL		066	AEND	BR IF H1 BIT4=0	TEST BIT 4 ODD
10B6	9E72	IBCH 076			IUBR 002	UNCDBR	BR	
10B8	DB22	IBCH 077	MMMM		066	AEND	BR IF H1 BIT5=0	TEST BIT 5 ODD
10BA	9E72	IBCH 078			IUBR 002	UNCDBR	BR	
10BC	EB22	IBCH 079	NNNN		066	AEND	BR IF H1 BIT6=0	TEST BIT 6 ODD

ADDR	WORD	SEQUENCE NO.	LABEL		NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
10BE	9E72	IBCH 080			IUBR 002	UNCDBR	BR	
10C0	FB22	IBCH 081	PPPP		066	AEND	BR IF H1 BIT7=0	TEST BIT 7 ODD
10C2	9E72	IBCH 082			IUBR 002	UNCDBR	BR	
10C4	C748	IBCH 083	BONLY		101	BSPECL	BR IF D1 BIT0=0	BR IF & OR *
10C6	B311	IBCH 084			088	BZONE	N	N=D1L
1080	8160	IBCH 088	BZONE	0	LERR 002	ERRTST 0	BR	BR ON PUNCH ERROR
1082	909C	IBCH 090	BZONE	1	063	TPBUSY	BR	BR ON TAPE OVERLAP BUSY
1084	8A30	IBCH 091	BZONE	2	JEND 129	EOR	BR	BR ON END OF REEL (K)
1086	8270	IBCH 092	BZONE	3	JEND 139	ERROR	BR	BR ON TAPE ERROR (L)
1088	8D7C	IBCH 093	BZONE	4	ICYC 037	HISTRT	BR	INVALID
108A	810C	IBCH 094	BZONE	5	108	SSSS	BR	BR ON FILE STATUS (N)
108C	8D7C	IBCH 095	BZONE	6	ICYC 037	HISTRT	BR	INVALID
108E	8900	IBCH 096	BZONE	7	IOCM 042	DECODE	BR	BR ON PRINTER BUSY
1090	90BC	IBCH 097	BZONE	8	079	NNNN	BR	BR ON INQ REQUEST (Q)
1092	57F9	IBCH 098	BZONE	9			H1=D1	BR ON CARRIAGE BUSY -R-
1094	3F63	IBCH 099					H1=H1$K06	
1096	8902	IBCH 100			IOCM 043	CKBIT	BR	
10C8	07CB	IBCH 101	BSPECL				Z=D1□K0C	
10CA	F0B5	IBCH 102			075	LLLL	BR IF LZ=0	BR IF INQUIRY CLEAR TEST
10CC	07C5	IBCH 103					Z=D1*-K00	
10CE	F08C	IBCH 104			095	BZONE 6	BR IF LZNZ	
10D0	5EF9	IBCH 105					H1=H0	BR ON EOF 1442-2 &
10D2	90C0	IBCH 106			081	PPPP	BR	
010A	2513	IBCH 107	QQQQ				G1=0$K01	
010C	251B	IBCH 108	SSSS				G1=G1+K01	
010E	8106	IBCH 109			111	READKA	BR	
0104	5759	IBCH 110	RRRR				G1=D1	
0106	5EB2	IBCH 111	READKA				RDH H DA,AE	READ FILE STATUS BYTE
0108	9153	IBCH 112			113	FILE N	N=G1 BITS567	
01C0	90B8	IBCH 113	FILE	0	077	MMMM	BR	BR ON ANY FILE ERROR (Y)
01C2	8D7C	IBCH 114	FILE	1	ICYC 037	HISTRT	BR	INVALID
01C4	90B0	IBCH 115	FILE	2	073	KKKK	BR	BR ON FILE BUSY ( )
01C6	8D7C	IBCH 116	FILE	3	ICYC 037	HISTRT	BR	INVALID
01C8	90C0	IBCH 117	FILE	4	081	PPPP	BR	BR ON FILE NOT RDY (N)
01CA	90BC	IBCH 118	FILE	5	079	NNNN	BR	BR ON FILE ER (V)
01CC	90B4	IBCH 119	FILE	6	075	LLLL	BR	BR ON FILE WLR (W)
01CE	90AC	IBCH 120	FILE	7	071	JJJJ	BR	BR ON FILE ADDR CMPR (X)
01D0	5E92	IBCH 121	RDRER				RDH H DA,AA	READ ERROR BYTE
01D2	DA46	IBCH 122			116	FILE 3	BR IF H0 BIT5=0	BR IF NO READ ERROR
01D4	1E43	IBCH 123					H0=H0*-K04	RESET ERROR BIT
01D6	7E92	IBCH 124					STH H DA,AA	STORE BYTE BACK
01D8	9E72	IBCH 125			IUBR 002	UNCDBR	BR	

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**********************************
* CROSS REFERENCE FOR CSECT IBCH *
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IBCH 002	ICYC 235	IERR 016	
IBCH 003	IBCH 011		
IBCH 004	IBCH 002		
IBCH 008	IBCH 0C6		
IBCH 012	IBCH 022		
IBCH 013	IBCH 004		
IBCH 015	IBCH 014		
IBCH 021	IBCH 019		

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***********************************
* CROSS REFERENCE FOR CSECT IBCH *
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IBCH 024      IBCH 017
IBCH 039      IBCH 041
IBCH 040      IBCH 015
IBCH 043      IBCH 042
IBCH 055      IBCH 056
IBCH 057      IBCH 044    IBCH 046   IBCH 048   IBCH 050   IBCH 052   IBCH 054
IBCH 058      IBCH 033
IBCH 061      IBCH 024
IBCH 063      IBCH 090
IBCH 066      IBCH 061    IBCH 067   IBCH 069   IBCH 071   IBCH 073   IBCH 075   IBCH 077   IBCH 079   IBCH 081
IBCH 067      IBCH 028
IBCH 069      IBCH 025
IBCH 071      IBCH 027    IBCH 120
IBCH 073      IBCH 026    IBCH 115
IBCH 075      IBCH 102    IBCH 119
IBCH 077      IBCH 113
IBCH 079      IBCH 097    IBCH 118
IBCH 081      IBCH 106    IBCH 117
IBCH 083      IBCH 016
IBCH 088      IBCH 084
IBCH 095      IBCH 104
IBCH 101      IBCH 083
IBCH 107      IBCH 038
IBCH 108      IBCH 094
IBCH 110      IBCH 029    IBCH 030   IBCH 031   IBCH 032
IBCH 111      IBCH 109
IBCH 113      IBCH 112
IBCH 116      IBCH 122
IBCH 121      IBCH 043
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ICLR DESCRIPTIVE TEXT

OBJECTIVES

THIS INSTRUCTION CLEARS UP TO 100 POSITIONS OF PROGRAM STOR-
AGE OF DATA. CLEARING STARTS AT THE A-ADDRESS AND CONTINUES
LEFTWARD TO THE NEAREST HUNDREDS POSITION. THE CLEARED AREA
IS SET TO BLANKS. FOR THE CLEAR STORAGE AND BRANCH INSTRUCT-
ION, CLEARING STARTS AT THE B-ADDRESS. THE I-ADDRESS GIVES
THE LOCATION OF THE NEXT INSTRUCTION.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		ICLR 001	T	1400		CLEAR, CLEAR AND BRANCH OPS.	KRAGER
21D8	4426	ICLR 002	CLRSTR			G=V	SET UP FOR CVT TO DEC
21DA	A304	ICLR 003		ICTD 021	CYTDEC	BAL	
21DC	2545	ICLR 004				G1=0$K40	SET BLANK CHAR
21DE	3002	ICLR 005				SET S K=90	SET S0 AND S3 ON
21E0	2A13	ICLR 006				TO=0$K01	SET SUBT CONST
21E2	0F05	ICLR 007				Z=H1*-K00	
21E4	C4ED	ICLR 008		012	STLAST	BR IF Z=0	
21E6	753A	ICLR 009	STORBK			STB G1 V-1	BLANK OUT B FLD CHAR
21E8	7FAF	ICLR 010				H1C=H1∂TO+C	SUBTRACT 1
21EA	C4E6	ICLR 011		009	STORBK	BR IF ZNZ	BCH IF NOT 0 RSLT
21EC	753A	ICLR 012	STLAST			STB G1 V-1	BLANK LAST POSITION
21EE	0E05	ICLR 013				Z=H0*-K00	CHECK HI ADDR
21F0	C4F6	ICLR 014	BCHCK	025	SETADR	BR IF ZNZ	BCH IF NOT WRAP
21F2	52A2	ICLR 022				RDH V DA,AC	
21F4	23F7	ICLR 024				V1=0$KFF	
21F6	F27B	ICLR 025	SETADR	027	ICYC	BR IF DO BIT7=1	BR IF CHAIN CMND
21F8	D27C	ICLR 026		028	GOBNCH	BR IF DO BIT5=0	BR IF CLR AND BR
21FA	8D7C	ICLR 027	ICYC	ICYC 037	HISTRT	BR	RTN TO I CYCLES
21FC	9E72	ICLR 028	GOBNCH	IUBR 002	UNCDBR	BR	GO BRANCH

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**********************************
* CROSS REFERENCE FOR CSECT ICLR *
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ICLR 002	ICYC 228
ICLR 009	ICLR 011
ICLR 012	ICLR 008
ICLR 025	ICLR 014
ICLR 027	ICLR 025
ICLR 028	ICLR 026

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		ICMP 001	T		1400	COMPARE OP	KRAGER
		ICMP 002	*			B FIELD COMPARED TO A FIELD CHAR BY CHAR. ON CMND CHAINED OPS THE	
		ICMP 003	*			CODE IS NOT CHANGED IF THE FIELDS ARE EQUAL. 4BIT=HI 5BIT=NOT EQUAL	
		ICMP 004	*			6BIT=LOW 7BIT=EQUAL	
26E0	7F71	ICMP 005	CONTIN			H1=H1-D1+1	COMPARE CHAR
26E2	C4ED	ICMP 006		011	COMPAR	BR IF Z=0	BR IF CHAR EQUAL
26E4	F4EB	ICMP 007		010	HIGHCD	BR IF AC=1	
26E6	2E63	ICMP 008				HO=0$K06	SET B LESS THAN A
26E8	A6EC	ICMP 009		011	COMPAR	BR	
26EA	2EC3	ICMP 010	HIGHCD			HO=0$K0C	SET B MORE THAN A
26EC	571A	ICMP 011	COMPAR			RDB D1 U-1	READ A FIELD CHAR
26EE	5F3A	ICMP 012				RDB H1 V-1	READ B FIELD CHAR
26F0	D74E	ICMP 013		021	CKBFWM	BR IF D1 BIT1=0	BCH ON A FLD WM
26F2	DF61	ICMP 014		005	CONTIN	BR IF H1 BIT1=1	BCH IF NO B FLD WM
26F4	3F45	ICMP 015				H1=H1$K40	INSURE NO B WM
26F6	7F71	ICMP 016	BFLDWM			H1=H1-D1+1	COMPARE CHAR
26F8	C4D3	ICMP 017		023	COMPEQ	BR IF Z=0	BR IF CHAR EQUAL
26FA	F4D1	ICMP 018		022	SETHGH	BR IF AC=1	
26FC	2E63	ICMP 019				HO=0$K06	SET B LESS THAN A
26FE	A6D8	ICMP 020		034	SETNEW	BR	
26CE	DF76	ICMP 021	CKBFWM	016	BFLDWM	BR IF H1 BIT1=0	BCH ON B WM
26D0	2EC3	ICMP 022	SETHGH			HO=0$K0C	SET B MORE THAN A
26D2	DA59	ICMP 023	COMPEQ	034	SETNEW	BR IF HO BIT5=1	BR IF UNEQUAL
26D4	F25F	ICMP 024		038	ENDOFC	BR IF DO BIT7=1	BR IF CHAINED COMP
26D6	2E13	ICMP 025				HO=0$K01	SET EQUAL COMPARE
26D8	5A82	ICMP 034	SETNEW			RDH T DA,A8	READ OLD COND CODE
26DA	4EB3	ICMP 035				T1=HOXH+T1L	SET NEW COND CODE
26DC	7A82	ICMP 036				STH T DA,A8	STORE NEW COND CODE
26DE	8D7C	ICMP 038	ENDOFC	ICYC 037	HISTRT	BR	RETURN TO I CYCLES

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*********************************
* CROSS REFERENCE FOR CSECT ICMP *
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ICMP 005    ICMP 014
ICMP 010    ICMP 007
ICMP 011    ICMP 006    ICMP 009    ICYC 283
ICMP 016    ICMP 021
ICMP 021    ICMP 013
ICMP 022    ICMP 018
ICMP 023    ICMP 017
ICMP 034    ICMP 020    ICMP 023
ICMP 038    ICMP 024
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ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		ICOM 001	T	1400		COMMON ROUTINES	TAYLOR
0118	0A61	ICOM 002	UNPACK			Z=T0+K06	ADD 6 TO DIGIT
011A	E094	ICOM 003		006	ATOF	BR IF HZNZ	TEST FOR A THRU F
011C	2AFD	ICOM 004				T0=T0+KF0	0-9 ADD F
011E	128E	ICOM 005				RTN	RETURN
0114	2A7F	ICOM 006	ATOF			T0=T0+K77	A-F ADD 77
0116	128E	ICOM 007				RTN	RETURN

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***********************************
* CROSS REFERENCE FOR CSECT ICOM *
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ICOM 002   ISTP 015 ISTP 018 ISTP 021 ISTP 024   JTYP 508
ICOM 006   ICOM 003

ICTD DESCRIPTIVE TEXT

OBJECTIVES

STORAGE CLEARS TO THE NEXT HUNDREDS POSITION. OTHER OPER-
ATIONS THAT USE THIS ROUTINE ARE   DISPLAY MESSAGE, STORE A-
OR B-STAR, AND INSTRUCTION STEP.

THIS ROUTINE IS USED FOR 1400-SERIES OPERATIONS THAT REQUIRE

REFERENCE TO UNIQUE DECIMAL VALUES. FOR EXAMPLE, CLEAR

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		ICTD 001	T			1401 COMPATIBILITY FEAT CONVERT ADDR BACK TO DEC. 1/12/67 R.C.HUANG
		ICTD 002	*			THIS IS A BAL ROUTINE WHICH CONVERTS THE HEX EQUIVALENT OF A 1401 ADDR
		ICTD 003	*			BACK TO DECIMAL. THE REGISTERS USED IN THIS ROUTINE ARE T,G,P,AND H.
		ICTD 004	*			UPON ENTRY, THE ADDR TO BE CONVERTED SHOULD BE IN G REG. CONV. ANSWER
		ICTD 005	*			IN H REGISTERS UPON RETURN WITH H1-LO AS UNIT'S, H1-HI AS TEN'S, HO-LO
		ICTD 006	*			AS HUNDRED'S, AND HO-HI AS THOUSAND'S. ONLY THOUSAND'S IS IN BINARY,
		ICTD 007	*			THE REST ARE ALL IN DECIMAL.
2300	54A2	ICTD 019	LOWRAP			RDH G DA,AC	GET HIGHEST ADDRESS
2302	35F7	ICTD 020				G1=G1$KFF	
2304	5A02	ICTD 021	CYTDEC			RDH T DA,88	READ BIAS CONSTANT
2306	2C07	ICTD 022				PO=0	INITIALIZE TO ZERO
2308	2E25	ICTD 023				HO=0$K20	
230A	2002	ICTD 025				SET S3	
230C	75B9	ICTD 026				G1C=G1-T1+C	SUBT BIAS LOW
230E	74A9	ICTD 027				GOC=GO-TO+C	SUBT BIAS HIGH
2310	F580	ICTD 028		019	LOWRAP	BR IF S3=0	ADDRESS LESS THAN BIAS
2312	6443	ICTD 029				GO=GO+GO	2 TIMES
2314	54D9	ICTD 030				P1=GO	STORE 2X IN P1
2316	6443	ICTD 031				GO=GO+GO	4 TIMES - QUOTIENT
2318	6D4B	ICTD 032				P1C=P1+GO	6 TIMES,CARRY IN S3
231A	6D53	ICTD 033				P1=P1+G1	**ADD 6XHI TO LO - REMAINDER
231C	F4A4	ICTD 034		038	NOCARY	BR IF AC=0	BR IF NO CARRY OUT
231E	244B	ICTD 035	CARY			GO=GO+K04	**CARRY OUT,ADD 1 TO QUOTIENT
2320	2D6B	ICTD 036				P1=P1+K06	ADD 6 TO REMAINDER
2322	F49F	ICTD 037		035	CARY	BR IF AC=1	BR IF CARRY OUT
2324	F5AC	ICTD 038	NOCARY	042	NOS3	BR IF S3=0	**BR IF NO CARRY WHEN X 6
2326	244B	ICTD 039	CARRYO			GO=GO+K04	**CARRY OUT,ADD 1 TO QUOTIENT
2328	2D6B	ICTD 040				P1=P1+K06	ADD 6 TO REMAINDER
232A	F4A7	ICTD 041		039	CARRYO	BR IF AC=1	BR IF CARRY OUT
232C	5DF5	ICTD 042	NOS3			H1=P1XL	TAKE REMAINDER HI
232E	2FBD	ICTD 043				H1=H1+KB0	**SET UP H TO ADDR AUX 1 TABLE
2330	55E0	ICTD 044				RDB G1 AS,H	X'LATE REM.HI TO DEC.
2332	1002	ICTD 045				RST S K=90	RESET SO, S3
2334	2F07	ICTD 046				H1=0	ZERO OUT RESULT REGS
2336	5FE9	ICTD 047				HO=H1	
2338	D03E	ICTD 048		051	N250	BR IF GO BIT5=0	BR IF NOT TO ADD 0250
233A	2F55	ICTD 049				H1=0$K50	GO5=1 ADD 0250
233C	2E23	ICTD 050				HO=0$K02	
233E	CD42	ICTD 051	N250	053	NADD1	BR IF P1 BIT0=0	BR IF REMAINDER ☐ 128
2340	2E1B	ICTD 052				HO=HO+K01	**REMAINDER ☐ OR = 128, ADD 100

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
2342	F148	ICTD 053	NADD1	059	TABOK	BR IF G1 BIT7=0	BR IF TABLE VALUE OK
2344	2E1B	ICTD 054				HO=HO+K01	**TABLE VALUE IS 101 LESS
		ICTD 055	*			THE TRANSLATION TABLE OF REMAINDER-HI IS SET UP WITH VALUES AS 11 FOR	
		ICTD 056	*			112, 07 FOR 208, 23 FOR 224,AND 39 FOR 240. SO THEY ARE 101 LESS OR	
		ICTD 057	*			201 LESS. THESE ARE THE ONLY VALUES IN THE TABLE WITH BIT 7 ON.	
2346	2002	ICTD 058				SET S3	
2348	C04C	ICTD 059	TABOK	065	N500	BR IF G0 BIT4=0	BR IF NOT TO ADD 500
234A	2E5B	ICTD 060				HO=HO+K05	G04=1, ADD 500
		ICTD 061	*			REG. G0 (REMAINDER) BITS 4,5=00 - ADD 0000	
		ICTD 062	*			01 - ADD 0250	
		ICTD 063	*			10 - ADD 0500	
		ICTD 064	*			11 - ADD 0750	
234C	C952	ICTD 065	N500	068	LESS8	BR IF P1 BIT4=0	BR IF REM.LO ¤ 8
234E	2F8B	ICTD 066				H1=H1+K08	**REM.LO ¤ OR =8. ADD 8 TO TOTAL
2350	1D83	ICTD 067				P1=P1*-K08	STRIP BIT 4 - WEIGHT8
2352	5DDD	ICTD 068	LESS8			P1=P1L	TAKE REMAINDER LO
2354	7FDF	ICTD 069				H1C=H1aP1+C	**ADD IT TO TOTAL. CAN'T HAVE
		ICTD 070	*				CARRY - OUT
2356	7F5F	ICTD 071				H1C=H1aG1+C	**ADD REM.HI VALUE FROM TABLE
2358	7ECF	ICTD 078				HOC=HOaPO+C	**PROPAGATE CARRY TO HI,P0=00
235A	544B	ICTD 080				G0=G0H	**TAKE THOUSANDS ONLY FROM QUOTIENT
235C	6E43	ICTD 081				HO=HO+G0	ADD IN BINARY TO HIGH
235E	128E	ICTD 082				RTN	DONE

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*********************************
* CROSS REFERENCE FOR CSECT ICTD *
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ICTD 019	ICTD 028
ICTD 021	ICLR 003 IDIS 021 IDIS 025 ISAB 041 ISTP 009
ICTD 035	ICTD 037
ICTD 038	ICTD 034
ICTD 039	ICTD 041
ICTD 042	ICTD 038
ICTD 051	ICTD 048
ICTD 053	ICTD 051
ICTD 059	ICTD 053
ICTD 065	ICTD 059
ICTD 068	ICTD 065

I-CYCLES OBJECTIVES

I-CYCLE OBJECTIVES VARY ACCORDING TO INSTRUCTION LENGTH
AND TYPE. THERE ARE 6 VALID INSTRUCTION LENGTHS- I1 (OPER-
ATION ALONE), I2, I4, I5, I7, AND I8. INSTRUCTION LENGTH AND
OP CODE VALIDITY ARE INDICATED BY WORD MARKS (1-BIT OFF).

I8 OBJECTIVES

1. NORMAL I-CYCLE ENTRY POINT (HISTRT). READ OPERATION
CODE, CHECK FOR WM. USE TABLE IN AUXILIARY STORAGE TO CONVERT
1400-SERIES OP CODE TO BIT SIGNIFICANT OP CODE AND PLACE IT IN
LOCAL STORAGE ZONE 0, G1 REGISTER.

2. READ I1 CHARACTER. CHECK FOR Q-OP CODE, INITIALIZE STATUS
REGISTER. USE I1 CHARACTER TO LOOK UP AUXILIARY STORAGE POS-
ITION. VALUE READ FROM TABLE INCLUDES HUND, THOU, AND BIAS.
THIS IS THE FIRST STEP IN DEVELOPING THE ACTUAL ADDRESS.

3. READ I2 CHARACTER. CHECK FOR SPECIAL CHARACTER, INVALID
DIGIT, ETC. IF THERE ARE TENS ZONES, BRANCH TO THE INDEXING
ROUTINE (INDX), PERFORM THE INDEXING OPERATION AND RETURN AT
THE SETTO LABEL WITH COMPLETE INDEXED A-ADDRESS.

4. IF THERE ARE NO TENS ZONES, READ I3 CHARACTER AND COMPLETE
TRANSLATION OF A-ADDRESS INCLUDING THOUSANDS ZONES.

5. READ I4 CHARACTER. TRANSFER A-ADDRESS TO A-STAR (U-REG),
AND SET STATUS. EXAMINE AND CLASSIFY I4 CHARACTER (BRANCH,
I/O OP, ETC.) TRANSLATE I4 ADDRESS FROM AUXILIARY STORAGE.

6. READ I5 CHARACTER. THIS IS A REPETITION OF STEP 3 WITH I5
SUBSTITUTED FOR I2.

7. REPEAT STEP 4 (IF APPLICABLE) WITH I6 SUBSTITUTED FOR I3.

8. READ I7 CHARACTER. TRANSFER B-ADDRESS TO B-STAR (V-REG).
SET MODIFIER CHARACTER INTO D1-REG.

9. READ I8 CHARACTER (WITH WM) AND SET STATUS. DECODE THE
OPERATION AND BRANCH TO THE APPROPRIATE ROUTINE FOR EXECUTION.

I7 OBJECTIVES

1 - 7. SAME AS FOR I8 OBJECTIVES.

8. READ I7 CHARACTER (WITH WM). TRANSFER B-ADDRESS TO B-STAR
(V-REG). BRANCH TO OPI478. DECODE OPERATION CODE AND BRANCH
TO APPROPRIATE ROUTINE FOR EXECUTION.

I5 OBJECTIVES

1 - 5. SAME AS FOR I8 OBJECTIVES.
6. READ I5 CHARACTER (WITH WM). BRANCH TO I25OP. SET MOD-
IFIER (I4 CHARACTER) INTO D1-REG AND SET STATUS. DECODE THE
OPERATION AND BRANCH TO THE APPROPRIATE ROUTINE FOR EXECUTION.

I4 OBJECTIVES

1 - 4. SAME AS FOR I8 OBJECTIVES.
5. READ I4 (WITH WM), TRANSFER A-ADDRESS TO A-STAR AND SET
STATUS. DECODE THE OPERATION AND BRANCH TO THE APPROPRIATE
ROUTINE FOR EXECUTION.

I2 OBJECTIVES

1 AND 2. SAME AS FOR I8 OBJECTIVES.
3. READ I2 CHARACTER (WITH WM). BRANCH TO I25OP. SET THE
MODIFIER CHARACTER INTO D1-REG. SET STATUS. DECODE THE OPER-
ATION AND BRANCH TO THE APPROPRIATE ROUTINE FOR EXECUTION.

I1 OBJECTIVES

1. SAME AS STEP 1 OF I8 OBJECTIVES.
2. READ THE I1 CHARACTER. WORD MARK INDICATES OPERATION
ALONE (I1 OP). SET STATUS AND DECODE THE OPERATION. BRANCH
TO THE APPROPRIATE ROUTINE FOR EXECUTION.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		ICYC 001	T			1401 COMPATIBILITY FEATURE I-CYCLE 12/7/66 R. C. HUANG	
		ICYC 002	*			***	
		ICYC 003	*				*
		ICYC 004	*			IN COMPATIBILITY MODE LOCAL STORAGE ZONE 0 REGISTERS HAVE THE	*
		ICYC 005	*			FOLLOWING MEANING.	*
		ICYC 006	*			U= A STAR (IF IO OP U0=TENS U1=UNITS)	*
		ICYC 007	*			V= B STAR	*
		ICYC 008	*			I= I STAR	*
		ICYC 009	*			G0= A ADDRESS HUNDREDS POSITION	*
		ICYC 010	*			G1= OP CODE	*
		ICYC 011	*			D0= STATUS AND FLAG REGISTER	*
		ICYC 012	*			D1= A REGISTER (D MODIFIER)	*
		ICYC 013	*			P0= MUST BE 00 ON ENTERING I CYCLES	*
		ICYC 014	*			T= USED	*
		ICYC 015	*			H= AS	*
		ICYC 016	*			P1= WORKING REGISTERS	*
		ICYC 017	*				*
		ICYC 018	*			THE STATUS REGISTER (D0) BITS WHEN ON MEAN	*
		ICYC 019	*			BIT 0= DURING I CYCLES=B ADDR BEING COMPUTED,AT END OF I CYCLES=I5 OP	
		ICYC 020	*			BIT 1= HUNDREDS OR TENS DIGIT IS INVALID	*
		ICYC 021	*			BIT 2= A STAR ADDRESS IS INVALID	*
		ICYC 022	*			BIT 3= B STAR ADDRESS IS INVALID	*
		ICYC 023	*			BIT 4= I2 OP	*
		ICYC 024	*			BIT 5= I4 OP	*
		ICYC 025	*			BIT 6= I8 OP	*
		ICYC 026	*			BIT 7= M%AAABBBD OP OR CHAINED CMND.	*
		ICYC 027	*				*
		ICYC 028	*			***	
0DE2	9682	ICYC 036	INTRPT	INRU 009	ENTER	BR	GO TO INTERRUPT ROUTINE
0D7C	2F43	ICYC 037	HISTRT			H1=0$K04	SET UP CONSTANT FROM I/O OPS
0D7E	4FFF	ICYC 038				MW=H1	ENABLE MACH CHK MASK,RESET WAIT
0D80	F1E2	ICYC 039		036	INTRPT	BR IF S7=0	
0D82	5F98	ICYC 041	ICYC			RDB H1 I+1	READ OP CODE
0D84	2E25	ICYC 047	EXTRA			H0=0$K20	
0D86	DF61	ICYC 049		067	OPNOWM	BR IF H1 BIT1=1	BR ON OP WM
0D88	16C5	ICYC 050				D0=D0*-KC0 **RESET STAT REG EXCEPT BITS2,3	
0D8A	16F3	ICYC 051				D0=D0*-K0F **RESET STAT REG EXCEPT BITS2,3	
0D8C	3F45	ICYC 052				H1=H1$K40	FORCE WM TO ADDR AUX STORAGE
0D8E	CF17	ICYC 053		057	NOSPEC	BR IF H1 BIT0=1	BR ON NON-SPECIAL CH
0D90	F094	ICYC 054		056	OPSPEC	BR IF LZNZ	SPEC CH. BR ON NON ROW 0 OPS
0D92	2FF7	ICYC 055				H1=0$KFF	INVALID OP'S,B,&,OR −
0D94	3F85	ICYC 056	OPSPEC			H1=H1$K80	FORCE 0 BIT TO ADDR AUX STORAGE
0D96	55E0	ICYC 057	NOSPEC			RDB G1 AS,H **READ OP TABLE IN AUX STORE	
0D98	5D58	ICYC 058	RDHUND			RDB P1 I+1	READ HUNDRED'S
0D9A	DD21	ICYC 059		069	HUNOWM	BR IF P1 BIT1=1	BR ON NO WM
0D9C	3613	ICYC 060				D0=D0$K01	SET CHAIN CMND FLAG ON
0D9E	8CAC	ICYC 061		195	OPI478	BR	OP ALONE
0DE0	8178	ICYC 067	OPNOWM	IERR 032	OPNOWM	BR	OP WITH NO WM
0DA0	D52A	ICYC 069	HUNOWM	074	AADRVD	BR IF G1 BIT1=0	BR IF NOT Q OP
0DA2	4206	ICYC 070				V=U	Q OP− TRANSFER A * TO B *
0DA4	1615	ICYC 071				D0=D0*-K10	B ADDR VALID
0DA6	E62A	ICYC 072		074	AADRVD	BR IF D0 BIT2=0	BR IF A ADDR VALID
0DA8	3615	ICYC 073				D0=D0$K10 **SET B ADDR INVALID STAT-D03	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
ODAA	1625	ICYC 074	AADRVD			DO=DO*-K20	A ADDR VALID
ODAC	5DF1	ICYC 075	BRHUSP			H1=P1X	CROSS HUNDREDS
ODAE	CD45	ICYC 076		110	NOSPCH	BR IF P1 BIT0=1	BR IF NOT SPCL CHAR
ODB0	0D1B	ICYC 077				Z=P1◻K01 **SPECIAL CH, MASK FOR /
ODB2	F0C7	ICYC 078		111	SLASH	BR IF LZ=0	BR IF SLASH
ODB4	C664	ICYC 079		086	TSTMLU	BR IF DO BIT0=0	BR IF A HUNDRED'S
ODB6	0D4D	ICYC 080				Z=P1◻K40 **B HUNDRED'S, MASK FOR BLANK
ODB8	C4C2	ICYC 081		109	IVDHUN	BR IF ZNZ	BR IF NOT BLANK
ODBA	05BB	ICYC 082				Z=G1◻K0B **BLANK IN I-4, MASK FOR BR OP
ODBC	C4C2	ICYC 083		109	IVDHUN	BR IF ZNZ	BR IF NOT BR OP
ODBE	5886	ICYC 084				I=I-1	DECREMENT I-STAR
ODC0	9E72	ICYC 085		IUBR 002	UNCDBR	BR **UNCONDITIONAL BRANCH, BXXXB
ODE4	5559	ICYC 086	TSTMLU			G1=G1	PUT G1 ON Z BUS
ODE6	F0C2	ICYC 087		109	IVDHUN	BR IF LZNZ	BR IF NOT M L U OP
ODE8	0DCB	ICYC 088				Z=P1◻K0C
ODEA	F0C2	ICYC 089		109	IVDHUN	BR IF LZNZ	BR IF NOT %,ə,◻,OR X
ODEC	ED42	ICYC 090		109	IVDHUN	BR IF P1 BIT2=0	BR IF NOT % OR ə
ODEE	5551	ICYC 097				G1=G1X	SET UP
ODF0	3525	ICYC 098				G1=G1$K20	G FOR
ODF2	35C3	ICYC 100				G1=G1$K0C	I/O OPS
ODF4	5D49	ICYC 102				G0=P1 **SAVE HUNDRED'S OF A ADDR
ODF6	3635	ICYC 103				DO=DO$K30	MAKE A AND B INVALID
ODF8	5198	ICYC 104				RDB U1 I+1	READ TENS
ODFA	5109	ICYC 105				U0=U1
ODFC	5198	ICYC 106				RDB U1 I+1	READ UNITS
ODFE	5D98	ICYC 107				RDB P1 I+1	READ I-4
OE00	8C92	ICYC 108		177	RDI4	BR **CONTINUE COMPUTE B ADDR
ODC2	3645	ICYC 109	IVDHUN			DO=DO$K40 **INVALID HUNDRED'S, SET DO1
ODC4	6FFF	ICYC 110	NOSPCH			H1C=H1L+H1+C	SHIFT LOW BY 1 BIT
ODC6	5AE0	ICYC 111	SLASH			RDH T AS,H ** XLATE HNDS+BIAS FOR AUX STG
ODC8	5F98	ICYC 112				RDB H1 I+1	READ TEN'S
ODCA	DF4F	ICYC 113		115	TENOWM	BR IF H1 BIT1=1	BR IF NO WM
ODCC	8C36	ICYC 114		197	I250P	BR	I-2,OR I-5 OP
ODCE	CF5F	ICYC 115	TENOWM	122	TENSPC	BR IF H1 BIT0=1	BR IF TEN'S NOT SP.CH
ODD0	0FAB	ICYC 116				Z=H1◻K0A **SP.CH, MASK FOR SUBSTITUTE B
ODD2	F0DD	ICYC 117		123	SUBSBK	BR IF LZ=0	BR IF SUBSTITUTE B
ODD4	0F4D	ICYC 118				Z=H1◻K40	MASK FOR BLANK
ODD6	C4DE	ICYC 119		122	TENSPC	BR IF ZNZ	BR IF NOT BLANK
ODD8	3645	ICYC 120				DO=DO$K40	SET INVALID HUNDREDS
ODDA	8C06	ICYC 121		127	TENZON 3	BR
ODDE	8F09	ICYC 122	TENSPC	124	TENZON N	N=H1 BITS23	BR ON TEN'S ZONE
ODDC	8718	ICYC 123	SUBSBK	INDX 003	INDXIN	BR **SUBSTITUTE B, INDEXED
OC00	8718	ICYC 124	TENZON 0	INDX 003	INDXIN	BR	A,B ZONE,INDEXED
OC02	8718	ICYC 125	TENZON 1	INDX 003	INDXIN	BR	B ZONE, INDEXED
OC04	8718	ICYC 126	TENZON 2	INDX 003	INDXIN	BR	A ZONE, INDEXED
OC06	5798	ICYC 127	TENZON 3			RDB D1 I+1 **NO INDEXING, READ UNIT'S
OC08	D721	ICYC 128		140	UNOWM	BR IF D1 BIT1=1	BR IF NO WM
OC0A	5F79	ICYC 129	XI3I6			D1=H1 **I-3,OR I-6 OPS,A REG EQUALS TEN'S
OC0C	5F29	ICYC 130				V0=H1 **B* TEN'S POSITION EQUALS TEN'S
OC0E	2345	ICYC 131				V1=0$K40	BLANK OUT B* LOW
OC10	C640	ICYC 132		202	I3	BR IF DO0=0	BR IF I-LENGTH OF 3
OC12	1685	ICYC 133				DO=DO*-K80	CLEAR I5 IND
OC14	8C44	ICYC 134		204	I5	BR	GO TO I5 ROUTINE

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
OC16	C61D	ICYC 135	INVALD	138	SETBER	BR IF DO BIT0=1	
OC18	3625	ICYC 136				DO=DO$K20	SET A INVALID
OC1A	8C32	ICYC 137		156	UNOSPC	BR	
OC1C	3615	ICYC 138	SETBER			DO=DO$K10	SET B INVALID
OC1E	8C32	ICYC 139		156	UNOSPC	BR	
OC20	5FFD	ICYC 140	UNOWM			H1=H1L	USE TEN'S NUMERIC
OC22	5FE0	ICYC 141				RDB H1 AS,H	XLATE TEN'S
OC24	6BFB	ICYC 142				T1C=T1+H1	ADD TEN'S TO HUNDREDS
OC26	6ACD	ICYC 149				TOC=TO+PO+C	ADD CARRY, PO=00
OC28	FB17	ICYC 151		135	INVALD	BR IF H1 BIT7=1	BR ON INVALID TENS
OC2A	D617	ICYC 152		135	INVALD	BR IF DO BIT1=1	BR ON INVALID HUNDREDS
OC2C	C733	ICYC 153		156	UNOSPC	BR IF D1 BIT0=1	BR IF UNITS NOT SP CH
OC2E	071B	ICYC 154				Z=D1□K01	SP.CH, MASK FOR /
OC30	F096	ICYC 155		135	INVALD	BR IF LZNZ	BR IF NOT /
OC32	57FD	ICYC 156	UNOSPC			H1=D1L	TAKE UNIT'S NUMERIC
OC34	8719	ICYC 157		158	UNZONE N	N=D1 BITS23	BR ON UNITS ZONE
OC80	8CCE	ICYC 158	UNZONE 0	159	TWELVE	BR **12,000 ADD 2EE0 TO UNIT'S	
OCCE	2FED	ICYC 159	TWELVE			H1=H1+KE0	
OCD0	2DE3	ICYC 160				P1=0$K0E	
OCD2	2D2D	ICYC 161				P1=P1+K20	
OCD4	8C88	ICYC 162		172	SUMUP	BR	
OC82	8530	ICYC 163	UNZONE 1	164	EIGHT	BR ** 8,000 ADD 1F40 TO UNIT'S	
0530	2F4D	ICYC 164	EIGHT			H1=H1+K40	
0532	3DE9	ICYC 165				P1=0-KE0	
0534	8C88	ICYC 166		172	SUMUP	BR	
OC84	820A	ICYC 167	UNZONE 2	168	FOUR	BR ** 4,000 ADD 0FA0 TO UNIT'S	
020A	2FAD	ICYC 168	FOUR			H1=H1+KA0	
020C	2DF3	ICYC 169				P1=0$K0F	
020E	8C88	ICYC 170		172	SUMUP	BR	
OC86	2DC7	ICYC 171	UNZONE 3			P1=0	** 0 THOUSAND,ZERO OUT P1
OC88	6BFB	ICYC 172	SUMUP			T1C=T1+H1	ADD UNIT'S TO TOTAL
OC8A	6ADD	ICYC 173	SETTO			TOC=TO+P1+C	TOTAL ADDR IN HEX
OC8C	5D98	ICYC 174				RDB P1 I+1	READ I-4 OR I-7
OC8E	C61B	ICYC 175		186	BADCMP	BR IF DO BIT0=1	BR IF B ADDR COMPUTE
OC90	40A6	ICYC 176				U=T	**A ADDR, TRANSFER ADDR TO A*
OC92	DD30	ICYC 177	RDI4	181	I40P	BR IF P1 BIT1=0	BR IF I4 WM
OC94	3685	ICYC 178				DO=DO$K80	**SET B ADDR COMPUTATION STAT
OC96	1655	ICYC 179				DO=DO*-K50	RST INV HNDRDS-SET B VALID
OC98	8DAC	ICYC 180		075	BRHUSP	BR	**GO BACK TO COMPUTE B ADDR
OCB0	3643	ICYC 181	I40P			DO=DO$K04	SET I-4 OP STAT
OCB2	C52D	ICYC 182		195	OPI478	BR IF G1 BIT0=1	BR IF M L Q OR H OP
OCB4	4206	ICYC 183				V=U	B* EQUALS A*
OCB6	1615	ICYC 184				DO=DO*-K10	SET B STAR VALID
OCB8	8CAC	ICYC 185		195	OPI478	BR	I-40P
OC9A	42A6	ICYC 186	BADCMP			V=T	**B ADDR COMPUTED,TRANSFER ADDR TO B*
OC9C	1685	ICYC 187				DO=DO*-K80	RESET B ADDR COMP
OC9E	DD2C	ICYC 188		195	OPI478	BR IF P1 BIT1=0	BR ON I-7 WM
OCA0	0553	ICYC 189				Z=G1*-K05	MASK FOR ,OR / OP
OCA2	C4AD	ICYC 190		195	OPI478	BR IF Z=0	BR ON , OR / OP
OCA4	5D79	ICYC 191	NOROWO			D1=P1	**I-8 OP,PUT MODIFIER IN D1-A REG.
OCA6	5D98	ICYC 192				RDB P1 I+1	READ I-8 CH.
OCA8	DD25	ICYC 193		191	NOROWO	BR IF P1 BIT1=1	BR IF NO I-8 WM
OCAA	3623	ICYC 194				DO=DO$K02	SET I-8 OP STAT

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
0CAC	5886	ICYC 195	OPI478			I=I-1	BACK-DATE I*
0CAE	862B	ICYC 196		207	VLDADR N	N=DO BITS23	BR ON ADDR VALIDITY
0C36	5D79	ICYC 197	I25OP			D1=P1 **I-2 OR I-5,MODIFIER IN D1-A REG.
0C38	2245	ICYC 198				V0=0$K40	BLANK OUT B* HI
0C3A	2345	ICYC 199	BLKBU			V1=0$K40	BLANK OUT B* LO
0C3C	C645	ICYC 200		204	I5	BR IF DO BIT0=1	BR IF I-5
0C3E	3683	ICYC 201				DO=DO$K08	SET I-2 OP STAT
0C40	3625	ICYC 202	I3			DO=DO$K20	I2 OR 3, SET INVD A ADDR STAT
0C42	4026	ICYC 203				U=V	A* EQUALS B*
0C44	3615	ICYC 204	I5			DO=DO$K10 **SET B ADDR INVALID STAT
0C46	5886	ICYC 205				I=I-1	BACKDATE I*
0C48	862B	ICYC 206	BRONMK	207	VLDADR N	N=DO BITS23	BR ON ADDR VALIDITY
0D20	850B	ICYC 207	VLDADR 0	211	OPROW N	N=G1 BITS23 **A & B ADDR VALID,START DECO
0D22	8515	ICYC 208	VLDADR 1	IERR 002	OPROW N	N=G1 BITS23	B ADDR INVALID
0D24	8515	ICYC 209	VLDADR 2	IERR 002	OPROW N	N=G1 BITS23	A ADDR INVALID
0D26	8515	ICYC 210	VLDADR 3	IERR 002	OPROW N	N=G1 BITS23 ** A & B ADDR BOTH INVALID
0D00	B167	ICYC 211	OPROW 0	225	OPROW0 N	N=G1L	OP ROW 1 DECODE
0D02	B169	ICYC 212	OPROW 1	239	OPROW1 N	N=G1L	OP ROW 2 DECODE
0D04	B179	ICYC 213	OPROW 2	284	OPROW2 N	N=G1L	OP ROW 3 DECODE
0D06	D10B	ICYC 214	OPROW 3	216	OPINVD	BR IF G1 BIT5=1	OP ROW 4 DECODE
0D08	914E	ICYC 215		ISAB 039	STAR	BR	H, Q, OR COL BIN
0D0A	A06C	ICYC 216	OPINVD	IERR 028	INVDOP	BR	INVALID OPS
		ICYC 220	*			**
		ICYC 221	*			
		ICYC 222	*			NORMAL OP CODE TABLE
		ICYC 223	*			
0B60	9CB8	ICYC 225	OPROW0 0	IMVE 028	MOVEOP	BR	M — MOVE OP
0B64	A062	ICYC 226	OPROW0 2	IERR 055	HALT	BR	. — HALT OP
0B68	8C50	ICYC 227	OPROW0 4	ISWM 004	SETWM	BR	, — SET WM OP
0B6A	A1D8	ICYC 228	OPROW0 5	ICLR 002	CLRSTR	BR	/ — CLEAR STORAGE OP
0B6C	8D7C	ICYC 229	OPROW0 6	ICYC 037	HISTRT	BR	NO OP,8, OR 9 OP
0B76	934C	ICYC 235	OPROW0 B	IBCH 002	BRANCH	BR	B — BRANCH OP
0B7C	8100	ICYC 237	OPROW0 E	IZWM 002	ZNWMBT	BR	V — BR ON ZONE OR WM
0B7E	840A	ICYC 238	OPROW0 F	IZWM 009	BRIBIT	BR	W — BR IF BIT EQUAL
0C60	9C9C	ICYC 239	OPROW1 0	IMVE 014	LOADOP	BR	L — LOAD OP
0C64	ADA6	ICYC 240	OPROW1 2	IMVZ 004	MVZONE	BR	D — MOVE NUMERIC
0C66	ADA6	ICYC 241	OPROW1 3	IMVZ 004	MVZONE	BR	Y — MOVE ZONE
0C68	9B7C	ICYC 242	OPROW1 4	IMAD 002	MDFADR	BR	# — MODIFY ADDR
0C6A	8C50	ICYC 243	OPROW1 5	ISWM 004	SETWM	BR	¤ — CLEAR WM
0C6C	9578	ICYC 244	OPROW1 6	IEDT 028	START	BR	E — EDIT
0C6E	A26E	ICYC 245	OPROW1 7	IMZS 004	ZEROSP	BR	Z —MOVE ZERO SUPPRESS
0C70	9704	ICYC 246	OPROW1 8	IADD 005	ADDOP	BR	A — ADD
0C72	9702	ICYC 247	OPROW1 9	IADD 004	SUBTOP	BR	S — SUBTRACT
0C74	85F4	ICYC 248	OPROW1 A	IMPY 010	MULTPY	BR	a — MULTIPLY
0C76	864E	ICYC 249	OPROW1 B	IDVD 014	DIVIDE	BR	% — DIVIDE
0C78	A2D4	ICYC 250	OPROW1 C	IRAD 005	RSTADD	BR	— RESET ADD
0C7A	A2D4	ICYC 251	OPROW1 D	IRAD 005	RSTADD	BR	— RESET SUBTRACT
0C7C	AE6C	ICYC 282	OPROW1 E	IMRC 005	RECORD	BR	P — MOVE RECORD
0C7E	A6EC	ICYC 283	OPROW1 F	ICMP 011	COMPAR	BR	C — COMPARE
0CE0	8D7C	ICYC 284	OPROW2 0	ICYC 037	HISTRT	BR	U —
0CE2	A57C	ICYC 287	OPROW2 1	LOPD 012	RDRPCH	BR	1 — READ A CARD
0CE4	999C	ICYC 288	OPROW2 2	MPRT 033	PRTCMD	BR	2 — PRINT
0CE6	999C	ICYC 289	OPROW2 3	MPRT 033	PRTCMD	BR	3 — PRINT,READ

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
OCE8	A57C	ICYC 290	OPROW2 4	LOPD 012	RDRPCH	BR	4 - PUNCH
OCEA	A57C	ICYC 291	OPROW2 5	LOPD 012	RDRPCH	BR	5 - READ,PUNCH
OCEC	999C	ICYC 292	OPROW2 6	MPRT 033	PRTCMD	BR	6 - PRINT,PUNCH
OCEE	999C	ICYC 293	OPROW2 7	MPRT 033	PRTCMD	BR	7 - PRINT,READ,PUNCH
OCF0	8D7C	ICYC 294	OPROW2 8	ICYC 037	HISTRT	BR	PFR
OCF2	AE40	ICYC 295	OPROW2 9	LSSO 002	STKSEL	BR	K - STACKER SELECT
OCF4	A874	ICYC 307	OPROW2 A	MPPP 003	FORMS	BR	F CONTROL CARRIAGE
OCF8	3613	ICYC 308	OPROW2 C			DO=DO$K01	M - MOVE I/O
OCFA	91CA	ICYC 309	OPROW2 D	IOCM 002	LOAD	BR	L - LOAD I/O
OCFC	91CC	ICYC 310	OPROW2 E	IOCM 003	UOP	BR	U - CONTROL UNIT

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           ICYC 328   *
           ICYC 329   *        ************************************
           ICYC 330   *        *.                                 *
           ICYC 331   *        * . 30D HALFWORD BIAS CONSTANT      *
           ICYC 332   *        * . FOR EACH MEMORY SIZE.           *
           ICYC 333   *        *  .                                *
           ICYC 334   *        *   . *****************************
           ICYC 335   *        * 1400.* 16,384 * 32,768 *  49,152 *
           ICYC 336   *        *****************************
           ICYC 337   *        * 16K *  0180  *  4180  *   8180  *
           ICYC 338   *        *-----------------------------------*
           ICYC 339   *        * 12K *  1120  *  5120  *   9120  *
           ICYC 340   *        *-----------------------------------*
           ICYC 341   *        *  8K *  20CO  *  60CO  *   AOCO  *
           ICYC 342   *        *-----------------------------------*
           ICYC 343   *        *  4K *  3060  *  7060  *   B060  *
           ICYC 344   *        *-----------------------------------*
           ICYC 345   *        *  2K *  3830  *  7830  *   B830  *
           ICYC 346   *        *-----------------------------------*
           ICYC 347   *        * 1.4K*  3A88  *  7A88  *   BA88  *
           ICYC 348   *        ************************************
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                               * CROSS REFERENCE FOR CSECT ICYC *
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ICYC 036	ICYC 039
ICYC 037	IADD 060 IADD 107 IADD 124 IADD 158 IBCH 012 IBCH 034 IBCH 035 IBCH 036 IBCH 037 IBCH 039 IBCH 057 IBCH 066
	IBCH 093 IBCH 095 IBCH 114 IBCH 116 ICLR 027 ICMP 038 ICYC 229 ICYC 284 ICYC 294 IDVD 167 IEDT 075 IEDT 153
	IEDT 197 IERR 010 IMAD 052 IMPY 170 IMRC 019 IMVE 012 IMVE 019 IMVE 072 IMVZ 020 IMZS 054 IRAD 029 ISAB 020
	ISWM 011 IUBR 014 IZWM 004 IZWM 018 IZWM 021 JDTA 067 JEND 135 JEND 145 JTPE 042 JTYP 140 KEND 029 LERR 009
	LOPD 039 MBBB 082 MNNN 006 MPRT 160 MPRT 363 MPRT 368 MPRT 375 MPRT 393 MPRT 412 MQQQ 011 MQQQ 018 MQQQ 024
	MQQQ 033
ICYC 041	INRU 049
ICYC 056	ICYC 054
ICYC 057	ICYC 053
ICYC 067	ICYC 049
ICYC 069	ICYC 059
ICYC 074	ICYC 069 ICYC 072
ICYC 075	ICYC 180
ICYC 086	ICYC 079
ICYC 109	ICYC 081 ICYC 083 ICYC 087 ICYC 089 ICYC 090
ICYC 110	ICYC 076
ICYC 111	ICYC 078
ICYC 115	ICYC 113

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**********************************
* CROSS REFERENCE FOR CSECT ICYC *
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ICYC 122      ICYC 115    ICYC 119
ICYC 123      ICYC 117
ICYC 124      ICYC 122
ICYC 127      ICYC 121    INDX 023
ICYC 135      ICYC 151    ICYC 152    ICYC 155
ICYC 138      ICYC 135
ICYC 140      ICYC 128
ICYC 156      ICYC 137    ICYC 139    ICYC 153
ICYC 158      ICYC 157
ICYC 159      ICYC 158
ICYC 164      ICYC 163
ICYC 168      ICYC 167
ICYC 172      ICYC 162    ICYC 166    ICYC 170
ICYC 173      INDX 076
ICYC 177      ICYC 108
ICYC 181      ICYC 177
ICYC 186      ICYC 175
ICYC 191      ICYC 193
ICYC 195      ICYC 061    ICYC 182    ICYC 185    ICYC 188    ICYC 190
ICYC 197      ICYC 114
ICYC 202      ICYC 132
ICYC 204      ICYC 134    ICYC 200
ICYC 207      ICYC 196    ICYC 206    MPRT 165
ICYC 211      ICYC 207    IERR 041
ICYC 213      IERR 004    MLLL 059
ICYC 214      IERR 054
ICYC 216      ICYC 214
ICYC 225      ICYC 211
ICYC 239      ICYC 212
ICYC 284      ICYC 213
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ADDR   WORD   SEQUENCE NO. LABEL   NEXTSEQ   NEXTLABEL STATEMENT   COMMENTS

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          ICYD 001   T                      OP CODE AND BIAS TABLE  -AUX STG ZONE 2-    KRAGER
          ICYD 002   *
          ICYD 003   *                                    BITS 4-7=
          ICYD 004   *                        0   1   2   3   4   5   6   7   8   9   A   B   C   D   E   F
          ICYD 005   *                      ***********************************************************************
          ICYD 006   *                    0* 00  0A  14  1E  28  32  3C  46  50  5A  01  01  01  01  01  01 *
          ICYD 007   *                      *---------------------------------------------------------------------*
          ICYD 008   *                    1* B+0059 ( A IND REG ADDR)  B+044C  B+0BB8    B+07D0    B+03E8    B+0000 *
          ICYD 009   *                      *---------------------------------------------------------------------*
          ICYD 010   *                    2* B+005E ( B IND REG ADDR)          B+0C1C    B+0834    B+044C    B+0064 *
          ICYD 011   *                      *---------------------------------------------------------------------*
          ICYD 012   *                    3* B+0063 (AB IND REG ADDR)          B+0C80    B+0898    B+04B0    B+00C8 *
          ICYD 013   *                      *---------------------------------------------------------------------*
          ICYD 014   *              B    4*                                    B+0CE4    B+08FC    B+0514    B+012C *
          ICYD 015   *                      *---------------------------------------------------------------------*
          ICYD 016   *              I    5*                                    B+0D48    B+0960    B+0578    B+0190 *
          ICYD 017   *                      *---------------------------------------------------------------------*
          ICYD 018   *              T    6*    (B= HALFWORD BIAS CONSTANT)      B+0DAC    B+09C4    B+05DC    B+01F4 *
          ICYD 019   *                      *---------------------------------------------------------------------*
          ICYD 020   *              S=7*    ( FROM KO AUX STG ZONE 0  )        B+0E10    B+0A28    B+0640    B+0258 *
          ICYD 021   *                      *---------------------------------------------------------------------*
          ICYD 022   *                    8*                                    B+0E74    B+0A8C    B+06A4    B+02BC *
          ICYD 023   *                      *---------------------------------------------------------------------*
          ICYD 024   *              0    9*                                    B+0ED8    B+0AF0    B+0708    B+0320 *
          ICYD 025   *                      *---------------------------------------------------------------------*
          ICYD 026   *              -    A*                                    B+0F3C    B+0B54    B+076C    B+0384 *
          ICYD 027   *                      *---------------------------------------------------------------------*
          ICYD 028   *              3    B* 00  16  32  48  64  80  96  11  28  44  60  76  92  07  23  39 *
          ICYD 029   *                      *---------------------------------------------------------------------*
          ICYD 030   *                    C* 1C  18  0B  1F  12  16  2A      B1          02  15              *
          ICYD 031   *                      *---------------------------------------------------------------------*
          ICYD 032   *                    D* 1D      29  90  80  06          1E  F1                          *
          ICYD 033   *                      *---------------------------------------------------------------------*
          ICYD 034   *                    E*     05  19      20  0E  0F          13  17      04  1B          *
          ICYD 035   *                      *---------------------------------------------------------------------*
          ICYD 036   *                    F*     21  22  23  24  25  26  27  06  06      14  1A              *
          ICYD 037   *                      ***********************************************************************
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ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IDIS 001	T	1400	COMP	STOP ROUTINE R TAYLOR	
		IDIS 002	*			SET UP FOR 16 CHARACTER DISPLAY MESSAGE	
2044	3404	IDIS 003	STOPPP			SET MODE K=A0	CPU ZONE AND 1052 MODE
2046	5CF2	IDIS 004				RDH P DA,BE	GET STOP CODE AND ZERO LOWER
2048	5E82	IDIS 005				RDH H DA,A8	GET SENSE BYTE
204A	1E13	IDIS 006				HO=HO*-KO1	INSURE BIT 7 IS OFF FOR DISPLAY
204C	5ED9	IDIS 007				P1=HO	PUT SWITCHES IN FOR DISPLAY
204E	7CF2	IDIS 008				STH P DA,BE	STORE IT BACK
2050	ACBE	IDIS 009		011	GO	BR	CONTINUE SET UP
2CBC	3404	IDIS 010	STOP			SET MODE K=A0	SET 1052 MODE AND CPU ZONERT
2CBE	74E2	IDIS 011	GO			STH G DA,BC	STORE G REG DURING CONVERT
2CC0	2CF7	IDIS 012				PO=0$KFF	
2CC2	5CD9	IDIS 013				P1=PO	INVALID ADD MESSAGE FFFF
2CC4	E648	IDIS 014	STOPAB	016	TRYB	BR IF DO BIT2=0	A STAR OK
2CC6	7C42	IDIS 015				STH P DA,98	STORE IN K4
2CC8	F650	IDIS 016	TRYB	020	AROUND	BR IF DO BIT3=0	B STAR GOOD
2CCA	7C52	IDIS 017				STH P DA,9A	STORE B STAR FOR DSPY
2CCC	E65F	IDIS 018		027	CONVI	BR IF DO BIT2=1	BR IF A IS BAD
2CCE	F657	IDIS 019		023	TRYA	BR IF DO BIT3=1	BR IF B IS BAD
2CD0	4426	IDIS 020	AROUND			G=V	PUT B INTO G HEX-DEC
2CD2	A304	IDIS 021		ICTD 021	CYTDEC	BAL	CONV
2CD4	7E52	IDIS 022				STH H DA,9A	STORE VALID IN K5
2CD6	E65F	IDIS 023	TRYA	027	CONVI	BR IF DO BIT2=1	
2CD8	4406	IDIS 024				G=U	PUT A INTO G HEX-DEC
2CDA	A304	IDIS 025		ICTD 021	CYTDEC	BAL	CONV
2CDC	7E42	IDIS 026				STH H DA,98	STORE VALID A IN K4
2CDE	CC80	IDIS 027	CONVI			RST S4	RESET S4 FOR ALLMESSAGES HERE
2CE0	3633	IDIS 028	CONVA			DO=DO$KO3	SET STATS FOR 16 CHAR MESSAGE
2CE2	1643	IDIS 029				DO=DO*-KO4	RST BIT 5
2CE4	0040	IDIS 030				RST S5	
2CE6	FFF2	IDIS 031		037	GOTB	BR IF TU3=0	B STAR OK
2CE8	0F02	IDIS 032				RST TA K=10	RESET ALTER DISPLAY ACTIVE IF ON
2CEA	54E2	IDIS 033				RDH G DA,BC	CHECK FOR AUX OR CONTROL A/D OP
2CEC	C170	IDIS 034		036	DECBST	BR IF G1 BIT4=0	NOT AUX OR CONTROL A/D OP
2CEE	7252	IDIS 035				STH V DA,9A	OVERRIDE B STAR DECIMAL ADDRESS
2CF0	5222	IDIS 036	DECBST			RDH V DA,8C	RESTORE ORIGINAL B STAR
2CF2	ABCE	IDIS 037	GOTB	ISTP 006	STOPCD	BR	
		IDIS 038	*			** IN ISTP I* IS PUT IN G REG DEC EQUIV IN H REG FOR UNPACK,	

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* CROSS REFERENCE FOR CSECT IDIS *
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IDIS 003	IERR 035	INRU 057	JCHL 106	JTPE 007	JTYP 112	KEND 016	LPCH 025	MPRT 346
IDIS 010	JTYP 113	LRDR 027	MMMM 042	MPRT 251				
IDIS 011	IDIS 009							
IDIS 016	IDIS 014							
IDIS 020	IDIS 016							
IDIS 023	IDIS 019							
IDIS 027	IDIS 018	IDIS 023	ITRP 057					
IDIS 028	IRST 145	ITRP 058						
IDIS 036	IDIS 034							
IDIS 037	IDIS 031							

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IDVD 001	T			1400 DIVIDE KRAGER	
		IDVD 002	*			THE DO REGISTER IS USED AS A FLAG REGISTER FOR DIVIDE. THE BITS IF ON	
		IDVD 003	*			MEAN THE FOLLOWING.	
		IDVD 004	*			BIT 1= THE B FIELD WAS MINUS.	
		IDVD 005	*			4= THE A FIELD WM WAS DETECTED.	
		IDVD 006	*			5= THE X POSITION OF THE QUOTIENT HAS BEEN DONE.	
		IDVD 007	*			6= AN OVERFLOW HAS OCCURED.	
		IDVD 008	*			7= B FIELD SIGN POSITION DETECTED.	
		IDVD 009	*			THE S REG BITS ARE	
		IDVD 010	*			BIT 0= SUBTRACT DIVISOR.	
		IDVD 011	*			3= CARRY BIT ON	
		IDVD 012	*			5= TRIAL SUBTRACT ON	
		IDVD 013	*			DIVIDE PREPERATION AND A CYCLE LOOP.	
064E	16C5	IDVD 014	DIVIDE			DO=DO*-KCO	RESET O AND 1 BIT
0650	16F3	IDVD 015				DO=DO*-KOF	RESET ALL LOW BITS
0652	3042	IDVD 016				SET S K=94	SET SO S3 AND S5
0654	7032	IDVD 022				STH U DA,8E	SET A AUX REG
0656	4426	IDVD 024				G=V	SET B AUX REG
0658	5D1A	IDVD 025	READAF			RDB P1 U-1	READ A FIELD
065A	CD5F	IDVD 026		035	AFLDOK	BR IF P1 BITO=1	BR IF A NOT A SP CHR
065C	8442	IDVD 033		IADD 160	CORCHR	BAL	GO CORRECT CHAR
065E	DD63	IDVD 035	AFLDOK	037	NOAWM	BR IF P1 BIT1=1	BR IF NO WORD MARK
0660	3683	IDVD 036				DO=DO$KO8	SET A WM FLAG
0662	5DFD	IDVD 037	NOAWM			H1=P1L	SAVE NUMERIC CHAR
		IDVD 038	*			B CYCLE LOOP	
0664	5D30	IDVD 039	SHIP			RDB P1 V+0	READ B FIELD
0666	CD6B	IDVD 040		049	BFLDOK	BR IF P1 BITO=1	BR IF NOT SP CHAR
0668	8442	IDVD 047		IADD 160	CORCHR	BAL	GO CORRECT CHAR
066A	5DAD	IDVD 049	BFLDOK			TO=P1L	SETUP FOR ADD SUBT
066C	C5F1	IDVD 050		052	SUBT	BR IF SO=1	BR IF SUBT
066E	3A95	IDVD 051				TO=TO$K90	SET UP FOR ADD
0670	7AFF	IDVD 052	SUBT			TOC=TOaH1+C	ADD,SUBT
0672	D1F7	IDVD 053		055	SKIP	BR IF S5=1	BR IF TRIAL SUBT
0674	4ADD	IDVD 054				P1=TOL+P1H	PUT ORIG ZONES ON CHR
0676	ED43	IDVD 055	SKIP	058	CKSLSH	BR IF P1 BIT2=1	BR IF NON STD SIGN
0678	FD35	IDVD 056		064	SETMIN	BR IF P1 BIT3=1	BR IF STD MINUS SIGN
067A	8636	IDVD 057		065	SETSGN	BR	STD PLUS SIGN
0642	0DED	IDVD 058	CKSLSH			Z=P1□KE0	
0644	E0B8	IDVD 059		066	STOREB	BR IF HZNZ	BR IF NOT SLASH
0646	0D1B	IDVD 060				Z=P1□KO1	
0648	F0B8	IDVD 061		066	STOREB	BR IF LZNZ	BR IF NOT SLASH
064A	1D85	IDVD 062				P1=P1*-K80	REMOVE O BIT
064C	8638	IDVD 063		066	STOREB	BR	
0634	3645	IDVD 064	SETMIN			DO=DO$K40	SET B MINUS FLAG
0636	3613	IDVD 065	SETSGN			DO=DO$KO1	SET SIGN POS FLAG
0638	D1BD	IDVD 066	STOREB	068	OK	BR IF S5=1	BR IF TRIAL SUBT
063A	7D30	IDVD 067				STB P1 V+0	STORE NEW RESULT
063C	5226	IDVD 068	OK			V=V-1	B STAR -1
063E	C22D	IDVD 069	CKTLED	071	NOTAWM	BR IF DO BIT4=1	BR IF A WM FLAG ON
0640	8658	IDVD 070		025	READAF	BR	GO FOR A CYCLE
062C	D27D	IDVD 071	NOTAWM	075	CKCARY	BR IF DO BIT5=1	BR IF X POS FLAG ON
062E	3643	IDVD 072				DO=DO$K04	SET X POS FLAG
0630	2FC7	IDVD 073				H1=0	RESET H1

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
0632	8664	IDVD 074		039	SHIP	BR	
067C	16C3	IDVD 075	CKCARY			DO=DO*-KOC	RESET AWM AND XPOS
067E	F583	IDVD 076		078	HADCRY	BR IF S3=1	
0680	869E	IDVD 077		098	STAUX	BR	GO START AUX CYCLES
0682	D187	IDVD 078	HADCRY	080	TRLSUB	BR IF S5=1	BR IF TRIAL SUBT
0684	86F0	IDVD 079		112	QUOADD	BR	GO INCREMENT QUOTIENT
0686	0040	IDVD 080	TRLSUB			RST S5	RST TRIAL SUBT
0688	5032	IDVD 086	SETAUX			RDH U DA,8E	SET A = A AUX
068A	C591	IDVD 088		091	SISCK	BR IF S0=1	BR IF SUBT
068C	3000	IDVD 089	INCBAX			SET S0	SET SUBT ON
068E	5444	IDVD 090				G=G+1	B AUX REG +1
0690	F595	IDVD 091	SISOK	093	SETBAX	BR IF S3=1	BR IF CARRY
0692	2002	IDVD 092				SET S3	
0694	4246	IDVD 093	SETBAX			V=G	B STAR = B AUX
0696	C59A	IDVD 094		096	RSTCRY	BR IF S0=0	BR IF ADD
0698	8658	IDVD 095		025	READAF	BR	GO FOR A CYCLE
069A	0002	IDVD 096	RSTCRY			RST S3	
069C	8658	IDVD 097		025	READAF	BR	GO FOR A CYCLE
069E	E222	IDVD 098	STAUX	105	CONTIN	BR IF DO BIT6=0	BR IF NOT OVFLO CYCLE
06A0	86CC	IDVD 099		141	OVFLON	BR	
06A2	5032	IDVD 105	CONTIN			RDH U DA,8E	SET A = A AUX
06A4	1000	IDVD 107				RST S0	RST SUBT
06A6	D194	IDVD 108		093	SETBAX	BR IF S5=0	BR IF NOT TRIAL SUBT
06A8	F2CC	IDVD 109		089	INCBAX	BR IF DO BIT7=0	BR IF NOT SIGN POS
06AA	86D2	IDVD 110	SGNPOS	149	SIGNLP	BR	GO INC B AUX REG
		IDVD 111	*			QUOTIENT ADD LOOP	
06F0	C5AD	IDVD 112	QUOADD	116	OKADD1	BR IF S0=1	BR IF SUBT ON
06F2	2040	IDVD 113	CKEND			SET S5	SET TRIAL SUBT ON
06F4	F22B	IDVD 114		110	SGNPOS	BR IF DO BIT7=1	BR IF SIGN POS FLAG ON
06F6	8688	IDVD 115		086	SETAUX	BR	GO TAKE AUX CYCLES
06AC	1000	IDVD 116	OKADD1			RST S K=80	RESET SUBT
06AE	5D30	IDVD 117				RDB P1 V+0	READ QUOTIENT
06B0	3DB5	IDVD 118				P1=P1$KB0	INSURE ZONE BITS ON
06B2	2A95	IDVD 119				TO=0$K90	
06B4	5DFD	IDVD 120				H1=P1L	
06B6	7FAF	IDVD 121				H1C=H1aTO+C	ADD 1 TO QUO
06B8	4DFB	IDVD 122				H1=P1H+H1L	
06BA	7F3A	IDVD 123				STB H1 V-1	STORE NEW QUOTIENT
06BC	F5C3	IDVD 124		135	OVFLER	BR IF S3=1	BR IF OVERFLOW
06BE	3042	IDVD 125				SET S K=94	
06C0	8688	IDVD 126		086	SETAUX	BR	
06C2	5A82	IDVD 135	OVFLER			RDH T DA,A8	
06C4	3B43	IDVD 136				T1=T1$K04	SET OVERFLOW BIT ON
06C6	7A82	IDVD 137				STH T DA,A8	
06C8	3623	IDVD 139				DO=DO$K02	SET OVFLO FLAG ON
06CA	2B33	IDVD 140				T1=0$K03	SET COUNTER
06CC	2BFF	IDVD 141	OVFLON			T1=T1+KFF	COUNTER - 1
06CE	C4D3	IDVD 142		149	SIGNLP	BR IF Z=0	
06D0	86A2	IDVD 143		105	CONTIN	BR	
06D2	5A32	IDVD 149	SIGNLP			RDH T DA,8E	
06D4	5DB0	IDVD 151				RDB P1 T+0	
06D6	CD5B	IDVD 152		161	NOSPEC	BR IF P1 BIT0=1	BR IF NOT SPC CHAR
06D8	8442	IDVD 159		IADD 160	CORCHR	BAL	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
06DA	5B30	IDVD 161	NOSPEC			RDB T1 V+0	READ QUO SIGN
06DC	ED61	IDVD 162		164	NOTMIN	BR IF P1 BIT2=1	CK A FIELD
06DE	FD69	IDVD 163		170	AHASB	BR IF P1 BIT3=1	FOR MINUS SIGN
06E0	D66D	IDVD 164	NOTMIN	168	FIX	BR IF DO BIT1=1	BR IF B MINUS
06E2	1B3D	IDVD 165	INVRT3			T1=T1◻K30	INVERT SIGN
06E4	7B3A	IDVD 166	STSIGN			STB T1 V-1	STORE SIGN POSITION
06E6	8D7C	IDVD 167		ICYC 037	HISTRT	BR	
06EC	1B2D	IDVD 168	FIX			T1=T1◻K20	INVERT SIGN
06EE	86E4	IDVD 169		166	STSIGN	BR	
06E8	D663	IDVD 170	AHASB	165	INVRT3	BR IF DO BIT1=1	BR IF B MINUS
06EA	86EC	IDVD 171		168	FIX	BR	

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* CROSS REFERENCE FOR CSECT IDVD *
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IDVD 014    ICYC 249
IDVD 025    IDVD 070   IDVD 095   IDVD 097
IDVD 035    IDVD 026
IDVD 037    IDVD 035
IDVD 039    IDVD 074
IDVD 049    IDVD 040
IDVD 052    IDVD 050
IDVD 055    IDVD 053
IDVD 058    IDVD 055
IDVD 064    IDVD 056
IDVD 065    IDVD 057
IDVD 066    IDVD 059   IDVD 061   IDVD 063
IDVD 068    IDVD 066
IDVD 071    IDVD 069
IDVD 075    IDVD 071
IDVD 078    IDVD 076
IDVD 080    IDVD 078
IDVD 086    IDVD 115   IDVD 126
IDVD 089    IDVD 109
IDVD 091    IDVD 088
IDVD 093    IDVD 091   IDVD 108
IDVD 096    IDVD 094
IDVD 098    IDVD 077
IDVD 105    IDVD 058   IDVD 143
IDVD 110    IDVD 114
IDVD 112    IDVD 079
IDVD 116    IDVD 112
IDVD 135    IDVD 124
IDVD 141    IDVD 099
IDVD 149    IDVD 110   IDVD 142
IDVD 161    IDVD 152
IDVD 164    IDVD 162
IDVD 165    IDVD 170
IDVD 166    IDVD 169
IDVD 168    IDVD 164   IDVD 171
IDVD 170    IDVD 163
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ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IEDT 001	T			1400 EDIT OP. KRAGER	
		IEDT 002	*			THE FOLLOWING BITS ARE USED AS FLAG BITS IN THE EDIT ROUTINE.	
		IEDT 003	*			G1 REG BIT 0 IF 1 = UNITS CHAR TRANSFERED.	
		IEDT 004	*			1 IF 1 = A FLD IS MINUS.	
		IEDT 005	*			2 IF 1 = FLOATING $ ON.	
		IEDT 006	*			3 IF 1 = * FILL ON.	
		IEDT 007	*			4 IF 1 = BODY PORTION OF CONTROL WORD.	
		IEDT 008	*			5 IF 1 = ZERO SUPPRESS ON.	
		IEDT 009	*			6 IF 1 = DECIMAL CONTROL ON.	
		IEDT 010	*			7 IF 1 = EXP EDIT FEATURE ON.	
		IEDT 011	*			ON THE FIRST FORWARD PASS THE FOLLOWING CHARACTERS HAVE SPECIAL	
		IEDT 012	*			MEANING. ALL OTHERS ARE REPLACED IN THE CONTROL WORD.	
		IEDT 013	*			& REPLACE WITH BLANK	
		IEDT 014	*			C,R,OR - REPLACE IN CONTROL WORD IF BODY FLAG ON OR STATUS AND A FLD	
		IEDT 015	*			MINUS FLAG ON.	
		IEDT 016	*			BLANK TURN ON BODY AND TRANSFER A FLD CHAR.	
		IEDT 017	*			0 SAME AS . TURN ON ZERO SUPPRESS IN ADDITION.	
		IEDT 018	*			* IF EXP EDIT AND NOT FLOATING $ SET * FILL ON.	
		IEDT 019	*			$ IF EXP EDIT AND NOT * FILL SET FLOATING $.	
		IEDT 020	*			. REVERSE SCAN ONLY-SET DECIMAL CTRL IF EXP EDIT FEATURE.	
1578	5EC2	IEDT 028	START			RDH H DA,B8	GET CONTROL INFO INTO HO
157A	571A	IEDT 030	STARTE			RDB D1 U-1	READ A FIELD
157C	57D9	IEDT 031				P1=D1	
157E	3D45	IEDT 032				P1=P1$K40	INSURE NO WM BIT
1580	C519	IEDT 033		051	NOUNIT	BR IF G1 BIT0=1	BR IF NOT UNITS CHAR
1582	2585	IEDT 034				G1=0$K80	SET UNITS FLAG CLEAR REST
1584	5DC0	IEDT 035				RDB P1 AS,P	CONVERT TO BCD
1586	EDCC	IEDT 036		039	PLUS	BR IF P1 BIT2=0	BR ON NO B BIT
1588	FD0D	IEDT 037		039	PLUS	BR IF P1 BIT3=1	BR ON A BIT
158A	3545	IEDT 038				G1=G1$K40	SET A FLD MINUS FLAG
158C	5DDD	IEDT 039	PLUS			P1=P1L	REMOVE ZONES
158E	5DC0	IEDT 040				RDB P1 AS,P	CONVERT TO EBDCIC
1590	FE14	IEDT 046		049	PI1	BR IF HO BIT3=0	BR IF NO PI BIT
1592	3613	IEDT 048				D0=D0$K01	SET PI FLAG ON
1594	EE18	IEDT 049	PI1	051	NOUNIT	BR IF HO BIT2=0	BR IF NO EXP EDIT BIT
1596	3513	IEDT 050				G1=G1$K01	SET FLAG
1598	5F30	IEDT 051	NOUNIT			RDB H1 V	READ B FIELD
159A	5FB9	IEDT 052				T1=H1	
159C	3B45	IEDT 053				T1=T1$K40	INSURE NO WM BIT
159E	0B5D	IEDT 054				Z=T1□K50	TEST CHAR
15A0	F0D7	IEDT 055		090	TESTHI	BR IF LZ=0	BR IF & 0 - BK
15A2	C151	IEDT 056		079	BODYON	BR IF G1 BIT4=1	BR IF BODY
15A4	2A33	IEDT 057				T0=0$K03	BUILD
15A6	3AC5	IEDT 058				T0=T0$KC0	MASK
15A8	6AB1	IEDT 059				T0=T0□T1	TEST CHAR
15AA	C4CD	IEDT 060		077	CR	BR IF Z=0	BR IF C
15AC	2A93	IEDT 061				T0=0$K09	BUILD
15AE	3AD5	IEDT 062				T0=T0$KD0	MASK
15B0	6AB1	IEDT 063				T0=T0□T1	TEST CHAR
15B2	C4CD	IEDT 064		077	CR	BR IF Z=0	BR IF R
15B4	2AB3	IEDT 065				T0=0$K0B	BUILD
15B6	3A65	IEDT 066				T0=T0$K60	MASK
15B8	F23C	IEDT 067		069	PI2	BR IF D0 BIT7=0	BR IF NO PI FLAG

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
15BA	1A25	IEDT 068				TO=TO*-K20	CHANGE MASK
15BC	6AB1	IEDT 069	PI2			TO=TO¤T1	TEST CHAR
15BE	C4C2	IEDT 070		072	STOREB	BR IF ZNZ	BR IF NOT ,
15C0	2B45	IEDT 071	BLANK1			T1=0$K40	FORCE BLANK CHAR
15C2	7B3A	IEDT 072	STOREB			STB T1 V-1	STORE CHAR BACK
15C4	DF19	IEDT 073		051	NOUNIT	BR IF H1 BIT1=1	BR IF NO B FLD WM
15C6	D14B	IEDT 074	TEST2	076	SUPP	BR IF G1 BIT5=1	BR IF ZERO SUPP ON
15C8	8D7C	IEDT 075		ICYC 037	HISTRT	BR	
15CA	A67C	IEDT 076	SUPP	138	REVSCN	BR	
15CC	D543	IEDT 077	CR	072	STOREB	BR IF G1 BIT1=1	BR IF A FLD MINUS
15CE	95C0	IEDT 078		071	BLANK1	BR	CLEAR CHAR
15D0	F142	IEDT 079	BODYON	072	STOREB	BR IF G1 BIT7=0	BR IF NO EXP EDIT
15D2	ECEE	IEDT 080		082	TEST11	BR IF HZNZ	
15D4	A57E	IEDT 081		102	TEST1	BR	GO TEST FOR * OR $
15EE	2A45	IEDT 082	TEST11			TO=0$K40	BUILD
15F0	3AB3	IEDT 083				TO=TO$KOB	MASK
15F2	F276	IEDT 084		086	PI3	BR IF DO BIT7=0	BR IF NO PI FLAG
15F4	3A25	IEDT 085				TO=TO$K20	CHANGE MASK
15F6	6AB1	IEDT 086	PI3			TO=TO¤T1	TEST CHAR
15F8	C4C2	IEDT 087		072	STOREB	BR IF ZNZ	BR IF NOT .
15FA	1525	IEDT 088				G1=G1*-K20	RESET FLOATING $
15FC	95C2	IEDT 089		072	STOREB	BR	
15D6	E0C1	IEDT 090	TESTHI	071	BLANK1	BR IF HZ=0	BR IF &
15D8	OBFD	IEDT 091				Z=T1¤KFO	TEST CHAR
15DA	C4DE	IEDT 092		094	NOZERO	BR IF ZNZ	BR IF NOT 0
15DC	A996	IEDT 093		120	ZERO	BR	CHAR IS 0
15DE	0B6D	IEDT 094	NOZERO			Z=T1¤K60	TEST CHAR
15E0	C4E6	IEDT 095		098	NODASH	BR IF ZNZ	BR IF NOT -
15E2	C14C	IEDT 096		077	CR	BR IF G1 BIT4=0	BR IF STATUS
15E4	95C2	IEDT 097		072	STOREB	BR	CHAR IS -
15E6	0B4D	IEDT 098	NODASH			Z=T1¤K40	TEST CHAR
15E8	C4C2	IEDT 099		072	STOREB	BR IF ZNZ	BR IF NOT BK
15EA	E143	IEDT 100		072	STOREB	BR IF G1 BIT6=1	BR IF A FLD TERMINATED
15EC	A99E	IEDT 101		124	SETBDY	BR	CHAR IS BK
297E	OBCB	IEDT 102	TEST1			Z=T1¤KOC	TEST LO BITS
2980	F0AA	IEDT 103		109	TRYDLR	BR IF LZNZ	NOT *
2982	0B5D	IEDT 104				Z=T1¤K50	TEST HI BITS
2984	E0AA	IEDT 105		109	TRYDLR	BR IF HZNZ	NOT *
2986	E515	IEDT 106		137	WAVE	BR IF G1 BIT2=1	FLOATING $ ON
2988	3515	IEDT 107				G1=G1$K10	SET * FILL ON
298A	A9A0	IEDT 108		125	SKIP1	BR	
29AA	0BBB	IEDT 109	TRYDLR			Z=T1¤KOB	TEST LO BITS
29AC	FC94	IEDT 110		137	WAVE	BR IF LZNZ	NOT $
29AE	0B5D	IEDT 111				Z=T1¤K50	TEST HI BITS
29B0	EC94	IEDT 112		137	WAVE	BR IF HZNZ	NOT $
29B2	D73C	IEDT 113		118	RSTDLR	BR IF D1 BIT1=0	BR IF A FLD WM
29B4	C13C	IEDT 114		118	RSTDLR	BR IF G1 BIT4=0	BR IF STATUS
29B6	F515	IEDT 115		137	WAVE	BR IF G1 BIT3=1	BR IF * FILL ON
29B8	3525	IEDT 116				G1=G1$K20	SET FLOATING $ ON
29BA	A9A0	IEDT 117		125	SKIP1	BR	
29BC	1525	IEDT 118	RSTDLR			G1=G1*-K20	RESET FLOATING DLR
29BE	A9A0	IEDT 119		125	SKIP1	BR	
2996	E10D	IEDT 120	ZERO	133	SPEC1	BR IF G1 BIT6=1	BR IF A FIELD TERMINATED

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
2998	D121	IEDT 121		125	SKIP1	BR IF G1 BIT5=1	BR IF ZERO SUPP ON
299A	1D45	IEDT 122				P1=P1*-K40	SET TEMP WM
299C	3543	IEDT 123				G1=G1$K04	SET SUPPRESS ON
299E	3583	IEDT 124	SETBDY			G1=G1$K08	SET BODY ON
29A0	7D3A	IEDT 125	SKIP1			STB P1 V-1	STORE A FLD CHAR IN B FLD
29A2	DF27	IEDT 126		128	NOBEND	BR IF H1 BIT1=1	BR IF NO B FLD WM
29A4	95C6	IEDT 127		074	TEST2	BR	
29A6	D740	IEDT 128	NOBEND	130	AEND	BR IF D1 BIT1=0	BR IF A FIELD WM
29A8	957A	IEDT 129		030	STARTE	BR	
29C0	1583	IEDT 130	AEND			G1=G1*-K08	RESET BODY
29C2	3523	IEDT 131				G1=G1$K02	SET A FLD TERMINATED
29C4	9598	IEDT 132		051	NOUNIT	BR	
298C	DF14	IEDT 133	SPEC1	137	WAVE	BR IF H1 BIT1=0	BR IF WM WITH 0
298E	D115	IEDT 134		137	WAVE	BR IF G1 BIT5=1	BR IF ZERO SUPP ON
2990	3543	IEDT 135				G1=G1$K04	SET SUPP ON
2992	1B45	IEDT 136				T1=T1*-K40	SET TEMP WM
2994	95C2	IEDT 137	WAVE	072	STOREB	BR	
267C	1523	IEDT 138	REVSCN			G1=G1*-K02	
267E	5224	IEDT 139				V=V+1	
2680	5F30	IEDT 140	BREAD			RDB H1 V	READ B FIELD
2682	5FB9	IEDT 141				T1=H1	
2684	3B45	IEDT 142				T1=T1$K40	INSURE NO WM
2686	0BFD	IEDT 143				Z=T1☐KF0	
2688	E0BB	IEDT 144		169	NUMRIC	BR IF HZ=0	BR IF 0-9
268A	0B4D	IEDT 145				Z=T1☐K40	
268C	C4C3	IEDT 146		173	ZRO	BR IF Z=0	BR IF BLANK
268E	0BBB	IEDT 147				Z=T1☐K0B	
2690	F0A3	IEDT 148		157	PRDCMA	BR IF LZ=0	BR IF , .
2692	3543	IEDT 149	ZON			G1=G1$K04	SET SUPP ON
2694	7B38	IEDT 150	BSTORE			STB T1 V+1	STORE CHAR BACK
2696	DF01	IEDT 151		140	BREAD	BR IF H1 BIT1=1	BR IF NO B FLD WM
2698	F11D	IEDT 152		154	EXEDT	BR IF G1 BIT7=1	BR IF EXP EDT ON
269A	8D7C	IEDT 153	OUT	ICYC 037	HISTRT	BR	
269C	05D7	IEDT 154	EXEDT			Z=G1*-KDD	TEST FLOAT $ AND DEC CTRL
269E	C49B	IEDT 155		153	OUT	BR IF Z=0	BR IF BOTH OFF
26A0	A79E	IEDT 156		179	FORAGN	BR	
26A2	CB6D	IEDT 157	PRDCMA			Z=T1☐K60	
26A4	F228	IEDT 158		160	PI4	BR IF D0 BIT7=0	BR IF NO PI FLAG
26A6	0B4D	IEDT 159				Z=T1☐K40	TEST CHAR
26A8	E0C3	IEDT 160	PI4	173	ZRO	BR IF HZ=0	BR IF ,
26AA	0B4D	IEDT 161				Z=T1☐K40	
26AC	F230	IEDT 162		164	PI5	BR IF D0 BIT7=0	BR IF NO PI FALG
26AE	0B6D	IEDT 163				Z=T1☐K60	TEST CHAR
26B0	E092	IEDT 164	PI5	149	ZON	BR IF HZNZ	BR IF NOT .
26B2	D114	IEDT 165		150	BSTORE	BR IF G1 BIT5=0	BR IF SUPPRESS OFF
26B4	F13E	IEDT 166		171	RSTZ	BR IF G1 BIT7=0	BR IF NO EXP EDIT
26B6	3523	IEDT 167				G1=G1$K02	SET DEC CTRL
26B8	A6BE	IEDT 168		171	RSTZ	BR	
26BA	F0C3	IEDT 169	NUMRIC	173	ZRO	BR IF LZ=0	BR IF 0
26BC	1523	IEDT 170				G1=G1*-K02	RESET DEC CTRL
26BE	1543	IEDT 171	RSTZ			G1=G1*-K04	RESET SUPPRESS
26C0	A694	IEDT 172		150	BSTORE	BR	
26C2	D114	IEDT 173	ZRO	150	BSTORE	BR IF G1 BIT5=0	BR IF SUPPRESS OFF

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
26C4	2B45	IEDT 174				T1=0$K40	SET BLANK CHAR
26C6	F514	IEDT 175		150	BSTORE	BR IF G1 BIT3=0	BR IF * FILL OFF
26C8	28C3	IEDT 176				T1=0$K0C	FORCE
26CA	3B55	IEDT 177				T1=T1$K50	CHAR TO *
26CC	A694	IEDT 178		150	BSTORE	BR	
279E	5226	IEDT 179	FORAGN			V=V-1	
27A0	5F30	IEDT 180	XREADB			RDB H1 V	READ B FIELD
27A2	0F4D	IEDT 181				Z=H1¤K40	TEST CHAR
27A4	C4C5	IEDT 182		213	BK2	BR IF Z=0	BR IF BLANK
27A6	E11E	IEDT 183		179	FORAGN	BR IF G1 BIT6=0	BR IF DEC CTRL OFF
27A8	2AB3	IEDT 184				T0=0$K0B	BUILD
27AA	3A45	IEDT 185				T0=T0$K40	MASK
27AC	F230	IEDT 186		188	PI6	BR IF DO BIT7=0	BR IF NO PI FLAG
27AE	3A25	IEDT 187				T0=T0$K20	CHANGE MASK
27B0	6AF1	IEDT 188	PI6			T0=T0¤H1	TEST CHAR
27B2	C499	IEDT 189		205	PRD2	BR IF Z=0	BR IF .
27B4	F08F	IEDT 190		208	CMA2	BR IF LZ=0	MAY BE ,
27B6	0FFD	IEDT 191	NOPE			Z=H1¤KF0	
27B8	E09E	IEDT 192		179	FORAGN	BR IF HZNZ	NOT 0-9
27BA	C481	IEDT 193		198	ZERO2	BR IF Z=0	BR IF 0
27BC	7F3A	IEDT 194				STB H1 V-1	STORE CHAR
27BE	1523	IEDT 195				G1=G1*-K02	RESET DEC CTRL
27C0	E521	IEDT 196		180	XREADB	BR IF G1 BIT2=1	BR IF FLOATING $ ON
27C2	8D7C	IEDT 197	ENDIT	ICYC 037	HISTRT	BR	
2780	2F45	IEDT 198	ZERO2			H1=0$K40	FORCE BLANK CHAR
2782	F5C8	IEDT 199		202	XTRE	BR IF G1 BIT3=0	BR IF * FILL OFF
2784	2FC3	IEDT 200				H1=0$K0C	BUILD
2786	3F55	IEDT 201	CMP			H1=H1$K50	CHAR
2788	7F3A	IEDT 202	XTRE			STB H1 V-1	STORE CHAR
278A	F142	IEDT 203		197	ENDIT	BR IF G1 BIT7=0	BR IF DONE
278C	A7A0	IEDT 204		180	XREADB	BR	
2798	1513	IEDT 205	PRD2			G1=G1*-K01	
279A	1525	IEDT 206				G1=G1*-K20	
279C	A780	IEDT 207		198	ZERO2	BR	
278E	0F6D	IEDT 208	CMA2			Z=H1¤K60	TEST CHAR
2790	F214	IEDT 209		211	PI7	BR IF DO BIT7=0	BR IF NO PI FLAG
2792	0F4D	IEDT 210				Z=H1¤K40	TEST CHAR
2794	E0B6	IEDT 211	PI7	191	NOPE	BR IF HZNZ	BR IF NOT ,
2796	A780	IEDT 212		198	ZERO2	BR	
27C4	E101	IEDT 213	BK2	198	ZERO2	BR IF G1 BIT6=1	BR IF DEC CTRL ON
27C6	1537	IEDT 214				G1=G1*-K33	RESET FLAGS
27C8	2FB3	IEDT 215				H1=0$K0B	
27CA	A786	IEDT 216		201	CMP	BR	

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* CROSS REFERENCE FOR CSECT IEDT *
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IEDT 028   ICYC 244
IEDT 030   IEDT 129
IEDT 039   IEDT 036   IEDT 037
IEDT 049   IEDT 046
IEDT 051   IEDT 033   IEDT 049   IEDT 073   IEDT 132
IEDT 069   IEDT 067
IEDT 071   IEDT 078   IEDT 090

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* CROSS REFERENCE FOR CSECT IEDT *
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IEDT 072    IEDT 070   IEDT 077   IEDT 079   IEDT 087   IEDT 089   IEDT 097   IEDT 099   IEDT 100   IEDT 137
IEDT 074    IEDT 127
IEDT 076    IEDT 074
IEDT 077    IEDT 060   IEDT 064   IEDT 096
IEDT 079    IEDT 056
IEDT 082    IEDT 080
IEDT 086    IEDT 084
IEDT 090    IEDT 055
IEDT 094    IEDT 092
IEDT 098    IEDT 095
IEDT 102    IEDT 081
IEDT 109    IEDT 103   IEDT 105
IEDT 118    IEDT 113   IEDT 114
IEDT 120    IEDT 093
IEDT 124    IEDT 101
IEDT 125    IEDT 1C8   IEDT 117   IEDT 119   IEDT 121
IEDT 128    IEDT 126
IEDT 130    IEDT 128
IEDT 133    IEDT 120
IEDT 137    IEDT 1C6   IEDT 110   IEDT 112   IEDT 115   IEDT 133   IEDT 134
IEDT 138    IEDT 076
IEDT 140    IEDT 151
IEDT 149    IEDT 164
IEDT 150    IEDT 165   IEDT 172   IEDT 173   IEDT 175   IEDT 178
IEDT 153    IEDT 155
IEDT 154    IEDT 152
IEDT 157    IEDT 148
IEDT 160    IEDT 158
IEDT 164    IEDT 162
IEDT 169    IEDT 144
IEDT 171    IEDT 166   IEDT 168
IEDT 173    IEDT 146   IEDT 160   IEDT 169
IEDT 179    IEDT 156   IEDT 183   IEDT 192
IEDT 180    IEDT 196   IEDT 204
IEDT 188    IEDT 186
IEDT 191    IEDT 211
IEDT 197    IEDT 203
IEDT 198    IEDT 193   IEDT 207   IEDT 212   IEDT 213
IEDT 201    IEDT 216
IEDT 202    IEDT 199
IEDT 205    IEDT 189
IEDT 208    IEDT 190
IEDT 211    IEDT 209
IEDT 213    IEDT 182
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ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IERR 001	T	A AND	B	INVALID ADDRESS CK ROUTINE.	KRAGER
0A80	B159	IERR 002	OPROW 0	006	OPROWO N	N=G1L	OP ROW 0 DECODE
0A82	81DA	IERR 003	OPROW 1	036	CKAORB	BR	GO CK BOTH A&B ADDR
0A84	8DC4	IERR 004	OPROW 2	ICYC 213	OPROW 2	BR	GO CHECK LENGTH
0A86	9378	IERR 005	OPROW 3	053	AINVLD	BR	GO CK A ADDR
0CC0	81DA	IERR 006	OPROWO 0	036	CKAORB	BR	MOVE OP
0CC4	A062	IERR 007	OPROWO 2	055	HALT	BR	HALT OP
0CC8	81DA	IERR 008	OPROWO 4	036	CKAORB	BR	SET WM
0CCA	936C	IERR 009	OPROWO 5	061	CKB	BR	CLEAR OP
0CCC	8D7C	IERR 010	OPROWO 6	ICYC 037	HISTRT	BR	NO OP
0CD6	934C	IERR 016	OPROWO B	IBCH 002	BRANCH	BR	BRANCH OP
0CDC	81DA	IERR 018	OPROWO E	036	CKAORB	BR	V OP
0CDE	81DA	IERR 019	OPROWO F	036	CKAORB	BR	W OP
206C	2A43	IERR 028	INVDOP			TO=0$K04	SET STOP CODE=04
206E	817C	IERR 029		034	STCODE	BR	
11CC	2A13	IERR 030	BHADER			TO=0$K01	
11DE	AC68	IERR 031		059	CKOP	BR	
0178	2A25	IERR 032	OPNOWM			TO=0$K20	SET STOP CODE=21
017A	3A13	IERR 033	ADD1		.	TO=TO$K01	
017C	7AF2	IERR 034	STCODE			STH T DA,BE	STORE STOP CODE
017E	A044	IERR 035		IDIS 003	STOPPP	BR	
01DA	56A5	IERR 036	CKAORB			TO=DOXL	
01DC	1AC3	IERR 037	CLER45			TO=TO*-KOC	CLEAR 4 & 5 BITS
01DE	AC68	IERR 038		059	CKOP	BR	
1374	E671	IERR 039	CKAADD	051	AHASER	BR IF DO BIT2=1	BR IF A ADD INVALID
1376	8D00	IERR 041	BOK	ICYC 211	OPROW 0	BR	
1370	2A23	IERR 051	AHASER			TO=0$K02	
1372	AC68	IERR 052		059	CKOP	BR	
1378	E671	IERR 053	AINVLD	051	AHASER	BR IF DO BIT2=1	BR IF A STAR INVALD
137A	8DC6	IERR 054		ICYC 214	OPROW 3	BR	
2062	2AF5	IERR 055	HALT			TO=0$KFO	SET NORMAL HALT -FO-
2064	D268	IERR 056		059	CKOP	BR IF DO BIT5=0	BR IF NOT I4
2066	2AF7	IERR 057	HLTBR			TO=0$KFF	SET HALT & BR
2068	E56D	IERR 059	CKOP	028	INVDOP	BR IF G1 BIT2=1	BR IF INVALID OP
206A	817C	IERR 060		034	STCODE	BR	
136C	F676	IERR 061	CKB	041	BOK	BR IF DO BIT3=0	BR IF B ADDR VALID
136E	91DC	IERR 067		030	BHADER	BR	

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**********************************
* CROSS REFERENCE FOR CSECT IERR *
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IERR 002	ICYC 208	ICYC 209	ICYC 210		
IERR 006	IERR 002				
IERR 028	ICYC 216	IERR 059			
IERR 030	IERR 067				
IERR 032	ICYC 067				
IERR 033	IOCM 008				
IERR 034	IERR 029	IERR 060	IOCM 010	IOCM 017	IUBR 009	MAAA 097
IERR 036	IBCH 007	IERR 003	IERR 006	IERR 008	IERR 018	IERR 019
IERR 041	IERR 061				
IERR 051	IERR 039	IERR 053			
IERR 053	IERR 005				
IERR 055	ICYC 226	IERR 007			
IERR 059	IERR 031	IERR 038	IERR 052	IERR 056	

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* CROSS REFERENCE FOR CSECT IERR *
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IERR 061   IERR 0C9

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IMAD 001	T		MODIFY ADDRESS	KRAGER	
187C	16F3	IMAD 002	MDFADR			DO=DO*-KOF	RESET FLAG BITS
187E	1002	IMAD 003				RST S K=90	RESET CARRY IN AND COMP
1880	5D1A	IMAD 004	RDAFLD			RDB P1 U-1	READ A FIELD
1882	3D45	IMAD 005				P1=P1$K40	INSURE NO WM
1884	CD09	IMAD 006		015	AFLDOK	BR IF P1 BIT0=1	BR IF NOT A SPECIAL CHARACTER
1886	8442	IMAD 013		IADD 160	CORCHR	BAL	GO CORRECT CHAR
1888	5D79	IMAD 015	AFLDOK			D1=P1	SET A REG
188A	1613	IMAD 016				DO=DO*-K01	RESET B WM FLAG BIT
188C	5D30	IMAD 017				RDB P1 V+0	READ B FIELD
188E	DD13	IMAD 018		020	NOBWM	BR IF P1 BIT1=1	BR IF NO B FLD WM
1890	3613	IMAD 019				DO=DO$K01	SET WM FLAG
1892	CD17	IMAD 020	NOBWM	029	BFLDOK	BR IF P1 BIT0=1	BR IF NOT A SPECIAL CHARACTER
1894	8442	IMAD 027		IADD 160	CORCHR	BAL	GO CORRECT CHAR
1896	2A95	IMAD 029	BFLDOK			TO=O$K90	
1898	3D45	IMAD 030				P1=P1$K40	
189A	4DAD	IMAD 031				TO=P1L+TOH	SET UP FOR ADD
189C	57BD	IMAD 032				T1=D1L	
189E	7BAF	IMAD 033				T1C=T1aTO+C	ADD NUMERICS
1BA0	E229	IMAD 034		038	UNITS	BR IF DO BIT6=1	BR IF UNITS POSITION DONE
1BA2	3623	IMAD 035				DO=DO$K02	SET UNITS DONE
1BA4	86F8	IMAD 036		070	ZONEAD	BAL	GO ADD ZONE BITS
1BA6	9BB6	IMAD 037		045	SLASH	BR	
1BA8	D230	IMAD 038	UNITS	042	TENS	BR IF DO BIT5=0	BR IF TENS NOT DONE
1BAA	3683	IMAD 039				DO=DO$K08	SET HNDRDS
1BAC	86F8	IMAD 040		070	ZONEAD	BAL	GO ADD ZONE BITS
1BAE	9BB6	IMAD 041		045	SLASH	BR	GO CHECK RSLT FOR SLASH
1BB0	4DBB	IMAD 042	TENS			T1=P1H+T1L	USE B FLD ZONE BITS
1BB2	3B85	IMAD 043				T1=T1$K80	FORCE 0 BIT ON
1BB4	3643	IMAD 044	GOOD			DO=DO$K04	SET TENS DONE
1BB6	0B1B	IMAD 045	SLASH			Z=T1¤K01	CHECK LOW BITS
1BB8	F0C7	IMAD 046		053	MAYBE	BR IF LZ=0	BR IF LOW BITS=1
1BBA	F23E	IMAD 047	CKWM	049	LEAVE	BR IF DO BIT7=0	BR IF B WM FLAG OFF
1BBC	1B45	IMAD 048				T1=T1*-K40	ADD WM TO CHAR
1BBE	7B3A	IMAD 049	LEAVE			STB T1 V-1	STORE CHAR
1BC0	C200	IMAD 050		004	RDAFLD	BR IF DO BIT4=0	BR IF HNDRDS NOT DONE
1BC2	E24F	IMAD 051		057	CORUTS	BR IF DO BIT6=1	
1BC4	8D7C	IMAD 052	ICYCLE	ICYC 037	HISTRT	BR	
1BC6	0BED	IMAD 053	MAYBE			Z=T1¤KE0	CHECK HIGH BITS
1BC8	E0BA	IMAD 054		047	CKWM	BR IF HZNZ	BR IF HIGH BITS NOT E
1BCA	1B8D	IMAD 055				T1=T1¤K80	REMOVE 0 BIT
1BCC	9BBA	IMAD 056		047	CKWM	BR	
1BCE	DF44	IMAD 057	CORUTS	052	ICYCLE	BR IF H1 BIT1=0	BR IF UNITS RSLT OK
1BD0	6224	IMAD 058				V=V+2	RE ADDRESS UNITS POSITION
1BD2	5224	IMAD 059				V=V+1	
1BD4	5B30	IMAD 060				RDB T1 V+0	READ CHARACTER
1BD6	1613	IMAD 061				DO=DO*-K01	RESET WM FLAG
1BD8	5B79	IMAD 062				D1=T1	
1BDA	2DF5	IMAD 063				P1=0$KF0	
1BDC	2002	IMAD 064				SET S3	
1BDE	D763	IMAD 065		067	PTCH	BR IF D1 BIT1=1	BR IF NO WM WITH CHAR
1BE0	3613	IMAD 066				DO=DO$K01	SET WM FLAG ON
1BE2	E6F8	IMAD 067	PTCH	070	ZONEAD	BAL	GO ADD ZONE BITS

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1BE4	1623	IMAD 068				D0=D0*-K02	RESET UNITS FLAG BIT
1BE6	9BB6	IMAD 069		045	SLASH	BR	GO CHECK FOR SLASH
06F8	57AB	IMAD 070	ZONEAD			T0=D1H	
06FA	5DFB	IMAD 071				H1=P1H	
06FC	1AFD	IMAD 072				T0=T0□KF0	INVERT ZONE BITS
06FE	1FFD	IMAD 073				H1=H1□KF0	INVERT ZONE BITS
0700	6FA3	IMAD 074				H1=H1+T0	ADD BITS
0702	D2C8	IMAD 075		078	NOCRY	BR IF D0 BIT5=0	BR IF NOT HNDRDS CHAR
0704	F588	IMAD 076		078	NOCRY	BR IF S3=0	BR IF NO NUMERIC CARRY
0706	2F1D	IMAD 077				H1=H1+K10	ADD 1 TO ZONES
0708	1FBD	IMAD 078	NOCRY			H1=H1□K80	INVERT ZONES
070A	4FBB	IMAD 079				T1=H1H+T1L	FORM NEW CHARACTER
070C	3BC5	IMAD 080				T1=T1$KC0	FORCE 0 AND 1 BITS ON
070E	128E	IMAD 081				RTN	
		IMAD 082	AEND				

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************************************
* CROSS REFERENCE FOR CSECT IMAD *
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IMAD 002	ICYC 242		
IMAD 004	IMAD 050		
IMAD 015	IMAD 006		
IMAD 020	IMAD 018		
IMAD 029	IMAD 020		
IMAD 038	IMAD 034		
IMAD 042	IMAD 038		
IMAD 045	IMAD 037	IMAD 041	IMAD 069
IMAD 047	IMAD 054	IMAD 056	
IMAD 049	IMAD 047		
IMAD 052	IMAD 057		
IMAD 053	IMAD 046		
IMAD 057	IMAD 051		
IMAD 067	IMAD 065		
IMAD 070	IMAD 036	IMAD 040	IMAD 067
IMAD 078	IMAD 075	IMAD 076	

IMEM DESCRIPTIVE TEXT

OBJECTIVES   ENTRY POINT

    SET 8F INTO 1400 PROGRAM STORAGE POSITION 0000-1 (FOR LOW   IPLS
    STORAGE WRAP DETECTION).
                                                                    THIS IS THE EXCLUSIVE ENTRY POINT FROM THE INITIAL
                                                                    PROGRAM LOAD PROCEDURE. MEMORY SCAN IS DONE EACH
    SCAN ENTIRE 1400-ASSIGNED PROGRAM STORAGE AREA AND REPLACE   TIME AN OBJECT PROGRAM IS LOADED.
    ANY INVALID 1400 CHARACTER WITH BLANKS (40).

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IMEM 001	T			** 1400 MEMORY SCAN R TAYLOR	
2084	2400	IMEM 002	SCAN			SET MODE K=00	SET NPL CPU MODE TO SCAN
2086	3779	IMEM 003			.	D1=0-K70	BUILD 8F CHARACTER
2088	2E07	IMEM 004				H0=0	
208A	5A02	IMEM 005				RDH T DA,88	GET BIAS CONSTANT
208C	5AA6	IMEM 006	BACK			T=T-1	GET 1400 0000-1 ORBACKUP TO FIX
208E	77B8	IMEM 007				STB D1 T+1	STORE 8F OR 40
2090	2745	IMEM 008				D1=0$K40	
2092	5DA2	IMEM 009	AGAIN			RDB P1 DA,AC	GET HI MEMORY ADDRESS
2094	7DA1	IMEM 010				P1=P1-T0+1	TRIAL SUBTRACT
2096	F4A2	IMEM 011		017	END	BR IF AC=0	SCAN DONE
2098	5FB8	IMEM 012				RDB H1 T+1	GET CHARACTER TO TABLE LOOKUP
209A	3F45	IMEM 013				H1=H1$K40	
209C	55E0	IMEM 014				RDB G1 AS,H	TEST FOR VALID 1400 CHARACTER
209E	D50D	IMEM 015		006	BACK	BR IF G11=1	ERROR STORE 40 FOR INVALID
20A0	D512	IMEM 016		009	AGAIN	BR IF G11=0	CHARACTER OK GET NEXT
20A2	3400	IMEM 017	END			SET MODE K=80	
20A4	128E	IMEM 018				RTN	

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**********************************
* CROSS REFERENCE FOR CSECT IMEM *
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IMEM 002   IPLS 0C5
IMEM 006   IMEM 015
IMEM 009   IMEM 016
IMEM 017   IMEM 011

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IMPY 001	T		1400 MULTIPLY	KRAGER	
		IMPY 002	*			MULTIPLY SIGN ANALYSIS AND B FIELD CLEAR LOOP.	
05F4	7222	IMPY 010	MULTPY			STH V DA,8C	SET B AUX REG
05F6	2C07	IMPY 012				PO=0	CLEAR FLAG BITS
05F8	1020	IMPY 013				RST S K=82	RESET S0 AND S6
05FA	4426	IMPY 014				G=V	SET AUX B STAR
05FC	7032	IMPY 020				STH U DA,8E	SET AUX A STAR
05FE	5D1A	IMPY 022				RDB P1 U-1	READ A FIELD
0600	CD05	IMPY 023	CKSPCL	032	NOSPEC	BR IF P1 BIT0=1	
0602	8442	IMPY 030		IADD 160	CORCHR	BAL	
0604	ED0B	IMPY 032	NOSPEC	035	SIGNOK	BR IF P1 BIT 2=1	BCH IF CHAR IS PLUS
0606	FD0A	IMPY 033		035	SIGNOK	BR IF P1 BIT3=0	BCH IF CHAR IS PLUS
0608	161B	IMPY 034				DO=DO□KO1	INVERT SIGN CTRL BIT
060A	5DF9	IMPY 035	SIGNOK			H1=P1	
060C	CC18	IMPY 036		038	NOAFWM	BR IF PO BIT0=0	BCH IF A WM FLAG OFF
060E	94FC	IMPY 037		050	AHADWM	BR	
0618	5D30	IMPY 038	NOAFWM			RDB P1 V+0	READ B FIELD
061A	5DDB	IMPY 039				P1=P1H	
061C	3DB5	IMPY 040				P1=P1$KB0	SET TO ZERO
061E	7D3A	IMPY 041				STB P1 V-1	STORE CHAR BACK
0620	CC15	IMPY 042		048	AFLGON	BR IF PO BIT0=1	BCH IF A WM FLAG ON
0622	DF10	IMPY 043		046	AFLDWM	BR IF H1 BIT1=0	BCH IF A FLD WM
0624	5F1A	IMPY 044				RDB H1 U-1	READ A FIELD
0626	8618	IMPY 045		038	NOAFWM	BR	
0610	3C85	IMPY 046	AFLDWM			PO=PO$K80	SET A WM FLAG
0612	8618	IMPY 047		038	NOAFWM	BR	
0614	5D30	IMPY 048	AFLGON			RDB P1 V+0	READ MLPR
0616	8600	IMPY 049		023	CKSPCL	BR	
14FC	5D50	IMPY 050	AHADWM			RDB P1 G+0	READ PRODUCT POS
14FE	5DDD	IMPY 051				P1=P1L	
1500	F204	IMPY 052		054	TRUADD	BR IF DO BIT7=0	BR IF ADD
1502	3D15	IMPY 053				P1=P1$K10	
1504	3DC5	IMPY 054	TRUADD			P1=P1$KC0	SET UP PLUS OR MINUS
1506	7D50	IMPY 055				STB P1 G+0	STORE UNITS OF PROD
1508	5032	IMPY 063	SETAUX			RDH U DA,8E	SET A=AUX
150A	1CF3	IMPY 064				PO=PO*-KOF	
150C	5422	IMPY 065				RDH G DA,8C	READ B AUX REG
150E	5D30	IMPY 067				RDB P1 V+0	READ MLPR
1510	DD15	IMPY 068		070	NOBWM	BR IF P1 BIT1=1	BCH IF NO B FLD WM
1512	3C45	IMPY 069				PO=PO$K40	SET B WM FLAG
1514	5DBB	IMPY 070	NOBWM			T1=P1H	
1516	5D79	IMPY 071				D1=P1	
1518	3BB5	IMPY 072				T1=T1$KB0	ZERO CHAR
151A	7B3A	IMPY 073				STB T1 V-1	
151C	CD21	IMPY 074		083	NOTSPC	BR IF P1 BIT0=1	BCH IF NOT SPC CHAR
151E	8442	IMPY 081		IADD 160	CORCHR	BAL	
1520	1DF5	IMPY 083	NOTSPC			P1=P1*-KF0	
1522	F0A6	IMPY 084		086	NONZRO	BR IF LZNZ	BCH ON NON 0 MLPR
1524	901C	IMPY 085		118	EXIT	BR	
1526	5DE9	IMPY 086	NONZRO			HO=P1	SET MLPR
		IMPY 087	*			MULTIPLY MAIN LOOP.	
1528	5D1A	IMPY 088				RDB P1 U-1	
152A	CD2F	IMPY 089		098	CHAROK	BR IF P1 BIT0=1	BCH IF NOT SPC CHAR

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
152C	8442	IMPY C96		IADD 160	CORCHR	BAL	
152E	00C2	IMPY 098	CHAROK			RST S K=10	RESET S3
1530	4DEB	IMPY 099				H0=P1H+HOL	SAVE ZONE BITS
1532	1E7B	IMPY 100				H0=H0□K07	CORRECT MLPR
1534	5DDD	IMPY 101				P1=P1L	
1536	5DFD	IMPY 102				H1=P1L	STRIP ZONE BITS
1538	9A01	IMPY 103		104	ADDER N	N=H0 BITS567	
1000	7DFF	IMPY 104	ADDER 0			P1C=P1∂H1+C	
1002	7DFF	IMPY 105	ADDER 1			P1C=P1∂H1+C	
1004	7DFF	IMPY 106	ADDER 2			P1C=P1∂H1+C	MPLY CNAD
1006	7DFF	IMPY 107	ADDER 3			P1C=P1∂H1+C	
1008	7DFF	IMPY 108	ADDER 4			P1C=P1∂H1+C	
100A	7DFF	IMPY 109	ADDER 5			P1C=P1∂H1+C	
100C	9016	IMPY 110	ADDER 6	115	CKBIT4	BR	
100E	CA1C	IMPY 111	ADDER 7	118	EXIT	BR IF H0 BIT4=0	BCH IF MLPR NOT 8
1010	1E83	IMPY 112	CONTIN			H0=H0*-K08	REMOVE 4 BIT
1012	7DFF	IMPY 113				P1C=P1∂H1+C	
1014	9000	IMPY 114		104	ADDER 0	BR	
1016	CA1C	IMPY 115	CKBIT4	118	EXIT	BR IF H0 BIT4=0	BCH IF MLPR NOT 9
1018	7DFF	IMPY 116				P1C=P1∂H1+C	
101A	9010	IMPY 117		112	CONTIN	BR	
101C	5CAD	IMPY 118	EXIT			T0=POL	
101E	7DAF	IMPY 119				P1C=P1∂T0+C	ADD ANY CAND CARRY
1020	4DC5	IMPY 120				P0=P1XL$POH	SAVE THIS CARRY
1022	5B50	IMPY 121				RDB T1 G+0	READ PROD POS
1024	E1AA	IMPY 122		125	NOCARY	BR IF S6=0	BCH IF NO PROD CARRY
1026	20C2	IMPY 123				SET S K=10	SET S3
1028	0020	IMPY 124				RST S K=02	RST S6
102A	5DDD	IMPY 125	NOCARY			P1=P1L	RSLT FIELD
102C	5BAD	IMPY 126				T0=T1L	PROD FIELD
102E	7DAF	IMPY 127				P1C=P1∂T0+C	
1030	ECB5	IMPY 128		130	NOPRCY	BR IF HZ=0	BCH IF NO PROD CARRY
1032	2020	IMPY 129				SET S K=02	SET S6
1034	4DBD	IMPY 130	NOPRCY			T1=P1L+T1H	ADD PROD ZONES
1036	57D9	IMPY 131				P1=D1	
1038	7B5A	IMPY 132				STB T1 G-1	STORE RESULT
103A	DE44	IMPY 133		136	AEND	BR IF H0 BIT1=0	BCH8IF A FLD WM
103C	9526	IMPY 134		086	NONZRO	BR	
		IMPY 135	*			MULTIPLY ENDING ROUTINE.	
1044	0002	IMPY 136	AEND			RST S K=10	RST S3
1046	5B50	IMPY 137				RDB T1 G+0	READ PRODUCT
1048	E1CE	IMPY 138		141	FINISH	BR IF S6=0	BCH IF NO PROD CARRY
104A	2002	IMPY 139				SET S K=10	SET S3
104C	0020	IMPY 140				RST S K=02	RST S6
104E	5BAD	IMPY 141	FINISH			T0=T1L	
1050	5CDD	IMPY 142				P1=POL	
1052	7DAF	IMPY 143				P1C=P1∂T0+C	ADD FIELDS
1054	4DBD	IMPY 144				T1=P1L+T1H	INSERT ZONES
1056	7B5A	IMPY 145				STB T1 G-1	STORE RESULT
1058	DC3F	IMPY 156		167	MPYEND	BR IF P0 BIT1=1	BCH IF B FLD WM FLG
105A	5422	IMPY 157				RDH G DA,8C	READ B AUX REG
105C	5446	IMPY 158				G=G-1	DECREMENT BAUX -1
105E	7422	IMPY 159				STH G DA,8C	STORE B AUX REG

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1060	95C8	IMPY 161		063	SETAUX	BR	
103E	2CC7	IMPY 167	MPYEND			PO=0	
1040	2607	IMPY 169				DO=0	
1042	8D7C	IMPY 170		ICYC 037	HISTRT	BR	

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**********************************
* CROSS REFERENCE FOR CSECT IMPY *
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IMPY 010    ICYC 248
IMPY 023    IMPY 049
IMPY 032    IMPY 023
IMPY 035    IMPY 032    IMPY 033
IMPY 038    IMPY 036    IMPY 045    IMPY 047
IMPY 046    IMPY 043
IMPY 048    IMPY 042
IMPY 050    IMPY 037
IMPY 054    IMPY 052
IMPY 063    IMPY 161
IMPY 070    IMPY 068
IMPY 083    IMPY 074
IMPY 086    IMPY 084    IMPY 134
IMPY 098    IMPY 089
IMPY 104    IMPY 1C3    IMPY 114
IMPY 112    IMPY 117
IMPY 115    IMPY 110
IMPY 118    IMPY 085    IMPY 111    IMPY 115
IMPY 125    IMPY 122
IMPY 130    IMPY 128
IMPY 136    IMPY 133
IMPY 141    IMPY 138
IMPY 167    IMPY 156
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ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IMRC 001	T		1400	MOVE RECORD. KRAGER	
		IMRC 002	*			DATA MOVED FROM A FLD TO B FLD. WORD MARKS ARE NOT CHANGED. OP ENDS	
		IMRC 003	*			AFTER FIRST RECORD MARK OR GMWM IS MOVED.	
2E6A	7738	IMRC 004	STORE			STB D1 V+1	STORE CHAR
2E6C	5718	IMRC 005	RECORD			RDB D1 U+1	READ A FIELD
2E6E	5F30	IMRC 006				RDB H1 V+0	READ B FIELD
2E70	07FB	IMRC 007				Z=D1¤KOF	
2E72	C4E1	IMRC 008		015	GMWMRM	BR IF Z=0	BR IF GMWM
2E74	3745	IMRC 009				D1=D1$K40	ADD WM BIT
2E76	07ED	IMRC 010				Z=D1¤KE0	
2E78	C4E1	IMRC 011		015	GMWMRM	BR IF Z=0	BR IF RECORD MARK
2E7A	DF6B	IMRC 012		004	STORE	BR IF H1 BIT 1=1	BR IF NO B FIELD WM
2E7C	1745	IMRC 013				D1=D1*-K40	ADD WM TO CHAR
2E7E	AE6A	IMRC 014		004	STORE	BR	
2E60	3745	IMRC 015	GMWMRM			D1=D1$K40	REMOVE WM BIT
2E62	DF67	IMRC 016		018	CHAROK	BR IF H1 BIT 1=1	BR IF NO B FLD WM
2E64	1745	IMRC 017				D1=D1*-K40	ADD WM TO CHAR
2E66	7738	IMRC 018	CHAROK			STB D1 V+1	STORE CHAR
2E68	8D7C	IMRC 019		ICYC 037	HISTRT	BR	

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**********************************
* CROSS REFERENCE FOR CSECT IMRC *
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IMRC 004	IMRC 012	IMRC 014
IMRC 005	ICYC 282	
IMRC 015	IMRC 0C8	IMRC 011
IMRC 018	IMRC 016	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IMVE 001	T			1400 MOVE AND LOAD OPS. KRAGER	
		IMVE 002	*			DATA MOVED A TO B FIELD. A WM IN EITHER FLD WILL END THE MOVE UP. THE	
		IMVE 003	*			WM'S ARE NOT MOVED OR CHANGED. ON A LOAD OP ONLY A WM'S WILL END	
		IMVE 004	*			THE OP AND IT WILL BE MOVED TO THE B FIELD.	
1CA8	773A	IMVE 005	STORE			STB D1 V-1	STORE CHAR
1CAA	571A	IMVE 006	MOVE			RDB D1 U-1	READ A FIELD
1CAC	5F30	IMVE 007				RDB H1 V+0	READ B FIELD
1CAE	DF22	IMVE 008		017	BFLDWM	BR IF H1 BIT1=0	BR IF B FIELD WM
1CB0	0729	IMVE 009		005	STORE	BR IF D1 BIT1=1	BR IF NO A FIELD WM
1CB2	3745	IMVE 010	AFLDWM			D1=D1$K40	REMOVE A FIELD WM
1CB4	773A	IMVE 011				STB D1 V-1	STORE CHAR
1CB6	8D7C	IMVE 012		ICYC 037	HISTRT	BR	
1C9A	773A	IMVE 013	LOAD			STB D1 V-1	STORE CHAR
1C9C	571A	IMVE 014	LOADOP			RDB D1 U-1	READ A FIELD
1C9E	5F30	IMVE 015				RDB H1 V+0	READ B FIELD
1CA0	D71B	IMVE 016		013	LOAD	BR IF D1 BIT1=1	BR IF NO A FIELD WM
1CA2	1745	IMVE 017	BFLDWM			D1=D1*-K40	ADD WM TO A FIELD CHAR
1CA4	773A	IMVE 018				STB D1 V-1	STORE CHAR
1CA6	8D7C	IMVE 019		ICYC 037	HISTRT	BR	
		IMVE 020	*			THIS SECTION TEST FOR THE FORM MAAABBB(D), WHERE D CAN BE A OR B.	
		IMVE 021	*			OTHER FORMS OF THE OP, NO COL BIN FEATURE, AND D NOT A-B WILL BE	
		IMVE 022	*			PERFORMED AS A NORMAL MOVE OP.	
		IMVE 023	*			MOVE(A) —DECODE-MOVE BINARY DATA FROM READ AREA(501-580,401-480) TO	
		IMVE 024	*			SUCCESSIVE LOCATIONS IN MAIN STORAGE. FORMAT-M580XXXA	
		IMVE 025	*			OPERATION-580 TO XXX, 480 TO XXX-1, 579 TO XXX-2, ETC. TO WM.	
		IMVE 026	*			MOVE(B)-ENCODE-OPPOSITE SEQUENCE OF MOVE(A). FORMAT-MXXX580B	
		IMVE 027	*			OPERATION-XXX TO 580, XXX-1 TO 480, XXX-2 TO 579, ETC. TO WM.	
1CB8	E22A	IMVE 028	MOVEOP	006	MOVE	BR IF D0 BIT6=0	BR TO NORMAL MOVE IF NOT IB
1CBA	5FC2	IMVE 034				RDB H1 DA,B8	READ CONTROL BYTE
1CBC	CB2A	IMVE 035		006	MOVE	BR IF H1 BIT4=0	BR TO NORMAL MOVE IF NO COL BIN
1CBE	2B65	IMVE 037				T1=0$K60	SET T1 TO DEC 99
1CC0	2B3B	IMVE 038				T1=T1+K03	FOR USE IN MOVE(A-B) ROUTINES
1CC2	37CD	IMVE 039				D1=D1-KC0	TEST FOR (A)
1CC4	C485	IMVE 040		073	MAOP	BR IF Z=0	BR IF (A) TO (A) ROUTINE
1CC6	071B	IMVE 041				Z=D1□K01	TEST FOR (B)
1CC8	C4AA	IMVE 042		006	MOVE	BR IF ZNZ	BR IF NOT (B) TO NORMAL MOVE OP
1CCA	3000	IMVE 043	MBOP			SET SO	MOVE(B)OP-SET SO ON
1CCC	571A	IMVE 044	RDAFLD			RDB D1 U-1	READ A-FIELD CHAR
1CCE	5F30	IMVE 045				RDB H1 V+0	READ B-FIELD CHAR
1CD0	DF60	IMVE 046		062	BWM	BR IF H1 BIT1=0	BR IF B-FIELD WM
1CD2	D700	IMVE 047		060	AWM	BR IF D1 BIT1=0	BR IF A-FIELD WM
1CD4	7730	IMVE 048				STB D1 V+0	STORE A CHARACTER IN B-FIELD
1CD6	73BD	IMVE 049				V1C=V1%T1+C	UPDATE B ADDR REG
1CD8	72CD	IMVE 055				V0C=V0%P0+C	BY -100 OR +99
1CDA	C5CA	IMVE 057		043	MBOP	BR IF SO=0	BR TO SET SO IF EVEN CYCLE
1CDC	1002	IMVE 058				RST S K=90	RESET SO & S3 ON ODD CYCLE
1CDE	9CCC	IMVE 059		044	RDAFLD	BR	BR TO READ NEW A-FIELD CHAR
1CE0	3745	IMVE 060	AWM			D1=D1$K40	A-WM BUT NO B WM-CLEAR WM AND
1CE2	9CE2	IMVE 061		063	ENDOP	BR	BR TO STORE CHAR IN B-FIELD
1CE0	1745	IMVE 062	BWM			D1=D1*-K40	B-WM, SET WM IN A-CHAR AND
1CE2	7730	IMVE 063	ENDOP			STB D1 V+0	STORE IN B-FIELD
1CE4	73BD	IMVE 064				V1C=V1%T1+C	UPDATE B ADDR REG
1CE6	72CD	IMVE 070				V0C=V0%P0+C	BY -100 OR +99

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1CE8	8D7C	IMVE 072		ICYC 037	HISTRT	BR	RETURN TO I-CYCLE
1C84	3000	IMVE 073	MAOP			SET S0	MOVE(A) ROUTINE
1C86	5710	IMVE 074	READA			RDB D1 U+0	READ A-FIELD CHAR
1C88	71BD	IMVE 075				U1C=U1%T1+C	UPDATE A ADDRESS REG
1C8A	70CD	IMVE 081				UOC=UO%PO+C	BY -100 OR +99
1C8C	5F30	IMVE 083				RDB H1 V+0	READ B-FIELD CHAR
1C8E	DF22	IMVE 084		017	BFLDWM	BR IF H1 BIT 1=0	BR IF B-FIELD WM
1C90	D732	IMVE 085		010	AFLDWM	BR IF D1 BIT 1=0	BR IF A-FIELD WM
1C92	773A	IMVE 086				STB D1 V-1	STORE A CHAR IN B-FIELD
1C94	C584	IMVE 087		073	MAOP	BR IF S0=0	BR TO SET S0 IF EVEN CYCLE
1C96	1002	IMVE 088				RST S K=90	RESET S0 & S3 ON ODD CYCLE
1C98	9C86	IMVE 089		074	READA	BR	BR TO READ NEW A FIELD CHAR

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*********************************
* CROSS REFERENCE FOR CSECT IMVE *
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IMVE 005	IMVE 0C9		
IMVE 006	IMVE 028	IMVE 035	IMVE 042
IMVE 010	IMVE 085		
IMVE 013	IMVE 016		
IMVE 014	ICYC 239		
IMVE 017	IMVE 008	IMVE 084	
IMVE 028	ICYC 225		
IMVE 043	IMVE 057		
IMVE 044	IMVE 059		
IMVE 060	IMVE 047		
IMVE 062	IMVE 046		
IMVE 063	IMVE 061		
IMVE 073	IMVE 040	IMVE 087	
IMVE 074	IMVE 089		

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IMVZ 001	T			MOVE ZONE OR DIGITOPS. KRAGER	
		IMVZ 002	*			THE ZONE OR DIGIT BITS ARE MOVED FROM THE A FIELD TO THE B FIELD.	
		IMVZ 003	*			WM'S ARE NOT CHANGED.	
2DA6	5D1A	IMVZ 004	MVZONE			RDB P1 U-1	READ A FIELD
2DA8	5D79	IMVZ 005				D1=P1	SET CHAR TO A REG
2DAA	3D45	IMVZ 006				P1=P1$K40	INSURE 1 BIT ON
2DAC	5BC0	IMVZ 007				RDB T1 AS,P	CONVERT CHAR TO BCD
2DAE	5D30	IMVZ 008				RDB P1 V+0	READ B FIELD
2DB0	5D49	IMVZ 009				G0=P1	SAVE B FLD WM
2DB2	3D45	IMVZ 010				P1=P1$K40	INSURE 1 BIT ON
2DB4	5DC0	IMVZ 011				RDB P1 AS,P	CONVERT CHAR TO BCD
2DB6	F13C	IMVZ 012		015	DIGIT	BR IF G1 BIT7=0	BR IF MOVE DIGIT OP
2DB8	4BDB	IMVZ 013				P1=T1H+P1L	MOVE BITS
2DBA	ADBE	IMVZ 014		016	XLATE	BR	
2DBC	4BDD	IMVZ 015	DIGIT			P1=T1L+P1H	MOVE DIGIT BITS
2DBE	5BC0	IMVZ 016	XLATE			RDB T1 AS,P	CONVERT TO NPL
2DC0	D445	IMVZ 017		019	STORE	BR IF G0 BIT1=1	BR IF WM FLAG OFF
2DC2	1B45	IMVZ 018				T1=T1*-K40	SET WM IN CHAR
2DC4	7B3A	IMVZ 019	STORE			STB T1 V-1	STORE CHAR
2DC6	8D7C	IMVZ 020		ICYC 037	HISTRT	BR	RTN TO I CYCLE

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                                   * CROSS REFERENCE FOR CSECT IMVZ *
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IMVZ 004    ICYC 240   ICYC 241
IMVZ 015    IMVZ 012
IMVZ 016    IMVZ 014
IMVZ 019    IMVZ 017
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ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IMZS 001	T			MOVE WITH ZERO SUPPRESS. KRAGER	
		IMZS 002	*			A FIELD DATA IS MOVED TO B FIELD. THE A WM ENDS THE OP. ZONE BITS ARE	
		IMZS 003	*			REMOVED FROM THE UNITS POSITION. HIGHO'S AND ,S ARE SUPPRESSED.	
226E	571A	IMZS 004	ZEROSP			RDB D1 U-1	READ A FIELD
2270	57D9	IMZS 005				P1=D1	
2272	3D45	IMZS 006				P1=P1$K40	INSURE NO WM BIT
2274	5DC0	IMZS 007				RDB P1 AS,P	CONVERT TO BCD
2276	5DDD	IMZS 008				P1=P1L	REMOVE ZONES
2278	5DC0	IMZS 009				RDB P1 AS,P	CONVERT TO EBDCIC
227A	1D45	IMZS 010				P1=P1*-K40	SET TEMPORARY WM
227C	7D3A	IMZS 011				STB P1 V-1	
227E	5EC2	IMZS 020				RDH H DA,B8	READ CONTROL BYTE
2280	FE04	IMZS 021		024	PI2	BR IF HO BIT3=0	BR IF NO PI BIT
2282	3613	IMZS 023				DO=DO$K01	SET PI FLAG
2284	D712	IMZS 024	PI2	031	INC	BR IF D1 BIT1=0	BR IF A FLD WM
2286	A28A	IMZS 025		027	XX	BR	
2288	7D3A	IMZS 026	STORE			STB P1 V-1	STORE DATA
228A	5D1A	IMZS 027	XX			RDB P1 U-1	READ A FIELD
228C	DD09	IMZS 028		026	STORE	BR IF P1 BIT1=1	BR IF NO A FIELD WM
228E	3D45	IMZS 029	AFLDWM			P1=P1$K40	REMOVE WM
2290	7D3A	IMZS 030				STB P1 V-1	STORE DATA
2292	5224	IMZS 031	INC			V=V+1	
2294	C145	IMZS 032	TEST	054	END	BR IF G1 BIT4=1	BR IF END OF RVC SCAN
2296	5F30	IMZS 033				RDB H1 V	READ B FIELD
2298	DF1F	IMZS 034		037	NOBWM	BR IF H1 BIT1=1	BR IF NO B FIELD WM
229A	3F45	IMZS 035				H1=H1$K40	REMOVE WM BIT
229C	3583	IMZS 036				G1=G1$K08	SET B END FLAG
229E	CFFD	IMZS 037	NOBWM			Z=H1¤KF0	TEST CHARACTER
22A0	C4C7	IMZS 038		055	ZERO	BR IF Z=0	BR IF CHAR WAS A 0
22A2	ECC1	IMZS 039		059	SIGDGT	BR IF HZ=0	BR IF CHAR WAS 1-9
22A4	CF3B	IMZS 040		051	SETSUP	BR IF H1 BIT0=1	BR IF NOT A SPECIAL CHAR
22A6	FCAC	IMZS 041		044	TSTFAP	BR IF LZNZ	BR IF CHAR NOT & - OR BLANK
22A8	0F5D	IMZS 042				Z=H1¤K50	TEST CHAR
22AA	E0BB	IMZS 043		051	SETSUP	BR IF HZ=0	BR IF CHAR IS A &
22AC	0FBB	IMZS 044	TSTFAP			Z=H1¤K0B	TEST CHAR
22AE	F0BC	IMZS 045		052	NOTAPS	BR IF LZNZ	BR IF NOT A ,
22B0	0F6D	IMZS 046				Z=H1¤K60	TEST CHAR
22B2	F238	IMZS 047		050	PI1	BR IF DO BIT7=0	BR IF NO PI FLAG
22B4	0F4D	IMZS 048				Z=H1¤K40	TEST CHAR
22B6	A2B8	IMZS 049		050	PI1	BR	
22B8	E0C7	IMZS 050	PI1	055	ZERO	BR IF HZ=0	BR IF ,
22BA	3515	IMZS 051	SETSUP			G1=G1$K10	SET ZERO SUPPRESS ON
22BC	7F38	IMZS 052	NOTAPS			STB H1 V+1	PUT B FLD CHAR BACK
22BE	A294	IMZS 053		032	TEST	BR	
22C4	8D7C	IMZS 054	END	ICYC 037	HISTRT	BR	RETURN TO I CYCLES
22C6	F53C	IMZS 055	ZERO	052	NOTAPS	BR IF G1 BIT3=0	BR IF ZERO SUPP IS OFF
22C8	2F45	IMZS 056				H1=0$K40	FORCE BLANK CHAR
22CA	7F38	IMZS 057				STB H1 V+1	STORE DATA
22CC	A294	IMZS 058		032	TEST	BR	
22C0	1515	IMZS 059	SIGDGT			G1=G1*-K10	RESET ZERO SUPPRESS
22C2	A2BC	IMZS 060		052	NOTAPS	BR	

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*********************************
* CROSS REFERENCE FOR CSECT IMZS *
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IMZS 004     ICYC 245
IMZS 024     IMZS 021
IMZS 026     IMZS 028
IMZS 027     IMZS 025
IMZS 031     IMZS 024
IMZS 032     IMZS 053    IMZS 058
IMZS 037     IMZS 034
IMZS 044     IMZS 041
IMZS 050     IMZS 047    IMZS 049
IMZS 051     IMZS 040    IMZS 043
IMZS 052     IMZS 045    IMZS 055    IMZS 060
IMZS 054     IMZS 032
IMZS 055     IMZS 038    IMZS 050
IMZS 059     IMZS 039
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INDX   DESCRIPTIVE   TEXT

ENTRY POINT

OBJECTIVES

1. SELECT THE CORRECT INDEX REGISTER.

INDXIN

THIS ROUTINE IS ENTERED ONLY FROM I-CYCLES. THIS IS
THE EXCLUSIVE ENTRY POINT, IT IS ENTERED FROM
A- AND/OR B-ADDRESS.

2. GENERATE AN ADDRESS CONSISTING OF TOTAL OF BASE ADDRESS,
   INDEX REGISTER VALUE, AND THE BIAS FACTOR.

3. RETURN TO I-CYCLES AND READ REMAINDER OF INSTRUCTION.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		INDX 001	T			1401 COMPATIBILITY INDEXING ROUTINE 12/19/66 R. C. HUANG	
		INDX 002	ASEQ	ALO7=18			
0718	1002	INDX 003	INDXIN			RST S K=90	INSURE S0 AND S3 OFF
071A	CD23	INDX 004		008	HDINVT	BR IF P1 BIT0=1	BR IF NO SPECIAL CHAR
071C	57C0	INDX 005				RDB D1 AS,P	READ HUND BCD CHAR FROM TABLE
071E	1783	INDX 006				D1=D1*-K08	SP CHAR-STRIP BIT 4-WEIGHT 8
0720	8726	INDX 007		010	TENS	BR	
0722	5079	INDX 008	HDINVT			D1=P1	PUT HUND IN D1
0724	17FD	INDX 009				D1=D1□KF0	INVERT HUND ZONES
0726	CF31	INDX 010	TENS	015	NOSPEC	BR IF H1 BIT0=1	BR IF TENS NOT A SPECIAL CHAR
0728	5FD9	INDX 011				P1=H1	SP CHAR-PUT TENS IN P1 FOR TLU
072A	5FC0	INDX 012				RDB H1 AS,P	READ TENS BCD
072C	1F83	INDX 013				H1=H1*-K08	STRIP BIT 4-WEIGHT 8
072E	8732	INDX 014		016	SAVEH1	BR	
0730	1FFD	INDX 015	NOSPEC			H1=H1□KF0	INVERT ZONES
0732	5F43	INDX 016	SAVEH1			GO=H1XH	SAVE TENS NUMERIC IN GOH
0734	5FFB	INDX 017				H1=H1H	SET H1 FOR TLU
0736	5AE0	INDX 018				RDH T AS,H	READ INDEX REGISTER ADDRESS
0738	5D98	INDX 019				RDB P1 I+1	READ UNIT'S
073A	DD43	INDX 020		024	NOUNWM	BR IF P1 BIT1=1	BR IF NO UNIT'S WM
073C	6886	INDX 021				I=I-2	UNIT'S WM, I3 OR I6-BACKDATE
073E	5F98	INDX 022				RDB H1 I+1	REREAD TEN'S
0740	8CC6	INDX 023		ICYC 127	TENZON 3	BR	DO NOT INDEX-RETURN TO I-CYCLE
0742	CD4B	INDX 024	NOUNWM	028	ZONINV	BR IF P1 BIT0=1	BR IF UNITS NOT SP CHAR
0744	5DC0	INDX 025				RDB P1 AS,P	READ UNITS BCD
0746	1D83	INDX 026				P1=P1*-K08	STRIP 4-WEIGHT 8
0748	874C	INDX 027		029	TENUNT	BR	
074A	1DFD	INDX 028	ZONINV			P1=P1□KF0	
074C	4D4D	INDX 029	TENUNT			GO=P1L+GOH	GO=TENS+UNITS
074E	5DFB	INDX 030				H1=P1H	UNIT'S ZONE IN H1 HI
0750	5DBA	INDX 031				RDB P1 T-1	READ INDEX REG UNITS
0752	3045	INDX 032				P1=P1$K40	OR IN WM BIT
0754	CD5D	INDX 033		037	NONSP	BR IF P1 BIT0=1	BR IF NOT SP CHAR
0756	5DC0	INDX 034				RDB P1 AS,P	READ UNITS BCD
0758	1D83	INDX 035				P1=P1*-K08	STRIP 4

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
075A	875E	INDX 036		038	UNITS	BR	
075C	1DFD	INDX 037	NONSP			P1=P1¤KF0	INVERT UNITS ZONE
075E	6FD3	INDX 038	UNITS			H1=H1+P1	ADD UNIT'S ZONE OF 2 FIELDS
0760	5DBA	INDX 039				RDB P1 T-1	READ INDEX REG TENS
0762	CD6B	INDX 040		044	HUNDED	BR IF P1 BIT0=1	BR IF TENS NOT A SP CHAR
0764	3D45	INDX 041				P1=P1$K40	OR IN WM BIT
0766	5DC0	INDX 042				RDB P1 AS,P	READS TENS BCD
0768	1D83	INDX 043				P1=P1*-K08	STRIP 4
076A	5BB0	INDX 044	HUNDED			RDB T1 T	READ INDEX REG HUNDREDS
076C	5FAB	INDX 045				T0=H1H	**TOTAL UNIT'S ZONES NOW IN T0
076E	4DF3	INDX 046				H1=P1XH+H1L	**COMBINE INDEX TEN'S & UNIT
0770	74FF	INDX 047				GOC=GOƏH1+C	**ADD THE TWO TENS' & UNITS'
0772	5BD9	INDX 048				P1=T1	**PUT HUNDRED'S IN P1 TO BAL
0774	3D45	INDX 049				P1=P1$K40	OR IN WM BIT
0776	CD7F	INDX 050		054	HDNOSP	BR IF P1 BIT0=1	BR IF HUND NOT A SP CHAR
0778	5DC0	INDX 051				RDB P1 AS,P	READ HUNDREDS BCD
077A	1D83	INDX 052				P1=P1*-K08	STRIP 4
077C	8780	INDX 053		055	ADDHUN	BR	
077E	1DFD	INDX 054	HDNOSP			P1=P1¤KF0	INVERT HUND ZONES
0780	77DF	INDX 055	ADDHUN			D1C=D1ƏP1+C	ADD HUNDREDS
0782	D708	INDX 056		059	NOZOCA	BR IF D1 BIT1=0	**BR IF NO HUND ZONECARRY
0784	2A1D	INDX 057				T0=T0+K10	**ZONE CARRY,ADD 1 TO UNIT ZONE
0786	1745	INDX 058				D1=D1*-K40	STRIP 1 BIT OF HUND.
0788	54F5	INDX 059	NOZOCA			H1=GOXL	**SET TEN'S IN H1 TO ADDR AUX ST
078A	5FE0	INDX 060				RDB H1 AS,H	**X'LATE TEN'S FROM TABLE
078C	64FF	INDX 061				GOC=GOL+H1+C	**ADD TEN'S & UNIT'S IN HEX
078E	5AF9	INDX 062				H1=T0	**MOVE UNIT ZONE TO H1 TO BR
0790	EF2D	INDX 063		077	UNITB	BR IF H1 BIT2=1	BR IF UNIT'S B ZONE
0792	2D07	INDX 064				P1=0	NO B ZONE,ZERO OUT P1
0794	FF1E	INDX 065		070	COMBIN	BR IF H1 BIT3=0	BR IF NO UNITS A ZONE
0796	2DFB	INDX 066	UNITA			P1=P1+KOF	A ZONE, ADD OFA0 HEX- 4000 DEC
0798	24AD	INDX 067				GO=GO+KA0	ADD IT TO TEN-UNITS'
079A	F49E	INDX 068		070	COMBIN	BR IF AC=0	BR IF NO CARRY
079C	2D1B	INDX 069				P1=P1+K01	CARRY, ADD ONE MORE
079E	17FD	INDX 070	COMBIN			D1=D1¤KF0	INVERT HUNDREDS'ZONES
07A0	57F1	INDX 071				H1=D1X	CROSS HUNDRED'S
07A2	6FFF	INDX 072				H1C=H1L+H1+C	SHIFT LO BY 1 BIT
07A4	5AE0	INDX 073				RDH T AS,H	**X'LATE HUND+BIAS FROM AUX ST
07A6	6B4B	INDX 074				T1C=T1+GO	**ADD TEN-UNITS' TO HUND & BIAS
07A8	1645	INDX 075				D0=D0*-K40	**RESET INVALID ADDR DIGITSTAT
07AA	8C8A	INDX 076		ICYC 173	SETT0	BR	INDEXING COMPLETED
07AC	3DE9	INDX 077	UNITB			P1=0-KE0	UNIT'S B ZONE-SET P1=1F
07AE	244D	INDX 078				GO=GO+K40	B ZONE, ADD1F40 HEX-8000 DEC
07B0	FF17	INDX 079		066	UNITA	BR IF H1 BIT3=1	BR IF UNIT'S A ZONE
07B2	879E	INDX 080		070	COMBIN	BR	
		INDX 081	AEND				

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**********************************
* CROSS REFERENCE FOR CSECT INDX *
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INDX 003   ICYC 123   ICYC 124   ICYC 125   ICYC 126
INDX 008   INDX 004
INDX 010   INDX 007
INDX 015   INDX 010

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*********************************
* CROSS REFERENCE FOR CSECT INDX *
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INDX 016      INDX 014
INDX 024      INDX 020
INDX 028      INDX 024
INDX 029      INDX 027
INDX 037      INDX 033
INDX 038      INDX 036
INDX 044      INDX 040
INDX 054      INDX 050
INDX 055      INDX 053
INDX 059      INDX 056
INDX 066      INDX 079
INDX 070      INDX 065   INDX 068   INDX 080
INDX 077      INDX 063
```

INIZ DESCRIPTIVE TEXT

OBJECTIVES

INITIALIZE BIAS CONSTANT (NORMALLY) DURING ICPL ROUTINE.

EXAMINE OVERLAY CARD, ANALYZE COLUMNS THAT ARE NOT BLANK.
ADJUST FOR BIAS FACTOR AND STORE NEW VALUE IN THE APPROP-
RIATE AUXILIARY STORAGE LOCATION.

SET STORAGE PROTECT KEYS TO ZERO.

ON RESET OPERATIONS, THE FILE TABLES THAT ARE LOCATED BELOW

THE 1400-ZERO EQUIVALENT POSITION, ARE RESTORED.

ENTRY POINTS

BEGIN

NORMAL ENTRY POINT FROM BDIA ROUTINE DURING CON-
TROL STORAGE LOAD.

FILETB

ENTRY POINT USED DURING A RESET OPERATION.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		INIZ 001	T			INITIALIZE BIAS CONSTANT	
2AFA	2D45	INIZ 002	BEGIN			P1=0$K40	SET STARTING ADDRESS
2AFC	2A07	INIZ 003				TO=0	SELECT MODULE 0
2AFE	3B89	INIZ 004				T1=0-K80	START ADDRESS
2B00	2C75	INIZ 008	NEXT			PO=0$K70	LAST MODULE ADDRESS
2B02	5AA4	INIZ 010				T=T+1	ADJUST TO ADDRESS 0080 INITIALLY
2B04	CD8D	INIZ 011				Z=P1□K80	CHECK END OF INITIALIZER
2B06	C493	INIZ 012		018	DONE	BR IF Z=0	
2B08	5FC8	INIZ 013				RDB H1 AS,P+1	GET DATA
2B0A	0F4D	INIZ 014				Z=H1□K40	CHECK FOR UPDATE
2B0C	C481	INIZ 015		008	NEXT	BR IF Z=0	CONTINUE
2B0E	7FA0	INIZ 016				STB H1 AS,T+0	STORE OVERLAY IN MODULE ZERO
2B10	AB00	INIZ 017		008	NEXT	BR	
2B12	5002	INIZ 018	DONE			RDH U DA,88	GET NEW BIAS
2B14	5BA2	INIZ 020				RDB T1 DA,AC	GET MAS ASSIGNED HI MEM ADDRESS
2B16	6B05	INIZ 021				T1=T1$U0	CREATE NEW HI MEM ADDRESS
2B18	7BA2	INIZ 022				STB T1 DA,AC	STORE NEW VALUE
2B1A	2C25	INIZ 029				PO=0$K20	DO BIAS INITIALIZATION
2B1C	2D15	INIZ 030				P1=0$K10	
2B1E	7012	INIZ 031				STH U DA,8A	PUT 1400 0 ADDRESS IN I VIA K1
2B20	58C0	INIZ 032	KEEPON			RDH I AS,P+0	
2B22	691B	INIZ 033				I1C=I1+U1	
2B24	680D	INIZ 034				I0C=I0+U0+C	
2B26	78C8	INIZ 035				STH I AS,P+2	
2B28	CDBD	INIZ 036				Z=P1□K80	
2B2A	C4A0	INIZ 037		032	KEEPON	BR IF ZNZ	
2B2C	26C7	INIZ 038				DO=0	
2B2E	81E6	INIZ 039		IRST 109	STRPRO	BAL	GO SET STACK KEYS TO 0
2B30	2645	INIZ 040				DO=0$K40	BUILD BLANK AND NO WORDMARK
2B32	2745	INIZ 041				D1=0$K40	
2B34	5DA2	INIZ 042	BACK			RDB P1 DA,AC	GET HI MEMORY ADDRESS
2B36	7618	INIZ 043				STH D U+2	STORE NO WORDMARK BLANK

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
2B38	7D01	INIZ 044				P1=P1-U0+1	TRIAL SUBTRACT
2B3A	F4B5	INIZ 045		042	BACK	BR IF AC=1	HAVENOT OVERSTEPPED MEMORY YET
2B3C	8240	INIZ 046		BDIA 018	START	BR	
2150	5E02	INIZ 047	FILETB			RDH H DA,88	GET BIAS CONSTANT
2152	3E0D	INIZ 048				H0=H0-K00	GO 256 BYTES BELOW FOR TABLE
2154	2FC3	INIZ 049				H1=0$K0C	ADJUST TO START ADDRESS
2156	76F8	INIZ 050	STORET			STH D H+2	
2158	272B	INIZ 051				D1=D1+K02	INCREMENT UNITS POSITION
215A	07AB	INIZ 052				Z=D1¤K0A	CHECK FOR UNITS OVERFLOW
215C	C4D6	INIZ 053		050	STORET	BR IF ZNZ	BR IF NOT UNITS TEN
215E	2707	INIZ 054				D1=0	MACK UNITS ZERO
2160	261D	INIZ 055				D0=D0+K10	INCREMENT TENS
2162	06AD	INIZ 056				Z=D0¤KA0	CHECK FOR TENS OVERFLOW
2164	E0D6	INIZ 057		050	STORET	BR IF HZNZ	BR IF TENS NOT TEN
2166	F26D	INIZ 058		061	HUND2	BR IF D07=1	HUNDREDS CARRY
2168	2613	INIZ 059				D0=0$K01	MAKE HUNDREDS 1
216A	F257	INIZ 060		050	STORET	BR IF D07=1	
216C	2623	INIZ 061	HUND2			D0=0$K02	MACH HUNDREDS 2
216E	76F0	INIZ 062				STH D H	
2170	2607	INIZ 063				D0=0	
2172	2707	INIZ 064				D1=0	
2174	128E	INIZ 065				RTN	

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*********************************
* CROSS REFERENCE FOR CSECT INIZ *
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INIZ 002   BDIA 004
INIZ 008   INIZ 015   INIZ 017
INIZ 018   INIZ 012
INIZ 032   INIZ 037
INIZ 042   INIZ 045
INIZ 047   IRST 068
INIZ 050   INIZ 053   INIZ 057   INIZ 060
INIZ 061   INIZ 058
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INRU DESCRIPTIVE TEXT

OBJECTIVES   ENTRY POINTS

                                                                   ENTER

HANDLE NATIVE I/O REQUESTS, EXTERNAL INTERRUPTIONS, CHAN-   ENTER FROM ICYC WHEN AN EXCEPTIONAL CONDITION
NEL INTERRUPTIONS, SET IC, INSTRUCTION STEP, AND SOFT STOP.   EXISTS FROM THE PREVIOUS OPERATION.
THESE CONDITIONS ACTIVATE A HARDWARE REQUEST LINE.

                                                                   STOPCK

                                                                            ENTER HERE FOR HANDLING THE VARIOUS STOP CONDIT-
CHECK CONDITIONS, DETERMINE WHETHER REMOTE RESTART, SET IC,   IONS.
CONSOLE INTERRUPT, ETC., AND GO TO APPROPRIATE ROUTINE FOR
EXECUTION.   GOBACK

                                                                            ENTER FROM READ REQUEST ROUTINE WHEN VARIOUS
                                                                            INTERRUPT CONDITIONS ARE PENDING.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		INRU 001	T			1400 COMP.SOFT STOP,I/O,CONSOLE REQ. R. TAYLOR	
		INRU 002	*		THIS ROUTINI PERFORMS THE FOLLOWING FUNCTIONS		
		INRU 003	*		1.NATIVE I/O REQUESTS		
		INRU 004	*		2.EXTERNAL INTERRUPT		
		INRU 005	*		3.CHANNEL INTERRUPT		
		INRU 006	*		4.SET I C		
		INRU 007	*		5.INSTRUCTION STEP		
		INRU 008	*		6.SOFT STOP		
1682	2206	INRU 009	ENTER			SET MMSK K=30	SET READ MODE & ZONE
1684	D416	INRU 010		019	INTRPT	BR IF GO BIT1=0	BR IF READER NOT ACTIVE
1686	5EFF	INRU 011				H1=RPS	PUT RPS IN H1 FOR BRANCHING
1688	EF17	INRU 012		019	INTRPT	BR IF H12=1	BR IF NOT 6 MILLI-SEC TIME-OUT
168A	0216	INRU 013				RST MMSK K=31	SET CPU ZONE & MODE
168C	3600	INRU 014				SET BC K=80	SET INST STEP LATCH-IF INST STEP
168E	DB97	INRU 015		019	INTRPT	BR IF BB5=1	BR TO INTERRUPT IF INST STEP
1690	5F90	INRU 016				RDB H1 I	READ NEXT OP CODE
1692	0F59	INRU 017				Z=H1+K50	TEST FOR I/O OP
1694	F4F2	INRU 018		049	ICYRTN	BR IF AC=0	
1696	0216	INRU 019	INTRPT			RST MMSK K=31	SET CPU ZONE & MODE
1698	2DC7	INRU 020				P1=0	ZERO OUT STOP CODE
169A	7CF2	INRU 021				STH P DA,BE	FROM I-CYCLES,SET STOPCODE TO 00
169C	00A0	INRU 022				RST S K=0A	RST S4,S6 DISPLAY STATS
169E	3600	INRU 023				SET BC K=80	ENABLE INSTRUCTION STEP LATCH
16A0	5A4F	INRU 024				GO=TIM	RESET TIMER IF ON
16A2	EFE8	INRU 025		056	RETURN	BR IF BB2=0	CHANNEL 0 INTRPT,ABORT,BACKUP I*
16A4	FFE2	INRU 026		059	CONSLE	BR IF BB3=0	CONSOLE INTRPT
16A6	CBFD	INRU 027		042	SETIC	BR IF BB4=1	SET INSTRUCTION COUNTER INTRPT
16A8	DBE1	INRU 028		058	STEPDY	BR IF BB5=1	INST STEP TO BE PERFORMED
16AA	CFDE	INRU 029		057	STEPDZ	BR IF BB0=0	STOP CONDITION SENSED
16AC	5EF2	INRU 030	STOPCK			RDH H DA,BE	READ OUT STOPCODE,GOOD IF S4=1

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
16AE	2CC7	INRU 031				PO=0	INSURE PO=0 FOR 2 CYCLES RETURN
16B0	DFC3	INRU 032		060	NATREQ	BR IF BB1=1	NATIVE REQUEST IN SMALLER LOOP
16B2	E1AD	INRU 033		030	STOPCK	BR IF S6=1	HONOR TYPEWRITER,WAIT UNTIL DONE
16B4	C1FA	INRU 034		041	BYPASS	BR IF S4=0	BYPASS SIXTEEN CHARACTER TEST
16B6	0FFB	INRU 035				Z=H1□KOF	CHECK FOR REMOTE RESTART
16B8	F0FA	INRU 036		041	BYPASS	BR IF LZNZ	IS NOT REMOTE RESTART
16BA	0004	INRU 037				RST S2	RESET S2 IF PREVIOUSLY ON
16BC	4FFF	INRU 038				MW=H1	SET WIAT LATCH,ENABLE MACH.CHECK
16BE	EFE8	INRU 039		056	RETURN	BR IF BB2=0	CHANNEL 0 INTRPT,ABORT,BACKUP I*
16C0	96AC	INRU 040		030	STOPCK	BR	STAY IN 11 WD LOOP,DEVICE CLEARS
16FA	CBEA	INRU 041	BYPASS	045	AROUND	BR IF BB4=0	BRANCH IF NOT SET IC
16FC	50EF	INRU 042	SETIC			H0=SWAB	READ SWITCHES
16FE	51FF	INRU 043				H1=SWCD	READ SWITCHES
1700	A378	INRU 044		ISIC 008	SETIC	BR	GO TYPE OUT NEW INSTRUCTION ADDR
16EA	FFE2	INRU 045	AROUND	059	CONSLE	BR IF BB3=0	BRANCH IF CONSOLE INTERRUPT
16EC	DBAD	INRU 046		030	STOPCK	BR IF BB5=1	WAIT FOR START KEY
16EE	CFAC	INRU 047		030	STOPCK	BR IF BB0=0	LOOP FOR START KEY
16F0	C1F5	INRU 048		050	TESTRT	BR IF S4=1	BRANCH TO TEST 16 CHAR.MESSAGES
16F2	8D82	INRU 049	ICYRTN	ICYC 041	ICYC	BR	EXECUTE I CYCLES,NO INTRPT TEST
16F4	0EFF	INRU 050	TESTRT			Z=H0□KFF	MASK FOR HALT AND BRANCH
16F6	C4E4	INRU 051		053	CHECK	BR IF ZNZ	TEST INTERVENTION RETURNS
16F8	9E72	INRU 052		IUBR 002	UNCDBR	BR	DO UNCONDITIONAL BRANCH
16E4	F0F2	INRU 053	CHECK	049	ICYRTN	BR IF LZNZ	NOT INTERVENTION STOP,NEXT INSTR
16E6	FE73	INRU 054		049	ICYRTN	BR IF H03=1	DF A/D STOP,GO TO NEXT INSTR.
		INRU 055	*				8F,4F(42),6F-PRINTER,CHAN 0 INT.
16E8	8990	INRU 056	RETURN	MQQQ 045	XXXXXX	BR	INSTRUCTION COUNTER IS BACKED UP
16DE	A044	INRU 057	STEPDZ	IDIS 003	STOPPP	BR	STOP CONDITION DISPLAY
16E0	ABC6	INRU 058	STEPDY	ISTP 002	INSTST	BR	INSTRUCTION STEP DISPLAY
16E2	9FDE	INRU 059	CONSLE	INTP 006	LABEL	BR	DO CONSOLE INTERRUPT
16C2	3404	INRU 060	NATREQ			SET MODE K=A0	SET 1052 MODE
16C4	EAC8	INRU 061		063	CKS6	BR IF TT6=0	NO 1052 REQUEST UP
16C6	82DA	INRU 062		JTYP 055	REQ	BR	SERVICE 1052 REQUEST
16C8	EECD	INRU 063	CKS6	065	GONE	BR IF TT2=1	CLEAR OTHER NATIVE REQUESTS
16CA	E1DB	INRU 064		080	GOBACK	BR IF S6=1	GO WAIT
16CC	3406	INRU 065	GONE			SET MODE K=B0	SET 2540 MODE
16CE	EBD3	INRU 066		069	REQEST	BR IF PS6=1	BR IF PUNCH REQUEST IS ACTIVE
16D0	E9D4	INRU 067		077	PRINTC	BR IF RS6=0	BRANCH IF NOT READER
16D2	9A60	INRU 069	REQEST	LREQ 007	START	BR	
16D4	3482	INRU 077	PRINTC			SET MODE K=98	
16D6	FADA	INRU 078		080	GOBACK	BR IF PRS7=0	BR IF NOT 1403
16D8	9C14	INRU 079		MPRT 265	SOSTRE	BR	GO TO NAT 1403
16DA	3400	INRU 080	GOBACK			SET MODE K=80	RESTORE CPU MODE
16DC	96AC	INRU 081		030	STOPCK	BR	GO BACK TO WAIT

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***********************************
* CROSS REFERENCE FOR CSECT INRU *
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```
INRU 009    ICYC 036
INRU 019    INRU 010   INRU 012   INRU 015
INRU 030    INRU 033   INRU 040   INRU 046   INRU 047   INRU 081   JTYP 050   JTYP 053   JTYP 084   JTYP 101   MPRT 318
INRU 041    INRU 034   INRU 036
INRU 042    INRU 027
INRU 045    INRU 041
INRU 049    INRU 018   INRU 053   INRU 054
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*********************************
* CROSS REFERENCE FOR CSECT INRU *
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INRU 050      INRU 048
INRU 053      INRU 051
INRU 056      INRU 025   INRU 039
INRU 057      INRU 029
INRU 058      INRU 028
INRU 059      INRU 026   INRU 045
INRU 060      INRU 032
INRU 063      INRU 061
INRU 065      INRU 063
INRU 069      INRU 066
INRU 077      INRU 067
INRU 080      INRU 064   INRU 078   LREQ 023
```

INTP   DESCRIPTIVE   TEXT

OBJECTIVES   ENTRY POINTS

SET OR RESET ANY OF THE SENSE SWITCHES (B-G), OR ANY OF THE   LABEL
SWITCH TYPE FUNCTIONS SUCH AS STERLING FEATURE, 2540/1442   INITIAL ENTRY FROM THE INTERRUPT ROUTINE.
EMULATION, ETC.

                                                                    CRTN
SET TAPE ASSIGNMENTS AND TAPE TRACK AND DENSITY.   RE-ENTRY POINT AFTER FUNCTION CHARACTER IS
                                                                               TRANSLATED.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		INTP 001	T		1400 COMP	SENSE SW, TAPE DENSITY START RESET INITIALIZE R M TAYLOR	
		INTP 002	*			THIS PREFACE INTHE INTERRUPT ROUTINE SHARES REGISTERS IN	
		INTP 003	*			THE CPU ZONE. PREG IS DEPENDENT TO THIS ROUTINE WHILE H AND	
		INTP 004	*			T ARE DEPENDENT TO TRANS AND TYPE ROUTINES IN TYYP. DO STATS	
		INTP 005	*			5 AND 7 CONTROL COMMUNICATIONS TO AND FROM TYYP	
1FDE	3404	INTP 006	LABEL			SET MODE K=A0	
1FE0	3F22	INTP 007				SET TA K=92	
1FE2	16F3	INTP 008				DO=DO*-KOF	RST LO 4 BITS
1FE4	2080	INTP 009				SET S4	
1FE6	3643	INTP 010				DO=DO$K04	TURN ON BIT5
1FE8	1040	INTP 011				RST S K=84	INSURE S5 AND S0 ARE OFF
1FEA	A416	INTP 012		JTYP 027	STORE	BR	WAIT FOR REQUEST
		INTP 013	*			** ENTRY AFTER TRANSLATION OF CHARACTER	
2494	F239	INTP 014	CRTN		058 OKFRST	BR IF DO BIT7=1	SERVICED 1ST CHAR
2496	3613	INTP 015				DO=DO$KO1	TURN ON DO 7
2498	2EA5	INTP 016				HO=O$KAO	BUILD MASK
249A	3E13	INTP 017				HO=HO$KO1	
249C	6EF1	INTP 018				HO=HO¤H1	ELIMINATE SET OF SW A,MASK FOR T
249E	E0AB	INTP 019			050 OKSOFR	BR IF HZ=0	OK SO FAR
24A0	F0A9	INTP 020			040 ERROR	BR IF LZ=0	NOT VALID
24A2	2E77	INTP 025				HO=O$K77	
24A4	6EF9	INTP 026				HOC=HO+H1+1	ELIMINATES CHAR,FROM Q3,Q2 OV 87
24A6	F4B0	INTP 027			054 SSSET	BR IF AC=0	ALTDYE CLEANS UP OTHERS(A2,A3OK)
24A8	8370	INTP 040	ERROR	JTYP 477	ALTDYE	BR	
24AA	0F3B	INTP 050	OKSOFR			Z=H1¤K03	COMPLETE TEST FOR T
24AC	F0A8	INTP 052			040 ERROR	BR IF LZNZ	NOT A T
24AE	3623	INTP 053	TAPEST			DO=DO$K02	SET INDICATOR FOR TAPE
24B0	5FA3	INTP 054	SSSET			TO=H1XH	MEANINGFUL FOR SS SETTINGS ONLY
24B2	4FFF	INTP 055	BUSSIT			TE=H1	BUSS OUT B-G,T,OR S IF STERLING
24B4	7AE2	INTP 056	BACKAG			STH T DA,BC	TEMPORARY STORAGE
24B6	A416	INTP 057		JTYP 027	STORE	BR	
24B8	5AE2	INTP 058	OKFRST			RDH T DA,BC	TEMPORARY STORAGE
24BA	0FFD	INTP 064				Z=H1¤KFO	
24BC	E0A8	INTP 065			040 ERROR	BR IF HZNZ	
24BE	E24B	INTP 066			089 TAPECH	BR IF DO BIT6=1	TAPE DENSITY SET

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
24C0	CFE1	INTP 067				Z=H1+K0E	
24C2	F4A9	INTP 068		040	ERROR	BR IF AC=1	NOT 0 OR 1 ERROR
24C4	4FFF	INTP 069				TE=H1	BUSS OUT CHARACTER
24C6	4FAD	INTP 087	NORMAL			TO=H1L+TOH	2-7=SENSE SWITCHES B-G
24C8	887A	INTP 088		109	DOSSW	BR	
24CA	C58D	INTP 089	TAPECH	104	TRAY	BR IF SO=1	
24CC	D181	INTP 090		098	DUCE	BR IF S5=1	
24CE	F0A9	INTP 091		040	ERROR	BR IF LZ=0	
24D0	CF91	INTP 092				Z=H1+K09	ONLY 1 TO 6 ACCEPTABLE
24D2	F4A9	INTP 093		040	ERROR	BR IF AC=1	
24D4	4FFF	INTP 094				TE=H1	BUSS OUT
24D6	5FA3	INTP 095				TO=H1XH	1ST TAPE CHAR
24D8	2040	INTP 096				SET S5	
24DA	A4B4	INTP 097		056	BACKAG	BR	
24B0	3000	INTP 098	DUCE			SET SO	
24B2	0FA1	INTP 099				Z=H1+K0A	0-5 ACCEPTABLE
24B4	F4A9	INTP 100		040	ERROR	BR IF AC=1	
24B6	4FFF	INTP 101				TE=H1	BUSS OUT 2ND TAPE
24B8	4FAD	INTP 102				TO=H1L+TOH	2ND CHAR FOR TAPE
24BA	A4B4	INTP 103		056	BACKAG	BR	
24BC	0F81	INTP 104	TRAY			Z=H1+K08	
24BE	F4A9	INTP 105		040	ERROR	BR IF AC=1	ERROR
24B0	4FFF	INTP 106				TE=H1	BUSS OUT 3RD
24B2	ADFC	INTP 107		150	TAPEEX	BR	EXECUTE TAPE SET BEFORE EXIT
		INTP 108	*			EXEC T-TOH(SYS DR),TOL (D),H1(1400DR) SS- TOH(SW),TOL ONOFF	
087A	5E82	INTP 109	DOSSW			RDH H DA,A8	SS BYTE IN HO
087C	4A65	INTP 110				DO=TOXL$DOH	PREPARE TO SPLIT OUT SWITCHES
087E	2F23	INTP 111				H1=0$K02	SET UP FOR BIT 7
0880	9245	INTP 112		116	SSBY N	N=DO BITS567	
0A44	6FF3	INTP 116	SSBY 2			H1=H1+H1	ALIGN B TO BIT 1 BY DOUBLING
0A46	6FF3	INTP 117	SSBY 3			H1=H1+H1	ALIGN C TO BIT 2 BY DOUBLING
0A48	6FF3	INTP 118	SSBY 4			H1=H1+H1	ALIGN D TO BIT 3 BY DOUBLING
0A4A	6FF3	INTP 119	SSBY 5			H1=H1+H1	ALIGN E TO BIT 4 BY DOUBLING
0A4C	6FF3	INTP 120	SSBY 6			H1=H1+H1	ALIGN F TO BIT 5 BY DOUBLING
0A4E	0A9D	INTP 121	SSBY 7			Z=TO¤K90	CHECK SET OR RESET
0A50	F0D7	INTP 128		131	RSTSW	BR IF LZ=0	RESET
0A52	6FE5	INTP 129				H1=H1$HO	OR IN APPROPRIATE BIT
0A54	8A5A	INTP 130		138	STORBT	BR	STORE RESULT
0A56	1FFF	INTP 131	RSTSW			H1=H1¤KFF	REVERSE H1 FOR RESET
0A58	6FE7	INTP 132				H1=H1*HO	AND FOR APPROPRIATE BIT RESET
0A5A	7F82	INTP 138	STORBT			STB H1 DA,A8	STORE NEW SENSE BYTE
0A5C	1F13	INTP 140				H1=H1*-K01	STRIP 7 BIT FOR DISPLAY
0A5E	5FB9	INTP 141	EXSTER			T1=H1	
0A60	8E82	INTP 142		229	DISPLY	BR	GO STORE STOP MESSAGE
2DFC	2C05	INTP 150	TAPEEX			P0=0$K00	
2DFE	5AE3	INTP 151				HO=TOXH	XO IN HO WHERE X IS DENSITY 0-5
2E00	E084	INTP 152		154	NOTO	BR IF HZNZ	
2E02	3E13	INTP 153				HO=HO$K01	X1 DENSITY IF DENSITY WAS O
2E04	5AD5	INTP 154	NOTO			P1=TOXL	SET UP P1 TO ADDRESS TAPE BYTE
2E06	3D85	INTP 155				P1=P1$K80	ADDRESS BUILT 008X X IS 1-6
2E08	7CE2	INTP 156				STH P DA,BC	STORE ADDRESS TEMPORARILY
2E0A	5BC0	INTP 157				RDB T1 AS,P+0	GET PARTICULAR BYTE
2E0C	0E4D	INTP 158				Z=HO¤K40	CK DENSITY 4 ,MEANS DISPLAY ONLY

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
2E0E	E092	INTP 159		161	NOTDY	BR IF HZNZ	
2E10	8E82	INTP 160		229	DISPLY	BR	JUST DISPLAY
2E12	4FBD	INTP 161	NOTDY			T1=H1L+T1H	MAKE NEW DRIVE ASSIGN 300/1400
2E14	2DA3	INTP 162				P1=0$KOA	
2E16	3DB5	INTP 163				P1=P1$KB0	BUILD BA ADDRESS TO CK FLAGS
2E18	5FC8	INTP 164				RDB H1 AS,P+1	READ 9TK FLAGS,INCR TO PHASE ENC
2E1A	4B6D	INTP 165				DO=T1L+DOH	USE DO LOW TO ALIGN DRIVE TO BIT
2E1C	8E76	INTP 166		169	MASK	BR	
0E72	2E07	INTP 167	PHASEC			HO=0	HO FOR PHASE ENC CHECK
0E74	5FC0	INTP 168	PHASEA			RDB H1 AS,P+0	PHASE ENC IN H1
0E76	2A13	INTP 169	MASK			TO=0$KO1	
0E78	922D	INTP 170		171	BRK N	N=DO BITS567	8 WAY TO CHECK FLAGS OR DRIVES
0E20	6AA3	INTP 171	BRK 0			TO=TO+TO	ALIGN DRIVE 0 TO BIT 0 BY DOUBLE
0E22	6AA3	INTP 172	BRK 1			TO=TO+TO	ALIGN DRIVE 1 TO BIT 1 BY DOUBLE
0E24	6AA3	INTP 173	BRK 2			TO=TO+TO	ALIGN DRIVE 2 TO BIT 2 BY DOUBLE
0E26	6AA3	INTP 174	BRK 3			TO=TO+TO	ALIGN DRIVE 3 TO BIT 3 BY DOUBLE
0E28	6AA3	INTP 175	BRK 4			TO=TO+TO	ALIGN DRIVE 4 TO BIT 4 BY DOUBLE
0E2A	6AA3	INTP 176	BRK 5			TO=TO+TO	ALIGN DRIVE 5 TO BIT 5 BY DOUBLE
0E2C	6AA3	INTP 177	BRK 6			TO=TO+TO	ALIGN DRIVE 6 TO BIT 6 BY DOUBLE
0E2E	DA45	INTP 178	BRK 7	202	RETALT	BR IF HO BIT5=1	BIT IS 0 UNLESS PHASE ENC ALTER
0E30	6AF7	INTP 179				TO=TO*H1	
0E32	C4D3	INTP 180		209	SEVEN	BR IF Z=0	7TK DR OR 9TK W/O PHS
		INTP 181	*			STATUS OF HO	9TK FLAG CK 50 7TK(800) DENS 5
		INTP 182	*			ON VARIOUS ENTRIES	9TK FLAG CK 01 7TK9/78000DENS 0
		INTP 183	*				PH ENC CK 00 A 9TK(800) DENS 5
		INTP 184	*		NOTE****	WHEN BRANCH	9TK FLAG CK 20 7TK(556) DENS 2
		INTP 185	*			IS SUCCESSFUL	7TK FLAG CK 10 7TK(200) DENS 1
		INTP 186	*			A=PHASE ALTER	9TK FLAG CK 30 7TK(800) DENS 3
		INTP 187	*				
		INTP 188	*			9TRACK DRIVES	9TK FLAG CK 50 (CK1600) DENS 5
		INTP 189	*		NOTE****	WHEN BRANCH IS	PH ENC CK 00 A(1600) DENS 5
		INTP 190	*			NOT SUCCESSFUL	9TK FLAG CK 20 DENS 2
		INTP 191	*				9TK FLAG CK 10 DENS 1
		INTP 192	*			A= PHASE ALTER	9TK FLAG CK 30 A (800) DENS 3
		INTP 193	*				9TK FLAG CK 01 7/9(USE9)DENS 0
0E34	DE73	INTP 194		167	PHASEC	BR IF HO BIT1=1	DENS 5 ,TEST PHASE EN
0E36	FA3C	INTP 195	NINE	198	NZERO	BR IF HO BIT7=0	NOT DENS 0
0E38	3BC5	INTP 196	SW12			T1=T1$KCO	INSURE 9TK SET CONTRL
0E3A	8E7E	INTP 197		227	DONE	BR	
0E3C	2E1D	INTP 198	NZERO			HO=HO+K10	00-10,20-30,30-40,AND
0E3E	EE39	INTP 199		196	SW12	BR IF HO BIT2=1	10-20 ALTERED DENS1,2
0E40	3E43	INTP 200	ALTER9			HO=HO$KO4	USE EXISTING 9TK DENS
0E42	8E74	INTP 201		168	PHASEA	BR	ALT 10-14,40-44,16/8C
0E44	FE4A	INTP 202	RETALT	205	RST	BR IF HO BIT3=0	04(9TK DENS 5) SET 8C
0E46	6FA5	INTP 203				H1=H1$TO	OR IN 1600 BIT IN FLG
0E48	8E4E	INTP 204		207	STPHST	BR	
0E4A	1AFF	INTP 205	RST			TO=TO¤KFF	INVERT BITS
0E4C	6FA7	INTP 206				H1=H1*TO	RST BIT IN PHASE EN
0E4E	7FC0	INTP 207	STPHST			STB H1 AS,P+0	UPDATE PHASE ENCODE
0E50	8E38	INTP 208		196	SW12	BR	
0E52	FA7B	INTP 209	SEVEN	225	SEVDSO	BR IF HO BIT7=1	7TK DENSO,CHK 9-7CHGE
0E54	0E0D	INTP 210				Z=HO¤KOO	
0E56	C4B7	INTP 211		195	NINE	BR IF Z=0	PUT 1600 BPI BIT BACK ON

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
0E58	DE60	INTP 212		216	ARRND	BR IF HO BIT1=0	DEN 5 9TK,7TK DEN 1-3
0E5A	3B85	INTP 213	SET800			T1=T1$K80	SET BIT0 IN CTRL BYTE
0E5C	1B45	INTP 214				T1=T1*-K40	RST BIT1 800 IS SET
0E5E	8E7E	INTP 215		227	DONE	BR	
0E60	0ED9	INTP 216	ARRND			Z=HO+KD0	
0E62	F4DB	INTP 217		213	SET800	BR IF AC=1	CHK DENS3 800 7TK
0E64	1BC5	INTP 218				T1=T1*-KC0	ASSUME 7TK 200
0E66	EE6F	INTP 219		223	SET556	BR IF HO BIT2=1	DENS2 SET 556
0E68	1E4B	INTP 220				HO=HO□KO4	00-04 AND 10-14,8/2C
0E6A	E0FE	INTP 221		227	DONE	BR IF HZNZ	200 7TK SET UP,EXIT
0E6C	8E40	INTP 222		200	ALTER9	BR	
0E6E	3B45	INTP 223	SET556			T1=T1$K40	7TK 556 SET,EXIT DONE
0E70	8E7E	INTP 224		227	DONE	BR	
0E7A	0B49	INTP 225	SEVDS0			Z=T1+K40	9TO7 TRACK TEST,DENS0
0E7C	F4DB	INTP 226		213	SET800	BR IF AC=1	
0E7E	5CE2	INTP 227	DONE			RDH P DA,BC	RESTORE CONTROL ADDR
0E80	7BC0	INTP 228				STB T1 AS,P+0	STORE NEW 1400 CONTRL
0E82	5EF2	INTP 229	DISPLY			RDH H DA,BE	PRESERVE HI ORDER OF CODED BYTE
0E84	5EA9	INTP 230				TO=HO	
0E86	0640	INTP 231				RST BC K=04	RESET CONSOLE INTERRUPT
0E88	7AF2	INTP 232				STH T DA,BE	STORE STP CODE,T INFO
0E8A	A412	INTP 233		JTYP 025	SETWRL	BR	LAST CHAR IN ,BUSSOUT ,LF NEXT

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* CROSS REFERENCE FOR CSECT INTP *
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INTP 006	INRU 059						
INTP 014	JTYP 403						
INTP 040	INTP 020	INTP 052	INTP 065	INTP 068	INTP 091	INTP 093	INTP 100 INTP 105
INTP 050	INTP 019						
INTP 054	INTP 027						
INTP 056	INTP 097	INTP 103					
INTP 058	INTP 014						
INTP 089	INTP 066						
INTP 098	INTP 090						
INTP 104	INTP 089						
INTP 109	INTP 088						
INTP 116	INTP 112						
INTP 131	INTP 128						
INTP 138	INTP 130						
INTP 150	INTP 1C7						
INTP 154	INTP 152						
INTP 161	INTP 159						
INTP 167	INTP 194						
INTP 168	INTP 201						
INTP 169	INTP 166						
INTP 171	INTP 170						
INTP 195	INTP 211						
INTP 196	INTP 199	INTP 208					
INTP 198	INTP 195						
INTP 200	INTP 222						
INTP 202	INTP 178						
INTP 205	INTP 202						
INTP 207	INTP 204						

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          *********************************
          * CROSS REFERENCE FOR CSECT INTP *
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INTP 209    INTP 180
INTP 213    INTP 217   INTP 226
INTP 216    INTP 212
INTP 223    INTP 219
INTP 225    INTP 209
INTP 227    INTP 197   INTP 215   INTP 221   INTP 224
INTP 229    INTP 142   INTP 160
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IOCM DESCRIPTIVE TEXT

ENTRY POINTS

LOAD

ALL MOVE OR LOAD I/O OPS ENTER HERE FROM THE
I-CYCLE OP CODE TABLE.

UOP

CONTROL UNIT OPERATIONS ENTER HERE FROM THE
I-CYCLE OP CODE TABLE.

BSTAR

ENTRY AT THIS POINT IS FROM IPLS OR LOPD WHEN AN
INVALID OPERATION HAS BEEN DETECTED. THIS ROUTINE
SETS THE STOP CODE.

ZONECK 3

BRANCH TO THIS POINT IS FROM WITHIN THIS ROUTINE
OR FROM VARIOUS ROUTINES WHEN AN INVALID
UNIT IS ADDRESSED.

PTRER

ENTRY AT THIS POINT IS FROM IBCH FOR A BRANCH ON
PRINTER ERROR.

DECODE

ENTRY HERE IS FROM IBCH FOR PRINTER BRANCH CON-
DITIONS   CHANNEL 9, CHANNEL 12, OR PRINTER BUSY.

CKBIT

ENTER HERE FROM IBCH WHEN ALL BRANCH INDICATORS
TEST NEGATIVE. THIS ENTRY IS ALSO USED AFTER A
PRINTER ERROR CONDITION.

CHNL

ENTRY AT THIS POINT IS FROM MPRT TO DECODE THE
REASON FOR CHANNEL PRINTER BRANCH.

OBJECTIVES

1. TEST B-STAR VALIDITY AND I/O UNIT VALIDITY. SET STOP
   CODE AS NECESSARY.

2. DECODE UNIT ADDRESS, BRANCH TO APPROPRIATE ROUTINE
   FOR DEVICE INDICATED.

3. HANDLE CONDITIONS FROM IBCH.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IOCM 001	T		MOVE OR LOAD I/O UNIT ADDRESS DECODE.		KRAGER
11CA	F659	IOCM 002	LOAD	009	BSTAR	BR IF DO BIT3=1	B STAR IS INVALID
11CC	51D9	IOCM 003	UOP			P1=U1	
11CE	DD54	IOCM 004		007	WMERR	BR IF P1 BIT1=0	
11D0	50D9	IOCM 005				P1=U0	
11D2	DD49	IOCM 006		011	OK	BR IF P1 BIT1=1	
11D4	2A35	IOCM 007	WMERR			TO=0$K30	
11D6	817A	IOCM 008		IERR 033	ADD1	BR	
11D8	2A53	IOCM 009	BSTAR			TO=0$K05	SET INVALID I/O OP
11DA	817C	IOCM 010		IERR 034	STCODE	BR	GO STOP
11C8	8D15	IOCM 011	OK	012	ZONECK N	N=P1 BITS23	
1280	928C	IOCM 012	ZONECK 0	018	ABZONE	BR	A AND B ZONE
1282	9286	IOCM 013	ZONECK 1	015	ZONECK 3	BR	
1284	929C	IOCM 014	ZONECK 2	030	AZONE	BR	A ZONE
1286	5AF2	IOCM 015	ZONECK 3			RDH T DA,BE	INVALID UNIT
1288	2A53	IOCM 016				TO=0$K05	
128A	817C	IOCM 017		IERR 034	STCODE	BR	
128C	C907	IOCM 018	ABZONE	015	ZONECK 3	BR IF P1 BIT4=1	
128E	E906	IOCM 019		015	ZONECK 3	BR IF P1 BIT6=0	
1290	D917	IOCM 020		023	GORF	BR IF P1 BIT5=1	

ADDR	WORD	SEQUENCE NO.	LABEL		NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1292	F9C7	IOCM 021			015	ZONECK 3	BR IF P1 BIT7=1	
1294	937C	IOCM 022			JTPE 002	UADMCK	BR	UNIT ADD IS B OR C
1296	F91B	IOCM 023	GORF		029	GISUNT	BR IF P1 BIT7=1	
1298	99EC	IOCM 025			KAAA 020	SRTFIL	BR	UNIT ADD IS F
129A	88EA	IOCM 029	GISUNT		MAAA 033	START	BR	UNIT ADDR IS G
129C	0DD1	IOCM 030	AZONE				Z=P1+KOD	
129E	FCAB	IOCM 031			037	TUNIT	BR IF LZ=0	CHECK
12A0	0DC1	IOCM 032					Z=P1+KOC	UNIT
12A2	F0AD	IOCM 033			038	UUNIT	BR IF LZ=0	ADDRESS
12A4	0D81	IOCM 034					Z=P1+K08	
12A6	FC86	IOCM 035			015	ZONECK 3	BR IF LZNZ	
12A8	9EFC	IOCM 036			MKKK 017	STRT43	BR	UNIT ADDR IS Y
12AA	A3E2	IOCM 037	TUNIT		JTYP 004	LABEL	BR	UNIT ADDR IS T
12AC	937C	IOCM 038	UUNIT		JTPE 002	UADMCK	BR	UNIT ADD IS U
0890	57F9	IOCM 039	PTRER				H1=D1	SAVE MODIFIER
0892	3F23	IOCM 040					H1=H1$KO2	ADD 6 BIT
0894	89C2	IOCM 041			043	CKBIT	BR	
0900	57F9	IOCM 042	DECODE				H1=D1	SAVE MODIFIER
0902	5AC2	IOCM 043	CKBIT				RDH T DA,B8	READ CONTROL BYTE
0904	0BB3	IOCM 044					Z=T1*-KOB	
0906	FC8A	IOCM 045			051	CHNL	BR IF LZNZ	BR IF 42,43
0908	9B11	IOCM 046			047	NTV N	N=H1 BITS567	NATIVE DECODE
0882	A564	IOCM 047	NTV	1	MPRT 359	BRCHN9	BR	BR ON CHANNEL 9
0884	ADD8	IOCM 048	NTV	2	MPRT 377	ERROR	BR	BR ON PRINTER ERROR
0888	A570	IOCM 049	NTV	4	MPRT 371	BRCH12	BR	BR ON CHANNEL 12
088E	A556	IOCM 050	NTV	7	MPRT 364	PRBUSY	BR	BR ON PRINTER BUSY
090A	9B13	IOCM 051	CHNL		052	CHANL N	N=H1 BITS567	CHANNEL DECODE
0982	A5FE	IOCM 052	CHANL	1	MQQQ 019	CH9	BR	BR ON CHANNEL 9
0984	A614	IOCM 053	CHANL	2	MQQQ 003	PTERR	BR	BR ON PRINTER ERROR
0988	A640	IOCM 054	CHANL	4	MQQQ 030	CH12	BR	BR ON CHANNEL 12
098E	83A0	IOCM 055	CHANL	7	MNNN 004	BUSY	BR	BR ON BUSY

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                                      * CROSS REFERENCE FOR CSECT IOCM *
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IOCM 002    ICYC 309
IOCM 003    ICYC 310
IOCM 007    IOCM 004
IOCM 009    IOCM 002   IPLS 021   LOPD 053
IOCM 011    IOCM 006
IOCM 012    IOCM 011
IOCM 015    IOCM 013   IOCM 018   IOCM 019   IOCM 021   IOCM 035   MAAA 032   MAAA 033   MAAA 161   MAAA 163   MDDD 055   MKKK 020   MPRT 035
IOCM 018    IOCM 012
IOCM 023    IOCM 020
IOCM 029    IOCM 023
IOCM 030    IOCM 014
IOCM 037    IOCM 031
IOCM 038    IOCM 033
IOCM 039    IBCH 062
IOCM 042    IBCH 020   IBCH 023   IBCH 096
IOCM 043    IBCH 100   IOCM 041
IOCM 047    IOCM 046
IOCM 051    IOCM 045   MPRT 398
IOCM 052    IOCM 051
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IPLS   DESCRIPTIVE   TEXT

OBJECTIVES   CHECK ADDRESS VALIDITY

    PERFORM LOAD KEY FUNCTION. (INITIAL PROGRAM LOADING.)   STORE GMWM IF LOADING FROM 1442.

    DECODE SWITCH VALUES (A-D) TO DETERMINE INPUT DEVICE.   SET 51-COLUMN FEATURE ADDRESSING (IF APPLICABLE).

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IPLS 001	T		1400 COMP	IPL START RESET ROUTINES R TAYLOR	
		IPLS 002	*			THIS ROUTINE IS ENTERED FROM THE RESET ROUTINE WHEN THE IPL LATCH IS	
		IPLS 003	*			ON. AFTER DISPLAY THE START RESET ENTERS AS WELL. THE NORMAL START	
		IPLS 004	*			KEY OPERATION AFTER DISPLAY GOES DIRECTLY TO THE LABEL (RESTOR)	
1D04	AD84	IPLS 005	IPLSTR	IMEM 002	SCAN	BAL	DO SCAN
1D06	51FF	IPLS 006				H1=SWCD	READ SWITCHES
1D08	5202	IPLS 007				RDH V DA,88	PUT 1400 0 ADDRESS B*
1D0A	5224	IPLS 008				V=V+1	POINT B* AT 1400 ADDR 001
1D0C	4826	IPLS 009				I=V	SAVE IN ADDRESS REGISTER I*
1D0E	50EF	IPLS 010				HO=SWAB	READ SWITCHES
1D10	6679	IPLS 011				DOC=DO+D1+1	DO=41,D1=40 TEST INITIALIZED
1D12	67F1	IPLS 012				D1=D1¤H1	CD=40 OR4X
1D14	C4D5	IPLS 013			027	NRD	BR IF Z=0	COULD BE 2540
1D16	E0CF	IPLS 014			024	CHLRD	BR IF HZ=0	COULD BE 1442
1D18	1E25	IPLS 015				HO=HO*-K20	IF TAPE A=2 AND D1=4X
1D1A	E0A2	IPLS 016			020	STOP	BR IF HZNZ	NOT VALID LOAD DEVICE
1D1C	5771	IPLS 017				D1=D1X	
1D1E	6E71	IPLS 018				HO=HO¤D1	TAPE TEST
1D20	F0A7	IPLS 019			022	TAPELD	BR IF LZ=0	TAPE A,C,B OK
1D22	2625	IPLS 020	STOP			DO=O$K20	MAKE A STAR INVALID
1D24	91D8	IPLS 021		IOCM 009	BSTAR	BR	DISPLAY INCORRECT LOAD MESSAGE
1D26	5E11	IPLS 022	TAPELD			U1=HOX	PUT TAPE LOAD DRIVE IN CORRECT
1D28	903C	IPLS 023			047	RESTOR	BR	
1D4E	0F23	IPLS 024	CHLRD			Z=H1*-KO2	CHECK LOW ORDER SWITCH FOR 2
1D50	F0A2	IPLS 025			020	STOP	BR IF LZNZ	NOT 1442
1D52	2E1F	IPLS 026				HO=HO+K11	CHANGE 14 TO25
1D54	3E1D	IPLS 027	NRD			HO=HO-K10	CHANGE 25 TO 14
1D56	5661	IPLS 028				DO=DOX	
1D58	6E61	IPLS 029				HO=HO¤DO	MASK FOR CORRECT AB SWITCHES
1D5A	C4A2	IPLS 030			020	STOP	BR IF ZNZ	READER LOAD ADDRESS NO GOOD
1D5C	EB2B	IPLS 031			038	COL80	BR IF H16=1	1442 LOAD UNIT
1D5E	5DC2	IPLS 032	READ25			RDB P1 DA,88	CHECK 51 COLUMN READ FEATURE
1D60	F92A	IPLS 033			038	COL80	BR IF P1 BIT7=0	51 COL READ TEST
1D62	23EB	IPLS 034				V1=V1+KOE	INCREMENT TO 1400 0015
1D64	4826	IPLS 035				I=V	INSTRUCTIONS START AT 015
1D66	2E37	IPLS 036				HO=O$K33	SET CNT TO 51
1D68	9D2C	IPLS 037			039	BEGIN	BR	START CLEAR
1D2A	2E55	IPLS 038	COL80			HO=O$K50	COUNT SET AT 80

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1D2C	2DC7	IPLS 039	BEGIN			P1=0	BUILD BLANK AND WORDMARK
1D2E	7D38	IPLS 040	CLEAR			STB P1 V+1	AND THEN
1D30	2D45	IPLS 041				P1=0$K40	STORE BLANKS AFTERWARDS
1D32	2EFF	IPLS 042				HO=HO+KFF	SUBT 1 FROM COUNT
1D34	C4AE	IPLS 043		040	CLEAR	BR IF ZNZ	CLEAR AGAIN
1D36	EB3C	IPLS 044		047	RESTOR	BR IF H1 BIT6=0	2500 SERIES
1D38	2DF3	IPLS 045				P1=0$KOF	BUILD GMWM FOR 1442
1D3A	7D30	IPLS 046				STB P1 V+0	STORE GMWM IN COL 81
1D3C	0620	IPLS 047	RESTOR			RST BC K=02	RESET IPL
1D3E	26C7	IPLS 048				DO=0	ZERO OUT DO FOR LOAD ROUTINES
1D40	25C7	IPLS 049				G1=0	
1D42	1210	IPLS 050				RST MMSK K=81	ALLOW TRAPS
1D44	4286	IPLS 051				V=I	SET UP B STAR FOR IPL
1D46	0F4D	IPLS 052				Z=H1¤K40	CHECK LOAD
1D48	E082	IPLS 053		061	TAPE	BR IF HZNZ	TAPE LOAD
1D4A	F081	IPLS 054		057	RDER25	BR IF LZ=0	
1D4C	890C	IPLS 055		MAAA 032	IPL42	BR	1442 LOAD
1D00	A57A	IPLS 057	RDER25	LOPD 011	LOAD	BR	2540 LOAD
1D02	90D4	IPLS 061	TAPE	JODE 007	TAPELD	BR	TAPE LOAD

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*********************************
* CROSS REFERENCE FOR CSECT IPLS *
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IPLS 005	IRST 101		
IPLS 020	IPLS 016	IPLS 025	IPLS 030
IPLS 022	IPLS 019		
IPLS 024	IPLS 014		
IPLS 027	IPLS 013		
IPLS 038	IPLS 031	IPLS 033	
IPLS 039	IPLS 037		
IPLS 040	IPLS 043		
IPLS 047	IPLS 023	IPLS 044	
IPLS 057	IPLS 054		
IPLS 061	IPLS 053		

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IRAD 001	T			1400 RESET ADD AND SUBTRACT. KRAGER	
		IRAD 002	*			1400 RESET AND OR SUBT. MOVE A FIELD TO B FIELD,INVERT SIGN ON RESET	
		IRAD 003	*			SUBT.ZERO FILL ALL CHARS IN B FIELD AFTER A FIELD WM. REMOVE ALL ZONE	
		IRAD 004	*			BITS EXCEPT FROM SIGN POSITION.	
22D4	571A	IRAD 005	RSTADD			RDB D1 U-1	READ A FIELD
22D6	57D9	IRAD 006				P1=D1	
22D8	3D45	IRAD 007				P1=P1$K40	INSURE NO WM
22DA	5DC0	IRAD 008				RDB P1 AS,P	CONVERT TO BCD
22DC	ED61	IRAD 009		011	ADDCK	BR IF P1 BIT 2=1	BR IF B BIT
22DE	3D35	IRAD 010				P1=P1$K30	FORCE A B ZONES
22E0	F164	IRAD 011	ADDCK	013	XLATE	BR IF G1 BIT7=0	BR IF RESET ADD
22E2	1D1D	IRAD 012				P1=P1¤K10	CORRECT ZONE BITS
22E4	5DC0	IRAD 013	XLATE			RDB P1 AS,P	CONVERT TO EBCDIC
22E6	5F30	IRAD 014	BFIELD			RDB H1 V	READ B FIELD
22E8	DF4E	IRAD 015		027	END	BR IF H1 BIT 1=0	BR IF B FIELD WM
22EA	7D3A	IRAD 016				STB P1 V-1	STORE DATA
22EC	2DF5	IRAD 017				P1=0$KF0	FORCE CONSTANT OF 0
22EE	D766	IRAD 018		014	BFIELD	BR IF D1 BIT 1=0	BR IF A FIELD WM
22F0	571A	IRAD 019				RDB D1 U-1	READ A FIELD
22F2	6D75	IRAD 020				P1=P1$D1	REMOVE ZONE BITS
22F4	C767	IRAD 021		014	BFIELD	BR IF D1 BIT0=1	BR IF NOT A SPECIAL CHAR
22F6	57D9	IRAD 022				P1=D1	
22F8	3D45	IRAD 023				P1=P1$K40	INSURE NO WM
22FA	5DC0	IRAD 024				RDB P1 AS,P	CONVERT TO BCD
22FC	5DDD	IRAD 025				P1=P1L	REMOVE ZONE BITS
22FE	A2E4	IRAD 026		013	XLATE	BR	
22CE	1D45	IRAD 027	END			P1=P1*-K40	ADD WM TO CHAR
22D0	7D3A	IRAD 028				STB P1 V-1	STORE DATA
22D2	8D7C	IRAD 029		ICYC 037	HISTRT	BR	

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*********************************
* CROSS REFERENCE FOR CSECT IRAD *
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IRAD 005	ICYC 250	ICYC 251
IRAD 011	IRAD 009	
IRAD 013	IRAD 011	IRAD 026
IRAD 014	IRAD 018	IRAD 021
IRAD 027	IRAD 015	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IREG 001	T			1400 STORE AND RESTORE REGISTER ROUTINES	RUCKER
03B0	5EC2	IREG 002	STOREV			RDH H DA,B8	READ CONTROL BYTE
03B2	EA37	IREG 003		005	STRINA	BR IF HO BIT6=1	BR IF 1401 MODEL G
03B4	7222	IREG 004				STH V DA,8C	STORE RDR-PUNCH ADDR IN B
03B6	128E	IREG 005	STRINA			RTN	
0258	2A15	IREG 006	STREGS			TO=0$K10	STORE U,V,I,G,D REGS
025A	2BF5	IREG 007				T1=0$KF0	IN BACKUP LOCATIONS OF BUMP
025C	76A8	IREG 008				STH D AS,T+2	
025E	74AA	IREG 009				STH G AS,T-2	
0260	2A07	IREG 010				TO=0	SET TO FOR TLU
0262	1B65	IREG 011				T1=T1*-K60	
0264	7222	IREG 012	STRUVI			STH V DA,8C	
0266	7032	IREG 013				STH U DA,8E	
0268	7812	IREG 014				STH I DA,8A	
026A	128E	IREG 015				RTN	
18EA	5222	IREG 016	RSTREG			RDH V DA,8C	RESTORE REGS V,U,I,D,G
18EC	5032	IREG 017				RDH U DA,8E	FROM BACKUP LOCATIONS
18EE	5812	IREG 018				RDH I DA,8A	
18F0	2E15	IREG 019				HO=0$K10	OF BUMP
18F2	2FF5	IREG 020				H1=0$KF0	
18F4	56E8	IREG 021				RDH D AS,H+2	
18F6	54E8	IREG 022				RDH G AS,H+2	
18F8	2C07	IREG 023				PO=0	
18FA	128E	IREG 024				RTN	

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**********************************
* CROSS REFERENCE FOR CSECT IREG *
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IREG 002	LPCB 054	LPXF 060	LRXF 048	
IREG 005	IREG 003			
IREG 006	JTPE 020	LOPD 030	MPRT 250	
IREG 012	JTYP 098			
IREG 016	IRST 099	JCHL 105	JCHL 173	JDTA 060 LOPD 034 LPCH 012 LPXF 061 LRDR 031 LRXF 027 LXFR 101 LXFR 103 MPRT 255

IRST   DESCRIPTIVE TEXT

OBJECTIVES   DO CHECK SUM ROUTINE.

   RESET AND INITIALIZE AUXILIARY STORAGE.   RESET STORAGE PROTECT KEYS.

   INITIALIZE PRINT CHARACTER COUNTER LENGTH (UCS FEATURE).   GO TO INIZ ROUTINE, BUILD FILE TABLES.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IRST 001	T			** 1400 SYSTEM RESET	R TAYLOR
		IRST 002	*			** THIS ROUTINE RESETS AND INITIALIZES AUX STORE LOCATIONS AND	
		IRST 003	*			OTHER REGISTERS AS REQUIRED	
1876	3210	IRST 004	STREST			SET MMSK K=81	BLOCK TRAPS
1878	3460	IRST 005				SET MODE K=86	
187A	2493	IRST 006				G0=0$K09	INITIALIZE TO 09
187C	2507	IRST 007				G1=0	INITIALIZE TO ZERO
187E	2605	IRST 008				D0=0$K00	INITIALIZE TO ZERO
1880	2705	IRST 009				D1=0$K00	INITIALIZE TO ZERO
1882	34E0	IRST 010				SET MODE K=8E	SET FILE MODE 2540 ZONE
1884	4F6F	IRST 011				FOP=D0	RESET OP REG
1886	4D6F	IRST 012				FFO=D0	RESET FLAG
1888	4B6F	IRST 013				TGRO=D0	RESET FILE TAGS
188A	4E6F	IRST 014				FBO=D0	RESET FILE BUSS
188C	1E00	IRST 015				RST FIB K=80	CHAIN END RESET
188E	2100	IRST 016				SET DIAB K=00	RESET DIAG
1890	0E08	IRST 017				RST FIB K=40	INITIAL RESET
1892	3400	IRST 018				SET MODE K=80	SET CPU MODE
1894	5C82	IRST 019				RDH P DA,A8	GET K8
1896	1C85	IRST 020				P0=P0*-K80	RST LAST CARD INDICATOR
1898	1C13	IRST 021				P0=P0*-K01	RST 2ND SERIAL READER LAST CARD
189A	2D05	IRST 022				P1=0$K00	
189C	7C82	IRST 023				STH P DA,A8	STORE BACK SS B-G UNCHANGED
189E	5C92	IRST 024				RDH P DA,AA	GET K9
18A0	5CCB	IRST 025				P0=P0H	RESET LOW HALF
18A2	1C35	IRST 026				P0=P0*-K30	RESET ALL BUT BITS 0,1
18A4	3C85	IRST 027				P0=P0$K80	TURN ON BIT 0
18A6	7C92	IRST 028				STH P DA,AA	STORE K9
18A8	5CB2	IRST 029				RDH P DA,AE	GET KB
18AA	2D05	IRST 030				P1=0$K00	RESET LOWER BYTE
18AC	7CB2	IRST 031				STH P DA,AE	STORE KB
18AE	5CC2	IRST 040	NOTNTV			RDH P DA,B8	GET KC
18B0	1D25	IRST 041				P1=P1*-K20	RESET ERASE BIT
18B2	3D83	IRST 043				P1=P1$K08	
18B4	7CC2	IRST 045				STH P DA,B8	STORE KC
18B6	D95C	IRST 046		102	NATIVE	BR IF P15=0	NATIVE PRINTER RESETS
18B8	2E05	IRST 047	DOREST			H0=0$K00	
18BA	2F95	IRST 048				H1=0$K90	CLEAR TAPE ERROR BYTE

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
18BC	3F63	IRST 049				H1=H1$K06	
18BE	2D07	IRST 050				P1=0	
18C0	7DEA	IRST 051				STB P1 AS,H-1	
18C2	3F4B	IRST 052				H1=H1-K04	
18C4	7DEA	IRST 053				STB P1 AS,H-1	SYS MASK=8F
18C6	2C05	IRST 054				P0=0$K00	
18C8	7CF2	IRST 055				STH P DA,BE	STORE STOP CODE
18CA	44FF	IRST 056				SM=H1	STORE MASK
18CC	1F83	IRST 057				H1=H1*-K08	H= 0087
18CE	2745	IRST 058				D1=0$K40	PUT 40 IN TAPE / STATUS
18D0	77E0	IRST 059				STB D1 AS,H	
18D2	2F1D	IRST 060				H1=H1+K10	H = 0097
18D4	3482	IRST 061				SET MODE K=98	
18D6	5FE0	IRST 062				RDB H1 AS,H	GET PCCL
18D8	49FF	IRST 063				PCCL=H1	STORE LENGTH FOR MCS
18DA	A9EC	IRST 064	SUMMIT	127	CKSUM	BR	DO SUM ROUTINE
1268	0604	IRST 065	CLEAR			RST BC K=20	RESET SYSTEM RESET
126A	2607	IRST 066				D0=0	
126C	81E6	IRST 067		109	STRPRO	BAL	SET ALL STACK KEYS TO 0
126E	A150	IRST 068		INIZ 047	FILETB	BAL	GO BUILD FILE TABLES,PROG STORGE
1270	C3FB	IRST 072	OK	101	BYPASS	BR IF BA4=1	IPL
1272	1600	IRST 097				RST BC K=80	SET SOFT STOP
1274	1210	IRST 098				RST MMSK K=81	ALLOW TRAPS
1276	98EA	IRST 099		IREG 016	RSTREG	BAL	REGS MEANINGFUL IF START/RESET
1278	ABC6	IRST 100		ISTP 002	INSTST	BR	
127A	9D04	IRST 101	BYPASS	IPLS 005	IPLSTR	BR	
18DC	5C62	IRST 102	NATIVE			RDH P DA,9C	PRINTER STATS
18DE	5CCB	IRST 103				P0=P0H	RESET LOW HALF
18E0	1C75	IRST 104				P0=P0*-K70	RESET ALL BUT BITS 0
18E2	3C43	IRST 105				P0=P0$K04	TURN ON BIT 5
18E4	2D07	IRST 106				P1=0	
18E6	7C62	IRST 107				STH P DA,9C	STORE STATS
18E8	98B8	IRST 108		047	DOREST	BR	DO NORMAL RESETS
01E6	3480	IRST 109	STRPRO			SET MODE K=88	SET FILE MODE CPU ZONE
01E8	426F	IRST 110				STP0=D0	RESET FILE Q
01EA	3400	IRST 111				SET MODE K=80	CPU MODE AND ZONE
01EC	2743	IRST 112				D1=0$K04	SET MACHINE CHECK MASK
01EE	4F7F	IRST 113				MW=D1	SET MC MASK
01F0	5649	IRST 114				G0=D0	ZERO OUT G REG
01F2	5659	IRST 115				G1=D0	ZERO OUT G REG
01F4	426F	IRST 116	LOOP			STP0=D0	ZERO CPU Q
01F6	534C	IRST 117				SSK STP1 AS,G+1	
01F8	151B	IRST 118				G1=G1□K01	RESET 7 BIT
01FA	258B	IRST 119				G1=G1+K08	TEST FOR END
01FC	C4F4	IRST 120		116	LOOP	BR IF ZNZ	NOT DONE YET
01FE	3486	IRST 121				SET MODE K=88	SET CHANNEL MODE TO CLEAR ITS Q
0200	5A60	IRST 122				RDH T AS,D+0	DUMMY ACCESS
0202	3400	IRST 123				SET MODE K=80	SET CPU MODE AND ZONE
0204	2705	IRST 124				D1=0$K00	SET D1 FOR OTHER ROUTINES
0206	5769	IRST 125				D0=D1	
0208	128E	IRST 126				RTN	
29EC	3404	IRST 127	CKSUM			SET MODE K=A0	SET 1052 MODE
29EE	FAC8	IRST 128		146	ENTRY	BR IF TT7=0	SKIP EC CHECK IF NOT ON

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
29F0	2007	IRST 129	AGAIN			U0=0	
29F2	2183	IRST 130				U1=0$K08	SELECT 0008,000A,GENERATED SUM
29F4	4208	IRST 134				RDH V CS,U+2	
29F6	21C5	IRST 135				U1=0$KC0	GET LOG OUT START ADDRESS
29F8	20E3	IRST 136				U0=0$K0E	
29FA	4E08	IRST 137				RDH H CS,U+2	GET FIRST TWO BYTES
29FC	4A08	IRST 138				RDH T CS,U+2	GET NEXT TWO BYTES
29FE	7A42	IRST 139				STH T DA,98	STORE IN PLACE OF A STAR DISPLAY
2A00	7252	IRST 140				STH V DA,9A	STORE IN PLACE OF B STAR DISPLAY
2A02	6208	IRST 141				STH V CS,U+2	
2A04	4200	IRST 142				RDH V CS,U	GET LAST TWO BYTES
2A06	72F2	IRST 143				STH V DA,BE	STORE IN PLACE OF STOP DISPLAY
2A08	2080	IRST 144				SET S4	PREVENT FIRST HALFWORD CONVERT
2A0A	ACE0	IRST 145		IDIS 028	CONVA	BR	DO EC LEVEL OR CHECK SUM DISPLAY
29C8	4282	IRST 146	ENTRY			RDH V DC,A8	
29CA	4626	IRST 147				D=V	
29CC	4A60	IRST 148				RDH T CS,D	
29CE	27EB	IRST 149				D1=D1+K0E	SKIP TABLE OF CHECK SUM VALUES
29D0	9BE8	IRST 150	MORE	165	DOFUNC	BAL	
29D2	6664	IRST 151				D=D+2	
29D4	0650	IRST 152		150	MORE	BR IF D01=0	
29D6	42A6	IRST 153				V=T	
29D8	C4C7	IRST 154		164	OKSUM	BR IF Z=0	
29DA	26E3	IRST 155				D0=0$K0E	
29DC	27C5	IRST 156				D1=0$KC0	
29DE	3763	IRST 157				D1=D1$K06	
29E0	C9E5	IRST 158		160	CEKEY	BR IF TD4=1	BRANCH IF CE KEY ON
29E2	2820	IRST 159				SET DR K=02	STOP ,CHECK SUM ERROR,CE KEY OFF
29E4	2610	IRST 160	CEKEY			SET BC K=01	SET LOG LATCH FOR RETURN
29E6	9BE8	IRST 161		165	DOFUNC	BAL	
29E8	6A60	IRST 162				STH T CS,D	
29EA	A9F0	IRST 163		129	AGAIN	BR	
29C6	9268	IRST 164	OKSUM	065	CLEAR	BR	CONTINUE SYSTEM RESET
1BE8	062B	IRST 165	DOFUNC			Z=D0□K02	
1BEA	C4F2	IRST 166		170	NOTCE	BR IF ZNZ	
1BEC	078D	IRST 167				Z=D1□K80	
1BEE	C4F2	IRST 168		170	NOTCE	BR IF ZNZ	
1BF0	274D	IRST 169				D1=D1+K40	
1BF2	4260	IRST 170	NOTCE			RDH V CS,D	
1BF4	6A21	IRST 171				T0=T0□V0	
1BF6	6B31	IRST 172				T1=T1□V1	
1BF8	128E	IRST 173				RTN	
		IRST 174	ATABLE	ADDR=0EC4			
0EC4	0000	IRST 175	C			XCTL'0000'	
0EC6	0000	IRST 176	C			XCTL'0000'	
		IRST 177	AEND				
		IRST 178	RESERVE 0EC0 THRU 0EC2				
		IRST 179	RESERVE 0280 THRU 02BE				
		IRST 180	ATABLE	ADDR=0388			
0388	07FF	IRST 181	C			XCTL'07FFC48A88004E08'	
		IRST 182	AEND				
		IRST 183	ATABLE	ADDR=0398			
0398	0000	IRST 184	C			XCTL'0000000000000000'	

ADDR   WORD   SEQUENCE NO.   LABEL   NEXTSEQ   NEXTLABEL   STATEMENT   COMMENTS

                  IRST 185   AEND
                  IRST 186   ATABLE   ADDR=03A8
03A8   0000   IRST 187   C   XCTL'0000000000000000'
                  IRST 188   AEND
                  IRST 189   ATABLE   ADDR=03B8
03B8   2FF7   IRST 190   C   XCTL'2FF72F1BC48C0F01'
                  IRST 191   AEND

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                                       * CROSS REFERENCE FOR CSECT IRST *
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IRST 004   BDIA 434
IRST 047   IRST 1C8
IRST 064   JTYP 096
IRST 065   IRST 164
IRST 101   IRST 072
IRST 102   IRST 046
IRST 109   INIZ 039   IRST 067
IRST 116   IRST 120
IRST 127   IRST 064
IRST 129   IRST 163
IRST 146   IRST 128
IRST 150   IRST 152
IRST 160   IRST 158
IRST 164   IRST 154
IRST 165   IRST 150   IRST 161
IRST 170   IRST 166   IRST 168

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		ISAB 001	T	1400		STORE A OR B STAR. KRAGER	
2A88	2BF5	ISAB 002	SETNZN			T1=0$KF0	SET NO ZONES
2A8A	AAAA	ISAB 003		006	CKEND	BR	
2AA6	DE22	ISAB 004	CKNXTB	026	SETBZN	BR IF HO BIT1=0	GO SET B ZONE BIT
2AA8	2BC5	ISAB 005	SETABZ			T1=0$KC0	SET UP AB ZONE BITS
2AAA	E19D	ISAB 006	CKEND	028	HNDRDS	BR IF S6=1	
2AAC	4FBD	ISAB 007				T1=H1L+T1H	MAKE UNITS CHAR
2AAE	5D10	ISAB 008	READ			RDB P1 U+0	
2AB0	DD35	ISAB 009		011	SLSHTS	BR IF P1 BIT1=1	BR IF NO WM
2AB2	1B45	ISAB 010	SETWM			T1=T1*-K40	SET WM IN CHAR
2AB4	0B1B	ISAB 011	SLSHTS			Z=T1¤K01	
2AB6	FC8F	ISAB 012		030	LCWONE	BR IF LZ=0	BCH IF LOW BITS = 1
2AB8	7B1A	ISAB 013	STORE			STB T1 U-1	STORE CHAR
2ABA	E18D	ISAB 014		020	OPDONE	BR IF S6=1	BCH IF HNDRDS DONE
2ABC	D181	ISAB 015		021	TENSDN	BR IF S5=1	BCH IF TENS DONE
2ABE	2BF5	ISAB 016				T1=0$KF0	
2AC0	4FB5	ISAB 017				T1=H1XL$T1H	MAKE TENS CHAR
2AC2	2040	ISAB 018				SET S5	
2AC4	AAAE	ISAB 019		008	READ	BR	
2A8C	8D7C	ISAB 020	OPDONE	ICYC 037	HISTRT	BR	
2A80	2020	ISAB 021	TENSDN			SET S6	
2A82	EE21	ISAB 022		025	CKHLF	BR IF HO BIT2=1	
2A84	FFG8	ISAB 023		002	SETNZN	BR IF HO BIT3=0	
2A86	9158	ISAB 024		037	SETAZN	BR	
2AA0	FE29	ISAB 025	CKHLF	005	SETABZ	BR IF HO BIT3=1	
2AA2	2BD5	ISAB 026	SETBZN			T1=0$KD0	SET B ZONE BIT
2AA4	AAAA	ISAB 027		006	CKEND	BR	
2A9C	4EBD	ISAB 028	HNDRDS			T1=HOL+T1H	MAKE HNDRDS CHAR
2A9E	AAAE	ISAB 029		008	READ	BR	
2A8E	DD15	ISAB 030	LCWONE	033	OK	BR IF P1 BIT1=1	BR IF NO WM
2A90	0BAD	ISAB 031				Z=T1¤KA0	CHECK FOR SLASH
2A92	AA96	ISAB 032		034	TEST	BR	
2A94	0BED	ISAB 033	OK			Z=T1¤KE0	CHECK FOR SLASH
2A96	E0B8	ISAB 034	TEST	013	STORE	BR IF HZNZ	BR IF NOT A SLASH
2A98	1B85	ISAB 035				T1=T1*-K80	REMOVE 0 BIT
2A9A	AAB8	ISAB 036		013	STORE	BR	
1158	2BE5	ISAB 037	SETAZN			T1=0$KE0	SET A ZONE BIT
115A	AAAA	ISAB 038		006	CKEND	BR	
114E	0060	ISAB 039	STAR			RST S K=06	RST S5 AND S6
1150	4426	ISAB 040				G=V	
1152	A304	ISAB 041		ICTD 021	CYTDEC	BAL	
1154	CE5C	ISAB 042		044	ZONESB	BR IF HO BIT0=0	BCH ON ZONE BITS
1156	AAA6	ISAB 043		004	CKNXTB	BR	
115C	DE59	ISAB 044	ZONESB	037	SETAZN	BR IF HO BIT1=1	GO SET A ZONE BIT
115E	AA88	ISAB 045		002	SETNZN	BR	

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*********************************
* CROSS REFERENCE FOR CSECT ISAB *
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ISAB 002	ISAB 023	ISAB 045		
ISAB 004	ISAB 043			
ISAB 005	ISAB 025			
ISAB 006	ISAB 003	ISAB 027	ISAB 038	
ISAB 008	ISAB 019	ISAB 029		

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********************************
* CROSS REFERENCE FOR CSECT ISAB *
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ISAB 011     ISAB 009
ISAB 013     ISAB 034   ISAB 036
ISAB 020     ISAB 014
ISAB 021     ISAB 015
ISAB 025     ISAB 022
ISAB 026     ISAB 004
ISAB 028     ISAB 006
ISAB 030     ISAB 012
ISAB 033     ISAB 030
ISAB 034     ISAB 032
ISAB 037     ISAB 024   ISAB 044
ISAB 039     ICYC 215
ISAB 044     ISAB 042
```

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		ISIC 001	T		1400	SET IC ---BAL TO SET B STAR TAYLOR	
		ISIC 002	*			THIS ROUTINE SETS THE I STAR IF THE SET IC LATCH IS ON, AND	
		ISIC 003	*			DISPLAYS THE DECIMAL AND HEX EQUIVALENTS ON THE 1052 BY USING	
		ISIC 004	*			THE STEP ADDRESS AND DISPLAY ROUTINE SWITCH SETTINGS IN H REG	
		ISIC 005	*			FROM SOFT STOP ROUTINE	
		ISIC 006	*			ENTRY IF SET IC IS FROM SOFT STOP LOOP, B STAR IS STORED TEMPLY	
		ISIC 007	*			IN T TO ALLOW THE MAIN PROGRAM TO SET B STAR ON A BAL BASIS.	
2378	4AE6	ISIC 008	SETIC			T=H	TEST SWITCHES
237A	0042	ISIC 009				RST S K=14	RESET CARRY LATCH,INSURE S5 OFF
237C	2791	ISIC 010				D1=0-K09	SET UP F6 FOR TEST
237E	6A7F	ISIC 011				TOC=TOL+D1+C	CHECK SWITCH B
2380	F48D	ISIC 012		018	OUT	BR IF AC=1	ERROR
2382	5BA1	ISIC 013				T0=T1X	
2384	6B7F	ISIC 014				T1C=T1L+D1+C	CHECK SWITCH D
2386	F48D	ISIC 015		018	OUT	BR IF AC=1	ERROR
2388	6A7F	ISIC 016				TOC=TOL+D1+C	CHECK SWITCH C
238A	F496	ISIC 017		023	SETBST	BR IF AC=0	ERROR CHECK COMPLETE GO ON
238C	2EF7	ISIC 018	OUT			HO=0$KFF	SET UP INVALID I STAR
238E	5EF9	ISIC 019				H1=HO	
2390	48E6	ISIC 020				I=H	DISPLAY IS FFFF FFFF
2392	20A0	ISIC 021				SET S K=0A	SET S4,S6
2394	ABC8	ISIC 022		ISTP 003	INVI	BR	GO TYPE INVALID SET IC MESSAGE
2396	5202	ISIC 023	SETBST			RDH V DA,88	READ BIAS CONST.
2398	0E0D	ISIC 024	TESTHO			Z=HO¤K00	TEST HI ORDER
239A	C4BB	ISIC 025		041	LORDER	BR IF Z=0	H1 ORDER DONE
239C	F0A6	ISIC 026		031	CNOTE	BR IF LZNZ	DO 100THS POSITION
239E	2C33	ISIC 027				P0=0$K03	HEX EQUIV OF 1000
23A0	2DE5	ISIC 028				P1=0$KE0	(03E8)
23A2	2D8B	ISIC 029				P1=P1+K08	
23A4	F82D	ISIC 030		034	ADD	BR IF P0 BIT7=1	GO ADD
23A6	2C07	ISIC 031	CNOTE			P0=0	HEX EQUIV OF 1000
23A8	2D65	ISIC 032				P1=0$K60	(0064)
23AA	2D4B	ISIC 033				P1=P1+K04	
23AC	63DB	ISIC 034	ADD			V1C=V1+P1	ADD IN CONST.
23AE	62CD	ISIC 035				VOC=V0+P0+C	MEMORY BIASED B STAR
23B0	DD3A	ISIC 036		041	LORDER	BR IF P1 BIT1=0	LOW ORDER RETURN
23B2	2EFF	ISIC 037				HO=HO+KFF	SUBT 1 FROM HUNDREDTH
23B4	F818	ISIC 038		024	TESTHO	BR IF P0 BIT7=0	SUB 1 FROM THOUSANDS
23B6	1EF3	ISIC 039				HO=HO*-KOF	KEEP LO ORDER HO=X0
23B8	F819	ISIC 040		024	TESTHO	BR IF P0 BIT7=1	TEST FOR THOUSANDS
23BA	0FOD	ISIC 041	LORDER			Z=H1¤K00	TEST LOW ORDER
23BC	C4CD	ISIC 042		050	ENDING	BR IF Z=0	LOW ORDER OK GET OUT
23BE	E0C9	ISIC 043		048	UNITS	BR IF HZ=0	GO DO UNITS
23C0	2C07	ISIC 044				P0=0	HEX EQUIV OF 10
23C2	2DA3	ISIC 045				P1=0$K0A	(0A)
23C4	2FFD	ISIC 046				H1=H1+KF0	CONTROL TENS COUNT
23C6	F4AD	ISIC 047		034	ADD	BR IF AC=1	ADD AGAIN
23C8	63FB	ISIC 048	UNITS			V1C=V1+H1	PUT IN UNITS
23CA	62ED	ISIC 049				VOC=V0+HO+C	HEX CONVERT DONE
23CC	CBD1	ISIC 050	ENDING	052	SETIST	BR IF BB BIT4=1	FROM SOFT STOP LOOP
23CE	128E	ISIC 051				RTN	WAS B STAR CONVERT
23D0	4826	ISIC 052	SETIST			I=V	MOVE TO I STAR
23D2	42A6	ISIC 053				V=T	RETORE B STAR

ADDR   WORD   SEQUENCE NO.   LABEL   NEXTSEQ   NEXTLABEL STATEMENT   COMMENTS

23D4   ABC6   ISIC 054   ISTP 002   INSTST   BR   GO SHARE INSTRUCTION STEP
                                                     ****
                                                     * CROSS REFERENCE FOR CSECT ISIC *
                                                     ****

ISIC 008   INRU 044
ISIC 018   ISIC 012   ISIC 015
ISIC 023   ISIC 017   JTYP 250
ISIC 024   ISIC 038   ISIC 040
ISIC 031   ISIC 026
ISIC 034   ISIC 030   ISIC 047
ISIC 041   ISIC 025   ISIC 036
ISIC 048   ISIC 043
ISIC 050   ISIC 042
ISIC 052   ISIC 050

ISTP   DESCRIPTIVE   TEXT

OBJECTIVE

CONVERT TO DECIMAL AND DISPLAY ON THE PR-KB THE ADDRESS OF THE NEXT INSTRUCTION TO BE EXECUTED.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		ISTP 001	T		** 1400	INSTRUCTION STEP	R.TAYLOR
2BC6	C0E0	ISTP 002	INSTST			RST S K=0E	RESET S4,S5,S6,
2BC8	3643	ISTP 003	INVI			D0=D0$K04	TURN ON BIT 5 FOR CONTROL
2BCA	E1D7	ISTP 004		010	GO	BR IF S6=1	SET IC ERROR
2BCC	CBD2	ISTP 005		008	AROUND	BR IF BB BIT4=0	IF NOT SET IC
2BCE	C1D7	ISTP 006	STOPCD	010	GO	BR IF S4=1	MACHINE CHECK LOGOUT
2BD0	2080	ISTP 007				SET S4	DOL=X011,S5=0 FOR NORMAL MESSAGE
2BD2	4486	ISTP 008	AROUND			G=I	PUT I* INTO G FOR CONVERT
2BD4	A304	ISTP 009		ICTD 021	CYTDEC	BAL	
2BD6	3000	ISTP 010	GO			SET S0	
		ISTP 011	*			PREPARE TO UNPACK A HALFWORD	
2BD8	2C15	ISTP 012	TYPEAG			P0=0$K10	SET TO 14,1 LESS THAN LINE FEED
2BDA	3C43	ISTP 013				P0=P0$K04	CHARACTER
2BDC	5FAD	ISTP 014				T0=H1L	TAKE LOW 4 FOR UNPACK
2BDE	8118	ISTP 015		ICOM 002	UNPACK	BAL	FIRST UNPACK INTO T0
2BE0	5A59	ISTP 016				G1=T0	STORE IN G1, 4TH POSITION
2BE2	5FA5	ISTP 017				T0=H1XL	SECOND UNPACK
2BE4	8118	ISTP 018		ICOM 002	UNPACK	BAL	UNPACK
2BE6	5A49	ISTP 019				G0=T0	STORE IN G0 3RD POSITION
2BE8	5EAD	ISTP 020				T0=H0L	GET 3RD
2BEA	8118	ISTP 021		ICOM 002	UNPACK	BAL	UNPACK
2BEC	5AB9	ISTP 022				T1=T0	PUT IN T1 2ND POSITION
2BEE	5EA5	ISTP 023				T0=H0XL	GET LAST
2BF0	8118	ISTP 024		ICOM 002	UNPACK	BAL	UNPACK , ANS IN T0 1ST POSITION
2BF2	5E92	ISTP 025				RDH H DA,AA	TEST FOR JYPE ROUTINE
2BF4	3E83	ISTP 026				H0=H0$K08	SET STAT FOR DISPLAY
2BF6	7E92	ISTP 027				STH H DA,AA	STORE STAT
2BF8	2F05	ISTP 028				H1=0$K00	INITIALIZE TO ZERO
2BFA	3404	ISTP 029				SET MODE K=A0	1052-1400 MODE,CPU ZONE
2BFC	2F08	ISTP 030				SET TA K=40	SET WRITE LATCH
2BFE	A416	ISTP 031		JTYP 027	STORE	BR	GO TO 1052 STORE ROUTINE ST WAIT

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**********************************
* CROSS REFERENCE FOR CSECT ISTP *
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ISTP 002    INRU 058  IRST 100  ISIC 054
ISTP 003    ISIC 022
ISTP 006    IDIS 037
ISTP 008    ISTP 005
ISTP 010    ISTP 004  ISTP 006
ISTP 012    JYPE 058
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ADDR    WORD   SEQUENCE NO.   LABEL      NEXTSEQ    NEXTLABEL  STATEMENT              COMMENTS

               ISWM 001    T                                  CLEAR OR SET WORD MARK ROUTINE.        KRAGER
               ISWM 002    *                                  WHEN ENTERING THIS ROUTINE G1 WILL CONTAIN 04 FOR SET WM OPS
               ISWM 003    *                                    AND 15 FOR CLEAR WM OPS.
OC50    5D10   ISWM 004    SETWM                                     RDB P1 U+0          READ A FLD CHAR
OC52    5B30   ISWM 005                                              RDB T1 V+0          READ B FLD CHAR
OC54    F14A   ISWM 006                012        SETAWM             BR IF G1 BIT7=0     CK OP FOR SET WM INST
OC56    3D45   ISWM 007                                              P1=P1$K40           CLEAR WM FROM CHAR
OC58    3B45   ISWM 008                                              T1=T1$K40           CLEAR WM FROM CHAR
OC5A    7D1A   ISWM 009    STOREA                                    STB P1 U-1          STORE CHAR DEC ADDR
OC5C    7B3A   ISWM 010                                              STB T1 V-1          STORE CHAR DEC ADDR
OC5E    8D7C   ISWM 011                ICYC 037   HISTRT             BR
OC4A    1D45   ISWM 012    SETAWM                                    P1=P1*-K40          SET WM OVER CHAR
OC4C    1B45   ISWM 013                                              T1=T1*-K40          SET WM OVER CHAR
OC4E    8C5A   ISWM 014                009        STOREA             BR
                                                  ***********************************
                                                  * CROSS REFERENCE FOR CSECT ISWM *
                                                  ***********************************

ISWM 004    ICYC 227   ICYC 243
ISWM 009    ISWM 014
ISWM 012    ISWM 006
```

ITRP   DESCRIPTIVE   TEXT

OBJECTIVES   DETERMINE LOG-OUT MESSAGE.

  PERFORM MACHINE CHECK TRAPS.   PERFORM COMMUNICATIONS SERVICE TRAPS.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		ITRP 001	T				STORAGE WRAP,MACHINE CHECK TRAP ROUTINES R. TAYLOR
		ITRP 002	*				COMMUNICATIONS TRAPS ARE RESET IN 1400 COMP. MODE
		ITRP 003	ATABLE	ADDR=0210			
0210	3200	ITRP 004				LINK U MMSK8=1	SAVE MICRO ADDRESS
0212	0080	ITRP 005				RST S4	RESET FOR STORAGE WRAP
0214	8224	ITRP 006		012	INTO	BR	
		ITRP 007	AEND				
		ITRP 008	*				
		ITRP 009	ATABLE	ADDR=0220			
0220	3202	ITRP 010				LINK U MMSK9=1	MACHINE CHECK TRAP ENTRY
0222	2080	ITRP 011	MACHCK			SET S4	SET FOR MACHINE CHECK LOGOUT
0224	57FF	ITRP 012	INTO			H1=BA	SAVE BRANCH/CONDITION REGISTER
0226	56EF	ITRP 013				H0=MMSK	SAVE MMSK REGISTER
0228	C4AC	ITRP 014		016	RESET	BR IF ZNZ	GO TO THE MMSK RESET
022A	7812	ITRP 015				STH I DA,8A	I STAR IS GOOD IF STORAGE WRAP
022C	7EF2	ITRP 016	RESET			STH H DA,BE	STORE MMSK,BA REGS FOR MA.CHECK
022E	0210	ITRP 017				RST MMSK K=01	RESETS MMSK 0,2 IF ON
0230	0216	ITRP 018				RST MMSK K=31	RESET 2540 READER TRAP
0232	0218	ITRP 019				RST MMSK K=41	RESET 2540 PUNCH TRAP
0234	AA0C	ITRP 020		024	GO	BR	
		ITRP 021	AEND				
		ITRP 022	*				
		ITRP 023	AEND				
2A0C	3444	ITRP 024	GO			SET MODE K=A4	SET MODE TO GET MICRO ADDRESS
2A0E	10C5	ITRP 025				U0=U0*-KC0	STRIP HIGH BITS IF ON
2A10	1113	ITRP 026				U1=U1*-K01	STRIP 7 BIT
2A12	6006	ITRP 027				U=U-2	GET TRAPPED MICROWORD ADDRESS
2A14	7052	ITRP 028				STH U DA,9A	PUT IN FOR DISPLAY
2A16	7042	ITRP 029				STH U DA,98	PUT IN FOR DISPLAY
2A18	3400	ITRP 030				SET MODE K=80	SET CPU MODE AND ZONE
2A1A	5812	ITRP 031				RDH I DA,8A	GET CORRECT I STAR FOR DISPLAY
2A1C	5EEF	ITRP 032				H0=MC	LOAD MACHINE CHECK REGISTER
2A1E	2F13	ITRP 033				H1=0$K01	LOAD COUNT
2A20	5282	ITRP 034				RDH V DA,A8	GET SENSE SWITCHES
2A22	1213	ITRP 035				V0=V0*-K01	RESET BIT 7
2A24	5279	ITRP 036				D1=V0	PREPARE TO STORE CODED HALT
2A26	2663	ITRP 037				D0=0$K06	WRAP STOP CODE
2A28	C1B0	ITRP 038		042	OUT	BR IF S4=0	STORAGE WRAP BRANCH
2A2A	261B	ITRP 039				D0=D0+K01	CHANGE STOP CODE TO 07 FOR MC
2A2C	7E42	ITRP 040				STH H DA,98	OVERLAY WITH MC AND COUNT INFO

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ADDR    WORD   SEQUENCE NO.   LABEL      NEXTSEQ   NEXTLABEL   STATEMENT            COMMENTS

2A2E    5EF2   ITRP 041                                        RDH H DA,BE          GET MMSK,BA REGISTERS
2A30    76F2   ITRP 042       OUT                              STH D DA,BE          STORE STOP CODE
2A32    1613   ITRP 043                                        DO=DO*-KO1           STRIP BIT 7
2A34    3404   ITRP 044                                        SET MODE K=AO        SET 1052 MODE
2A36    5092   ITRP 045                                        RDH U DA,AA          SWITCH 1052 STATUS IF NECESSARY
2A38    3085   ITRP 046                                        UO=UO$K80            TURN BIT ONE ON
2A3A    7092   ITRP 047                                        STH U DA,AA          STORE NEW STATUS
2A3C    26FB   ITRP 048                                        DO=DO+KOF            CHANGE TO  NEW LINE CHARACTER
2A3E    1F2E   ITRP 049                                        RST TA K=F2          RESET ALL
2A40    2F08   ITRP 050                                        SET TA K=40          SET WRITE
2A42    EAC2   ITRP 051       LOOPA        051     LOOPA       BR IF TT6=0          WAIT FOR REQUEST
2A44    4F6F   ITRP 052                                        TE=DO                ISSUE LINE FEED
2A46    OF20   ITRP 053                                        RST TA K=02          RESET SHARE REQUEST
2A48    EAC8   ITRP 054       LOOPB        054     LOOPB       BR IF TT6=0          WAIT FOR REQUEST
2A4A    1F2E   ITRP 055                                        RST TA K=F2          RESET ALL
2A4C    C1D1   ITRP 056                    058     NOIST       BR IF S4=1           DECIMAL CONVERT BYPASSED FOR MC
2A4E    ACDE   ITRP 057                IDIS 027    CONVI       BR                   TYPE MESSAGE
2A50    ACEO   ITRP 058       NOIST    IDIS 028    CONVA       BR
               ITRP 059       *                    ****   COMMUNICATIONS BIT SERVICE TRAP ****
               ITRP 060       ATABLE  ADDR=01E0
01E0    226A   ITRP 061       CBTRAP                           LINK D MMSK5=1       IGNORE
01E2    1F00   ITRP 062                                        RST CCTRL K=80       COMMUNICATION
01E4    026A   ITRP 063                                        RTN D MMSK5=0        CHANNEL
               ITRP 064       AEND
               ITRP 065       *                    ****   COMMUNICATION CHAR.SERVICE TRAP *****
               ITRP 066       ATABLE  ADDR=0120
0120    22EC   ITRP 067       CCTRAP                           LINK H MMSK6=1       IGNORE
0122    1F00   ITRP 068                                        RST CCTRL K=80       COMMUNICATION
0124    02EC   ITRP 069                                        RTN H MMSK6=0        CHANNEL
               ITRP 070       AEND
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*********************************
* CROSS REFERENCE FOR CSECT ITRP *
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ITRP 011    KAAN 050
ITRP 012    ITRP 006
ITRP 016    ITRP 014
ITRP 024    ITRP 020
ITRP 042    ITRP 038
ITRP 051    ITRP 051
ITRP 054    ITRP 054
ITRP 058    ITRP 056
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ADDR      WORD   SEQUENCE NO.   LABEL      NEXTSEQ   NEXTLABEL  STATEMENT              COMMENTS

                 IUBR 001   T                                UNCONDITIONAL BRANCH      12/20/66   R. C. HUANG
1E72      E678   IUBR 002   UNCDBR        011       AOK        BR IF DO BIT2=0       BR IF A STAR VALID
1E74      2A23   IUBR 008                                      TO=O$KO2
1E76      817C   IUBR 009              IERR 034      STCODE     BR
1E78      4286   IUBR 011   AOK                                 V=I                  STORE I* IN B*
1E7A      1615   IUBR 012                                       DO=DO*-K10           B* VALID
1E7C      4806   IUBR 013                                       I=U                  XFER A* TO I*
1E7E      8D7C   IUBR 014              ICYC 037      HISTRT     BR                   RETURN TO I CYCLE
                                           ***********************************
                                           * CROSS REFERENCE FOR CSECT IUBR *
                                           ***********************************
IUBR 002      IBCH 003   IBCH 045   IBCH 047   IBCH 049   IBCH 051   IBCH 053   IBCH 055   IBCH 060   IBCH 068   IBCH 070   IBCH 072   IBCH 074
              IBCH 076   IBCH 078   IBCH 080   IBCH 082   IBCH 125   ICLR 028   ICYC 085   INRU 052   IZWM 008   IZWM 023   JEND 138   JEND 146
              LERR 007   LOPD 040   MBBB 084   MNNN 003   MPRT 376   MPRT 392   MPRT 410   MQQQ 014   MQQQ 029
IUBR 011      IUBR 002
```

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		IZWM 001	T			BRANCH ON ZONE, WORD MARK OR BIT TEST. KRAGER	
0100	5D3A	IZWM 002	ZNWMBT			RDB P1 V-1	READ B FIELD
0102	8309	IZWM 003		004	MODIFR N	N=D1 BITS67	DECODE D MODIFIER
0400	8D7C	IZWM 004	MODIFR 0	ICYC 037	HISTRT	BR	INVALID-IGNORE
0402	8424	IZWM 005	MODIFR 1	022	WM	BR	
0404	840E	IZWM 006	MODIFR 2	011	NOTWM	BR	GO TEST ZONE BITS
0406	DD0F	IZWM 007	MODIFR 3	011	NOTWM	BR IF P1 BIT1=1	BR IF NO WM BIT
0408	9E72	IZWM 008	END	IUBR 002	UNCDBR	BR	WM-GO BRANCH
040A	3685	IZWM 009	BRIBIT			D0=D0$K80	SET BIT TEST FLAG
040C	5D3A	IZWM 010				RDB P1 V-1	READ B FIELD
040E	3D45	IZWM 011	NOTWM			P1=P1$K40	INSURE 1 BIT ON
0410	5FC0	IZWM 012				RDB H1 AS,P	CONVERT B FLD TO BCD
0412	57D9	IZWM 013				P1=D1	
0414	55C0	IZWM 014				RDB G1 AS,P	CONVERT D MODIFIER TO BCD
0416	C61E	IZWM 015		019	NOTBIT	BR IF D0 BIT0=0	BR IF NOT BIT TEST
0418	65F7	IZWM 016				G1=G1*H1	COMPARE BITS
041A	C488	IZWM 017		008	END	BR IF ZNZ	
041C	8D7C	IZWM 018		ICYC 037	HISTRT	BR	
041E	6F51	IZWM 019	NOTBIT			H1=H1⊓G1	COMPARE ZONES
0420	E089	IZWM 020		008	END	BR IF HZ=0	
0422	8D7C	IZWM 021	IEND	ICYC 037	HISTRT	BR	
0424	DD23	IZWM 022	WM	021	IEND	BR IF P1 BIT1=1	BR IF NO WM BIT
0426	9E72	IZWM 023		IUBR 002	UNCDBR	BR	

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***********************************
* CROSS REFERENCE FOR CSECT IZWM *
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```
IZWM 002    ICYC 237
IZWM 004    IZWM 003
IZWM 008    IZWM 017   IZWM 020
IZWM 009    ICYC 238
IZWM 011    IZWM 006   IZWM 007
IZWM 019    IZWM 015
IZWM 021    IZWM 022
IZWM 022    IZWM 005
```

JCHL   DESCRIPTIVE TEXT

ENTRY POINTS   OBJECTIVES

    JCHL   1. PERFORM INITIAL CHANNEL SELECTION.
              THIS IS THE NORMAL ENTRY POINT FOR INITIAL CHANNEL
              SELECTION FOR TAPE OPERATIONS. ENTRY HERE IS FROM   2. DO MODE SET, TIE, OR DATA COMMANDS.
              JODE FOLLOWING OPERATION DECODE.
                                                                            DO CONTROL COMMANDS.
    CHL25
              ENTRY HERE IS FROM CHANNEL LOW (STATUS) TRAP FOLL-   4. LOOP   WAIT FOR DATA TRAPS AS LONG AS BURST MODE
              OWING AN EARLY (INVALID) TAPE DISCONNECT ON WRITE   LATCH IS ON.
              OPS. OTHER ENDING CONDITIONS BRANCH HERE FROM
              WITHIN THIS ROUTINE.   5. SET PARITY AND DENSITY.

    CHL53   ENTRY IS FROM CHANNEL LOW TRAP ENDING ROUTINE ON   6. CHECK FOR SHORT RECORDS DURING READ OPS.
              READ OPERATIONS.

ADDR   WORD   SEQUENCE NO.   LABEL   NEXTSEQ   NEXTLABEL   STATEMENT   COMMENTS

               JCHL 001   T   1401 TAPE CHANNEL
               JCHL 002   *   TAPE AUX STORAGE DESCRIPTION
               JCHL 003   *   **
               JCHL 004   *   0080   *
               JCHL 005   *   BIT 0   LAST OP WAS A WRITE OR WRITE TAPE MARK.   *
               JCHL 006   *   BITS 1-3   LAST 1401 DRIVE ADDRESSED.   *
               JCHL 007   *   BITS 4-7   TAPE CONTROL UNIT ADDRESS   *
               JCHL 008   *   **
               JCHL 009   *
               JCHL 010   *   **
               JCHL 011   *   008X   *
               JCHL 012   *   X EQUALS 1401 TAPE DRIVE NUMBER.   *
               JCHL 013   *   BITS 0,1   00 FOR 7 TRACK DRIVE TO RUN AT 200 BITS PER INCH.   *
               JCHL 014   *   01 FOR 7 TRACK DRIVE TO RUN AT 556 BITS PER INCH.   *
               JCHL 015   *   10 FOR 7 TRACK DRIVE TO RUN AT 800 BITS PER INCH.   *
               JCHL 016   *   11 FOR ALL 9 TRACK DRIVES.   *
               JCHL 017   *   *
               JCHL 018   *   BIT 2   LAST OP WAS A BACKSPACE.   *
               JCHL 019   *   BIT 3   THIS BIT IS TURNED ON FOR END OF FILE AND TURNED OFF   *
               JCHL 020   *   WHEN THE END OF FILE BRANCH IS TAKEN.   *
               JCHL 021   *   BITS4-7   360 TAPE DRIVE ADDRESS.   *
               JCHL 022   *   **
               JCHL 023   *
               JCHL 024   *   **
               JCHL 025   *   0087   *
               JCHL 026   *   LAST TAPE STATUS.   *
               JCHL 027   *   **
               JCHL 028   *

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ADDR    WORD   SEQUENCE NO.  LABEL    NEXTSEQ   NEXTLABEL  STATEMENT                     COMMENTS

               JCHL 029   *            *********************************************************************
               JCHL 030   *                              0090-0093   TAPE SENSE BYTES 0-3
               JCHL 031   *                            TAPE SENSE BYTES STORED AFTER READ ERROR OR
               JCHL 032   *                            WHEN TAPE INTERVENTION IS REQUIRED-8F HALT
               JCHL 033   *            *********************************************************************
               JCHL 034   *
               JCHL 035   *            *********************************************************************
               JCHL 036   *                              0094-0095
               JCHL 037   *                            O STAR
               JCHL 038   *            *********************************************************************
               JCHL 039   *
               JCHL 040   *            *********************************************************************
               JCHL 041   *                              0096                                            *
               JCHL 042   *            BIT 0       UNUSED.                                                *
               JCHL 043   *            BITS 1-6    END OF FILE BLOCK BIT. BIT 2 FOR 1401 DRIVE 2 ETC.     *
               JCHL 044   *            BIT 7       UNUSED.                                                *
               JCHL 045   *            *********************************************************************
               JCHL 046   *
               JCHL 047   *            *********************************************************************
               JCHL 048   *                              0098                                            *
               JCHL 049   *            BIT 0       REWIND OR REWIND UNLOAD FLAG.                          *
               JCHL 050   *            BITS 1-6    END OF FILE BLOCK BIT RESET MASK.                      *
               JCHL 051   *            BIT 7       UNUSED.                                                *
               JCHL 052   *            *********************************************************************
               JCHL 053   *
               JCHL 054   *            *********************************************************************
               JCHL 055   *                              0099                                            *
               JCHL 056   *                            TAPE CONTROL BYTE ADDRESS.                        *
               JCHL 057   *            *********************************************************************
               JCHL 058   *
               JCHL 059   *
               JCHL 060   *            *********************************************************************
               JCHL 061   *                              009A                                            *
               JCHL 062   *            BIT 0       ODD REDUNDANCY FLAG.                                   *
               JCHL 063   *            BIT 1       9 TRACK OP.                                            *
               JCHL 064   *            BITS 2-7    TEMPORARY COMMAND STORAGE.                             *
               JCHL 065   *            *********************************************************************
               JCHL 066   *
               JCHL 067   *            *********************************************************************
               JCHL 068   *                              009B                                            *
               JCHL 069   *                            TEMPORARY STORAGE FOR DEVICE ADDRESS.             *
               JCHL 070   *            *********************************************************************
               JCHL 071   *
               JCHL 072   *            *********************************************************************
               JCHL 073   *                              00B9                                            *
               JCHL 074   *            BIT 2       ERASE BIT.                                             *
               JCHL 075   *            BIT 3       ALTERNATE 9 TRACK MODE.                                *
               JCHL 076   *            *********************************************************************
               JCHL 077   *
               JCHL 078   *            *********************************************************************
               JCHL 079   *                              00BA                                            *
               JCHL 080   *                            9 TRACK BYTE. BIT 2 IS ON IF 360 DRIVE 2 IS 9 TRACK ETC.*
               JCHL 081   *            *********************************************************************
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ADDR    WORD   SEQUENCE NO.  LABEL    NEXTSEQ   NEXTLABEL  STATEMENT            COMMENTS

               JCHL 082      *
               JCHL 083      *        *********************************************************************
               JCHL 084      *                                           00BB                             *
               JCHL 085      *                        PHASE ENCODE BYTE. BIT 2 IS ON IF 360 DRIVE 2 IS TO  *
               JCHL 086      *                        WRITE IN P.E. MODE ETC.                              *
               JCHL 087      *        *********************************************************************
177E    5FB9   JCHL 088      CHNL                            T1=H1                SAVE DEVICE ADDRESS
1780    3486   JCHL 089                                      SET MODE K=B8        CHANNEL EXTERNALS, CPU ZONE
1782    221E   JCHL 090      CHL10                           SET MMSK K=71        BLOCK ALL TRAPS-LEVEL 1
1784    2D85   JCHL 091                                      P1=0$K80             P=C080
1786    57C0   JCHL 092                                      RDB D1 AS,P+0        GET TCU CTRL BYTE
1788    4FFF   JCHL 093      CHL11                           GB/OUT=H1            DEVICE ADDR ON BUS OUT
178A    2B04   JCHL 094                                      SET GA K=20          SET ADDR-OUT
178C    2B44   JCHL 095                                      SET GA K=24          SET SELECT-OUT
178E    C9DB   JCHL 096      CHL13        115    CHL12       BR IF GT BIT4=1      CHECK OP-IN
1790    FDA5   JCHL 097                   107    CHL27       BR IF GT BIT3=1      CHECK STATUS-IN
1792    DD8F   JCHL 098                   096    CHL13       BR IF GT BIT1=1      CHECK SELECT-IN
1794    2A27   JCHL 099      NOADDR                          TO=0$K22             SET NO ADDR COMPARE STOP CODE
1796    3A23   JCHL 100      CHL25                           TO=TO$K02            OR IN BIT 6 TO STOP CODE
1798    7AF2   JCHL 101                                      STH T DA,BE          STORE STOP CODE
179A    021E   JCHL 102                                      RST MMSK K=71        RESET THE BLOCK TRAP REGISTER
179C    0214   JCHL 103                                      RST MMSK K=21        MMSK 0 SHOULD BE OFF,RST MMSK 2
179E    3400   JCHL 104                                      SET MODE K=80        RESTORE TO CPU MODE
17A0    98EA   JCHL 105               IREG 016  RSTREG       BAL                  RESTORE REGS U,V,I,G,D
17A2    A044   JCHL 106               IDIS 003  STOPPP       BR                   STOP
17A4    2B04   JCHL 107      CHL27                           SET GA K=20          RESET SELECT-OUT
17A6    FDA7   JCHL 108      CHL22        108    CHL22       BR IF GT BIT3=1      STATUS-IN
17A8    C9A9   JCHL 109      CHL23        109    CHL23       BR IF GT BIT4=1      OP-IN
17AA    2B00   JCHL 110                                      SET GA K=00          RESET ADDR-OUT
17AC    021E   JCHL 111                                      RST MMSK K=71        RESET THE BLOCK TRAP REGISTER
17AE    2D2B   JCHL 112      STAY                            P1=P1+K02            WAIT FOR APP. 125 MICROSECONDS
17B0    E0AE   JCHL 113                   112    STAY        BR IF HZNZ               BEFORE RE-SELECTING
17B2    9782   JCHL 114                   090    CHL10       BR
17DA    2B40   JCHL 115      CHL12                           SET GA K=04          OP IN-RESET ADDR-OUT
17DC    021E   JCHL 116                                      RST MMSK K=71        RESET MMSK, ALLOW R/P TRAPS
17DE    CDDE   JCHL 117      CHL14        117    CHL14       BR IF GT BIT0=0      ADDR-IN
17E0    5FAF   JCHL 118                                      TO=GB/IN             DEVICE ADDR FROM BUS IN
17E2    6AF1   JCHL 119                                      TO=TO¤H1             COMPARE ADDRESSES
17E4    C494   JCHL 120                   099    NOADDR      BR IF ZNZ            ADDR MISMATCH BR
17E6    4F4F   JCHL 121      CHL24                           GB/OUT=GO            CMD OR MODE SET ON BUS OUT
17E8    2B42   JCHL 122      CHL30                           SET GA K=14          CMD-OUT
17EA    FDEA   JCHL 123      CHL31        123    CHL31       BR IF GT BIT3=0      STATUS-IN
17EC    5FEF   JCHL 124                                      HO=GB/IN             BUS IN FOR TESTING
17EE    FE34   JCHL 125      CHL34        129    CHL32       BR IF HO3=0          BUSY BIT
17F0    2B00   JCHL 126                                      SET GA K=00          RESET SELECT-OUT AND ADDR OUT
17F2    2B08   JCHL 127                                      SET GA K=40          ISSUE COMMAND-OUT
17F4    97A6   JCHL 128                   108    CHL22       BR                   RETURN TO SHORT BUSY LOOP
17B4    044B   JCHL 129      CHL32                           Z=GO¤K04             NOT BUSY-MASK FOR SENSE OP
17B6    C4BA   JCHL 130                   132    CHL52       BR IF ZNZ            BR IF NOT SENSE OP
17B8    88D8   JCHL 131                   208    SENSE       BR
17BA    5FFF   JCHL 132      CHL52                           H1=GB/IN             NOT SENSE OP-GET UNIT STATUS
17BC    5842   JCHL 133                                      RDH I DA,98          GET TU CTRL BYTE ADR-98
17BE    E645   JCHL 134                   137    CHL50       BR IF DO2=1          TEST IF FSR OP
```

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
17C0	C646	JCHL 135		138	CHL51	BR IF D00=0	BR IF NOT WR-WTM OP
17C2	3983	JCHL 136				I1=I1$K08	SET WR-WTM IND FOR USE IN TRAP
17C4	2F07	JCHL 137	CHL50			H1=0	WTM OR FSR THIS OP-SET 0 STATUS
17C6	3D73	JCHL 138	CHL51			P1=P1$K07	STATUS BYTE ADDR=0087
17C8	7FC0	JCHL 139				STB H1 AS,P+0	STORE STATUS BYTE
17CA	4973	JCHL 140				D1=I1XH+D1L	UPDATE LAST TU ADR BIT IN TCUBYT
17CC	2D85	JCHL 141				P1=0$K80	TCU CTRL BYTE ADR=0080
17CE	77C8	JCHL 142				STB D1 AS,P+1	STORE TCU CNTL BYTE-0080
17D0	0EC3	JCHL 143				Z=H0*-K0C	TEST FOR ANY STATUS OTHER THAN
17D2	C4D6	JCHL 144		146	CHL56	BR IF ZNZ	CHANNEL END OR DEVICE END
17D4	A238	JCHL 145		148	CHL57	BR	
17D6	2B08	JCHL 146	CHL56			SET GA K=40	ISSUE SERVICE OUT
17D8	A212	JCHL 147		176	CHL62	BR	
2238	CA4D	JCHL 148	CHL57	158	CHL53	BR IF H04=1	CHECK CHANNEL END
223A	2B48	JCHL 149				SET GA K=44	ISSUE SERVICE OUT
223C	FDBD	JCHL 150	CHL80	150	CHL80	BR IF GT BIT3=1	WAIT FOR FALL OF STATUS-IN
223E	D616	JCHL 151		190	CHL87	BR IF D01=0	CK IF TIE BEING PERFORMED
2240	2D1F	JCHL 152				P1=P1+K11	TIE-GET TIE BYTE IN 0092
2242	5DC0	JCHL 153				RDB P1 AS,P+0	TIE BYTE
2244	4FDF	JCHL 154				GB/OUT=P1	TIE BYTE ON BUS-OUT
2246	EDC6	JCHL 155	CHL81	155	CHL81	BR IF GT BIT2=0	WAIT FOR RISE OF SERVICE-IN
2248	2B48	JCHL 156				SET GA K=44	ISSUE SERVICE OUT
224A	FDCA	JCHL 157	CHL82	157	CHL82	BR IF GT BIT3=0	WAIT FOR RISE OF STATUS-IN
224C	2B00	JCHL 158	CHL53			SET GA K=00	RESET SELECT-OUT
224E	2B08	JCHL 159				SET GA K=40	ISSUE SERVICE-OUT
2250	FDD1	JCHL 160	CHL54	160	CHL54	BR IF GT BIT3=1	WAIT FOR FALL OF STATUS-IN
2252	C9D3	JCHL 161	CHL55	161	CHL55	BR IF GT BIT4=1	WAIT FOR FALL OF OP-IN
2254	0214	JCHL 162				RST MMSK K=21	RESET MMSK 2 IF ON
2256	D602	JCHL 163		168	CHL60	BR IF D01=0	CHECK IF MODE SET
2258	5549	JCHL 164				GO=G1	MODE SET PERFORMED-GET COMMAND
225A	1645	JCHL 165				D0=D0*-K40	RESET MODE SET FLAG-D01
225C	5BF9	JCHL 166	CHL61			H1=T1	RESTORE DEVICE ADDRESS
225E	9782	JCHL 167		090	CHL10	BR	RETURN TO CHANNEL
2202	C593	JCHL 168	CHL60	176	CHL62	BR IF S0=1	NOT MODE SET,TEST UNIT CHECK
2204	5EC2	JCHL 169				RDH H DA,B8	GET FSR AND ERASE BITS-B90,1,2
2206	EF10	JCHL 170		175	CHL64	BR IF H12=0	ERASE LATCH-H12
2208	1F25	JCHL 171				H1=H1*-K20	RESET ERASE BIT
220A	7EC2	JCHL 172				STH H DA,B8	RESTORE FLAG BYTE IN B9
220C	98EA	JCHL 173		IREG 016	RSTREG	BAL	RESTORE REGS U,V,I,G,D
220E	937C	JCHL 174		JTPE 002	UADMCK	BR	ERASE COMPLETE-GO DO WRITE OP
2210	843A	JCHL 175	CHL64	178	CHL72	BR	
2212	2443	JCHL 176	CHL62			GO=0$K04	SENSE OP-COMMAND=04
2214	A25C	JCHL 177		166	CHL61	BR	PERFORM SENSE COMMAND
043A	FCA8	JCHL 178	CHL72	181	CHL71	BR IF GS BIT3=0	TEST FOR ZERO CHANNEL STATUS
043C	2A45	JCHL 179				T0=0$K40	CHNL STATUS NOT ZERO
043E	9796	JCHL 180		100	CHL25	BR	STOP
0428	5F42	JCHL 181	CHL71			RDB H1 DA,98	GET EOF BLOCK MASK
042A	CF39	JCHL 182		189	CHL85	BR IF H10=1	BR IF NOT REW OR RUN CMD
042C	2D95	JCHL 183				P1=0$K90	ADDR OF EOF BLOCK BITS-
042E	3D63	JCHL 184				P1=P1$K06	SET P=0096
0430	51C0	JCHL 185				RDB U1 AS,P+0	GET EOF BLOCK BITS
0432	1FFF	JCHL 186				H1=H1□KFF	INVERT MASK
0434	6F17	JCHL 187				H1=H1*U1	RESET EOF BLOCK BIT

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
0436	7FC0	JCHL 188				STB H1 AS,P	STORE EOF BLOCK BITS IN 0096
0438	9DE4	JCHL 189	CHL85	JDTA 055	DTA23	BR	
2216	76F2	JCHL 190	CHL87			STH D DA,BE	MOVE DO FLAGS TO CHNL ZONE
2218	34F6	JCHL 191				SET MODE K=BF	SET CHNL MODE AND ZONE
221A	56F2	JCHL 192				RDH D DA,BE	FLAGS NOW IN CHANNEL ZONE
221C	5752	JCHL 193				RDB D1 DA,9A	GET ODD REDUN AND 9-TRK FLAGS
221E	2065	JCHL 194				U0=0$K60	FORM WORD SEPARATOR=6D FOR
2220	30D3	JCHL 195				U0=U0$K0D	EVEN REDUNDANCY
2222	2143	JCHL 196				U1=0$K04	EVEN REDUNDANCY MASK=04
2224	5222	JCHL 197				RDH V DA,8C	GET DATA ADDR=B-STAR
2226	C72E	JCHL 198		202	CHL90	BR IF D10=0	CK IF EVEN REDUNDANCY
2228	5111	JCHL 199				U1=U1X	ODD REDUNDANCY MASK=40
222A	D72E	JCHL 200		202	CHL90	BR IF D11=0	CK IF 7-TRACK TAPE
222C	1045	JCHL 201				U0=U0*-K40	9-TRK-MAKE WS=2D FOR ODD REDUN
222E	5079	JCHL 202	CHL90			D1=U0	SAVE WS FOR TESTING
2230	021E	JCHL 203				RST MMSK K=71	ALLOW LEVEL 1 TRAPS
2232	2DC4	JCHL 204				SET GB K=20	SET BURST MODE LATCH
2234	EC80	JCHL 205	CHL91	207	WREND	BR IF GS2=0	BR IF BURST LATCH OFF
2236	A234	JCHL 206		205	CHL91	BR	WAIT FOR TRAPS
2200	9DE2	JCHL 207	WREND	JDTA 054	DTAEND	BR	GO TO WRITE END ROUTINE
08D8	2B48	JCHL 208	SENSE			SET GA K=44	ISSUE SERVICE OUT
08DA	AA31	JCHL 209		222	SENCHK N	BR IF H0=NZ	TEST FOR STATUS NON-ZERO
08DC	2095	JCHL 210				P1=0$K90	SET UP STARTING ADDR-0090
08DE	EDDE	JCHL 211	CHL92	211	CHL92	BR IF GT2=0	CHECK IF SERV-IN IS UP
08E0	D917	JCHL 212		217	CHL96	BR IF P1 BIT5=1	BR IF SENSE BYTES 0-3 COMPLETED
08E2	5F7F	JCHL 213				D1=GB/IN	GET SENSE BYTE
08E4	2B48	JCHL 214				SET GA K=44	SEL-OUT AND SERVICE-OUT
08E6	77C8	JCHL 215				STB D1 AS,P+1	STORE SENSE BYTES IN AS 0090-3
08E8	88DE	JCHL 216		211	CHL92	BR	GET NEXT SENSE BYTE
0896	2B42	JCHL 217	CHL96			SET GA K=14	SET COM-OUT
0898	FD98	JCHL 218	CHL97	218	CHL97	BR IF GT3=0	WAIT FOR STATUS-IN
089A	2B00	JCHL 219				SET GA K=00	RESET SELECT-OUT
089C	2B08	JCHL 220				SET GA K=40	ISSUE SERVICE-OUT
089E	C5A5	JCHL 221		224	CHL93	BR IF S0=1	BR IF UNIT CHECK ON READ OP
08A0	3A79	JCHL 222	SENCHK O			T0=0-K70	TAPE INT. REQUIRED-SET 8F HALT
08A2	9796	JCHL 223	CHL94	100	CHL25	BR	
08A4	2A95	JCHL 224	CHL93			T0=0$K90	SET-UNIT CHK ON IPL-STOP CODE
08A6	D1A3	JCHL 225		223	CHL94	BR IF S5=1	BR IF IPL
08A8	3D2B	JCHL 226				P1=P1-K02	SET ADDR TO 0091
08AA	5FC0	JCHL 227				RDB H1 AS,P	READ SENSE BYTE 1
08AC	CF56	JCHL 228		250	NONOIS	BR IF H10=0	BR IF NOISE BIT OFF
08AE	4A26	JCHL 229				T=V	GET STARTING B-STAR ADDR.
08B0	20D3	JCHL 230				U0=0$K0D	SET COUNT OF 13
08B2	6B0B	JCHL 231				T1C=T1+U0	ADD 13 TO B-STAR
08B4	6ACD	JCHL 232				T0C=T0+P0+C	P0=0
08B6	5E22	JCHL 233				RDH H DA,8C	GET ENDING B-STAR
08B8	7FB9	JCHL 234				H1C=H1-T1+C	SUBTACT INCREMENTED B-STAR
08BA	7EA9	JCHL 235				H0C=H0-T0+C	FROM ENDING B-STAR
08BC	F5D7	JCHL 236		250	NONOIS	BR IF S3=1	CK IF LESS THAN 13 CHARACTERS
08BE	D345	JCHL 237		240	CHLA0	BR IF D15=1	CK PHASE-ENCODED BIT IN SENSE 3
08C0	2AC7	JCHL 238				T0=0$KCC	SET UP STOP CODE-CE
08C2	9796	JCHL 239		100	CHL25	BR	RESTORE LS AND STOP
08C4	5730	JCHL 240	CHLA0			RDB D1 V+0	GET STORED DATA LOCATIONS. BLANK

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		JCHL 241	*				OUT THE FIRST 13 LOCATIONS. SAVE ANY GMWM AND ANY WORD MARKS
08C6	07FB	JCHL 242				Z=D1□KOF	TEST FOR GMWM
08C8	C4CF	JCHL 243		246	CHLA1	BR IF Z=0	
08CA	577B	JCHL 244				D1=D1H	SET BLANK AND
08CC	17B5	JCHL 245				D1=D1*-KB0	SAVE WORDMARK
08CE	7738	JCHL 246	CHLA1			STB D1 V+1	STORE BLANKED OUT DATA
08D0	2QFF	JCHL 247				U0=U0+KFF	DECREMENT COUNTER
08D2	C4C4	JCHL 248		240	CHLA0	BR IF ZNZ	Z=0=12 CHARACTERS BLANKED OUT
08D4	9DE2	JCHL 249		JDTA 054	DTAEND	BR	
08D6	9DE4	JCHL 250	NONOIS	JDTA 055	DTA23	BR	

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*********************************
* CROSS REFERENCE FOR CSECT JCHL *
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JCHL 088	JODE 081			
JCHL 090	JCHL 114	JCHL 167		
JCHL 096	JCHL 058			
JCHL 099	JCHL 120			
JCHL 100	JCHL 180	JCHL 223	JCHL 239	JEND 080
JCHL 107	JCHL 097			
JCHL 108	JCHL 108	JCHL 128		
JCHL 109	JCHL 109			
JCHL 112	JCHL 113			
JCHL 115	JCHL 096			
JCHL 117	JCHL 117			
JCHL 123	JCHL 123			
JCHL 129	JCHL 125			
JCHL 132	JCHL 130			
JCHL 137	JCHL 134			
JCHL 138	JCHL 135			
JCHL 146	JCHL 144			
JCHL 148	JCHL 145			
JCHL 150	JCHL 150			
JCHL 155	JCHL 155			
JCHL 157	JCHL 157			
JCHL 158	JCHL 148	JEND 128		
JCHL 160	JCHL 160			
JCHL 161	JCHL 161			
JCHL 166	JCHL 177			
JCHL 168	JCHL 163			
JCHL 175	JCHL 170			
JCHL 176	JCHL 147	JCHL 168		
JCHL 178	JCHL 175			
JCHL 181	JCHL 178			
JCHL 189	JCHL 182			
JCHL 190	JCHL 151			
JCHL 202	JCHL 198	JCHL 200		
JCHL 205	JCHL 206			
JCHL 207	JCHL 205			
JCHL 208	JCHL 131			
JCHL 211	JCHL 211	JCHL 216		
JCHL 217	JCHL 212			
JCHL 218	JCHL 218			
JCHL 222	JCHL 209			

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**********************************
* CROSS REFERENCE FOR CSECT JCHL *
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JCHL 223    JCHL 225
JCHL 224    JCHL 221
JCHL 240    JCHL 237   JCHL 248
JCHL 246    JCHL 243
JCHL 250    JCHL 228   JCHL 236
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JDTA DESCRIPTIVE TEXT

ENTRY POINTS   CONTROL OPERATIONS.

0170
        NORMAL ENTRY POINT FOR READ OR WRITE TRAPS FROM   OBJECTIVES
        JCHL.
                                                              1. SERVICE TAPE CONTROL FOR READ OR WRITE DATA.
DTAEND
        NORMAL ENTRY FROM JCHL WHEN BURST MODE LATCH IS   2. TEST FOR GMWM IN STORAGE.
        OFF (INDICATING DATA END) DURING WRITE OPS. ALSO
        USED AS ENTRY AFTER SOME SENSE OPS FOLLOWING A   3. RESET BURST LATCH.
        READ ERROR.
                                                              4. HANDLE WORD MARKS AND WORD SEPARATORS TO AND FROM
DTA23   TAPE.
        ENTERED FROM JCHL. NORMAL ENDING FOR READ AND

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		JDTA 001	T		1401	TAPE READ AND WRITE DATA LOOPS	
		JDTA 002	ATABLE	ADDR=0170			
0170	2240	JDTA 003				LINK G MMSKO=1	BLOCK LOWER PRIORITY TRAPS
0172	C1F7	JDTA 004		006	RD	BR IF S4=1	CK IF READ OP
0174	AD46	JDTA 005		033	WRITE	BR	DO WRITE DATA LOOP
0176	A00E	JDTA 006	RD	008	READ	BR	DO READ DATA LOOP
		JDTA 007	AEND				
200E	5F4F	JDTA 008	READ			GO=GB/IN	GET READ DATA IN FROM TAPE
2010	2B48	JDTA 009				SET GA K=44	ISSUE SERVICE-OUT
2012	5419	JDTA 010				U1=GO	SAVE READ DATA
2014	5530	JDTA 011				RDB G1 V+0	GET NEXT STORAGE LOCATION
2016	05FB	JDTA 012				Z=G1□KOF	TEST FOR GMWM
2018	C4B1	JDTA 013		022	DTA15	BR IF Z=0	IN STORAGE
201A	E234	JDTA 014	DTA10	027	DTA11	BR IF DO6=0	WAS WORD SEPARATOR SENT LAST
201C	1145	JDTA 015				U1=U1*-K40	WS SENT LAST-INSERT WD MARK
201E	5709	JDTA 016	LOAD			UO=D1	RESTORE WS FOR TEST
2020	6041	JDTA 017				UO=UO□GO	TEST DATA BYTE FOR WORD
2022	C4AB	JDTA 018		024	WSSENT	BR IF Z=0	SEPARATOR CHARACTER
2024	1623	JDTA 019				DO=DO*-KO2	NO WS THIS-RESET WS LAST FLAG
2026	7138	JDTA 020	DTA12			STB U1 V+1	STORE DATA
2028	0240	JDTA 021				RTN G MMSKO=0	ALLOW TRAPS-WAIT FOR SERV-IN
2030	D19B	JDTA 022	DTA15	014	DTA10	BR IF S5=1	CK IF IPL
2032	0240	JDTA 023				RTN G MMSKO=0	ALLOW TRAPS
202A	E227	JDTA 024	WSSENT	020	DTA12	BR IF DO6=1	WAS WS SENT LAST
202C	3623	JDTA 025				DO=DO$KO2	SET WS SENT LAST FLAG
202E	0240	JDTA 026				RTN G MMSKO=0	ALLOW TRAPS-WAIT FOR SERVICE-IN
2034	3145	JDTA 027	DTA11			U1=U1$K40	NO WS-REST WM BIT IN DATA BYTEV
2036	F21E	JDTA 028		016	LOAD	BR IF DO7=0	CK IF READ-LOAD OP
2038	D527	JDTA 029		020	DTA12	BR IF G11=1	TEST IF WD MARK IN STORAGE

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
203A	1145	JDTA 030				U1=U1*-K40	SET WM IN DATA BYTE
203C	7138	JDTA 031				STB U1 V+1	STORE DATA
203E	0240	JDTA 032				RTN G MMSK0=0	ALLOW TRAPS-WAIT FOR SERV-IN
2D46	E255	JDTA 033	WRITE	044	WRLOAD	BR IF D06=1	CK IF WS SENT LAST
2D48	5538	JDTA 034				RDB G1 V+1	GET DATA FROM STORAGE
2D4A	05FB	JDTA 035				Z=G1⌐KOF	WM-TEST IF GMWM
2D4C	C4BF	JDTA 036		050	GMWM	BR IF Z=0	
2D4E	D536	JDTA 037		040	WMINST	BR IF G11=0	NO WS LAST-CK IF WM IN STORAGE
2D50	517B	JDTA 038				D1=U1H	NO WM-CORRECT REDUNDANCY
2D52	AD58	JDTA 039		046	DTA21	BR	
2D36	F257	JDTA 040	WMINST	045	DTA22	BR IF D07=1	CK IF MOVE OP
2D38	3623	JDTA 041				DO=DO$K02	SET WS SENT LAST FLAG
2D3A	4FOF	JDTA 042				GB/OUT=U0	SEND WORD SEPARATOR
2D3C	AD5C	JDTA 043		048	DTA24	BR	
2D54	1623	JDTA 044	WRLOAD			DO=DO*-K02	RESET WS SENT LAST FLAG-D06
2D56	5173	JDTA 045	DTA22			D1=U1XH	CORRECT REDUNDANCY
2D58	6571	JDTA 046	DTA21			G1=G1⌐D1	
2D5A	4F5F	JDTA 047				GB/OUT=G1	DATA ON BUS OUT TO TAPE
2D5C	2B48	JDTA 048	DTA24			SET GA K=44	SERVICE AND SELECT OUT UP
2D5E	0240	JDTA 049				RTN G MMSK0=0	ALLOW SERV-IN TRAPS
2D3E	2B00	JDTA 050	GMWM			SET GA K=00	RESET SELECT-OUT
2D40	2B02	JDTA 051				SET GA K=10	ISSUE CMD-OUT
2D42	0D04	JDTA 052				RST GB K=20	RST BURST MODE LATCH
2D44	0240	JDTA 053				RTN G MMSK0=0	RTN FOR POSSIBLE LO TRP COMP
1DE2	7222	JDTA 054	DTAEND			STH V DA,8C	SAVE LAST B-STAR FOR RESTORE LS
1DE4	C9E5	JDTA 055	DTA23	055	DTA23	BR IF GT BIT4=1	WAIT FOR FALL OF OP-IN
1DE6	3400	JDTA 056				SET MODE K=80	SET CPU ZONE
1DE8	0214	JDTA 057				RST MMSK K=21	RESET MMSK 2 IF ON
1DEA	0210	JDTA 058				RST MMSK K=01	RESET MMSK 0 & 2 IF ON
1DEC	021E	JDTA 059				RST MMSK K=71	RESET MMSK7, IF ON
1DEE	98EA	JDTA 060		IREG 016	RSTREG	BAL	RESTORE REGS U,V,I,G,D
1DF0	2D85	JDTA 061				P1=0$K80	
1DF2	3D73	JDTA 062				P1=P1$K07	P=0087-ADDR OF STATUS BYTE
1DF4	C1F9	JDTA 063		065	DONE	BR IF S4=1	BR IF READ OP
1DF6	E17D	JDTA 064		067	END	BR IF G1 BIT6=1	BR IF CONTROL-U OP
1DF8	2DDB	JDTA 065	DONE			P1=P1+KOD	0- STAR ADDR,0094-5
1DFA	72CO	JDTA 066				STH V AS,P+0	STORE B-STAR IN 0-STAR
1DFC	8D7C	JDTA 067	END	ICYC 037	HISTRT	BR	TAPE SEL END BR END

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**********************************
*  CROSS REFERENCE FOR CSECT JDTA  *
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JDTA 006	JDTA 004	
JDTA 008	JDTA 006	
JDTA 014	JDTA 022	
JDTA 016	JDTA 028	
JDTA 020	JDTA 024	JDTA 029
JDTA 022	JDTA 013	
JDTA 024	JDTA 018	
JDTA 027	JDTA 014	
JDTA 033	JDTA 005	
JDTA 040	JDTA 037	
JDTA 044	JDTA 033	
JDTA 045	JDTA 040	

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* CROSS REFERENCE FOR CSECT JDTA *
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JDTA 046    JDTA 039
JDTA 048    JDTA 043
JDTA 050    JDTA 036
JDTA 054    JCHL 207   JCHL 249
JDTA 055    JCHL 189   JCHL 250   JDTA 055
JDTA 065    JDTA 063
JDTA 067    JDTA 064
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JEND   DESCRIPTIVE   TEXT

ENTRY POINTS

OBJECTIVES

0180

THIS IS THE MAJOR ENTRY TO THIS ROUTINE. TRAP TO
THIS ADDRESS IS THE NORMAL READ ENDING ROUTINE
FROM JCHL. ENTRY CAN ALSO BE A RESULT OF DEVICE
END FROM ANY CHANNEL DEVICE.

EOR

ENTRY AT THIS POINT IS FROM THE IBCH ROUTINE FOR
A BRANCH ON END OF REEL CONDITION.

ERROR

ENTRY AT THIS POINT IS FROM THE IBCH ROUTINE FOR
BRANCH ON TAPE ERROR CONDITION.

1. ENDING STATUS.

2. CHECK FOR SHORT RECORDS (EARLY DISCONNECT) DURING
   WRITE OPS.

3. GENERATE GMWM FOR END OF READ FIELD.

4. HANDLE TAPE MARKS.

5. STORE B-STAR IN BACK-UP AREA.

6. FLAG UNIT CHECK FOR POSSIBLE TIE OPERATION.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		JEND 001	T		1401	TAPE ENDING ROUTINE AND RDR-PUNCH REQ-IN	
		JEND 002	ATABLE	ADDR=0180			
0180	2204	JEND 003				LINK U MMSK2=1	CHNL LOW PRIORITY-PREVENT TRAPS
0182	FD86	JEND 004		006	RDRPCH	BR IF GT3=0	TEST STATUS-IN
0184	9ACA	JEND 005		059	ENDING	BR	
0186	8FA0	JEND 006	RDRPCH	008	REQIN	BR	TRAP FROM RDR-PUNCH REQ-IN
		JEND 007	AEND				
0FA0	2B40	JEND 008	REQIN			SET GA K=04	ISSUE SELECT OUT
0FA2	CDAB	JEND 009	CKADDR	013	ADDR	BR IF GT BIT0=1	BR IF ADDR-IN
0FA4	DDA3	JEND 010		009	CKADDR	BR IF GT1=1	BR IF NOT SELECT-IN
0FA6	2B00	JEND 011				SET GA K=00	SELECT-IN, RESET SELECT-OUT
0FA8	0204	JEND 012				RTN U MMSK2=0	RETURN TO MAIN PROGRAM
0FAA	2B00	JEND 013	ADDR			SET GA K=00	ADDR-IN, RESET SELECT-OUT
0FAC	5FEF	JEND 014				H0=GB/IN	PUT ADDRESS IN H0
0FAE	2B02	JEND 015				SET GA K=10	ISSUE COMMAND OUT
0FB0	FDB0	JEND 016	STATUS	016	STATUS	BR IF GT3=0	WAIT FOR STATUS IN
0FB2	5FFF	JEND 017				H1=GB/IN	PUT STATUS IN H1
0FB4	2B08	JEND 018				SET GA K=40	SET SERVICE OUT
0FB6	2C07	JEND 019				P0=0	SET P FOR
0FB8	2D85	JEND 020				P1=0$K80	READ-OUT OF
0FBA	57C0	JEND 021				RDB D1 AS,P	TAPE ADDRESS
0FBC	5731	JEND 022				V1=D1X	
0FBE	63E1	JEND 023				V1=V1¤H0	LOOK AT CONTROL UNIT ADDRESS
0FC0	E094	JEND 024		053	NOTAPE	BR IF HZNZ	BR IF NOT TAPE ADDRESS
0FC2	2D7B	JEND 025				P1=P1+K07	SET P FOR
0FC4	55C0	JEND 026				RDB G1 AS,P	READ-OUT OF TAPE STATUS BYTE
0FC6	5559	JEND 027				G1=G1	PUT G1 ON BUS FOR TESTING
0FC8	C494	JEND 028		053	NOTAPE	BR IF ZNZ	BR IF STATUS NON-ZERO

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
0FCA	7FC0	JEND 029				STB H1 AS,P	STORE NEW STATUS BYTE
0FCC	FB14	JEND 030		053	NOTAPE	BR IF H17=0	TEST UNIT EXCEPTION BIT
0FCE	47D5	JEND 031				P1=D1XL$P1H	ADDR OF LAST TU CTRL BYTE=008X
0FD0	1D83	JEND 032				P1=P1*-K08	CLEAR WR-WTM BIT FROM ADDR
0FD2	55C0	JEND 033				RDB G1 AS,P+0	GET LAST TU CTRL BYTE
0FD4	C710	JEND 034		051	CHL44	BR IF D10=0	BR IF NOT WR-WTM OP LAST
0FD6	2007	JEND 035				U0=0	0096-ADDR OF EOF BLOCK
0FD8	2195	JEND 036				U1=0$K90	BITS 1-6
0FDA	3163	JEND 037				U1=U1$K06	
0FDC	5300	JEND 038				RDB V1 AS,U+0	GET EOF BLOCK BITS
0FDE	2215	JEND 039				V0=0$K10	CONSTANT FOR EOF BL BIT TESTING
0FE0	D764	JEND 040		042	CHL43	BR IF D11=0	IS TAPE UA=X0XX
0FE2	5221	JEND 041				V0=V0X	NO-CHANGE TEST CONSTANT TO 01
0FE4	871F	JEND 042	CHL43	043	CHL45 N	N=D1 BITS23	TEST 1400 TAPE UNIT ADDRESS
0F80	6223	JEND 043	CHL45 0			V0=V0+V0	PREPARE
0F82	6223	JEND 044	CHL45 1			V0=V0+V0	EOF BLOCK
0F84	6223	JEND 045	CHL45 2			V0=V0+V0	BIT POINTER
0F86	5249	JEND 046	CHL45 3			G0=V0	SAVE EOF BLOCK BIT POINTER
0F88	6237	JEND 047				V0=V0*V1	TEST IF BLOCK
0F8A	C494	JEND 048		053	NOTAPE	BR IF ZNZ	BIT IS ON
0F8C	6345	JEND 049				V1=V1$G0	BLOCK BIT OFF-SET BLOCK BIT
0F8E	7300	JEND 050				STB V1 AS,U+0	STORE BLOCK BITS IN 0096
0F90	3515	JEND 051	CHL44			G1=G1$K10	SET EOF BIT 3 IN TO CTRL BYTE
0F92	75C0	JEND 052				STB G1 AS,P+0	STORE TU CTRL BYTE IN 008X
0F94	5C62	JEND 053	NOTAPE			RDH P DA,9C	READ OUT 1443 ADDRESS
0F96	1CE5	JEND 054				P0=P0*-KE0	CLEAR NON-ADDRESS BITS
0F98	6CE1	JEND 055				P0=P0¤H0	TEST ADDRESS
0F9A	C49F	JEND 056		058	IS1443	BR IF Z=0	BR IF 1443 ADDRESS
0F9C	8FE6	JEND 057		147	NO1443	BR	
0F9E	A94C	JEND 058	IS1443	159	43STAT	BR	
1ACA	5F5F	JEND 059	ENDING			G1=GB/IN	GET STATUS BYTE FROM TAPE
1ACC	0Q04	JEND 060				RST GB K=20	RST BURST MODE LATCH
1ACE	C188	JEND 061		077	WRSTIN	BR IF S4=0	CK IF WRITE OP
1AD0	1623	JEND 062				D0=D0*-K02	RESET WS LAST FLAG
1AD2	D191	JEND 063		081	IPL	BR IF S5=1	BR IF IPL
1AD4	5130	JEND 064	END12			RDB U1 V+0	CONTENTS OF NEXT DATA LOCATION
1AD6	01FB	JEND 065				Z=U1¤K0F	TEST FOR GMWM
1AD8	C493	JEND 066		082	STORE	BR IF Z=0	IN STORAGE
1ADA	11B7	JEND 067				U1=U1*-KBB	NO GMWM-SAVE WM BIT POSITION
1ADC	F261	JEND 068		070	MOVE	BR IF D07=1	BR IF MOVE OP
1ADE	2145	JEND 069				U1=0$K40	LOAD OP-CLEAR WM
1AE0	31F3	JEND 070	MOVE			U1=U1$K0F	U1=GM=4F OR GMWM-OF
1AE2	E213	JEND 071		082	STORE	BR IF D06=1	CK IF TAPE MARK STORED LAST
1AE4	F112	JEND 072		082	STORE	BR IF G17=0	BR IF NOT UNIT EXCEPTION
1AE6	3135	JEND 073				U1=U1$K30	TAPE MARK, 3F OR 7F
1AE8	7138	JEND 074				STB U1 V+1	STORE TAPE MARK
1AFA	3623	JEND 075				D0=D0$K02	SET TM STORED LAST FLAG-D06
1AEC	9AD4	JEND 076		064	END12	BR	
1A88	7222	JEND 077	WRSTIN			STH V DA,8C	GET B-STAR READY FOR CPU ZONE
1A8A	2808	JEND 078				SET GA K=40	ISSUE SERVICE OUT
1A8C	2A55	JEND 079				T0=0$K50	STOP CODE =52-EARLY TAPE DISC.
1A8E	9756	JEND 080		JCHL 100	CHL25	BR	STORE STOP CODE AND STOP
1A90	31B9	JEND 081	IPL			U1=0-K80	IPL, SET GROUP MARK-4F

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1A92	7138	JEND 082	STORE			STB U1 V+1	STORE GM OR GMWM
1A94	2CC7	JEND 083	END13			U0=0	ADDRESS OF STATUS
1A96	2185	JEND 084				U1=0$K80	BYTE=0087
1A98	3173	JEND 085				U1=U1$K07	
1A9A	5752	JEND 086				RDB D1 DA,9A	GET ODD REDUN AND 9-TRACK FLAGS
1A9C	C743	JEND 087		090	END20	BR IF D10=1	TEST IF ODD REDUNDANCY
1A9E	D422	JEND 088		098	END22	BR IF G01=0	TEST READ DATA FOR CORRECT REDUN
1AA0	9AC4	JEND 089		091	END21	BR	DATA HAS CORRECT REDUNDANCY
1AC2	D423	JEND 090	END20	098	END22	BR IF G01=1	ODD REDUN-TEST LAST DATA REDUN
1AC4	F127	JEND 091	END21	100	END28	BR IF G17=1	NO REDUNDANCY ERROR-CK UNIT EXCP
1AC6	7500	JEND 092	END23			STB G1 AS,U+0	STORE STATUS BYTE
1AC8	9AB2	JEND 093		106	END25	BR	
1A80	5EC2	JEND 094	END24			RDH H DA,B8	CHECK IF ALTERNATE READ MODE
1A82	CF47	JEND 095		092	END23	BR IF H10=1	
1A84	3523	JEND 096				G1=G1$K02	NOT ALT RD MODE. SET UNIT CHECK
1A86	9AC6	JEND 097		092	END23	BR	
1AA2	D744	JEND 098	END22	091	END21	BR IF D11=0	POSSIBLE REDUN ERROR-CK IF 7-TRK
1AA4	F100	JEND 099		094	END24	BR IF G17=0	9-TRK-CHECK IF UNIT EXCEPTION
1AA6	7500	JEND 100	END28			STB G1 AS,U+0	STORE STATUS BYTE
1AA8	5042	JEND 101				RDH U DA,98	TU CTRL BYTE ADDR IN 0099
1AAA	2007	JEND 102				U0=0	U=008X
1AAC	5700	JEND 103				RDB D1 AS,U+0	GET TU CTRL BYTE
1AAE	3715	JEND 104				D1=D1$K10	SET EOF BIT IN TU CTRL BYTE
1AB0	7700	JEND 105				STB D1 AS,U+0	STORE TU CTRL BYTE
1AB2	5022	JEND 106	END25			RDH U DA,8C	GET STARTING DATA ADDRESS
1AB4	E138	JEND 107		109	END26	BR IF G16=0	TEST IF UNIT CHECK
1AB6	3000	JEND 108				SET S0	TURN ON UNIT CHECK FLAG
1AB8	5510	JEND 109	END26			RDB G1 U+0	GET FIRST DATA BYTE READ IN
1ABA	F23E	JEND 110		112	END27	BR IF D07=0	TEST IF LOAD OP
1ABC	3545	JEND 111				G1=G1$K40	MOVE OP-REMOVE WORD MARK
1ABE	2007	JEND 112	END27			U0=0	
1AC0	8A62	JEND 113		122	END32	BR	
0A70	5552	JEND 114	TPMARK			RDB G1 DA,9A	TM-GET REDUNDANCY FLAG
0A72	C56B	JEND 115		126	END30	BR IF G10=1	TEST IF ODD REDUNDANCY
0A74	5042	JEND 116				RDH U DA,98	GET TP CTRL ADDR FROM 0099
0A76	2005	JEND 117				U0=0$K00	U=008X
0A78	5700	JEND 118				RDB D1 AS,U+0	FETCH TAPE CONTROL BYTE.
0A7A	3715	JEND 119				D1=D1$K10	SET END OF FILE BIT.
0A7C	7700	JEND 120				STB D1 AS,U+0	STORE TAPE CTRL BYTE.
0A7E	8A6A	JEND 121		126	END30	BR	
0A62	C5EB	JEND 122	END32	126	END30	BR IF S0=1	TEST UNIT CHECK FLAG
0A64	3189	JEND 123				U1=0-K80	TAPE MARK=7F
0A66	6151	JEND 124				U1=U1□G1	TEST FIRST DATA FOR TAPE MARK
0A68	C4F1	JEND 125		114	TPMARK	BR IF Z=0	WAS IT A TAPE MARK
0A6A	7222	JEND 126	END30			STH V DA,8C	STORE B-STAR IN B BACKUP
0A6C	3486	JEND 127				SET MODE K=B8	CPU ZONE, CHNL EXTERNALS
0A6E	A24C	JEND 128		JCHL 158	CHL53	BR	RETURN TO CHANNEL
0A30	2D85	JEND 129	EOR			P1=0$K80	P=0080=ADDR OF TCU BYTE
0A32	5FC0	JEND 130				RDB H1 AS,P+0	GET TCU BYTE
0A34	4FD5	JEND 131				P1=H1XL$P1H	ADDR OF LAST ADDRESSED TU BYTE
0A36	1D83	JEND 132				P1=P1*-K08	
0A38	5FC0	JEND 133				RDB H1 AS,P+0	GET LAST ADDRESSED TAPE UNIT BYT
0A3A	FF3F	JEND 134		136	EOFON	BR IF H13=1	WAS EOF BIT ON-H13

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
0A3C	8D7C	JEND 135		ICYC 037	HISTRT	BR	RETURN TO I-CYCLES
0A3E	1F15	JEND 136	EOFON			H1=H1*-K10	RESET EOF BIT
0A40	7FC0	JEND 137				STB H1 AS,P+0	STORE TU CTRL BYTE
0A42	9E72	JEND 138		IUBR 002	UNCDBR	BR	GO TO BRANCH ROUTINE
0270	2D85	JEND 139	ERROR			P1=0$K80	
0272	3D73	JEND 140				P1=P1$K07	P1=0087-ADDR OF LAST STATUS BYTE
0274	5FC0	JEND 141	END40			RDB H1 AS,P+0	GET STATUS BYTE
0276	5FF9	JEND 142				H1=H1	
0278	C4F5	JEND 143		141	END40	BR IF Z=0	WAIT FOR NON-ZERO STATUS
027A	EB7F	JEND 144		146	END41	BR IF H16=1	TEST STATUS FOR UNIT CHECK
027C	8D7C	JEND 145		ICYC 037	HISTRT	BR	RETURN TO I-CYCLES
027E	9E72	JEND 146	END41	IUBR 002	UNCDBR	BR	GO TO BRANCH ROUTINE
0FE6	5C72	JEND 147	NO1443			RDH P DA,9E	READ 1442 ADDRESS BYTES
0FE8	6CE1	JEND 148				P0=P0¤H0	
0FEA	C4F4	JEND 149		154	NO421	BR IF ZNZ	BR IF NOT 1ST 42
0FEC	5C82	JEND 150				RDH P DA,A8	RESET EOF
0FEE	1C85	JEND 151				P0=P0*-K80	BIT 1ST READER
0FF0	7C82	JEND 152	WAS42			STH P DA,A8	STORE BACK SSW BYTE
0FF2	A97A	JEND 153	NOTRDR	182	NORST	BR	
0FF4	6DE1	JEND 154	NO421			P1=P1¤H0	
0FF6	C4F2	JEND 155		153	NOTRDR	BR IF ZNZ	BR IF NOT 2ND 42
0FF8	5C82	JEND 156				RDH P DA,A8	READ SSW BYTE
0FFA	1C13	JEND 157				P0=P0*-K01	RESET EOF BIT 2ND RDR
0FFC	8FF0	JEND 158		152	WAS42	BR	
294C	5C92	JEND 159	43STAT			RDH P DA,AA	READ STATUS BYRE
294E	5662	JEND 160				RDH D DA,9C	
2950	DB5E	JEND 161		168	NODE	BR IF H1 BIT5=0	BR IF NO DEVICE END
2952	54C2	JEND 162				RDH G DA,B8	READ SYSTEM CONTROL BYTE
2954	C15A	JEND 163		166	BOX43	BR IF G1 BIT4=0	BR IF 1443
2956	E35B	JEND 164		166	BOX43	BR IF D1 BIT6=1	BR IF LAST CMND SS OR SKIP
2958	1665	JEND 165				D0=D0*-K60	RESET CH 9 AND 12 BITS
295A	1F43	JEND 166	BOX43			H1=H1*-K04	RESET DE BIT
295C	1743	JEND 167				D1=D1*-K04	RESET ACTIVE BIT
295E	FB64	JEND 168	NODE	171	NO12	BR IF H1 BIT7=0	BR IF NO UNIT EX
2960	3625	JEND 169				D0=D0$K20	SET CH 12 BIT ON
2962	1F13	JEND 170				H1=H1*-K01	RESET UE BIT
2964	7662	JEND 171	NO12			STH D DA,9C	
2966	6DF5	JEND 172				P1=P1$H1	OR STATUS BUTE WITH CHNL STATUS
2968	7C92	JEND 173				STH P DA,AA	
296A	5CF2	JEND 174				RDH P DA,BE	READ STOP CODE BYTE
296C	6CD1	JEND 175				P0=P0¤P1	
296E	C4FA	JEND 176		182	NORST	BR IF ZNZ	BR IF REMOTE RST OFF
2970	0D6D	JEND 177				Z=P1¤K60	
2972	E0FA	JEND 178		182	NORST	BR IF HZNZ	
2974	0DFB	JEND 179				Z=P1¤K0F	
2976	F0FA	JEND 180		182	NORST	BR IF LZNZ	
2978	2010	JEND 181				SET S7	
297A	0204	JEND 182	NORST			RTN U MMSK2=0	RTN TO MAIN PROG

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                       ***********************************
                       * CROSS REFERENCE FOR CSECT JEND *
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     JEND 006     JEND 004
     JEND 008     JEND 006
     JEND 009     JEND 010
     JEND 013     JEND 009
     JEND 016     JEND 016
     JEND 042     JEND 040
     JEND 043     JEND 042
     JEND 051     JEND 034
     JEND 053     JEND 024     JEND 028  JEND 030  JEND 048
     JEND 058     JEND 056
     JEND 059     JEND 005
     JEND 064     JEND 076
     JEND 070     JEND 068
     JEND 077     JEND 061
     JEND 081     JEND 063
     JEND 082     JEND 066     JEND 071  JEND 072
     JEND 090     JEND 087
     JEND 091     JEND 089     JEND 098
     JEND 092     JEND 095     JEND 097
     JEND 094     JEND 099
     JEND 098     JEND 088     JEND 090
     JEND 100     JEND 091
     JEND 106     JEND 093
     JEND 109     JEND 107
     JEND 112     JEND 110
     JEND 114     JEND 125
     JEND 122     JEND 113
     JEND 126     JEND 115     JEND 121  JEND 122
     JEND 129     IBCH 091
     JEND 136     JEND 134
     JEND 139     IBCH 092
     JEND 141     JEND 143
     JEND 146     JEND 144
     JEND 147     JEND 057
     JEND 152     JEND 158
     JEND 153     JEND 155
     JEND 154     JEND 149
     JEND 159     JEND 058
     JEND 166     JEND 163     JEND 164
     JEND 168     JEND 161
     JEND 171     JEND 168
     JEND 182     JEND 153     JEND 176  JEND 178  JEND 180
```

JODE DESCRIPTIVE TEXT

ENTRY POINTS   JTPE ROUTINE FOLLOWING D-MODIFIER DECODE.

RDORWR   OBJECTIVES
           ENTRY AT THIS POINT IS FROM JTPE FOLLOWING DECODE
           OF A WRITE OR READ TAPE OPERATION.   1. DECODE TAPE OPERATION TYPE. SAVE STARTING ADDRESS IN
                                                                       AUXILIARY STORAGE.
TAPELD
           THIS ENTRY POINT IS FROM IPLS WHEN INITIAL PROGRAM   2. SET APPROPRIATE COMMAND. CHECK BACKSPACE STATUS.
           LOAD IS FROM TAPE.
                                                                    3. CHECK DENSITY AND REDUNDANCY.
ODE
           THIS ENTRY IS FROM ONE OF SEVERAL POINTS IN THE   4. DO MODE SET OR TIE OP IF REQUIRED.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		JODE 001	T	1401	TAPES-OP	CODE DECODE	
141A	F75B	JODE 002	RDORWR	013	READ	BR IF D13=1	CHECK IF READ OP
141C	36C5	JODE 003				D0=D0$KC0	SET WRITE-WTM FLAG & MODE SET
141E	EF25	JODE 004		020	ERASE	BR IF H12=1	CHECK ERASE BIT
1420	2513	JODE 005				G1=0$K01	WRITE CMD=01
1422	9428	JODE 006		022	ODE30	BR	
10D4	20E5	JODE 007	TAPELD			U0=0$KE0	INITIAL PROGRAM LOAD
10D6	31F5	JODE 008				U1=U1$KF0	SET UNIT NO. TO FX
10D8	2793	JODE 009				D1=0$K09	
10DA	37D5	JODE 010				D1=D1$KD0	SET D TO READ(R) COMMAND
10DC	2040	JODE 011				SET S5	SET IPL INDICATOR
10DE	937E	JODE 012		JTPE 003	TAPELD	BR	
145A	2080	JODE 013	READ			SET S4	READ OP STAT
145C	3843	JODE 014				T1=T1$K04	0-STAR ADDR,0094-5
145E	72A0	JODE 015				STH V AS,T+0	STORE STARTING ADDR IN /-STAR
1460	2523	JODE 016				G1=0$K02	READ CMD=02
1462	1F25	JODE 017	ODE			H1=H1*-K20	U OP OR READ, RESET ERASE BIT
1464	7EC2	JODE 018				STH H DA,B8	STORE RESET ERASE BIT
1466	9428	JODE 019		022	ODE30	BR	
1424	2515	JODE 020	ERASE			G1=0$K10	ERASE CMD=17
1426	3573	JODE 021				G1=G1$K07	
1428	2D85	JODE 022	ODE30			P1=0$K80	
142A	41DD	JODE 023				P1=U1L+P1H	ADR OF TU CTRL BYTE=008X
142C	5FE9	JODE 024				H0=H1	SAVE ALT. MODE BIT FOR LATER BR
142E	5FC0	JODE 025				RDB H1 AS,P+0	GET TU CTRL BYTE
1430	5D19	JODE 026				U1=P1	SAVE LOW-ORDER TU CTRL BYTE ADDR
1432	7042	JODE 027				STH U DA,98	98-EOF BLOCK MASK,99-TUCB ADDR
1434	E195	JODE 028		047	ODE33	BR IF S6=1	CK IF BKSP NOW
1436	EF3C	JODE 029		032	ODE34	BR IF H12=0	CK BKSP LAT OP BIT
1438	2020	JODE 030				SET S6	BKSP LAST OP STAT

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
143A	1F25	JODE 031				H1=H1*-K20	RESET BKSP LAST OP BIT-H12
143C	7FC0	JODE 032	ODE34			STB H1 AS,P+0	STORE TU CTRL BYTE
143E	1DF3	JODE 033				P1=P1*-K0F	ADDR OF TCU CTRL BYTE=0080
1440	16E3	JODE 034				D0=D0*-K0E	ZERO D04,5,6 FOR FLAG USE
1442	1F35	JODE 035				H1=H1*-K30	RST BKSP LAST OP AND EOF BIT
1444	57C0	JODE 036				RDB D1 AS,P+0	GET TCU CTRL BYTE
1446	5D32	JODE 037				RDB P1 DA,8E	GET UNIT TYPE FOR REDUNDANCY TST
1448	0FCD	JODE 038				Z=H1□KC0	TEST TU CTRL BYTE FOR 9-TR DENS
144A	E081	JODE 039		050	ODE40	BR IF HZ=0	WAS IT 9-TRACK DENSITY
144C	3645	JODE 040				D0=D0$K40	MODE SET FLAG-D01
144E	5F4B	JODE 041				G0=H1H	OR-IN 7-TRK DENSITY FOR MODE SET
1450	ED57	JODE 042		045	ODE51	BR IF P12=1	CHECK IF ODD REDUNDANCY
1452	258D	JODE 043				G1=G1+K80	ODD REDUNDANCY FLAG-G10
1454	3435	JODE 044				G0=G0$K30	MODE SET=DD111011
1456	3425	JODE 045	ODE51			G0=G0$K20	EVEN REDUN MODE SET=DD101011
1458	92CE	JODE 046		067	ODE52	BR	
1414	0020	JODE 047	ODE33			RST S6	RESET BKSP NOW FLAG
1416	3F25	JODE 048				H1=H1$K20	SET BKSP LAST OP BIT
1418	943C	JODE 049		032	ODE34	BR	
1400	3545	JODE 050	ODE40			G1=G1$K40	9-TRACK TAPE FLAG-G11
1402	ED09	JODE 051		054	EVEN	BR IF P12=1	BR IF EVEN RED
1404	FE09	JODE 052		054	EVEN	BR IF H03=1	BR IF ALTERNATE MODE
1406	3585	JODE 053				G1=G1$K80	SET ODD RED FLAG-G10
1408	58D2	JODE 054	EVEN			RDH I DA,BA	GET PHASE ENCODED BYTE
140A	24C5	JODE 055				G0=0$KC0	START MODE-2 SET
140C	2815	JODE 056				I0=0$K10	CONSTANT FOR P.E. TEST
140E	0B12	JODE 057		059	ODE41	BR IF H15=0	IS 360 DRIVE NUMBER A X1XX
1410	5881	JODE 058				I0=I0X	YES-CHANGE CONSTANT
1412	8B55	JODE 059	ODE41	060	ODE42 N	N=H1 BITS67	BR ON LOW-2 ADDR BITS
12C0	6883	JODE 060	ODE42 0	060	ODE42	I0=I0+I0	
12C2	6883	JODE 061	ODE42 1			I0=I0+I0	
12C4	6883	JODE 062	ODE42 2			I0=I0+I0	
12C6	6897	JODE 063	ODE42 3			I0=I0*I1	CK IF TAPE IS PHASE ENCODED
12C8	C4CF	JODE 064		067	ODE52	BR IF Z=0	GO SET 800 BPI
12CA	3433	JODE 065				G0=G0$K03	1600 BPI-MODE SET=C3
12CC	92D0	JODE 066		068	ODE54	BR	
12CE	34B3	JODE 067	ODE52			G0=G0$K0B	MODE SET=DD1X1011
12D0	47F3	JODE 068	ODE54			H1=D1XH+H1L	DEVICE ADDR=TCUA-TUA
12D2	55E9	JODE 069				H0=G1	MOVE CMD BYTE
12D4	7E52	JODE 070				STH H DA,9A	9A-CMD BYTE, 9B-DEVICE ADDR
12D6	D562	JODE 071		077	ODE53	BR IF G11=0	CK IF 9-TRACK
12D8	C1E2	JODE 072		077	ODE53	BR IF S4=0	9-TRACK, CK IF READ OP
12DA	E1E2	JODE 073		077	ODE53	BR IF S6=0	READ OP- CK IF BKSP LAST OP
12DC	3645	JODE 074				D0=D0$K40	D01 MEANS TIE
12DE	544D	JODE 075				G0=G0L	
12E0	3415	JODE 076				G0=G0$K10	TIE MODE SET=18
12E2	15C5	JODE 077	ODE53			G1=G1*-KC0	STRIP 9-TRK+ODD REDUN FLAGS
12E4	0020	JODE 078				RST S6	
12E6	D66B	JODE 079		081	ODE60	BR IF D01=1	CK IF MODE SET OR TIE
12E8	5549	JODE 080				G0=G1	NO MODE SET-CMD IN G
12EA	977E	JODE 081	ODE60	JCHL 088	CHNL	BR	GO TO CHANNEL

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                        ***********************************
                        * CROSS REFERENCE FOR CSECT JODE *
                        ***********************************
JODE 002      JTPE 017
JODE 007      IPLS 061
JODE 013      JODE 002
JODE 017      JTPE 057    JTPE 060   JTPE 063   JTPE 066
JODE 020      JODE 004
JODE 022      JODE 006    JODE 019
JODE 032      JODE 029    JODE 049
JODE 045      JODE 042
JODE 047      JODE 028
JODE 050      JODE 039
JODE 054      JODE 051    JODE 052
JODE 059      JODE 057
JODE 060      JODE 059
JODE 067      JODE 046    JODE 064
JODE 068      JODE 066
JODE 077      JODE 071    JODE 072   JODE 073
JODE 081      JODE 079
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JTPE   DESCRIPTIVE   TEXT

ENTRY POINTS   OBJECTIVES

    UADMCK   1. TEST TAPE UNIT ADDRESS VALIDITY (1-6).
        THIS IS THE NORMAL ENTRY POINT FOR TAPE UNIT ADD-
        RESS DECODE FROM THE IOCM ROUTINE FOR DEVICE   2. TEST D-MODIFIER FOR VALIDITY AND OPERATION TYPE.
        ADDRESSES B, C, AND U. IT IS ALSO THE ENTRY FROM
        JCHL FOLLOWING AN ERASE OPERATION.   3. SET CONTROL COMMAND, ERASE, BACKSPACE, OR ERROR
                                                         MESSAGE, AS APPROPRIATE.

    TAPELD
        THIS IS THE ENTRY FROM THE JODE ROUTINE WHEN AN
        INITIAL PROGRAM LOAD IS DONE FROM TAPE.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		JTPE 001	T		1401 TAPES-UNIT	ADDRESS AND D-MODIFIER TEST	
137C	10EE	JTPE 002	UADMCK			RST S K=FE	RESET ALL S-REG STATS
137E	01F1	JTPE 003	TAPELD			Z=U1+K0F	IS UA GREATER THAN F0
1380	F489	JTPE 004			018 YES	BR IF AC=1	
1382	2A53	JTPE 005	UAERR			TO=0$K05	STOP CODE=05
1384	7AF2	JTPE 006	STOP			STH T DA,BE	STORE STOP CODE
1386	A044	JTPE 007		IDIS 003	STOPPP	BR	STOP
13D4	07DD	JTPE 008	MLOP			Z=D1¤KD0	TEST D-MOD=DX
13D6	E0CF	JTPE 009			015 DX	BR IF HZ=0	
13D8	2D6B	JTPE 010				P1=P1+K06	SET P1 TO E6
13DA	6D71	JTPE 011				P1=P1¤D1	TEST FOR W MOD.
13DC	C4D3	JTPE 012			017 VALID	BR IF Z=0	BR IF W MOD.
13DE	2A95	JTPE 013	DMERR			TO=0$K90	STOP CODE=90
13E0	9384	JTPE 014			006 STOP	BR	
13CE	079B	JTPE 015	DX			Z=D1¤K09	TEST D-MOD=R=09
13C0	FODE	JTPE 016			013 DMERR	BR IF LZNZ	
13D2	941A	JTPE 017	VALID	JODE 002	RDORWR	BR	START TAPE OP DECODE
1388	0191	JTPE 018	YES			Z=U1+K09	IS UA GREATER THAN 6
138A	F483	JTPE 019			005 UAERR	BR IF AC=1	ADDR ERROR
138C	8258	JTPE 020		IREG 006	STREGS	BAL	SAVE U,V,I,G,D
138E	5EC2	JTPE 021				RDH H DA,B8	GET ERASE BIT
1390	16F5	JTPE 022				DO=DO*-KF0	ZERO OUT DOH FOR FLAG USE
1392	2DE5	JTPE 023				P1=0$KE0	SET P FOR LATER USE
1394	E154	JTPE 024			008 MLOP	BR IF G16=0	BR IF MOVE OR LOAD OP
1396	07CD	JTPE 025				Z=D1¤KC0	U OP-TEST D-MOD=CX
1398	E0E3	JTPE 026			034 ABE	BR IF HZ=0	
139A	07DD	JTPE 027				Z=D1¤KD0	NOT C-TEST IF D-MOD=DX
139C	E0A9	JTPE 028			043 MORR	BR IF HZ=0	
139E	2D4B	JTPE 029				P1=P1+K04	SET P EQ TO E4
13A0	6D71	JTPE 030				P1=P1¤D1	TEST FOR U MOD
13A2	C4DE	JTPE 031			013 DMERR	BR IF ZNZ	BR IF NOT U MOD

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
13A4	25F3	JTPE 032				G1=0$KOF	REWIND UNLOAD CMD=0F
13A6	93B2	JTPE 033		048	ODE12	BR	
13E2	071B	JTPE 034	ABE			Z=D1□K01	CX-TEST IF D-MOD=C1-A
13E4	F0C9	JTPE 035		058	AMOD	BR IF LZ=0	
13E6	072B	JTPE 036				Z=D1□K02	NOT C1-TEST IF C2-B
13E8	F0C3	JTPE 037		061	BMOD	BR IF LZ=0	
13EA	075B	JTPE 038				Z=D1□K05	NOT C1 OR C2-TEST IF C5-E
13EC	F0DE	JTPE 039		013	DMERR	BR IF LZNZ	INVALID MODIFIER
13EE	3F25	JTPE 040				H1=H1$K20	ERASE COM, SET ERASE BIT
13F0	7EC2	JTPE 041				STH H DA,B8	STORE ERASE BIT
13F2	8D7C	JTPE 042		ICYC 037	HISTRT	BR	RETURN TO I-CYCLES
13A8	074B	JTPE 043	MORR			Z=D1□K04	DX-TEST IF D-MOD=D4-M
13AA	F0BD	JTPE 044		064	MMOD	BR IF LZ=0	
13AC	079B	JTPE 045				Z=D1□K09	NOT D4-TEST IF D9-R
13AE	F0DE	JTPE 046		013	DMERR	BR IF LZNZ	BR IF INVALID MODIFIER
13B0	2573	JTPE 047				G1=0$K07	REW CMD=07
13B2	51E9	JTPE 048	ODE12			H0=U1	MOVE UNIT ADDRESS FOR BRANCHING
13B4	2015	JTPE 049				U0=0$K10	CONSTANT FOR EOF BLOCK BIT TEST
13B6	DA3A	JTPE 050		052	ODE20	BR IF H05=0	IS 1400 UNIT ADDRESS=X0XX
13B8	5C01	JTPE 051				U0=U0X	NO-CHANGE CONSTANT
13BA	8A73	JTPE 052	ODE20	053	ODE21 N	N=H0 BITS67	BR ON 1400 TAPE UNIT ADDRESS
11E0	6003	JTPE 053	ODE21 0			U0=U0+U0	SHIFT CONSTANT BIT DEPENDENT ON
11E2	6003	JTPE 054	ODE21 1			U0=U0+U0	THE UA SO THAT THE BIT POINTS AT
11E4	6003	JTPE 055	ODE21 2			U0=U0+U0	THE CORRECT EOF BLOCK BIT.
11E6	5EC2	JTPE 056	ODE21 3			RDH H DA,B8	RESTORE H
11E8	9462	JTPE 057		JODE 017	ODE	BR	GO TO OP DECODE SECTION
13C8	259B	JTPE 058	AMOD			G1=G1+K09	FSR CMD=37, G1 WAS 2E
13CA	3625	JTPE 059				D0=D0$K20	SET THIS OP FWD SPACE BIT
13CC	9462	JTPE 060		JODE 017	ODE	BR	GO TO OP DECODE SECTION
13C2	159B	JTPE 061	BMOD			G1=G1□K09	BSR CMD=27, G2 WAS 2E
13C4	2020	JTPE 062				SET S6	BKSP NOW
13C6	9462	JTPE 063		JODE 017	ODE	BR	GO TO OP DECODE SECTION
13BC	35E9	JTPE 064	MMOD			G1=0-KE0	WTM CMD=1F
13BE	36C5	JTPE 065				D0=D0$KC0	SET WR-WTMFLAG AND MODE SET IND
13C0	9462	JTPE 066		JODE 017	ODE	BR	GO TO OP DECODE SECTION

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**********************************
* CROSS REFERENCE FOR CSECT JTPE *
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JTPE 002    IOCM 022  IOCM 038  JCHL 174
JTPE 003    JODE 012
JTPE 005    JTPE 019
JTPE 006    JTPE 014
JTPE 008    JTPE 024
JTPE 013    JTPE 016  JTPE 031  JTPE 039  JTPE 046
JTPE 015    JTPE 009
JTPE 017    JTPE 012
JTPE 018    JTPE 004
JTPE 034    JTPE 026
JTPE 043    JTPE 028
JTPE 048    JTPE 033
JTPE 052    JTPE 050
JTPE 053    JTPE 052
JTPE 058    JTPE 035
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*********************************
* CROSS REFERENCE FOR CSECT JTPE *
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JTPE 061   JTPE 037
JTPE 064   JTPE 044

JTYP   DESCRIPTIVE TEXT

GENERAL

    THE PRINTER KEYBOARD PERFORMS PROGRAM OR CONSOLE INITIATED
READ OR WRITE FUNCTIONS. IT OPERATES IN ONE CHARACTER AT A
TIME MODE.

    THE REQUEST LINE IS ACTIVE WHEN A KEY IS PRESSED FOR A READ
OR ALTER FUNCTION OR FOR A PROGRAM INITIATED WRITE OR DISPLAY
(LOGOUT) FUNCTION.   THESE CONDITIONS CAUSE ENTRY AT THE REQ
ENTRY POINT.

ENTRY POINTS

    LABEL
                EXCLUSIVE ENTRY POINT FOR PROGRAM INITIATED READ
                OR WRITE OPERATIONS.

    SETRDL
    SETWRL
                ENTRY IS AT THESE POINTS TO SET THE READ OR WRITE
                LATCH AS APPROPRIATE.

    REQ
                THIS ENTRY POINT IS USED FOR A CONSOLE INITIATED
                READ OR ALTER FUNCTION OR A PROGRAM INITIATED
                WRITE OR DISPLAY (LOGOUT) FUNCTION. IT IS ALSO
                USED WHEN THE PR-KB CHANGES FROM NOT READY TO
                READY STATUS.

    GFIX
                THIS PORTION OF THE ROUTINE HANDLES NOT READY TO
                READY STATUS ON THE PR-KB.

    EXITA
                THIS PERFORMS THE NORMAL EXIT FUNCTION AFTER PR-KB
                OPERATION IS COMPLETE.

    STOPCD
                ENTRY TO DETERMINE ALTER/DISPLAY STOP CODE PRESEN-
                TED ON LOGOUT MESSAGES.

SETADA
                THIS POINT IS ENTERED WHEN THE PR-KB ALTER DISPLAY
                KEY IS PRESSED ON THE CONSOLE AND THE PR-KB IS NOT
                IN RUN MODE.

TRAN
TRANSB
                THE READ (INPUT) CHARACTER IS TRANSLATED, CHECKED,
                AND STORED.

TW
                NORMAL ENTRY POINT (FROM REQUEST HANDLING ROUTINE)
                FOR A WRITE OR ALTER DISPLAY FUNCTION.

TSTLO
                ENTRY POINT FOR THE RE-TRANSLATE TABLE. THIS
                TABLE CONVERTS SPECIAL CHARACTER EBCDIC REPRESEN-
                TATION IN MAIN STORAGE INTO THE 1052 PTT CODE TO
                PRINT THE CHARACTER.

ALTDYE
                THIS ENTRY IS USED FOR HANDLING ANY ERROR ON CON-
                SOLE OPERATIONS.

TE
                ENTRY FOR NORMAL ENDING ROUTINE.

CSALT
                CONTROL STORAGE ALTER ENTRY (FROM REQUEST HANDLING
                ROUTINE).

ALTAUX
                AUXILIARY STORAGE ALTER ENTRY (FROM REQUEST HAND-
                LING ROUTINE).

CSDIS
                CONTROL STORAGE DISPLAY ENTRY (FROM REQUEST HAND-
                LING ROUTINE).

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		JTYP 001	T			**1400 TYPEWRITER ROUTINES	R TAYLOR
		JTYP 002	*			I CYCLE ENTRY	
		JTYP 003	*				
23E2	3404	JTYP 004	LABEL			SET MODE K=A0	SET 1400 1052 MODE,LSZONE CPU
23E4	5553	JTYP 005				G1=G1XH	
23E6	1545	JTYP 006				G1=G1*-K40	REMOVE BIT 1
23E8	00C0	JTYP 007				RST S K=0C	
23EA	5C92	JTYP 008				RDH P DA,AA	READ STATUS BYTE
23EC	1C35	JTYP 009				P0=P0*-K30	
23EE	6C55	JTYP 010				P0=P0$G1	G1=80 OR 90 SETS LOAD,HBALL,NAN
23F0	5C5B	JTYP 011				G1=P0H	PUT HBALL STATUS IN G1 G1=COORDO
23F2	1C87	JTYP 012				P0=P0*-K88	RST MANUAL,1052 ERROR BITS,HBALL
23F4	7C92	JTYP 013				STH P DA,AA	AND LOAD STATUS SET AS REQUIRED
23F6	16F3	JTYP 014				D0=D0*-K0F	RST D0 LOW ORDER BITS(USED A/D)
23F8	5C82	JTYP 015				RDH P DA,A8	CLEAR ERROR CONDITIONS
23FA	1D83	JTYP 016				P1=P1*-K08	RESET REQUEST BIT
23FC	7C82	JTYP 017				STH P DA,A8	IO ERROR CLEARED
23FE	079B	JTYP 018				Z=D1¤K09	TEST FOR READ
2400	F092	JTYP 019		025	SETWRL	BR IF LZNZ	BR IF WRITE
2402	1D23	JTYP 020				P1=P1*-K02	
2404	7C82	JTYP 021				STH P DA,A8	
2406	0F08	JTYP 022	SETRDL			RST TA K=40	RESET WRITE
2408	3F20	JTYP 023				SET TA K=82	SET READ AND INITIALIZE
240A	A416	JTYP 024		027	STORE	BR	
2412	1F00	JTYP 025	SETWRL			RST TA K=80	RESET READ
2414	2F08	JTYP 026				SET TA K=40	SET WRITE
2416	7032	JTYP 027	STORE			STH U DA,8E	
2418	2075	JTYP 029				U0=0$K70	
241A	2145	JTYP 033				U1=0$K40	
241C	7208	JTYP 034				STH V AS,U+2	STORE
241E	76C8	JTYP 035				STH D AS,U+2	CPU
2420	7408	JTYP 036				STH G AS,U+2	ZONE
2422	7808	JTYP 037				STH I AS,U+2	REGS
2424	7A08	JTYP 038				STH T AS,U+2	IN
2426	7C08	JTYP 039				STH P AS,U+2	AUX
2428	7E08	JTYP 040				STH H AS,U+2	STORAGE
242A	2020	JTYP 041				SET S6	STAY IN SOFT STOP
242C	EE8C	JTYP 042		051	EXITZ	BR IF TT2=0	NO INTV
242E	5FFF	JTYP 043				H1=TU	
2430	7F00	JTYP 044				STB H1 AS,U	STORE R OR W LATCH
2432	2FF3	JTYP 045				H1=0$K0F	
2434	1F28	JTYP 046				RST TA K=C2	
2436	3400	JTYP 047				SET MODE K=80	
2438	0004	JTYP 048				RST S2	
243A	4FFF	JTYP 049				MW=H1	
243C	96AC	JTYP 050		INRU 030	STOPCK	BR	
240C	0F20	JTYP 051	EXITZ			RST TA K=02	RESET SHARE
240E	3400	JTYP 052				SET MODE K=80	SET 1400 CPU ZONE AND MODE
2410	96AC	JTYP 053		INRU 030	STOPCK	BR	
		JTYP 054	*			1052 REQUEST	SHARE REQUEST
02DA	5FFF	JTYP 055	REQ			H1=TU	
02DC	0FC9	JTYP 056				Z=H1+KC0	TEST RUN MODE
02DE	F4FC	JTYP 057		087	TRY	BR IF AC=0	NOT READ OR WRITE

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
02E0	9F5E	JTYP 058		129	ATTENT	BAL	CHECK ATTENTION
02E2	2075	JTYP 060	RESREG			U0=0$K70	
02E4	2145	JTYP 064				U1=0$K40	
02E6	5208	JTYP 065				RDH V AS,U+2	RESTORE
02E8	56C8	JTYP 066				RDH D AS,U+2	CPU
02EA	5408	JTYP 067				RDH G AS,U+2	ZONE
02EC	5808	JTYP 068				RDH I AS,U+2	REGS
02EE	5A08	JTYP 069				RDH T AS,U+2	IN
02F0	5C08	JTYP 070				RDH P AS,U+2	AUX
02F2	5E92	JTYP 071				RDH H DA,AA	CHECK FOR JYPE ROUTINE ENTRY
02F4	CA78	JTYP 072		085	SECBIT	BR IF HO BIT4=0	NORMAL TYPE BRANCH
02F6	9F7C	JTYP 073		JYPE 008	LABEL	BR	GO DISPLAY
034A	DED3	JTYP 074	GFIX	076	RT	BR IF TT1=1	
034C	A40C	JTYP 075		051	EXITZ	BR	
0352	5F0A	JTYP 076	RT			RDB H1 AS,U-1	
0354	CF5A	JTYP 077		080	GETWR	BR IF H10=0	
0356	3F20	JTYP 078				SET TA K=82	
0358	835C	JTYP 079		081	OKNOW	BR	
035A	2F08	JTYP 080	GETWR			SET TA K=40	
035C	0F20	JTYP 081	OKNOW			RST TA K=02	
035E	3400	JTYP 082				SET MODE K=80	
0360	4F1F	JTYP 083				MW=U1	
0362	96AC	JTYP 084		INRU 030	STOPCK	BR	
02F8	5E08	JTYP 085	SECBIT			RDH H AS,U+2	RESTORE H REG
02FA	5032	JTYP 086				RDH U DA,8E	RESTORE A STAR
02FC	5C92	JTYP 087	TRY			RDH P DA,AA	GET STATUS FOR TESTING
02FE	EC10	JTYP 088		114	TRYRD	BR IF PO BIT2=0	BR NOT SECONDARY BIT
0300	1F2C	JTYP 089				RST TA K=E2	RESET RUN MODE,SHARE REQ
0302	1040	JTYP 090				RST S K=84	RST SO S5
0304	1C35	JTYP 091				PO=PO*-K30	
0306	CC1A	JTYP 092		136	MLOP	BR IF POO=0	MOVE OR LOAD RTN TO I CYCLE
0308	7C92	JTYP 093				STH P DA,AA	STORE BLANK 1052 STATUS EXC ER,H
030A	FAA4	JTYP 094		097	NOTSUM	BR IF TT7=0	NOT CHECK SUM OPERATION
030C	0610	JTYP 095				RST BC K=01	RST LOG LTCH IN CASE LAST ENTRY
030E	98DA	JTYP 096		IRST 064	SUMMIT	BR	
0324	FFAF	JTYP 097	NOTSUM		102	STOPCD	BR IF TU3=1	ALTER DISPLAY ACTIVE BRANCH
0326	8264	JTYP 098		IREG 012	STRUVI	BAL	SAVE REGS IN CASE START/RST USED
0328	0020	JTYP 099				RST S6	ALLOW EXIT FROM SOFT STOP
032A	3400	JTYP 100	EXITA			SET MODE K=80	
032C	96AC	JTYP 101		INRU 030	STOPCK	BR	TRY I CYCLE START
032E	C1B2	JTYP 102	STOPCD	104	PASS1	BR IF S4=0	NOT A CONSOLE FUNCTION
0330	0F02	JTYP 103				RST TA K=10	RST ACTIVE FOR C.INTP. ONLY
0332	5EF2	JTYP 104	PASS1			RDH H DA,BE	CHECK CODED HALT
0334	3400	JTYP 105				SET MODE K=80	SET CPU MODE AND ZONE
0336	CFBD	JTYP 106		109	PASS4	BR IF BBO=1	USE DF CODE IF SOFT STOP IS OFF
0338	0E11	JTYP 107				Z=HO+KO1	CHECK FOR XF STOP CODE FROM HALT
033A	F0BF	JTYP 108		110	PASS2	BR IF LZ=0	
033C	3E29	JTYP 109	PASS4			HO=0-K20	SETUP DF AS HALT CODE
033E	7EF2	JTYP 110	PASS2			STH H DA,BE	STORE APPROPRIATE CODE
0340	C1C5	JTYP 111		113	PASS3	BR IF S4=1	SENSE INFO IN ALREADY
0342	A044	JTYP 112		IDIS 003	STOPPP	BR	PUT SENSE SWITCH BYTE IN DISPLAY
0344	ACBC	JTYP 113	PASS3	IDIS 010	STOP	BR	PUT NEW S SW OR TAPE SETTING IN
0310	CFC7	JTYP 114	TRYRD		121	NNRTRR	BR IF TU BIT0=1	READ LATCH

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
0312	DFC7	JTYP 115		121	NNRTRR	BR IF TU BIT1=1	WRITE LATCH ON
0314	E1CB	JTYP 116		074	GFIX	BR IF S6=1	
0316	FECE	JTYP 117		119	PASSME	BR IF TT BIT3=0	NOT ALTER DISPLAY
0318	92EC	JTYP 118		142	SETADA	BR	ALT DISPLAY
034E	9F5E	JTYP 119	PASSME	129	ATTENT	BAL	CHECK ATTENTION
0350	A40C	JTYP 120		051	EXITZ	BR	NOT RUN MODE EXIT VIA INRU
0346	FFE5	JTYP 121	NNRTRR	123	INITL	BR IF TU BIT3=1	ALT DISPLAY ACTIVE
0348	890E	JTYP 122	STARTD	265	BEGIN	BR	
0364	C249	JTYP 123	INITL	122	STARTD	BR IF DO BIT4=1	ALTER DISPLAY SET TO GO
0366	C1EC	JTYP 124		128	SKPSKP	BR IF S4=0	
0368	DFEF	JTYP 125		127	PASS5	BR IF TU BIT1=1	WRITE LATCH ON HERE FOR LINE FD.
036A	8536	JTYP 126		322	TRAN	BR	DO CHAR FOR CONSOLE INTERRUPT
036E	8376	JTYP 127	PASS5	480	TE	BR	GO DO LINEFEED
036C	AC0E	JTYP 128	SKPSKP	152	SETAD	BR	
1F5E	CEEA	JTYP 129	ATTENT	135	FORGET	BR IF TT BIT0=0	NOT ATTENTION
1F60	FFEB	JTYP 130		135	FORGET	BR IF TU BIT3=1	ALTER DISPLAY ACTIVE
1F62	5C82	JTYP 131				RDH P DA,A8	SET
1F64	3D23	JTYP 132				P1=P1$K02	INQUIRY
1F66	7C82	JTYP 133				STH P DA,A8	FLAG
1F68	0F10	JTYP 134				RST TA K=01	RESET ATTENTION
1F6A	128E	JTYP 135	FORGET			RTN	
031A	3C85	JTYP 136	MLOP			PO=PO$K80	
031C	7C92	JTYP 137				STH P DA,AA	STORE STATUS
031E	2C05	JTYP 138				PO=0$K00	
0320	3400	JTYP 139				SET MODE K=80	SET CPU MODE AND ZONE
0322	8D7C	JTYP 140		ICYC 037	HISTRT	BR	RETURN TO I CYCLES
		JTYP 141	*			** ALTER DISPLAY SET UP	
12EC	3F22	JTYP 142	SETADA			SET TA K=92	SET READ,INITIALIZE,A/D ACTIVE
12EE	3C95	JTYP 143				PO=PO$K90	OR IN MANUAL,LOAD MODE IN STATUS
12F0	5C5B	JTYP 144				G1=POH	G1 CHANGED MAN LOAD FORCE,H IF
12F2	16F3	JTYP 145				DO=DO*-KOF	RST DO LOW FOUR BITS
12F4	7C92	JTYP 146				STH P DA,AA	STORE STATUS
12F6	10C0	JTYP 147				RST S K=8C	RST SO AND4 AND 5
12F8	2E05	JTYP 148				HO=0$K00	
12FA	2F73	JTYP 149				H1=0$K07	INITIALIZE B STAR BACK UP
12FC	7EE2	JTYP 150				STH H DA,BC	STORE CONTROL DIGIT STATS
12FE	A416	JTYP 151		027	STORE	BR	GO BACK SOFT STOP
2C0E	DAAB	JTYP 152	SETAD	178	ERR4	BR IF TT5=1	ALTERNATE CODE IS INVALID
2C10	F214	JTYP 153		155	FIRST	BR IF DO7=0	COUNT ZERO
2C12	8B6E	JTYP 154		243	ADCOMP	BR	
2C14	CFAD	JTYP 155	FIRST	157	CKFRST	BR IF TU BIT0=1	BR IF READ LATCH
2C16	A406	JTYP 156	BACK	022	SETRDL	BR	SET READ
2C2C	5AEF	JTYP 157	CKFRST			HO=TI	PUT 1ST CHAR ON BUSS IN
2C2E	0E3F	JTYP 158				Z=HO□K33	CHECK FOR C
2C30	C499	JTYP 159		169	CTRLA	BR IF Z=0	IS A C
2C32	E0A3	JTYP 160		174	TESTFT	BR IF HZ=0	A THRU I POSSIBLE
2C34	D1AA	JTYP 161		178	ERR4	BR IF S5=0	ERROR IF 1ST CHAR
2C36	2F25	JTYP 162				H1=0$K20	2ND CHAR-
2C38	3F73	JTYP 163				H1=H1$K07	TEST FOR P
2C3A	6FE1	JTYP 164				H1=H1□HO	
2C3C	C4AA	JTYP 165		178	ERR4	BR IF ZNZ	IF NOT P, ERROR
2C3E	2E7D	JTYP 166				HO=HO+K70	CHANGE TO 97 FOR P ON BUS OUT
2C40	5EF9	JTYP 167				H1=HO	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
2C42	A516	JTYP 168		198	ADDR	BR	READY FOR ADDRESS NEXT TIME
2C18	D1AA	JTYP 169	CTRLA	178	ERR4	BR IF S5=0	C VALID FOR 2ND CHAR ONLY
2C1A	E21F	JTYP 170		172	DOMORE	BR IF DO6=1	OKAY IF DISPLAY OP
2C1C	C9AA	JTYP 171		178	ERR4	BR IF TD4=0	ALTER CONTROL OK IF CE KEY IS ON
2C1E	3583	JTYP 172	DOMORE			G1=G1$K08	CONTROL STORE OP
2C20	8538	JTYP 173		323	TRANSB	BR	DO TRANSLATE
2C22	0E4B	JTYP 174	TESTFT			Z=HO¤K04	IS IT A D
2C24	F087	JTYP 175		182	DISPLY	BR IF LZ=0	YES DO A DISPLAY OP
2C26	0E1B	JTYP 176				Z=HO¤KO1	IS IT A
2C28	F081	JTYP 177		179	ALTCK	BR IF LZ=0	CHECK FOR EITHER ALTER OP ,AUX
2C2A	8370	JTYP 178	ERR4	477	ALTDYE	BR	INPUT ERROR GET OUT
2C00	D18A	JTYP 179	ALTCK	184	ALTER	BR IF S5=0	1ST CHAR A MEANS ALTER OP
2C02	35C3	JTYP 180				G1=G1$KOC	SET STATS FOR AUX OP
2C04	8538	JTYP 181		323	TRANSB	BR	DO TRANSLATE
2C06	3623	JTYP 182	DISPLY			DO=DO$KO2	SET DO BIT6 FOR DISPLAY
2C08	D1AB	JTYP 183		178	ERR4	BR IF S5=1	
2C0A	3643	JTYP 184	ALTER			DO=DO$KO4	SET DO BITS FOR TRANS TABLE CTL
2C0C	8538	JTYP 185		323	TRANSB	BR	GO TO TRANSLATE TABLE HOIN,H1OT
24FE	0FFD	JTYP 186	ADRTN			Z=H1¤KFO	TEST FOR NUMERIC
2500	E0A3	JTYP 187		204	DIG	BR IF HZ=0	
2502	2C75	JTYP 188				PO=0$K70	BUILD CONSTANT TO TEST
2504	3C93	JTYP 189				PO=PO$KO9	TRANSLATED CHARACTER
2506	6CF3	JTYP 190				PO=PO+H1	
2508	F48C	JTYP 191		193	CKCNT	BR IF AC=0	CHARACTER IS HEXIDECIMAL DIGIT
250A	8370	JTYP 192		477	ALTDYE	BR	ERROR
250C	E125	JTYP 193	CKCNT	205	MIX	BR IF G1 BIT6=1	ADDRESS COMPLETE
250E	F21D	JTYP 194		201	CKMAN	BR IF DO BIT7=1	OFF FOR FIRST 2 CHAR
2510	D197	JTYP 195		198	ADDR	BR IF S5=1	PUT DO 7 ON AFTER 1ST TWO CHAR
2512	2040	JTYP 196				SET S5	FIRST DIGIT CONTROL
2514	A518	JTYP 197		199	PUTCHR	BR	A OR D 1ST CHAR TO BUSSOUT
2516	3613	JTYP 198	ADDR			DO=DO$KO1	TURN FOR ADDRESS
2518	4FFF	JTYP 199	PUTCHR			TE=H1	BUSS OUT CHARACTER
251A	A416	JTYP 200		027	STORE	BR	
251C	C123	JTYP 201	CKMAN	204	DIG	BR IF G1 BIT4=1	AUX OR CONTROL STORAGE OP
251E	D1A3	JTYP 202		204	DIG	BR IF S5=1	1ST CHAR FLAG
2520	8370	JTYP 203		477	ALTDYE	BR	INV SET UP FOR DECIMAL CONVERT
2522	0040	JTYP 204	DIG			RST S5	RST 1ST CHAR FLAG
2524	5FE1	JTYP 205	MIX			HO=H1X	CROSS EBCDIC CHAR,ADD TO BUSSOUT
2526	6EF9	JTYP 206				HOC=HO+H1+1	EBCDIC+1 AND THROW AWAY HI 4 BTS
2528	E12C	JTYP 207		209	SETBY	BR IF G1 BIT6=0	NOT COMPLETE ADDRESS YET
252A	814E	JTYP 208		489	CSALT	BR	ALTER CONTROL STORAGE
252C	5CE2	JTYP 209	SETBY			RDH P DA,BC	GET ALTER DISPLAY ADDRESS BUILD
252E	D93F	JTYP 210		219	ONE	BR IF P1 BIT5=1	ADDRESS AND CONTROL DIGIT COUNT
2530	E939	JTYP 211		235	TWO	BR IF P1 BIT6=1	ACTUAL B STAR IS IN V P1 BITS
2532	F951	JTYP 212		238	THREE	BR IF P1 BIT7=1	CONTROL DIGITS UNTIL FINAL ADDR
2534	3523	JTYP 213				G1=G1$KO2	ADDRESS COMPLETE
2536	8CD8	JTYP 214		241	FOURTH	BR	
2E2A	7CE2	JTYP 215	BUILD			STH P DA,BC	SAVE ADDRESS BUILD FOR FOUR CHAR
2E2C	4FFF	JTYP 216				TE=H1	BUSS OUT CHAR
2E2E	E133	JTYP 217		247	CKKEY	BR IF G1 BIT6=1	
2E30	A416	JTYP 218		027	STORE	BR	CONTINUE IF OTHERWISE
253E	5EC3	JTYP 219	ONE			PO=HOXH	PUT 1ST IN POH
2540	1D4B	JTYP 220				P1=P1¤KO4	RST 1ST STAT

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
2542	D148	JTYP 221		231	ONEOK	BR IF G1 BIT5=0	NOT AUX SETUP
2544	CC3C	JTYP 223		237	ONEOK1	BR IF POO=0	VALID AUX DIGIT
2546	8370	JTYP 230		477	ALTDYE	BR	
2548	C13C	JTYP 231	ONEOK	237	ONEOK1	BR IF G14=0	NOT CONTROL STORE OP
254A	0CC9	JTYP 232				Z=PO+KCO	TEST FOR 0-3 FOR 1 ST
254C	F48C	JTYP 233		237	ONEOK1	BR IF AC=0	VALID 1ST CHAR FOR CONTROL STORE
254E	8370	JTYP 234		477	ALTDYE	BR	
2538	4ECD	JTYP 235	TWO			PO=HOL+POH	PUT 2ND IN POL
253A	1D2B	JTYP 236				P1=P1¤K02	RST 2ND STAT
253C	AE2A	JTYP 237	ONEOK1	215	BUILD	BR	
2550	4ED3	JTYP 238	THREE			P1=HOXH+P1L	PUT 3RD IN P1H
2552	1D1B	JTYP 239				P1=P1¤K01	RST 3RD STAT
2554	AE2A	JTYP 240		215	BUILD	BR	
0CD8	4EDD	JTYP 241	FOURTH			P1=HOL+P1H	PUT 4TH IN P1L
0CDA	AE2A	JTYP 242		215	BUILD	BR	
0B6E	E172	JTYP 243	ADCOMP	245	GETPTT	BR IF G1 BIT6=0	ADDRESS NOT COMPLETE
0B70	AE1E	JTYP 244		254	ADSTRT	BR	
0B72	5AEF	JTYP 245	GETPTT			HO=TI	GET BUSS IN CHAR
0B74	8538	JTYP 246		323	TRANSB	BR	
2E32	7222	JTYP 247	CKKEY			STH V DA,8C	STORE ORIGINAL B*
2E34	4EC6	JTYP 248				H=P	PUT ADDRESS IN H REG
2E36	C13D	JTYP 249		252	CONAUX	BR IF G1 BIT4=1	AUX OR CONTROL STORAGE OP
2E38	A396	JTYP 250		ISIC 023	SETBST	BAL	CONVERTED ADDRESS, DEC IN B STAR
2E3A	A412	JTYP 251	WRITE	025	SETWRL	BR	SET WRITE LATCH
2E3C	42C6	JTYP 252	CONAUX			V=P	PUT ADDRESS IN B STAR
2E3E	A412	JTYP 253		025	SETWRL	BR	
2E1E	2F53	JTYP 254	ADSTRT			H1=0$K05	ISSUE LINE FD
2E20	3F15	JTYP 255				H1=H1$K10	CHARACTER
2E22	4FFF	JTYP 256				TE=H1	BUSS OUT LINE FEED
2E24	16DB	JTYP 257				DO=DO¤KOD	SET BIT4,60N IF DISP, 5AND7 RST
2E26	E23B	JTYP 258	SETLCH	251	WRITE	BR IF DO BIT6=1	IS DISPLAY OPERATION
2E28	A406	JTYP 259		022	SETRDL	BR	DO ALTER OPERATION
0710	5C82	JTYP 260	SETIO			RDH P DA,A8	SET ERROR BIT INQ CLEAR
0712	3D83	JTYP 261				P1=P1$K08	SET ERROR BIT
0714	7C82	JTYP 262				STH P DA,A8	T ERROR BIT SET
0716	128E	JTYP 263				RTN	
		JTYP 264	ASEQ	ALO7=0E			
090E	CFA3	JTYP 265	BEGIN	275	RDALTR	BR IF TU BIT0=1	BRANCH IF READ
0910	C114	JTYP 266		268	NCSDY	BR IF G1 BIT4=0	NOT AUX OR CONTROL STORAGE OP
0912	924C	JTYP 267		502	CSDIS	BR	
0914	5F30	JTYP 268	NCSDY			RDB H1 V+0	READ MEMORY CHAR
0916	0FFB	JTYP 269				Z=H1¤KOF	TEST FOR GMWM
0918	C49D	JTYP 270		272	TSDISP	BR IF Z=0	YES WE HAVE ONE,TEST DISPLAY
091A	85E4	JTYP 271	TWBACK	416	TW	BR	WRITE ROUTINE
091C	E21B	JTYP 272	TSDISP	271	TWBACK	BR IF DO BIT6=1	BR IF DISPLAY
091E	5224	JTYP 273				V=V+1	INCREMENT B STAR
0920	8376	JTYP 274		480	TE	BR	GO ENDING ROUTINE
0922	5AEF	JTYP 275	RDALTR			HO=TI	PUT BUSS IN CHAR IN HO
0924	DAA9	JTYP 276		278	CANEND	BR IF TT BIT5=1	ALT CODE CANCEL OR END TEST
0926	8948	JTYP 277	TRBACK	295	TR	BR	BRANCH TO READ ROUTINE
0928	1EC5	JTYP 278	CANEND			HO=HO*-KCO	STRIP CASE BITS
092A	0E5B	JTYP 279				Z=HO¤K05	EOB TEST
092C	C4B8	JTYP 280		286	CONTST	BR IF ZNZ	BR IF NOT EOB

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
092E	C232	JTYP 281		283	NOTALT	BR IF DO BIT4=0	BR IF NOT ALTER
0930	8376	JTYP 282		480	TE	BR	GO ENDING IF ALTER
0932	2FF3	JTYP 283	NOTALT			H1=0$KOF	BUILD GMWM
0934	7F38	JTYP 284				STB H1 V+1	STORE GMWM,INCREMENT ADDRESS
0936	8376	JTYP 285	TEBACK	480	TE	BR	GO ENDING
0938	8710	JTYP 286	CONTST	260	SETIO	BAL	BAL TO SET IO ERROR
093A	0EAB	JTYP 287				Z=HO¤KOA	CK CANCEL
093C	C4C8	JTYP 288		295	TR	BR IF ZNZ	TRY TO READ CHAR OUT
093E	2F45	JTYP 289				H1=0$K40	PUT BLANK IN IN CASE OF READ OP
0940	C237	JTYP 290		285	TEBACK	BR IF DO BIT4=1	IF ALTER GO ENDING ROUTINE
0942	8710	JTYP 291	SETINQ	260	SETIO	BAL	SET ERROR
0944	CACB	JTYP 292		296	RTNTR	BR IF TT BIT4=1	READ ROUTINE ENTRY AFTER TRANS.
0946	85AA	JTYP 293		384	TRA	BR	IF TT BIT4=0
		JTYP 294	*			** READ ROUTINE STARTS HERE	
0948	CAC3	JTYP 295	TR	291	SETINQ	BR IF TT BIT4=1	KEY CHECK
094A	CA4F	JTYP 296	RTNTR	298	GOON	BR IF HO BIT4=1	LOW 4 BITS OF PTT TO BE EXAMINED
094C	8538	JTYP 297		323	TRANSB	BR	X0-X7 GO TO TRANS BEGIN
094E	DA53	JTYP 298	GOON	300	TSTD	BR IF HO BIT5=1	XC-XF POSSIBLE
0950	8538	JTYP 299		323	TRANSB	BR	X8-XB GO TO TRANS BEGIN
0952	0EDB	JTYP 300	TSTD			Z=HO¤KOD	XC,XE,XF ARE NOT FUNCTIONAL,
0954	F0D8	JTYP 301		303	ERROR1	BR IF LZNZ	CHANGE TO 40 FOR READ SET IO ERR
0956	FE60	JTYP 302		307	CHANGE	BR IF HO BIT3=0	DD,ID,FD,3D ARE NOT FUNCTIONAL
0958	2F45	JTYP 303	ERROR1			H1=0$K40	BUILD BLANK
095A	8710	JTYP 304		260	SETIO	BAL	SET ERROR BIT
095C	C26F	JTYP 305	CKALTR	314	GETOUT	BR IF DO BIT4=1	IF ALTER,BUSS OUT AND RETURN
095E	85AA	JTYP 306		384	TRA	BR	RTN AFTER TRANSLATE
0960	C269	JTYP 307	CHANGE	311	ALTLF	BR IF DO4=1	GIVE LINE FEED OP IF A/D ROUTINE
0962	2F55	JTYP 308				H1=0$K50	CHANGE ED OR 2D TO 5D EBCDIC
0964	3FD3	JTYP 309				H1=H1$KOD	NOT FUNCTIONAL OD OR CD ARE CHGE
0966	85AA	JTYP 310		384	TRA	BR	CHARACTER SET UP BYPASS TRANS
0968	2F15	JTYP 311	ALTLF			H1=0$K10	DO LINE FEED
096A	3F53	JTYP 312				H1=H1$K05	
096C	E273	JTYP 313	TG	316	CKATT	BR IF DO BIT6=1	
096E	4FFF	JTYP 314	GETOUT			TE=H1	BUSS OUT CHARACTER
0970	A416	JTYP 315		027	STORE	BR	
0972	CEEE	JTYP 316	CKATT	314	GETOUT	BR IF TT BIT0=0	BR NOT ATTENTION
0974	5226	JTYP 317				V=V-1	BACK UP B STAR IF END OF DISPLAY
0976	8376	JTYP 318		480	TE	BR	ATT AND DISPLAY,GO ENDING ROUTE
		JTYP 319	*			** TRANSLATE BEGIN, BUSS IN CHAR IN HO	
		JTYP 320	AEND				
		JTYP 321	ASEQ	AL07=36			
0536	5AEF	JTYP 322	TRAN			HO=TI	FOR CONSOLE INTERRUPT
0538	5EB9	JTYP 323	TRANSB			T1=HO	PUT PTT IN BIAS
053A	1BC5	JTYP 324				T1=T1*-KCO	STRIP CASE,CK FOR SPACE
053C	C4FB	JTYP 325		357	TBLKUP	BR IF Z=0	IS SPACE GO TABLE
053E	CE66	JTYP 326	TRANAG	346	LOCASE	BR IF HO BIT0=0	LOWER CASE CHAR
0540	0BBB	JTYP 327	UPCASE			Z=T1¤KOB	CK XB
0542	F0C8	JTYP 328		331	NOTUCB	BR IF LZNZ	BR NOT UPPER CASE XB
0544	2B1B	JTYP 329				T1=T1+KO1	UPPER CASE XB IN XC LOCATIONS
0546	857A	JTYP 330		357	TBLKUP	BR	
0548	0B0D	JTYP 331	NOTUCB			Z=T1¤KOO	TEST FOR UPPER CASE LOW ORDER 0
054A	F0D0	JTYP 332		335	NOTUCO	BR IF LZNZ	NOT XO UPPER CASE
054C	3BA3	JTYP 333				T1=T1$KOA	CHANGE BIAS FOR XO CHAR TO XA

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
054E	857A	JTYP 334		357	TBLKUP	BR	GO TABLE
0550	EOFB	JTYP 335	NOTUCO	357	TBLKUP	BR IF HZ=0	CX CHAR EXC CO ARE HANDLED HERE
0552	OB1F	JTYP 336				Z=T1□K11	CK PTT FOR
0554	C4DA	JTYP 337		340	UCINVX	BR IF ZNZ	CK FOR INVALID UPPER CASE
0556	2BF3	JTYP 338				T1=0$KOF	D1 CHAR PUT IN OF POSITION
0558	857A	JTYP 339		357	TBLKUP	BR	
055A	DA60	JTYP 340	UCINVX	343	UCINV	BR IF HO BIT5=0	INVALID UPPER CASE ONLY
055C	OB4B	JTYP 341				Z=T1□K04	X5,X6,X7 ALLOWED
055E	FOE2	JTYP 342		344	BIASSC	BR IF LZNZ	
0560	859E	JTYP 343	UCINV	378	ERROR2	BR	INVALID CHARACTER
0562	2B8B	JTYP 344	BIASSC			T1=T1+K08	X5,X6,X7 UC PUT IN XD,XE,XF
0564	857A	JTYP 345		357	TBLKUP	BR	GO TABLE
0566	OBOD	JTYP 346	LOCASE			Z=T1□K00	
0568	EOFA	JTYP 347		357	TBLKUP	BR IF HZNZ	ALL EXC NUMS,POUND SIGN IN TABLE
056A	OBBB	JTYP 348				Z=T1□K0B	
056C	C4FB	JTYP 349		357	TBLKUP	BR IF Z=0	LOOK UP POUND SIGN
056E	3BF5	JTYP 350				T1=T1$KF0	OR F FOR NUMERICS 0-9
0570	5BF9	JTYP 351				H1=T1	PUT ANS IN H1 TRANS COMP REG
0572	OFAB	JTYP 352				Z=H1□K0A	FA MUST BE CHANGED TO FO
0574	FOFE	JTYP 353		362	TRCOMP	BR IF LZNZ	TRANS COMPLETE FOR 1-9
0576	1FF3	JTYP 354				H1=H1*-KOF	
0578	857E	JTYP 355		362	TRCOMP	BR	TRANS COMPLETE FOR 0
057A	2A65	JTYP 357	TBLKUP			T0=0$K60	LOCATE
057C	5FA0	JTYP 361				RDB H1 AS,T+0	READ TRANSLATED CHARACTER
057E	D26B	JTYP 362	TRCOMP	419	TWR	BR IF DO BIT5=1	ALT DISPLAY SET UP
0580	C16B	JTYP 363		419	TWR	BR IF G1 BIT4=1	ALTER RTN FOR AUX OR CONTROL OP
0582	OFOD	JTYP 364				Z=H1□K00	NO TABLE ERROR, CK WM FLAG
0584	C488	JTYP 365		367	TESTX	BR IF ZNZ	VALID SO FAR
0586	859E	JTYP 366	ERRRS	378	ERROR2	BR	INVALID CHARACTER
0588	CE13	JTYP 367	TESTX	372	UPPER	BR IF HO BITO=1	UPPER CASE CHECK
058A	D526	JTYP 368		382	OVER	BR IF G1 BIT1=0	NO H BALL
058C	OF7D	JTYP 369	CHEC			Z=H1□K70	LOW AND H,UP ANDNO H WITH XB,XC
058E	EC87	JTYP 370		366	ERRRS	BR.IF HZ=0	INVALID CHANGE TO BLANK
0590	85A6	JTYP 371		382	OVER	BR	CONTINUE VALID CHARACTER
0592	D527	JTYP 372	UPPER	382	OVER	BR IF G1 BIT1=1	EXIT IF H BALL
0594	OFBB	JTYP 373				Z=H1□K0B	
0596	F08D	JTYP 374		369	CHEC	BR IF LZ=0	COULD BE 7B CHARACTER
0598	OFCB	JTYP 375				Z=H1□KOC	
059A	F08D	JTYP 376		369	CHEC	BR IF LZ=0	COULD BE 7C CHARACTER
059C	85A6	JTYP 377		382	OVER	BR	
059E	8710	JTYP 378	ERROR2	260	SETIO	BAL	INVALID CHARACTER
05A0	2F45	JTYP 379				H1=0$K40	PUT BLANK IN MEMORY
05A2	85AA	JTYP 380		384	TRA	BR	PUT BLANK IN ACC TO MODE
05A4	2FE7	JTYP 381	WORD			H1=0$KEE	PUT IN EE FOR WM
05A6	OFEF	JTYP 382	OVER			Z=H1□KEE	LOOK FOR WM
05A8	C4C7	JTYP 383		398	WORDMK	BR IF Z=0	BRANCH IF WORD MARK
05AA	5D30	JTYP 384	TRA			RDB P1 V+0	READ MAIN STORAGE BYTE
05AC	ODFB	JTYP 385				Z=P1□KOF	TEST FOR GROUP MK WD MK
05AE	C4B2	JTYP 386		388	NOGMWM	BR IF ZNZ	
05B0	C260	JTYP 387		411	TOMUCH	BR IF DO BIT4=0	NOT ALTER
05B2	C23F	JTYP 388	NOGMWM	394	CKMODE	BR IF DO BIT4=1	ALTER OPERATION
05B4	DD3E	JTYP 389		394	CKMODE	BR IF P1 BIT1=0	READ OPERATION
05B6	F53F	JTYP 390		394	CKMODE	BR IF G1 BIT3=1	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
05B8	3F45	JTYP 391	ORBTIN			H1=H1$K40	TAKE WM OUT
05BA	7F38	JTYP 392	STORCH			STB H1 V+1	STORE AND INCR ADDRESS
05BC	85EA	JTYP 393		419	TWR	BR	
05BE	F542	JTYP 394	CKMODE	396	RSTBTO	BR IF G1 BIT3=0	BR IF MOVE MODE
05C0	F138	JTYP 395		391	ORBTIN	BR IF G1 BIT7=0	LAST CHAR WM
05C2	1F45	JTYP 396	RSTBTO			H1=H1*-K40	PUT WM IN
05C4	85BA	JTYP 397		392	STORCH	BR	STORE CHAR
05C6	3513	JTYP 398	WORDMK			G1=G1$K01	SET LAST CHAR WORD MARK INDICATE
05C8	1F83	JTYP 399				H1=H1*-K08	CHANGE EE TO E6
05CA	9DB6	JTYP 400		467	CKRDLH	BR	
05CC	D254	JTYP 401	TWRTN	405	CKINQC	BR IF DO BIT5=0	ALT DISP SET UP
05CE	C1D2	JTYP 402		404	THRU	BR IF S4=0	CHECK ALT DISP RTN
05D0	A494	JTYP 403		INTP 014	CRTN	BR	VALID CHAR FOR CONSOLE INT SETUP
05D2	A4FE	JTYP 404	THRU	186	ADRTN	BR	YES RETURN
05D4	C153	JTYP 405	CKINQC	404	THRU	BR IF G1 BIT4=1	ALTER RTN FOR AUX OR CONTROL OP
05D6	DADE	JTYP 406		410	EXITB	BR IF TT BIT5=0	TEST FOR CANCEL
05D8	5ADF	JTYP 407				P1=TI	CK BUSS IN CHARACTER
05DA	0DAB	JTYP 408				Z=P1□K0A	
05DC	F0E1	JTYP 409		411	TOMUCH	BR IF LZ=0	WAS CANCEL
05DE	896C	JTYP 410	EXITB	313	TG	BR	NOT CANCEL GOBON
05E0	8710	JTYP 411	TOMUCH	260	SETIO	BAL	
05E2	8376	JTYP 412		480	TE	BR	
		JTYP 413	*				
		JTYP 414	*			** WRITE ROUTINE	
		JTYP 415	*				
05E4	DF6B	JTYP 416	TW	419	TWR	BR IF H1 BIT1=1	NO WORD MARK
05E6	F56A	JTYP 417		419	TWR	BR IF G1 BIT3=0	BR IF MOVE
05E8	F124	JTYP 418		381	WORD	BR IF G1 BIT7=0	BR IF LAST CHAR. NOT A WM.
05EA	1513	JTYP 419	TWR			G1=G1*-K01	RST LAST CHAR WAS WORDMARK
05EC	9D7E	JTYP 420		422	STRING	BR	
		JTYP 421	AEND				
1D7E	3F45	JTYP 422	STRING			H1=H1$K40	INSURE NO WORDMARK
1D80	CF12	JTYP 423		432	QUAD1	BR IF H1 BIT0=0	QUADRANT 1
1D82	0FFD	JTYP 424				Z=H1□KF0	AUADRANT 3
1D84	E088	JTYP 425		427	TSTLO	BR IF HZNZ	NOT NUMERIC
1D86	9DB6	JTYP 426		467	CKRDLH	BR	NUMERIC, GET OUT
1D88	F08F	JTYP 427	TSTLO	430	CHSPEC	BR IF LZ=0	TEST FOR SPECIAL CHARACTERS
1D8A	1F45	JTYP 428				H1=H1*-K40	REGAIN QUADRANT2
1D8C	9DB6	JTYP 429		467	CKRDLH	BR	
1D8E	3F73	JTYP 430	CHSPEC			H1=H1$K07	CHANGE C0,D0,E0 TO C7,D7,E7
1D90	9DB6	JTYP 431		467	CKRDLH	BR	
1D92	D216	JTYP 432	QUAD1	434	TSTBLK	BR IF DO BIT5=0	ALT DISP SET UP TEST
1D94	8370	JTYP 433	ERRS	477	ALTDYE	BR	YES,THIS QUAD IS ERROR FOR SET
1D96	C115	JTYP 434	TSTBLK	433	ERRS	BR IF G1 BIT4=1	ALTER RTN FOR AUX OR CONTROL ERR
1D98	0F4D	JTYP 435				Z=H1□K40	TEST BLANK
1D9A	C4D0	JTYP 436		447	TSTLOW	BR IF ZNZ	NOT A BLANK
1D9C	CFC9	JTYP 437		442	TESTC	BR IF TU BIT0=1	BR IF READ LATCH
1D9E	F550	JTYP 438		447	TSTLOW	BR IF G1 BIT3=0	MOVE MODE
1DA0	2FC5	JTYP 439	PICK			H1=0$KC0	
1DA2	3F63	JTYP 440				H1=H1$K06	
1DA4	9DB6	JTYP 441		467	CKRDLH	BR	
1DC8	5AEF	JTYP 442	TESTC			HO=TI	RE EXAMINE PTT CHARACTER
1DCA	CE50	JTYP 443		447	TSTLOW	BR IF HO BIT0=0	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1DCC	1EC5	JTYP 444				HO=HO*-KCO	
1DCE	C4A0	JTYP 445		439	PICK	BR IF ZNZ	
1DD0	2A75	JTYP 447	TSTLOW			TO=O$K70	BUILD AUX ADDRESS
1DD2	2F4D	JTYP 451				H1=H1+K40	RETRANSLATE TABLE FOR 1052
1DD4	5FB9	JTYP 452				T1=H1	USING MEMORY CHAR AS BIAS
1DD6	D55A	JTYP 453	SHIFT	455	NOHB	BR IF G1 BIT1=0	NO H BALL IN STATUS
1DD8	1B8B	JTYP 454				T1=T1□K08	SHIFT TABLE FOR H BALL
1DDA	5CA0	JTYP 455	NOHB			RDH P AS,T+0	READ TABLE
1DDC	FB27	JTYP 456		459	ODD	BR IF H1 BIT7=1	SELECT ODD
1DDE	5CF9	JTYP 457				H1=PO	EVEN
1DE0	9DB6	JTYP 458		467	CKRDLH	BR	DONE
1DA6	5DF9	JTYP 459	ODD			H1=P1	
1DA8	CFC1	JTYP 460		472	FUNCT	BR IF TUO=1	CHECK FUNCTION KEY IF READ
1DAA	F537	JTYP 461		467	CKRDLH	BR IF G1 BIT3=1	DONE IF LOAD MODE
1DAC	6DA9	JTYP 462				P1C=P1+TO+1	TEST FOR LINE FEED
1DAE	F0B6	JTYP 463		467	CKRDLH	BR IF LZNZ	ALL BUT 4D%5D MEMORY CHAR
1DB0	FD37	JTYP 464		467	CKRDLH	BR IF P1 BIT3=1	4D EXIT
1DB2	2F15	JTYP 465	DOLFD1			H1=O$K10	BUILD LINE FEED
1DB4	3F53	JTYP 466				H1=H1$KO5	CHARACTER
1DB6	CFBA	JTYP 467	CKRDLH	469	AROUND	BR IF TU BIT0=0	NOT READ LATCH
1DB8	85CC	JTYP 468		401	TWRTN	BR	READ RETURN
1DBA	F13F	JTYP 469	AROUND	471	NOINCR	BR IF G1 BIT7=1	WORD MARK DO NOT INCREMENT
1DBC	5224	JTYP 470				V=V+1	INCREMENT B STAR
1DBE	896C	JTYP 471	NOINCR	313	TG	BR	TEST ATT IF DISP,BUSS OUT, STORE
1DC0	5ACF	JTYP 472	FUNCT			PO=TI	LOOK AT BUSS IN CHAR
1DC2	0CDB	JTYP 473				Z=PO□KOD	CHECK FOR LINEFEED PTT
1DC4	F0B3	JTYP 474		465	DOLFD1	BR IF LZ=0	IS FUNCTION KEY DO LINEFEED
1DC6	9DB6	JTYP 475		467	CKRDLH	BR	
		JTYP 476	*			** TYPE ENDING	
0370	10C0	JTYP 477	ALTDYE			RST S K=8C	RST SO,S5,S4
0372	0F02	JTYP 478				RST TA K=10	RST ,ALT DISPLY ACTIVE
0374	0640	JTYP 479				RST BC K=04	RESET CONSOLE INTERRUPT
0376	5C92	JTYP 480	TE			RDH P DA,AA	GET STATUS
0378	3C25	JTYP 481				PO=PO$K20	SET SECONDARY BIT
037A	7C92	JTYP 482				STH P DA,AA	STORE IT BACK
037C	16F3	JTYP 483				DO=DO*-KOF	
037E	2C53	JTYP 484				PO=O$KO5	
0380	3C15	JTYP 485				PO=PO$K10	
0382	4FCF	JTYP 486				TE=PO	LINE FEED
0384	0F10	JTYP 487				RST TA K=01	RESET ATTENTION IF ON
0386	A412	JTYP 488		025	SETWRL	BR	
014E	5BE2	JTYP 489	CSALT			RDB T1 DA,BC	GARBAGE WHEN DO BIT7=0
0150	F258	JTYP 490		494	STEPOV	BR IF DO BIT7=0	OFF FOR FIRST CHAR OF ALTER BYT
0152	4EBD	JTYP 491				T1=HOL+T1H	PUT IN 2ND CHAR OF ALTER BYTE
0154	D147	JTYP 492		498	ALTAUX	BR IF G1 BIT5=1	ALTER AUX STORAGE
0156	6B28	JTYP 493				STB T1 CS,V+1	ALTER AND INCREMENT B STAR
0158	5EB3	JTYP 494	STEPOV			T1=HOXH	PUT 1ST CHAR IN FOR AUX STORE
015A	7BE2	JTYP 495				STB T1 DA,BC	STORE FIRST OR SECOND CHARACTER
015C	161B	JTYP 496				DO=DO□KO1	CHANGE STATE OF DO BIT 7
015E	896C	JTYP 497		313	TG	BR	GO BUSS CHAR OUT AND CONTINUE
0146	32F3	JTYP 498	ALTAUX			VO=VO$KOF	FORCE DONT CARE DIGIT TO F
0148	7B28	JTYP 499				STB T1 AS,V+1	STORE ALTERED BYTE
014A	81B6	JTYP 500		517	CKME	BAL	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
014C	8158	JTYP 501		494	STEPOV	BR	CONTINUE AFTER ADDRESS CHECK
124C	F253	JTYP 502	CSDIS	505	SKIPOV	BR IF DO BIT7=1	OFF INITIALLY,WHEN 2ND CHAR UNPK
124E	D145	JTYP 503		512	DISAUX	BR IF G1 BIT5=1	DISPLAY AUX STORAGE
1250	4B28	JTYP 504				RDB T1 CS,V+1	FETCH 1ST BYTE FOR UNPACK,INC B*
1252	5BB1	JTYP 505	SKIPOV			T1=T1X	
1254	5BF9	JTYP 506				H1=T1	1ST CHAR PUT IN H1 LOW FOR UNPK
1256	5FAD	JTYP 507				TO=H1L	WHEN DO BIT7=1 2ND CHAR IN H1L
1258	8118	JTYP 508		ICOM 002	UNPACK	BAL	DO THE UNPACK
125A	5AF9	JTYP 509				H1=TO	PUT IN REG FOR BUSS OUT
125C	161B	JTYP 510				DO=DO¤KO1	CHANGE STATE OF DO BIT 7 .
125E	896C	JTYP 511		313	TG	BR	BUSS OUT CHAR OR END DISP IF ATT
1244	32F3	JTYP 512	DISAUX			VO=VO$KOF	FORCE DONT CARE DIGIT TO F
1246	5B28	JTYP 513				RDB T1 AS,V+1	READ AUX BYTE FOR DISPLAY
1248	81B6	JTYP 514		517	CKME	BAL	
124A	9252	JTYP 515		505	SKIPOV	BR	CONTINUE AFTER ADDRESS CHECK
01B6	028D	JTYP 517	CKME			Z=VO¤K80	
01B8	C4BC	JTYP 518		529	RTNADR	BR IF ZNZ	ADDRESS OK
01BA	1285	JTYP 519				VO=VO*-K80	ALLOW WRAP TO 0000 AUX
01BC	12F3	JTYP 529	RTNADR			VO=VO*-KOF	
01BE	128E	JTYP 530				RTN	

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* CROSS REFERENCE FOR CSECT JTYP *
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JTYP 004	IOCM 037									
JTYP 022	JTYP 156	JTYP 259								
JTYP 025	INTP 233	JTYP 019	JTYP 251	JTYP 253	JTYP 488					
JTYP 027	INTP 012	INTP 057	ISTP 031	JTYP 024	JTYP 151	JTYP 200	JTYP 218	JTYP 315	JYPE 015	JYPE 023	JYPE 032	JYPE 037
	JYPE 046									
JTYP 051	JTYP 042	JTYP 075	JTYP 120							
JTYP 055	INRU 062									
JTYP 074	JTYP 116									
JTYP 076	JTYP 074									
JTYP 080	JTYP 077									
JTYP 081	JTYP 079									
JTYP 085	JTYP 072									
JTYP 087	JTYP 057									
JTYP 097	JTYP 094									
JTYP 102	JTYP 097									
JTYP 104	JTYP 102									
JTYP 109	JTYP 106									
JTYP 110	JTYP 108									
JTYP 113	JTYP 111									
JTYP 114	JTYP 088									
JTYP 119	JTYP 117									
JTYP 121	JTYP 114	JTYP 115								
JTYP 122	JTYP 123									
JTYP 123	JTYP 121									
JTYP 127	JTYP 125									
JTYP 128	JTYP 124									
JTYP 129	JTYP 058	JTYP 119								
JTYP 135	JTYP 129	JTYP 130								
JTYP 136	JTYP 092									
JTYP 142	JTYP 118									

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                          * CROSS REFERENCE FOR CSECT JTYP *
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JTYP 152      JTYP 128
JTYP 155      JTYP 153
JTYP 157      JTYP 155
JTYP 169      JTYP 159
JTYP 172      JTYP 170
JTYP 174      JTYP 160
JTYP 178      JTYP 152    JTYP 161   JTYP 165   JTYP 169   JTYP 171   JTYP 183
JTYP 179      JTYP 177
JTYP 182      JTYP 175
JTYP 184      JTYP 179
JTYP 186      JTYP 404
JTYP 193      JTYP 191
JTYP 198      JTYP 168    JTYP 195
JTYP 199      JTYP 197
JTYP 201      JTYP 194
JTYP 204      JTYP 187    JTYP 201   JTYP 202
JTYP 205      JTYP 193
JTYP 209      JTYP 207
JTYP 215      JTYP 237    JTYP 240   JTYP 242
JTYP 219      JTYP 210
JTYP 231      JTYP 221
JTYP 235      JTYP 211
JTYP 237      JTYP 223    JTYP 231   JTYP 233
JTYP 238      JTYP 212
JTYP 241      JTYP 214
JTYP 243      JTYP 154
JTYP 245      JTYP 243
JTYP 247      JTYP 217
JTYP 251      JTYP 258
JTYP 252      JTYP 249
JTYP 254      JTYP 244
JTYP 260      JTYP 286    JTYP 291   JTYP 304   JTYP 378   JTYP 411
JTYP 265      JTYP 122
JTYP 268      JTYP 266
JTYP 271      JTYP 272
JTYP 272      JTYP 270
JTYP 275      JTYP 265
JTYP 278      JTYP 276
JTYP 283      JTYP 281
JTYP 285      JTYP 290
JTYP 286      JTYP 280
JTYP 291      JTYP 295
JTYP 295      JTYP 277    JTYP 288
JTYP 296      JTYP 292
JTYP 298      JTYP 296
JTYP 300      JTYP 298
JTYP 303      JTYP 301
JTYP 307      JTYP 302
JTYP 311      JTYP 307
JTYP 313      JTYP 410    JTYP 471   JTYP 497   JTYP 511
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* CROSS REFERENCE FOR CSECT JTYP *
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JTYP 314      JTYP 305   JTYP 316
JTYP 316      JTYP 313
JTYP 322      JTYP 126
JTYP 323      JTYP 173   JTYP 181   JTYP 185   JTYP 246   JTYP 297   JTYP 299
JTYP 331      JTYP 328
JTYP 335      JTYP 332
JTYP 340      JTYP 337
JTYP 343      JTYP 340
JTYP 344      JTYP 342
JTYP 346      JTYP 326
JTYP 357      JTYP 325   JTYP 330   JTYP 334   JTYP 335   JTYP 339   JTYP 345   JTYP 347   JTYP 349
JTYP 362      JTYP 353   JTYP 355
JTYP 366      JTYP 370
JTYP 367      JTYP 365
JTYP 369      JTYP 374   JTYP 376
JTYP 372      JTYP 367
JTYP 378      JTYP 343   JTYP 366
JTYP 381      JTYP 418
JTYP 382      JTYP 368   JTYP 371   JTYP 372   JTYP 377
JTYP 384      JTYP 293   JTYP 306   JTYP 310   JTYP 380
JTYP 388      JTYP 386
JTYP 391      JTYP 395
JTYP 392      JTYP 397
JTYP 394      JTYP 388   JTYP 389   JTYP 390
JTYP 396      JTYP 394
JTYP 398      JTYP 383
JTYP 401      JTYP 468
JTYP 404      JTYP 402   JTYP 405
JTYP 405      JTYP 401
JTYP 410      JTYP 406
JTYP 411      JTYP 387   JTYP 409
JTYP 416      JTYP 271
JTYP 419      JTYP 362   JTYP 363   JTYP 393   JTYP 416   JTYP 417
JTYP 422      JTYP 420
JTYP 427      JTYP 425
JTYP 430      JTYP 427
JTYP 432      JTYP 423
JTYP 433      JTYP 434
JTYP 434      JTYP 432
JTYP 439      JTYP 445
JTYP 442      JTYP 437
JTYP 447      JTYP 436   JTYP 438   JTYP 443
JTYP 455      JTYP 453
JTYP 459      JTYP 456
JTYP 465      JTYP 474
JTYP 467      JTYP 400   JTYP 426   JTYP 429   JTYP 431   JTYP 441   JTYP 458   JTYP 461   JTYP 463   JTYP 464   JTYP 475
JTYP 469      JTYP 467
JTYP 471      JTYP 469
JTYP 472      JTYP 460
JTYP 477      INTP 040   JTYP 178   JTYP 192   JTYP 203   JTYP 230   JTYP 234   JTYP 433
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                                  * CROSS REFERENCE FOR CSECT JTYP *
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JTYP 480      JTYP 127  JTYP 274  JTYP 282  JTYP 285  JTYP 318  JTYP 412
JTYP 489      JTYP 208
JTYP 494      JTYP 490  JTYP 501
JTYP 498      JTYP 492
JTYP 502      JTYP 267
JTYP 505      JTYP 502  JTYP 515
JTYP 512      JTYP 503
JTYP 517      JTYP 500  JTYP 514
JTYP 529      JTYP 518
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JYPE   DESCRIPTIVE   TEXT

ENTRY POINT

LABEL
THIS IS THE EXCLUSIVE ENTRY FROM THE REQUEST HANDLING ROUTINE FOR HANDLING LOGOUT MESSAGES.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		JYPE 001	T			** 1400 TYPE DISPLAY MESSAGES R.TAYLOR	
		JYPE 002	*			** THIS ROUTINE TAKES THE UNPACKED HALFWORD(S) AND TYPES OUT	
		JYPE 003	*			H1 BIT7 TELLS IF IF FIRST OR SECOND HALF OF BYTE, S4 CONTROLS	
		JYPE 004	*			FIRST OR SECOND BYTE S5 TELLS ROUTINE TO UNPACK ANOTHER BYTE	
		JYPE 005	*			P1 USED TO PROVIDE SPACE BETWEEN TYPED HALF WORDS P0 ALSO	
		JYPE 006	*			SERVES AS LINE FEED CHARACTER AFTER EACH CONVERT AND UNPACK	
		JYPE 007	*			UPON ENTRY 1052 MODE IS ESTABLISHED CPU REGISTERS RESTORE	
1F7C	5E08	JYPE 008	LABEL			RDH H AS,U+2	RESTORE H REG
1F7E	5032	JYPE 009				RDH U DA,8E	RESTORE A STAR
1F80	F827	JYPE 010		024	CKEND	BR IF P0 BIT7=1	OFF TIL ENDING SEQUENCE
1F82	D1A3	JYPE 011		057	CKUNPK	BR IF S5=1	TEST FOR ANOTHER UNPACK
1F84	FB0D	JYPE 012		016	SECOND	BR IF H1 BIT7=1	
1F86	4FAF	JYPE 013	FIRST			TE=T0	BUSS OUT 1ST
1F88	1F1B	JYPE 014	TEST			H1=H1□K01	TURN H1 BIT7 ON FOR 2ND CHAR
1F8A	A416	JYPE 015		JTYP 027	STORE	BR	OFF AFTER SECOND
1F8C	4FBF	JYPE 016	SECOND			TE=T1	BUSS SECOND
1F8E	C596	JYPE 017		021	EXIT	BR IF S0=0	FIRST TIME THRU S0=1
1F90	4A46	JYPE 018				T=G	MOVE NEXT BYTE IN
1F92	1000	JYPE 019				RST S0	LAST BYTE OF PRESENT UNPACK
1F94	9F88	JYPE 020		014	TEST	BR	
1F96	C19D	JYPE 021	EXIT	035	MORE	BR IF S4=1	GO ON EXCEPT INSTRUCTION STEP
1F98	1C1B	JYPE 022				P0=P0□K01	ALLOW CKEND NEXT TIME SET 15
1F9A	A416	JYPE 023		JTYP 027	STORE	BR	
1FA6	C1CD	JYPE 024	CKEND	038	SPACE	BR IF S4=1	MORE COMING NEED SPACE
1FA8	5A92	JYPE 025				RDH T DA,AA	SEC BIT
1FAA	3A25	JYPE 026				T0=T0$K20	SET ON
1FAC	1A83	JYPE 027				T0=T0*-K08	
1FAE	7A92	JYPE 028				STH T DA,AA	STORE NEW STATUS
1FB0	D235	JYPE 029		031	LINEFD	BR IF D0 BIT5=1	SETIC INSTRUCT STEP WANTS S4 OFF
1FB2	2C80	JYPE 030				SET S4	
1FB4	4FCF	JYPE 031	LINEFD			TE=P0	GIVE LINE FEED
1FB6	A416	JYPE 032		JTYP 027	STORE	BR	NEXT TIME IS DEVICE END SEC ON
		JYPE 033	*				S6 IS RESET , RTN IS TO SOFT STP
		JYPE 034	*				LOOP AWAITING START KEY EXIT
1F9C	2D45	JYPE 035	MORE			P1=0$K40	BUILD SPACE
1F9E	1C1B	JYPE 036				P0=P0□K01	MAKE P0 ODD
1FA0	A416	JYPE 037		JTYP 027	STORE	BR	
1FCC	4FDF	JYPE 038	SPACE			TE=P1	ISSUE SPACE
1FCE	1C1B	JYPE 039				P0=P0□K01	MAKE P0 EVEN

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1FD0	3400	JYPE 040				SET MODE K=80	SET CPU MODE
1FD2	CBB8	JYPE 041		047	GETAUX	BR IF BB BIT4=0	NOT SET IC
1FD4	1602	JYPE 042				RST BC K=90	SET SOFT STOP ,SETIC LATCH RESET
1FD6	0080	JYPE 043				RST S4	SET IC RST S4
1FD8	4E86	JYPE 044				H=I	
1FDA	3040	JYPE 045	NEXT			SET S K=84	SET S0,S5
1FDC	A416	JYPE 046		JTYP 027	STORE	BR	
1FB8	F247	JYPE 047	GETAUX	051	ASTAR	BR IF DO BIT7=1	PUT A STAR DISPLAY IN H
1FBA	E241	JYPE 048		054	BSTAR	BR IF DO BIT6=1	PUT B STAR DISPLAY IN H
1FBC	5EF2	JYPE 049				RDH H DA,BE	PUT CODED STOP IN H
1FBE	97F6	JYPE 050		059	CHECK	BR	CK TERMINATION
1FC6	5E42	JYPE 051	ASTAR			RDH H DA,98	READ A STAR DISPLAY
1FC8	1613	JYPE 052				DO=DO*-KO1	RST STAT SET IN DISPLAY ROUT
1FCA	9FDA	JYPE 053		045	NEXT	BR	GO DO IT
1FC0	5E52	JYPE 054	BSTAR			RDH H DA,9A	GET B STAR DISPLAY
1FC2	1623	JYPE 055				DO=DO*-KO2	RST STAT
1FC4	9FDA	JYPE 056		045	NEXT	BR	GO DO IT
1FA2	0040	JYPE 057	CKUNPK			RST S5	RESET S5 AFTER FLAG TO UNPACK
1FA4	ABD8	JYPE 058		ISTP 012	TYPEAG	BR	GO UNPACK
17F6	0080	JYPE 059	CHECK			RST S4	RST S4 THIS IS LAST UNPACK
17F8	0F11	JYPE 060				Z=H1+KO1	TEST
17FA	F0FF	JYPE 061		063	NTSOFT	BR IF LZ=0	REMOTE RESTART CAPABILITY
17FC	1600	JYPE 062	SOFT			RST BC K=80	SET SOFT STOP IF NOT REMOTE RST
17FE	9FDA	JYPE 063	NTSOFT	045	NEXT	BR	

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*********************************
* CROSS REFERENCE FOR CSECT JYPE *
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JYPE 008	JTYP 073		
JYPE 014	JYPE 020		
JYPE 016	JYPE 012		
JYPE 021	JYPE 017		
JYPE 024	JYPE 010		
JYPE 031	JYPE 029		
JYPE 035	JYPE 021		
JYPE 038	JYPE 024		
JYPE 045	JYPE 053	JYPE 056	JYPE 063
JYPE 047	JYPE 041		
JYPE 051	JYPE 047		
JYPE 054	JYPE 048		
JYPE 057	JYPE 011		
JYPE 059	JYPE 050		
JYPE 063	JYPE 061		

KAAA   DESCRIPTIVE   TEXT

START FILE ROUTINE

ENTRY POINTS

SRTFIL   MOTSEK

    THIS IS THE INITIAL ENTRY POINT.   ALL DISK OPER-   THIS PORTION IS USED BY ALL SEEKS   REGULAR, ALT-
    ATIONS ENTER HERE FROM IOCM.   ERNATE, AND DEFECTIVE TRACK.   ENTRY IS FROM KBBE,
                                               KAAQ, OR KBBG.

BBBTWO

    ENTRY AT THIS POINT IS FROM THE KBBB ROUTINE   HDSLCT
    DURING WRITE WITH ADDRESS.   THE DCF IS DECODED TO
    A BINARY VALUE IN THIS PORTION OF THE ROUTINE.   ENTRY AT THIS POINT IS FROM KBBG TO PERFORM HEAD
                                              SELECT DURING ALTERNATE TRACK ENDING.   ENTRY IS
                                              FROM KAAH DURING MULTI TRACK HEAD SWITCHING.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		KAAA 001	T			KAAA START FILE	R.HUTCHINSON
		KAAA 002	*			**	
		KAAA 003	*				
		KAAA 004	*			*START 14XX FILE OPERATION ENTRY FROM I CYCLES	
		KAAA 005	*			*VREG=BBB U1=OP D1=R/W DO BIT7= MOVE	
		KAAA 006	*				
		KAAA 007	*			THE FOLLOWING LIST REPRESENTS THE K ADDRESSABLE	
		KAAA 008	*			LOCATION USED DURING 14XX DISK OPERATION	
		KAAA 009	*			K1 TEMPORARY I REG STORAGE	
		KAAA 010	*			K2 TEMPORARY D REG STORAGE	
		KAAA 011	*			K3 COUNT FIELD ADDRESS MAIN STORAGE	
		KAAA 012	*			K4 FILE DATA FIELD ADDRESS	
		KAAA 013	*			K5 ZONE XFER INFORMATION & ADDRESS OF SELECTED 2311	
		KAAA 014	*			K8 FILE SET BRANCH CONDITIONS	
		KAAA 015	*			KB PREVIOUS FILE OP & FILE SET BRANCH CONDITIONS	
		KAAA 016	*			KE PRESENT FILE MODULE VALUE & 2311 CYL VALUE	
		KAAA 017	*			KF WORD COUNT FOR DATA XFER	
		KAAA 018	*				
		KAAA 019	*			**	
19EC	7622	KAAA 020	SRTFIL			STH D DA,8C	BACK UP K2
19EE	7812	KAAA 021				STH I DA,8A	BACK UP K1
19F0	5C02	KAAA 022				RDH P DA,88	READ BIAS CONSTANT K0
19F2	3C0D	KAAA 023				P0=P0-K00	BUILD STORAGE ADDRESS
19F4	2DC7	KAAA 024				P1=0	
19F6	7D52	KAAA 025				STB P1 DA,9A	CLEAR MARK AREA
19F8	7C32	KAAA 026				STH P DA,8E	STORE COUNT ADDRESS FIELD K3
19FA	6C24	KAAA 027				P=V+2	MAKE P = BBB+2
19FC	2053	KAAA 028				U0=0$K05	SET COUNT = 5
19FE	2E45	KAAA 029				H0=0$K40	BUILD CM-6 BLANK
1A00	5FD8	KAAA 030	READBT			RDB H1 P+1	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1A02	3F45	KAAA 031				H1=H1$K40	DESTROY WORD MARK
1A04	6FE1	KAAA 032				H1=H1□H0	COMPARE
1A06	C48C	KAAA 033		036	VALID	BR IF ZNZ	BR IF CHAR NOT BLANK
1A08	4026	KAAA 034				U=V	MAKE A STAR VALID
1A0A	A70A	KAAA 035		KAAQ 009	XERROR	BR	BR TO SET NO ADDR COMPARE
1A0C	300D	KAAA 036	VALID			U0=U0-K00	DEC COUNT
1A0E	C480	KAAA 037		030	READBT	BR IF ZNZ	
1A10	2407	KAAA 038				G0=0	SET AUX 00
1A12	25A5	KAAA 039				G1=0$KA0	SET A
1A14	3513	KAAA 040				G1=G1$K01	SET 1
1A16	5F40	KAAA 041				RDB H1 AS,G	GET MOD PROT AND COMP DIS.
1A18	5FE9	KAAA 042				H0=H1	
1A1A	5530	KAAA 043				RDB G1 V	READ BBB * POSITION
1A1C	6224	KAAA 044				V=V+2	UPDATE V TO BBB+2
1A1E	7242	KAAA 045				STH V DA,98	STORE V K4
1A20	E525	KAAA 046		048	AUXADR	BR IF G1 BIT2=1	BR IF NOT *
1A22	5530	KAAA 047				RDB G1 V	READ MOD SELECT BBB+2
1A24	1513	KAAA 048	AUXADR			G1=G1*-K01	STRIP ODD BIT
1A26	555D	KAAA 049				G1=G1L	THROW AWAY HI ORDER
1A28	35A5	KAAA 050				G1=G1$KA0	BUILD ROW A
1A2A	C12E	KAAA 051		053	DOITT	BR IF G1 BIT4=0	1400 MODULE IN ROW A LOOKUP
1A2C	25EB	KAAA 052				G1=G1+K0E	IN ROW B FOR 1400 MODULE 8
1A2E	5C40	KAAA 053	DOITT			RDH P AS,G	14XXMODULEPOL,NPL SELECT P1H
1A30	2455	KAAA 054				G0=0$K50	RESTORE MOD 5 FOR AUX ADDR
1A32	5D55	KAAA 055				G1=P1XL	
1A34	C4BD	KAAA 056		060	STOP60	BR IF Z=0	MODULE MISMATCH
1A36	35B5	KAAA 057				G1=G1$KB0	
1A38	5F40	KAAA 058				RDB H1 AS,G	TLU-50BX
1A3A	EF40	KAAA 059		061	DOITTO	BR IF H1 BIT2=0	CK FOR MORE THAN 1 MOD SEL
1A3C	9CEA	KAAA 060	STOP60	KEND 002	STOP60	BR	MODULE MISMATCH
1A40	FA4F	KAAA 061	DOITTO	068	OPGREG	BR IF H0 BIT7=1	BR IF NO OVFLO PROTECT
1A42	5530	KAAA 062				RDB G1 V	READ ACTUAL MODULE VALUE BBB+2
1A44	555D	KAAA 063				G1=G1L	
1A46	1513	KAAA 064				G1=G1*-K01	STRIP BIT 7
1A48	7C51	KAAA 065				P0=P0-G1+1	COMPARE EXPECTED AND ACTUAL
1A4A	C4CF	KAAA 066		068	OPGREG	BR IF Z=0	CHECK FOR MOD MISMATCH
1A4C	2C85	KAAA 067				P0=0$K80	SET MISMATCH MARK
1A4E	515D	KAAA 068	OPGREG			G1=U1L	14XXOP TO G1 LOW
1A50	4026	KAAA 069				U=V	MAKE A STAR VALID
1A52	253D	KAAA 070				G1=G1+K30	SET ROW 3
1A54	5F40	KAAA 071				RDB H1 AS,G	TABLE OP TO H1
		KAAA 072	*			**	
		KAAA 073	*				
		KAAA 074	*			THE FOLLOWING LIST REPRESENTS THE BIT	
		KAAA 075	*			SIGNIFICANCE OF THE H REGISTER	
		KAAA 076	*			H1-0 SEEK H1-6 SECTOR OVERLAY	
		KAAA 077	*			H1-1 SCAN H1-7 READ BACK CHECK	
		KAAA 078	*			H1-2 HIGH H0-3 READ	
		KAAA 079	*			H1-3 EQUAL H0-5 MOVE	
		KAAA 080	*			H1-4 TRACK H0-6 RECALIBRATE	
		KAAA 081	*			H1-5 ADDR OP H0-7 COMPARE DISABLE	
		KAAA 082	*				
		KAAA 083	*			**	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1A56	CC3E	KAAA 084		087	CONTIN	BR IF P0 BIT0=0	BR IF NO MISMATCH
1A58	CF3F	KAAA 085		087	CONTIN	BR IF H1 BIT0=1	CHECK SEEK OP
1A5A	9CEA	KAAA 086		KEND 002	STOP60	BR	MISMATCH NOT SEEK - STOP
1A3E	9338	KAAA 087	CONTIN	088	BREAK	BR	
1338	EA2C	KAAA 088	BREAK	091	OPHREG	BR IF H0 BIT6=0	BR IF COMP DISABLE OFF
133A	2E13	KAAA 089				H0=0$K01	SET COMP DISABLE MARK
133C	932E	KAAA 090		092	DISABL	BR	
132C	2EC7	KAAA 091	OPHREG			H0=0	
132E	F332	KAAA 092	DISABL	094	WRITE	BR IF D1 BIT7=0	BR IF OP IS WRITE
1330	3E15	KAAA 093				H0=H0$K10	SET H0 BIT3=READ
1332	F236	KAAA 094	WRITE	096	STMODE	BR IF D0 BIT7=0	BR IF LOAD
1334	3E43	KAAA 095				H0=H0$K04	SET H0 BIT5=MOVE
1336	87EC	KAAA 096	STMODE	097	SETMO	BR	
07EC	3480	KAAA 097	SETMO			SET MODE K=88	CPU ZONE FILE MODE
07EE	F5EF	KAAA 098	CUBUSY	098	CUBUSY	BR IF DASI BIT3=1	BR IF CUB ERASING
07F0	5ECF	KAAA 099				P0=DS	
07F2	C4E9	KAAA 100		103	RESET	BR IF Z=0	BR IF UNSELECTED FILE STATUS=0
07F4	A5D0	KAAA 101	NOTRDY	KAAN 029	ERROR	BAL	GO STORE REGS
07F6	8390	KAAA 102		KAAQ 015	NOTRDY	BR	GO SET NOT READY
07E8	4ECF	KAAA 103	RESET			FB0=P0	RESET FILE BUSS
07EA	8468	KAAA 104		338	CCTEST	BR	GO TEST CC HARDWARE
07B4	49DF	KAAA 105	SLECT			MS=P1	SELECT FILE
07B6	56B2	KAAA 106				RDH D DA,AE	READ PREVIOUS OP TO D KB
07B8	7C52	KAAA 107				STH P DA,9A	STORE NPL MODULE SELECT K5
07BA	EEF5	KAAA 108		101	NOTRDY	BR IF DS BIT2=1	BR IF UNSAFE
07BC	DEF4	KAAA 109		101	NOTRDY	BR IF DS BIT1=0	BR IF NOT ON LINE
07BE	FAF5	KAAA 110		101	NOTRDY	BR IF DS BIT7=1	BR IF SEEK INCOMPLETE
07C0	CEE0	KAAA 111		KAAQ 019	BUSY	BR IF DS BIT0=0	BR IF NOT READY TO BUSY EXIT
07C2	8BF0	KAAA 112		KBBG 027	ATTEN	BAL	GO RESET ATTEN
		KAAA 113	*			***	
		KAAA 114	*				
		KAAA 115	*			THE FOLLOWING LIST REPRESENTS THE FILE SET	
		KAAA 116	*			BRANCH CONDITIONS LOCATED IN KB ODD BYTE	
		KAAA 117	*			BIT 0 RBC INTL,K BIT 4 W WLR	
		KAAA 118	*			BIT 1 RECAL SEQ BIT 5 Y ANY ERROR	
		KAAA 119	*			BIT 2 X UNEQUAL COMP BIT 6 V VALIDITY	
		KAAA 120	*			BIT 3 BUSY BIT 7 N NOT READY	
		KAAA 121	*				
		KAAA 122	*			***	
07C4	E754	KAAA 123		131	CKSEQ	BR IF D1 BIT2=0	BR IF NOT X ERROR
07C6	0753	KAAA 124				Z=D1*-K05	
07C8	F0D6	KAAA 125		132	NOSAVE	BR IF LZNZ	X ERROR CK VAL-WLR
07CA	CF58	KAAA 126		133	SAVE	BR IF H1 BIT0=0	BR IF NOT SEEK
07CC	174D	KAAA 127				D1=D1¤K40	SEEK OP INVERT SEQ BIT
07CE	D759	KAAA 128		133	SAVE	BR IF D1 BIT1=1	BR IF 1ST OF SEQ
07D0	3E23	KAAA 129				H0=H0$K02	SET RECAL MARK
07D2	87D8	KAAA 130		133	SAVE	BR	
07D4	C659	KAAA 131	CKSEQ	133	SAVE	BR IF D0 BIT0=1	BR IF PREV OP WAS SEEK
07D6	1745	KAAA 132	NOSAVE			D1=D1*-K40	CLEAR SEQ BIT
07D8	1685	KAAA 133	SAVE			D0=D0*-K80	CLEAR SEEK FROM PREV OP
07DA	FB79	KAAA 134		137	OPRRBC	BR IF H1 BIT7=1	BR IF RBC OP
07DC	C778	KAAA 135		137	OPRRBC	BR IF D1 BIT0=0	CHECK RBC INTL,K
07DE	9F6C	KAAA 136		KEND 010	STOP10	BR	BR TO STOP IF RBC INTL*K ON

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
07F8	17B5	KAAA 137	OPRRBC			D1=D1*-K80	CLR INTL'K & ERROR CODES
07FA	577B	KAAA 138				D1=D1H	
07FC	2E08	KAAA 139				SET FIB K=40	RST FLAG REG
07FE	9E48	KAAA 140		141	MAINSR	BR	
1E48	CF4E	KAAA 141	MAINSR	144	PROCEE	BR IF H1 BIT0=0	BR IF NOT SEEK
1E4A	3685	KAAA 142				DO=DO$K80	SET SEEK TEMP IN PREV OP
1E4C	9E02	KAAA 143		151	PREVOP	BR	
1E4E	FB01	KAAA 144	PROCEE	150	RBC	BR IF H1 BIT7=1	BR IF RBC
1E50	5F69	KAAA 145				DO=H1	MOVE THIS OP TO PREVIOUS OP
1E52	FE03	KAAA 146		151	PREVOP	BR IF HO BIT3=1	BR IF OP IS READ
1E54	DF03	KAAA 147		151	PREVOP	BR IF H1 BIT1=1	BR IF OP IS SCAN
1E56	3785	KAAA 148				D1=D1$K80	OP IS WRITE SET RBC INTL'K
1E58	9E02	KAAA 149		151	PREVOP	BR	
1E00	6F65	KAAA 150	RBC			H1=H1$DO	RBC MOVE PREVIOUS OP TO H1
1E02	76B2	KAAA 151	PREVOP			STH D DA,AE	STORE PREVIOUS OP & ERROR KB
1E04	25C7	KAAA 152				G1=0	
		KAAA 153	*			**	
		KAAA 154	*				
		KAAA 155	*			WRT ADR OP ENTERS HERE FOR CM6 TO BINARY DECODE	
		KAAA 156	*				
		KAAA 157	*			**	
1E06	3400	KAAA 158	BBBTWO			SET MODE K=80	CPU ZONE CPU MODE
1E08	5738	KAAA 159				RDB D1 V+1	READ DISK CTRL FLD HUNDS
1E0A	5769	KAAA 160				DO=D1	MOVE HUNDS TO WORK
1E0C	5738	KAAA 161				RDB D1 V+1	READ DISK CTRL FLD TENS
1E0E	58E2	KAAA 162				RDH I DA,BC	
1E10	568D	KAAA 163				IO=DOL	MOVE MODULE VALUE TO IO
1E12	1813	KAAA 164				IO=IO*-K01	REMOVE ODD CYLINDER
1E14	78E2	KAAA 165				STH I DA,BC	SAVE MODULE FOR ADR RESTORE KE
1E16	10EE	KAAA 166	SETDCF			RST S K=FE	RESET S REG
1E18	F31E	KAAA 167		170	CKHUND	BR IF D1 BIT7=0	CHK TENS FOR ODD UNITS
1E1A	2040	KAAA 168				SET S5	UNITS ONE INDICATOR
1E1C	1713	KAAA 169				D1=D1*-K01	CLR ODD UNITS
1E1E	F222	KAAA 170	CKHUND	172	AUXTLU	BR IF DO BIT7=0	CHK HUNDS LESS THAN 50
1E20	3713	KAAA 171				D1=D1$K01	ADD 50
1E22	2655	KAAA 172	AUXTLU			DO=0$K50	SET AUX STORAGE 5
1E24	577D	KAAA 173				D1=D1L	TENS CHAR FOR TLU
1E26	272D	KAAA 174				D1=D1+K20	SET ROW TWO
1E28	5960	KAAA 175				RDB I1 AS,D	READ CYL TENS
1E2A	5D38	KAAA 176				RDB P1 V+1	READ UNITS BBB+4
1E2C	5D89	KAAA 177				IO=P1	SAVE UNITS CHAR FOR SEEK
1E2E	F934	KAAA 178		181	TENEVN	BR IF P1 BIT7=0	BR IF UNITS EVEN
1E30	2020	KAAA 179				SET S6	HEAD ONE INDICATOR
1E32	1D13	KAAA 180				P1=P1*-K01	CLR ODD UNITS
1E34	D1BA	KAAA 181	TENEVN	184	UNTLU	BR IF S5=0	BR IF TENS EVEN
1E36	3D13	KAAA 182				P1=P1$K01	MAKE UNITS ODD
1E38	0040	KAAA 183				RST S5	
1E3A	5D7D	KAAA 184	UNTLU			D1=P1L	UNITS CHAR FOR TLU
1E3C	3775	KAAA 185				D1=D1$K70	UNITS CHAR FOR TLU
1E3E	5B60	KAAA 186				RDB T1 AS,D	READ UNITS TABLE
1E40	69B9	KAAA 187				I1C=I1+T1+1	ADD BIN TENS &UNITS CYL + 1
1E42	5D38	KAAA 188				RDB P1 V+1	READ HEAD BBB+5
1E44	CF5A	KAAA 189		196	NOTSEK	BR IF H1 BIT0=0	BR IF NOT SEEK

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		KAAA 190	*			**	
		KAAA 191	*				
		KAAA 192	*			SEEK OP EXITS HERE. BINARY CYL IN I1 REG. SEEK TYPE NOT DECODED	
		KAAA 193	*				
		KAAA 194	*			**	
1E46	A43E	KAAA 195		KBBE 008	SKCHK	BR	BR IF OP IS SEEK SEEK ADR IN I1
1E5A	5A32	KAAA 196	NOTSEK			RDH T DA,8E	READ COUNT FIELD ADR K3
1E5C	2807	KAAA 197				I0=0	
1E5E	78B8	KAAA 198				STH I T+2	STORE BIN CC 1 THRU 100
1E60	993E	KAAA 199		200	MNSTAM	BR	
193E	F944	KAAA 200	MNSTAM	203	CKHDOD	BR IF P1 BIT7=0	BR IF HEAD EVEN
1940	2040	KAAA 201				SET S5	RECORD TEN INDICATOR
1942	1D13	KAAA 202				P1=P1*-K01	CLR ODD HEAD
1944	E1C8	KAAA 203	CKHDOD	205	MOVEHD	BR IF S6=0	BR IF UNITS EVEN
1946	3D13	KAAA 204				P1=P1$K01	ODD HEAD
1948	5D7D	KAAA 205	MOVEHD			D1=P1L	HEAD FOR TLU
194A	3775	KAAA 206				D1=D1$K70	UNITS CHAR FOR TLU
194C	5960	KAAA 207				RDB I1 AS,D	READ HEAD TABLE
194E	78B8	KAAA 208				STH I T+2	STORE BIN HH 0 THRU 9
1950	5D38	KAAA 209				RDB P1 V+1	READ RECORD BBB+6
1952	5DDD	KAAA 210				P1=P1L	
1954	D1D8	KAAA 211		213	RCORD1	BR IF S5=0	BR IF ODD HEAD
1956	2DAB	KAAA 212				P1=P1+K0A	ADD TEN
1958	2D1B	KAAA 213	RCORD1			P1=P1+K01	ADD ONE
195A	7DB8	KAAA 214				STB P1 T+1	STORE BIN RECORD 1 THRU 20
195C	E500	KAAA 215		236	WRTADR	BR IF G1 BIT2=0	BR IF NOT ADR OP
		KAAA 216	*			**	
		KAAA 217	*				
		KAAA 218	*			WRT ADR OP EXIT. BINARY ADR STORED IN MAIN STORAGE COUNT FIELD	
		KAAA 219	*				
		KAAA 220	*			**	
195E	9D6A	KAAA 221		KAAF 048	WRCLCO	BR	BR IF ADR OP TO CLOCK COUNT XFER
		KAAA 222	*			**	
		KAAA 223	*				
		KAAA 224	*			THE FOLLOWING LIST REPRESENTS THE BIT	
		KAAA 225	*			SIGNIFICANCE OF THE G REGISTER	
		KAAA 226	*			G0-0 1ST SEARCH G1-0 ALTER TRK RETURN	
		KAAA 227	*			G0-1 1ST XFER G1-1 DCF DONE	
		KAAA 228	*			G0-2 XFER G1-2 ADDR OP	
		KAAA 229	*			G0-3 SCAN G1-3 READ	
		KAAA 230	*			G0-4 RBC G1-4 SECTOR 000	
		KAAA 231	*			G0-5 RO G1-5 MOVE MODE	
		KAAA 232	*			G0-6 LO G1-6 RECALIBRATE	
		KAAA 233	*			G0-7 EQ G1-7 2ND SEARCH	
		KAAA 234	*				
		KAAA 235	*			**	
1900	2485	KAAA 236	WRTADR			G0=0$K80	SET 1ST SEARCH
1902	5E59	KAAA 237				G1=H0	SET G1 BIT3 IF READ BITS IF MOVE
1904	4026	KAAA 238				U=V	U=BBB+7
1906	EB1F	KAAA 239		251	CNTADR	BR IF H1 BIT6=1	BR IF SECTOR OVERLAY
1908	DF14	KAAA 240		246	BBBATE	BR IF H1 BIT1=0	BR IF NOT SCAN
190A	3415	KAAA 241				G0=G0$K10	SET G0 BIT3 IF SCAN
190C	EF15	KAAA 242		246	BBBATE	BR IF H1 BIT2=1	BR IF HIGH

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
190E	3413	KAAA 243				GO=GO$KO1	SET GO BIT7 EQUAL
1910	FF15	KAAA 244		246	BBBATE	BR IF H1 BIT3=1	BR IF EQUAL
1912	143B	KAAA 245				GO=GO¤KO3	SET GO BIT6 LOW CLR BIT7 EQUAL
1914	5224	KAAA 246	BBBATE			V=V+1	V=BBB+8
1916	6224	KAAA 247				V=V+2	V=BBB+10
1918	DB1E	KAAA 248		251	CNTADR	BR IF H1 BIT5=0	BR IF NOT ADR OP
191A	3525	KAAA 249				G1=G1$K20	SET G1 BIT2= ADR OP
191C	FA21	KAAA 250		252	KEY	BR IF HO BIT7=1	BR IF COMP DISABLE ON
191E	1513	KAAA 251	CNTADR			G1=G1*-KO1	CLEAR 2ND SCH
1920	27C7	KAAA 252	KEY			D1=0	
1922	77B8	KAAA 253				STB D1 T+1	ZERO KL POS
1924	26C7	KAAA 254				DO=0	ZERO HIGH DL
1926	2725	KAAA 255				D1=0$K20	BUILD LOW DL
1928	CB2E	KAAA 256		259	DALLOW	BR IF H1 BIT4=0	BR IF SECTOR MODE
192A	26B3	KAAA 257				DO=0$KOB	DO=2816
192C	274D	KAAA 258				D1=D1+K40	D1=96
192E	274F	KAAA 259	DALLOW			D1=D1+K44	D1=164 TRACK 100 SECTOR
1930	76BA	KAAA 260				STH D T-2	STORE DATA LENGTH IN DLDL
1932	D163	KAAA 261		268	WRDCNT	BR IF G1 BIT5=1	BR IF MOVE COUNT CORRECT
1934	CB60	KAAA 262		267	NOTTRK	BR IF H1 BIT4=0	BR IF NOT TRACK
1936	26A3	KAAA 263				DO=0$KOA	DO=2560
1938	2775	KAAA 264				D1=0$K70	D1=112
193A	27AB	KAAA 265				D1=D1+KOA	D1=122 LOAD TRK WORD CNT= 2682
193C	9962	KAAA 266		268	WRDCNT	BR	
1960	379B	KAAA 267	NOTTRK			D1=D1-K09	D1=5A LOAD SECTOR WORD CNT= 90
1962	76F2	KAAA 268	WRDCNT			STH D DA,BE	STORE IN COUNT LOCATION KF
1964	FB68	KAAA 269		271	HEDPOS	BR IF H1 BIT7=0	BR IF NOT RBC
1966	3483	KAAA 270				GO=GO$KO8	SET GO BIT4=RBC
1968	6AA6	KAAA 271	HEDPOS			T=T-2	POINT T TO HEAD
196A	56B0	KAAA 272				RDH D T	READ BIN HEAD D1
196C	7242	KAAA 273				STH V DA,98	DATA ADR TO K4
196E	3480	KAAA 274				SET MODE K=88	SET CPU ZONE FILE MODE
		KAAA 275	*			**	
		KAAA 276	*				
		KAAA 277	*			OP DECODE IS COMPLETE. THE HEAD TO BE SELECTED IS IN THE D1 REG	
		KAAA 278	*				
		KAAA 279	*			**	
1970	519F	KAAA 280				I1=FBI	READ OLD ADR TO BECOME NEW CYL
1972	A800	KAAA 281	ALLSEK	287	MOTSEK	BR	
		KAAA 282	*			**	
		KAAA 283	*				
		KAAA 284	*			MOTION SEEKS ENTER HERE. RTH,DIRECT,ALTERNATE,AND DEFECTIVE	
		KAAA 285	*				
		KAAA 286	*			**	
2800	3480	KAAA 287	MOTSEK			SET MODE K=88	MOTION SEEKS ENTRY CYL I1 HD D1
2802	518F	KAAA 288				IO=FBI	OLD ADR TO IO
2804	3785	KAAA 289				D1=D1$K80	SET FORWARD
2806	7893	KAAA 290				IO=IO-I1	COMPARE OLD ADR-NEW ADR
2808	F490	KAAA 291		295	HDMASK	BR IF AC=0	BR IF FORWARD
280A	1785	KAAA 292				D1=D1*-K80	REVERSE CLR FORWARD
280C	281B	KAAA 293				IO=IO+KO1	
280E	18FF	KAAA 294				IO=IO¤KFF	COMPL
2810	2D15	KAAA 295	HDMASK			P1=0$K10	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS	
2812	2C07	KAAA 296				P0=0		
2814	4EDF	KAAA 297				FB0=P1	RESET HD REG	BUS
2816	4BDF	KAAA 298				TGR0=P1	CONTROL	TAG
2818	4BCF	KAAA 299				TGR0=P0	RESET	TAG
281A	4E9F	KAAA 300				FB0=I1	NEW CYL TO BUS	BUS
281C	2D45	KAAA 301				P1=0$K40		
281E	4BDF	KAAA 302				TGR0=P1	SET CYL	TAG
2820	4BCF	KAAA 303				TGR0=P0	RESET	TAG
2822	4E7F	KAAA 304				FB0=D1	HEAD & DIRECTION	BUS
2824	2D25	KAAA 305				P1=0$K20		
2826	4BDF	KAAA 306				TGR0=P1	SET HEAD	TAG
2828	4BCF	KAAA 307				TGR0=P0	RESET	TAG
282A	4E8F	KAAA 308				FB0=I0	DIFFERENCE	BUS
282C	0811	KAAA 309				Z=I0+K01	CHK FOR 0 DIFFERENCE	
282E	F4B6	KAAA 310		314	MOTION	BR IF AC=0	BR IF MOTION SEEK	
2830	CF49	KAAA 311		323	SEKDON	BR IF H1 BIT0=1	BR IF OP IS SEEK	
2832	9B62	KAAA 312		325	HDSLCT	BAL		
2834	AD0C	KAAA 313		KAAF 012	RUSAVS	BR		
2836	2D85	KAAA 314	MOTION			P1=0$K80		
2838	4BDF	KAAA 315				TGR0=P1	SET DIFFERENCE	TAG
283A	4BCF	KAAA 316				TGR0=P0	RESET	TAG
283C	2D25	KAAA 317				P1=0$K20		
283E	4EDF	KAAA 318				FB0=P1	SEEK START	BUS
2840	2D13	KAAA 319				P1=0$K01		
2842	4BDF	KAAA 320				TGR0=P1	CTRL LATCH	
2844	C54B	KAAA 321		324	RECRTN	BR IF G1 BIT0=1	BR IF ALT TRK SEEK	
2846	004B	KAAA 322		324	RECRTN	BR IF G0 BIT5=1	BR IF REC 0	
2848	82C0	KAAA 323	SEKDON	KEND 017	SEKEND	BR	SEEK COMPLETE BR TO SEEK END	
284A	A854	KAAA 324	RECRTN	KBBG 008	RECRTN	BR	GO WAIT FOR ATTEN.	
1B62	2D43	KAAA 325	HDSLCT			P1=0$K04	SEL HEAD ALL OPS EXCEPT SEEK	
1B64	4EDF	KAAA 326				FB0=P1	SEL HEAD	
1B66	6DD3	KAAA 327	P13			P1=P1+P1		
1B68	FD66	KAAA 328		327	P13	BR IF P1 BIT3=0		
1B6A	4BDF	KAAA 329				TGR0=P1	CTRL	
1B6C	2D65	KAAA 330				P1=0$K60	SET CMD CH AND SILI	
1B6E	4DDF	KAAA 331				FF0=P1	SET FLAGS	
1B70	1445	KAAA 332				G0=G0*-K40	CLEAR 1ST SCH	
1B72	128E	KAAA 333				RTN		
		KAAA 334	*			***		
		KAAA 335	*	*		CYCLIC CODE HARDWARE TEST		**
		KAAA 336	*			***		
		KAAA 337	ASEQ	AL07=68				
0468	3210	KAAA 338	CCTEST			SET MMSK K=81	SET PRIORITY TO PREVENT DC TRAPS	
046A	5D79	KAAA 339				D1=P1	MOVE MOD SEL VALUE DURING CC TST	
046C	0E08	KAAA 340				RST FIB K=40	INITIAL RESET DROPS CHAIN END	
046E	2302	KAAA 341				SET DIAC K=10	SET DIAGNOSTIC @ 1400 FILE MODE	
0470	2304	KAAA 342				SET DIAC K=20	SET DIAG INDEX	
0472	3110	KAAA 343				SET DIAB K=81	DIAG ADDR 0&COMP GATE,RAISE READ	
0474	3D29	KAAA 344				P1=0-K20	SET CONSTANT DF	
0476	4FDF	KAAA 345				FOP=P1	LOAD OP REG WITH DF	
0478	43DF	KAAA 346				FEB0=P1	LOAD WRITE BUFFER WITH DF	
047A	8526	KAAA 347		440	PEDS	BAL	TST FOR DF IN WR BFR.ALUCHK =ERR	
047C	5FCF	KAAA 348				P0=FOP	GET OP REG BITS	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
047E	1CFF	KAAA 349				PO=PO□KFF	MASK FOR CORRECT OP REG BITS
0480	C4FA	KAAA 350		418	ALUCHK	BR IF ZNZ	BR IF OP REG NOT FF
0482	4FCF	KAAA 351				FOP=PO	RESET OP REG
0484	5FCF	KAAA 352				PO=FOP	GET OP REG BITS
0486	C4FA	KAAA 353		418	ALUCHK	BR IF ZNZ	BR IF OP REG NOT ALL ZERO
0488	8512	KAAA 354		430	SHIFT8	BAL	ADVANCE BIT RING 8 TIMES
048A	5BCF	KAAA 355				PO=SDI	GET READ BUFF BITS EXTERNAL B
048C	8528	KAAA 356		441	XOR	BAL	TST XFER WR TO RD BFR,DF
		KAAA 357	*			EXIT TO ALUCHK IF DF HEX WAS NOT XFERRED TO READ BFR	
048E	5ECF	KAAA 358				PO=DS	GET DIAG INFO FROM WR BFR-OADDR-
0490	C4FA	KAAA 359		418	ALUCHK	BR IF ZNZ	BR IF WR BUFF NOT RESET TO ZERO
0492	2310	KAAA 360				SET DIAC K=01	ADV TO ZONE 1
0494	2390	KAAA 361				SET DIAC K=09	ADV TO ZONE 2&SET SEP DATA BIT
0496	2D13	KAAA 362				P1=O$K01	SET WRITE BIT OF OP REG
0498	4FDF	KAAA 363				FOP=P1	LOAD OP REG WITH 01
049A	2D25	KAAA 364				P1=O$K20	
049C	43DF	KAAA 365				FEBO=P1	SET WR BFR TO 20
049E	3110	KAAA 366				SET DIAB K=81	DIAG ADDRO&COMP GATE,RAISE READ
04A0	851E	KAAA 367		436	SHIFT2	BAL	2 BIT RING ADV WITH WR PHASE A
04A2	2D35	KAAA 368				P1=O$K30	
04A4	2D1B	KAAA 369				P1=P1+K01	SET SEARCH EQ ID OP 31 HEX
04A6	4FDF	KAAA 370				FOP=P1	SCH EQ ID TO OP REG HARDWARE
04A8	8516	KAAA 371		432	SHIFT6	BAL	6 BIT RING ADV WITH DIAG WR PH A
04AA	5BCF	KAAA 372				PO=SDI	GET READ BUFF BITS
04AC	2D85	KAAA 373				P1=O$K80	
04AE	3D23	KAAA 374				P1=P1$K02	SET P1 TO TEST FOR 82 IN RD BFR
04B0	8528	KAAA 375		441	XOR	BAL	TEST READ BUFFER FOR 82
04B2	3D73	KAAA 376				P1=P1$K07	P1 TO 87 HEX
04B4	8524	KAAA 377		439	SET3	BAL	TEST CC REG FOR 1ON,16,17 OFF
04B6	3114	KAAA 378				SET DIAB K=A1	DIAG ADDR O&DIAG COMP PH TURN ON
		KAAA 379	*			READ GATE. DIAG ADDR 2 AND DIAG COMP PH TURN ON COMPARE TGR	
04B8	851A	KAAA 380		434	SHIFT4	BAL	4 BIT RING ADV WITH DIAG WR PH A
04BA	2DA3	KAAA 381				P1=O$K0A	
04BC	8524	KAAA 382		439	SET3	BAL	TEST FOR UNEQ COMP AND WR CLK BT
04BE	1D00	KAAA 383				RST FIA K=80	RST HI LO CC ERR&TRAP LATCH
04C0	CAFB	KAAA 384		418	ALUCHK	BR IF DS4=1	EXIT IF UNEQUAL COMP NOT RESET
04C2	2380	KAAA 385				SET DIAC K=08	SET SEPERATED DATA BIT
04C4	3114	KAAA 386				SET DIAB K=A1	DIAG ADDR O&DIAG COMP PH TURN ON
		KAAA 387	*			READ GATE. DIAG ADDR 2 AND DIAG COMP PH TURN ON COMPARE TGR	
04C6	851A	KAAA 388		434	SHIFT4	BAL	4 BIT RING ADV WITH DIAG WR PH A
04C8	2D45	KAAA 389				P1=O$K40	
04CA	3DE3	KAAA 390				P1=P1$K0E	P1 SET TO 4E
04CC	8524	KAAA 391		439	SET3	BAL	TEST FOR CC REG 16 ON, UNEQ COMP
		KAAA 392	*				BIT RING 7 AND WRITE CLOCK ON
04CE	1D00	KAAA 393				RST FIA K=80	RST HI LO CC ERR&TRAP LATCH
04D0	2390	KAAA 394				SET DIAC K=09	ADV TO ZONE 3&SET SEP DATA BIT
04D2	3114	KAAA 395				SET DIAB K=A1	DIAG ADDR O&DIAG COMP PH TURN ON
		KAAA 396	*			READ GATE. DIAG ADDR 2 AND DIAG COMP PH TURN ON COMPARE TGR	
04D4	2308	KAAA 397				SET DIAC K=40	ADV BIT RING WITH DIAG WR PH A
04D6	2D75	KAAA 398				P1=O$K70	
04D8	3DA3	KAAA 399				P1=P1$K0A	P1=7A
04DA	8524	KAAA 400		439	SET3	BAL	TEST FOR CC16,17, CC ERR-
		KAAA 401	*				UNEQ COMP & WR CLOCK BIT

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
04DC	1D00	KAAA 402				RST FIA K=80	RST HI LO CC ERR&TRAP LATCH
04DE	3114	KAAA 403				SET DIAB K=A1	DIAG ADDR 0&COMP GATE,READ-COMP
04E0	2380	KAAA 404				SET DIAC K=08	SET SEP DATA BIT
04E2	2308	KAAA 405				SET DIAC K=40	ADV BIT RING WITH DIAG WR PH A
04E4	2D35	KAAA 406				P1=0$K30	
04E6	3DA3	KAAA 407				P1=P1$K0A	P1=3A
04E8	8524	KAAA 408		439	SET3	BAL	TST CC17,CCERR,UNEQUAL,WR CLK BT
04EA	1D00	KAAA 409				RST FIA K=80	RST HI LO CC ERR&TRAP LATCH
04EC	3114	KAAA 410				SET DIAB K=A1	DIAG ADDR 0&DIAG COMP PH TURN ON
		KAAA 411	*			READ GATE. DIAG ADDR 2 AND DIAG COMP PH TURN ON COMPARE TGR	
04EE	2308	KAAA 412				SET DIAC K=40	ADV BIT RING WITH DIAG WR PH A
04F0	2D55	KAAA 413				P1=0$K50	
04F2	3DB3	KAAA 414				P1=P1$K0B	P1=5B
04F4	8524	KAAA 415		439	SET3	BAL	TST CC16,CCERR UNEQ,WR CLK&DA BT
04F6	1D00	KAAA 416				RST FIA K=80	RST HI LO CC ERR&TRAP LATCH
04F8	8506	KAAA 417		424	CCDONE	BR	CC TEST FINISHED
04FA	2100	KAAA 418	ALUCHK			SET DIAB K=00	RST DIAG ADDR LATCHES
04FC	1E00	KAAA 419				RST FIB K=80	CHAIN END RESET
04FE	0EC8	KAAA 420				RST FIB K=40	INITIAL RST,DROP CHAIN END&DIAG
0500	1210	KAAA 421				RST MMSK K=81	RELEASE PRIORITY,ALLOW TRAPS
0502	A5D0	KAAA 422		KAAN 029	ERROR	BAL	STORE DIAGNOSTIC INFO IN 00B0AUX
0504	8B58	KAAA 423		KAAN 052	ALUCHK	BR	SET ALUCHK,NOT READY AND EXIT
0506	2100	KAAA 424	CCDONE			SET DIAB K=00	RESET DIAGNOSTIC ADDRESS LATCHES
0508	3E00	KAAA 425				SET FIB K=80	SET NTO LATCH
050A	0E08	KAAA 426				RST FIB K=40	INITIAL RST,DROPS NTO&DIAG MODE
050C	1210	KAAA 427				RST MMSK K=81	RELEASE PRIORITY,ALLOW TRAPS
050E	57D9	KAAA 428				P1=D1	REPLACE MOD SELECT VALUE IN P1
0510	87B4	KAAA 429		105	SLECT	BR	RETURN TO MAIN STREAM
0512	2308	KAAA 430	SHIFT8			SET DIAC K=40	ADV BIT RING WITH DIAG WR PH A
0514	2308	KAAA 431	SHIFT7			SET DIAC K=40	
0516	2308	KAAA 432	SHIFT6			SET DIAC K=40	
0518	2308	KAAA 433	SHIFT5			SET DIAC K=40	
051A	2308	KAAA 434	SHIFT4			SET DIAC K=40	
051C	2308	KAAA 435	SHIFT3			SET DIAC K=40	
051E	2308	KAAA 436	SHIFT2			SET DIAC K=40	
0520	2308	KAAA 437	SHIFT1			SET DIAC K=40	
0522	128E	KAAA 438				RTN	
0524	2112	KAAA 439	SET3			SET DIAB K=11	SET DIAG ADDR 3
0526	5ECF	KAAA 440	PEDS			P0=DS	
0528	6CD1	KAAA 441	XOR			P0=P0¤P1	MASK FOR EQUAL VALUES
052A	C4AF	KAAA 442		444	RETURN	BR IF Z=0	BR IF NO ERROR
052C	84FA	KAAA 443		418	ALUCHK	BR	
052E	128E	KAAA 444	RETURN			RTN	

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*********************************
* CROSS REFERENCE FOR CSECT KAAA *
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KAAA 020	IOCM 025		
KAAA 030	KAAA 037		
KAAA 036	KAAA 033		
KAAA 048	KAAA 046		
KAAA 053	KAAA 051		
KAAA 060	KAAA 056		
KAAA 061	KAAA 059		

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**********************************
* CROSS REFERENCE FOR CSECT KAAA *
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KAAA 068    KAAA 061    KAAA 066
KAAA 087    KAAA 084    KAAA 085
KAAA 088    KAAA 087
KAAA 091    KAAA 088
KAAA 092    KAAA 090
KAAA 094    KAAA 092
KAAA 096    KAAA 094
KAAA 097    KAAA 096
KAAA 098    KAAA 098
KAAA 101    KAAA 108    KAAA 109    KAAA 110
KAAA 103    KAAA 100
KAAA 105    KAAA 429
KAAA 131    KAAA 123
KAAA 132    KAAA 125
KAAA 133    KAAA 126    KAAA 128    KAAA 130    KAAA 131
KAAA 137    KAAA 134    KAAA 135
KAAA 141    KAAA 140
KAAA 144    KAAA 141
KAAA 150    KAAA 144
KAAA 151    KAAA 143    KAAA 146    KAAA 147    KAAA 149
KAAA 158    KBBB 047
KAAA 170    KAAA 167
KAAA 172    KAAA 170
KAAA 181    KAAA 178
KAAA 184    KAAA 181
KAAA 196    KAAA 189
KAAA 200    KAAA 199
KAAA 203    KAAA 200
KAAA 205    KAAA 203
KAAA 213    KAAA 211
KAAA 236    KAAA 215
KAAA 246    KAAA 240    KAAA 242    KAAA 244
KAAA 251    KAAA 239    KAAA 248
KAAA 252    KAAA 250
KAAA 259    KAAA 256
KAAA 267    KAAA 262
KAAA 268    KAAA 261    KAAA 266
KAAA 271    KAAA 269
KAAA 287    KAAA 281    KAAQ 059    KBBE 030    KBBG 016
KAAA 295    KAAA 291
KAAA 314    KAAA 310
KAAA 323    KAAA 311
KAAA 324    KAAA 321    KAAA 322
KAAA 325    KAAA 312    KAAH 092    KBBG 021    KBBG 025
KAAA 327    KAAA 328
KAAA 338    KAAA 104
KAAA 418    KAAA 350    KAAA 353    KAAA 359    KAAA 384    KAAA 443
KAAA 424    KAAA 417
KAAA 430    KAAA 354
KAAA 432    KAAA 371
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********************************
* CROSS REFERENCE FOR CSECT KAAA *
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KAAA 434      KAAA 380   KAAA 388
KAAA 436      KAAA 367
KAAA 439      KAAA 377   KAAA 382   KAAA 391   KAAA 400   KAAA 408   KAAA 415
KAAA 440      KAAA 347
KAAA 441      KAAA 356   KAAA 375
KAAA 444      KAAA 442
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KAAF   DESCRIPTIVE   TEXT

SEARCH ID ROUTINE

OBJECTIVES

   INITIAL ENTRY   OR RE-ENTRY FROM ALTERNATE OR DEFECTIVE
TRACK SEEK.

1.   CHECK TO SEE IF READER OR PUNCH IS BUSY . WAIT FOR NOT
     BUSY, THEN SET PRIORITY LEVEL TO BLOCK ALL TRAPS WITH
     LESS THAN FILE PRIORITY.

I.   DECODE MOVE OR LOAD MODE AND SET INTO HARDWARE.

3.   CHECK COMPARE DISABLE BIT   IF ON AND NOT ALTERNATE
     TRACK, EXIT TO KAAH ROUTINE TO SET UP RECORD 0 FOR A
     SEARCH ARGUMENT.

A.   IF ADDRESS OPS AND NOT COMPARE DISABLE, SEARCH FOR
     THE ADDRESS DECODED FROM THE DCF. IF FOUND SEARCH
     FOR RO (FOR ORIENTATION).

B.   FOR ADDRESS OPS WITH COMPARE DISABLE ON, SEARCH FOR
     RECORD 0 ONLY.

4.   ENTRY WITH ADDRESS OP, COMPARE DISABLE, AND ALTERNATE
     TRACK INDICATES THAT THE RO SEARCH ARGUMENT HAS BEEN
     PREVIOUSLY SET UP AND THE SEARCH CAN NOW BE DONE ON
     ALTERNATE TRACK.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		KAAF 001	T			14XX FILE COMP.	R.E. AVIS 8/16/67
		KAAF 002	*				
		KAAF 003	*			ROUTINE KAAF	SEARCH ID
		KAAF 004	*				
		KAAF 005	*			***	
		KAAF 006	*			*	*
		KAAF 007	*			* THIS ROUTINE WILL SET THE DAC OP REG UP TO	*
		KAAF 008	*			* PERFORM A SEARCH EQ CNT OP REG = 31	*
		KAAF 009	*			*	*
		KAAF 010	*			***	
		KAAF 011	*				
200C	3462	KAAF 012	RUSAVS			SET MODE K=96	SET 2540 MODE AND ZONE
200E	0435	KAAF 013	PCHBSY			Z=GO*-K30	CK FOR RD OR PCH BUSY
2010	EC8E	KAAF 014		013	PCHBSY	BR IF HZNZ	
2012	3480	KAAF 015				SET MODE K=88	2311 MODE
2014	220E	KAAF 016				SET MMSK K=70	PREVENT LOW PRIORITY TRAP
2016	0E04	KAAF 017	NOTBSY			RST FIB K=20	SET COLD START
2018	0340	KAAF 018				RST DIAC K=04	RST MOVE LATCH
201A	D11E	KAAF 019		021	START	BR IF G1 BIT5=0	BR IF LOAD OP
201C	2340	KAAF 020				SET DIAC K=04	SET MOVE LATCH
201E	F109	KAAF 021	START	033	CKALTR	BR IF G1 BIT7=1	CK COMP DISABLE 1ST SCH
2020	2717	KAAF 022	RESTOP			D1=0$K11	SET SCH EQ CNT
2022	272D	KAAF 023				D1=D1+K20	SET WRITE
2024	4F7F	KAAF 024				FOP=D1	SEND OP
2026	3D00	KAAF 025				SET FIA K=80	SEND GO
2028	3485	KAAF 026				GO=GO$K80	SET SCH MARK

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
2D2A	D407	KAAF 027		035	SCHXFR	BR IF GO BIT1=1	BR IF 1ST XFER
2D2C	3490	KAAF 028	CLKSCH			SET MODE K=89	SET 2311 MODE AND ZONE
2D2E	28C7	KAAF 029				I0=0	CNT HIGH EQ 0
2D30	2953	KAAF 030				I1=0$K05	CNT LOW EQ 5
2D32	5A32	KAAF 031				RDH T DA,8E	READ COUNT FIELD ADR K3
2D34	AD34	KAAF 032	STABR1	032	STABR1	BR	WAIT FOR STATUS
2D08	C521	KAAF 033	CKALTR	022	RESTOP	BR IF G1 BIT0=1	CK FOR ALTER TRK ENTRY
2D0A	A728	KAAF 034		KAAH 155	SETRO	BR	ADDR OP CMP DISA COMPARE RO ONLY
2D0b	AAC6	KAAF 035	SCHXFR	KBBH 008	INCDCF	BR	GO INCREMENT DCF
2D00	DFAC	KAAF 036	SCHDES	028	CLKSCH	BR IF FOP BIT1=0	BR IF NOT MT
2D02	C52C	KAAF 037		028	CLKSCH	BR IF G1 BIT0=0	MT CK FOR ALTER TRK
2D04	A7CE	KAAF 038		KAAQ 035	RSTTAG	BR	HD SW ON ALT TRK GO SEEK BACK
		KAAF 039	*				
		KAAF 040	*			**	
		KAAF 041	*			*	*
		KAAF 042	*			* ENTER HERE AFTER DCF TO BIN	*
		KAAF 043	*			* CONVERT ON WRITE ADDR. OP	*
		KAAF 044	*			* THIS LOOP CLOCKS THE 8 BYTE COUNT FIELD.	*
		KAAF 045	*			*	*
		KAAF 046	*			**	
		KAAF 047	*				
106A	3490	KAAF 048	WRCLCO			SET MODE K=89	SET 2311 MODE AND ZONE
106C	5BD9	KAAF 049				P1=T1	GET DATA ADDR IN P REG
106E	2D8B	KAAF 050				P1=P1+K08	ADD 8
1070	5DC9	KAAF 051				P0=P1	SAVE ADDR
1072	5CD9	KAAF 052	COMPRE			P1=P0	RE-INITIALIZE COUNT
1074	6DB1	KAAF 053				P1=P1¬T1	COMPARE
1076	C4F2	KAAF 054		052	COMPRE	BR IF ZNZ	EXIT AFTER 8 BYTES
1078	A8BC	KAAF 055	CNT0	KBBC 009	DECSEC	BR	GO TO DECREMENT SECTOR CNT

```
***********************************
* CROSS REFERENCE FOR CSECT KAAF *
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```
KAAF 012    KAAA 313   KBBG 022   KBBG 026
KAAF 013    KAAF 014
KAAF 017    KAAH 093
KAAF 021    KAAF 019
KAAF 022    KAAF 033   KAAH 132   KAAH 173   KAAH 179   KAAQ 092
KAAF 028    KAAF 036   KAAF 037   KAAH 047
KAAF 032    KAAF 032
KAAF 033    KAAF 021
KAAF 035    KAAF 027
KAAF 036    KBBH 028
KAAF 048    KAAA 221
KAAF 052    KAAF 054
```

KAAH   DESCRIPTIVE TEXT

MAIN STATUS ROUTINE

OBJECTIVES

1. ALL FILE TRAPS FORCE ADDRESS 0140. THIS ROUTINE INTERRO-
   GATES THE STATUS. DECISIONS ARE MADE TO CONTINUE OR END
   THE OPERATION.

2. CHECK FOR UNUSUAL CONDITIONS   IF NONE EXIST CHECK 1400
   OPERATION TYPE. CHECK PROGRESS OF OPERATION.

   A. UNUSUAL CONDITION AND MT HEAD SWITCH ON   BRANCH TO
       PORTION OF ROUTINE THAT PERFORMS HEAD SWITCHING.

   B. UNUSUAL CONDITION AND RECALIBRATE BUT NOT HEAD
       SWITCH   EXIT TO KBBG TO HANDLE STATUS. RECALIBRATE
       TRAP OCCURS 15 MS AFTER THE COMMAND IS ISSUED.

   C. UNUSUAL CONDITION, NOT RECALIBRATE AND NOT HEAD
       SWITCH   EXIT TO KAAN TO DETERMINE TYPE OF ERROR.

3. NOT UNUSUAL STATUS. CHECK FOR RO OF A DEFECTIVE TRACK.
   EXIT TO KAAN FOR ALTERNATE TRACK SEEK.

4. CHECK FOR MODE ERROR   IF ON EXIT TO KAAQ.

5. CHECK STATUS MODIFIER BIT. IF ON (SUCCESSFUL SEARCH OR
   EQUAL SCAN), DETERMINE OPERATION BEING DONE.

6. SEARCH OP OR DATA TRANSFER END   END   CHECK PROGRESS.

7. SEARCH OP, STATUS MODIFIER NOT ON   HAS 2ND SEARCH BEEN
   DONE

   A. ADDRESS OPS, NOT 2ND SEARCH, EXIT TO KAAF FOR RETRY.

   B. ADDRESS OPS, 2ND SEARCH ON   CHECK FOR RBC. IF NOT
       RBC, RETRY SEARCH.

   6. RBC   CHECK FOR EQUAL BEING SET INDICATING SUCCESSFUL
       SEARCH FOR RO. IF EQUAL, EXIT TO KBBB TO SET UP
       TRANSFER OF DATA FOR RBC OF ADDRESS OP. IF NOT
       EQUAL, RETRY SEARCH.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		KAAH 001	T			14XX FILE COMP. R.E. AVIS 8/16/67	
		KAAH 002	*				
		KAAH 003	*			ROUTINE KAAH MAIN STATUS 1#	
		KAAH 004	*				
		KAAH 005	*			**	
		KAAH 006	*			*	*
		KAAH 007	*			* STATUS TRAP FROM DAC WILL ENTER HERE. STATUS IS	*
		KAAH 008	*			* CHECKED FOR UNUSUAL,	*
		KAAH 009	*			* HEAD SWITCHING AND RECALIBRATE	*
		KAAH 010	*			*	*
		KAAH 011	*			**	
		KAAH 012	*				
		KAAH 013	ATABLE	ADDR=0140			
0140	3210	KAAH 014				SET MMSK K=81	PREVENT ALL TRAPS
0142	3480	KAAH 015				SET MODE K=88	SET CPU ZONE
0144	95FE	KAAH 016		KAAH 018	MSTAT1	BR	
		KAAH 017	AEND				
15FE	5EDF	KAAH 018	MSTAT1			P1=DS	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1600	C1B4	KAAH 019		036	MSTAT2	BR IF DASI BIT4=0	BRANCH IF NOT UNUSUAL
1602	2C07	KAAH 020				PO=0	
1604	4BCF	KAAH 021				TGRO=PO	RESET TRAP GATE AND TAGS
1606	1D00	KAAH 022				RST FIA K=80	RESET TRAP LATCH
1608	DFDB	KAAH 023		058	SWHEAD	BR IF FOP BIT1=1	BR IF MT
160A	E110	KAAH 024		027	BAD	BR IF G1 BIT6=0	BR IF NOT RECALIBRATE
160C	1210	KAAH 025				RST MMSK K=81	ALLOW FILE TRAPS
160E	A854	KAAH 026		KBBG 008	RECRTN	BR	GO TO RECALIBRATE ROUTINE
1610	A5D0	KAAH 027	BAD	KAAN 029	ERROR	BAL	GO STORE REGS
1612	8EC8	KAAH 028		KAAN 081	UNSTA1	BR	GO TO UNUSUAL STATUS
		KAAH 029	*				
		KAAH 030	*			**	
		KAAH 031	*			*	*
		KAAH 032	*			*	COME HERE WITH NOT UNUSUAL STATUS	*
		KAAH 033	*			*	*
		KAAH 034	*			**	
		KAAH 035	*				
1634	1D00	KAAH 036	MSTAT2			RST FIA K=80	RESET TRAP LATCH
1636	1210	KAAH 037				RST MMSK K=81	ALLOW FILE TRAPS
1638	D059	KAAH 038		050	FLAG	BR IF GO BIT5=1	BR IF JUST READ RO RECORD
163A	C8D1	KAAH 039		KAAQ 005	MODER	BR IF FGA BIT4=1	CK FOR MODE ERROR
163C	FDCF	KAAH 040		049	MODIFY	BR IF FFI BIT3=1	BR IF STATUS MODIFIER
163E	C44C	KAAH 041		048	CHDEV1	BR IF GO BIT0=0	BR IF NOT SCH
1640	F148	KAAH 042		046	RETRY	BR IF G1 BIT7=0	HAS 2ND SCH BEEN DONE
1642	CC48	KAAH 043		046	RETRY	BR IF GO BIT4=0	BR IF NOT RBC OP
1644	F048	KAAH 044		046	RETRY	BR IF GO BIT7=0	
1646	8F2C	KAAH 045		KBBB 056	OPREST	BR	RBC 2ND SCH DONE X EXP GO XFER
1648	3D00	KAAH 046	RETRY			SET FIA K=80	SET GO
164A	AD2C	KAAH 047		KAAF 028	CLKSCH	BR	RETRY SEARCH
164C	AB82	KAAH 048	CHDEV1	105	RESUME	BR	CK END STATUS
164E	A722	KAAH 049	MODIFY	152	STMOD1	BR	CK STATUS MODIFIER
1658	9C6A	KAAH 050	FLAG	KAAN 130	RODONE	BR	GO SET UP ALT TRK SEEK
		KAAH 051	*				
		KAAH 052	*			**	
		KAAH 053	*			*	*
		KAAH 054	*			*	ENTER HERE FOR MULTI TRK HEAD SWITCHING.	*
		KAAH 055	*			*	*
		KAAH 056	*			**	
		KAAH 057	*				
165A	1210	KAAH 058	SWHEAD			RST MMSK K=81	ALLOW FILE TRAPS
165C	2613	KAAH 059				DO=0$K01	SET HD. ADV.
165E	4E6F	KAAH 060				FBO=DO	SEND HD ADV
1660	263D	KAAH 061				DO=DO+K30	RESET MT
1662	4F6F	KAAH 062				FOP=DO	SEND OP
1664	2653	KAAH 063				DO=0$K05	SET DELAY CTR
1666	26FF	KAAH 064	DELAY			DO=DO+KFF	DELAY
1668	C4E6	KAAH 065		064	DELAY	BR IF ZNZ	CTR WILL DELAY 10.8 U SEC.
166A	2613	KAAH 066				DO=0$K01	SET CTRL PULSE
166C	4B6F	KAAH 067				TGRO=DO	SEND TAGS
166E	4BCF	KAAH 068				TGRO=PO	RESET TAGS
1670	2643	KAAH 069				DO=0$K04	SET HD. SEL
1672	4E6F	KAAH 070				FBO=DO	SEND HD SEL
1674	DAB1	KAAH 071		078	EOCEND	BR IF DS BIT5=1	BR IF END OF CYL

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1676	3462	KAAH 072				SET MODE K=96	READ PCH MODE
1678	E995	KAAH 073		080	RDTRAP	BR IF RS BIT6=1	CK READ REQ
167A	3480	KAAH 074				SET MODE K=88	
167C	2615	KAAH 075				DO=0$K10	SET CTRL
167E	4B6F	KAAH 076				TGRO=DO	SEND TAGS
1680	9680	KAAH 077	WAITBR	077	WAITBR	BR	WAIT FOR STATUS
1630	2FC7	KAAH 078	EOCEND			H1=0	
1632	9EA6	KAAH 079		KAAN 152	TOOFAR	BR	
1614	3480	KAAH 080	RDTRAP			SET MODE K=88	2311 MODE
1616	2D07	KAAH 081				P1=0	
1618	2CC7	KAAH 082				PO=0	
161A	3EC8	KAAH 083				SET FIB K=CO	SET NTO
161C	4BCF	KAAH 084				TGRO=PO	RST TAGS
161E	4FCF	KAAH 085				FOP=PO	RST OP
1620	4DCF	KAAH 086				FFO=PO	RST FLAGS
1622	021E	KAAH 087	COUNT			RST MMSK K=71	RELEASE PRIORITY
1624	5CC4	KAAH 088				P=P+1	DELAY
1626	C4A2	KAAH 089		087	COUNT	BR IF ZNZ	
1628	220E	KAAH 090				SET MMSK K=70	SET PRIORITY
162A	F8AA	KAAH 091	INDEX	091	INDEX	BR IF FGA BIT7=0	WAIT FOR INDEX
162C	9B62	KAAH 092		KAAA 325	HDSLCT	BAL	GO SEL HEAD
162E	AD16	KAAH 093		KAAF 017	NOTBSY	BR	GO SEARCH
		KAAH 094	*				
		KAAH 095	*				
		KAAH 096	*				
		KAAH 097	*				
		KAAH 098	*				
		KAAH 099	*				
		KAAH 100	*				
		KAAH 101	*				
		KAAH 102	*				
		KAAH 103	*				
		KAAH 104	*				
2B82	3490	KAAH 105	RESUME			SET MODE K=89	SET 2311 MODE AND ZONE
2B84	7A42	KAAH 106				STH T DA,98	STORE DATA ADDR IN BUMP
2B86	2F07	KAAH 107				H1=0	ZERO H1 REG
2B88	4C86	KAAH 108				P=I	CK COUNT ZERO
2B8A	C48E	KAAH 109		111	CKGMWM	BR IF ZNZ	BR IF CNT NOT ZERO
2B8C	2F85	KAAH 110				H1=0$K80	SET MARK CNT WAS ZERO
2B8E	5DB0	KAAH 111	CKGMWM			RDB P1 T	GET SET TO CK GMWM
2B90	0DFB	KAAH 112				Z=P1□KOF	CK FOR GMWM
2B92	C496	KAAH 113		115	STMARK	BR IF ZNZ	BR IF NO GMWM
2B94	3F45	KAAH 114				H1=H1$K40	SET MARK WAS GMWM
2B96	7F52	KAAH 115	STMARK			STB H1 DA,9A	STORE MARKS IN AUX
2B98	3480	KAAH 116				SET MODE K=88	CPU ZONE
2B9A	5242	KAAH 117				RDH V DA,98	PUT DATA ADDR IN V REG
2B9C	5652	KAAH 118				RDH D DA,9A	GET MARKS
2B9E	C141	KAAH 119		126	SSSO	BR IF G1 BIT4=1	BR IF SECT 000
2BA0	D630	KAAH 120		127	CHDEV2	BR IF DO BIT1=0	BR IF NOT GMWM
2BA2	F42E	KAAH 121		134	WLREC	BR IF GO BIT3=0	BR IF NOT SCAN
2BA4	C628	KAAH 122	SCCKCT	124	SCCNTO	BR IF DO BITO=0	SCAN CK CNT 0
2BA6	AB60	KAAH 123	SCNWLR	KAAQ 076	SCNERR	BR	SCAN WLR GO TO SCAN COND
2BA8	2707	KAAH 124	SCCNTO			D1=0	

The comment block (KAAH 095–103) reads:

```
**********************************************************************
*                                                                    *
*        ENTER THIS ROUTINE WITH ALL DATA XFER END STATUS.*
*        THIS ROUTINE WILL STORE THE DATA ADDRESS INTO      *
*        THE V REG AND K4 OF AUX STORE. A CHECK IS MADE     *
*        ON ENDING CONDITIONS. CHECK FOR SECT. CNT 000      *
*        FOR GMWM AND DATA CNT 0.                           *
*                                                                    *
**********************************************************************
```

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
2BAA	AB64	KAAH 125		KAAQ 078	SCNCND	BR	GO TO SCAN COND
2BC0	AB3E	KAAH 126	SSS0	KAAQ 109	SECTR0	BR	SECT 0 GO TO END OP
2BB0	E53D	KAAH 127	CHDEV2		135 CKCNT0	BR IF G1 BIT2=1	BR IF ADDR OP
2BB2	F427	KAAH 128			123 SCNWLR	BR IF G0 BIT3=1	BR IF SCAN OP
2BB4	C02C	KAAH 129			133 CKCNT	BR IF G0 BIT4=0	BR IF NOT RBC OP
2BB6	C62E	KAAH 130			134 WLREC	BR IF D0 BIT0=0	RBC CK CNT 0 WLR IF NOT 0
2BB8	FDC2	KAAH 131		KAAQ 011	VERROR	BR IF FFI BIT3=0	CK STAT MOD V ERR IF NO
2BBA	AD20	KAAH 132	RCSEOK	KAAF 022	RESTOP	BR	RBC OK OR SECT OP OK GO SCH
2BAC	C63B	KAAH 133	CKCNT		132 RCSEOK	BR IF D0 BIT0=1	SECT OP CK CNT 0 WLR IF NOT 0
2BAE	8CBA	KAAH 134	WLREC	KAAQ 013	WLRERR	BR	WLR GO TO ERROR END
2BBC	C62E	KAAH 135	CKCNT0		134 WLREC	BR IF D0 BIT0=0	ADDR OP CK CNT 0 WLR IF NOT 0
2BBE	8F4C	KAAH 136		KBBB 031	SENDG0	BR	GO XFER SECTOR
		KAAH 137	*				

```
            KAAH 138  *    ****************************************************************
            KAAH 139  *          *                                                      *
            KAAH 140  *          *    ENTER HERE WITH STATUS MODIFIER.                  *
            KAAH 141  *          *    THIS ROUTINE SETS UP THE SCH ARGUMENT             *
            KAAH 142  *          *    FOR ADDRESS OPERATIONS.                           *
            KAAH 143  *          *    IF COMPARE DISABLE IS ON,                         *
            KAAH 144  *          *    THE SCH WILL BE MADE ON RECORD 0 ONLY.            *
            KAAH 145  *          *    OTHERWISE A 1ST SCH USING THE 14XX                *
            KAAH 146  *          *    DCF AND THEN THE R0 ADDR WILL BE DONE.            *
            KAAH 147  *          *    ADDR. OP RBC WILL PERFORM TWO R0 SCHS. THE 2ND    *
            KAAH 148  *          *    ONE IS DONE TO ORIENT THE 2311 AT REC 1           *
            KAAH 149  *          *                                                      *
            KAAH 150  *    ****************************************************************
            KAAH 151  *
```

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
2722	E51A	KAAH 152	STMOD1		187 STMOD2	BR IF G1 BIT2=0	BR IF NOT ADDR OP
2724	F10F	KAAH 153			174 2NDCMP	BR IF G1 BIT7=1	ADDR OP CK 2ND SCH
2726	3E08	KAAH 154				SET FIB K=C0	SET NT0 RST FLAG REG
2728	5632	KAAH 155	SETR0			RDH D DA,8E	READ COUNT FIELD ADR K3
272A	5664	KAAH 156				D=D+1	
272C	5EE2	KAAH 157				RDH H DA,BC	GET PRES CYL BUMP LOC
272E	C535	KAAH 158			161 STRACT	BR IF G1 BIT0=1	BR IF ON ALTER TRK
2730	51FF	KAAH 159				H1=FBI	GET ACTUAL CYL LOC FROM 2311
2732	7EE2	KAAH 160				STH H DA,BC	STORE CYL IN BUMP
2734	F140	KAAH 161	STRACT		167 STORE	BR IF G1 BIT7=0	CK IF ENTERING WITH COMP DISABLE
2736	2C13	KAAH 162				P0=0$K01	
2738	6CF3	KAAH 163				P0=P0+H1	2311 CYL VALUE PLUS 1
273A	5D70	KAAH 164				RDB P1 D	
273C	6CD1	KAAH 165				P0=P0□P1	CK FOR CYL OVFLO
273E	C48B	KAAH 166		KAAQ 009	XERROR	BR IF Z=0	GO SET X ERROR CYL OVFLO
2740	7F70	KAAH 167	STORE			STB H1 D	STORE CYL IN MAIN
2742	273B	KAAH 168				D1=D1+K03	UPDATE TO REC POS ADDR
2744	2FC7	KAAH 169				H1=0	ZERO FOR REC
2746	7F70	KAAH 170				STB H1 D	STORE REC 0 IN MAIN
2748	3513	KAAH 171				G1=G1$K01	SET 2ND SCH
274A	0E04	KAAH 172				RST FIB K=20	SET COLD START
274C	AD20	KAAH 173		KAAF 022	RESTOP	BR	GO SCH ID ON R0 REC
270E	C015	KAAH 174	2NDCMP		177 RCADDR	BR IF G0 BIT4=1	BR IF RBC ADDR OP
2710	3425	KAAH 175	EXIT01			G0=G0$K20	SET XFER
2712	8F3C	KAAH 176		KBBB 023	RESECH	BR	GO XFER ADDR OP OR SECT OP
2714	152D	KAAH 177	RCADDR			G1=G1□K20	REMOVE ADDR OP MARK

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
2716	3433	KAAH 178				GO=GO$KO3	SET LO-EQ , RBC ADDR OP
2718	AD20	KAAH 179		KAAF 022	RESTOP	BR	GO DO 3RD SCH RBC ADDR
		KAAH 180	*				
		KAAH 181	*			***	
		KAAH 182	*			*	*
		KAAH 183	*			* CONTINUE STATUS MODIFIER CHECK	*
		KAAH 184	*			*	*
		KAAH 185	*			***	
		KAAH 186	*				
271A	F401	KAAH 187	STMOD2	191	CKSCH1	BR IF GO BIT3=1	CK SCAN OP
271C	C010	KAAH 188		175	EXIT01	BR IF GO BIT4=0	CK RBC
271E	C408	KAAH 189		195	EXIT	BR IF GO BIT0=0	CK SCH
2720	8F2C	KAAH 190	EXIT02	KBBB 056	OPREST	BR	GO XFER RBC OR SCAN
2700	C421	KAAH 191	CKSCH1	190	EXIT02	BR IF GO BIT0=1	CK SCH
2702	3583	KAAH 192				G1=G1$KO8	SCAN HIT SET SECT 000
2704	2CC7	KAAH 193				PO=0	
2706	4DCF	KAAH 194				FFO=PO	RST CMD CH
2708	AB82	KAAH 195	EXIT	105	RESUME	BR	

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                                           ***********************************
                                           * CROSS REFERENCE FOR CSECT KAAH *
                                           ***********************************

KAAH 018     KAAH 016
KAAH 027     KAAH 024
KAAH 036     KAAH 019
KAAH 046     KAAH 042   KAAH 043   KAAH 044
KAAH 048     KAAH 041
KAAH 049     KAAH 040
KAAH 050     KAAH 038
KAAH 058     KAAH 023
KAAH 064     KAAH 065
KAAH 077     KAAH 077
KAAH 078     KAAH 071
KAAH 080     KAAH 073
KAAH 087     KAAH 089
KAAH 091     KAAH 091
KAAH 105     KAAH 048   KAAH 195
KAAH 111     KAAH 109
KAAH 115     KAAH 113
KAAH 122     KAAQ 116
KAAH 123     KAAH 128
KAAH 124     KAAH 122
KAAH 126     KAAH 119
KAAH 127     KAAH 120
KAAH 132     KAAH 133
KAAH 133     KAAH 129
KAAH 134     KAAH 121   KAAH 130   KAAH 135
KAAH 135     KAAH 127
KAAH 152     KAAH 049
KAAH 155     KAAF 034
KAAH 161     KAAH 158
KAAH 167     KAAH 161
KAAH 174     KAAH 153
KAAH 175     KAAH 188
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********************************
* CROSS REFERENCE FOR CSECT KAAH *
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KAAH 177      KAAH 174
KAAH 187      KAAH 152
KAAH 190      KAAH 191
KAAH 191      KAAH 187
KAAH 195      KAAH 189
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ADDR   WORD   SEQUENCE NO.   LABEL   NEXTSEQ   NEXTLABEL   STATEMENT   COMMENTS

```
                KAAN 001   T                                   1400 FILE COMP.
                KAAN 002   *
                KAAN 003   *                            ROUTINE  KAAN      UNUSUAL STATUS 1#
                KAAN 004   *
                KAAN 005   *
                KAAN 006   *      *******************************************************************
                KAAN 007   *      *                                                                 *
                KAAN 008   *      *          THE FILE EXTERNAL REGS WITH UNUSUAL CONDITION           *
                KAAN 009   *      *          BITS ARE STORED AS FOLLOWS,                             *
                KAAN 010   *      *                                                                 *
                KAAN 011   *      *AUX00B0 AUX 00B2        AUX 00B3        AUX 00B4      AUX 00B5 *
                KAAN 012   *      *        TC REG          DS REG          DASI REG      FGA REG  *
                KAAN 013   *      *        0 DC IN CNT     0 READY         0 HD COMP     0 ALUCHK  *
                KAAN 014   *      *I NEXT  1 TRK OVRUN     1 ON LINE       1 SKIP        1-------- *
                KAAN 015   *      *        2 NRF           2 UNSAFE        2--------     2-------- *
                KAAN 016   *      *        3 MAM           3 0             3--TGRI--     3-------- *
                KAAN 017   *      *        4 DATA CK       4 TPGT NOT ER4--------        4 WLR     *
                KAAN 018   *      *        5 OVERRUN       5 EOC           5 MACH CK     5 UNIT EX *
                KAAN 019   *      *        6 TK COND       6 --------      6 STR PRT     6 FLAG BT6*
                KAAN 020   *      *        7 0             7 SK INC        7 STR WRP     7-------- *
                KAAN 021   *      *                                                                 *
                KAAN 022   *      *******************************************************************
                KAAN 023   *      ********************************************************************
                KAAN 024   *      TO DISPLAY FILE OP WHICH STORED UNUSUAL CONDITIONS   1DISPLAY INEXT,HEX
                KAAN 025   *      2 SUBSTRACT BIAS,HEX 3CONVERT TO DECIMAL 4SUBTRACT 8,DEC. 5 DISPLAY THE
                KAAN 026   *      RESULTING ADDRESS WITH I/O TYPEWRITER,MANUAL DISPLAY
                KAAN 027   *      *******************************************************************
                KAAN 028   *
25D0   2E07     KAAN 029   ERROR                              HO=0                     SET AUX =00
25D2   2FB5     KAAN 030                                      H1=0$KB0                          B0
25D4   5612     KAAN 031                                      RDH D DA,8A              GET I CYCLE BACKUP
25D6   76E8     KAAN 032                                      STH D AS,H+2             PUT I CYC BACK-UP IN B0 AUX BFR
25D8   5A6F     KAAN 033                                      D0=TC                    GET TC REG
25DA   5E7F     KAAN 034                                      D1=DS                    GET DS REG
25DC   1723     KAAN 035                                      D1=D1*-K02               STRIP LO COMP
25DE   76E8     KAAN 036                                      STH D AS,H+2             STORE TC - DS
25E0   507F     KAAN 037                                      D1=TGRI                  GET TGRI REG
25E2   1783     KAAN 038                                      D1=D1*-K08               REMOVE MOD 20 TRAP BIT
25E4   556F     KAAN 039                                      D0=DASI                  GET DASI REG
25E6   1635     KAAN 040                                      D0=D0*-K30               SAVE HD COMP SKIP BIT
25E8   476D     KAAN 041                                      D0=D1L+D0H               MERGE DASI - TGRI
25EA   5C7F     KAAN 042                                      D1=FGA                   GET FGA REG
25EC   577D     KAAN 043                                      D1=D1L                   STRIP MOD SELS
25EE   1713     KAAN 044                                      D1=D1*-K01               STRIP INDEX
25F0   76E0     KAAN 045                                      STH D AS,H               STORE DASI-TGRI-FGA
25F2   0683     KAAN 046                                      Z=D0*-K08                STRIP TRAP GATE BIT FROM TAGRI
25F4   F0FD     KAAN 047            051    NOCHEK             BR IF LZ=0               CK FOR MACHINE CHECK
25F6   1E00     KAAN 048                                      RST FIB K=80             TURN ON CH END
25F8   3202     KAAN 049                                      LINK U MMSK9=1           CPU ERROR DURING SHARE CYCLE
25FA   8222     KAAN 050   ITRP 011 MACHCK                    BR                       GO LOG MACHINE CK
25FC   128E     KAAN 051   NOCHEK                             RTN
0B58   56E0     KAAN 052   ALUCHK                             RDH D AS,H               GET UNUSUAL CONDITIONS
0B5A   3785     KAAN 053                                      D1=D1$K80                OR IN ALUCHK,FLUNKED CC TEST
```

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
0B5C	76E0	KAAN 054				STH D AS,H	STR UNUSUAL COND WITH ALUCHK
0B5E	8390	KAAN 055		KAAQ 015	NOTRDY	BR	GO SET NOT READY & EXIT
		KAAN 056	*			***	
		KAAN 057	*			*	*
		KAAN 058	*			* THE DAC ERROR STATUS CONDITION	*
		KAAN 059	*			* IS DECODED IN THIS ROUTINE.	*
		KAAN 060	*			* THE 14XX ERROR BRANCH BYTE IS SETUP AND	*
		KAAN 061	*			* STORED IN KB OF AUX 0 STORE.	*
		KAAN 062	*			* THE READING OF RECORD 0 FOR ALTERNATE SEEKS	*
		KAAN 063	*			* IS ALSO DONE IN THIS ROUTINE.	*
		KAAN 064	*			*	*
		KAAN 065	*			* THE FOLLOWING IS A LIST OF DAC ERROR CONDITIONS	*
		KAAN 066	*			* AND THE CORRESPONDING 14XX ERROR THAT IS SET	*
		KAAN 067	*			* DATA CK IN COUNT = NO REC FOUND = X ERROR	*
		KAAN 068	*			* TRACK OVERRUN = NOT READY = N ERROR	*
		KAAN 069	*			* END OF CYLINDER = NRF + WLR = X + WLR ERROR	*
		KAAN 070	*			* DATA CHECK = VALIDITY = V ERROR	*
		KAAN 071	*			* OVERRUN = VALIDITY = V ERROR	*
		KAAN 072	*			* NOT READY = NOT READY = N ERROR	*
		KAAN 073	*			* NOT ON LINE = NOT READY = N ERROR	*
		KAAN 074	*			* UNSAFE = NOT READY = N ERROR	*
		KAAN 075	*			* SEEK INCOMPLETE = NOT READY = N ERROR	*
		KAAN 076	*			* MISSING ADDR MRK = NO REC FOUND = X ERROR	*
		KAAN 077	*			* WRONG LGTH REC = MODE ERROR = WLR + V ERROR	*
		KAAN 078	*			*	*
		KAAN 079	*			***	
		KAAN 080	*				
0EC8	2F07	KAAN 081	UNSTA1			H1=0	ZERO H1 REG
0ECA	5AEF	KAAN 082				HO=TC	CALL IN ERROR REG FOR ERROR ASEM
0ECC	0E55	KAAN 083				Z=HO*-K50	CHK FOR X,DC CT,NRF
0ECE	E0D3	KAAN 084		086	NOTX	BR IF HZ=0	BR IF NOT X
0ED0	3F25	KAAN 085				H1=H1$K20	SET X
0ED2	0EB5	KAAN 086	NOTX			Z=HO*-KB0	CK FOR N,TRACK OVERRUN
0ED4	E0D9	KAAN 087		089	NOTN	BR IF HZ=0	BR IF NOT N
0ED6	3F13	KAAN 088				H1=H1$K01	SET N
0ED8	0E33	KAAN 089	NOTN			Z=HO*-K03	CK FOR V,DC OR DATA OVERRUN
0EDA	F0EB	KAAN 090		098	NOTV	BR IF LZ=0	BR IF NOT V
0EDC	3F23	KAAN 091				H1=H1$K02	SET V
0EDE	FE66	KAAN 092	NOTF	096	NOMISS	BR IF HO BIT3=0	CHECK FOR MISSING ADDRESS MARK
0EE0	3F27	KAAN 093				H1=H1$K22	SET X AND V
0EE2	D5E6	KAAN 094		096	NOMISS	BR IF DASI BIT1=0	CK ATTEN
0EE4	3F13	KAAN 095				H1=H1$K01	SET N
0EE6	5EEF	KAAN 096	NOMISS			HO=DS	CALL IN DISK STATUS REG
0EE8	9E98	KAAN 097		145	UNSTA2	BR	GO TO UNUSUAL STATUS 2#
0EEA	EA5E	KAAN 098	NOTV	092	NOTF	BR IF HO BIT6=0	BR IF NOT FLAGGED TRACK
		KAAN 099	*				
		KAAN 100	*			***	
		KAAN 101	*			* READ IN RECORD 0 OF DEF. TRACK	*
		KAAN 102	*			***	
		KAAN 103	*				
0EEC	3E00	KAAN 104	READRO			SET FIB K=80	NTO RESET TO RST ERRORS HOLD MS
0EEE	1210	KAAN 105				RST MMSK K=81	ALLOW FILE TRAPS
0EF0	2725	KAAN 106				D1=0$K20	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
0EF2	4D7F	KAAN 107				FFO=D1	SET SILI
0EF4	2715	KAAN 108				D1=0$K10	
0EF6	4B7F	KAAN 109				TGRO=D1	SET CTRL
0EF8	0340	KAAN 110				RST DIAC K=04	RST MOVE
0EFA	3763	KAAN 111				D1=D1$K06	D1=16
0EFC	0E04	KAAN 112				RST FIB K=20	
0EFE	2E08	KAAN 113				SET FIB K=40	RST FLAG REG
0F00	4F7F	KAAN 114				FOP=D1	SEND OP
0F02	3D00	KAAN 115				SET FIA K=80	SEND GO
0F04	3443	KAAN 116				GO=GO$K04	SET RO IN G REG
0F06	3490	KAAN 117				SET MODE K=89	SET 2311 MODE AND ZONE
0F08	2807	KAAN 118				IO=0	CNT HIGH EQ 0
0F0A	2943	KAAN 119				I1=0$K04	CNT LOW EQ 4
0F0C	5A32	KAAN 120				RDH T DA,8E	READ COUNT FIELD ADR K3
0F0E	2B8B	KAAN 121				T1=T1+K08	GET TO RO DATA ADDR
0F10	8F10	KAAN 122	STABRO	122	STABRO	BR	
		KAAN 123	*				
		KAAN 124	*			**	
		KAAN 125	*			*	*
		KAAN 126	*			* ENTER HERE AFTER READING RO RECORD	*
		KAAN 127	*			*	*
		KAAN 128	*			**	
		KAAN 129	*				
1C6A	58E2	KAAN 130	RODONE			RDH I DA,BC	SAVE MOD VALUE
1C6C	519F	KAAN 131				I1=FBI	GET OA
1C6E	78E2	KAAN 132				STH I DA,BC	STORE CYL
1C70	5E32	KAAN 133				RDH H DA,8E	READ COUNT FIELD ADR K3
1C72	2F8B	KAAN 134				H1=H1+K08	GET TO RO CYL POS ADDR
1C74	58F8	KAAN 135				RDH I H+2	PUT CYL IN I1
1C76	56F0	KAAN 136				RDH D H	PUT HD IN D1
1C78	A7E6	KAAN 137		KAAQ 047	DASIBR	BR	GO TO ERASE WAIT
		KAAN 138	*				
		KAAN 139	*			**	
		KAAN 140	*			*	*
		KAAN 141	*			* CONTINUE UNUSUAL STATUS CHECK.	*
		KAAN 142	*			*	*
		KAAN 143	*			**	
		KAAN 144	*				
1E98	CE22	KAAN 145	UNSTA2	150	SETN	BR IF HO BIT0=0	CHECK NOT READY
1E9A	DE22	KAAN 146		150	SETN	BR IF HO BIT1=0	CHECK NOT ON LINE
1E9C	EE23	KAAN 147		150	SETN	BR IF HO BIT2=1	CHECK UNSAFE
1E9E	FA23	KAAN 148		150	SETN	BR IF HO BIT7=1	CHECK SEEK INCOMPLETE
1EA0	9EA4	KAAN 149		151	DSOK	BR	
1EA2	3F13	KAAN 150	SETN			H1=H1$K01	SET NOT READY
1EA4	DA2A	KAAN 151	DSOK	154	FFORST	BR IF HO BIT5=0	CHECK EOC
1EA6	3F83	KAAN 152	TOOFAR			H1=H1$K08	SET WLR
1EA8	3F25	KAAN 153				H1=H1$K20	SET X
1EAA	2E25	KAAN 154	FFORST			HO=0$K20	
1EAC	4DEF	KAAN 155				FFO=HO	
1EAE	2E07	KAAN 156				HO=0	
1EB0	4FEF	KAAN 157				FOP=HO	
1EB2	3F43	KAAN 158				H1=H1$K04	SET ANY
1EB4	56B2	KAAN 159				RDH D DA,AE	SAVE PREVIOUS OP

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1EB6	D73A	KAAN 160		162	NOBIT	BR IF D1 BIT1=0	CK RECAL SEQ
1EB8	3F45	KAAN 161				H1=H1$K40	SAVE RECAL SEQ BIT
1EBA	5F79	KAAN 162	NOBIT			D1=H1	ASSEM. ERROR BYTE
1EBC	76B2	KAAN 163				STH D DA,AE	STORE ERROR
1EBE	1E00	KAAN 164	RSTCTL			RST FIB K=80	CHAIN END RESET
1EC0	1D00	KAAN 165				RST FIA K=80	RST TRAP LATCH
1EC2	1210	KAAN 166				RST MMSK K=81	ALLOW FILE TRAPS
1EC4	C54C	KAAN 167		171	ENDCK	BR IF G1 BIT0=0	BR IF NOT ON ALT TRK
1EC6	F5C7	KAAN 168	RESET	168	RESET	BR IF DASI BIT3=1	WAIT FOR ERASE TO FINISH
1EC8	0EC8	KAAN 169				RST FIB K=40	RST CHAIN END WITH INITIAL RST
1ECA	8236	KAAN 170		196	ALTTRK	BR	
1ECC	E501	KAAN 171	ENDCK	177	CKWR	BR IF G1 BIT2=1	BR IF ADDR OP
1ECE	D559	KAAN 172		199	SETUP	BR IF G1 BIT1=1	BR IF MORE THAN ONE SECTOR
1ED0	C056	KAAN 173		176	SECTO1	BR IF G0 BIT4=0	CK RBC
1ED2	F457	KAAN 174		176	SECTO1	BR IF G0 BIT3=1	CK FOR RBC OF SCAN OP
1ED4	E017	KAAN 175		195	NTMSMK	BR IF G0 BIT6=1	CK LO FOR RBC ADDR OP
1ED6	986E	KAAN 176	SECTO1	KEND 033	SECEND	BR	GO TO END SECT OP
1E80	F516	KAAN 177	CKWR	195	NTMSMK	BR IF G1 BIT3=0	BR IF WRITE ADDR. OP.
1E82	EF17	KAAN 178	CKX	195	NTMSMK	BR IF H1 BIT2=1	BR IF NO COMP ON ADDR OP
		KAAN 179	*				
		KAAN 180	*			***	
		KAAN 181	*			*	*
		KAAN 182	*			*	ENTER HERE ON ADDR. OPS TO CHECK FOR MISSING AM. *
		KAAN 183	*			*	*
		KAAN 184	*			***	
		KAAN 185	*				
1E84	56B2	KAAN 186				RDH D DA,AE	GET PREV. OP.
1E86	C217	KAAN 187		195	NTMSMK	BR IF D0 BIT4=1	BR IF TRK ADDR OP
1E88	5E32	KAAN 188				RDH H DA,8E	READ COUNT FIELD ADR K3
1E8A	2F48	KAAN 189				H1=H1+K04	UPDATE TO REC POS
1E8C	5DF0	KAAN 190				RDB P1 H	RD REC
1E8E	FD17	KAAN 191		195	NTMSMK	BR IF P1 BIT3=1	BR IF REC 16 OR MORE
1E90	3725	KAAN 192				D1=D1$K20	POST MISSING ADDR. MARK
1E92	3743	KAAN 193				D1=D1$K04	SET ANY
1E94	76B2	KAAN 194				STH D DA,AE	
1E96	85EE	KAAN 195	NTMSMK	KEND 030	ADREND	BR	GO TO END OP ADDR OP
0236	5652	KAAN 196	ALTTRK			RDH D DA,9A	END ON ALT TRK
0238	497F	KAAN 197				MS=D1	RESELECT MODULE
023A	A7CC	KAAN 198		KAAQ 034	DESLHD	BR	GO SEEK BACK
1ED8	3400	KAAN 199	SETUP			SET MODE K=80	SET CPU MODE AND ZONE
1EDA	6206	KAAN 200				V=U-2	GET V TO DCF
1EDC	6226	KAAN 201				V=V-2	GET V TO DCF
1EDE	6226	KAAN 202				V=V-2	GET V TO DCF
1EE0	9804	KAAN 203		KBBD 010	SECEND	BR	GO UPDATE DCF

```
***********************************
* CROSS REFERENCE FOR CSECT KAAN *
***********************************
KAAN 029   KAAA 101  KAAA 422  KAAH 027  KAAQ 054  KBBG 012
KAAN 051   KAAN 047
KAAN 052   KAAA 423
KAAN 081   KAAH 028
KAAN 086   KAAN 084
KAAN 089   KAAN 087
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**********************************
* CROSS REFERENCE FOR CSECT KAAN *
**********************************
KAAN 092    KAAN 098
KAAN 096    KAAN 092   KAAN 094
KAAN 098    KAAN 090
KAAN 122    KAAN 122
KAAN 130    KAAH 050
KAAN 145    KAAN 097
KAAN 150    KAAN 145   KAAN 146   KAAN 147   KAAN 148
KAAN 151    KAAN 149
KAAN 152    KAAH 079
KAAN 154    KAAN 151   KAAQ 008   KAAQ 010   KAAQ 012   KAAQ 014   KAAQ 018
KAAN 162    KAAN 160
KAAN 164    KAAQ 097
KAAN 168    KAAN 168
KAAN 171    KAAN 167   KBBG 018
KAAN 176    KAAN 173   KAAN 174
KAAN 177    KAAN 171
KAAN 195    KAAN 175   KAAN 177   KAAN 178   KAAN 187   KAAN 191
KAAN 196    KAAN 170
KAAN 199    KAAN 172
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ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		KAAQ 001	T			14XX FILE COMP.	R.E. AVIS 8/16/67
		KAAQ 002	*				
		KAAQ 003	*			ROUTINE KAAQ	END CONDITIONS
		KAAQ 004	*				
1650	2F23	KAAQ 005	MODER			H1=0$K02	SET V
1652	1423	KAAQ 006				G0=G0*-K02	CLEAR LO
1654	1525	KAAQ 007				G1=G1*-K20	CLEAR ADDR OP
1656	9EAA	KAAQ 008		KAAN 154	FFORST	BR	
270A	2F25	KAAQ 009	XERROR			H1=0$K20	SET X
270C	9EAA	KAAQ 010		KAAN 154	FFORST	BR	
2BC2	2F23	KAAQ 011	VERROR			H1=0$K02	SET V
2BC4	9EAA	KAAQ 012		KAAN 154	FFORST	BR	
0CBA	2F83	KAAQ 013	WLRERR			H1=0$K08	SET WLR
0CBC	9EAA	KAAQ 014		KAAN 154	FFORST	BR	
0390	2F13	KAAQ 015	NOTRDY			H1=0$K01	SET NOT READY
0392	15E5	KAAQ 016	CLEAR			G1=G1*-KE0	CLR ADDR OP DCF DONE AND ALT TRK
0394	1483	KAAQ 017				G0=G0*-K08	CLR RBC OP
0396	9EAA	KAAQ 018		KAAN 154	FFORST	BR	
07E0	2F07	KAAQ 019	BUSY			H1=0	
07E2	49FF	KAAQ 020				MS=H1	DESEL MOD
07E4	2F15	KAAQ 021				H1=0$K10	SET BUSY
07E6	8392	KAAQ 022		016	CLEAR	BR	
		KAAQ 023	*				
		KAAQ 024	*			**	
		KAAQ 025	*			* *	
		KAAQ 026	*			* ENTER HERE IF END OR HD. SW. ON ALTER. TRK. *	
		KAAQ 027	*			* THIS ROUTINE SETS UP THE CYL AND HD VALUES FOR *	
		KAAQ 028	*			* SEEKING TO ALTERNATE SURFACES AND RETURN TO DEF *	
		KAAQ 029	*			* SURFACES. THE CYL VALUE IS PLACED IN I1 REG. *	
		KAAQ 030	*			* THE HD VALUE IS PLACED IN THE D1 REG. *	
		KAAQ 031	*			* *	
		KAAQ 032	*			**	
		KAAQ 033	*				
27CC	9FEC	KAAQ 034	DESLHD	060	FORCE	BAL	
27CE	58E2	KAAQ 035	RSTTAG			RDH I DA,BC	GET CYL
27D0	5E32	KAAQ 036				RDH H DA,8E	READ COUNT FIELD ADR K3
27D2	2F3B	KAAQ 037				H1=H1+K03	UPDATE TO HD POS
27D4	57F0	KAAQ 038				RDB D1 H	PUT HD IN D1
27D6	57F9	KAAQ 039				H1=D1	
27D8	C4E6	KAAQ 040		047	DASIBR	BR IF ZNZ	BR IF HEAD NOT ZERO
27DA	DFE6	KAAQ 041		047	DASIBR	BR IF FOP BIT1=0	HEAD IS ZERO CK HEAD SW
27DC	5EB2	KAAQ 042				RDH H DA,AE	
27DE	3F25	KAAQ 043				H1=H1$K20	SET X ERROR
27E0	3FC3	KAAQ 044				H1=H1$K0C	SET WLR AND ANY
27E2	7EB2	KAAQ 045				STH H DA,AE	STORE ERROR
27E4	9FEC	KAAQ 046		060	FORCE	BAL	
27E6	F5E7	KAAQ 047	DASIBR	047	DASIBR	BR IF DASI BIT3=1	WAIT FOR ERASE DONE
27E8	3E08	KAAQ 048				SET FIB K=C0	SET NTO RST FLAG REG
27EA	021E	KAAQ 049				RST MMSK K=71	RELEASE PRIORITY
27EC	2F07	KAAQ 050				H1=0	ZERO H1
27EE	4BFF	KAAQ 051				TGR0=H1	RESET TAGS
27F0	4DFF	KAAQ 052				FF0=H1	RESET FLAGS
27F2	C1F8	KAAQ 053		056	NOUNS	BR IF DASI BIT4=0	BR IF NO UNUSUAL STAT

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
27F4	A5D0	KAAQ 054		KAAN 029	ERROR	BAL	GO STORE REGS
27F6	8390	KAAQ 055		015	NOTRDY	BR	UNUS STAT GO END
27F8	2F18	KAAQ 056	NOUNS			H1=H1+K01	DELAY BEFORE SEEK
27FA	DF78	KAAQ 057		056	NOUNS	BR IF H1 BIT1=0	
27FC	2F07	KAAQ 058				H1=0	
27FE	A800	KAAQ 059		KAAA 287	MOTSEK	BR	GO SEEK
1FEC	C179	KAAQ 060	FORCE	066	RTN	BR IF G1 BIT4=1	CK SECT. O
1FEE	3583	KAAQ 061				G1=G1$K08	FORCE SECTOR O
1FF0	5E52	KAAQ 062				RDH H DA,9A	
1FF2	5EF9	KAAQ 063				H1=HO	
1FF4	3F25	KAAQ 064				H1=H1$K20	
1FF6	7F52	KAAQ 065				STB H1 DA,9A	STORE MARK SECT O FORCED
1FF8	128E	KAAQ 066	RTN			RTN	
		KAAQ 067	*				
		KAAQ 068	*			***	
		KAAQ 069	*			*	*
		KAAQ 070	*			* THIS ROUTINE CHECKS THE DAC SCAN CONDITION.	*
		KAAQ 071	*			* THE 14XX SCAN BRANCH BYTE IS SET UP AND	*
		KAAQ 072	*			* STORED IN K8 OF AUX O STORAGE.	*
		KAAQ 073	*			*	*
		KAAQ 074	*			***	
		KAAQ 075	*				
2B60	2725	KAAQ 076	SCNERR			D1=0$K20	SET WLR
2B62	3583	KAAQ 077				G1=G1$K08	SET SECT O
2B64	2F15	KAAQ 078	SCNCND			H1=0$K10	SET EQUAL
2B66	FDF3	KAAQ 079		085	HIHIT	BR IF FFI BIT3=1	BR IF SCAN WAS EQ
2B68	2F65	KAAQ 080				H1=0$K60	SET UNEQ. LO
2B6A	E96E	KAAQ 081		083	CKSCLO	BR IF P1 BIT6=0	BRANCH IF SCAN WAS LO
2B6C	2FC5	KAAQ 082				H1=0$KCO	SET UNEQ. HI
2B6E	E04A	KAAQ 083	CKSCLO	099	HIOP	BR IF GO BIT6=0	BR IF HI OR EQ. OP.
2B70	EF74	KAAQ 084		086	BRREG	BR IF H1 BIT2=0	OP WAS LO BR IF NOT SCAN LO
2B72	3583	KAAQ 085	HIHIT			G1=G1$K08	SET SECT O
2B74	5C82	KAAQ 086	BRREG			RDH P DA,A8	READ OUT BR REG SAVE HI HALF
2B76	4FDB	KAAQ 087				P1=H1H+P1L	SET NEW COND.
2B78	7C82	KAAQ 088				STH P DA,A8	
2B7A	C151	KAAQ 089		093	CHREG	BR IF G1 BIT4=1	BR IF SECT O
2B7C	6204	KAAQ 090				V=U+2	
2B7E	5224	KAAQ 091				V=V+1	
2B80	AD20	KAAQ 092		KAAF 022	RESTOP	BR	NOT O GO SCH ID
2B50	3E00	KAAQ 093	CHREG			SET FIB K=80	SET NTO
2B52	0E04	KAAQ 094				RST FIB K=20	RST NTO
2B54	E75B	KAAQ 095		098	ENDWLR	BR IF D1 BIT2=1	BR IF WLR
2B56	2F07	KAAQ 096	EXITO1			H1=0	
2B58	9EBE	KAAQ 097		KAAN 164	RSTCTL	BR	GO TO END CHECK
2B5A	8CBA	KAAQ 098	ENDWLR	013	WLRERR	BR	WLR GO TO ERROR END
2B4A	FC75	KAAQ 099	HIOP	086	BRREG	BR IF GO BIT7=1	BR IF EQ. OP.
2B4C	CF73	KAAQ 100		085	HIHIT	BR IF H1 BIT0=1	OP WAS HI BR IF SCAN WAS HI
2B4E	AB74	KAAQ 101		086	BRREG	BR	
		KAAQ 102	*				
		KAAQ 103	*			***	
		KAAQ 104	*			*	*
		KAAQ 105	*			* ENTER HERE FROM STATUS WITH SECTOR 000	*
		KAAQ 106	*			*	*

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		KAAQ 107	*			**	
		KAAQ 108	*				
2B3E	F45D	KAAQ 109	SECTRO	115	SCCKGM	BR IF GO BIT3=1	BR IF SCAN TO CK GMWM
2B40	C65A	KAAQ 110		098	ENDWLR	BR IF DO BIT0=0	NOT SCAN BR IF NOT CNT 0
2B42	D65A	KAAQ 111		098	ENDWLR	BR IF DO BIT1=0	BR IF NOT GM WM
2B44	C056	KAAQ 112		096	EXIT01	BR IF GO BIT4=0	CK RBC
2B46	FDD7	KAAQ 113		096	EXIT01	BR IF FFI BIT3=1	RBC CK STAT MOD
2B48	ABC2	KAAQ 114		011	VERROR	BR	NO STAT MOD RBC V ERROR
2B5C	D660	KAAQ 115	SCCKGM	076	SCNERR	BR IF DO BIT1=0	SCAN CK GMWM WLR IF NOT
2B5E	ABA4	KAAQ 116		KAAH 122	SCCKCT	BR	GMWM OK GO TO CH AND DEV 1#

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                        ***********************************
                        * CROSS REFERENCE FOR CSECT KAAQ  *
                        ***********************************
KAAQ 005    KAAH 039
KAAQ 009    KAAA 035   KAAH 166
KAAQ 011    KAAH 131   KAAQ 114
KAAQ 013    KAAH 134   KAAQ 098
KAAQ 015    KAAA 102   KAAN 055   KAAQ 055   KBBG 013
KAAQ 016    KAAQ 022
KAAQ 019    KAAA 111
KAAQ 034    KAAN 198
KAAQ 035    KAAF 038
KAAQ 047    KAAN 137   KAAQ 040   KAAQ 041   KAAQ 047
KAAQ 056    KAAQ 053   KAAQ 057
KAAQ 060    KAAQ 034   KAAQ 046
KAAQ 066    KAAQ 060
KAAQ 076    KAAH 123   KAAQ 115
KAAQ 078    KAAH 125
KAAQ 083    KAAQ 081
KAAQ 085    KAAQ 079   KAAQ 100
KAAQ 086    KAAQ 084   KAAQ 099   KAAQ 101
KAAQ 093    KAAQ 089
KAAQ 096    KAAQ 112   KAAQ 113
KAAQ 098    KAAQ 095   KAAQ 110   KAAQ 111
KAAQ 099    KAAQ 083
KAAQ 109    KAAH 126
KAAQ 115    KAAQ 109
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ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		KBBB 001	T			14XX FILE COMP. R.E. AVIS 8/16/67	
		KBBB 002	*				
		KBBB 003	*			ROUTINE KBBB XFER COMMAND DECODE	
		KBBB 004	*				
		KBBB 005	*			**	
		KBBB 006	*			* *	
		KBBB 007	*			* THIS ROUTINE DECODES THE 14XX CMD INTO NPL FORM *	
		KBBB 008	*			* THE G REG CONTAINS THE TYPE OF 14XX CMD TO BE *	
		KBBB 009	*			* PERFORMED AND THE DAC OP REG IS SET AS FOLLOWS *	
		KBBB 010	*			*READ DATA OP REG = 06 *	
		KBBB 011	*			*WRITE DATA OP REG = 05 *	
		KBBB 012	*			*READ CNT KEY DATA OP REG = 1E *	
		KBBB 013	*			*WRITE CNT KEY DATA OP REG = 1D *	
		KBBB 014	*			*READ BACK CHECK EQ OP REG = 6D *	
		KBBB 015	*			*SCAN EQ OP REG = 2D *	
		KBBB 016	*			* *	
		KBBB 017	*			* *	
		KBBB 018	*			* *	
		KBBB 019	*			* ADDR AND SECT XFER ENTER HERE *	
		KBBB 020	*			* *	
		KBBB 021	*			**	
		KBBB 022	*				
OF3C	1485	KBBB 023	RESECH			G0=G0*-K80	RST SCH IN G REG
OF3E	2753	KBBB 024				D1=0$K05	SET DATA WRITE
OF40	F544	KBBB 025		027	CKADDR	BR IF G1 BIT3=0	CK WRITE OP
OF42	271B	KBBB 026				D1=D1+K01	SET READ
OF44	E538	KBBB 027	CKADDR	062	SCXFER	BR IF G1 BIT2=0	CK ADDR OP
OF46	271D	KBBB 028				D1=D1+K10	ADDR OP SET CNT
OF48	278B	KBBB 029				D1=D1+K08	SET KEY
OF4A	4F7F	KBBB 030				FOP=D1	SEND OP
OF4C	3D00	KBBB 031	SENDGO			SET FIA K=80	SEND GO
OF4E	3490	KBBB 032				SET MODE K=89	2311 MODE AND ZONE
OF50	2807	KBBB 033				I0=0	CNT HI EQ 0
OF52	2915	KBBB 034				I1=0$K10	CNT LOW EQ 16
OF54	5A32	KBBB 035				RDH T DA,8E	READ COUNT FIELD ADR K3
OF56	3480	KBBB 036				SET MODE K=88	CPU ZONE
OF58	F56A	KBBB 037		045	WRADOP	BR IF G1 BIT3=0	CK WR ADDR OP
OF5A	3490	KBBB 038				SET MODE K=89	READ ADDR 2311 ZONE FOR CLOCKING
OF5C	6CA4	KBBB 039				P=T+2	SET CNT
OF5E	5DC9	KBBB 040				P0=P1	
OF60	6DB1	KBBB 041	CPCTZR			P1=P1□T1	COMPARE
OF62	C4E9	KBBB 042		048	EXIT03	BR IF Z=0	READ 2 BYTES THEN BR
OF64	5CD9	KBBB 043				P1=P0	
OF66	8F60	KBBB 044		041	CPCTZR	BR	GO COMP AGAIN
OF6A	5224	KBBB 045	WRADOP			V=V+1	WR ADDR OP GET B STAR +1
OF6C	2F07	KBBB 046				H1=0	
OF6E	9E06	KBBB 047		KAAA 158	BBBTWO	BR	GO CONVERT DCF TO BIN
OF68	9800	KBBB 048	EXIT03	KBBD 008	BINCM6	BR	GO CONVERT BIN TO DCF
		KBBB 049	*				
		KBBB 050	*			**	
		KBBB 051	*			* *	
		KBBB 052	*			* RBC AND SCAN XFER ENTER HERE *	
		KBBB 053	*			* *	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		KBBB 054	*			***
		KBBB 055	*				
0F2C	1485	KBBB 056	OPREST			G0=G0*-K80	RST SCH IN G REG
0F2E	27D3	KBBB 057				D1=0$K0D	SET KEY,DATA,WRITE
0F30	F437	KBBB 058		061	SCANEQ	BR IF G0 BIT3=1	BR ON SCAN OP
0F32	3765	KBBB 059				D1=D1$K60	SET RBC EQ.
0F34	EC71	KBBB 060		064	RCADDR	BR IF G0 BIT6=1	CK LO FOR RBC OF ADDR OP
0F36	3725	KBBB 061	SCANEQ			D1=D1$K20	SET SCAN EQ.
0F38	3445	KBBB 062	SCXFER			G0=G0$K40	SET 1ST XFER
0F3A	8F7A	KBBB 063		069	START	BR	
0F70	5A42	KBBB 064	RCADDR			RDH T DA,98	RBC ADDR OP START OF +6
0F72	2B6B	KBBB 065				T1=T1+K06	ADD 6 TO ADDR TO BYPASS CNT
0F74	F4F8	KBBB 066		068	NUDAAD	BR IF AC=0	CK FOR CARRY
0F76	2A1B	KBBB 067				T0=T0+K01	ADD CARRY
0F78	42A6	KBBB 068	NUDAAD			V=T	STORE NEW DATA ADDR.
0F7A	4F7F	KBBB 069	START			FOP=D1	SEND OP
0F7C	3D00	KBBB 070				SET FIA K=80	SEND GO
0F7E	A8BC	KBBB 071		KBBC 009	DECSEC	BR	GO DECREMENT SECTOR CNT

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                                      ************************************
                                      * CROSS REFERENCE FOR CSECT KBBB *
                                      ************************************

KBBB 023      KAAH 176
KBBB 027      KBBB 025
KBBB 031      KAAH 136
KBBB 041      KBBB 044
KBBB 045      KBBB 037
KBBB 048      KBBB 042
KBBB 056      KAAH 045   KAAH 190
KBBB 061      KBBB 058
KBBB 062      KBBB 027
KBBB 064      KBBB 060
KBBB 068      KBBB 066
KBBB 069      KBBB 063
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ADDR    WORD   SEQUENCE NO.  LABEL   NEXTSEQ   NEXTLABEL  STATEMENT                    COMMENTS

               KBBC 001    T                            KBBC DEC SECTOR                    R.HUTCHINSON
               KBBC 002    *                            ************************************************************
               KBBC 003    *
               KBBC 004    *                            KBBC THIS ROUTINE DECREMENTS THE SECTOR COUNT G1BIT4 IS SECTOR 0
               KBBC 005    *                            DATA XFERS OCCUR DURING PREFETCH. END TRAP WILL FORCE
               KBBC 006    *                            ADDR 0140 ROUTINE KAAH
               KBBC 007    *
               KBBC 008    *                            ************************************************************
28BC    3400   KBBC 009    DECSEC                       SET MODE K=80
28BE    2CB5   KBBC 010                                 P0=0$KB0                  BUILD MOVE MASK
28C0    D145   KBBC 011             013    READAD       BR IF G1 BIT5=1           BR IF MOVE
28C2    2CF5   KBBC 012                                 P0=0$KF0                  BUILD LOAD MASK
28C4    2D07   KBBC 013    READAD                       P1=0                      READ S1                BBB+7
28C6    5718   KBBC 014                                 RDB D1 U+1                READ S1                BBB+7
28C8    5918   KBBC 015                                 RDB I1 U+1                READ S2                BBB+8
28CA    5B10   KBBC 016                                 RDB T1 U                  READ S3                BBB+9
28CC    67C5   KBBC 017                                 D1=D1$P0                  DESTROY ZONE
28CE    69C5   KBBC 018                                 I1=I1$P0                  DESTROY ZONE
28D0    6BC5   KBBC 019                                 T1=T1$P0                  DESTROY ZONE
28D2    57FD   KBBC 020                                 H1=D1L                    S1 TO WORK
28D4    596D   KBBC 021                                 D0=I1L                    S2 TO WORK
28D6    5BED   KBBC 022                                 H0=T1L                    S3 TO WORK
28D8    10EE   KBBC 023                                 RST S K=FE                RESET S REG
28DA    3000   KBBC 024                                 SET S0                    SET COMP
28DC    7EDF   KBBC 025                                 H0C=H0aP1+C               DEC S3
28DE    76DF   KBBC 026                                 D0C=D0aP1+C               DEC S2
28E0    7FDF   KBBC 027                                 H1C=H1aP1+C               DEC S1
28E2    4EBD   KBBC 028                                 T1=H0L+T1H                RESTORE S3
28E4    469D   KBBC 029                                 I1=D0L+I1H                RESTORE S2
28E6    4F7D   KBBC 030                                 D1=H1L+D1H                RESTORE S1
28E8    7B1A   KBBC 031                                 STB T1 U-1                STORE S3
28EA    791A   KBBC 032                                 STB I1 U-1                STORE S2
28EC    7710   KBBC 033                                 STB D1 U                  STORE S1
28EE    E5F9   KBBC 034             039    NOCNT0       BR IF S2=1                BR IF NOT SECTOR 0
28F0    3583   KBBC 035                                 G1=G1$K08                 SET G1 BIT4 SECTOR COUNT 0
28F2    3480   KBBC 036                                 SET MODE K=88             CPU ZONE FILE MODE
28F4    2D25   KBBC 037                                 P1=0$K20                  RESET CC
28F6    4DDF   KBBC 038                                 FF0=P1                    RESET CC
28F8    7242   KBBC 039    NOCNT0                       STH V DA,98               DATA ADR TO STORAGE    K4
28FA    3490   KBBC 040                                 SET MODE K=89             FILE MODE&ZONE
28FC    5A42   KBBC 041                                 RDH T DA,98               DATA ADR TO T          K4
28FE    58F2   KBBC 042                                 RDH I DA,BE               WORD COUNT TO I        KF
2900    53BC   KBBC 043    PRDAL0                       RDB FEB0 T+1              PRE FETCH BYTE OF DATA
               KBBC 044    *                            T REG ADDR. WILL INCRE. +1 WHEN DATA CYCLE OCCURS
2902    A900   KBBC 045             043    PRDAL0       BR                        UNTIL END TRAP OCCURS
                                                        ***********************************
                                                        * CROSS REFERENCE FOR CSECT KBBC *
                                                        ***********************************

KBBC 009    KAAF 055   KBBB 071
KBBC 013    KBBC 011   KBBD 062
KBBC 039    KBBC 034
KBBC 043    KBBC 045
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ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		KBBD 001	T			KBBD BINARY TO CM-6	R.HUTCHINSON
		KBBD 002	*			***	
		KBBD 003	*				
		KBBD 004	*			KBBD THIS ROUTINE CONVERTS BINARY COUNT FIELDS TO CM-6	
		KBBD 005	*			DURING READ ADDR OPERATION AND AT THE COMPLETION OF SECTOR OPS	
		KBBD 006	*				
		KBBD 007	*			***	
1800	3400	KBBD 008	BINCM6			SET MODE K=80	SET CPU MODE ZONE
1802	5242	KBBD 009				RDH V DA,98	READ DATA ADR K4
1804	2CF5	KBBD 010	SECEND			PO=O$KFO	BLD LOAD MASK NO ZONE NO WM
1806	D10A	KBBD 011		013	LOAD	BR IF G1 BIT5=0	BR IF LOAD
1808	2CB5	KBBD 012				PO=O$KBO	BUILD MOVE MASK NO ZONE
180A	5F30	KBBD 013	LOAD			RDB H1 V	READ 1ST 14XX STORAGE POS
180C	6FC5	KBBD 014				H1=H1$PO	DESTROY ZONE
180E	1FF3	KBBD 015				H1=H1*-KOF	ZERO DIGITS
1810	7F38	KBBD 016				STB H1 V+1	STORE 1ST POSITION
1812	5632	KBBD 017	CNFLAD			RDH D DA,8E	READ COUNT FIELD ADR · K3
1814	5A78	KBBD 018				RDH T D+2	READ BIN CYL
1816	5864	KBBD 019				I=D+1	POINT TO HR
1818	278B	KBBD 020				D1=D1+K08	POINT ADR TO TABLE
181A	6BB3	KBBD 021				T1=T1+T1	MAKE CYL EVEN
181C	67B3	KBBD 022				D1=D1+T1	ADD CYL TO BASE
181E	5A70	KBBD 023				RDH T D	READ TABLE TO T TOH=TENS L=HUND
1820	5F30	KBBD 024				RDB H1 V	READ CM6 HUNDS
1822	6FC5	KBBD 025				H1=H1$PO	DESTROY ZONE
1824	56E2	KBBD 026				RDH D DA,BC	READ DCF MODULE VALUE KE
1826	10EE	KBBD 027				RST S K=FE	RESET S REG ·
1828	76AF	KBBD 028				DOC=DOaTO+C	ADD MODULE
182A	46FD	KBBD 029				H1=DOL+H1H	MERGE HUND VALUE
182C	7F38	KBBD 030				STB H1 V+1	STORE HUNDS ·
182E	5F30	KBBD 031				RDB H1 V	READ CM6 TENS
1830	6FC5	KBBD 032				H1=H1$PO	DESTROY ZONE
1832	4AF5	KBBD 033				H1=TOXL$H1H	MERGE TENS VALUE
1834	7F38	KBBD 034				STB H1 V+1	STORE TENS
1836	5D98	KBBD 035				RDB P1 I+1	READ BINARY HEAD
1838	5F90	KBBD 036				RDB H1 I	READ BINARY RECORD
183A	3FOD	KBBD 037				H1=H1-KOO	REMOVE 1 FROM RECORD
183C	5F79	KBBD 038				D1=H1	BIN RECORD
183E	2002	KBBD 039				SET S3	SET RECORD TEN INDICATOR
1840	3F9B	KBBD 040				H1=H1-K09	REMOVE TEN
1842	E0C9	KBBD 041		044	HDWORK	BR IF HZ=0	BR IF TEN H1 CORRECT
1844	10EE	KBBD 042				RST S K=FE	RST RECORD TEN INDICATOR
1846	57F9	KBBD 043				H1=D1	RESTORE RECORD
1848	2A95	KBBD 044	HDWORK			TO=O$K90	BUILD DECIMAL DIGIT
184A	4DAD	KBBD 045				TO=P1L+TOH	MERGE HEAD VALUE
184C	7DAF	KBBD 046				P1C=P1aTO+C	DOUBLE HEAD
184E	F4D2	KBBD 047		049	HEAD4	BR IF AC=0	BR IF HEAD 4OR LESS
1850	2B1B	KBBD 048				T1=T1+K01	ADD ONE TO UNITS
1852	5730	KBBD 049	HEAD4			RDB D1 V	READ CM6 UNITS
1854	67C5	KBBD 050				D1=D1$PO	DESTROY ZONE
1856	4B7D	KBBD 051				D1=T1L+D1H	MERGE UNITS
1858	7738	KBBD 052				STB D1 V+1	STORE UNITS
185A	5730	KBBD 053				RDB D1 V	READ CM6 HEAD

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
185C	67C5	KBBD 054				D1=D1$P0	DESTROY ZONE
185E	4D7D	KBBD 055				D1=P1L+D1H	MERGE HEAD
1860	7738	KBBD 056				STB D1 V+1	STORE HEAD
1862	5730	KBBD 057				RDB D1 V	READ CM6 RECORD
1864	67C5	KBBD 058				D1=D1$P0	DESTROY ZONE
1866	4F7D	KBBD 059				D1=H1L+D1H	MERGE RECORD
1868	7738	KBBD 060				STB D1 V+1	STORE RECORD V POINTS TO ISTDATA
186A	E56E	KBBD 061		KEND 033	SECEND	BR IF G1 BIT2=0	BR IF SECTOR OP
186C	A8C4	KBBD 062		KBBC 013	READAD	BR	OP IS READ ADR

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************************************
* CROSS REFERENCE FOR CSECT KBBD *
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KBBD 008	KBBB 048
KBBD 010	KAAN 203
KBBD 013	KBBD 011
KBBD 044	KBBD 041
KBBD 049	KBBD 047

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		KBBE 001	T			KBBE SEEK OP	R.HUTCHINSON
		KBBE 002	*			**	
		KBBE 003	*				
		KBBE 004	*			KBBE THIS ROUTINE WILL DECODE A SEEK OP ADDRESS INTO A BINARY	
		KBBE 005	*			VALUE	
		KBBE 006	*				
		KBBE 007	*			**	
243E	0DBB	KBBE 008	SKCHK			Z=P1¤KOB	CHECK FOR # DIRECT SEEK
2440	F0E6	KBBE 009		028	RNTOHM	BR IF LZNZ	BR IF RETURN TO HOME SEEK
2442	1E23	KBBE 010				HO=HO*-KO2	CLR RECALIBRATE
2444	390D	KBBE 011				I1=I1-K00	REMOVE 1 FROM BIN CYL
2446	58B9	KBBE 012				T1=IO	BBB+4 CHAR FOR TLU
2448	3B45	KBBE 013				T1=T1$K40	FORCE WM POSITION
244A	2A07	KBBE 014				TO=0	SET AUX STORAGE 0
244C	57A0	KBBE 015				RDB D1 AS,T	READ BBB+4 IN DECIMAL
244E	3480	KBBE 016				SET MODE K=88	SET CPU ZONE FILE MODE
2450	516F	KBBE 017				DO=FBI	PRESENT CYLINDER VALUE TO DO
2452	3400	KBBE 018				SET MODE K=80	SET CPU ZONE CPU MODE
2454	10EE	KBBE 019				RST S K=FE	RESET S REG
2456	E75C	KBBE 020		023	INCDEC	BR IF D1 BIT2=0	BR IF POSITIVE
2458	F75D	KBBE 021		023	INCDEC	BR IF D1 BIT3=1	BR IF POSITIVE
245A	3002	KBBE 022				SET S K=90	SET SO&S3 OP IS REVERSE
245C	769D	KBBE 023	INCDEC			DOC=DO%I1+C	BINARY
245E	C5E4	KBBE 024		027	NEWCYL	BR IF SO=0	BR IF FORWARD
2460	F5E5	KBBE 025		027	NEWCYL	BR IF S3=1	BR IF WITHIN LIMITS
2462	16FF	KBBE 026				DO=DO¤KFF	MAKE CYL WITHIN LIMITS
2464	5699	KBBE 027	NEWCYL			I1=DO	NEW CYL TO I1
2466	2713	KBBE 028	RNTOHM			D1=0$KO1	BUILD HEAD1
2468	EA6D	KBBE 029		037	RTN000	BR IF HO BIT6=1	BR IF RECALIBRATE
246A	A800	KBBE 030		KAAA 287	MOTSEK	BR	GO SEEK
		KBBE 031	*			**	
		KBBE 032	*				
		KBBE 033	*			THIS ROUTINE ISSUES A RECALIBRATE COMMAND. A TRAP WILL OCCUR IN	
		KBBE 034	*			15 MILS RETURN WILL BE TO KBBG RECRTN	
		KBBE 035	*				
		KBBE 036	*			**	
246C	3480	KBBE 037	RTN000			SET MODE K=88	CPU ZONE FILE MODE
246E	3523	KBBE 038				G1=G1$KO2	SET G1 BIT6=RECALIBRATE
2470	2D23	KBBE 039				P1=0$KO2	
2472	4EDF	KBBE 040				FBO=P1	RETURN TO 0 BUS
2474	2D15	KBBE 041				P1=0$K10	
2476	4BDF	KBBE 042				TGRO=P1	CONTROL TAG
2478	A478	KBBE 043	DELAY1	043	DELAY1	BR	WAIT HERE UNTIL TRAP OCCURS

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                              * CROSS REFERENCE FOR CSECT KBBE *
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KBBE 008      KAAA 195
KBBE 023      KBBE 020    KBBE 021
KBBE 027      KBBE 024    KBBE 025
KBBE 028      KBBE 009
KBBE 037      KBBE 029
KBBE 043      KBBE 043
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ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		KBBG 001	T			KBBG DEVICE END	R.HUTCHINSON
		KBBG 002	*			***	
		KBBG 003	*				
		KBBG 004	*			THIS ROUTINE WILL WAIT FOR DEVICE ENDS AS A RESULT OF SEEKS TO	
		KBBG 005	*			DEF/ALT TRACKS AND RECALIBRATE OPERATION	
		KBBG 006	*				
		KBBG 007	*			***	
2854	CEE1	KBBG 008	RECRTN	014	SGA	BR IF DS BIT0=1	BR IF READY
2856	EEDD	KBBG 009		012	NOTRDY	BR IF DS BIT2=1	BR IF UNSAFE
2858	FADD	KBBG 010		012	NOTRDY	BR IF DS BIT7=1	BR IF SEEK INCOMPLETE
285A	A854	KBBG 011		008	RECRTN	BR	WAIT FOR READY
285C	A5D0	KBBG 012	NOTRDY	KAAN 029	ERROR	BAL	GO STORE REGS
285E	8390	KBBG 013		KAAQ 015	NOTRDY	BR	GO SET NOT READY
2860	8BF0	KBBG 014	SGA		027 ATTEN	BAL	GO RESET ATTEN
2862	E166	KBBG 015		017	SECTCK	BR IF G1 BIT6=0	BR IF NOT RECALIBRATE
2864	A800	KBBG 016		KAAA 287	MOTSEK	BR	GO SEEK
2866	C14C	KBBG 017	SECTCK	019	ALTRTN	BR IF G1 BIT4=0	BR IF NOT SECTOR 0
2868	9ECC	KBBG 018	ENDCHK	KAAN 171	ENDCK	BR	
284C	C56A	KBBG 019	ALTRTN	023	CLRRCD	BR IF G1 BIT0=0	BR IF NOT ALT TRK RETURN
284E	1585	KBBG 020				G1=G1*-K80	CLR ALT TRACK RETURN
2850	9B62	KBBG 021		KAAA 325	HDSLCT	BAL	
2852	AD0C	KBBG 022		KAAF 012	RUSAVS	BR	CONTINUE OP NEXT HEAD
286A	1443	KBBG 023	CLRRCD			G0=G0*-K04	CLR RECORD 0
286C	3585	KBBG 024				G1=G1$K80	SET ALT TRACK RETURN
286E	9B62	KBBG 025		KAAA 325	HDSLCT	BAL	
2870	AD0C	KBBG 026		KAAF 012	RUSAVS	BR	CONTINUE OP NEXT HEAD
0BF0	2C45	KBBG 027	ATTEN			P0=0$K40	* RESET
0BF2	4ECF	KBBG 028				FB0=P0	SET READ GATE
0BF4	2C15	KBBG 029				P0=0$K10	* ATTENTION
0BF6	4BCF	KBBG 030				TGR0=P0	SET CTRL *
0BF8	2C07	KBBG 031				P0=0	*
0BFA	4ECF	KBBG 032				FB0=P0	RST READ GATE *
0BFC	4BCF	KBBG 033				TGR0=P0	RST CTRL *
0BFE	128E	KBBG 034				RTN	*

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************************************
* CROSS REFERENCE FOR CSECT KBBG *
************************************
```

```
KBBG 008    KAAA 324   KAAH 026   KBBG 011
KBBG 012    KBBG 009   KBBG 010
KBBG 014    KBBG 008
KBBG 017    KBBG 015
KBBG 019    KBBG 017
KBBG 023    KBBG 019
KBBG 027    KAAA 112   KBBG 014
```

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		KBBH 001	T			KBBH INC DCF	R.HUTCHINSON
		KBBH 002	*			***	
		KBBH 003	*				
		KBBH 004	*			KBBH THIS ROUTINE WILL INCREMENT THE BINARY DCF. IF THE HEAD	
		KBBH 005	*			VALUE IS CHANGED, THE OP REG WILL BE SET FOR HEAD SWITCH	
		KBBH 006	*				
		KBBH 007	*			***	
2AC6	5E32	KBBH 008	INCDCF			RDH H DA,8E	READ COUNT FIELD ADR K3
2AC8	2F4B	KBBH 009				H1=H1+K04	SET H1 TO RECORD POSITION
2ACA	57F0	KBBH 010				RDB D1 H	READ RECORD
2ACC	F768	KBBH 011		025	INCREM	BR IF D1 BIT3=0	BR IF RECORD LESS THAN 16
2ACE	D368	KBBH 012		025	INCREM	BR IF D1 BIT5=0	BR IF RECORD LESS THAN 4
2AD0	2713	KBBH 013				D1=0$K01	RECORD IS 20 MAKE 1
2AD2	26B5	KBBH 014				D0=0$KB0	
2AD4	3613	KBBH 015				D0=D0$K01	
2AD6	4F6F	KBBH 016				FOP=D0	SET OP=MULTI-TRK SEARCH
2AD8	77FA	KBBH 017				STB D1 H-1	STORE RECORD
2ADA	57F0	KBBH 018				RDB D1 H	READ BINARY HEAD
2ADC	079B	KBBH 019				Z=D1¤K09	CHK FOR HEAD 9
2ADE	C4E8	KBBH 020		025	INCREM	BR IF ZNZ	BR IF NOT HEAD 9
2AE0	2707	KBBH 021				D1=0	HEAD 9 MAKE 0
2AE2	77F0	KBBH 022				STB D1 H	STORE HEAD
2AE4	6EE6	KBBH 023				H=H-2	POINT H TO CC
2AE6	57F0	KBBH 024				RDB D1 H	READ CYL
2AE8	271B	KBBH 025	INCREM			D1=D1+K01	INCREMENT CYL OR RECORD OR HEAD
2AEA	77F0	KBBH 026				STB D1 H	STORE RECORD OR HEAD OR CYL
2AEC	3545	KBBH 027	DCFDON			G1=G1$K40	SET DCF DONE
2AEE	AD00	KBBH 028		KAAF 036	SCHDES	BR	BR TO SEARCH DECISION

```
*********************************
* CROSS REFERENCE FOR CSECT KBBH *
*********************************
```

```
KBBH 008    KAAF 035
KBBH 025    KBBH 011  KBBH 012  KBBH 020
```

KEND   DESCRIPTIVE   TEXT

ENTRY POINTS   SEKEND

    STOP60   NORMAL ENTRY FROM START FILE ROUTINE FOR PERFORM-
                                                                                    ING ENDING OF A SEEK OPERATION.
            THIS ENTRY IS FROM THE START FILE ROUTINE WHEN A
            MODULE MISMATCH IS DETECTED.   ADREND

    STOP10   NORMAL ENTRY USED FOR ENDING READ/WRITE WITH
                                                                                    ADDRESS OPERATIONS.
            ENTRY HERE IS FROM THE START FILE ROUTINE FOR A
            READ BACK CHECK INTERLOCK STOP.   SECEND

                                                                                    NORMAL ENTRY USED FOR ENDING SECTOR OPERATIONS.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		KEND 001	T		KEND RESTORE STARS		R.HUTCHINSON
1CEA	2665	KEND 002	STOP60			DO=O$K60	MODULE MISMATCH SET STOP CODE
1CEC	5412	KEND 003				RDH G DA,8A	GET I BACK UP
1CEE	6446	KEND 004				G=G-2	BACK I CYCLES UP 8 COUNTS
1CF0	6446	KEND 005				G=G-2	
1CF2	6446	KEND 006				G=G-2	
1CF4	6446	KEND 007				G=G-2	
1CF6	7412	KEND 008				STH G DA,8A	POINT TO FILE OP FOR RETRY
1CF8	9F72	KEND 009		013	ZEROD1	BR	
1F6C	1E00	KEND 010	STOP10			RST FIB K=80	CHAIN END RESET , DESELECT MOD
1F6E	3400	KEND 011				SET MODE K=80	SET CPU MODE&ZONE
1F70	2615	KEND 012				DO=O$K10	RBC STOP SET STOP CODE
1F72	76F2	KEND 013	ZEROD1			STH D DA,BE	STORE STOP CODE
1F74	5622	KEND 014				RDH D DA,8C	RESTORE D REG K2
1F76	5812	KEND 015				RDH I DA,8A	GET I STAR FROM BACKUP K1
1F78	A044	KEND 016		IDIS 003	STOPPP	BR	BR TO STOP ROUTINE
02C0	4026	KEND 017	SEKEND			U=V	MAKE A STAR U =BBB+6
02C2	5224	KEND 018	UPDATE			V=V+1	MAKE B STAR V =BBB+7
02C4	1E00	KEND 019	STAROK			RST FIB K=80	TURN ON CHAIN END
02C6	2C07	KEND 020				PO=0	
02C8	4FCF	KEND 021				FOP=PO	RST OP
02CA	4DCF	KEND 022				FFO=PO	RST FLAGS
02CC	3400	KEND 023				SET MODE K=80	
02CE	5622	KEND 024				RDH D DA,8C	RESTORE D REG K2
02D0	1625	KEND 025				DO=DO*-K20	CLEAR INVALID A STAR
02D2	5812	KEND 026				RDH I DA,8A	GET I STAR FROM BACKUP K1
02D4	021E	KEND 027				RST MMSK K=71	RESET MMSK 7
02D6	2C07	KEND 028				PO=0	
02D8	8D7C	KEND 029		ICYC 037	HISTRT	BR	BR TO I CYCLES
05EE	3480	KEND 030	ADREND			SET MODE K=88	
05F0	6004	KEND 031				U=U+2	MAKE A STAR U =BBB+9
05F2	9872	KEND 032		035	RDDAAD	BR	
186E	3480	KEND 033	SECEND			SET MODE K=88	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS	
1870	5006	KEND 034				U=U-1	MAKE A STAR U =BBB+6	
1872	5242	KEND 035	RDDAAD			RDH V DA,98	READ DATA ADDRESS	K4
1874	9EE2	KEND 036		037	BSTAR	BR		
1EF2	5652	KEND 037	BSTAR			RDH D DA,9A	GET MARKS	
1EE4	D66D	KEND 038		042	ADD	BR IF D0 BIT1=1	CK END WITH GMWM	
1EE6	F46F	KEND 039		043	ASIS	BR IF G0 BIT3=1	NO GM , IS IT SCAN	
1EE8	C16E	KEND 040		043	ASIS	BR IF G1 BIT4=0	NOT SCAN IS IT SECT 0	
1EEA	E66F	KEND 041		043	ASIS	BR IF D0 BIT2=1	WAS SECT 0 FORCED	
1EEC	82C2	KEND 042	ADD	018	UPDATE	BR	ADD 1 TO B STAR	
1EEE	82C4	KEND 043	ASIS	019	STAROK	BR	B STAR OK	

```
*********************************
* CROSS REFERENCE FOR CSECT KEND *
*********************************
```

```
KEND 002      KAAA 060   KAAA 086
KEND 010      KAAA 136
KEND 013      KEND 009
KEND 017      KAAA 323
KEND 018      KEND 042
KEND 019      KEND 043
KEND 030      KAAN 195
KEND 033      KAAN 176   KBBD 061
KEND 035      KEND 032
KEND 037      KEND 036
KEND 042      KEND 038
KEND 043      KEND 039   KEND 040   KEND 041
```

```
ADDR    WORD   SEQUENCE NO.  LABEL      NEXTSEQ   NEXTLABEL  STATEMENT                    COMMENTS

               LERR 001   T                     BRANCH ON PUNCH ERROR ROUTINE                                       RUCKER
0160    3462   LERR 002   ERRTST 0                          SET MODE K=96            2540 ZONE, PUNCH MODE
0162    C461   LERR 003              002      ERRTST 0   BR IF GO BIT0=1         IF BUSY-WAIT FOR NOT BUSY
0164    FFEC   LERR 004              008      NOERR      BR IF PS BIT3=0         BR IF NO ERROR
0166    1F00   LERR 005                                  RST P K=80              RESET PUNCH ERROR
0168    3400   LERR 006                                  SET MODE K=80           CPU MODE
016A    9E72   LERR 007   IUBR 002   UNCDBR              BR
016C    3400   LERR 008   NOERR                          SET MODE K=80           CPU MODE
016E    8D7C   LERR 009   NOERRR     ICYC 037  HISTRT    BR                      TO I-CYCLE START
                                               **********************************
                                               * CROSS REFERENCE FOR CSECT LERR *
                                               **********************************

LERR 002     IBCH 088   LERR 003
LERR 008     LERR 004
```

LOPD   DESCRIPTIVE   TEXT

READ AND PUNCH OP DECODE ROUTINE

ENTRY POINTS

LOAD

THIS IS THE ENTRY POINT FROM THE IPL START-RESET
ROUTINE. IT IS USED WHEN AN IPL IS DONE FROM THE
2540.

RDRPCH

NORMAL ENTRY POINT. ALL 2540 READER PUNCH OPS AND
READER PUNCH PORTION OF COMBINATION OPS ENTER AT
THIS POINT FROM ICYC. THE OPERATION IS DECODED
AND BRANCHES TO THE APPROPRIATE ROUTINE FOR
EXECUTION.

NOTI25

THIS IS A NORMAL RE-ENTRY POINT FROM THE PUNCH AND
READ ENDING ROUTINES. RESTORE REGISTERS, TEST FOR
COMBINATION OPS AND UNCONDITIONAL BRANCH.

RETURN

THIS ENTRY POINT IS USED FROM THE ROUTINE FOR
TRANSFER OF ROW IMAGE TO COLUMN BINARY AND FOR A
RETURN FROM INTERVENTION REQUIRED HALT.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		LOPD 001	T		1400	READ AND PUNCH OP DECODE.	RUCKER
		LOPD 007	*			THE READ AND PUNCH OP ARE DECODED TO ENTER THE APPROPRIATE	
		LOPD 008	*			SUB-ROUTINE. I 2-5 IS INTERROGATED FOR COL BIN OR PFR MODIFIERS	
		LOPD 009	*			AND STATUS BITS SET FOR FUTURE BRANCHING. G1 BIT0-PFR OP	
		LOPD 010	*			IF READ OP, NECESSARY REGISTERS ARE INITIALIZED. DO BIT7-COL BIN	
257A	2513	LOPD 011	LOAD			G1=0$K01	INITIAL PROGRAM LOAD
257C	1613	LOPD 012	RDRPCH			DO=DO*-K01	SET DO BIT7=0
257E	0677	LOPD 013				Z=DO*-K77	MASK FOR I2-3-5-6
2580	C4A1	LOPD 014		030	NOTI25	BR IF Z=0	BR IF NOT I-2-3-5-6
2582	2BC5	LOPD 015				T1=0$KC0	I25
2584	2B3B	LOPD 016				T1=T1+K03	SET T TO MASK FOR A C IN D1
2586	6B71	LOPD 017				T1=T1□D1	TEST FOR C
2588	C494	LOPD 018		024	TSTPFR	BR IF ZNZ	BR IF NOT C-NO COL BIN
258A	5EC2	LOPD 019				RDH H DA,B8	
258C	CA14	LOPD 020		024	TSTPFR	BR IF HO BIT4=0	BR IF COL BIN NOT INSTALLED
258E	055B	LOPD 021				Z=G1□K05	MASK FOR COMBINED OP
2590	F095	LOPD 022		024	TSTPFR	BR IF LZ=0	SKIP COL BIN OP IF COMBINED OP
2592	3613	LOPD 023				DO=DO$K01	SET COL BIN INDICATOR
2594	2BD5	LOPD 024	TSTPFR			T1=0$KD0	SET T
2596	2B9B	LOPD 025				T1=T1+K09	FOR R MASK
2598	6B71	LOPD 026				T1=T1□D1	TEST FOR R
259A	C4A0	LOPD 027		030	NOTI25	BR IF ZNZ	BR IF NOT R
259C	F139	LOPD 028		053	INVDOP	BR IF G1 BIT7=1	BR TO INVALID OP IF 5-7R OP
259E	3585	LOPD 029				G1=G1$K80	SET PFR INDICATOR
25A0	8258	LOPD 030	NOTI25	IREG 006	STREGS	BAL	STORE U,V,I,G, D
25A2	F13B	LOPD 031		042	1OP	BR IF G1 BIT7=1	BR IF READ OP
25A4	D137	LOPD 032		041	4OP	BR IF G1 BIT5=1	BR IF PUNCH OP

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
25A6	C137	LOPD 033		041	40P	BR IF G1 BIT4=1	BR IF PFR OP
25A8	98EA	LOPD 034		IREG 016	RSTREG	BAL	RESTORE U,V,I,G,D
25AA	1615	LOPD 035	TESTBR			DO=DO*-K10	SET B STAR VALID IND
25AC	2C07	LOPD 036				PO=0	
25AE	D235	LOPD 037		040	BRANCH	BR IF DO BIT5=1	BR IF 14 OP
25B0	C635	LOPD 038	TESTI5	040	BRANCH	BR IF DO BIT0=1	BR IF I5 OP
25B2	8D7C	LOPD 039		ICYC 037	HISTRT	BR	RETURN TO I-CYCLE
25B4	9E72	LOPD 040	BRANCH	IUBR 002	UNCDBR	BR	GO TO UNCONDITIONAL BRANCH
25B6	8B80	LOPD 041	40P	LPSU 004	PCHSTT 0	BR	
25BA	5202	LOPD 042	10P			RDH V DA,88	READ BIAS INTO V
25BC	2155	LOPD 043				U1=0$K50	SET COUNT TO 80
25BE	2925	LOPD 044				I1=0$K20	SET LOW COL FORM ADDR
25C0	5EC2	LOPD 045				RDH H DA,88	READ CONTROL BYTE
25C2	FA4C	LOPD 046		051	SETHGH	BR IF HO BIT7=0	BR IF NOT 51 COL CARD
25C4	23EB	LOPD 047				V1=V1+KOE	51 COL CARD-ADD 14 TO ADDRESS
25C6	2935	LOPD 048				I1=0$K30	SET LOW COL FORM ADDR
25C8	29CB	LOPD 049				I1=I1+KOC	TO NORMAL +28
25CA	2137	LOPD 050				U1=0$K33	SET COUNT TO 51
25CC	2845	LOPD 051	SETHGH			IO=0$K40	SET HIGH COL FORM ADDR -40XX
25CE	8994	LOPD 052		LRXF 003	ENTRY	BR	
25B8	91D8	LOPD 053	INVDOP	IOCM 009	BSTAR	BR	SET INVALID I/O OP

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**********************************
* CROSS REFERENCE FOR CSECT LOPD *
**********************************
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```
LOPD 011      IPLS 057
LOPD 012      ICYC 287   ICYC 290   ICYC 291
LOPD 024      LOPD 018   LOPD 020   LOPD 022
LOPD 030      LOPD 014   LOPD 027   LPCH 018   LRDR 019   LXFR 102
LOPD 035      MPRT 168
LOPD 038      LSSO 017
LOPD 040      LOPD 037   LOPD 038
LOPD 041      LOPD 032   LOPD 033
LOPD 042      LOPD 031
LOPD 051      LOPD 046
LOPD 053      LOPD 028
```

LPCB   DESCRIPTIVE   TEXT

ENTRY POINT

    START
        EXCLUSIVE ENTRY POINT, USED ONLY FROM LPSU DURING
        COLUMN BINARY OPERATION. 1400 ADDRESS 100
        HAS BEEN SET.

OBJECTIVES

    1. SET ADDRESS 401. SET CONTROL COUNTERS, INITIALIZE

ACCUMULATING REGISTERS. READ PUNCH MASK.

2. READ CHARACTER FROM PROGRAM STORAGE 401-480. LOOK UP
    BCD EQUIVALENT.

3. TRANSLATE BCD CHARACTER FOR UPPER HALF TO ROW IMAGE AND
    STORE IN PUNCH ROW IMAGE BUFFER (COMPLEMENT FORM).

4. REPEAT TRANSLATION FROM 501-580 FOR LOWER HALF OF CARD
    AND STORE IN PUNCH ROW IMAGE BUFFER.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		LPCB 001	T			TRANSFER OF EBCDIC DATA TO COL BIN	RUCKER
		LPCB 002	*			FORM ON 1400 PUNCH COL BIN COMMAND	
1AF4	2807	LPCB 003	COLBIN			I0=0	INITIALIZE COUNT TO 0
1AF6	27F7	LPCB 004	INITAL			D1=0$KFF	RESET ALL
1AF8	5799	LPCB 005				I1=D1	REGISTERS
1AFA	57E9	LPCB 006				H0=D1	TO FF
1AFC	57F9	LPCB 007				H1=D1	
1AFE	40E6	LPCB 008				U=H	
1B00	2A65	LPCB 010	NEWMSK			T0=0$K60	SET T FOR TABLE
1B02	58BD	LPCB 014				T1=I0L	LOOK-UP OF MASK
1B04	3B85	LPCB 015				T1=T1$K80	
1B06	54A0	LPCB 016				RDH G AS,T	READ MASK INTO G0
1B08	5B38	LPCB 017				RDB T1 V+1	READ ODD CHAR FROM STORAGE
1B0A	3B45	LPCB 018				T1=T1$K40	LOCATIONS 401,402...480. USE
1B0C	2AC7	LPCB 019				T0=0	EBCDIC CHAR TO LOOK UP BCD
1B0E	55A0	LPCB 020				RDB G1 AS,T	EQUIVALENT.
1B10	E514	LPCB 021		023	N	BR IF G1 BIT2=0	BUILD ROW IMAGE CHARACTERS
1B12	6741	LPCB 022				D1=D1¤G0	
1B14	F518	LPCB 023	N	025	NE	BR IF G1 BIT3=0	
1B16	6941	LPCB 024				I1=I1¤G0	
1B18	C11C	LPCB 025	NE	027	NEX	BR IF G1 BIT4=0	
1B1A	6E41	LPCB 026				H0=H0¤G0	
1B1C	D120	LPCB 027	NEX	029	NEXT	BR IF G1 BIT5=0	
1B1E	6F41	LPCB 028				H1=H1¤G0	
1B20	E124	LPCB 029	NEXT	031	NEXTB	BR IF G1 BIT6=0	
1B22	6041	LPCB 030				U0=U0¤G0	
1B24	F128	LPCB 031	NEXTB	033	NEXTBT	BR IF G1 BIT7=0	
1B26	6141	LPCB 032				U1=U1¤G0	
1B28	282B	LPCB 033	NEXTBT			I0=I0+K02	UPDATE COUNT
1B2A	F080	LPCB 034		010	NEWMSK	BR IF LZNZ	BR IF NOT 8TH CHAR ASSEMBLED
1B2C	77C0	LPCB 035				STB D1 AS,P	STORE DATA
1B2E	2DAB	LPCB 036				P1=P1+KOA	INTO PUNCH
1B30	79C0	LPCB 037				STB I1 AS,P	IMAGE BUFFER

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1B32	2DAB	LPCB 038				P1=P1+KOA	
1B34	5E79	LPCB 039				D1=HO	
1B36	77C0	LPCB 040				STB D1 AS,P	
1B38	2DAB	LPCB 041				P1=P1+KOA	
1B3A	7FC0	LPCB 042				STB H1 AS,P	
1B3C	2DAB	LPCB 043				P1=P1+KOA	
1B3E	5079	LPCB 044				D1=UO	
1B40	77C0	LPCB 045				STB D1 AS,P	
1B42	2DAB	LPCB 046				P1=P1+KOA	
1B44	71C0	LPCB 047				STB U1 AS,P	
1B46	08AD	LPCB 048				Z=IO¤KAO	TEST I FOR HALF COMPLETED
1B48	C4D1	LPCB 049		052	HALFOK	BR IF Z=0	BR IF 1ST OR 2ND HALF COMPLETED
1B4A	3D3D	LPCB 050				P1=P1-K30	HALF NOT COMP, DEC P BY DEC 49
1B4C	9AF6	LPCB 051		004	INITAL	BR	GO BACK
1B50	DD4F	LPCB 052	HALFOK	061	DONE	BR IF P1 BIT1=1	BR IF 2ND HALF COMPLETE
1B52	2D1B	LPCB 053				P1=P1+KO1	
1B54	83B0	LPCB 054		IREG 002	STOREV	BAL	STORE V IN A OR B STAR
1B56	2B15	LPCB 055				T1=0$K10	
1B58	2B3B	LPCB 056				T1=T1+KO3	SET UP T TO INCREMENT V BY 20
1B5A	2A07	LPCB 057				TO=0	481 TO 501
1B5C	63B9	LPCB 058	START			V1C=V1+T1+1	UPDATE V BY 401 ON INITIAL
1B5E	62AD	LPCB 059				VOC=V0+TO+C	ENTRY, BY 20 AFTER 1ST HALF
1B60	9AF4	LPCB 060		003	COLBIN	BR	
1B4E	A74E	LPCB 061	DONE	LPCH 002	ENDING	BR	COL BIN PUNCH XFER COMPLETE

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***********************************
* CROSS REFERENCE FOR CSECT LPCB *
***********************************
```

LPCB 003	LPCB 060
LPCB 004	LPCB 051
LPCB 010	LPCB 034
LPCB 023	LPCB 021
LPCB 025	LPCB 023
LPCB 027	LPCB 025
LPCB 029	LPCB 027
LPCB 031	LPCB 029
LPCB 033	LPCB 031
LPCB 052	LPCB 049
LPCB 058	LPSU 060
LPCB 061	LPCB 052

LPCH DESCRIPTIVE TEXT

ENTRY POINT

OBJECTIVES

ENDING

EXCLUSIVE ENTRY POINT. THIS IS THE ENDING ROUTINE
FOR REGULAR PUNCH OPS AND FOR THE PUNCH PORTION OF
PFR OPS.

1. RESET ERRORS, SET STACKERS AND FEED. CHANGE OP CODE.

2. TEST OVERLAP STATUS. WAIT IF BUSY. TEST FOR ERRORS.
    SET STOP CODE IF REQUIRED.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		LPCH 001	T		PUNCH	ENDING ROUTINE	RUCKER
274E	3462	LPCH 002	ENDING			SET MODE K=96	2540 ZONE, PUNCH MODE
2750	1F80	LPCH 003				RST P K=88	RESET PREVIOUS ERRORS
2752	3485	LPCH 004				GO=GO$K80	SET ACTIVE BIT
2754	C158	LPCH 005		007	NORP3	BR IF G1 BIT4=0	BR IF NO RP3 STACKER SEL
2756	2F02	LPCH 006				SET P K=10	SET RP3 STACKER
2758	D15C	LPCH 007	NORP3	009	NOP2	BR IF G1 BIT5=0	BR IF NO P2 STACKER SEL
275A	2F04	LPCH 008				SET P K=20	SET P2 STACKER
275C	2F08	LPCH 009	NOP2			SET P K=40	SET FEED
275E	2507	LPCH 010				G1=0	CLEAR STACKER SELECT BYTE
2760	3400	LPCH 011				SET MODE K=80	CPU MODE AND ZONE
2762	98EA	LPCH 012		IREG 016	RSTREG	BAL	RESTORE V,U,I,G,D
2764	5555	LPCH 013				G1=G1XL	RESET G5
2766	152F	LPCH 014				G1=G1□K22	SET G4 IF GO(PFR) IS ON
2768	5EC2	LPCH 015				RDH H DA,B8	READ CONTROL BYTE
276A	DA71	LPCH 016		019	NOBUFR	BR IF HO BIT5=1	BR IF PUNCH IS NOT TO BE OVERLAP
276C	3400	LPCH 017	CONTUE			SET MODE K=80	SET CPU MODE & ZONE
276E	A5A0	LPCH 018		LOPD 030	NOTI25	BR	
2770	3462	LPCH 019	NOBUFR			SET MODE K=96	2540 ZONE, PUNCH MODE
2772	C471	LPCH 020		019	NOBUFR	BR IF GO BIT0=1	WAIT FOR BUSY TO DROP
2774	FFEC	LPCH 021		017	CONTUE	BR IF PS BIT3=0	NOT BUSY-TEST FOR ERROR
2776	3400	LPCH 022				SET MODE K=80	ERROR
2778	3AA9	LPCH 023				TO=0-KA0	SET STOP
277A	7AF2	LPCH 024				STH T DA,BE	STORE STOP CODE
277C	A044	LPCH 025		IDIS 003	STOPPP	BR	GO TO GEN STOP

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***********************************
* CROSS REFERENCE FOR CSECT LPCH *
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LPCH 002    LPCB 061   LPXF 062
LPCH 007    LPCH 005
LPCH 009    LPCH 0C7
LPCH 017    LPCH 021
LPCH 019    LPCH 016   LPCH 020
```

LPSU   DESCRIPTIVE   TEXT

ENTRY POINT

   PCHSTTO

       THIS POINT IS ENTERED ONLY FROM LOPD

OBJECTIVES

PUNCH

1. LOOP IF BUSY, BRANCH TO INTERVENTION REQUIRED ENDING
   ROUTINE IF NOT READY OR OFF LINE. HANDLE ERROR
   ACCORDING TO I/O CHECK STOP SWITCH SETTING.

2. SET UP REGISTERS FOR ADDRESS OF PUNCH IMAGE AND PUNCH
   CHECK BUFFERS AND MOVE DATA, PUNCH IMAGE TO PUNCH
   CHECK.

3. SET UP REGISTERS FOR ADDRESSING PROGRAM STORAGE AREA.
   100-180. STORE PUNCH COMPLETE INDICATOR AND BRANCH
   TO LPXF FOR PUNCH TRANSFER.

PFR (WRITE)

1. SAME AS PUNCH OBJECTIVES ITEM #1.

2. SET PFR WRITE CONDITIONS. (ZONE, MODE, NEG LOGIC,
   ETC). SET PUNCH IMAGE AND PUNCH CHECK BUFFER ADD-
   RESSES. TRANSFER DATA.

3. SAME AS PUNCH OBJECTIVES ITEM #3.

PFR (READ)

1. SAME AS PUNCH OBJECTIVES ITEM #1.

2. SET PFR READ CONDITIONS (ZONE & MODE). INITIALIZE
   REGISTERS FOR ADDRESSING PFR COLUMN FORM BUFFER AND
   PFR IMAGE BUFFER. BRANCH TO LXFR TO MOVE DATA FROM
   PFR IMAGE TO PFR COLUMN FORM BUFFER.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		LPSU 001	T			PUNCH OR PFR OP SET-UP	RUCKER
		LPSU 002	*			SET-UP NECESSARY REGS, TEST FOR BUSY AND PREVIOUS ERROR, ETC	
		LPSU 003	ASEQ	ALO7=00			
0B80	3462	LPSU 004	PCHSTT 0			SET MODE K=96	2540 ZONE, PUNCH8MODE
0B82	C401	LPSU 005		004	PCHSTT 0	BR IF GO BIT0=1	BR BACK IF BUSY-DO NOT CONTINUE
0B84	3402	LPSU 006				SET MODE K=90	PUNCH MODE, CPU ZONE (NOT BUSY)
0B86	2D80	LPSU 007				SET RP K=08	SET COMMAND INTERLOCK
0B88	CFC8	LPSU 008		041	NOTRDY	BR IF PS BIT0=0	BR IF PUNCH NOT READY
0B8A	CEC8	LPSU 009		041	NOTRDY	BR IF RPS0=0	BR IF PUNCH OFF LINE
0B8C	FFC5	LPSU 010		039	ERROR	BR IF PS BIT3=1	BR IF PUNCH CHECK
0B8E	C14F	LPSU 011	NOSTOP	044	PFREAD	BR IF G1 BIT4=1	BR IF PFR READ OP
0B90	C563	LPSU 012		054	PFRWRI	BR IF G1 BIT0=1	BR IF PFR WRITE OP
0B92	3462	LPSU 013				SET MODE K=96	2540 ZONE, PUNCH MODE
0B94	F419	LPSU 014		016	GOON	BR IF GO BIT3=1	BR IF LAST COM WAS A PFR READ
0B96	3443	LPSU 015				GO=GO$K04	SET NORMAL WRITE IND(NON-PFR)
0B98	2400	LPSU 016	GOON			SET MODE K=00	RESTORE CPU MODE & ZONE
		LPSU 017	*			1400 MODE INDICATOR IS NOW OFF	
0B9A	2815	LPSU 018				I0=0$K10	SET I TO HIGH END ADDRESS
0B9C	2977	LPSU 019				I1=0$K77	OF PUNCH IMAGE BUFFER
0B9E	2C35	LPSU 020				P0=0$K30	SETUP TO HIGH END
0BA0	59D9	LPSU 021				P1=I1	ADDRESS OF PUNCH CHECK BUFFER
0BA2	2AF7	LPSU 022				T0=0$KFF	SET T
0BA4	5AB9	LPSU 023				T1=T0	TO FFFF

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
0BA6	5280	LPSU 024	IMACHK			RDH V AS,I	READ 2 BYTES FROM PUNCH IMAGE
0BA8	7A8A	LPSU 025				STH T AS,I-2	STORE ALL ONES IN PUNCH IMAGE
0BAA	72CA	LPSU 026				STH V AS,P-2	STORE PUNCH IMAGE DATA IN PCHCHK
0BAC	C826	LPSU 027		024	IMACHK	BR IF P0 BIT4=0	BR IF TRANSFER NOT COMPLETE
0BAE	5202	LPSU 028				RDH V DA,88	READ MEMORY BIAS(000 ADDR) IN V
0BB0	2C15	LPSU 029				P0=0$K10	SET UP PUNCH IMAGE ADDR
0BB2	2D07	LPSU 030				P1=0	IN P FOR PUNCH XFER
0BB4	F26B	LPSU 031		058	COLBIN	BR IF DO BIT7=1	TEST COL BIN
0BB6	2A65	LPSU 032				TO=0$K60	SET VALUE
0BB8	3A43	LPSU 033				TO=TO$K04	100 IN TO
0BBA	63AB	LPSU 034				V1C=V1+TO	UPDATE V
0BBC	62DD	LPSU 035				VOC=VO+P1+C	TO 1400 ADDR 100
0BBE	2BF5	LPSU 036				T1=0$KF0	STORE FO IN 1400 ADDRESS 100
0BC0	7B38	LPSU 037				STB T1 V+1	TO INDICATE PUNCH COMPLETE
0BC2	94B8	LPSU 038		LPXF 002	BEGIN	BR	GO DO PUNCH XFER
0BC4	5EC2	LPSU 039	ERROR			RDH H DA,B8	READ CONTROL BYTE
0BC6	CE0E	LPSU 040		011	NOSTOP	BR IF HO BIT0=0	CONTINUE IF I/O CHK STOP SW OFF
0BC8	3AA9	LPSU 041	NOTRDY			TO=0-KA0	INTERVENTION REQUIRED-SET STOP
0BCA	0D80	LPSU 042				RST RP K=08	CODE IN TO, RESET CMD INTLK,
0BCC	8EBA	LPSU 043		LRDR 025	INTREQ	BR	AND BR TO GEN. STOP
0BCE	0D80	LPSU 044	PFREAD			RST RP K=08	RESET COMMAND INTLK
0BD0	3462	LPSU 045				SET MODE K=96	2540 ZONE, PUNCH MODE
0BD2	3415	LPSU 046				GO=GO$K10	SET PFR READ LAST COM IND
0BD4	3400	LPSU 047				SET MODE K=80	CPU MODE AND ZONE
0BD6	2435	LPSU 048				G=3001-COL FORM BUFFER
0BD8	2513	LPSU 049				G1=0$K01	FIRST HALF, 4-9 ROWS
0BDA	2015	LPSU 050				U0=0$K10	U=10E6-PFR IMAGE BUFFER
0BDC	21E7	LPSU 051				U1=0$KEE	FROM BOTTOM TO TOP
0BDE	317B	LPSU 052				U1=U1-K07	
0BE0	8AB6	LPSU 053		LXFR 025	BYTECT	BR	
0BE2	3462	LPSU 054	PFRWRI			SET MODE K=96	2540 ZONE, PUNCH MODE
0BE4	1443	LPSU 055				GO=GO*-K04	SET PFR WRITE MODE(NEG LOGIC)
0BE6	2F40	LPSU 056				SET P K=04	SET PUNCH RESTART GATE
0BE8	8B98	LPSU 057		016	GOON	BR	
0BEA	2B95	LPSU 058	COLBIN			T1=0$K90	SET T FOR USE
0BEC	2A13	LPSU 059				TO=0$K01	IN UPDATING V ADDRESS REG
0BEE	985C	LPSU 060		LPCB 058	START	BR	GO TO COL BIN DATA XFER
		LPSU 061	AEND				

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**********************************
* CROSS REFERENCE FOR CSECT LPSU *
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LPSU 004	LOPD 041	LPSU 005
LPSU 011	LPSU 040	
LPSU 016	LPSU 014	LPSU 057
LPSU 024	LPSU 027	
LPSU 039	LPSU 010	
LPSU 041	LPSU 008	LPSU 009
LPSU 044	LPSU 011	
LPSU 054	LPSU 012	
LPSU 058	LPSU 031	

LPTR DESCRIPTIVE TEXT

OBJECTIVES

  CLUTCH TRAP

  1. SET BUFFER ADDRESS (PUNCH IMAGE, ROW FORM).
  2. SET TRAP COUNTER.
  3. SEND FIRST DATA BYTE TO BUFFER.

  RUN IN (DATA)

  1. TRANSFER PUNCH DATA BYTE FROM PUNCH IMAGE BUFFER TO PUNCH
      DATA OUT (PO).
  2. SEND RP1 DATA BYTE TO LS.

AFTER RUN IN (DATA)

1. TRANSFER PUNCH DATA BYTE FROM PUNCH IMAGE BUFFER TO PO.
2. COMPARE PUNCH CHECK BRUSHES TO PUNCH CHECK BUFFER. SAVE
    ERROR CONDITION AFTER FIRST CARD HAS PASSED PUNCH CHECK.

AFTER RUN IN (PFR)

1. TRANSFER PUNCH DATA BYTE FROM PUNCH IMAGE BUFFER TO PUNCH
    DATA OUT (PO).
2. COMBINE PUNCH IMAGE BUFFER AND PFR IMAGE BUFFER AND PUT
    IN PUNCH IMAGE BUFFER.
3. STORE DATA FROM RP1 INTO PFR IMAGE BUFFER.
4. COMPARE RP2 DATA WITH PUNCH CHECK BUFFER. SAVE ERRORS
    IF ANY.

```
********************************************************************************************************
*                                                                                                    *
*                     PROCEDURE FOR ANALYZING PUNCH CHECKS DUE TO HOLE COUNT                          *
*                                                                                                    *
*  1.  SET ADDRESS SWITCHES TO ADDRESS OF LABEL PCHCHK.                                               *
*  2.  SET MODE SWITCH TO SAR DELAYED STOP.                                                           *
*  3.  WHEN THE ERROR OCCURS, THE PUNCH ATTENTION LIGHT COMES ON AND THE FOLLOWING AREAS MAY BE DISPLAYED - *
*                                                                                                    *
*  PUNCH CHECK LOGOUT AREA -                                                                          *
*                                                                                                    *
*  AUX     50F6       50F7       50F8       50F9       50FA       50FB       50FC       50FD       50FE       50FF      *
*        *----------*----------*----------*----------*----------*----------*----------*----------*----------*----------* *
*  BITS * 01234567 * 01234567 * 01234567 * 01234567 * 01234567 * 01234567 * 01234567 * 01234567 * 01234567 * 01234567 * *
*        *          *          *          *          *          *          *          *          *          *          * *
*  COLS * 1 THRU 8 * 9 THRU 16*17 THRU 24*25 THRU 32*33 THRU 40*41 THRU 48*49 THRU 56*57 THRU 64*65 THRU 72*73 THRU 80* *
*        *----------*----------*----------*----------*----------*----------*----------*----------*----------*----------* *
*                                                                                                    *
*          A BIT BEING ON IN THE LOGOUT AREA SIGNIFIES AN ERROR FOR THAT COLUMN.                      *
*                                                                                                    *
*          THIS AREA MUST BE LOADED WITH BLANKS AFTER EVERY ERROR FOR SUBSEQUENT ERROR ANALYSIS.      *
*                                                                                                    *
*  ROW FORM PUNCH IMAGE -                                                                             *
*                                                                                                    *
*  ROW        AUX ADDRESS         ROW      AUX ADDRESS                                                *
*                                                                                                    *
*  12         1000 - 1009         11       100A - 1013          A BIT BEING OFF IN THE ROW FORM PUNCH IMAGE BUFFER *
*   0         1014 - 101D          1       101E - 1027          SIGNIFIES A HOLE IN THE CARD.  THE CARD IS IN THE  *
*   2         1028 - 1031          3       1032 - 1038          STACKER POCKET.                       *
*   4         103C - 1045          5       1046 - 104F                                                *
*   6         1050 - 1059          7       105A - 1063                                                *
*   8         1064 - 106D          9       106E - 1077                                                *
********************************************************************************************************
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ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		LPTR 001	T		NATIVE	PUNCH TRAP ROUTINE(1400 MODE).	RUCKER
		LPTR 002	*		GO=	STAT REG BIT0-PUNCH ACTIVE	5-NORMAL PUNCH(NON-PFR)
		LPTR 003	*		DO=	COUNT REG BIT0-ROW 12 INDICATION	
		LPTR 004	ATABLE	ADDR=0110			
0110	2208	LPTR 005				LINK U MMSK4=1	
0112	9062	LPTR 006		008	START	BR	
		LPTR 007	AEND				
1062	FAEC	LPTR 008	START	049	SETUP	BR IF RPS BIT7=0	BR IF CLUTCH TRAP
1064	5BFF	LPTR 009				H1=RP1	GET PFR DATA
1066	5ACF	LPTR 010				PO=RP2	GET CHK DATA FROM RP2
1068	A213	LPTR 011		013	OK N	BR IF DO=NZ	CONTINUE IF SETUP HAS OCCURRED
106A	9074	LPTR 012		053	FALSE	BR	RETURN-FALSE TRAP
1180	5F2C	LPTR 013	OK O			RDB PO AS,V+1	SEND NEXT PCH DATA
1182	C6C7	LPTR 014		016	NOT12	BR IF DO BIT0=1	BR IF NOT ROW 12
1184	D638	LPTR 015		041	ROW12	BR IF DO BIT1=0	BR IF ROW 12
1186	33BB	LPTR 016	NOT12			V1=V1-K0B	ADD F4 TO V1 FOR CHK BUFFER
1188	D00C	LPTR 017		019	PFR	BR IF GO BIT5=0	BR IF PFR OP
118A	DF9D	LPTR 018		027	CHKBFR	BR IF PS BIT1=1	BR IF NOT NORMAL RUN-IN
118C	238D	LPTR 019	PFR			V1=V1+K80	PFR OP-MODIFY V1 TO PFR AREA
118E	337B	LPTR 020				V1=V1-K07	
1190	5D20	LPTR 021				RDB P1 AS,V	READ PFR DATA OF LAST CARD
1192	7F20	LPTR 022				STB H1 AS,V	STORE PFR DATA OF THIS CARD
1194	337F	LPTR 023				V1=V1-K77	SET ADDR TO PCH IMAGE BUFFER
1196	5F20	LPTR 024				RDB H1 AS,V	READ PUNCH DATA
1198	6DF7	LPTR 025				P1=P1*H1	OR THE PUNCH AND PFR DATA
119A	7D20	LPTR 026				STB P1 AS,V	STORE IN IMAGE
119C	2235	LPTR 027	CHKBFR			V0=0$K30	SET ADDR TO CHECK BUFFER
119E	5F20	LPTR 028				RDB H1 AS,V	READ THE CHK IMAGE
11A0	6CF1	LPTR 029				PO=PO¤H1	CHECK OLD DATA
11A2	C4B5	LPTR 030		039	NOERR	BR IF Z=0	BR IF OK
11A4	CAB4	LPTR 031		039	NOERR	BR IF RPS BIT4=0	BR IF NO CARD THRU CHK STATION
11A6	3F40	LPTR 032	PCHCHK			SET P K=84	SET PUNCH CHECK & RESTART GATE
11A8	2E55	LPTR 033				HO=0$K50	SET UP ADDR OF
11AA	56FD	LPTR 034				H1=DOL	COLUMN IN ERROR
11AC	3FF5	LPTR 035				H1=H1$KF0	-AUX STORAGE 50F6-50FF
11AE	5DE0	LPTR 036				RDB P1 AS,H	READ BYTE
11B0	6DC5	LPTR 037				P1=P1$PO	OR IN ERROR COLUMNS
11B2	7DE0	LPTR 038				STB P1 AS,H	STORE BACK ACCUMULATED ERRS
11B4	2215	LPTR 039	NOERR			V0=0$K10	RESET ADDR TO
11B6	23CB	LPTR 040				V1=V1+K0C	IMAGE BUFFER
11B8	261B	LPTR 041	ROW12			DO=DO+K01	INCREMENT COUNT
11BA	C4C2	LPTR 042		046	RETURN	BR IF ZNZ	BR IF COUNT NOT ZERO
11BC	0D80	LPTR 043				RST RP K=08	RESET PUNCH COMMAND INTLK
11BE	1495	LPTR 044				GO=GO*-K90	RESET ACTIVE & PFR READ LAST
11C0	0208	LPTR 045				RTN U MMSK4=0	
11C2	FOC6	LPTR 046	RETURN	048	DONE	BR IF LZNZ	
11C4	266B	LPTR 047				DO=DO+K06	CORRECT COUNT
11C6	0208	LPTR 048	DONE			RTN U MMSK4=0	
106C	3485	LPTR 049	SETUP			GO=GO$K80	SET THE ACTIVE BIT
106E	1F80	LPTR 050				RST P K=88	RESET PUNCH ERRORS
1070	2635	LPTR 051				DO=0$K30	SET COUNT TO 130
1072	266B	LPTR 052				DO=DO+K06	-HEX-36
1074	2215	LPTR 053	FALSE			V0=0$K10	SET-UP, INITIALIZE V0

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1076	23C7	LPTR 054				V1=0	ADDRESS FOR 1ST BYTE OF IMAGE
1078	5F2C	LPTR 055				RDB PO AS,V+1	1ST RUN-IN CYCLE, SEND PCH DATA
107A	0208	LPTR 056				RTN U MMSK4=0	

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**********************************
* CROSS REFERENCE FOR CSECT LPTR *
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```
LPTR 008    LPTR 006
LPTR 013    LPTR 011
LPTR 016    LPTR 014
LPTR 019    LPTR 017
LPTR 027    LPTR 018
LPTR 039    LPTR 030    LPTR 031
LPTR 041    LPTR 015
LPTR 046    LPTR 042
LPTR 048    LPTR 046
LPTR 049    LPTR 008
LPTR 053    LPTR 012
```

LPXF   DESCRIPTIVE   TEXT

ENTRY POINT

   BEGIN

       FROM LPSU, EXCLUSIVE ENTRY POINT.

OBJECTIVES

   1. INITIALIZE FOR TRANSLATE TABLE ADDRESS. SET WORK
      REGISTERS TO FF. SET MASK FOR CARD COLUMNS.

2. READ CHARACTER FROM PROGRAM STORAGE (1400 101-180).
    USE TLU TO READ FROM TRANSLATE TABLE, PUT IN PUNCH
    IMAGE BUFFER.

3. SET UP NEW MASK FOR NEXT CHARACTER, LOOP UNTIL ALL 80
    COLUMNS ARE COMPLETE, THEN STORE REGS AND BRANCH TO
    PUNCH ENDING ROUTINE.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		LPXF 001	T		1400	PUNCH TRANFER(EBCDIC TO ROW FORM)	RUCKER
14B8	2807	LPXF 002	BEGIN			I0=0	SET CONTROL COUNTER TO 0
14BA	2A65	LPXF 004				T0=0$K60	XLATE TABLE ADDR HIGH
14BC	21F7	LPXF 008	CLEAR			U1=0$KFF	CLEAR
14BE	5179	LPXF 009				D1=U1	ALL THE
14C0	51F9	LPXF 010				H1=U1	ACCUMULATING
14C2	51E9	LPXF 011				H0=U1	REGISTERS
14C4	5199	LPXF 012				I1=U1	
14C6	58BD	LPXF 013	NEWMSK			T1=I0L	SET-UP T FOR
14C8	3B85	LPXF 014				T1=T1$K80	TABLE LOOK-UP OF
14CA	54A0	LPXF 015				RDH G AS,T	NEW MASK(IN G0)
14CC	5B38	LPXF 016				RDB T1 V+1	READ BYTE FROM STORAGE
14CE	3B45	LPXF 017				T1=T1$K40	CLEAR WORD MARK(IF PRESENT)
14D0	55A0	LPXF 018				RDB G1 AS,T	XLATE TO CONDENSED PUNCH DATA
14D2	157B	LPXF 019				G1=G1¤K07	INVERT BITS 4,2,1
14D4	9163	LPXF 020		021	BIT421 N	N=G1 BITS567	BR UNDER MASK
1160	2DAB	LPXF 021	BIT421 0			P1=P1+K0A	ADD 5A(90)-7 PUNCH
1162	2DAB	LPXF 022	BIT421 1			P1=P1+K0A	ADD 50(80)-6 PUNCH
1164	2DAB	LPXF 023	BIT421 2			P1=P1+K0A	ADD 46(70)-5 PUNCH
1166	2DAB	LPXF 024	BIT421 3			P1=P1+K0A	ADD 3C(60 -4 PUNCH
1168	2DAB	LPXF 025	BIT421 4			P1=P1+K0A	ADD 32(50 -3 PUNCH
116A	2DAB	LPXF 026	BIT421 5			P1=P1+K0A	ADD 28(40)-2 PUNCH
116C	9474	LPXF 027	BIT421 6	029	ADD1E	BR	BR TO ADD 1E(30)-1 PUNCH
116E	9480	LPXF 028	BIT421 7	035	BYTES	BR	NO 1-7 PUNCH
1474	2D1D	LPXF 029	ADD1E			P1=P1+K10	ADD 1E
1476	2DEB	LPXF 030				P1=P1+K0E	TO PUNCH IMAGE BUFFER
1478	5BC0	LPXF 031				RDB T1 AS,P	STORE
147A	6B41	LPXF 032				T1=T1¤G0	1 THRU 7
147C	7BC0	LPXF 033				STB T1 AS,P	PUNCH
147E	58D5	LPXF 034				P1=I0XL	RECOVER PUNCH IMAGE ADDR
1480	C504	LPXF 035	BYTES	037	N	BR IF G1 BIT0=0	
1482	6141	LPXF 036				U1=U1¤G0	12 PUNCH
1484	D5C8	LPXF 037	N	039	NE	BR IF G1 BIT 1=0	
1486	6741	LPXF 038				D1=D1¤G0	11 PUNCH

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1488	E50C	LPXF 039	NE	041	NEX	BR IF G1 BIT2=0	
148A	6941	LPXF 040				I1=I1□GO	O PUNCH
148C	F510	LPXF 041	NEX	043	NEXT	BR IF G1 BIT3=0	
148E	6F41	LPXF 042				H1=H1□GO	8 PUNCH
1490	C114	LPXF 043	NEXT	045	DONE	BR IF G1 BIT4=0	
1492	6E41	LPXF 044				HO=HO□GO	9 PUNCH
1494	282B	LPXF 045	DONE			IO=IO+KO2	ADD 2 TO CONTROL COUNTER
1496	FOC6	LPXF 046		013	NEWMSK	BR IF LZNZ	BR TO GET NEW MASK IF NOT 8TH CH
1498	71CO	LPXF 047				STB U1 AS,P	STORE ROW 12
149A	2DAB	LPXF 048				P1=P1+KOA	UPDATE P BY 10
149C	77CO	LPXF 049				STB D1 AS,P	STORE ROW 11
149E	2DAB	LPXF 050				P1=P1+KOA	P+10
14A0	79CO	LPXF 051				STB I1 AS,P	STORE ROW O
14A2	2D5D	LPXF 052				P1=P1+K50	UPDATE P BY 80
14A4	7FCO	LPXF 053				STB H1 AS,P	STORE ROW 8
14A6	2DAB	LPXF 054				P1=P1+KOA	P+10
14A8	5EF9	LPXF 055				H1=HO	
14AA	7FCO	LPXF 056				STB H1 AS,P	STORE ROW 9
14AC	58D5	LPXF 057				P1=IOXL	RESTORE IMAGE BUFFER ADDRESS
14AE	08AD	LPXF 058				Z=IO□KAO	
14B0	C4BC	LPXF 059		008	CLEAR	BR IF ZNZ	BR IF NOT ALL 80 COL COMPLETE
14B2	83B0	LPXF 060		IREG 002	STOREV	BAL	STORE V IN 1400 A OR B ADDR REG
14B4	98EA	LPXF 061		IREG 016	RSTREG	BAL	RESTORE V,U,I,G,D
14B6	A74E	LPXF 062		LPCH 002	ENDING	BR	

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***********************************
* CROSS REFERENCE FOR CSECT LPXF *
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```

LPXF 002	LPSU 038
LPXF 008	LPXF 059
LPXF 013	LPXF 046
LPXF 021	LPXF 020
LPXF 029	LPXF 027
LPXF 035	LPXF 028
LPXF 037	LPXF 035
LPXF 039	LPXF 037
LPXF 041	LPXF 039
LPXF 043	LPXF 041
LPXF 045	LPXF 043

LRDR   DESCRIPTIVE TEXT

ENTRY POINTS

    RDREND

        ENTER HERE FROM LXFR FOR NORMAL ENDING.

    PFR

        ENTER HERE FROM PFR OPS FOR NORMAL ENDING.

OBJECTIVES

    1. (RDREND) RESET ERRORS, ALLOW CHECKS. SET 1400 DELAYED

FEED. READ AND CLEAR EOF INDICATOR. CHECK FOR ERRORS.
CHANGE OP CODE.

2. IF THERE ARE ERRORS, SET INDICATOR. READ CONTROL BYTE,
    IF I/O CHECK STOP IS ON, SET 3F STOP CODE. BRANCH TO
    STOP ROUTINE FOR DISPLAY.

3. READER NOT READY OR OFF LINE   SET 4F STOP CODE AND GO TO
    INTERVENTION REQUIRED STOP.

4. (PFR) START WITH ERROR CONDITION CHECK.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		LRDR 001	T		READ ENDING ROUTINE		RUCKER
OE8C	2B40	LRDR 002	RDREND			SET R K=04	ALLOW READ CHECKS
OE8E	2D08	LRDR 003				SET RP K=40	SET 1400 DELAYED FEED
OE90	3445	LRDR 004				GO=GO$K40	SET READER ACTIVE BIT
OE92	3406	LRDR 005				SET MODE K=B0	SET READ MODE, CPU ZONE
OE94	5A82	LRDR 006				RDH T DA,A8	READ AND
OE96	1A85	LRDR 007				TO=TO*-K80	CLEAR EOF INDICATOR
OE98	F99F	LRDR 008			011 STORE	BR IF RS7=1	BR IF NO NEW EOF IND TO BE SET
OE9A	3D00	LRDR 009				SET RP K=80	ACCEPT EOF BIT, READY WILL DROP
OE9C	3A85	LRDR 010				TO=TO$K80	SET NEW EOF INDICATOR
OE9E	7A82	LRDR 011	STORE			STH T DA,A8	STORE BACK CONTROL BYTE
OEA0	5A92	LRDR 012	PFR			RDH T DA,AA	READ ERROR CONTROL BYTE
OEA2	FDB1	LRDR 013			020 ERROR	BR IF RS3=1	BR IF READ(HOLE COUNT)ERROR
OEA4	C9B1	LRDR 014			020 ERROR	BR IF RS4=1	BR IF VALIDITY ERROR
OEA6	1A43	LRDR 015				TO=TO*-K04	NO ERROR-CLEAR ERROR BIT
OEA8	7A92	LRDR 016	CONTIN			STH T DA,AA	STORE CONTROL BYTE
OEAA	3400	LRDR 017				SET MODE K=80	CPU ZONE AND MODE
OEAC	1593	LRDR 018				G1=G1*-K09	RESET READ AND PFR INDICATOR
OEAE	A5A0	LRDR 019	REREAD	LOPD 030	NOTI25	BR	CONTINUE-BR TO TEST FOR COMB OP
OEB0	3A43	LRDR 020	ERROR			TO=TO$K04	SET ERROR INDICATOR
OEB2	5DC2	LRDR 021				RDB P1 DA,88	READ CONTROL BYTE
OEB4	CD28	LRDR 022			016 CONTIN	BR IF P10=0	BR IF I/O CHK STOP SWITCH OFF
OEB6	1583	LRDR 023				G1=G1*-K08	ERR AND CHK STOP ON-RESET PFR
OEB8	3AC9	LRDR 024				TO=0-KC0	INDICATOR-SET 3F STOP CODE
OEBA	5AB9	LRDR 025	INTREQ			T1=TO	IN TO AND T1.
OEBC	7AF2	LRDR 026				STH T DA,BE	STORE STOP CODE
OEBE	ACBC	LRDR 027		IDIS 010	STOP	BR	STOP CODE COMPLETE
13F4	0D04	LRDR 028	NOTRDY			RST RP K=20	RESET COMMAND INTLK
13F6	1B00	LRDR 029				RST R K=80	RESET READ ERRORS(IF ON)
13F8	3406	LRDR 030				SET MODE K=B0	SET READ MODE, CPU ZONE
13FA	98EA	LRDR 031		IREG 016	RSTREG	BAL	RESTORE CPU REGS

ADDR   WORD   SEQUENCE NO.   LABEL   NEXTSEQ   NEXTLABEL   STATEMENT   COMMENTS

13FC   3AB9   LRDR 032   TO=0-KBO   SET 4F STOP CODE IN TO
13FE   8EBA   LRDR 033   025   INTREQ   BR   GO TO INTERVENTION REQ. STOP
                                                            ****
                                                            * CROSS REFERENCE FOR CSECT LRDR *
                                                            ****

LRDR 002   LXFR 105
LRDR 011   LRDR 0C8
LRDR 012   LRXF 028
LRDR 016   LRDR 022
LRDR 020   LRDR 013   LRDR 014
LRDR 025   LPSU 043   LRDR 033
LRDR 028   LXFR 011

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		LREQ 001	T			READ REQUEST ROUTINE	RUCKER
		LREQ 002	*			READ REQUEST LATCH IS SET ONLY DURING RUN-IN	
		LREQ 003	*			TO HANDLE THE DATA TRANFER AT THAT TIME. IF HARDWARE DI IS ON,	
		LREQ 004	*			DATA TRANSFER IS BYPASSED.	
		LREQ 005	*	**		BOTH THE READ & PUNCH DEVICE ENDS ARE TESTED FOR REMOTE RESTART.	
1A5E	1FB0	LREQ 006	PCHREQ			RST P K=8B	RESET PCH REQUEST & ERROR
1A60	E9E8	LREQ 007	START	011	NORST	BR IF RS6=0	BR IF NO READ REQ
1A62	5A82	LREQ 008				RDH T DA,A8	RESET
1A64	1A85	LREQ 009				T0=T0*-K80	EOF
1A66	7A82	LREQ 010				STH T DA,A8	BIT
1A68	2AC7	LREQ 011	NORST			T0=0	
1A6A	2B07	LREQ 012				T1=0	INITIALIZE COUNT REG TO ZERO
1A6C	0B30	LREQ 013	RDRREQ			RST R K=03	RESET READ REQ
1A6E	6AA4	LREQ 014				T=T+2	WAIT APP
1A70	C4EC	LREQ 015		013	RDRREQ	BR IF ZNZ	90 MILLISECONDS
1A72	EBDF	LREQ 016		006	PCHREQ	BR IF PS6=1	TEST PCH REQUEST
1A74	C1DC	LREQ 017		023	BACK	BR IF S4=0	BR IF NOT 16 CHAR HALT MESSAGE
1A76	3E99	LREQ 018				H0=0-K90	MASK FOR 6F PRINTER RETURN
1A78	6EF1	LREQ 019				H0=H0□H1	CHECK REMOTE RESTART
1A7A	C4DD	LREQ 020		023	BACK	BR IF Z=0	PRINTER INTERVENTION
1A7C	F0DC	LREQ 021		023	BACK	BR IF LZNZ	NOT READER PUNCH INTERVENTION
1A7E	8B4E	LREQ 022		LXFR 101	RETURN	BR	REMOTR RESTART-RETURN TO RDR/PCH
1A5C	96DA	LREQ 023	BACK	INRU 080	GOBACK	BR	GO BACK TO WAIT LOOP

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                                                  **********************************
                                                  * CROSS REFERENCE FOR CSECT LREQ *
                                                  **********************************

LREQ 006    LREQ 016
LREQ 007    INRU 069
LREQ 011    LREQ 007
LREQ 013    LREQ 015
LREQ 023    LREQ 017  LREQ 020  LREQ 021
```

LRTR   DESCRIPTIVE   TEXT

OBJECTIVES

  CLUTCH CYCLE

  1. SET READER TRAP CONDITIONS.
  2. SET READ CARD IMAGE BUFFER 1 ADDRESS.
  3. SET TRAP COUNTER.

  RUN IN (DATA)

  1. SET READ CARD IMAGE BUFFER 2 ADDRESS (2 FEED CYCLES).

     SET READER ACTIVE AND TRANSFER BITS.
  2. COMPARE (RESULTS ARE NOT CHECKED).

  AFTER RUN IN (DATA)

  1. TRANSFER RP1 DATA TO READ CARD IMAGE BUFFER 1.
  2. COMPARE RP2 DATA TO BUFFER, LOG ERRORS, IF ANY.
  3. INCREMENT BYTE COUNTER, WHEN 120 TRAPS ARE COMPLETED, END
     THE OPERATION.

```
****************************************************************************************************************
*                                                                                                            *
*                        PROCEDURE FOR ANALYZING READER CHECKS DUE TO HOLE COUNT.                             *
*                                                                                                            *
*  1.  SET ADDRESS SWITCHES TO ADDRESS OF LABEL -RDRCHK-                                                      *
*  2.  SET MODE SWITCH TO SAR DELAYED STOP.                                                                   *
*  3.  WHEN AN ERROR OCCURS, THE READER ATTENTION LIGHT COMES ON AND THE FOLLOWING AREAS MAY BE DISPLAYED.    *
*                                                                                                            *
*  READER CHECK LOGOUT AREA--                                                                                 *
*                                                                                                            *
*  AUX     10F6       10F7       10F8       10F9       10FA       10FB       10FC       10FD       10FE       10FF  *
*        +----------+----------+----------+----------+----------+----------+----------+----------+----------+----------+  *
*  BITS * 01234567 * 01234567 * 01234567 * 01234567 * 01234567 * 01234567 * 01234567 * 01234567 * 01234567 * 01234567 *  *
*        *          *          *          *          *          *          *          *          *          *          *  *
*  COLS * 1 THRU 8 * 9 THRU 16*17 THRU 24*25 THRU 32*33 THRU 40*41 THRU 48*49 THRU 56*57 THRU 64*65 THRU 72*73 THRU 80*  *
*        +----------+----------+----------+----------+----------+----------+----------+----------+----------+----------+  *
*                                                                                                            *
*  A BIT BEING ON IN THE LOGOUT AREA SIGNIFIES AN ERROR FOR THAT COLUMN.                                      *
*                                                                                                            *
*  THIS AREA MUST BE LOADED WITH BLANKS AFTER EVERY ERROR FOR SUBSEQUENT ERROR ANALYSIS.                      *
*                                                                                                            *
*  ---COLUMN FORM AREA---      AUXILIARY STORAGE  4020 - 40BF       ---RJW FORM AREA---      AUXILIARY STORAGE 3FA0 - 4017  *
*     A BIT BEING ON INDICATES A HOLE IN THE CARD THAT IS NOW          A BIT BEING A ZERO INDICATES A HOLE IN THE CARD THAT *
*     IN THE PRE STACKER STATION.  THIS IS A RESULT OF THE             IS BETWEEN THE FIRST AND SECOND READ STATIONS.       *
*     FIRST READ STATION TRAPS.                                                                               *
*  FORMAT    4020           4021                                                                              *
*     BIT  ROW  COL     BIT  ROW  COL                              ROW     AUX ADDRESS          ROW     AUX ADDRESS        *
*     0    X             0    X             FORMAT IS THE                                                      *
*     1    X             1    X             SAME FOR EACH           9    3FA0 - 3FA9             3    3FDC - 3FE5          *
*     2    12            2    4             CARD COLUMN.            8    3FAA - 3FB3             2    3FE6 - 3FEF          *
*     3    11   -1-      3    5   -1-       AUX 4022-4023           7    3FB4 - 3FBD             1    3FF0 - 3FF9          *
*     4    0             4    6             FOR COL 2. AUX          6    3FBE - 3FC7             0    3FFA - 4003          *
*     5    1             5    7             4024-4025 FOR           5    3FC8 - 3FD1             11   4004 - 400D          *
*     6    2             6    8             COL 3, ETC.             4    3FD2 - 3FDB             12   400E - 4017          *
*     7    3             7    9                                                                                *
****************************************************************************************************************
```

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		LRTR 001	T			READER TRAP ROUTINE	RUCKER
		LRTR 002	*			NATIVE READER TRAP GO=STATUS REGISTER	
		LRTR 003	*			ROUTINE-1400 MODE 1-RDR ACTIVE	2-CPU TRANSFER NECESSARY
		LRTR 004	ATABLE ADDR=01B0				
01B0	2206	LRTR 005				LINK U MMSK3=1	
01B2	5ACF	LRTR 006				P0=RP2	TAKE READ 2 INFO
01B4	9146	LRTR 007		009	START	BR	
		LRTR 008	AEND				
1146	EAAE	LRTR 009	START	036	SETUP	BR IF RPS BIT6=0	BR IF READER CLUTCH CYCLE
1148	5BDF	LRTR 010				P1=RP1	TAKE READ 1 INFO
114A	A303	LRTR 011		013	OK N	BR IF D1=NZ	CONTINUE IF SETUP WAS OK
114C	0206	LRTR 012				RTN U MMSK3=0	RETURN-FALSE TRAP HAS OCCURRED
1100	5F00	LRTR 013	OK O			RDB H1 AS,U	READ OLD DATA
1102	7D08	LRTR 014				STB P1 AS,U+1	STORE NEW DATA
1104	CD8E	LRTR 015		020	NOTRUN	BR IF RS BIT0=0	BR IF GATE READ COMPLETE
1106	201D	LRTR 016				U0=U0+K10	SET U TO IMAGE 2 ADDR.
1108	7D00	LRTR 017				STB P1 AS,U	STORE NEW CHAR IN IMAGE 2 BUF.
110A	30FB	LRTR 018				U0=U0-KOF	RESTORE IMAGE 1 ADDRESS
110C	3465	LRTR 019				GO=GO$K60	SET READER ACTIVE & XFER BITS
110E	6CF1	LRTR 020	NOTRUN			P0=P0□H1	CHECK OLD DATA
1110	C4A3	LRTR 021		030	NOERR	BR IF Z=0	BR IF NO ERROR
1112	CDA3	LRTR 022		030	NOERR	BR IF RS BIT0=1	BR IF NOT GATE READ COMPLETE
1114	3B00	LRTR 023	RDRCHK			SET R K=80	SET READ ERROR
1116	2E15	LRTR 024				H0=0$K10	SET UP ADDR OF
1118	57FD	LRTR 025				H1=D1L	COLUMN IN ERROR
111A	3FF5	LRTR 026				H1=H1$KF0	-AUX STORAGE 10F6-10FF
111C	5DE0	LRTR 027				RDB P1 AS,H	READ BYTE
111E	6DC5	LRTR 028				P1=P1$P0	OR IN ERROR COLUMNS
1120	7DE0	LRTR 029				STB P1 AS,H	STORE BACK ACCUMULATED ERRS
1122	271B	LRTR 030	NOERR			D1=D1+K01	INCREMENT BYTE COUNTER BY 1
1124	C4B8	LRTR 031		041	RETURN	BR IF ZNZ	
1126	CDC5	LRTR 032		047	RET	BR IF RS0=1	BR IF NOT GATE READ COMPLETE
1128	74C0	LRTR 033				STH G AS,U	STORE XFER BIT STATUS
112A	1465	LRTR 034				GO=GO*-K60	RESET ACTIVE & XFER BIT(IF ON)
112C	02C6	LRTR 035				RTN U MMSK3=0	
112E	5BDF	LRTR 036	SETUP			P1=RP1	TAKE READ 1 INFO
1130	3445	LRTR 037				GO=GO$K40	SET THE ACTIVE BIT
1132	30C9	LRTR 038				U0=0-KC0	SET U TO 3FA0 TO ADDRESS
1134	21A5	LRTR 039				U1=0$KA0	READ IMAGE BUFFER
1136	2745	LRTR 040				D1=0$K40	SET READ
1138	F0C4	LRTR 041	RETURN	047	RET	BR IF LZNZ	
113A	3763	LRTR 042				D1=D1$K06	LZ=0, UPDATE D1 FOR DECIMAL CNT
113C	07A1	LRTR 043				Z=D1+KOA	TEST FOR ROW 11 END
113E	C4C4	LRTR 044		047	RET	BR IF ZNZ	RETURN IF NOT ROW 11 END
1140	CDC5	LRTR 045		047	RET	BR IF RS0=1	BR IF NOT GATE READ COMP.
1142	0D04	LRTR 046				RST RP K=20	RESET COMMAND INTLK
1144	02C6	LRTR 047	RET			RTN U MMSK3=0	

```
***********************************
* CROSS REFERENCE FOR CSECT LRTR *
***********************************
LRTR 009      LRTR 007
LRTR 013      LRTR 011
LRTR 020      LRTR 015
LRTR 030      LRTR 021   LRTR 022
LRTR 036      LRTR 009
LRTR 041      LRTR 031
LRTR 047      LRTR 032   LRTR 041   LRTR 044   LRTR 045
```

LRXF   DESCRIPTIVE   TEXT

ENTRY POINTS

ENTRY
    NORMAL ENTRY POINT FROM READ OP DECODE OR FROM PFR
    ROUTINE AFTER PUNCHING AND READING HAS OCCURRED
    AND COLUMN FORM BUFFER HAS BEEN LOADED FROM THE
    ROW FORM BUFFER.

OBJECTIVES

1. SET CHARACTER COUNT AND INITIALIZE FOR READ TRANSLATE
    TABLE LOOKUP. TRANSFER DATA FROM COLUMN FORM BUFFER TO
    1400 PROGRAM STORAGE 001-080. USE TLU AND READ TRANSLATE
    TABLE.

2. CHECK CHARACTER VALIDITY. STORE BLANK (40) IF INVALID.
    REPEAT UNTIL CHARACTER COUNT BECOMES 0. END IF NOT COL-
    UMN BINARY.

3. FOR COLUMN BINARY READ, REPEAT READ OUT OF COLUMN FORM
    BUFFER. STORE HIGH COL BIN IN 1400 PROGRAM ADDRESS 501-
    580. STORE LOW COL BIN IN 401-480. END ON FULL CARD.

4. FOR PFR OP   TRANSFER DATA AS IN STEP 1.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		LRXF 001	T		1400	TRANFER OF DATA FROM BUMP TO MAINSTORAGE	RUCKER
		LRXF 002	ASEQ	ALO7=14			
0994	2B55	LRXF 003	ENTRY			T1=0$K50	STORE 50 IN
0996	7B38	LRXF 004				STB T1 V+1	1400 ADDRESS 000
0998	2406	LRXF 005				SET MODE K=30	READ MODE, CPU ZONE
		LRXF 006	*		1400	MODE INDICATOR IS NOW OFF	
099A	1B00	LRXF 007				RST R K=80	RESET PREVIOUS READ ERRS(IFON)
099C	2A55	LRXF 008				TO=0$K50	SET T FOR READ TABLE LOOK-UP
099E	5C88	LRXF 009	NEWCHA			RDH P AS,I+2	READ COL FORM DATA
09A0	2B73	LRXF 010				T1=0$K07	SET MASK IN T
09A2	6DD3	LRXF 011				P1=P1+P1	SHIFT
09A4	6DD3	LRXF 012				P1=P1+P1	LEFT TWICE
09A6	E0BB	LRXF 013		023	NO4567	BR IF HZ=0	BR IF ROWS 4567 HAVE NO PUNCHES
09A8	6BC7	LRXF 014				T1=T1*P0	MASK ROWS 123
09AA	C4C7	LRXF 015		029	NO123	BR IF Z=0	BR IF 123 HAVE NO PUNCHES
09AC	F231	LRXF 016	VALCHK	018	NOERR	BR IF DO BIT7=1	SKIP VAL ERROR SET IF COL BIN
09AE	2B80	LRXF 017				SET R K=08	SET VALIDITY ERROR
09B0	2545	LRXF 018	NOERR			G1=0$K40	SET BLANK IN G FOR STORING
09B2	084D	LRXF 019				Z=I0□K40	MASK FOR NORMAL READ OP
09B4	E0E1	LRXF 020		042	MAINRO	BR IF HZ=0	BR IF NOT PFR
09B6	2F80	LRXF 021				SET P K=08	SET PFR VALIDITY CHK
09B8	89E0	LRXF 022		042	MAINRO	BR	
09BA	6BC7	LRXF 023	NO4567			T1=T1*P0	MASK FOR 123
09BC	C4D1	LRXF 024		034	NOT123	BR IF Z=0	BR IF NO 123
09BE	1C73	LRXF 025				PO=PO*-K07	CLEAR PO
09C0	89CA	LRXF 026		031	TABLUP	BR	GO DO TABLE LOOK UP
09C2	98EA	LRXF 027	PFRCOM	IREG 016	RSTREG	BAL	RESTORE REGS U,V,I,G,D
09C4	8EA0	LRXF 028		LRDR 012	PFR	BR	GO TO READ END ROUTINE
09C6	3C43	LRXF 029	NO123			PO=PO$K04	456 OR 7, OR IN VALUE 4

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
09C8	5DB5	LRXF 030				T1=P1XL	SET T FOR TABLE LOOK-UP
09CA	3BB5	LRXF 031	TABLUP			T1=T1$KB0	OR IN CONSTANT
09CC	57A0	LRXF 032				RDB D1 AS,T	DO TABLE LOOK-UP FOR 123 OR 4567
09CE	6C75	LRXF 033				P0=P0$D1	OR 12,11,0 TO TABLE VALUE
09D0	5DB3	LRXF 034	NOT123			T1=P1XH	PUT 89 PUNCHES IN T1
09D2	C4D6	LRXF 035		037	8OR9	BR IF ZNZ	BR IF 8 OR 9 PUNCH
09D4	2BC5	LRXF 036				T1=0$KC0	OR IN 8-9 BITS FOR PROPER TLU
09D6	6BC5	LRXF 037	8OR9			T1=T1$P0	OR 89 PUNCHES TO BASE
09D8	EC5C	LRXF 038		040	OK	·BR IF P0 BIT2=0	BR IF NOT 12 PUNCH
09DA	FC2D	LRXF 039		016	VALCHK	BR IF P0 BIT3=1	BR IF 12 & 11 PUNCH-INVALID
09DC	55A0	LRXF 040	OK			RDB G1 AS,T	DO TOTAL CHAR TABLE LOOK-UP
09DE	D52C	LRXF 041		016	VALCHK	BR IF G1 BIT1=0	BR IF INVALID 1400 CHAR
09E0	5D30	LRXF 042	MAINRO			RDB P1 V	READ MAIN STORAGE
09E2	DD67	LRXF 043		045	NOWM	BR IF P1 BIT1=1	BR IF NO WORD MARK
09E4	1545	LRXF 044				G1=G1*-K40	SET WM
09E6	7538	LRXF 045	NOWM			STB G1 V+1	STORE CHARACTER
09E8	21FF	LRXF 046				U1=U1+KFF	UP DATE COUNT(-1)
09EA	C49E	LRXF 047		009	NEWCHA	BR IF ZNZ	BR IF COUNT NOT 0
09EC	83B0	LRXF 048		IREG 002	STOREV	BAL	STORE V IN 1401 A OR B ADDR REG
09EE	084D	LRXF 049				Z=I0¤K40	MASK FOR NORMAL READ OP
09F0	E0C2	LRXF 050		027	PFRCOM	BR IF HZNZ	BR IF PFR OP
09F2	F277	LRXF 051		053	PASS	BR IF D0 BIT7=1	BR IF COL BIN OP
09F4	8A2E	LRXF 052		081	DONE	BR	
09F6	2A07	LRXF 053	PASS			T0=0	SET UP T0 FOR BCD TO EBCDIC TLU
09F8	2C45	LRXF 054				P0=0$K40	SET P TO COL FORM BUFFER
09FA	2D25	LRXF 055				P1=0$K20	ADDRESS -4020-
09FC	2945	LRXF 056				I1=0$K40	
09FE	639B	LRXF 057				V1C=V1+I1	ADD 320 TO V TO
0A00	62AD	LRXF 058				VOC=V0+T0+C	UPDATE FROM
0A02	62A9	LRXF 059				VOC=V0+T0+1	C81 TO 401
0A04	292F	LRXF 060				I1=I1+K22	
0A06	6024	LRXF 061				U=V+2	SET U=V+100
0A08	619B	LRXF 062				U1C=U1+I1	FOR HIGH 1400
0A0A	60AD	LRXF 063				U0C=U0+T0+C	COL BINARY HALF(501)
0A0C	58C8	LRXF 064	CBREAD			RDH I AS,P+2	READ COL FORM DATA, 2 CHARS
0A0E	58B9	LRXF 065				T1=I0	SET CHAR1 INTO T1
0A10	55A0	LRXF 066				RDB G1 AS,T	CONVERT TO EBCDIC
0A12	3545	LRXF 067				G1=G1$K40	INSURE GOOD DATA AFTER RUN IN
0A14	5F30	LRXF 068				RDB H1 V	READ ADDRESS 401-480
0A16	DF1B	LRXF 069		071	STBYT1	BR IF H1 BIT1=1	BR IF NO WORD MARK
0A18	1545	LRXF 070				G1=G1*-K40	SET WORD MARK
0A1A	7538	LRXF 071	STBYT1			STB G1 V+1	STORE BYTE IN 401-480
0A1C	59B9	LRXF 072				T1=I1	PUT CHAR2 INTO T1
0A1E	55A0	LRXF 073				RDB G1 AS,T	CONVERT TO EBCDIC
0A20	3545	LRXF 074				G1=G1$K40	INSURE GOOD DATA AFTER RUN IN
0A22	5F10	LRXF 075				RDB H1 U	READ ADDRESS 501-580
0A24	DF29	LRXF 076		078	STBYT2	BR IF H1 BIT1=1	BR IF NO WORD MARK
0A26	1545	LRXF 077				G1=G1*-K40	CLEAR WORD MARK
0A28	7518	LRXF 078	STBYT2			STB G1 U+1	STORE BYTE IN 501-580 AREA
0A2A	CDCC	LRXF 079		064	CBREAD	BR IF P1 BIT0=0	BR IF FULL CARD(80 CHAR) NOT COM
0A2C	DD0C	LRXF 080		064	CBREAD	BR IF P1 BIT1=0	BR IF FULL CARD(80 CHAR) NOT COM
0A2E	8A8A	LRXF 081	DONE	LXFR 003	WAIT	BR	BR TO ROW TO COL TRANSFER
		LRXF 082	AEND				

ADDR   WORD SEQUENCE NO. LABEL   NEXTSEQ   NEXTLABEL STATEMENT   COMMENTS

                                     ****
                                     * CROSS REFERENCE FOR CSECT LRXF *
                                     ****

LRXF 003   LOPD 052   LXFR 098
LRXF 009   LRXF 047
LRXF 016   LRXF 039   LRXF 041
LRXF 018   LRXF 016
LRXF 023   LRXF 013
LRXF 027   LRXF 050
LRXF 029   LRXF 015
LRXF 031   LRXF 026
LRXF 034   LRXF 024
LRXF 037   LRXF 035
LRXF 040   LRXF 038
LRXF 042   LRXF 020   LRXF 022
LRXF 045   LRXF 043
LRXF 053   LRXF 051
LRXF 064   LRXF 079   LRXF 080
LRXF 071   LRXF 069
LRXF 078   LRXF 076
LRXF 081   LRXF 052

LSSO   DESCRIPTIVE   TEXT

ENTRY POINT   TEST.   END OPERATION IF THERE ARE AB ZONES.

   STKSEL
      EXCLUSIVE ENTRY POINT FROM I-CYCLES WHEN K-OP IS   2.   FORCE READ MODE AND ZONE, SAVE STACKER SELECT BITS IN
      DECODED.   AUX STORAGE.   GET READER PUNCH BRANCH CONDITIONS.
                                                       END IF TOO LATE FOR READ STACKERS.
   OBJECTIVES

     1.   TRANSLATE EBCDIC D-MODIFIER CHARACTER TO BCD FOR BIT   3.   SET INDICATED STACKERS.   RESTORE CPU MODE AND ZONE.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		LSSO 001	T	1402		STACKER SELECT COMMAND	RUCKER
2E40	57D9	LSSO 002	STKSEL			P1=D1	
2E42	5DC0	LSSO 003				RDB P1 AS,P	XLATE EBCDIC TO BCD
2E44	5DB9	LSSO 004				T1=P1	
2E46	E0DC	LSSO 005		016	END	BR IF HZNZ	BR IF AB ZONE
2E48	7C52	LSSO 006				STH P DA,9A	STORE BYTE FOR ZONE CHANGE
2E4A	2206	LSSO 007				SET MMSK K=30	FORCE READ MODE & ZONE
2E4C	5C52	LSSO 008				RDH P DA,9A	READ ST. SEL. BYTE BACK OUT
2E4E	65D5	LSSO 009				G1=G1$P1	SAVE PUNCH ST. SEL. BITS
2E50	5ECF	LSSO 010				P0=RPS	
2E52	EC5D	LSSO 011		016	END	BR IF P02=1	BR IF 6 MILLI-SECONDS OVER
2E54	E958	LSSO 012		014	NOTR3	BR IF P1 BIT6=0	BR IF NOT R3 STACKER
2E56	2B02	LSSO 013				SET R K=10	SET R3 STACKER
2E58	F95C	LSSO 014	NOTR3	016	END	BR IF P1 BIT7=0	BR IF NOT R2 STACKER
2E5A	2B04	LSSO 015				SET R K=20	SET R2 STACKER
2E5C	0216	LSSO 016	END			RST MMSK K=31	RESTORE CPU MODE & ZONE
2E5E	A5B0	LSSO 017		LOPD 038	TEST15	BR	COMPLETE

****
* CROSS REFERENCE FOR CSECT LSSO *
****

LSSO 002   ICYC 295
LSSO 014   LSSO 012
LSSO 016   LSSO 005   LSSO 011   LSSO 014

LXFR DESCRIPTIVE TEXT

ENTRY POINTS

    WAIT

        NORMAL ENTRY   USED DURING READ OPERATIONS.
        ENTERED FROM LRXF.

    BYTECT

        ENTRY USED DURING PUNCH PFR OPERATIONS. ENTER
        FROM LPSU.

OBJECTIVES

1. SET UP ADDRESSES OF COLUMN IMAGE AND ROW IMAGE BUFFERS.
    SET ROW IMAGE BUFFER 2 OR BUFFER 1 IF TRANSFER BIT IS
    NOT ON (RUN IN).

2. TRANSFER ROW BITS OF EACH CARD COLUMN FROM ROW IMAGE
    BUFFER TO COLUMN IMAGE BUFFER.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		LXFR 001	T		READER	XFER OF ROW IMAGE TO COLUMN BINARY FORM	B.RUCKER
		LXFR 002	ASEQ	AL07=0A			
OA8A	3466	LXFR 003	WAIT			SET MODE K=B6	SET 2540 ZONE & MODE
OA8C	D414	LXFR 004		008	2NDHLF	BR IF GO BIT1=0	CONTINUE IF ACTIVE NOT ON
OA8E	0719	LXFR 005				Z=D1+K10	WAIT FOR ROW 11
OA90	EC8A	LXFR 006		003	WAIT	BR IF HZNZ	BEFORE PROCEEDING
OA92	E40B	LXFR 007		003	WAIT	BR IF GO BIT2=1	BR BACK IF TRANSFER REQUIRED
OA94	2D04	LXFR 008	2NDHLF			SET RP K=20	SET READ COMMAND INTLK
OA96	DD9A	LXFR 009		011	NOTRDY	BR IF RS1=0	TEST READY
OA98	CE9D	LXFR 010		012	READY	BR IF RPS0=1	BR IF AVAILABLE-ON LINE
OA9A	93F4	LXFR 011	NOTRDY	LRDR 028	NOTRDY	BR	GO TO NOT READY HALT
OA9C	3406	LXFR 012	READY			SET MODE K=B0	OK TO CONTINUE
OA9E	2045	LXFR 013				U0=0$K40	SET U TO IMAGE 2
OAA0	2115	LXFR 014				U1=0$K10	
OAA2	3183	LXFR 015				U1=U1$K08	U=4018
OAA4	5400	LXFR 016				RDH G AS,U	READ TRANSFER BIT
OAA6	7008	LXFR 017				STH U AS,U+2	CLEAR XFER BIT FROM 4018
OAA8	5111	LXFR 018				U1=U1X	U=40A1, IMAGE BUFFER 2
OAAA	E431	LXFR 019		022	XFER	BR IF GO BIT2=1	BR IF XFER BIT ON
OAAC	2035	LXFR 020				U0=0$K30	SET U TO IMAGE 1
OAAE	21A5	LXFR 021				U1=0$KA0	BUFFER ADDR -30A0-
OAB0	2445	LXFR 022	XFER			G0=0$K40	SET G TO 2ND BYTE OF
OAB2	2525	LXFR 023				G1=0$K20	COLUMN BUFFER
OAB4	251B	LXFR 024				G1=G1+K01	ADDR -4021-
OAB6	22A3	LXFR 025	BYTECT			V0=0$K0A	10 GROUPS OF 8 BYTES CNTR
OAB8	2807	LXFR 026	BITCT			I0=0	CLEAR
OABA	2907	LXFR 027				I1=0	WORK
OABC	4A86	LXFR 028				T=I	REGISTERS
OABE	4C86	LXFR 029				P=I	
OAC0	4E86	LXFR 030				H=I	
OAC2	2613	LXFR 031				D0=0$K01	SET MASK FOR COL 1
OAC4	5700	LXFR 032	RDBYTE			RDB D1 AS,U	READ BYTE FROM IMAGE
OAC6	C74B	LXFR 033		035	N	BR IF D1 BIT0=1	BITS ARE COMPLIMENT
OAC8	6965	LXFR 034				I1=I1$D0	OR BIT IN COL 1

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
0ACA	D74F	LXFR 035	N	037	NE	BR IF D1 BIT1=1	
0ACC	6B65	LXFR 036				T1=T1$D0	COL 2
0ACE	E753	LXFR 037	NE	039	NEX	BR IF D1 BIT2=1	
0AD0	6D65	LXFR 038				P1=P1$D0	COL 3
0AD2	F757	LXFR 039	NEX	041	NEXT	BR IF D1 BIT3=1	
0AD4	6F65	LXFR 040				H1=H1$D0	COL 4
0AD6	C35B	LXFR 041	NEXT	043	NEXTB	BR IF D1 BIT4=1	
0AD8	6865	LXFR 042				I0=I0$D0	COL 5
0ADA	D35F	LXFR 043	NEXTB	045	NEXTBT	BR IF D1 BIT5=1	
0ADC	6A65	LXFR 044				T0=T0$D0	COL 6
0ADE	E363	LXFR 045	NEXTBT	047	BTNEXT	BR IF D1 BIT6=1	
0AE0	6C65	LXFR 046				P0=P0$D0	COL 7
0AE2	F367	LXFR 047	BTNEXT	049	BTDONE	BR IF D1 BIT7=1	
0AE4	6E65	LXFR 048				H0=H0$D0	COL 8
0AE6	6663	LXFR 049	BTDONE			D0=D0+D0	SHIFT MASK LEFT ONE
0AE8	D679	LXFR 050		058	STORE	BR IF D01=1	BR TO STORE IF 6 BIT CHAR ASSEM
0AEA	F475	LXFR 051		056	RPFR1	BR IF G0 BIT3=1	CHECK FOR PFR READ
0AEC	21AB	LXFR 052				U1=U1+K0A	NO- INCREMENT ADR
0AEE	F4F2	LXFR 053		055	READM	BR IF AC=0	
0AF0	201D	LXFR 054				U0=U0+K10	UPDATE TO 60
0AF2	8AC4	LXFR 055	READM	032	RDBYTE	BR	
0AF4	319B	LXFR 056	RPFR1			U1=U1-K09	DECREMENT ADDR BY 10
0AF6	8AC4	LXFR 057		032	RDBYTE	BR	
0AF8	7940	LXFR 058	STORE			STB I1 AS,G+0	STORE COL ONE OR FIVE
0AFA	6444	LXFR 059				G=G+2 **POINT ADDR TO EVERY OTHER BYTE	
0AFC	7B40	LXFR 060				STB T1 AS,G+0	COL TWO OR SIX
0AFE	6444	LXFR 061				G=G+2	
0B00	7040	LXFR 062				STB P1 AS,G+0	COL THREE OR SEVEN
0B02	6444	LXFR 063				G=G+2	
0B04	7F40	LXFR 064				STB H1 AS,G+0	COL FOUR OR EIGHT
0B06	6444	LXFR 065				G=G+2	
0B08	C114	LXFR 066		072	STRDON	BR IF G1 BIT4=0	BR IF DONE 2ND 4 BYTES
0B0A	5899	LXFR 067				I1=I0	MOVE
0B0C	5AB9	LXFR 068				T1=T0	2ND
0B0E	5CD9	LXFR 069				P1=P0	4
0B10	5EF9	LXFR 070				H1=H0	BYTES
0B12	8AF8	LXFR 071		058	STORE	BR	
0B14	22FF	LXFR 072	STRDON			V0=V0+KFF	GROUP CNTR MINUS
0B16	C4A7	LXFR 073		081	HALF	BR IF Z=0	BR IF DONE HALF
0B18	F423	LXFR 074		079	RPFR2	BR IF G0 BIT3=1	BR IF PFR READ
0B1A	313D	LXFR 075				U1=U1-K30	NEXT GROUP OF 8 BYTESS
0B1C	C020	LXFR 076		078	HAF1ST	BR IF G0 BIT4=0	BR IF 1ST HALF
0B1E	20FD	LXFR 077				U0=U0+KF0	2ND HALF-RESTORE U0
0B20	8AB8	LXFR 078	HAF1ST	026	BITCT	BR	GO DO ANOTHER GROUP
0B22	213F	LXFR 079	RPFR2			U1=U1+K33	NEXT GROUP OF 8 BYTES
0B24	8AB8	LXFR 080		026	BITCT	BR	GO DO ANOTHER GROUP
0B26	148B	LXFR 081	HALF			G0=G0¤K08 **INVERT BIT 4 - 2ND HALF	
0B28	C03E	LXFR 082		093	DONE	BR IF G0 BIT4=0	BR IF DONE 2ND HALF
0B2A	F439	LXFR 083		090	RPFR3	BR IF G0 BIT3=1	BR IF PFR RD
0B2C	211B	LXFR 084				U1=U1+K01	U= 50DC
0B2E	2525	LXFR 085				G1=0$K20	G= 4820
0B30	3466	LXFR 086	DELAY			SET MODE K=B6	2540 ZONE, READ MODE
0B32	D331	LXFR 087		086	DELAY	BR IF D15=1	WAIT UNTIL ROW 12 HAS BEGAN

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
0B34	3400	LXFR 088				SET MODE K=80	CPU MODE
0B36	8AB6	LXFR 089		025	BYTECT	BR	GO DO 2ND HALF
0B38	21A7	LXFR 090	RPFR3			U1=0$KAA	PFR READ, SET U TO 1OAA
0B3A	25C7	LXFR 091				G1=0	G=5800
0B3C	8AB6	LXFR 092		025	BYTECT	BR	GO DO 2ND HALF
0B3E	F44A	LXFR 093	DONE	099	ENDING	BR IF GO BIT3=0	BR IF NOT PFR RD
0B40	5202	LXFR 094				RDH V DA,88	RESTORE BIAS(000) TO V ADDR REG
0B42	2155	LXFR 095				U1=0$K50	SET U1 TO COUNT OF 80
0B44	2907	LXFR 096				I1=0	SET I TO PFR
0B46	2835	LXFR 097				I0=0$K30	COL BUFFER-3000
0B48	8994	LXFR 098		LRXF 003	ENTRY	BR	BR TO TRANSFER DATA TO MAIN STOR
0B4A	004D	LXFR 099	ENDING			Z=U0¤K40	
0B4C	C4D3	LXFR 100		103	RUNON	BR IF Z=0	BR IF NO XFER OCCURED
0B4E	98EA	LXFR 101	RETURN	IREG 016	RSTREG	BAL	RESTORE CPU REGS
0B50	A5A0	LXFR 102		LOPD 030	NOTI25	BR	XFER CYCLE-RETURN TO READ OP
0B52	98EA	LXFR 103	RUNON	IREG 016	RSTREG	BAL	RESTORE CPU REGS
0B54	3466	LXFR 104				SET MODE K=B6	SET 2540 ZONE, READ MODE
0B56	8E8C	LXFR 105		LRDR 002	RDREND	BR	GO TO READ END ROUTINE
		LXFR 106	AEND				

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**********************************
* CROSS REFERENCE FOR CSECT LXFR *
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LXFR 003	LRXF 081	LXFR 006	LXFR 007
LXFR 008	LXFR 004		
LXFR 011	LXFR 0C9		
LXFR 012	LXFR 010		
LXFR 022	LXFR 019		
LXFR 025	LPSU 053	LXFR 089	LXFR 092
LXFR 026	LXFR 078	LXFR 080	
LXFR 032	LXFR 055	LXFR 057	
LXFR 035	LXFR 033		
LXFR 037	LXFR 035		
LXFR 039	LXFR 037		
LXFR 041	LXFR 039		
LXFR 043	LXFR 041		
LXFR 045	LXFR 043		
LXFR 047	LXFR 045		
LXFR 049	LXFR 047		
LXFR 055	LXFR 053		
LXFR 056	LXFR 051		
LXFR 058	LXFR 050	LXFR 071	
LXFR 072	LXFR 066		
LXFR 078	LXFR 076		
LXFR 079	LXFR 074		
LXFR 081	LXFR 073		
LXFR 086	LXFR 087		
LXFR 090	LXFR 083		
LXFR 093	LXFR 082		
LXFR 099	LXFR 093		
LXFR 101	LREQ 022		
LXFR 103	LXFR 100		

MAAA   DESCRIPTIVE   TEXT

ENTRY POINTS FOR 1401-1460 OPERATIONS

IPL42

ENTRY AT THIS POINT IS FROM THE IPL START RESET
ROUTINE WHEN A 1442 LOAD IS INDICATED. THIS IS AN
ERROR. BRANCH TO SET INVALID UNIT STOP CODE.

START

ENTRY HERE IS FROM IOCM FOLLOWING UNIT ADDRESS G
DECODE. BRANCH BACK TO IOCM TO SET INVALID UNIT.

NOTC

ENTRY FROM MODIFIER DECODE ROUTINE FOLLOWING IN-
VALID MODIFIER DETECTION. BRANCH TO IERR ROUTINE.

RSMSK

ENTRY FROM SENSE COMMAND AND STATUS DECODE WHEN
THE UNIT IS ADDRESSED INCORRECTLY OR THE UNIT IS
NOT THERE. THIS ROUTINE IS USED DURING CHANNEL
OPERATIONS (1401-1460 OR 1440) TO FACILITATE RE-
SETTING MASK AND STORING THE STOP CODE AND OTHER
INFORMATION NEEDED FOR RESTART.

RESLCT

ENTRY IS FROM READ COMMAND AND STATUS LOOP OR MOD-
IFIER DECODE ROUTINE WHEN A RESELECTION OF A
CHANNEL DEVICE (READ-PUNCH OR PRINTER) IS
REQUIRED.

ENTRY POINTS FOR 1440 OPERATIONS

IPL42

ENTRY HERE IS FROM THE IPL START RESET ROUTINE
WHEN A 1442 LOAD IS SPECIFIED.

START

NORMAL ENTRY POINT FROM IOCM FOR EXECUTION OF 1442
INSTRUCTIONS. ALSO THE ENTRY POINT FOR RETRY READ
OR WRITE OPERATIONS FROM BRANCH ON ERROR ROUTINE.

NOTC

ENTRY FROM THE MODIFIER DECODE ROUTINE FOLLOWING
INVALID MODIFIER DETECTION.

RSMSK

ENTRY AT THIS POINT ENSURES THAT THE MASK IS OFF
PRIOR TO DISPLAYING THE STOP MESSAGE.

SKIP

ENTRY POINT FOR 1442 STACKER SELECT.

RESLCT

ENTRY IS FROM THE MODIFIER DECODE (MKKK) ROUTINE
TO PERFORM INITIAL SELECTION AND SENSE DURING 1442
OR 1443 OPERATIONS. ENTRY IS FROM READ COMMAND
AND STATUS LOOP WHEN RESELECTION IS NECESSARY.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		MAAA 001	T		1442	MODIFIER DECODE AND INITIAL SELECTION. KRAGER	
090C	9286	MAAA 032	IPL42	IOCM 015	ZONECK 3	BR	
08EA	9286	MAAA 033	START	IOCM 015	ZONECK 3	BR	
1170	2A95	MAAA 090	NOTC			TO=0$K90	SET INVALID MODIFIER STOP CODE
1172	2B05	MAAA 091	RSMSK			T1=0$K00	CLEAR LOW STOP CODE BYTE
1174	021E	MAAA 092	RSMSK1			RST MMSK K=71	ALLOW TRAPS
1176	5EA2	MAAA 093				RDH H DA,AC	SAVE
1178	56F9	MAAA 094				H1=D0	OP TYPE
117A	7EA2	MAAA 095				STH H DA,AC	FOR ERROR RESTART
117C	2C05	MAAA 096				P0=0$K00	
117E	817C	MAAA 097		IERR 034	STCODE	BR	GO STORE STOP CODE
0628	2A85	MAAA 120	NOUNIT			TO=0$K80	SET STOP CODE
062A	9172	MAAA 121		091	RSMSK	BR	
0978	221E	MAAA 133	RESLCT			SET MMSK K=71	BLOCK TRAPS
097A	3486	MAAA 134				SET MODE K=B8	SET 1401 AND CPU MODE

ADDR	WORD	SEQUENCE NO.	LABEL		NEXTSEQ	NEXTLABEL	STATEMENT		COMMENTS
097C	2B08	MAAA 135					SET GA K=40		SERVICE OUT
097E	94D8	MAAA 136			137	OPIN	BR		
14D8	C9D9	MAAA 137	OPIN		137	OPIN	BR IF GT4=1		WAIT FOR NO OPIN
14DA	4FAF	MAAA 138					GB/OUT=T0		SET BUSS OUT
14DC	2B04	MAAA 139					SET GA K=20		SET ADDRESS OUT
14DE	2B44	MAAA 140					SET GA K=24		SET ADDRESS OUT/SELECT OUT
14E0	C9EB	MAAA 141	OPINOT		144	OPINUP	BR IF GT4=1		BR IF OP IN
14E2	DDE1	MAAA 142			141	OPINOT	BR IF GT1=1		BR IF SELECT IN DOWN
14E4	8628	MAAA 143			120	NOUNIT	BR		
14EA	2B40	MAAA 144	OPINUP				SET GA K=04		RESET ADDRESS OUT
14EC	CDEC	MAAA 145	ADDIN		145	ADDIN	BR IF GT0=0		WAIT FOR ADDRESS IN
14EE	5FBF	MAAA 146					T1=GB/IN		
14F0	6AB1	MAAA 147					T0=T0□T1		COMPARE ADDRESS
14F2	C4E7	MAAA 148			151	ADDOK	BR IF Z=0		ADDRESS OK
14F4	2A85	MAAA 149					T0=0$K80		SET STOP CODE
14F6	9172	MAAA 150			091	RSMSK	BR		GO STORE STOP CODE
14E6	C256	MAAA 151	ADDOK		160	NOT43	BR IF DO BIT4=0		BR IF NOT 1443 SELECTION
14E8	9C7C	MAAA 152			MJJJ 003	PRNTR	BR		
14D6	9265	MAAA 160	NOT43		161	OPIS	N=DO BITS567		
1260	9286	MAAA 161	OPIS	0	IOCM 015	ZONECK 3	BR		
1264	AE80	MAAA 162	OPIS	2	MDDD 019	SENSE	BR		
1266	9286	MAAA 163	OPIS	3	IOCM 015	ZONECK 3	BR		

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**********************************
* CROSS REFERENCE FOR CSECT MAAA *
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MAAA 032    IPLS 055
MAAA 033    IOCM 029
MAAA 090    MKKK 023    MKKK 028
MAAA 091    MAAA 121    MAAA 150    MDDD 053
MAAA 120    MAAA 143
MAAA 133    MBBB 048    MKKK 065
MAAA 137    MAAA 136    MAAA 137
MAAA 141    MAAA 142
MAAA 144    MAAA 141
MAAA 145    MAAA 145
MAAA 151    MAAA 148
MAAA 160    MAAA 151
MAAA 161    MAAA 160
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MBBB   DESCRIPTIVE TEXT

ENTRY POINTS FOR 1401-1460 OPERATIONS

    RETRY
                RESELECT ENTRY POINT WHEN CHANNEL DEVICE IS BUSY.

    ENDOK
                CHANNEL END STATUS ENTERS HERE.

    ENDIT
                DEVICE END STATUS ENTERS HERE.

ENTRY POINTS FOR 1440 OPERATIONS

    RDWR
                THIS IS THE NORMAL ENTRY POINT FOR 1442 READ AND
                WRITE OPERATIONS.

SETUP
                THIS IS THE NORMAL ENTRY POINT FROM THE STACKER
                SELECT ROUTINE.

STATLP
                NORMAL ENTRY FROM THE DATA LOOP. THIS ROUTINE
                PERFORMS NORMAL ENDING OF READ AND PUNCH
                OPERATIONS.

RETRY
                ENTRY FOR RESELECT WHEN CHANNEL DEVICE IS BUSY.

ENDOK
                CHANNEL END STATUS ENTRY.

ENDIT
                DEVICE END STATUS ENTRY

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		MBBB 001	T			READ COMMAND AND STATUS LOOP.	KRAGER
0F12	1645	MBBB 043	OK			DO=DO*-K40	
0F14	3685	MBBB 044				DO=DO$K80	SET FLAG BIT
0F16	1633	MBBB 045	PTR			DO=DO*-K03	
0F18	3623	MBBB 046				DO=DO$K02	SET SENSE OP TYPE
0F1A	5AE2	MBBB 047	RETRY			RDH T DA,BC	
0F1C	8978	MBBB 048		MAAA 133	RESLCT	BR	GO READDRESS UNIT
0D0C	2808	MBBB 075	ENDOK			SET GA K=40	SERVICE OUT
0D0E	021E	MBBB 076				RST MMSK K=71	ALLOW TRAPS
0D10	3400	MBBB 077	ENDIT			SET MODE K=80	1401 CPU MODE
0D12	2C05	MBBB 078				PO=O$K00	
0D14	56F2	MBBB 079				RDH D DA,BE	
0D16	D21D	MBBB 080			083	QAZWSY	BR IF DO BIT5=1	BR IF I4 OP
0D18	C61D	MBBB 081			083	QAZWSY	BR IF DO BIT0=1	BR IF STK SEL AND BR OP
0D1A	8D7C	MBBB 082		ICYC 037	HISTRT	BR	
0D1C	5032	MBBB 083	QAZWSY			RDH U DA,8E	RESTORE A STAR
0D1E	9E72	MBBB 084		IUBR 002	UNCDBR	BR	

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                                    **********************************
                                    * CROSS REFERENCE FOR CSECT MBBB *
                                    **********************************

MBBB 047     MDDD 025   NKKK 094
MBBB 075     MKKK 090   MLLL 053   MPPP 034
MBBB 077     MLLL 061   MPPP 030
MBBB 083     MBBB 080   MBBB 081
```

MDDD   DESCRIPTIVE   TEXT

ENTRY POINTS   CKSTOP
                                                                                  ENTRY FROM SENSE STATUS DECODE ROUTINE FOR EQUIP-
                                                                                  MENT CHECK STATUS WITH I/O CHECK STOP SWITCH ON.
       SENSE
              NORMAL ENTRY POINT WHEN A SENSE COMMAND IS
              DECODED.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		MDDD 001	T		SENSE	COMMAND AND STATUS DECODE.	KRAGER
2E80	2A43	MDDD 019	SENSE			TO=0$KO4	SET COMMAND
2E82	4FAF	MDDD 020	OUTIT			GB/OUT=TO	SET BUSS OUT
2E84	2B42	MDDD 021				SET GA K=14	COMMAND OUT
2E86	FD86	MDDD 022	STATUS	022	STATUS	BR IF GT3=0	WAIT FOR STATUS IN
2E88	5FDF	MDDD 023				P1=GB/IN	
2E8A	FD10	MDDD 024	NTTIO	026	STATOK	BR IF P1 BIT3=0	BR IF NOT BUSY
2E8C	8F1A	MDDD 025		MBBB 047	RETRY	BR	GO RESLECT UNIT
2E90	2B48	MDDD 026	STATOK			SET GA K=44	SERVICE OUT
2E92	ED92	MDDD 027	SVCIN	027	SVCIN	BR IF GT2=0	WAIT FOR SERVICE IN
2E94	5FDF	MDDD 028				P1=GB/IN	
2E96	2B48	MDDD 029				SET GA K=44	SERVICE OUT
2E98	FD98	MDDD 030	CKSTAT	030	CKSTAT	BR IF GT3=0	WAIT FOR STATUS IN
2E9A	2B08	MDDD 031				SET GA K=40	SERVICE OUT
2E9C	C20E	MDDD 032			055	NTPTR	BR IF DO BIT4=0	BR IF NOT PRINTER
2E9E	AC80	MDDD 033		MMMM 018	CKDATA	BR	GO TO PRINTER LOOP
0B78	2AB5	MDDD 052	CKSTOP			TO=0$KB0	SET ERROR STOP CODE
0B7A	9172	MDDD 053		MAAA 091	RSMSK	BR	GO STORE STOP CODE
2E8E	9286	MDDD 055	NTPTR	IOCM 015	ZONECK 3	BR	

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                                                    **********************************
                                                    * CROSS REFERENCE FOR CSECT MDDD *
                                                    **********************************
MDDD 019    MAAA 162  MKKK 069  MMMM 017
MDDD 022    MDDD 022
MDDD 026    MDDD 024
MDDD 027    MDDD 027
MDDD 030    MDDD 030
MDDD 052    MMMM 047
MDDD 055    MDDD 032
```

MJJJ   DESCRIPTIVE   TEXT

ENTRY POINTS

PRNTR   OPIS1 4
    THIS IS THE NORMAL ENTRY POINT FROM INITIAL SEL-   ENTRY HERE IS FROM MKKK (FINISH MODIFIER DECODE)
    ECTION ROUTINE FOR A CONTINUATION OF SELECTION AND   FOR A FORMS AFTER COMMAND OR FROM MPPP (FORMS OP
    OP CODE DECODE (SPACE AND SKIP STATUS) ETC.   DECODE) FOR A PRINTER CONTROL COMMAND.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		MJJJ 001	T		1443 MODIFIER DECODE AND INITIAL SELECTION. KRAGER		
		MJJJ 002	*				
107C	8205	MJJJ 003	PRNTR	004	OPIS1 N	N=DO BITS67	DECODE
1200	8D28	MJJJ 004	OPIS1 0	MKKK 066	SETCMD	BR	OPERATION
1204	8A88	MJJJ 005	OPIS1 2	MMMM 017	SENSE	BR	
1206	8D28	MJJJ 006	OPIS1 3	MKKK 066	SETCMD	BR	
1208	5F49	MJJJ 007	OPIS1 4			GO=H1	MOVE COMMAND
120A	5E62	MJJJ 008				RDH H DA,9C	
120C	1473	MJJJ 009				GO=GO*-K07	REMOVE FLAG BITS
		MJJJ 010	*				
		MJJJ 011	*		CONTROL COMMAND		
		MJJJ 012	*				
120E	5FB9	MJJJ 013				T1=H1	SHIFT CMND
1210	CF2A	MJJJ 014		027	SPACE	BR IF H1 BIT0=0	BR IF SPACE CMND
1212	6BB3	MJJJ 015				T1=T1+T1	LEFT 1 BIT
1214	3F23	MJJJ 016				H1=H1$K02	SET SKIP FLAG
1216	0B9D	MJJJ 017				Z=T1□K90	TEST BITS
1218	E0B9	MJJJ 018		034	CH9	BR IF HZ=0	BR IF SKIP TO CH 9
121A	0BCD	MJJJ 019				Z=T1□KC0	TEST BITS
121C	E0BF	MJJJ 020		037	CH12	BR IF HZ=0	BR IF SKIP TO CH 12
121E	CC33	MJJJ 021		031	CH1	BR IF P0 BIT0=1	BR IF 1403
1220	0B1D	MJJJ 022				Z=T1□K10	TEST BITS
1222	E0B3	MJJJ 023		031	CH1	BR IF HZ=0	BR IF SKIP TO CH 1
1224	FB2F	MJJJ 024	ADD	029	AFTER	BR IF H1 BIT7=1	BR IF COMND AFTER
1226	3433	MJJJ 025				GO=GO$K03	SET CMND IMED
1228	9F26	MJJJ 026		MKKK 045	TEST	BR	
122A	1F23	MJJJ 027	SPACE			H1=H1*-K02	RESET SKIP FLAG
122C	9234	MJJJ 028		032	STORE	BR	
122E	3413	MJJJ 029	AFTER			GO=GO$K01	SET CMND AFTER
1230	9F26	MJJJ 030		MKKK 045	TEST	BR	
1232	1E65	MJJJ 031	CH1			H0=H0*-K60	RESET CH 9 AND 12 FLAG BITS
1234	7E62	MJJJ 032	STORE			STH H DA,9C	STORE
1236	9224	MJJJ 033		024	ADD	BR	GO BUILD LOW 3 BITS
1238	3E45	MJJJ 034	CH9			H0=H0$K40	SET CH 9 BIT ON
123A	1E25	MJJJ 035				H0=H0*-K20	RESET CHNL 12
123C	9234	MJJJ 036		032	STORE	BR	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
123E	3E25	MJJJ 037	CH12			HO=HO$K20	SET CH 12 BIT ON
1240	1E45	MJJJ 038				HO=HO*-K40	RESET CHNL 9
1242	9234	MJJJ 039		032	STORE	BR	
		MJJJ 040	*				

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*********************************
* CROSS REFERENCE FOR CSECT MJJJ *
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MJJJ 003	MAAA 152		
MJJJ 004	MJJJ 0C3		
MJJJ 007	MKKK 039	MPPP 027	
MJJJ 024	MJJJ 033		
MJJJ 027	MJJJ 014		
MJJJ 029	MJJJ 024		
MJJJ 031	MJJJ 021	MJJJ 023	
MJJJ 032	MJJJ 028	MJJJ 036	MJJJ 039
MJJJ 034	MJJJ 018		
MJJJ 037	MJJJ 020		

MKKK DESCRIPTIVE TEXT

ENTRY POINTS   TEST

                                                                         ENTRY HERE IS FROM MODIFIER DECODE AND INITIAL
    STRT43   SELECTION FOLLOWING SETTING OF CONTROL COMMAND
                  NORMAL ENTRY POINT FROM IOCM ROUTINE FOLLOWING   FLAGS.
                  PRINT OPERATION DECODE. THIS ROUTINE DECODES THE
                  MODIFIER AND SETS THE COMMAND.   ADDR

    SETUP   ENTRY HERE IS FROM BRANCH ON PRINTER ERROR.

                  ENTRY AT THIS POINT IS FROM THE 1403 PRINTER   SETCMD
                  ROUTINE FOLLOWING NON INTEGRATED ATTACHED PRINTER
                  DETECTION.   ENTRY HERE IS FROM MODIFIER DECODE AND INITIAL
                                                                         SELECTION WHEN A SET COMMAND IS DECODED.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		MKKK 001	T			FINISH MODIFIER DECODE ISSUE COMMAND. KRAGER	
		MKKK 002	*				
		MKKK 003	*			***	
		MKKK 004	*				
		MKKK 005	*			1443 STATUS BYTE BITS =	
		MKKK 006	*			BIT 0 = NOT USED	
		MKKK 007	*			BIT 1 = NOT USED	
		MKKK 008	*			BIT 2 = NOT USED	
		MKKK 009	*			BIT 3 = BUSY	
		MKKK 010	*			BIT 4 = CHANNEL END	
		MKKK 011	*			BIT 5 = DEVICE END	
		MKKK 012	*			BIT 6 = UNIT CHECK	
		MKKK 013	*			BIT 7 = CHANNEL 12 DETECTED	
		MKKK 014	*				
		MKKK 015	*			***	
		MKKK 016	*				
1EFC	5EC2	MKKK 017	STRT43			RDH H DA,B8	READ CONTROL BYTE
1EFE	7812	MKKK 018				STH I DA,8A	SAVE I STAR
1F00	CB04	MKKK 019		021	LEGAL	BR IF H1 BIT4=0	BR IF M% OP LEGAL
1F02	9286	MKKK 020		IOCM 015	ZONECK 3	BR	GO SET UP 05 STOP CODE
1F04	07ED	MKKK 021	LEGAL			Z=D1□KE0	TEST MODIFIER
1F06	E08B	MKKK 022		024	SORW	BR IF HZ=0	BR IF S OR W MODIFIER
1F08	9170	MKKK 023		MAAA 090	NOTC	BR	GO SET ERROR STOP CODE
1F0A	072B	MKKK 024	SORW			Z=D1□K02	
1F0C	F0B1	MKKK 025		029	SMOD	BR IF LZ=0	BR IF S MODIFIER
1F0E	076B	MKKK 026				Z=D1□K06	
1F10	FC95	MKKK 027		036	WMOD	BR IF LZ=0	BR IF W MODIFIER
1F12	9170	MKKK 028		MAAA 090	NOTC	BR	GO SET ERROR STOP CODE
1F30	5A62	MKKK 029	SMOD			RDH T DA,9C	
1F32	3B23	MKKK 030				T1=T1$K02	SET SPACE SUPP FLAG
1F34	0BE3	MKKK 031				Z=T1*-K0E	
1F36	F094	MKKK 032		036	WMOD	BR IF LZNZ	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1F38	7A62	MKKK 033				STH T DA,9C	
1F3A	2413	MKKK 034				GO=0$K01	
1F3C	9F24	MKKK 035		044	SETUP	BR	
1F14	5E62	MKKK 036	WMOD			RDH H DA,9C	
1F16	FB1C	MKKK 037		040	NEXT	BR IF H1 BIT7=0	BR IF NOT FORMS AFTER CMND
1F18	76F2	MKKK 038	FORMS			STH D DA,BE	SAVE A STAR
1F1A	9208	MKKK 039		MJJJ 007	OPIS1 4	BR	
1F1C	2493	MKKK 040	NEXT			GO=0$K09	SET WRITE AND SPACE CMND
1F1E	5A62	MKKK 041				RDH T DA,9C	
1F20	1B23	MKKK 042				T1=T1*-K02	RESET SS A SKIP FLAG
1F22	7A62	MKKK 043				STH T DA,9C	
1F24	76F2	MKKK 044	SETUP			STH D DA,BE	SAVE D REGISTER
1F26	2683	MKKK 045	TEST			DO=0$K08	SET PRINTER FLAG ON
1F28	5AC2	MKKK 046				RDH T DA,B8	
1F2A	1BB3	MKKK 047				T1=T1*-K0B	
1F2C	F0BE	MKKK 048		050	NOTNAT	BR IF LZNZ	BR IF CHNL DEVICE
1F2E	9978	MKKK 049		MPRT 063	NATV43	BR	GO TO NATIVE ROUTINE
1F3E	5AC2	MKKK 050	NOTNAT			RDH T DA,B8	READ CONTROL BYTE
1F40	0B73	MKKK 051				Z=T1*-K07	
1F42	F0C7	MKKK 052		054	XXXX	BR IF LZ=0	BR IF 1443 MODE
1F44	3C85	MKKK 053				PO=PO$K80	SET 1403 MODE
1F46	5A92	MKKK 054	XXXX			RDH T DA,AA	RESET
1F48	1A13	MKKK 055				TO=TO*-K01	ERROR BIT
1F4A	7A92	MKKK 056				STH T DA,AA	ERROR BIT
1F4C	5E62	MKKK 057	ADDR			RDH H DA,9C	READ PRINTER ADDRESS BYTE
1F4E	2753	MKKK 058				D1=0$K05	SET COUNT LOW
1F50	3765	MKKK 059				D1=D1$K60	SET COUNT HIGH
1F52	CE56	MKKK 060		062	IS100	BR IF HO BIT0=0	BR IF 100 POS 1403
1F54	272D	MKKK 061				D1=D1+K20	MODIFY COUNT HIGH TO 132 POS
1F56	5EA9	MKKK 062	IS100			TO=HO	STRIP OFF
1F58	1AE5	MKKK 063				TO=TO*-KE0	UPPER 3 BITS
1F5A	7AE2	MKKK 064				STH T DA,BC	SAVE UNIT ADDRESS
1F5C	8978	MKKK 065		MAAA 133	RESLCT	BR	
0D28	5E92	MKKK 066	SETCMD			RDH H DA,AA	
0D2A	EB5C	MKKK 067		070	GOON	BR IF H1 BIT6=0	BR IF NO UNIT CK IN BUFFER
0D2C	26A3	MKKK 068				DO=0$K0A	SET UP A SENSE CMND
0D2E	AE80	MKKK 069		MDDD 019	SENSE	BR	
0D5C	4F4F	MKKK 070	GOON			GB/OUT=GO	SET BUSS OUT
0D5E	2B42	MKKK 071				SET GA K=14	CMND OUT
0D60	FDE0	MKKK 072	STATUS	072	STATUS	BR IF GT3=0	WAIT FOR STATUS IN
0D62	5FDF	MKKK 073				P1=GB/IN	
0D64	FD55	MKKK 074		091	BUSY	BR IF P1 BIT3=1	BR IF PRINTER BUSY
0D66	2F05	MKKK 075				H1=0$K00	CLEAR OLD STATUS
0D68	7E92	MKKK 076				STH H DA,AA	
0D6A	5E62	MKKK 077				RDH H DA,9C	
0D6C	E94D	MKKK 078		104	UCK	BR IF P1 BIT6=1	BR IF UNIT CK ON
0D6E	C931	MKKK 079		086	CEND	BR IF P1 BIT4=1	BR IF CHANNEL END ON
0D70	1F13	MKKK 080				H1=H1*-K01	RESET FORMS AFTER BIT
0D72	3F43	MKKK 081				H1=H1$K04	SET ACTIVE BIT ON
0D74	7E62	MKKK 082				STH H DA,9C	
0D76	2B48	MKKK 083	BBBB			SET GA K=44	SERVICE OUT
0D78	021E	MKKK 084				RST MMSK K=71	ALLOW TRAPS
0D7A	AC4A	MKKK 085		MLLL 012	SVCIN	BR	GO TO DATA LOOP

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
0D30	D939	MKKK 086	CEND	090	NOATV	BR IF P1 BIT5=1	BR IF DEVICE END ON
0D32	5E62	MKKK 087				RDH H DA,9C	
0D34	3F43	MKKK 088				H1=H1$K04	SET ACTIVE BIT ON
0D36	7E62	MKKK 089				STH H DA,9C	
0D38	8D0C	MKKK 090	NOATV	MBBB 075	ENDOK	BR	CONTROL CMND END
0D54	D93B	MKKK 091	BUSY	095	DEVEND	BR IF P1 BIT5=1	BR IF DEVICE END ON
0D56	2B08	MKKK 092	XYPP			SET GA K=40	SERVICE OUT
0D58	021E	MKKK 093				RST MMSK K=71	ALLOW TRAPS
0D5A	8F1A	MKKK 094		MBBB 047	RETRY	BR	
0D3A	5E62	MKKK 095	DEVEND			RDH H DA,9C	
0D3C	1F43	MKKK 096				H1=H1*-K04	RESET ACTIVE BIT
0D3E	CC44	MKKK 097		100	CKSTAT	BR IF P0 BIT0=0	BR IF 1443
0D40	EB45	MKKK 098		100	CKSTAT	BR IF H1 BIT6=1	BR IF LAST CMND WAS SS OR SKIP
0D42	1E65	MKKK 099				H0=H0*-K60	RESET CH 9 A 12 BITS
0D44	F948	MKKK 100	CKSTAT	102	NO12	BR IF P1 BIT7=0	BR IF NO CH 12 BIT
0D46	3E25	MKKK 101				H0=H0$K20	SET CH 12 ON
0D48	7E62	MKKK 102	NO12			STH H DA,9C	
0D4A	E956	MKKK 103		092	XYPP	BR IF P1 BIT6=0	BR IF NO UNIT CHECK
0D4C	2B08	MKKK 104	UCK			SET GA K=40	SERVICE OUT
0D4E	021E	MKKK 105				RST MMSK K=71	ALLOW TRAPS
0D50	26A3	MKKK 106				D0=0$K0A	SET SENSE AND PRNTR
0D52	9F4C	MKKK 107		057	ADDR	BR	

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*********************************
* CROSS REFERENCE FOR CSECT MKKK *
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MKKK 017    IOCM 036
MKKK 021    MKKK 019
MKKK 024    MKKK 022
MKKK 029    MKKK 025
MKKK 036    MKKK 027  MKKK 032
MKKK 040    MKKK 037
MKKK 044    MKKK 035  MPRT 110
MKKK 045    MJJJ 026  MJJJ 030
MKKK 050    MKKK 048
MKKK 054    MKKK 052
MKKK 057    MKKK 107  MQQQ 043
MKKK 062    MKKK 060
MKKK 066    MJJJ 004  MJJJ 006
MKKK 070    MKKK 067
MKKK 072    MKKK 072
MKKK 086    MKKK 079
MKKK 090    MKKK 086
MKKK 091    MKKK 074
MKKK 092    MKKK 103
MKKK 095    MKKK 091
MKKK 100    MKKK 097  MKKK 098
MKKK 102    MKKK 100
MKKK 104    MKKK 078
```

MLLL   DESCRIPTIVE TEXT

ENTRY POINT

SVCIN

NORMAL DATA LOOP ENTRY FOR HANDLING 1443 PRINTER
DATA.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		MLLL 001	T			PRINTER DATA LOOP. KRAGER	
		MLLL 002	*				
		MLLL 003	*			**	
		MLLL 004	*				
		MLLL 005	*			EACH CHARACTER IS LOOKED UP IN A TRANSLATION TABLE LOCATED IN	
		MLLL 006	*			AUX STORAGE 7 AND THE CHARACTER AT THAT LOCATION IS SENT TO	
		MLLL 007	*			THE PRINTER.	
		MLLL 008	*			** NOTE ** AUX STG 7 MOVED TO AUX STG 9 IF 24K MACHINE	
		MLLL 009	*				
		MLLL 010	*			**	
		MLLL 011	*				
2C4A	EDEB	MLLL 012	SVCIN	015	DATA	BR IF GT2=1	WAIT FOR SERVICE IN
2C4C	FDCA	MLLL 013		012	SVCIN	BR IF GT3=0	OR STATUS IN
2C4E	8E02	MLLL 014		047	STATUS	BR	
2C6A	5F38	MLLL 015	DATA			RDB H1 V+1	READ B FIELD DATA
2C6C	CC5D	MLLL 016		036	UNIT03	BR IF PO BITO=1	BR IF 1403
2C6E	OFFB	MLLL 017				Z=H1□KOF	TEST CHARACTER
2C70	C4D9	MLLL 018		030	WMGM	BR IF Z=0	BR IF WMGM
2C72	CF50	MLLL 019	XLATE	032	CKFO	BR IF H1 BITO=0	BR IF SPECIAL CHAR
2C74	1FC5	MLLL 020	STRIP			H1=H1*-KCO	REMOVE 0 AND 1 BITS
2C76	2E75	MLLL 022				HO=0$K70	SET UP TLU ADDR
2C78	5BE0	MLLL 026				RDB T1 AS,H	TLU CHARACTER
2C7A	4FBF	MLLL 027				GB/OUT=T1	SET BUSS OUT
2C7C	2B48	MLLL 028				SET GA K=44	SERVICE OUT
2C7E	AC4A	MLLL 029		012	SVCIN	BR	
2C58	2B42	MLLL 030	WMGM			SET GA K=14	COMMAND OUT
2C5A	AC4A	MLLL 031		012	SVCIN	BR	
2C50	OFF5	MLLL 032	CKFO			Z=H1*-KFO	TEST CHAR
2C52	FOF4	MLLL 033		020	STRIP	BR IF LZNZ	BR IF NOT - & OR BLK
2C54	2FAB	MLLL 034				H1=H1+KOA	ADD 10 TO CHAR
2C56	AC74	MLLL 035		020	STRIP	BR	
2C5C	E865	MLLL 036	UNIT03	040	PTWM	BR IF PO BIT6=1	BR IF PRINT WM CMND
2C5E	27FF	MLLL 037	DECCT			D1=D1+KFF	
2C60	C4D9	MLLL 038		030	WMGM	BR IF Z=0	BR OUT IF COUNT = 0
2C62	AC72	MLLL 039		019	XLATE	BR	
2C64	DF44	MLLL 040	PTWM	043	WM	BR IF H1 BIT1=0	BR IF WM IN STORAGE
2C66	2F45	MLLL 041				H1=0$K40	SET BLANK CHAR
2C68	AC5E	MLLL 042		037	DECCT	BR	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
2C44	2FF5	MLLL 043	WM			H1=0$KF0	
2C46	3F13	MLLL 044				H1=H1$K01	SET UP F1 CHAR
2C48	AC5E	MLLL 045		037	DECCT	BR	
		MLLL 046	*				
0E02	5FDF	MLLL 047	STATUS			P1=GB/IN	GET STATUS
0E04	0D8B	MLLL 048				Z=P1▯K08	CK STATUS
0E06	F090	MLLL 049		060	STACK	BR IF LZNZ	BR IF OTHER THAN CE
0E08	CC0E	MLLL 050		053	END	BR IF P0 BIT0=0	BR IF 1443
0E0A	1523	MLLL 051				G1=G1*-K02	REMOVE PRINT BIT
0E0C	F094	MLLL 052		054	COMBOP	BR IF LZNZ	BR IF COMBINED OP
0E0E	8D0C	MLLL 053	END	MBBB 075	ENDOK	BR	GO DO NORMAL 1443 END
0E14	2B08	MLLL 054	COMBOP			SET GA K=40	SERVICE OUT
0E16	3400	MLLL 055				SET MODE K=80	SET CPU MODE
0E18	2C05	MLLL 056				P0=0$K00	CLEAR P0 REG
0E1A	5032	MLLL 057				RDH U DA,8E	RESTORE A STAR
0E1C	56F2	MLLL 058				RDH D DA,BE	RESTORE D REGISTER
0E1E	8D04	MLLL 059		ICYC 213	OPROW 2	BR	
0E10	2B02	MLLL 060	STACK			SET GA K=10	STACK STATUS
0E12	8D10	MLLL 061		MBBB 077	ENDIT	BR	

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************************************
* CROSS REFERENCE FOR CSECT MLLL *
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MLLL 012    MKKK 085  MLLL 013  MLLL 029  MLLL 031
MLLL 015    MLLL 012
MLLL 019    MLLL 039
MLLL 020    MLLL 033  MLLL 035
MLLL 030    MLLL 018  MLLL 038
MLLL 032    MLLL 019
MLLL 036    MLLL 016
MLLL 037    MLLL 042  MLLL 045
MLLL 040    MLLL 036
MLLL 043    MLLL 040
MLLL 047    MLLL 014
MLLL 053    MLLL 050
MLLL 054    MLLL 052
MLLL 060    MLLL 049
```

MMMM DESCRIPTIVE TEXT

ENTRY POINTS   CKDATA

SENSE   ENTRY HERE IS FROM THE SENSE COMMAND AND STATUS
                                                                               DECODE ROUTINE FOLLOWING SENSE COMMAND PRINTER
        ENTRY HERE IS FROM MODIFIER DECODE AND INITIAL   OPERATION DECODE.
        SELECTION WHEN SENSE OPERATION IS DECODED.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		MMMM 001	T			SENSE STATUS DECODE. KRAGER	
		MMMM 002	*				
		MMMM 003	*			**	
		MMMM 004	*				
		MMMM 005	*			1443 SENSE STATUS BYTE BITS =	
		MMMM 006	*			BIT 0 = COMMAND REJECT	
		MMMM 007	*			BIT 1 = NOT READY	
		MMMM 008	*			BIT 2 = BUSS OUT CHECK	
		MMMM 009	*			BIT 3 = EQUIPMENT CHECK	
		MMMM 010	*				
		MMMM 011	*			BITS 4&5 INDICARE TYPEBAR SIZE	
		MMMM 012	*			BIT 6 = NOT USED	
		MMMM 013	*			BIT 7 = CHANNEL 9 DETECTED	
		MMMM 014	*				
		MMMM 015	*			**	
		MMMM 016	*				
0A88	AE80	MMMM 017	SENSE	MDDD 019	SENSE	BR	GO ISSUE COMMAND
2C80	5A92	MMMM 018	CKDATA			RDH T DA,AA	
2C82	2B05	MMMM 019				T1=0$K00	
2C84	7A92	MMMM 020				STH T DA,AA	
2C86	CC0A	MMMM 021		023	NOT03	BR IF P0 BIT0=0	BR IF 1443
2C88	D90D	MMMM 022		024	ERROR	BR IF P1 BIT5=1	BR IF UCS ERROR
2C8A	FD12	MMMM 023	NOT03	027	EQUPOK	BR IF P1 BIT3=0	BR IF NO EQUIP CHECK
2C8C	5A92	MMMM 024	ERROR			RDH T DA,AA	SET
2C8E	3A13	MMMM 025				TO=TO$K01	PRINTER
2C90	7A92	MMMM 026				STH T DA,AA	ERROR BIT ON
2C92	F92E	MMMM 027	EQUPOK	036	NOTCH9	BR IF P1 BIT7=0	BR IF NOT CHANNEL 9
2C94	5E62	MMMM 028				RDH H DA,9C	SET
2C96	3E45	MMMM 029				HO=HO$K40	CHANNEL
2C98	7E62	MMMM 030				STH H DA,9C	9 BIT ON
2C9A	DD31	MMMM 031		037	INVREQ	BR IF P1 BIT1=1	BR IF NOT READY
2C9C	3400	MMMM 032	FORGET			SET MODE K=80	SET CPU MODE
2C9E	021E	MMMM 033				RST MMSK K=71	ALLOW TRAPS
2CA0	2C05	MMMM 034				PO=0$K00	
2CA2	A638	MMMM 035		MQQQ 015	DECMT	BR	
2CAE	DD24	MMMM 036	NOTCH9	043	NOTINV	BR IF P1 BIT1=0	BR IF PRINTER READY
2CB0	3A99	MMMM 037	INVREQ			TO=0-K90	SET INV REQ STOP
2CB2	5AB9	MMMM 038				T1=TO	SET REMOTE RESTART ON

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
2CB4	7AF2	MMMM 039				STH T DA,BE	STORE STOP CODE
2CB6	021E	MMMM 040				RST MMSK K=71	ALLOW TRAPS
2CB8	2C05	MMMM 041				PO=0$K00	
2CBA	ACBC	MMMM 042		IDIS 010	STOP	BR	
2CA4	5EC2	MMMM 043	NOTINV			RDH H DA,B8	
2CA6	CE1C	MMMM 044		032	FORGET	BR IF HO BIT0=0	BR IF I/O CK STOP SW OFF
2CA8	0AE3	MMMM 045				Z=T0*-K0E	
2CAA	F09D	MMMM 046		032	FORGET	BR IF LZ=0	
2CAC	8B78	MMMM 047		MDDD 052	CKSTOP	BR	

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**********************************
* CROSS REFERENCE FOR CSECT MMMM *
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MMMM 017	MJJJ 005	
MMMM 018	MDDD 033	
MMMM 023	MMMM 021	
MMMM 024	MMMM 022	
MMMM 027	MMMM 023	
MMMM 032	MMMM 044	MMMM 046
MMMM 036	MMMM 027	
MMMM 037	MMMM 031	
MMMM 043	MMMM 036	

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ADDR     WORD    SEQUENCE NO.  LABEL     NEXTSEQ   NEXTLABEL  STATEMENT              COMMENTS

                 MNNN 001      T                   BR ON PRINTER BUSY.    KRAGER
                 MNNN 002      *
03A6     9E72    MNNN 003      BUSY1     IUBR 002  UNCDBR     BR
03A0     5E62    MNNN 004      BUSY                           RDH H DA,9C
03A2     DB27    MNNN 005                          003  BUSY1 BR IF H1 BIT5=1        BR IF ACTIVE BIT ON
03A4     8D7C    MNNN 006      ICYC 037  HISTRT     BR
                                         *********************************
                                         * CROSS REFERENCE FOR CSECT MNNN *
                                         *********************************

MNNN 003      MNNN 005
MNNN 004      IOCM 055
```

MPPP DESCRIPTIVE TEXT

ENTRY POINT

FORMS
       THIS IS THE EXCLUSIVE ENTRY POINT, USED WHEN A
       FORMS OPERATION IS DECODED IN I-CYCLES.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		MPPP 001	T		FORMS	OP DECODE. KRAGER	
		MPPP 002	*				
2874	0020	MPPP 003	FORMS			RST S6	
2876	76F2	MPPP 004				STH D DA,BE	SAVE D REGISTER
2878	7032	MPPP 005				STH U DA,8E	SAVE A STAR
287A	57F9	MPPP 006				H1=D1	
287C	2E05	MPPP 007				H0=0$K00	
287E	5FE0	MPPP 008				RDB H1 AS,H	CONVERT MODIFIER TO BCD
2880	EF2E	MPPP 009		031	NORA	BR IF H1 BIT2=0	BR IF NO ZONES OR A ZONE
2882	FF28	MPPP 010		036	BONLY	BR IF H1 BIT3=0	BR IF B ZONE ONLY
2884	2020	MPPP 011				SET S6	BOTH ZONES -SKIP AFTER-
2886	3F15	MPPP 012	ORIN3			H1=H1$K10	SET SKIP BIT ON
2888	6FF3	MPPP 013	SHIFT			H1=H1+H1	SHIFT
288A	6FF3	MPPP 014				H1=H1+H1	NUMERIC
288C	6FF3	MPPP 015				H1=H1+H1	BITS LEFT
288E	5A62	MPPP 016				RDH T DA,9C	READ FORMS BYTE
2890	1BF5	MPPP 017				T1=T1*-KF0	REMOVE
2892	1B83	MPPP 018				T1=T1*-K08	UPPER 5 BITS
2894	6BF5	MPPP 019				T1=T1$H1	OR MARKER BITS AND COMND
2896	E1B7	MPPP 020		028	AFTER	BR IF S6=1	BR IF CMND AFTER
2898	1B13	MPPP 021				T1=T1*-K01	RESET FORMS AFTER BIT
289A	7A62	MPPP 022				STH T DA,9C	
289C	56C2	MPPP 023				RDH D DA,B8	READ CONTROL BYTE
289E	26B3	MPPP 024				D0=0$K0B	SET PRINTER CONTROL CMND
28A0	C324	MPPP 025		027	NO03	BR IF D1 BIT4=0	BR IF 1443
28A2	3C85	MPPP 026				P0=P0$K80	SET 1403 FLAG
28A4	92C8	MPPP 027	NO03	MJJJ 007	OPIS1 4	BR	
28B6	3B13	MPPP 028	AFTER			T1=T1$K01	SET FORMS AFTER BIT
28B8	7A62	MPPP 029				STH T DA,9C	
28BA	8D10	MPPP 030		MBBB 077	ENDIT	BR	
28AE	FF27	MPPP 031	NORA	035	SET	BR IF H1 BIT3=1	BR IF A ZONE
28B0	0FF5	MPPP 032				Z=H1*-KF0	
28B2	FC86	MPPP 033		012	ORIN3	BR IF LZNZ	BR IF NOT BLANK MODIFIER
28B4	8D0C	MPPP 034		MBBB 075	ENDOK	BR	
28A6	2020	MPPP 035	SET			SET S6	SET FORMS AFTER
28A8	1FC3	MPPP 036	BONLY			H1=H1*-K0C	REMOVE 4 AND 5 BITS
28AA	1F35	MPPP 037				H1=H1*-K30	REMOVE 2&3 BITS
28AC	A888	MPPP 038		013	SHIFT	BR	

ADDR   WORD SEQUENCE NO. LABEL   NEXTSEQ   NEXTLABEL STATEMENT   COMMENTS

                MPPP 039   *

                                                          ****
                                                          * CROSS REFERENCE FOR CSECT MPPP *
                                                          ****

MPPP 003   ICYC 307
MPPP 012   MPPP 033
MPPP 013   MPPP 038
MPPP 027   MPPP 025
MPPP 028   MPPP 020
MPPP 031   MPPP 009
MPPP 035   MPPP 031
MPPP 036   MPPP 010

MPRT   DESCRIPTIVE   TEXT

ENTRY POINTS   SOSTRE

PRTCMD   THIS IS THE ENTRY FROM THE INRU ROUTINE FOR THE
                                                                               CONDITION SOFT SOFT STOP LOOP, REQUEST UP.
          THIS IS THE NORMAL ENTRY FROM I-CYCLES FOR 1403
          PRINTER INSTRUCTIONS 2, 3, 6, AND 7.   BRCHN9
                                                                        PRBUSY
     NATV43   BRCH12
                                                                        ERROR
          ENTRY HERE IS FROM THE MKKK ROUTINE FOR 1443
          OPERATIONS THAT ARE TO BE EXECUTED ON THE INTE-   THESE FOUR ENTRY POINTS ARE FROM IOCM TO HANDLE
          GRATED (NATIVE) 1403 PRINTER.   THE RESPECTIVE BRANCH INSTRUCTIONS FOR THE CON-
                                                                               DITIONS   CHANNEL 9, BUSY, CHANNEL 12, AND ERROR.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		MPRT 001	T			** 1403 COMPATIBILITY ROUTINE	- WOLFGANG ROHDE - **
		MPRT 002	*				
		MPRT 003	*			REGISTER USAGE GO	PRINTER /360 OP CODE
		MPRT 004	*			T1	DATA COUNT (100 OR 132)
		MPRT 005	*			DO	1400 STATUS REGISTER
		MPRT 006	*			D1	MODIFIER
		MPRT 007	*			PO	NATIVE PRINTER STATUS
		MPRT 008	*				BIT 0 = 132 PRINT POSITIONS
		MPRT 009	*				IF 0 = 100 PRT POS BY 1403
		MPRT 010	*				120 PRT POS BY 1443
		MPRT 011	*				1 = CHNL 9 SENSED
		MPRT 012	*				2 = CHNL 12 SENSED
		MPRT 013	*				3 = INVALID CHANNEL (TEMPORARELY)
		MPRT 014	*				4 = SECONDARY BIT
		MPRT 015	*				5 = DEVICE END
		MPRT 016	*				6 = PRINT WORDMARK
		MPRT 017	*				7 = PRINTER ERROR
		MPRT 018	*				PO BITS 3-7 USED IF NATIVE PRINTER IS
		MPRT 019	*				USED.IF CHNL PRINTER IS USED BITS 3-7
		MPRT 020	*				CONTAINS UNIT ADDRESS
		MPRT 021	*				P1 PRINTER CONDITIONS FROM BUMP
		MPRT 022	*				BIT 0 = 1403 PRINTER
		MPRT 023	*				1 = PRINTER ON CHANNEL CONNECTED
		MPRT 024	*				2 =
		MPRT 025	*				3 =
		MPRT 026	*				4 = GO TO SET UP AFTER RMT/RST
		MPRT 027	*				5 = FROM GENERAL STOP LOOP
		MPRT 028	*				6 = LAST CMD WAS SKIP OR SPC SUP
		MPRT 029	*				7 = FORMS AFTER COMMAND
		MPRT 030	*				VO,1 DATA ADDRESS (HEX)
		MPRT 031	*				
		MPRT 032	*			ENTRY FROM 2,3,6 OR 7 OP CODE	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
199C	5EC2	MPRT 033	PRTCMD			RDH H DA,B8	READ OUT TO CHECK FOR NUMERIC
199E	CB23	MPRT 034		036	VALID	BR IF H1 BIT4=1	OP CODE
19A0	9286	MPRT 035		IOCM 015	ZONECK 3	BR	GO TO DISPLAY INVALID OP CODE
19A2	7032	MPRT 036	VALID			STH U DA,8E	SAVE A STAR
19A4	5062	MPRT 037				RDH U DA,9C	READ OUT PRT CONTROL BYTE
19A6	1000	MPRT 038				RST SO	
19A8	5149	MPRT 039				GO=U1	SET TEMPORARY FORMS INFORMATION
19AA	2D05	MPRT 040				P1=0$K00	RESET STATUS REGISTER
19AC	F034	MPRT 041		045	NOFORM	BR IF GO BIT7=0	BR IF NO FORMS AFTER
19AE	1113	MPRT 042				U1=U1*-K01	RESET FORMS AFTER BIT
19B0	1463	MPRT 043				GO=GO*-K06	BLANK OUT INDICATION BITS
19B2	99B6	MPRT 044		046	DONE	BR	
19B4	2493	MPRT 045	NOFORM			GO=0$K09	SET UP PRINT WITH SINGLE SPACE
19B6	0677	MPRT 046	DONE			Z=DO*-K77	TEST FOR OP CODE WITH MODIFIER
19B8	C4BC	MPRT 047		049	MODIFI	BR IF DYN BIT0=0	BR IF I2 OR I5 OP LENGTH
19BA	9980	MPRT 048		067	VALFOR	BR	
19BC	2BC3	MPRT 049	MODIFI			T1=0$K0C	SET UP FOR TEST PRINT WM
19BE	3B45	MPRT 050				T1=T1$K40	
19C0	6B71	MPRT 051				T1=T1◻D1	
19C2	C4C8	MPRT 052		055	TESTMO	BR IF ZNZ	BR IF NOT PRINT WM
19C4	2C23	MPRT 053				PO=0$K02	SET PRINT WM BIT
19C6	9980	MPRT 054		067	VALFOR	BR	
19C8	2B23	MPRT 055	TESTMO			T1=0$K02	SET UP FOR TEST SPACE SUP MODIFI
19CA	3BE5	MPRT 056				T1=T1$KE0	
19CC	6B71	MPRT 057				T1=T1◻D1	
19CE	C480	MPRT 058		067	VALFOR	BR IF ZNZ	BR IF NOT SPACE SUPPRESS MODIF
19D0	3123	MPRT 059				U1=U1$K02	SET PRINT W SPACE SUPPRESS
19D2	1113	MPRT 060				U1=U1*-K01	RESET FORMS AFTER
19D4	2413	MPRT 061				GO=0$K01	SET UP WRITE CMD
19D6	9980	MPRT 062		067	VALFOR	BR	
1978	56F2	MPRT 063	NATV43			RDH D DA,BE	RESTORE DO,D1
197A	1000	MPRT 064				RST SO	
197C	2C05	MPRT 065				PO=0$K00	SET PO TO ZERO
197E	5062	MPRT 066	RESTRT			RDH U DA,9C	READ OUT PRT CONTROL BYTES
1980	5EC2	MPRT 067	VALFOR			RDH H DA,B8	START TO ASSEMBLE STATUS BITS
1982	1183	MPRT 068				U1=U1*-K08	
1984	6D15	MPRT 069				P1=P1$U1	
1986	1F33	MPRT 070				H1=H1*-K03	H1= HHHH HH00
1988	4FD3	MPRT 071				P1=H1XH+P1L	P1=HH00 PPPP
198A	C58E	MPRT 072		074	NOTINT	BR IF SO=0	BR IF NOT FROM INTV REQUIRED
198C	128E	MPRT 073				RTN	BACK TO INTV REQ ROUTINE
198E	54A9	MPRT 074	NOTINT			TO=GO	
1990	1A83	MPRT 075				TO=TO*-K08	SET 4BIT TO ZERO
1992	0A3B	MPRT 076				Z=TO◻K03	SET UP TO TEST IMMEDIATE CMD
1994	F098	MPRT 077		079	SETUP	BR IF LZNZ	BR IF NOT IMMEDIATE CMD
1996	A938	MPRT 078		101	CKCHNL	BR	GO TO CHECK SKIP CHANNEL
1998	CD59	MPRT 079	SETUP	081	ADDRSU	BR IF P1 BIT0=1	BR IF 1403 PRINTER IS DEFINED
199A	99E4	MPRT 080		087	ADR43	BR	SKIP ADDRESS SET UP
19D8	5202	MPRT 081	ADDRSU			RDH V DA,88	READ OUT BIAS CONSTANT
19DA	2BC7	MPRT 082				T1=0$KCC	SET T1 TO C9 DEC = 201
19DC	1B5B	MPRT 083				T1=T1◻K05	
19DE	2A05	MPRT 084				TO=0$K00	
19E0	63BB	MPRT 085				V1C=V1+T1	SET UP DATA ADDRESS

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
19E2	62AD	MPRT 086				VOC=VO+TO+C	
19E4	2B67	MPRT 087	ADR43			T1=O$K66	SET DATA COUNT TO DEC 100
19E6	1B23	MPRT 088				T1=T1*-K02	
19E8	A922	MPRT 089		090	PTCNT1	BR	GO AHEAD
2922	0075	MPRT 090	PTCNT1			Z=U0*-K70	SET UP FOR TEST O BIT
2924	E0A9	MPRT 091		093	PRTCNT	BR IF HZ=0	BR IF 100 PRINT POSITIONS
2926	1BED	MPRT 092				T1=T1□KE0	CHANGE COUNT TO 132 PRINT POS
2928	CD33	MPRT 093	PRTCNT	098	SKPTST	BR IF P1 BIT0=1	BR IF 1403 IS DEFINED
292A	0075	MPRT 094				Z=U0*-K70	
292C	E0B2	MPRT 095		098	SKPTST	BR IF HZNZ	BR IF NOT 120 PRINT POSITIONS
292E	2B75	MPRT 096				T1=O$K70	CHANGE COUNT TO 120 PRT POS
2930	3B83	MPRT 097				T1=T1$K08	
2932	DD45	MPRT 098	SKPTST	107	NOTNTV	BR IF P1 BIT 1=1	BR IF NOT NATIVE PRINTER
2934	C442	MPRT 099		106	NOSKP1	BR IF GO BIT0=0	BR IF NO SKIP
2936	CD42	MPRT 100		106	NOSKP1	BR IF P1 BIT0=0	BR IF 1443 PRINTER
2938	54E9	MPRT 101	CKCHNL			H0=G0	
293A	1E85	MPRT 102				H0=H0*-K80	
293C	2E9F	MPRT 103				H0=H0+K99	CHECK SKIP CHNL VALUE
293E	F4C2	MPRT 104		106	NOSKP1	BR IF DYN BIT3=0	BR IF VALID CHANNEL
2940	3C17	MPRT 105				P0=P0$K11	SET INVALID SKIP BIT = PRT ERR
2942	DD06	MPRT 106	NOSKP1	111	SIOROU	BR IF P1 BIT1=0	BR IF NATIVE PRINTER
2944	7062	MPRT 107	NOTNTV			STH U DA,9C	STORE PRINTER CONDITIONS
2946	3C85	MPRT 108				P0=P0$K80	
2948	1615	MPRT 109				D0=D0*-K10	SET B STAR VALID
294A	9F24	MPRT 110		MKKK 044	SETUP	BR	GO TO CHANNEL PRINTER
2906	6C05	MPRT 111	SIOROU			P0=P0$U0	PUT STATUS IN P0
2908	3482	MPRT 112	RETRYO			SET MODE K=98	SET 1401 AND 1403 MODE
290A	0040	MPRT 113				RST S5	
290C	DE9B	MPRT 114		116	READY1	BR IF PRS BIT1=1	BR IF READY
290E	92AE	MPRT 115	FIXME	243	INTREQ	BR	GO TO INTV REQUIRED ROUTINE
291A	D81F	MPRT 116	READY1	118	TSTERR	BR IF P0 BIT5=1	BR ON DE IN NATIVE PRT STATUS
291C	A910	MPRT 117		120	SECBIT	BR	
291E	F804	MPRT 118	TSTERR	125	STRSIO	BR IF P0 BIT7=0	BR IF NO PRINTER ERROR
2920	954C	MPRT 119		326	PRTERR	BR	GO TO ERROR ROUTINE
2910	C815	MPRT 120	SECBIT	122	WAITDE	BR IF P0 BIT4=1	BR IF SECONDARY BIT IS ON
2912	9468	MPRT 121		399	DISCON	BR	NO DE AND NO SECONDARY BIT
2914	CE90	MPRT 122	WAITDE	120	SECBIT	BR IF PRS BIT0=0	BR IF DE NOT YET UP
2916	DE8E	MPRT 123		115	FIXME	BR IF PRS BIT1=0	CHECK READY AGAIN
2918	9BFE	MPRT 124		283	CLRDEV	BR	DE UP GO TO LOOK FOR STATUS
2904	A650	MPRT 125	STRSIO	126	CONSIO	BR	
2650	5E92	MPRT 126	CONSIO			RDH H DA,AA	
2652	1E13	MPRT 127				H0=H0*-K01	RESET PTR ERROR BIT
2654	7E92	MPRT 128				STH H DA,AA	
2656	CD64	MPRT 129		136	SKIP43	BR IF P1 BIT0=0	BR IF 1443
2658	1D23	MPRT 130				P1=P1*-K02	RESET SS OR SKIP LAST FLAG
265A	041B	MPRT 131				Z=G0□K01	
265C	C4E3	MPRT 132		135	SSCMND	BR IF Z=0	BR IF SPACE SUPP CMND
265E	C472	MPRT 133		143	NOSKP	BR IF GO BIT0=0	BR IF NOT A SKIP CMND
2660	1C65	MPRT 134				P0=P0*-K60	RESET CH 9 AND 12 FLAGS
2662	3D23	MPRT 135	SSCMND			P1=P1$K02	SET SS OR SKIP LAST FLAG
2664	04ED	MPRT 136	SKIP43			Z=G0□KE0	
2666	E0EA	MPRT 137		139	TNO12	BR IF HZNZ	BR IF NOT SKIP TO CH 12
2668	3C25	MPRT 138				P0=P0$K20	SET CH 12 FLAG ON

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
266A	04CD	MPRT 139	TNO12			Z=GO¤KCO	
266C	EOF2	MPRT 140		143	NOSKP	BR IF HZNZ	BR IF NOT SKIP TO CH 9
266E	CO72	MPRT 141		143	NOSKP	BR IF GO BIT4=0	BR IF NOT SKIP TO CH 9
2670	3C45	MPRT 142				PO=PO$K40	SET CH 9 FLAG ON
2672	EC77	MPRT 143	NOSKP	145	X1A	BR IF GO BIT6=1	BR IF CTRL IMMED CMND
2674	8126	MPRT 144		172	WRTCMD	BR	
2676	4D4F	MPRT 145	X1A			PRC=GO	LOAD CARRIAGE DATA
2678	1D00	MPRT 146				RST PRA K=80	RESET EXT SENSE LATCHES
267A	818C	MPRT 147		150	SEBUSY	BR	
0188	56E2	MPRT 148	STRPRT			RDH D DA,BC	RELOAD D REGISTER
018A	3D00	MPRT 149				SET PRA K=80	SET PRINT GATE LATCH
018C	2D02	MPRT 150	SEBUSY			SET PRA K=10	SET BUSY LATCH
018E	1C63	MPRT 151				PO=PO*-K06	RESET DE AND PRT WM BIT
0190	3C83	MPRT 152				PO=PO$K08	SET SECONDARY BIT
0192	5032	MPRT 153				RDH U DA,8E	GET A STAR
0194	1D97	MPRT 154				P1=P1*-K99	RESET CONTROL BITS
0196	7C62	MPRT 155				STH P DA,9C	STORE STATUS INTO BUMP
0198	3400	MPRT 156				SET MODE K=80	RESET 1403 MODE
019A	2C05	MPRT 157				PO=0$K00	
019C	5EC2	MPRT 158				RDH H DA,B8	
019E	CB23	MPRT 159		161	PRENDO	BR IF H1 BIT4=1	BR IF 1403 PRINTER
01A0	8D7C	MPRT 160		ICYC 037	HISTRT	BR	1440 GO BACK TO I-CYCLES
01A2	05AB	MPRT 161	PRENDO			Z=G1¤KOA	
01A4	FOAD	MPRT 162		166	PREND1	BR IF LZ=0	BR IF CONTROL COMMAND
01A6	1523	MPRT 163				G1=G1*-K02	SUBTRACT 2 FROM OP CODE
01A8	FOAD	MPRT 164		166	PREND1	BR IF DYN BIT7=1	BR IF NO 3,6 OR 7 OP CODE
01AA	8D20	MPRT 165		ICYC 207	VLDADR 0	BR	GO TO EXECUTE NEXT IO OP
01AC	1525	MPRT 166	PREND1			G1=G1*-K20	RESET OP CODE
01AE	A5AA	MPRT 168		LOPD 035	TESTBR	BR	
0126	4D4F	MPRT 172	WRTCMD			PRC=GO	LOAD CARRIAGE DATA
0128	1D00	MPRT 173				RST PRA K=80	RESET EXTERNAL SENSE LATCHES
012A	76E2	MPRT 174				STH D DA,BC	STORE D REGISTER
012C	2785	MPRT 175				D1=0$K80	SET PLB COUNT TO DEC 132
012E	274B	MPRT 176				D1=D1+K04	
0130	2613	MPRT 177				DO=0$K01	SET PLBAR COUNT 01
0132	2A25	MPRT 178				TO=0$K20	SET PLBAR ADR CONSTANT 2C DEC 44
0134	2ACB	MPRT 179				TO=TO+KOC	
0136	2E75	MPRT 181				HO=0$K70	PLB TABLE ADDR CONST 7A
0138	2EAB	MPRT 185				HO=HO+KOA	
013A	20A7	MPRT 186				UO=0$KAA	
013C	20FF	MPRT 187				UO=UO+KFF	SET UP ADDR CONST A9
013E	A1BE	MPRT 188		190	PRBULO	BR	BR TO PRINT BUFFER LOAD
		MPRT 189	*				
21BE	5F38	MPRT 190	PRBULO			RDB H1 V+1	READ DATA CHARACTER
21C0	CD45	MPRT 191		193	NATVO3	BR IF P1 BITO=1	BR IF 1403 IS DEFINED
21C2	DF34	MPRT 192		204	NOTWMA	BR IF H1 BIT1=0	BR IF CHARACTER HAS A WM
21C4	E851	MPRT 193	NATVO3	200	PRTWMA	BR IF PO BIT6=1	BR IF PRINT WM
21C6	0F75	MPRT 194	XFER43			Z=H1*-K70	TEST IF CHARACTER IS 0XXX 0000
21C8	C4CC	MPRT 195		197	NOSPEC	BR IF ZNZ	BR IF NOT
21CA	3FA3	MPRT 196	BLKTBK			H1=H1$KOA	ADJUST FOR TLU
21CC	3FC5	MPRT 197	NOSPEC			H1=H1$KCO	OR IN WM-BIT AND ADJUST FOR
		MPRT 198	*				TABLE LOOK UP. ADR 11XX YYYY
21CE	A176	MPRT 199		209	DATAXF	BR	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
21D0	DF3B	MPRT 200	PRTWMA	207	NOWOMA	BR IF H1 BIT1=1	BR IF DATA-CHARACTER HAS WM
21D2	2FF5	MPRT 201				H1=0$KF0	SET H1 REG TO HEX F1 DEC 1
21D4	3F13	MPRT 202				H1=H1$K01	
21D6	A176	MPRT 203		209	DATAXF	BR	
21B4	0FFB	MPRT 204	NOTWMA			Z=H1◻K0F	SET UP FOR TEST GM
21B6	C4C6	MPRT 205		194	XFER43	BR IF ZNZ	BR IF NOT A GROUPMARK WORDMARK
21B8	3D25	MPRT 206				P1=P1$K20	SET BIT TO BLANK REST OF BUFFER
21BA	2F45	MPRT 207	NOWOMA			H1=0$K40	INSERT A BLANK IN H1
21BC	A1CA	MPRT 208		196	BLKTBK	BR	
2176	4F6F	MPRT 209	DATAXF			PR=D0	LOAD PLBAR
2178	2D04	MPRT 210				SET PRA K=20	SET READ CALL LATCH
217A	51E0	MPRT 211				RDB U1 AS,H+0	TRANSLATE DATA BY TABLE LOOK UP
217C	4B1F	MPRT 212				PRO=U1	LOAD PLB
217E	2BFF	MPRT 213				T1=T1+KFF	DECREMENT COUNT BY 1
2180	C498	MPRT 214		218	PLBCNT	BR IF ZNZ	BR IF COUNT NOT ZERO
2182	27FF	MPRT 215				D1=D1+KFF	DECREMENT PLB BY 1
2184	C488	MPRT 216		235	HUNPOS	BR IF ZNZ	
2186	8188	MPRT 217	INIPRT	148	STRPRT	BR	BR TO INITIALIZE PRINT OPERA
2198	27FF	MPRT 218	PLBCNT			D1=D1+KFF	DECREMENT PLB BY 1
219A	C4A2	MPRT 219		223	DXFER3	BR IF ZNZ	CONTINUE BUFFER LOAD
219C	CD06	MPRT 220		217	INIPRT	BR IF P1 BIT0=0	BR IF 1443 PRT ROUTINE
219E	3C13	MPRT 221	XFERRO			PO=PO$K01	SET PRINTER CHECK
21A0	8188	MPRT 222		148	STRPRT	BR	GO TO START PRINT
21A2	5E11	MPRT 223	DXFER3			U1=H0X	SET U1 TO A7
21A4	6163	MPRT 227				U1=U1+D0	ADD PLBAR COUNT
21A6	F4AD	MPRT 228		231	DXFER1	BR IF DYN BIT3=1	BR IF PLBAR COUNT .DEC 88
21A8	66A3	MPRT 229				D0=D0+T0	ADD DEC 44 TO PLBAR
21AA	A1AE	MPRT 230		232	DXFER2	BR	
21AC	6603	MPRT 231	DXFER1			D0=D0+U0	ADD DEC 169 TO PLBAR
21AE	ED3E	MPRT 232	DXFER2	190	PRBULO	BR IF P1 BIT2=0	BR TO CONTINUE BUFFER LOAD
21B0	2F45	MPRT 233				H1=0$K40	100 PRT POS OR GMWM BLANK OUT
21B2	A1CA	MPRT 234		196	BLKTBK	BR	
2188	CC0C	MPRT 235	HUNPOS	237	BLKOUT	BR IF PO BIT0=0	BR IF 100 PRT POSITIONS
218A	A19E	MPRT 236		221	XFERRO	BR	SET PRINTER ERROR
218C	3D25	MPRT 237	BLKOUT			P1=P1$K20	SET BIT TO BLANK REST OF BUFFER
218E	CD15	MPRT 238		241	GOONO3	BR IF P1 BIT0=1	BR IF 1403 IS DEFINED
2190	2BC3	MPRT 239				T1=0$K0C	
2192	A1A2	MPRT 240		223	DXFER3	BR	GO TO CONTINUE PRT BUFFER LOAD
2194	2B25	MPRT 241	GOONO3			T1=0$K20	CHANGE DATA COUNT FOR BLK OUT
2196	A1A2	MPRT 242		223	DXFER3	BR	GO TO CONTINUE PRT BUFFER LOAD
12AE	2AF3	MPRT 243	INTREQ			T0=0$K0F	SET ERROR CODE 6F
12B0	3A65	MPRT 244				T0=T0$K60	
12B2	5AB9	MPRT 245				T1=T0	
12B4	5032	MPRT 246				RDH U DA,8E	GET A STAR
12B6	7AF2	MPRT 247				STH T DA,BE	STORE STOP CODE TWICE - RESTART
12B8	7C62	MPRT 248				STH P DA,9C	STORE PRT CONDITIONS
12BA	3400	MPRT 249				SET MODE K=80	RESET 1403 MODE
12BC	8258	MPRT 250		IREG 006	STREGS	BAL	STORE REGS
12BE	ACBC	MPRT 251		IDIS 010	STOP	BR	BR TO INT REQU DISPLAY ROUTINE
		MPRT 252	*				
		MPRT 253	*			ENTRY FROM INTERVENTION REQUIRED DISPLAY ROUTINE	
		MPRT 254	*			PRINTER REQUEST LINE UP	
1E62	98EA	MPRT 255	RMTRST	IREG 016	RSTREG	BAL	GET REGS BACK

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1E64	2E07	MPRT 256				HO=0	
1E66	5EF9	MPRT 257				H1=HO	SET HO,H1 TO ZERO
1E68	7EF2	MPRT 258				STH H DA,BE	SET REMT/RSTRT BUMP LOC TO ZERO
1E6A	5C62	MPRT 259				RDH P DA,9C	RESTORE PRT CONDITIONS
1E6C	3D83	MPRT 260				P1=P1$K08	SET RMT/RSTRT BIT
1E6E	0080	MPRT 261				RST S4	RESET S 4 - NOT WAIT STATE
1E70	9BFE	MPRT 262		283	CLRDEV	BR	
		MPRT 263	*				
		MPRT 264	*			ENTRY FROM SOFT STOP LOOP,REQUEST UP	
1C14	5EC2	MPRT 265	SOSTRE			RDH H DA,B8	
1C16	DB1E	MPRT 266		270	NOCHNL	BR IF H1 BIT5=0	BR IF NOT CHNL PRINTER
1C18	0DC8	MPRT 267				RST PRA K=40	RESET PRT REQUEST LATCH
1C1A	3400	MPRT 268				SET MODE K=80	RESET 1403 MODE
1C1C	9C4A	MPRT 269		318	HISTRT	BR	BRANCH BACK
1C1E	CAAC	MPRT 270	NOCHNL	277	CLRDE1	BR IF PRS BIT4=0	BR IF NOT INITIAL READY
1C20	5EF2	MPRT 271				RDH H DA,BE	READ OUT STOP CODE FROM BUMP
1C22	2E65	MPRT 272				HO=0$K60	
1C24	3EF3	MPRT 273				HO=HO$KOF	SET UP STOP CODE
1C26	6EF1	MPRT 274				HO=HO¤H1	
1C28	C4AC	MPRT 275		277	CLRDE1	BR IF ZNZ	BR IF NO STOP CODE MATCH
1C2A	9E62	MPRT 276		255	RMTRST	BR	BR TO REMOTE RESTART RESTORE
1C2C	5C62	MPRT 277	CLRDE1			RDH P DA,9C	READ OUT PRT CONDITIONS
1C2E	1000	MPRT 278				RST SO	
1C30	CE81	MPRT 279		284	CLRDE2	BR IF PRS BITO=1	BR IF DE UP
1C32	CAD2	MPRT 280		297	CLDEUC	BR IF PRS BIT4=0	BR IF NOT INITIAL READY, SET UC
1C34	1C65	MPRT 281				PO=PO*-K60	RESET CHNL 9 AND 12 INDICATORS
1C36	9C00	MPRT 282		284	CLRDE2	BR	CONTINUE
1BFE	3000	MPRT 283	CLRDEV			SET SO	SET SO FOR BR BACK TO SIO
1C00	3C43	MPRT 284	CLRDE2			PO=PO$K04	SET DE IN PRT COND
1C02	1C83	MPRT 285				PO=PO*-K08	RESET SECONDARY BIT
1C04	E94F	MPRT 286		295	CLRDE3	BR IF P1 BIT6=1	BR IF LST CMD WAS SKP OR SPC SU
1C06	5EC2	MPRT 287				RDH H DA,B8	
1C08	CB0C	MPRT 288		290	CLRDE7	BR IF H1 BIT4=0	BR IF 1443 IS DEFINED
1C0A	1C65	MPRT 289				PO=PO*-K60	RST CHNL 9 AND 12 INDICATORS
1C0C	EECD	MPRT 290	CLRDE7	294	SETCH9	BR IF PRS BIT2=1	BR IF CHANL 9 SENSED
1C0E	FECE	MPRT 291		295	CLRDE3	BR IF PRS BIT3=0	BR IF NOT CHNL 12
1C10	3C25	MPRT 292				PO=PO$K20	SET CHNL 12 SENSED
1C12	9C4E	MPRT 293		295	CLRDE3	BR	
1C4C	3C45	MPRT 294	SETCH9			PO=PO$K40	SET CHNL 9 SENSED
1C4E	DAD3	MPRT 295	CLRDE3	297	CLDEUC	BR IF PRS BIT5=1	BR IF HAMMER CHECK
1C50	EADA	MPRT 296		301	CLRDE4	BR IF PRS BIT6=0	BR IF NO PARITY CHECK
1C52	3C13	MPRT 297	CLDEUC			PO=PO$K01	SET PRINTER ERROR
1C54	5E92	MPRT 298				RDH H DA,AA	
1C56	3E13	MPRT 299				HO=HO$K01	SET PTR ERROR BIT
1C58	7E92	MPRT 300				STH H DA,AA	
1C5A	0D0A	MPRT 301	CLRDE4			RST PRA K=50	RST PRT REQUEST AND BUSY LATCH
1C5C	D1B8	MPRT 302		309	CLRDE6	BR IF S5=0	BR IF NOT FROM BR ON ERROR ROUT
1C5E	0040	MPRT 303				RST S5	
1C60	4EC6	MPRT 304				H=P	PUT PRT CONDITIONS IN HO,H1
1C62	7C62	MPRT 305				STH P DA,9C	STORE PRINTER CONDITIONS
1C64	3400	MPRT 306				SET MODE K=80	RESET 1403 MODE
1C66	2C05	MPRT 307				PO=0$K00	
1C68	ADCA	MPRT 308		386	ERROR1	BR	BR TO PTR ERROR BRANCH

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
1C38	C5C4	MPRT 309	CLRDE6	315	CLRDE5	BR IF SO=0	BR IF NOT FROM SIO ROUTINE
1C3A	997E	MPRT 310		066	RESTRT	BAL	GO TO ASSEMBLE STATUS
1C3C	1000	MPRT 311				RST SO	
1C3E	C943	MPRT 312		314	RMRST1	BR IF P1 BIT4=1	BR IF FROM RMT/RSTRT
1C40	A91E	MPRT 313		118	TSTERR	BR	GO BACK TO SIO
1C42	998E	MPRT 314	RMRST1	074	NOTINT	BR	GO TO SET UP AGAIN
1C44	7C62	MPRT 315	CLRDE5			STH P DA,9C	STORE PRT CONDITIONS
1C46	3400	MPRT 316				SET MODE K=80	RESET 1403 MODE
1C48	2C05	MPRT 317				PO=0$K00	
1C4A	96AC	MPRT 318	HISTRT	INRU 030	STOPCK	BR	GO BACK TO CHECK FOR OTHER INTR
		MPRT 319	*				
		MPRT 320	*			ERROR ROUTINE	
		MPRT 321	*			IF I/O CHECK STOP SWITCH IS ON,PROGRAM ENTERS GENERAL STOP LOOP,	
		MPRT 322	*			OTHERWISE EXTERNAL SENSE LATCHES BECOMES A RESET.	
		MPRT 323	*			IF AN INVALID SKIP TO CHANNEL MODIFIER EXISTS,PROGRAM	
		MPRT 324	*			ENTERS ALWAYS GENERAL STOP LOOP , UNLESS THE MODIFIER	
		MPRT 325	*			WILL BE CHANGED .	
154C	D93B	MPRT 326	PRTERR	347	GENSTP	BR IF P1 BIT5=1	BR IF FROM GENERAL STOP LOOP
154E	5E92	MPRT 327				RDH H DA,AA	
1550	3E13	MPRT 328				HO=HO$K01	SET PTR ERROR BIT
1552	7E92	MPRT 329				STH H DA,AA	
1554	5EC2	MPRT 330				RDH H DA,B8	
1556	CE5F	MPRT 331		335	CHKSTP	BR IF HO BIT0=1	BR IF I/O CHECK STOP SWITCH ON
1558	FC5F	MPRT 332		335	CHKSTP	BR IF PO BIT3=1	BR IF INVALID SKIP MODIFIER
155A	1C13	MPRT 333				PO=PO*-K01	RESET PRT ERROR BIT
155C	A908	MPRT 334		112	RETRY0	BR	
155E	2E65	MPRT 335	CHKSTP			HO=0$K60	SET ERROR CODE -6F-
1560	3EF3	MPRT 336				HO=HO$KOF	
1562	2F05	MPRT 337				H1=0$K00	
1564	7EF2	MPRT 338				STH H DA,BE	STORE ERROR CODE
1566	3043	MPRT 339				P1=P1$K04	SET FROM GEN STOP LOOP BIT
1568	7C62	MPRT 340				STH P DA,9C	STORE PRT CONDITIONS
156A	5CA2	MPRT 341				RDH P DA,AC	
156C	56D9	MPRT 342				P1=DO	SAVE STATUS REGISTER
156E	7CA2	MPRT 343				STH P DA,AC	
1570	3400	MPRT 344				SET MODE K=80	RESET 1403 MODE
1572	2C05	MPRT 345				PO=0$K00	
1574	A044	MPRT 346		IDIS 003	STOPPP	BR	GO TO GENERAL STOP LOOP
153A	5CA2	MPRT 347	GENSTP			RDH P DA,AC	
153C	5D69	MPRT 348				DO=P1	RESTORE STATUS REGISTER
153E	5C62	MPRT 349				RDH P DA,9C	RESTORE PRT CONDITIONS
1540	5622	MPRT 350				RDH D DA,8C	
1542	FC47	MPRT 351		353	PRTER2	BR IF PO BIT3=1	BR IF INVALID SKIP MODIFIER
1544	1C13	MPRT 352				PO=PO*-K01	RST PRT ERROR BIT
1546	1D43	MPRT 353	PRTER2			P1=P1*-K04	RST GENERAL STOP BIT
1548	F84D	MPRT 354		326	PRTERR	BR IF PO BIT7=1	BR IF PRT ERROR
154A	A908	MPRT 355		112	RETRY0	BR	GO TO CONTINUE SIO
		MPRT 356	*				
		MPRT 357	*				
		MPRT 358	*			PRINTER BRANCH CONDITIONS	
2564	8216	MPRT 359	BRCHN9	394	CKNATV	BAL	CHECK IF NATIVE PRINTER
2566	C960	MPRT 360		369	WAIT43	BR IF P1 BIT4=0	BR IF 1443 IS DEFINED
2568	5E62	MPRT 361				RDH H DA,9C	READ OUT PRT CONDITIONS

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
256A	DE6F	MPRT 362		376	UNBR	BR IF H0 BIT1=1	BR IF CHNL 9 SENSED AND TAKE BR
256C	8D7C	MPRT 363		ICYC 037	HISTRT	BR	BR TO EXECUTE NEXT SEQUENTIAL OP
2556	8216	MPRT 364	PRBUSY	394	CKNATV	BAL	CHECK IF NATIVE PRINTER
2558	5E62	MPRT 365				RDH H DA,9C	READ OUT PRINTER CONDITIONS
255A	DA6E	MPRT 366		376	UNBR	BR IF H0 BIT5=0	BR IF DE NOT YET UP
255C	CA6F	MPRT 367		376	UNBR	BR IF H0 BIT4=1	BR IF SECONDARY BIT ON
255E	8D7C	MPRT 368		ICYC 037	HISTRT	BR	BR TO EXECUTE NEXT SEQUENTIAL OP
2560	2080	MPRT 369	WAIT43			SET S K=08	
2562	ADDC	MPRT 370		379	WAIT	BR	
2570	8216	MPRT 371	BRCH12	394	CKNATV	BAL	CHECK IF NATIVE PRINTER
2572	C960	MPRT 372		369	WAIT43	BR IF P1 BIT4=0	BR IF 1443 IS DEFINED
2574	5E62	MPRT 373				RDH H DA,9C	READ OUT PRT CONDITIONS
2576	EE6F	MPRT 374		376	UNBR	BR IF H0 BIT2=1	BR IF CHNL 12 AND TAKE BRANCH
2578	8D7C	MPRT 375		ICYC 037	HISTRT	BR	BR TO EXECUTE NEXT SEQUENTIAL OP
256E	9E72	MPRT 376	UNBR	IUBR 002	UNCDBR	BR	BR TO UNCONDITIONAL BRANCH
2DD8	0080	MPRT 377	ERROR			RST S4	
2DDA	8216	MPRT 378		394	CKNATV	BAL	CK FOR NATIVE PRINTER
2DDC	5E62	MPRT 379	WAIT			RDH H DA,9C	READ OUT PRT CONDITIONS
2DDE	DA4B	MPRT 380		386	ERROR1	BR IF H0 BIT5=1	BR IF DE STORED
2DE0	CA4A	MPRT 381		386	ERROR1	BR IF H0 BIT4=0	BR IF NOT BUSY
2DE2	3482	MPRT 382				SET MODE K=98	SET 1403 MODE
2DE4	2040	MPRT 383				SET S5	
2DE6	4CE6	MPRT 384				P=H	
2DE8	A914	MPRT 385		122	WAITDE	BR	BR TO WAIT FOR DE UP
2DCA	C1CE	MPRT 386	ERROR1	388	NOTCHN	BR IF S4=0	BR IF FROM BR ON ERROR
2DCC	91F2	MPRT 387		404	BRANCH	BR	
2DCE	5E92	MPRT 388	NOTCHN			RDH H DA,AA	READ OUT PTR ERROR BIT
2DD0	FA48	MPRT 389		393	ERROR2	BR IF H0 BIT7=0	BR IF NOT PTR ERROR
2DD2	1E13	MPRT 390				H0=H0*-K01	RESET PTR ERROR BIT
2DD4	7E92	MPRT 391				STH H DA,AA	
2DD6	9E72	MPRT 392		IUBR 002	UNCDBR	BR	TAKE BRANCH
2DC8	8D7C	MPRT 393	ERROR2	ICYC 037	HISTRT	BR	GO TO I-CYCLES
0216	5CC2	MPRT 394	CKNATV			RDH P DA,B8	
0218	2C05	MPRT 395				P0=0$K00	
021A	D91F	MPRT 396		398	CHNLPR	BR IF P1 BIT5=1	BR IF CHANNEL PRINTER
021C	128E	MPRT 397				RTN	RETURN TO NATIVE PRINTER
021E	890A	MPRT 398	CHNLPR	IOCM 051	CHNL	BR	BR TO CHANNEL PRINTER BRANCH
1468	5EEF	MPRT 399	DISCON			H0=PRS	
146A	0E93	MPRT 400				Z=H0*-K09	
146C	F0F1	MPRT 401		403	OKAY	BR IF LZ=0	
146E	954C	MPRT 402		326	PRTERR	BR	GO TO ERROR ROUTINE
1470	A650	MPRT 403	OKAY	126	CONSIO	BR	GO TO CONTINUE SIO
11F2	1C80	MPRT 404	BRANCH			RST S K=88	RESET SO AND S4
11F4	07CB	MPRT 405				Z=D1¤K0C	
11F6	F0EE	MPRT 406		411	NOT12	BR IF LZNZ	BR IF NOT BR ON CHNL 12
11F8	EE70	MPRT 407		412	BRBACK	BR IF H0 BIT2=0	BR IF NOT CHNL 12
11FA	1E25	MPRT 408				H0=H0*-K20	RESET CHNL 12 BIT
11FC	7E62	MPRT 409	ENDING			STH H DA,9C	STORE PRT CONDITIONS
11FE	9E72	MPRT 410		IUBR 002	UNCDBR	BR	TAKE BRANCH ON CHANNEL
11EE	DE6B	MPRT 411	NOT12	413	BRCH09	BR IF H0 BIT1=1	BR IF CHNL 9 IS SENSED
11F0	8D7C	MPRT 412	BRBACK	ICYC 037	HISTRT	BR	GO BACK TO I-CYCLES
11EA	1E45	MPRT 413	BRCH09			H0=H0*-K40	RESET CHNL 9 BIT
11EC	91FC	MPRT 414		409	ENDING	BR	

ADDR   WORD   SEQUENCE NO.   LABEL   NEXTSEQ   NEXTLABEL STATEMENT   COMMENTS

                               ****
                               * CROSS REFERENCE FOR CSECT MPRT *
                               ****
MPRT 033   ICYC 288   ICYC 289 ICYC 292 ICYC 293
MPRT 036   MPRT 034
MPRT 045   MPRT 041
MPRT 046   MPRT 044
MPRT 049   MPRT 047
MPRT 055   MPRT 052
MPRT 063   MKKK 049
MPRT 066   MPRT 310
MPRT 067   MPRT 048   MPRT 054 MPRT 058 MPRT 062
MPRT 074   MPRT 072   MPRT 314
MPRT 079   MPRT 077
MPRT 081   MPRT 079
MPRT 087   MPRT 080
MPRT 090   MPRT 089
MPRT 093   MPRT 091
MPRT 098   MPRT 093   MPRT 095
MPRT 101   MPRT 078
MPRT 106   MPRT 099   MPRT 100 MPRT 104
MPRT 107   MPRT 098
MPRT 111   MPRT 106
MPRT 112   MPRT 334   MPRT 355
MPRT 115   MPRT 123
MPRT 116   MPRT 114
MPRT 118   MPRT 116   MPRT 313
MPRT 120   MPRT 117   MPRT 122
MPRT 122   MPRT 120   MPRT 385
MPRT 125   MPRT 118
MPRT 126   MPRT 125   MPRT 403
MPRT 135   MPRT 132
MPRT 136   MPRT 129
MPRT 139   MPRT 137
MPRT 143   MPRT 133   MPRT 140 MPRT 141
MPRT 145   MPRT 143
MPRT 148   MPRT 217   MPRT 222
MPRT 150   MPRT 147
MPRT 161   MPRT 159
MPRT 166   MPRT 162   MPRT 164
MPRT 172   MPRT 144
MPRT 190   MPRT 188   MPRT 232
MPRT 193   MPRT 191
MPRT 194   MPRT 205
MPRT 196   MPRT 208   MPRT 234
MPRT 197   MPRT 195
MPRT 200   MPRT 193
MPRT 204   MPRT 192
MPRT 207   MPRT 200
MPRT 209   MPRT 199   MPRT 203
MPRT 217   MPRT 220
MPRT 218   MPRT 214
MPRT 221   MPRT 236

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                        **********************************
                        * CROSS REFERENCE FOR CSECT MPRT *
                        **********************************
MPRT 223     MPRT 219   MPRT 240   MPRT 242
MPRT 231     MPRT 228
MPRT 232     MPRT 230
MPRT 235     MPRT 216
MPRT 237     MPRT 235
MPRT 241     MPRT 238
MPRT 243     MPRT 115
MPRT 255     MPRT 276
MPRT 265     INRU 079
MPRT 270     MPRT 266
MPRT 277     MPRT 270   MPRT 275
MPRT 283     MPRT 124   MPRT 262
MPRT 284     MPRT 279   MPRT 282
MPRT 290     MPRT 288
MPRT 294     MPRT 290
MPRT 295     MPRT 286   MPRT 291   MPRT 293
MPRT 297     MPRT 280   MPRT 295
MPRT 301     MPRT 296
MPRT 309     MPRT 302
MPRT 314     MPRT 312
MPRT 315     MPRT 309
MPRT 318     MPRT 269
MPRT 326     MPRT 119   MPRT 354   MPRT 402
MPRT 335     MPRT 331   MPRT 332
MPRT 347     MPRT 326
MPRT 353     MPRT 351
MPRT 359     IOCM 047
MPRT 364     IOCM 050
MPRT 369     MPRT 360   MPRT 372
MPRT 371     IOCM 049
MPRT 376     MPRT 362   MPRT 366   MPRT 367   MPRT 374
MPRT 377     IOCM 048
MPRT 379     MPRT 370
MPRT 386     MPRT 308   MPRT 380   MPRT 381
MPRT 388     MPRT 386
MPRT 393     MPRT 389
MPRT 394     MPRT 359   MPRT 364   MPRT 371   MPRT 378
MPRT 398     MPRT 396
MPRT 399     MPRT 121
MPRT 403     MPRT 401
MPRT 404     MPRT 387
MPRT 409     MPRT 414
MPRT 411     MPRT 406
MPRT 412     MPRT 407
MPRT 413     MPRT 411
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MQQQ   DESCRIPTIVE TEXT

ENTRY POINTS (CHANNEL ATTACHED PRINTER)   CH9
                                                                  CH12
    PTERR   THESE ENTRY POINTS ARE FROM THE IOCM ROUTINE FOR
              THIS ENTRY IS FROM THE IOCM ROUTINE FOR HANDLING   BRANCH ON CHANNEL 9 AND 12 INSTRUCTIONS.
              BRANCH ON PRINTER ERROR INSTRUCTIONS.
                                                                  XXXXXX
    DECMT   ENTRY HERE IS FROM THE SOFT STOP ROUTINE (INRU)
              ENTRY HERE IS FROM THE SENSE STATUS DECODE   WHEN THERE IS A CHANNEL INTERRUPT CONDITION.
              ROUTINE.

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
		MQQQ 001	T			BRANCH ON PRINTER ERROR. KRAGER	
		MQQQ 002	*				
2614	5EC2	MQQQ 003	PTERR			RDH H DA,B8	READ CONTROL BYTE
2616	CB20	MQQQ 004		009	CKFER	BR IF H1 BIT4=0	BR IF 1443
2618	5E62	MQQQ 005				RDH H DA,9C	READ FORMS BYTE
261A	DB2D	MQQQ 006		038	WAIT	BR IF H1 BIT5=1	BR IF PRINTER ACTIVE
261C	5492	MQQQ 007				RDH G DA,AA	READ CHNL STATUS BYTE
261E	E135	MQQQ 008		042	SENSE	BR IF G1 BIT6=1	BR IF UNIT CHECK ON
2620	5E92	MQQQ 009	CKFER			RDH H DA,AA	READ ERROR BYTE
2622	FA27	MQQQ 010		012	RESET	BR IF HO BIT7=1	BR IF ERROR BIT ON
2624	8D7C	MQQQ 011		ICYC 037	HISTRT	BR	
2626	1E13	MQQQ 012	RESET			HO=HO*-KO1	RESET ERROR BIT
2628	7E92	MQQQ 013				STH H DA,AA	STORE ERROR BYTE
262A	9E72	MQQQ 014		IUBR 002	UNCDBR	BR	
2638	5886	MQQQ 015	DECMT			I=I-1	DECREMENT I STAR -1
263A	5790	MQQQ 016				RDB D1 I+0	READ MAIN STORAGE
263C	D739	MQQQ 017		015	DECMT	BR IF D1 BIT1=1	BR IF NO WM YET
263E	8D7C	MQQQ 018		ICYC 037	HISTRT	BR	
25FE	5E62	MQQQ 019	CH9			RDH H DA,9C	READ LATCH BITS
2600	DB2D	MQQQ 020		038	WAIT	BR IF H1 BIT5=1	BR IF ACTIVE BIT ON
2602	5492	MQQQ 021				RDH G DA,AA	READ CHNL STATUS BYTE
2604	E135	MQQQ 022		042	SENSE	BR IF G1 BIT6=1	BR IF UNIT CHECK ON
2606	DEOB	MQQQ 023		025	REMOVE	BR IF HO BIT1=1	BR IF CH 9 BIT ON
2608	8D7C	MQQQ 024		ICYC 037	HISTRT	BR	
260A	54C2	MQQQ 025	REMOVE			RDH G DA,B8	
260C	C113	MQQQ 026		029	ISO3	BR IF G1 BIT4=1	BR IF 1403
260E	1E45	MQQQ 027				HO=HO*-K40	RESET CH 9 BIT
2610	7E62	MQQQ 028	STORE			STH H DA,9C	STORE BACK
2612	9E72	MQQQ 029	ISO3	IUBR 002	UNCDBR	BR	
2640	5E62	MQQQ 030	CH12			RDH H DA,9C	READ LATCH BITS
2642	DB2D	MQQQ 031		038	WAIT	BR IF H1 BIT5=1	BR IF ACTIVE BIT ON
2644	EE49	MQQQ 032		034	BLANK	BR IF HO BIT2=1	BR IF CH 12 BIT ON
2646	8D7C	MQQQ 033		ICYC 037	HISTRT	BR	
2648	54C2	MQQQ 034	BLANK			RDH G DA,B8	

ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
264A	C113	MQQQ 035		029	ISO3	BR IF G1 BIT4=1	BR IF 1403
264C	1E25	MQQQ 036				H0=H0*-K20	RESET CH 12 BIT
264E	A610	MQQQ 037		028	STORE	BR	
262C	5E62	MQQQ 038	WAIT			RDH H DA,9C	READ STATUS BYTE
262E	DB2D	MQQQ 039		038	WAIT	BR IF H1 BIT5=1	WAIT FOR ACTIVE BIT TO DROP
2630	5E92	MQQQ 040				RDH H DA,AA	
2632	EB38	MQQQ 041		015	DECMT	BR IF H1 BIT6=0	BR IF UNIT CK OFF
2634	26A3	MQQQ 042	SENSE			DO=O$KOA	SET SENSE AND PRINTER
2636	9F4C	MQQQ 043		MKKK 057	ADDR	BR	
0980	A638	MQQQ 044		015	DECMT	BR	GO BACK UP I STAR
0990	0010	MQQQ 045	XXXXXX			RST S7	
0992	A638	MQQQ 055		015	DECMT	BR	

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* CROSS REFERENCE FOR CSECT MQQQ *
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MQQQ 003	IOCM 053				
MQQQ 009	MQQQ 004				
MQQQ 012	MQQQ 010				
MQQQ 015	MMMM 035	MQQQ 017	MQQQ 041	MQQQ 044	MQQQ 055
MQQQ 019	IOCM 052				
MQQQ 025	MQQQ 023				
MQQQ 028	MQQQ 037				
MQQQ 029	MQQQ 026	MQQQ 035			
MQQQ 030	IOCM 054				
MQQQ 034	MQQQ 032				
MQQQ 038	MQQQ 006	MQQQ 020	MQQQ 031	MQQQ 039	
MQQQ 042	MQQQ 008	MQQQ 022			
MQQQ 045	INRU 056				

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ADDR    WORD   SEQUENCE NO.   LABEL    NEXTSEQ   NEXTLABEL  STATEMENT                COMMENTS

               MZZZ 001       T                             AUX STORAGE TABLES
               MZZZ 002       *                                MODULE 0              AUXILIARY  STORAGE
               MZZZ 003       ATABLE   ADDR=0000                 0 1 2 3 4 5 6 7 8 9 A B C D E F
               MZZZ 004       *                             ADDRESS=00RC
0000    40F1   MZZZ 005       CAROW0                        XAUX'40F1F2F3F4F5F6F7F8F9F07B7C7D7E7F'BCD  TO  EBCDIC
0010    7A61   MZZZ 006       CAROW1                        XAUX'7A61E2E3E4E5E6E7E8E9E06B6C6D6E6F' CONVERSION
0020    60D1   MZZZ 007       CAROW2                        XAUX'60D1D2D3D4D5D6D7D8D9D05B5C5D5E5F'    TABLE
0030    50C1   MZZZ 008       CAROW3                        XAUX'50C1C2C3C4C5C6C7C8C9C04B4C4D4E4F'        ****
0040    0040   MZZZ 009       CAROW4                        XAUX'00404040404040404040403B3C3D3E3F'EBCDIC  TO  BCD
0050    3040   MZZZ 010       CAROW5                        XAUX'30404040404040404040402B2C2D2E2F' CONVERSION
0060    2011   MZZZ 011       CAROW6                        XAUX'20115240404040404040401B1C1D1E1F'    TABLE 1
0070    4A70   MZZZ 012       CAROW7                        XAUX'4A704040404040404040100B0C0D0E0F'        ****
0080    08C0   MZZZ 014       CAROW8                        XAUX'08C0C1C2C3C4C540018000000000000'INITIALIZE AREA
0090    0000   MZZZ 018       CAROW9                        XAUX'0000000000004000000008E000A00'OVERLY WITH
00A0    0081   MZZZ 020       CAROWA                        XAUX'008102400420061000080003F000000'OPTIONS ON 2ND
00B0    0000   MZZZ 024       CAROWB                        XAUX'0000000000000800E800FF0000000000'FRM LAST LOADCD
00C0    3A31   MZZZ 025       CAROWC                        XAUX'3A313233343536373839404048455C'EBCDIC  TO  BCD
00D0    2A21   MZZZ 026       CAROWD                        XAUX'2A2122232425262728294040404065D' CONVERSION
00E0    1A51   MZZZ 027       CAROWE                        XAUX'1A51121314151617181940404049F56'    TABLE 2
00F0    0A01   MZZZ 028       CAROWF                        XAUX'0A0102030405060708094040404445F'        ****
               MZZZ 029       AEND
               MZZZ 030       *                                MODULE 2              AUXILIARY  STORAGE
               MZZZ 031       ATABLE   ADDR=2000                 0 1 2 3 4 5 6 7 8 9 A B C D E F
               MZZZ 032       *                             ADDRESS=20RC
2000    000A   MZZZ 033       CBROW0                        XAUX'000A141E28323C46505A0101010101'TENS DEC/HEX***
2010    0059   MZZZ 034       CBROW1                        XAUX'005900000000044C0BB807D003E80000'HUNDREDS
2020    005E   MZZZ 035       CBROW2                        XAUX'005E00000000000000C1C0834044C0064' CONVERSION
2030    0063   MZZZ 036       CBROW3                        XAUX'00630000000000000C80089804B000C8'  DEC TO HEX
2040    0000   MZZZ 037       CBROW4                        XAUX'000000000000000CE408FC0514012C'AND INDEX REGS.
2050    0000   MZZZ 038       CBROW5                        XAUX'00000000000000000D48096005780190'THE VALUES IN
2060    0000   MZZZ 039       CBROW6                        XAUX'000000000000000000DAC09C405DC01F4' THIS AREA ARE
2070    0000   MZZZ 040       CBROW7                        XAUX'00000000000000000E100A2806400258'  ADDED TO THE
2080    0000   MZZZ 041       CBROW8                        XAUX'00000000000000000E740A8C06A402BC'BIAS CONSTANT
2090    0000   MZZZ 042       CBROW9                        XAUX'00000000000000000ED80AF007080320'AND STORED BACK
20A0    0000   MZZZ 043       CBROWA                        XAUX'000000000000000F3C0B54076C0384'DURING CSL ****
20B0    0016   MZZZ 044       CBROWB                        XAUX'00163248648096112844607692072339'TENS HEX/DEC***
20C0    1C18   MZZZ 045       CBROWC                        XAUX'1C180B1F12162A34B1343402153434 34' OP-CODE
20D0    1D34   MZZZ 046       CBROWD                        XAUX'1D34299080063411EF1343434343434' DECODE
20E0    3405   MZZZ 047       CBROWE                        XAUX'34051934200E0F341317340418343434' TABLE
20F0    3421   MZZZ 048       CBROWF                        XAUX'3421222324252627060634141A343434'        ****
               MZZZ 049       AEND
               MZZZ 050       *                                MODULE 5              AUXILIARY  STORAGE
               MZZZ 051       ATABLE   ADDR=5000                 0 1 2 3 4 5 6 7 8 9 A B C D E F
               MZZZ 052       *                             ADDRESS=50RC
5000    0000   MZZZ 053       CCROW0                        XAUX'00000000000000000000000000000000'WORK AREA FOR
5010    0000   MZZZ 054       CCROW1                        XAUX'00000000000000000000000000000000' 2540        ****
5020    0032   MZZZ 055       CCROW2                        XAUX'00320A3C14461E50285A000000000000'FILE TABLE
5030    8000   MZZZ 056       CCROW3                        XAUX'80000801000204405060000000C000000'        ****
5040    F900   MZZZ 057       CCROW4                        XAUX'F900000000000000E9000000000000000'2540
5050    D900   MZZZ 058       CCROW5                        XAUX'D9000000000000000000000000000000'
5060    C900   MZZZ 059       CCROW6                        XAUX'C9000000000000000000000000000000'READ
5070    0005   MZZZ 060       CCROW7                        XAUX'00050106020703080409000000000000'
5080    F800   MZZZ 061       CCROW8                        XAUX'F8007A7B7C7D7E7FE800E06B6C6D6E6F'TRANSLATE
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ADDR	WORD	SEQUENCE NO.	LABEL	NEXTSEQ	NEXTLABEL	STATEMENT	COMMENTS
5090	D800	MZZZ 062	CCROW9			XAUX' D800005B5C5D5E5F0000000000000000'	
50A0	C800	MZZZ 063	CCROWA			XAUX' C800004B4C4D4E4F0000000000000000'	
50B0	0003	MZZZ 064	CCROWB			XAUX' 00030230013030300030303030303030'	
50C0	40F1	MZZZ 065	CCROWC			XAUX' 40F1F2F3F4F5F6F7F061E2E3E4E5E6E7'	
50D0	60D1	MZZZ 066	CCROWD			XAUX' 60D1D2D3D4D5D6D7D00000000000000000'	
50E0	50C1	MZZZ 067	CCROWE			XAUX' 50C1C2C3C4C5C6C7C00000000000000000'	
		MZZZ 068	AEND				
		MZZZ 070	*			MODULE 6 AUXILIARY STORAGE	
		MZZZ 071	ATABLE	ADDR=6000		0 1 2 3 4 5 6 7 8 9 A B C D E F	
		MZZZ 072	*		ADDRESS=60RC		
6000	407E	MZZZ 078	CDROW0			XAUX' 407E4C5E7A6C7D6E5C4D5D7B7F40406F'CONSOLE	
6010	7C61	MZZZ 079	CDROW1			XAUX' 7C61E2E3E4E5E6E7E8E9006B4F6CEEE0' PRINTER	
6020	60D1	MZZZ 080	CDROW2			XAUX' 60D1D2D3D4D5D6D7D8D096D5B007C7BD0' TRANSLATE	
6030	50C1	MZZZ 081	CDROW3			XAUX' 50C1C2C3C4C5C6C7C8C94E4B5F4C40C0'PTT/EBCDIC ****	
6040	0000	MZZZ 082	CDROW4			XAUX' 00000000000000000009394959697'2540 PUNCH	
6050	8000	MZZZ 083	CDROW5			XAUX' 800000000000000000005354555657' TRANSLATE	
6060	4021	MZZZ 084	CDROW6			XAUX' 402100000000000000003334353637' TABLE 1	
6070	0000	MZZZ 085	CDROW7			XAUX' 000000000000000000002013141516171' ****	
6080	8000	MZZZ 086	CDROW8			XAUX' 800040002000100008C00040002000100'2540 PUNCH MASK	
6090	0000	MZZZ 087	CDROW9			XAUX' 00000000000000000000000000000000'WORKING	
60A0	0000	MZZZ 088	CDROWA			XAUX' 00000000000000000000000000000000' STORAGE	
60B0	0000	MZZZ 089	CDROWB			XAUX' 00000000000000000000000000000000' ****	
60C0	A081	MZZZ 090	CDROWC			XAUX' A08182838485868790880000000000000'2540 PUNCH	
60D0	6041	MZZZ 091	CDROWD			XAUX' 60414243444546475048000000000000' TRANSLATE	
60E0	3200	MZZZ 098	CDROWE			XAUX' 32002223242526273028000000000000' TABLE 2	
60F0	2001	MZZZ 100	CDROWF			XAUX' 20010203040506071008000000000000' ****	
		MZZZ 101	AEND				
		MZZZ 103	*			MODULE 7 AUXILIARY STORAGE	
		MZZZ 104	ATABLE	ADDR=7000		0 1 2 3 4 5 6 7 8 9 A B C D E F	
		MZZZ 105	*		ADDRESS=70RC		
7000	4EC1	MZZZ 111	CEROW0			XAUX' 4EC1C2C3C4C5C6C7C8C9404B4C404040'1443	
7010	7DD1	MZZZ 112	CEROW1			XAUX' 7DD1D2D3D4D5D6D7D8D95505B5C404040' GRAPHICS	
7020	7E61	MZZZ 113	CEROW2			XAUX' 7E61E2E3E4E5E6E7E8E96006B6C404040' TABLE	
7030	F0F1	MZZZ 114	CEROW3			XAUX' F0F1F2F3F4F5F6F7F8F9407B7C404040' ****	
7040	4040	MZZZ 115	CEROW4			XAUX' 40404040404040404040404040404040'WORKING	
7050	4040	MZZZ 116	CEROW5			XAUX' 40404040404040404040404040404040'STORAGE	
7060	4040	MZZZ 117	CEROW6			XAUX' 40404040404040404040404040404040'WORKING	
7070	4040	MZZZ 118	CEROW7			XAUX' 40404040404040404040404040404040'STORAGE	
7080	0000	MZZZ 119	CEROW8			XAUX' 0000004BC57FC67A0000004B4E7F6C7A'CONSOLE PRINTER	
7090	7C00	MZZZ 120	CEROW9			XAUX' 7C00005B7D4F4C4A7C00005B7D4F4C4A'SPECIAL CHAR	
70A0	5061	MZZZ 121	CEROWA			XAUX' 5061006BE56E5C6D5061006B5D6E5C6D'RE-TRANSLATE	
70B0	0000	MZZZ 122	CEROWB			XAUX' 00005FD6D55E4D7E00005F7B605E4D7E'EBCDIC/PTT ****	
70C0	1625	MZZZ 123	CEROWC			XAUX' 1625262728292A2B2C2D002F30000000'1403	
70D0	2219	MZZZ 124	CEROWD			XAUX' 22191A1B1C1D1E1F2021162324000000' GRAPHICS	
70E0	2E0D	MZZZ 125	CEROWE			XAUX' 2E0D0E0F1011121314152217180000000' TABLE 2	
70F0	0A01	MZZZ 126	CEROWF			XAUX' 0A010203040506070809 2E0B0C000000' ****	
		MZZZ 127	AEND				

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0000-	BCPL 003	BCPL 004	BCPL 004	BCPL 004	BCPL 004	BCPL 004	BCPL 004	BCPL 005	-0000-
	8000	0BAD	0BAD	0BAD	0BAD	0BAD	0BAD	80AC	
-0010-	BCPL 009	BCPL 010	BCPL 011	BCPL 012	BCPL 013	BCPL 014	BCPL 015	BCPL 016	-0010-
	3210	2610	50CF	51AF	2413	0CCF	C4AD	0CDF	
-0020-	BCPL 017	BCPL 018	BCPL 019	BCPL 020	BCPL 021	BCPL 022	BCPL 023	BCPL 024	-0020-
	C48F	0CEF	C4E3	0CFF	C4A8	80DE	2486	2507	
-0030-	BCPL 025	BCPL 026	BCPL 027	BCPL 028	BCPL 029	BCPL 030	BCPL 031	BCPL 032	-0030-
	2B08	C9B3	4FAF	2B04	2B44	C9BA	2B40	CDBE	
-0040-	BCPL 033	BCPL 034	BCPL 035	BCPL 036	BCPL 037	BCPL 038	BCPL 039	BCPL 040	-0040-
	2B23	4FBF	2B42	FDC6	5FBF	C4CA	2B48	FDCF	
-0050-	BCPL 041	BCPL 042	BCPL 043	BCPL 044	BCPL 045	BCPL 046	BCPL 047	BCPL 048	-0050-
	EDCE	5FFF	F05B	7F48	F05C	6F48	055D	C4CC	
-0060-	BCPL 049	BCPL 050	BCPL 051	BCPL 052	BCPL 053	BCPL 054	BCPL 055	BCPL 056	-0060-
	8100	2406	2617	2783	3775	2507	4066	5EEF	
-0070-	BCPL 057	BCPL 058	BCPL 059	BCPL 060	BCPL 061	BCPL 062	BCPL 063	BCPL 064	-0070-
	DE6E	5B3F	6348	736A	F0EE	161B	F0E7	8100	

008-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0080-	BCPL 065	BCPL 066	BCPL 067	BCPL 068	BCPL 069	BCPL 070	BCPL 071	BCPL 072	-0080-
	6EE3	6EE3	6EE3	0E08	0E04	49EF	4EDF	4BFF	
-0090-	BCPL 073	BCPL 074	BCPL 075	BCPL 076	BCPL 077	BCPL 078	BCPL 079	BCPL 080	-0090-
	2E63	3E15	4FEF	2E43	E598	4EEF	4BFF	3D00	
-00A0-	BCPL 081	BCPL 082	BCPL 083	BCPL 084	BCPL 085	BCPL 086	BCPL 087	BCPL 088	-00A0-
	E5A1	1D00	50EF	CA25	C1A9	810A	240E	2507	
-00B0-	BCPL 089	BCPL 090	BCPL 091	BCPL 092	BCPL 093	BCPL 094	BCPL 095	BCPL 096	-00B0-
	2F04	5FDF	DAB8	ED33	2F10	DAC6	CAB9	58FF	
-00C0-	BCPL 097	BCPL 098	BCPL 099	BCPL 100	BCPL 101	BCPL 102	BCPL 103	BCPL 104	-00C0-
	5AEF	4EF3	6F48	2B14	055D	C4B4	8100	FFFF	
-00D0-	BCPL 104	BCPL 104	BCPL 104	BCPL 104	BCPL 104	BCPL 104	BCPL 105	BCPL 106	-00D0-
	FFFF	FFFF	FFFF	FFFF	FFFF	FFFF	FFFF	2B07	
-00E0-	BCPL 107	BCPL 108	BCPL 109	BCPL 110	BCPL 111	BCPL 112	BCPL 113	BCPL 114	-00E0-
	6A02	2490	2813	2907	4A86	4C02	2F15	5FE9	
-00F0-	BCPL 115	BCPL 116	BCPL 117	BCPL 118	BCPL 119	BCPL 120	BCPL 121	BCPL 122	-00F0-
	2D23	4D9F	8811	54E8	6488	FA76	0608	88FE	

ADDRESS LIST DATE 11/08/68

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-01C0-	IZWM 002	IZWM 003	IBCH 110	IBCH 111	IBCH 112	IBCH 107	IBCH 108	IBCH 109	-0100-
	5D3A	8309	5759	5EB2	9153	2513	251B	8106	
-0110-	LPTR 005	LPTR 006	ICOM 006	ICOM 007	ICOM 002	ICOM 003	ICOM 004	ICOM 005	-0110-
	2208	9062	2A7F	128E	0A61	E094	2AFD	128E	
-0120-	ITRP 067	ITRP 068	ITRP 069	MPRT 172	MPRT 173	MPRT 174	MPRT 175	MPRT 176	-0120-
	22EC	1F00	02EC	4D4F	1D00	76E2	2785	274B	
-0130-	MPRT 177	MPRT 178	MPRT 179	MPRT 181	MPRT 185	MPRT 186	MPRT 187	MPRT 188	-0130-
	2613	2A25	2ACB	2E75	2EAB	20A7	20FF	A1BE	
-0140-	KAAH 014	KAAH 015	KAAH 016	JTYP 498	JTYP 499	JTYP 500	JTYP 501	JTYP 489	-0140-
	3210	3480	95FE	32F3	7B28	81B6	8158	5BE2	
-0150-	JTYP 490	JTYP 491	JTYP 492	JTYP 493	JTYP 494	JTYP 495	JTYP 496	JTYP 497	-0150-
	F258	4EBD	D147	6B28	5EB3	7BE2	161B	896C	
-0160-	LERR 002	LERR 003	LERR 004	LERR 005	LERR 006	LERR 007	LERR 008	LERR 009	-0160-
	3462	C461	FFEC	1F00	3400	9E72	3400	8D7C	
-0170-	JDTA 003	JDTA 004	JDTA 005	JDTA 006	IERR 032	IERR 033	IERR 034	IERR 035	-0170-
	2240	C1F7	AD46	A00E	2A25	3A13	7AF2	A044	

018-

	0	2	4	6	8	A	C	E	
-0180-	JEND 003	JEND 004	JEND 005	JEND 006	MPRT 148	MPRT 149	MPRT 150	MPRT 151	-0180-
	2204	FD86	9ACA	8FA0	56E2	3D00	2D02	1C63	
-0190-	MPRT 152	MPRT 153	MPRT 154	MPRT 155	MPRT 156	MPRT 157	MPRT 158	MPRT 159	-0190-
	3C83	5032	1D97	7C62	3400	2C05	5EC2	CB23	
-01A0-	MPRT 160	MPRT 161	MPRT 162	MPRT 163	MPRT 164	MPRT 165	MPRT 166	MPRT 168	-01A0-
	8D7C	05AB	F0AD	1523	F0AD	8D20	1525	A5AA	
-01B0-	LRTR 005	LRTR 006	LRTR 007	JTYP 517	JTYP 518	JTYP 519	JTYP 529	JTYP 530	-01B0-
	2206	5ACF	9146	028D	C4BC	1285	12F3	128E	
-01C0-	IBCH 113	IBCH 114	IBCH 115	IBCH 116	IBCH 117	IBCH 118	IBCH 119	IBCH 120	-01C0-
	90B8	8D7C	90B0	8D7C	90C0	90BC	90B4	90AC	
-01D0-	IBCH 121	IBCH 122	IBCH 123	IBCH 124	IBCH 125	IERR 036	IERR 037	IERR 038	-01D0-
	5E92	DA46	1E43	7E92	9E72	56A5	1AC3	A068	
-01E0-	ITRP 061	ITRP 062	ITRP 063	IRST 109	IRST 110	IRST 111	IRST 112	IRST 113	-01E0-
	226A	1F00	026A	3480	426F	3400	2743	4F7F	
-01F0-	IRST 114	IRST 115	IRST 116	IRST 117	IRST 118	IRST 119	IRST 120	IRST 121	-01F0-
	5649	5659	426F	534C	151B	258B	C4F4	3486	

CONTROL ADDRESS

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0200-	IRST 122	IRST 123	IRST 124	IRST 125	IRST 126	ICYC 168	ICYC 169	ICYC 170	-0200-
	5A60	3400	2705	5769	128E	2FAD	2DF3	8C88	
-0210-	ITRP 004	ITRP 005	ITRP 006	MPRT 394	MPRT 395	MPRT 396	MPRT 397	MPRT 398	-0210-
	3200	0080	8224	5CC2	2C05	D91F	128E	890A	
-0220-	ITRP 010	ITRP 011	ITRP 012	ITRP 013	ITRP 014	ITRP 015	ITRP 016	ITRP 017	-0220-
	3202	2080	57FF	56EF	C4AC	7812	7EF2	0210	
-0230-	ITRP 018	ITRP 019	ITRP 020	KAAN 196	KAAN 197	KAAN 198	BDIA 075	BDIA 080	-0230-
	0216	0218	AA0C	5652	497F	A7CC	2810	F56C	
-0240-	BDIA 018	BDIA 030	BDIA 048	BDIA 053	BDIA 054	BDIA 056	BDIA 057	BDIA 061	-0240-
	2810	3210	2400	F8CB	B7C9	2810	25F3	C54F	
-0250-	BDIA 062	BDIA 066	BDIA 067	BDIA 072	IREG 006	IREG 007	IREG 008	IREG 009	-0250-
	2810	D553	2810	E53C	2A15	2BF5	76A8	74AA	
-0260-	IREG 010	IREG 011	IREG 012	IREG 013	IREG 014	IREG 015	BDIA 083	BDIA 084	-0260-
	2A07	1B65	7222	7032	7812	128E	2810	9FFC	
-0270-	JEND 139	JEND 140	JEND 141	JEND 142	JEND 143	JEND 144	JEND 145	JEND 146	-0270-
	2D85	3D73	5FC0	5FF9	C4F5	EB7F	8D7C	9E72	

028-

-0280-									-0280-
-0290-									-0290-
-02A0-									-02A0-
-02B0-									-02B0-
-02C0-	KEND 017	KEND 018	KEND 019	KEND 020	KEND 021	KEND 022	KEND 023	KEND 024	-02C0-
	4026	5224	1E00	2C07	4FCF	4DCF	3400	5622	
-02D0-	KEND 025	KEND 026	KEND 027	KEND 028	KEND 029	JTYP 055	JTYP 056	JTYP 057	-02D0-
	1625	5812	021E	2C07	8D7C	5FFF	0FC9	F4FC	
-02E0-	JTYP 058	JTYP 060	JTYP 064	JTYP 065	JTYP 066	JTYP 067	JTYP 068	JTYP 069	-02E0-
	9F5E	2075	2145	5208	5608	5408	5808	5A08	
-02F0-	JTYP 070	JTYP 071	JTYP 072	JTYP 073	JTYP 085	JTYP 086	JTYP 087	JTYP 088	-02F0-
	5C08	5E92	CA78	9F7C	5E08	5032	5C92	EC10	

ADDRESS LIST   DATE 11/08/68   03--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0300-	JTYP 089	JTYP 090	JTYP 091	JTYP 092	JTYP 093	JTYP 094	JTYP 095	JTYP 096	-0300-
	1F2C	1040	1C35	CC1A	7C92	FAA4	0610	98DA	
-0310-	JTYP 114	JTYP 115	JTYP 116	JTYP 117	JTYP 118	JTYP 136	JTYP 137	JTYP 138	-0310-
	CFC7	DFC7	E1CB	FECE	92EC	3C85	7C92	2C05	
-0320-	JTYP 139	JTYP 140	JTYP 097	JTYP 098	JTYP 099	JTYP 100	JTYP 101	JTYP 102	-0320-
	3400	8D7C	FFAF	8264	0020	3400	96AC	C1B2	
-0330-	JTYP 103	JTYP 104	JTYP 105	JTYP 106	JTYP 107	JTYP 108	JTYP 109	JTYP 110	-0330-
	0F02	5EF2	3400	CFBD	0E11	F0BF	3E29	7EF2	
-0340-	JTYP 111	JTYP 112	JTYP 113	JTYP 121	JTYP 122	JTYP 074	JTYP 075	JTYP 119	-0340-
	C1C5	A044	ACBC	FFE5	890E	DED3	A40C	9F5E	
-0350-	JTYP 120	JTYP 076	JTYP 077	JTYP 078	JTYP 079	JTYP 080	JTYP 081	JTYP 082	-0350-
	A40C	5F0A	CF5A	3F20	835C	2F08	0F20	3400	
-0360-	JTYP 083	JTYP 084	JTYP 123	JTYP 124	JTYP 125	JTYP 126	JTYP 128	JTYP 127	-0360-
	4F1F	96AC	C249	C1EC	DFEF	8536	AC0E	8376	
-0370-	JTYP 477	JTYP 478	JTYP 479	JTYP 480	JTYP 481	JTYP 482	JTYP 483	JTYP 484	-0370-
	10C0	0F02	0640	5C92	3C25	7C92	16F3	2C53	

038-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0380-	JTYP 485	JTYP 486	JTYP 487	JTYP 488	IRST 181	IRST 181	IRST 181	IRST 181	-0380-
	3C15	4FCF	0F10	A412	07FF	C48A	8800	4E08	
-0390-	KAAQ 015	KAAQ 016	KAAQ 017	KAAQ 018	IRST 184	IRST 184	IRST 184	IRST 184	-0390-
	2F13	15E5	1483	9EAA	0000	0000	0000	0000	
-03A0-	MNNN 004	MNNN 005	MNNN 006	MNNN 003	IRST 187	IRST 187	IRST 187	IRST 187	-03A0-
	5E62	DB27	8D7C	9E72	0000	0000	0000	0000	
-03B0-	IREG 002	IREG 003	IREG 004	IREG 005	IRST 190	IRST 190	IRST 190	IRST 190	-03B0-
	5EC2	EA37	7222	128E	2FF7	2F1B	C4BC	0F01	
-03C0-	BDIA 347	BDIA 348	BDIA 349	BDIA 350	BDIA 351	BDIA 352	BDIA 353	BDIA 354	-03C0-
	C4C0	4AC2	4CD2	4EF2	2A1B	2C1B	2E1B	E0F2	
-03D0-	BDIA 355	BDIA 356	BDIA 357	BDIA 358	BDIA 331	BDIA 332	BDIA 333	BDIA 334	-03D0-
	6AC2	6CD2	6EF2	83B8	4812	3935	292B	68E2	
-03E0-	BDIA 335	BDIA 336	BDIA 337	BDIA 338	BDIA 339	BDIA 340	BDIA 341	BDIA 342	-03E0-
	2A25	2BF5	3B73	2C25	2D15	3DB3	2E05	2F13	
-03F0-	BDIA 343	BDIA 373	BDIA 374	BDIA 375	BDIA 376	BDIA 377	BDIA 381	BDIA 382	-03F0-
	83D0	2505	251B	F4FD	C4F4	5007	2413	883C	

CONTROL ADDRESS   03--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0400-	IZWM 004	IZWM 005	IZWM 006	IZWM 007	IZWM 008	IZWM 009	IZWM 010	IZWM 011	-0400-
	8D7C	8424	840E	DD0F	9E72	3685	5D3A	3D45	
-0410-	IZWM 012	IZWM 013	IZWM 014	IZWM 015	IZWM 016	IZWM 017	IZWM 018	IZWM 019	-0410-
	5FC0	57D9	55C0	C61E	65F7	C488	8D7C	6F51	
-0420-	IZWM 020	IZWM 021	IZWM 022	IZWM 023	JCHL 181	JCHL 182	JCHL 183	JCHL 184	-0420-
	E089	8D7C	DD23	9E72	5F42	CF39	2D95	3D63	
-0430-	JCHL 185	JCHL 186	JCHL 187	JCHL 188	JCHL 189	JCHL 178	JCHL 179	JCHL 180	-0430-
	51C0	1FFF	6F17	7FC0	9DE4	FCA8	2A45	9796	
-0440-	BDIA 122	IADD 160	IADD 161	IADD 162	IADD 163	IADD 164	IADD 165	IADD 166	-0440-
	5007	0DF5	F0D9	0DAB	F0D5	0D1B	F0D1	1D83	
-0450-	IADD 167	IADD 168	IADD 169	IADD 170	IADD 171	IADD 172	IADD 173	IADD 174	-0450-
	3D85	128E	1DF3	F95C	ED61	FD64	1D1D	FD50	
-0460-	IADD 175	IADD 176	IADD 177	IADD 178	KAAA 338	KAAA 339	KAAA 340	KAAA 341	-0460-
	1D3D	FD51	3DB5	128E	3210	5D79	0E08	2302	
-0470-	KAAA 342	KAAA 343	KAAA 344	KAAA 345	KAAA 346	KAAA 347	KAAA 348	KAAA 349	-0470-
	2304	3110	3D29	4FDF	43DF	8526	5FCF	1CFF	

048-

	0	2	4	6	8	A	C	E	
-0480-	KAAA 350	KAAA 351	KAAA 352	KAAA 353	KAAA 354	KAAA 355	KAAA 356	KAAA 358	-0480-
	C4FA	4FCF	5FCF	C4FA	8512	5BCF	8528	5ECF	
-0490-	KAAA 359	KAAA 360	KAAA 361	KAAA 362	KAAA 363	KAAA 364	KAAA 365	KAAA 366	-0490-
	C4FA	2310	2390	2D13	4FDF	2D25	43DF	3110	
-04A0-	KAAA 367	KAAA 368	KAAA 369	KAAA 370	KAAA 371	KAAA 372	KAAA 373	KAAA 374	-04A0-
	851E	2D35	2D1B	4FDF	8516	5BCF	2D85	3D23	
-04B0-	KAAA 375	KAAA 376	KAAA 377	KAAA 378	KAAA 380	KAAA 381	KAAA 382	KAAA 383	-04B0-
	8528	3D73	8524	3114	851A	2DA3	8524	1D00	
-04C0-	KAAA 384	KAAA 385	KAAA 386	KAAA 388	KAAA 389	KAAA 390	KAAA 391	KAAA 393	-04C0-
	CAFB	2380	3114	851A	2D45	3DE3	8524	1D00	
-04D0-	KAAA 394	KAAA 395	KAAA 397	KAAA 398	KAAA 399	KAAA 400	KAAA 402	KAAA 403	-04D0-
	2390	3114	2308	2D75	3DA3	8524	1D00	3114	
-04E0-	KAAA 404	KAAA 405	KAAA 406	KAAA 407	KAAA 408	KAAA 409	KAAA 410	KAAA 412	-04E0-
	2380	2308	2D35	3DA3	8524	1D00	3114	2308	
-04F0-	KAAA 413	KAAA 414	KAAA 415	KAAA 416	KAAA 417	KAAA 418	KAAA 419	KAAA 420	-04F0-
	2D55	3DB3	8524	1D00	8506	2100	1E00	0E08	

ADDRESS LIST   DATE 11/08/68

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0500-	KAAA 421	KAAA 422	KAAA 423	KAAA 424	KAAA 425	KAAA 426	KAAA 427	KAAA 428	-0500-
	1210	A5D0	8858	2100	3E00	0E08	1210	57D9	
-0510-	KAAA 429	KAAA 430	KAAA 431	KAAA 432	KAAA 433	KAAA 434	KAAA 435	KAAA 436	-0510-
	87B4	2308	2308	2308	2308	2308	2308	2308	
-0520-	KAAA 437	KAAA 438	KAAA 439	KAAA 440	KAAA 441	KAAA 442	KAAA 443	KAAA 444	-0520-
	2308	128E	2112	5ECF	6CD1	C4AF	84FA	128E	
-0530-	ICYC 164	ICYC 165	ICYC 166	JTYP 322	JTYP 323	JTYP 324	JTYP 325	JTYP 326	-0530-
	2F4D	3DE9	8C88	5AEF	5EB9	1BC5	C4FB	CE66	
-0540-	JTYP 327	JTYP 328	JTYP 329	JTYP 330	JTYP 331	JTYP 332	JTYP 333	JTYP 334	-0540-
	0BBB	F0C8	2B1B	857A	0B0D	F0D0	3BA3	857A	
-0550-	JTYP 335	JTYP 336	JTYP 337	JTYP 338	JTYP 339	JTYP 340	JTYP 341	JTYP 342	-0550-
	E0FB	0B1F	C4DA	2BF3	857A	DA60	0B4B	F0E2	
-0560-	JTYP 343	JTYP 344	JTYP 345	JTYP 346	JTYP 347	JTYP 348	JTYP 349	JTYP 350	-0560-
	859E	2B8B	857A	0B0D	E0FA	0BBB	C4FB	3BF5	
-0570-	JTYP 351	JTYP 352	JTYP 353	JTYP 354	JTYP 355	JTYP 357	JTYP 361	JTYP 362	-0570-
	5BF9	0FAB	F0FE	1FF3	857E	2A65	5FA0	D26B	

058-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0580-	JTYP 363	JTYP 364	JTYP 365	JTYP 366	JTYP 367	JTYP 368	JTYP 369	JTYP 370	-0580-
	C16B	0F0D	C488	859E	CE13	D526	0F7D	E087	
-0590-	JTYP 371	JTYP 372	JTYP 373	JTYP 374	JTYP 375	JTYP 376	JTYP 377	JTYP 378	-0590-
	85A6	D527	0FBB	F08D	0FCB	F08D	85A6	8710	
-05A0-	JTYP 379	JTYP 380	JTYP 381	JTYP 382	JTYP 383	JTYP 384	JTYP 385	JTYP 386	-05A0-
	2F45	85AA	2FE7	0FEF	C4C7	5D30	0DFB	C4B2	
-05B0-	JTYP 387	JTYP 388	JTYP 389	JTYP 390	JTYP 391	JTYP 392	JTYP 393	JTYP 394	-05B0-
	C260	C23F	DD3E	F53F	3F45	7F38	85EA	F542	
-05C0-	JTYP 395	JTYP 396	JTYP 397	JTYP 398	JTYP 399	JTYP 400	JTYP 401	JTYP 402	-05C0-
	F138	1F45	85BA	3513	1F83	9DB6	D254	C1D2	
-05D0-	JTYP 403	JTYP 404	JTYP 405	JTYP 406	JTYP 407	JTYP 408	JTYP 409	JTYP 410	-05D0-
	A494	A4FE	C153	DADE	5ADF	0DAB	F0E1	896C	
-05E0-	JTYP 411	JTYP 412	JTYP 416	JTYP 417	JTYP 418	JTYP 419	JTYP 420	KEND 030	-05E0-
	8710	8376	DF6B	F56A	F124	1513	9D7E	3480	
-05F0-	KEND 031	KEND 032	IMPY 010	IMPY 012	IMPY 013	IMPY 014	IMPY 020	IMPY 022	-05F0-
	6004	9872	7222	2C07	1020	4426	7032	5D1A	

CONTROL ADDRESS   05--

ADDRESS LIST   DATE 11/08/68

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0600-	IMPY 023 CD05	IMPY 030 8442	IMPY 032 ED0B	IMPY 033 FD0A	IMPY 034 161B	IMPY 035 5DF9	IMPY 036 CC18	IMPY 037 94FC	-0600-
-0610-	IMPY 046 3C85	IMPY 047 8618	IMPY 048 5D30	IMPY 049 8600	IMPY 038 5D30	IMPY 039 5DDB	IMPY 040 3DB5	IMPY 041 7D3A	-0610-
-0620-	IMPY 042 CC15	IMPY 043 DF10	IMPY 044 5F1A	IMPY 045 8618	MAAA 120 2A85	MAAA 121 9172	IDVD 071 D27D	IDVD 072 3643	-0620-
-0630-	IDVD 073 2F07	IDVD 074 8664	IDVD 064 3645	IDVD 065 3613	IDVD 066 D1BD	IDVD 067 7D30	IDVD 068 5226	IDVD 069 C22D	-0630-
-0640-	IDVD 070 8658	IDVD 058 0DED	IDVD 059 E0B8	IDVD 060 0D1B	IDVD 061 F0B8	IDVD 062 1D85	IDVD 063 8638	IDVD 014 16C5	-0640-
-0650-	IDVD 015 16F3	IDVD 016 3042	IDVD 022 7032	IDVD 024 4426	IDVD 025 5D1A	IDVD 026 CD5F	IDVD 033 8442	IDVD 035 DD63	-0650-
-0660-	IDVD 036 3683	IDVD 037 5DFD	IDVD 039 5D30	IDVD 040 CD6B	IDVD 047 8442	IDVD 049 5DAD	IDVD 050 C5F1	IDVD 051 3A95	-0660-
-0670-	IDVD 052 7AFF	IDVD 053 D1F7	IDVD 054 4ADD	IDVD 055 ED43	IDVD 056 FD35	IDVD 057 8636	IDVD 075 16C3	IDVD 076 F583	-0670-

068-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0680-	IDVD 077 869E	IDVD 078 D187	IDVD 079 86F0	IDVD 080 0040	IDVD 086 5032	IDVD 088 C591	IDVD 089 3000	IDVD 090 5444	-0680-
-0690-	IDVD 091 F595	IDVD 092 2002	IDVD 093 4246	IDVD 094 C59A	IDVD 095 8658	IDVD 096 0002	IDVD 097 8658	IDVD 098 E222	-0690-
-06A0-	IDVD 099 86CC	IDVD 105 5032	IDVD 107 1000	IDVD 108 D194	IDVD 109 F20C	IDVD 110 86D2	IDVD 116 1000	IDVD 117 5D30	-06A0-
-06B0-	IDVD 118 3DB5	IDVD 119 2A95	IDVD 120 5DFD	IDVD 121 7FAF	IDVD 122 4DFB	IDVD 123 7F3A	IDVD 124 F5C3	IDVD 125 3042	-06B0-
-06C0-	IDVD 126 8688	IDVD 135 5A82	IDVD 136 3B43	IDVD 137 7A82	IDVD 139 3623	IDVD 140 2833	IDVD 141 2BFF	IDVD 142 C4D3	-06C0-
-06D0-	IDVD 143 86A2	IDVD 149 5A32	IDVD 151 5DB0	IDVD 152 CD5B	IDVD 159 8442	IDVD 161 5B30	IDVD 162 ED61	IDVD 163 FD69	-06D0-
-06E0-	IDVD 164 D66D	IDVD 165 1B3D	IDVD 166 7B3A	IDVD 167 8D7C	IDVD 170 D663	IDVD 171 86EC	IDVD 168 1B2D	IDVD 169 86E4	-06E0-
-06F0-	IDVD 112 C5AD	IDVD 113 2040	IDVD 114 F22B	IDVD 115 8688	IMAD 070 57AB	IMAD 071 5DFB	IMAD 072 1AFD	IMAD 073 1FFD	-06F0-

CONTROL ADDRESS   06--

ADDRESS LIST   DATE 11/08/68

CONTROL ADDRESS   0   2   4   6   8   A   C   E

-07C0-   IMAD 074 IMAD 075 IMAD 076 IMAD 077 IMAD 078 IMAD 079 IMAD 080 IMAD 081   -0700-
          6FA3   D208   F588   2F1D   1FBD   4FBB   3BC5   128E

-0710-   JTYP 260 JTYP 261 JTYP 262 JTYP 263 INDX 003 INDX 004 INDX 005 INDX 006   -0710-
          5C82   3D83   7C82   128E   1002   CD23   57C0   1783

-0720-   INDX 007 INDX 008 INDX 009 INDX 010 INDX 011 INDX 012 INDX 013 INDX 014   -0720-
          8726   5D79   17FD   CF31   5FD9   5FC0   1F83   8732

-0730-   INDX 015 INDX 016 INDX 017 INDX 018 INDX 019 INDX 020 INDX 021 INDX 022   -0730-
          1FFD   5F43   5FFB   5AE0   5D98   DD43   6886   5F98

-0740-   INDX 023 INDX 024 INDX 025 INDX 026 INDX 027 INDX 028 INDX 029 INDX 030   -0740-
          8C06   CD4B   5DC0   1D83   874C   1DFD   4D4D   5DFB

-0750-   INDX 031 INDX 032 INDX 033 INDX 034 INDX 035 INDX 036 INDX 037 INDX 038   -0750-
          5DBA   3D45   CD5D   5DC0   1D83   875E   1DFD   6FD3

-0760-   INDX 039 INDX 040 INDX 041 INDX 042 INDX 043 INDX 044 INDX 045 INDX 046   -0760-
          5DBA   CD6B   3D45   5DC0   1D83   5BB0   5FAB   4DF3

-0770-   INDX 047 INDX 048 INDX 049 INDX 050 INDX 051 INDX 052 INDX 053 INDX 054   -0770-
          74FF   5BD9   3D45   CD7F   5DC0   1D83   8780   1DFD

                                          078-

-0780-   INDX 055 INDX 056 INDX 057 INDX 058 INDX 059 INDX 060 INDX 061 INDX 062   -0780-
          77DF   D708   2A1D   1745   54F5   5FE0   64FF   5AF9

-0790-   INDX 063 INDX 064 INDX 065 INDX 066 INDX 067 INDX 068 INDX 069 INDX 070   -0790-
          EF2D   2D07   FF1E   2DFB   24AD   F49E   2D1B   17FD

-07A0-   INDX 071 INDX 072 INDX 073 INDX 074 INDX 075 INDX 076 INDX 077 INDX 078   -07A0-
          57F1   6FFF   5AE0   6B4B   1645   8C8A   3DE9   244D

-07B0-   INDX 079 INDX 080 KAAA 105 KAAA 106 KAAA 107 KAAA 108 KAAA 109 KAAA 110   -07B0-
          FF17   879E   49DF   56B2   7C52   EEF5   DEF4   FAF5

-07C0-   KAAA 111 KAAA 112 KAAA 123 KAAA 124 KAAA 125 KAAA 126 KAAA 127 KAAA 128   -07C0-
          CEE0   8BF0   E754   0753   F0D6   CF58   174D   D759

-07D0-   KAAA 129 KAAA 130 KAAA 131 KAAA 132 KAAA 133 KAAA 134 KAAA 135 KAAA 136   -07D0-
          3E23   87D8   C659   1745   1685   FB79   C778   9F6C

-07E0-   KAAQ 019 KAAQ 020 KAAQ 021 KAAQ 022 KAAA 103 KAAA 104 KAAA 097 KAAA 098   -07E0-
          2F07   49FF   2F15   8392   4ECF   8468   3480   F5EF

-07F0-   KAAA 099 KAAA 100 KAAA 101 KAAA 102 KAAA 137 KAAA 138 KAAA 139 KAAA 140   -07F0-
          5ECF   C4E9   A5D0   8390   17B5   577B   2E08   9E48

CONTROL ADDRESS   07--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0800-	BDIA 280	BDIA 281	BDIA 282	BDIA 283	BDIA 284	BDIA 285	BDIA 302	BDIA 303	-0800-
	4E02	2E1B	2F1D	CA0D	6E02	8388	E1A3	2020	
-0810-	BDIA 304	BDIA 305	BDIA 306	BDIA 307	BDIA 308	BDIA 309	BDIA 310	BDIA 311	-0810-
	E190	2EC5	3E43	2F85	3FA3	6E12	2EF7	3F89	
-0820-	BDIA 312	BDIA 313	BDIA 314	BDIA 315	BDIA 316	BDIA 317	BDIA 318	BDIA 319	-0820-
	8802	0020	E1A5	D1AC	0040	83D8	2040	D1AE	
-0830-	BDIA 320	BDIA 321	BDIA 322	BDIA 323	BDIA 324	BDIA 385	BDIA 386	BDIA 387	-0830-
	4E22	6E12	3EC9	5EF1	8802	6443	2505	7543	
-0840-	BDIA 388	BDIA 389	BDIA 390	BDIA 391	BDIA 392	BDIA 393	BDIA 394	BDIA 399	-0840-
	3808	050D	3800	DAC6	1212	2800	C43A	2440	
-0850-	BDIA 400	BDIA 401	BDIA 402	BDIA 403	BDIA 404	BDIA 405	BDIA 406	BDIA 407	-0850-
	886E	0E3F	FED4	4E80	6E80	FADA	0E3F	EADE	
-0860-	BDIA 408	BDIA 409	BDIA 410	BDIA 411	BDIA 412	BDIA 413	BDIA 414	BDIA 415	-0860-
	1212	886E	0F1F	FEE6	4E80	6E80	02E2	4E80	
-0870-	BDIA 416	BDIA 417	BDIA 418	BDIA 419	BDIA 420	INTP 109	INTP 110	INTP 111	-0870-
	3804	6E80	CAF4	3800	128E	5E82	4A65	2F23	

088-

	0	2	4	6	8	A	C	E	
-0880-	INTP 112	IOCM 047	IOCM 048		IOCM 049			IOCM 050	-0880-
	9245	A564	ADD8	5007	A570	5007	5007	A556	
-0890-	IOCM 039	IOCM 040	IOCM 041	JCHL 217	JCHL 218	JCHL 219	JCHL 220	JCHL 221	-0890-
	57F9	3F23	8902	2B42	FD98	2B00	2B08	C5A5	
-08A0-	JCHL 222	JCHL 223	JCHL 224	JCHL 225	JCHL 226	JCHL 227	JCHL 228	JCHL 229	-08A0-
	3A79	9796	2A95	D1A3	3D2B	5FC0	CF56	4A26	
-08B0-	JCHL 230	JCHL 231	JCHL 232	JCHL 233	JCHL 234	JCHL 235	JCHL 236	JCHL 237	-08B0-
	20D3	680B	6ACD	5E22	7FB9	7EA9	F5D7	D345	
-08C0-	JCHL 238	JCHL 239	JCHL 240	JCHL 242	JCHL 243	JCHL 244	JCHL 245	JCHL 246	-08C0-
	2AC7	9796	5730	07FB	C4CF	577B	17B5	7738	
-08D0-	JCHL 247	JCHL 248	JCHL 249	JCHL 250	JCHL 208	JCHL 209	JCHL 210	JCHL 211	-08D0-
	20FF	C4C4	9DE2	9DE4	2B48	AA31	2D95	EDDE	
-08E0-	JCHL 212	JCHL 213	JCHL 214	JCHL 215	JCHL 216	MAAA 033	BDIA 269	BDIA 270	-08E0-
	D917	5F7F	2B48	77C8	88DE	9286	D1ED	E1EF	
-08F0-	BDIA 271	BDIA 272	BDIA 273	BDIA 274	BDIA 275	BDIA 276	BDIA 277	BDIA 004	-08F0-
	2E87	2F05	6E12	6E22	3EE9	2F77	8802	AAFA	

CONTROL ADDRESS   08--

ADDRESS LIST   DATE 11/08/68

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0900-	IOCM 042 57F9	IOCM 043 5AC2	IOCM 044 0BB3	IOCM 045 F08A	IOCM 046 9B11	IOCM 051 9B13	MAAA 032 9286	JTYP 265 CFA3	-0900-
-0910-	JTYP 266 C114	JTYP 267 924C	JTYP 268 5F30	JTYP 269 0FFB	JTYP 270 C49D	JTYP 271 85E4	JTYP 272 E21B	JTYP 273 5224	-0910-
-0920-	JTYP 274 8376	JTYP 275 5AEF	JTYP 276 DAA9	JTYP 277 8948	JTYP 278 1EC5	JTYP 279 0E5B	JTYP 280 C4B8	JTYP 281 C232	-0920-
-0930-	JTYP 282 8376	JTYP 283 2FF3	JTYP 284 7F38	JTYP 285 8376	JTYP 286 8710	JTYP 287 0EAB	JTYP 288 C4C8	JTYP 289 2F45	-0930-
-0940-	JTYP 290 C237	JTYP 291 8710	JTYP 292 CACB	JTYP 293 85AA	JTYP 295 CAC3	JTYP 296 CA4F	JTYP 297 8538	JTYP 298 DA53	-0940-
-0950-	JTYP 299 8538	JTYP 300 0EDB	JTYP 301 F0D8	JTYP 302 FE60	JTYP 303 2F45	JTYP 304 8710	JTYP 305 C26F	JTYP 306 85AA	-0950-
-0960-	JTYP 307 C269	JTYP 308 2F55	JTYP 309 3FD3	JTYP 310 85AA	JTYP 311 2F15	JTYP 312 3F53	JTYP 313 E273	JTYP 314 4FFF	-0960-
-0970-	JTYP 315 A416	JTYP 316 CEEE	JTYP 317 5226	JTYP 318 8376	MAAA 133 221E	MAAA 134 3486	MAAA 135 2B08	MAAA 136 94D8	-0970-

098-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0980-	MQQQ 044 A638	IOCM 052 A5FE	IOCM 053 A614	5007	IOCM 054 A640	5007	5007	IOCM 055 83A0	-0980-
-0990-	MQQQ 045 0010	MQQQ 055 A638	LRXF 003 2B55	LRXF 004 7B38	LRXF 005 2406	LRXF 007 1B00	LRXF 008 2A55	LRXF 009 5C88	-0990-
-09A0-	LRXF 010 2B73	LRXF 011 6DD3	LRXF 012 6DD3	LRXF 013 E0BB	LRXF 014 6BC7	LRXF 015 C4C7	LRXF 016 F231	LRXF 017 2B80	-09A0-
-09B0-	LRXF 018 2545	LRXF 019 084D	LRXF 020 E0E1	LRXF 021 2F80	LRXF 022 89E0	LRXF 023 6BC7	LRXF 024 C4D1	LRXF 025 1C73	-09B0-
-09C0-	LRXF 026 89CA	LRXF 027 98EA	LRXF 028 8EA0	LRXF 029 3C43	LRXF 030 5DB5	LRXF 031 3BB5	LRXF 032 57A0	LRXF 033 6C75	-09C0-
-09D0-	LRXF 034 5DB3	LRXF 035 C4D6	LRXF 036 2BC5	LRXF 037 6BC5	LRXF 038 EC5C	LRXF 039 FC2D	LRXF 040 55A0	LRXF 041 D52C	-09D0-
-09E0-	LRXF 042 5D30	LRXF 043 DD67	LRXF 044 1545	LRXF 045 7538	LRXF 046 21FF	LRXF 047 C49E	LRXF 048 83B0	LRXF 049 084D	-09E0-
-09F0-	LRXF 050 E0C2	LRXF 051 F277	LRXF 052 8A2E	LRXF 053 2A07	LRXF 054 2C45	LRXF 055 2D25	LRXF 056 2945	LRXF 057 639B	-09F0-

CONTROL ADDRESS   09--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0A00-	LRXF 058	LRXF 059	LRXF 060	LRXF 061	LRXF 062	LRXF 063	LRXF 064	LRXF 065	-0A00-
	62AD	62A9	292F	6024	619B	60AD	58C8	58B9	
-0A10-	LRXF 066	LRXF 067	LRXF 068	LRXF 069	LRXF 070	LRXF 071	LRXF 072	LRXF 073	-0A10-
	55A0	3545	5F30	DF1B	1545	7538	59B9	55A0	
-0A20-	LRXF 074	LRXF 075	LRXF 076	LRXF 077	LRXF 078	LRXF 079	LRXF 080	LRXF 081	-0A20-
	3545	5F10	DF29	1545	7518	CD0C	DD0C	8A8A	
-0A30-	JEND 129	JEND 130	JEND 131	JEND 132	JEND 133	JEND 134	JEND 135	JEND 136	-0A30-
	2D85	5FC0	4FD5	1D83	5FC0	FF3F	8D7C	1F15	
-0A40-	JEND 137	JEND 138	INTP 116	INTP 117	INTP 118	INTP 119	INTP 120	INTP 121	-0A40-
	7FC0	9E72	6FF3	6FF3	6FF3	6FF3	6FF3	0A9D	
-0A50-	INTP 128	INTP 129	INTP 130	INTP 131	INTP 132	INTP 138	INTP 140	INTP 141	-0A50-
	F0D7	6FE5	8A5A	1FFF	6FE7	7F82	1F13	5FB9	
-0A60-	INTP 142	JEND 122	JEND 123	JEND 124	JEND 125	JEND 126	JEND 127	JEND 128	-0A60-
	8E82	C5EB	3189	6151	C4F1	7222	3486	A24C	
-0A70-	JEND 114	JEND 115	JEND 116	JEND 117	JEND 118	JEND 119	JEND 120	JEND 121	-0A70-
	5552	C56B	5042	2005	5700	3715	7700	8A6A	

0A8-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0A80-	IERR 002	IERR 003	IERR 004	IERR 005	MMMM 017	LXFR 003	LXFR 004	LXFR 005	-0A80-
	B159	81DA	8D04	9378	AE80	3466	D414	0719	
-0A90-	LXFR 006	LXFR 007	LXFR 008	LXFR 009	LXFR 010	LXFR 011	LXFR 012	LXFR 013	-0A90-
	E08A	E40B	2D04	DD9A	CE9D	93F4	3406	2045	
-0AA0-	LXFR 014	LXFR 015	LXFR 016	LXFR 017	LXFR 018	LXFR 019	LXFR 020	LXFR 021	-0AA0-
	2115	3183	5400	7008	5111	E431	2035	21A5	
-0AB0-	LXFR 022	LXFR 023	LXFR 024	LXFR 025	LXFR 026	LXFR 027	LXFR 028	LXFR 029	-0AB0-
	2445	2525	251B	22A3	2807	2907	4A86	4C86	
-0AC0-	LXFR 030	LXFR 031	LXFR 032	LXFR 033	LXFR 034	LXFR 035	LXFR 036	LXFR 037	-0AC0-
	4E86	2613	5700	C74B	6965	D74F	6B65	E753	
-0AD0-	LXFR 038	LXFR 039	LXFR 040	LXFR 041	LXFR 042	LXFR 043	LXFR 044	LXFR 045	-0AD0-
	6D65	F757	6F65	C35B	6865	D35F	6A65	E363	
-0AE0-	LXFR 046	LXFR 047	LXFR 048	LXFR 049	LXFR 050	LXFR 051	LXFR 052	LXFR 053	-0AE0-
	6C65	F367	6E65	6663	D679	F475	21AB	F4F2	
-0AF0-	LXFR 054	LXFR 055	LXFR 056	LXFR 057	LXFR 058	LXFR 059	LXFR 060	LXFR 061	-0AF0-
	201D	8AC4	319B	8AC4	7940	6444	7B40	6444	

CONTROL ADDRESS   0A--

ADDRESS LIST   DATE 11/08/68   0B--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0BC0-	LXFR 062	LXFR 063	LXFR 064	LXFR 065	LXFR 066	LXFR 067	LXFR 068	LXFR 069	-0B00-
	7D40	6444	7F40	6444	C114	5899	5AB9	5CD9	
-0B10-	LXFR 070	LXFR 071	LXFR 072	LXFR 073	LXFR 074	LXFR 075	LXFR 076	LXFR 077	-0B10-
	5EF9	8AF8	22FF	C4A7	F423	313D	C020	20FD	
-0B20-	LXFR 078	LXFR 079	LXFR 080	LXFR 081	LXFR 082	LXFR 083	LXFR 084	LXFR 085	-0B20-
	8AB8	213F	8AB8	148B	C03E	F439	211B	2525	
-0B30-	LXFR 086	LXFR 087	LXFR 088	LXFR 089	LXFR 090	LXFR 091	LXFR 092	LXFR 093	-0B30-
	3466	D331	3400	8AB6	21A7	2507	8AB6	F44A	
-0B40-	LXFR 094	LXFR 095	LXFR 096	LXFR 097	LXFR 098	LXFR 099	LXFR 100	LXFR 101	-0B40-
	5202	2155	2907	2835	8994	004D	C4D3	98EA	
-0B50-	LXFR 102	LXFR 103	LXFR 104	LXFR 105	KAAN 052	KAAN 053	KAAN 054	KAAN 055	-0B50-
	A5A0	98EA	3466	8E8C	56E0	3785	76E0	8390	
-0B60-	ICYC 225		ICYC 226		ICYC 227	ICYC 228	ICYC 229	JTYP 243	-0B60-
	9CB8	5007	A062	5007	8C50	A1D8	8D7C	E172	
-0B70-	JTYP 244	JTYP 245	JTY,P 246	ICYC 235	MDDD 052	MDDD 053	ICYC 237	ICYC 238	-0B70-
	AE1E	5AEF	8538	934C	2AB5	9172	8100	840A	

0B8-

	0	2	4	6	8	A	C	E	
-0B80-	LPSU 004	LPSU 005	LPSU 006	LPSU 007	LPSU 008	LPSU 009	LPSU 010	LPSU 011	-0B80-
	3462	C401	3402	2D80	CFC8	CEC8	FFC5	C14F	
-0B90-	LPSU 012	LPSU 013	LPSU 014	LPSU 015	LPSU 016	LPSU 018	LPSU 019	LPSU 020	-0B90-
	C563	3462	F419	3443	2400	2815	2977	2C35	
-0BA0-	LPSU 021	LPSU 022	LPSU 023	LPSU 024	LPSU 025	LPSU 026	LPSU 027	LPSU 028	-0BA0-
	59D9	2AF7	5AB9	5280	7A8A	72CA	C826	5202	
-0BB0-	LPSU 029	LPSU 030	LPSU 031	LPSU 032	LPSU 033	LPSU 034	LPSU 035	LPSU 036	-0BB0-
	2C15	2D07	F26B	2A65	3A43	63AB	62DD	2BF5	
-0BC0-	LPSU 037	LPSU 038	LPSU 039	LPSU 040	LPSU 041	LPSU 042	LPSU 043	LPSU 044	-0BC0-
	7B38	94B8	5EC2	CE0E	3AA9	0D80	8EBA	0D80	
-0BD0-	LPSU 045	LPSU 046	LPSU 047	LPSU 048	LPSU 049	LPSU 050	LPSU 051	LPSU 052	-0BD0-
	3462	3415	3400	2435	2513	2015	21E7	317B	
-0BE0-	LPSU 053	LPSU 054	LPSU 055	LPSU 056	LPSU 057	LPSU 058	LPSU 059	LPSU 060	-0BE0-
	8AB6	3462	1443	2F40	8B98	2B95	2A13	9B5C	
-0BF0-	KBBG 027	KBBG 028	KBBG 029	KBBG 030	KBBG 031	KBBG 032	KBBG 033	KBBG 034	-0BF0-
	2C45	4ECF	2C15	4BCF	2C07	4ECF	4BCF	128E	

CONTROL ADDRESS   0B--

ADDRESS LIST   DATE 11/08/68   0C--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0C00-	ICYC 124 8718	ICYC 125 8718	ICYC 126 8718	ICYC 127 5798	ICYC 128 D721	ICYC 129 5F79	ICYC 130 5F29	ICYC 131 2345	-0C00-
-0C10-	ICYC 132 C640	ICYC 133 1685	ICYC 134 8C44	ICYC 135 C61D	ICYC 136 3625	ICYC 137 8C32	ICYC 138 3615	ICYC 139 8C32	-0C10-
-0C20-	ICYC 140 5FFD	ICYC 141 5FE0	ICYC 142 6BFB	ICYC 149 6ACD	ICYC 151 FB17	ICYC 152 D617	ICYC 153 C733	ICYC 154 071B	-0C20-
-0C30-	ICYC 155 F096	ICYC 156 57FD	ICYC 157 8719	ICYC 197 5D79	ICYC 198 2245	ICYC 199 2345	ICYC 200 C645	ICYC 201 3683	-0C30-
-0C40-	ICYC 202 3625	ICYC 203 4026	ICYC 204 3615	ICYC 205 5886	ICYC 206 862B	ISWM 012 1D45	ISWM 013 1B45	ISWM 014 8C5A	-0C40-
-0C50-	ISWM 004 5D10	ISWM 005 5B30	ISWM 006 F14A	ISWM 007 3D45	ISWM 008 3B45	ISWM 009 7D1A	ISWM 010 7B3A	ISWM 011 8D7C	-0C50-
-0C60-	ICYC 239 9C9C	5007	ICYC 240 ADA6	ICYC 241 ADA6	ICYC 242 9B7C	ICYC 243 8C50	ICYC 244 9578	ICYC 245 A26E	-0C60-
-0C70-	ICYC 246 9704	ICYC 247 9702	ICYC 248 85F4	ICYC 249 864E	ICYC 250 A2D4	ICYC 251 A2D4	ICYC 282 AE6C	ICYC 283 A6EC	-0C70-

0C8-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0C80-	ICYC 158 8CCE	ICYC 163 8530	ICYC 167 820A	ICYC 171 2D07	ICYC 172 6BFB	ICYC 173 6ADD	ICYC 174 5D98	ICYC 175 C61B	-0C80-
-0C90-	ICYC 176 40A6	ICYC 177 DD30	ICYC 178 3685	ICYC 179 1655	ICYC 180 8DAC	ICYC 186 42A6	ICYC 187 1685	ICYC 188 DD2C	-0C90-
-0CA0-	ICYC 189 0553	ICYC 190 C4AD	ICYC 191 5D79	ICYC 192 5D98	ICYC 193 DD25	ICYC 194 3623	ICYC 195 5886	ICYC 196 862B	-0CA0-
-0CB0-	ICYC 181 3643	ICYC 182 C52D	ICYC 183 4206	ICYC 184 1615	ICYC 185 8CAC	KAAQ 013 2F83	KAAQ 014 9EAA	5007	-0CB0-
-0CC0-	IERR 006 81DA	5007	IERR 007 A062	5007	IERR 008 81DA	IERR 009 936C	IERR 010 8D7C	ICYC 159 2FED	-0CC0-
-0CD0-	ICYC 160 2DE3	ICYC 161 2D2D	ICYC 162 8C88	IERR 016 934C	JTYP 241 4EDD	JTYP 242 AE2A	IERR 018 81DA	IERR 019 81DA	-0CD0-
-0CE0-	ICYC 284 8D7C	ICYC 287 A57C	ICYC 288 999C	ICYC 289 999C	ICYC 290 A57C	ICYC 291 A57C	ICYC 292 999C	ICYC 293 999C	-0CE0-
-0CF0-	ICYC 294 8D7C	ICYC 295 AE40	ICYC 307 A874	5007	ICYC 308 3613	ICYC 309 91CA	ICYC 310 91CC	5007	-0CF0-

CONTROL ADDRESS   0C--

ADDRESS LIST   DATE 11/08/68   OD--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-OD00-	ICYC 211 B167	ICYC 212 B169	ICYC 213 B179	ICYC 214 D10B	ICYC 215 914E	ICYC 216 A06C	MBBB 075 2B08	MBBB 076 021E	-OD00-
-OD10-	MBBB 077 3400	MBBB 078 2C05	MBBB 079 56F2	MBBB 080 D21D	MBBB 081 C61D	MBBB 082 8D7C	MBBB 083 5032	MBBB 084 9E72	-OD10-
-OD20-	ICYC 207 850B	ICYC 208 8515	ICYC 209 8515	ICYC 210 8515	MKKK 066 5E92	MKKK 067 EB5C	MKKK 068 26A3	MKKK 069 AE80	-OD20-
-OD30-	MKKK 086 D939	MKKK 087 5E62	MKKK 088 3F43	MKKK 089 7E62	MKKK 090 8D0C	MKKK 095 5E62	MKKK 096 1F43	MKKK 097 CC44	-OD30-
-OD40-	MKKK 098 EB45	MKKK 099 1E65	MKKK 100 F948	MKKK 101 3E25	MKKK 102 7E62	MKKK 103 E956	MKKK 104 2B08	MKKK 105 021E	-OD40-
-OD50-	MKKK 106 26A3	MKKK 107 9F4C	MKKK 091 D93B	MKKK 092 2B08	MKKK 093 021E	MKKK 094 8F1A	MKKK 070 4F4F	MKKK 071 2B42	-OD50-
-OD60-	MKKK 072 FDE0	MKKK 073 5FDF	MKKK 074 FD55	MKKK 075 2F05	MKKK 076 7E92	MKKK 077 5E62	MKKK 078 E94D	MKKK 079 C931	-OD60-
-OD70-	MKKK 080 1F13	MKKK 081 3F43	MKKK 082 7E62	MKKK 083 2B48	MKKK 084 021E	MKKK 085 AC4A	ICYC 037 2F43	ICYC 038 4FFF	-OD70-

OD8-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-OD80-	ICYC 039 F1E2	ICYC 041 5F98	ICYC 047 2E25	ICYC 049 DF61	ICYC 050 16C5	ICYC 051 16F3	ICYC 052 3F45	ICYC 053 CF17	-OD80-
-OD90-	ICYC 054 F094	ICYC 055 2FF7	ICYC 056 3F85	ICYC 057 55E0	ICYC 058 5D98	ICYC 059 DD21	ICYC 060 3613	ICYC 061 8CAC	-OD90-
-ODA0-	ICYC 069 D52A	ICYC 070 4206	ICYC 071 1615	ICYC 072 E62A	ICYC 073 3615	ICYC 074 1625	ICYC 075 5DF1	ICYC 076 CD45	-ODA0-
-ODB0-	ICYC 077 0D1B	ICYC 078 F0C7	ICYC 079 C664	ICYC 080 0D4D	ICYC 081 C4C2	ICYC 082 05BB	ICYC 083 C4C2	ICYC 084 5886	-ODB0-
-ODC0-	ICYC 085 9E72	ICYC 109 3645	ICYC 110 6FFF	ICYC 111 5AE0	ICYC 112 5F98	ICYC 113 DF4F	ICYC 114 8C36	ICYC 115 CF5F	-ODC0-
-ODD0-	ICYC 116 0FAB	ICYC 117 F0DD	ICYC 118 0F4D	ICYC 119 C4DE	ICYC 120 3645	ICYC 121 8C06	ICYC 123 8718	ICYC 122 8F09	-ODD0-
-ODE0-	ICYC 067 8178	ICYC 036 9682	ICYC 086 5559	ICYC 087 F0C2	ICYC 088 0DCB	ICYC 089 F0C2	ICYC 090 ED42	ICYC 097 5551	-ODE0-
-ODF0-	ICYC 098 3525	ICYC 100 35C3	ICYC 102 5D49	ICYC 103 3635	ICYC 104 5198	ICYC 105 5109	ICYC 106 5198	ICYC 107 5D98	-ODF0-

CONTROL ADDRESS   OD--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0E00-	ICYC 108	MLLL 047	MLLL 048	MLLL 049	MLLL 050	MLLL 051	MLLL 052	MLLL 053	-0E00-
	8C92	5FDF	0D8B	F090	CC0E	1523	F094	8D0C	
-0E10-	MLLL 060	MLLL 061	MLLL 054	MLLL 055	MLLL 056	MLLL 057	MLLL 058	MLLL 059	-0E10-
	2B02	8D10	2B08	3400	2C05	5032	56F2	8D04	
-0E20-	INTP 171	INTP 172	INTP 173	INTP 174	INTP 175	INTP 176	INTP 177	INTP 178	-0E20-
	6AA3	6AA3	6AA3	6AA3	6AA3	6AA3	6AA3	DA45	
-0E30-	INTP 179	INTP 180	INTP 194	INTP 195	INTP 196	INTP 197	INTP 198	INTP 199	-0E30-
	6AF7	C4D3	DE73	FA3C	3BC5	8E7E	2E1D	EE39	
-0E40-	INTP 200	INTP 201	INTP 202	INTP 203	INTP 204	INTP 205	INTP 206	INTP 207	-0E40-
	3E43	8E74	FE4A	6FA5	8E4E	1AFF	6FA7	7FC0	
-0E50-	INTP 208	INTP 209	INTP 210	INTP 211	INTP 212	INTP 213	INTP 214	INTP 215	-0E50-
	8E38	FA7B	0E0D	C4B7	DE60	3B85	1B45	8E7E	
-0E60-	INTP 216	INTP 217	INTP 218	INTP 219	INTP 220	INTP 221	INTP 222	INTP 223	-0E60-
	0ED9	F4DB	1BC5	EE6F	1E4B	E0FE	8E40	3B45	
-0E70-	INTP 224	INTP 167	INTP 168	INTP 169	INTP 170	INTP 225	INTP 226	INTP 227	-0E70-
	8E7E	2E07	5FC0	2A13	922D	0B49	F4DB	5CE2	

0E8-

	0	2	4	6	8	A	C	E	
-0E80-	INTP 228	INTP 229	INTP 230	INTP 231	INTP 232	INTP 233	LRDR 002	LRDR 003	-0E80-
	7BC0	5EF2	5EA9	0640	7AF2	A412	2B40	2D08	
-0E90-	LRDR 004	LRDR 005	LRDR 006	LRDR 007	LRDR 008	LRDR 009	LRDR 010	LRDR 011	-0E90-
	3445	3406	5A82	1A85	F99F	3D00	3A85	7A82	
-0EA0-	LRDR 012	LRDR 013	LRDR 014	LRDR 015	LRDR 016	LRDR 017	LRDR 018	LRDR 019	-0EA0-
	5A92	FDB1	C9B1	1A43	7A92	3400	1593	A5A0	
-0EB0-	LRDR 020	LRDR 021	LRDR 022	LRDR 023	LRDR 024	LRDR 025	LRDR 026	LRDR 027	-0EB0-
	3A43	5DC2	CD28	1583	3AC9	5AB9	7AF2	ACBC	
-0EC0-			IRST 175	IRST 176	KAAN 081	KAAN 082	KAAN 083	KAAN 084	-0EC0-
			0000	0000	2F07	5AEF	0E55	E0D3	
-0ED0-	KAAN 085	KAAN 086	KAAN 087	KAAN 088	KAAN 089	KAAN 090	KAAN 091	KAAN 092	-0ED0-
	3F25	0EB5	E0D9	3F13	0E33	F0EB	3F23	FE66	
-0EE0-	KAAN 093	KAAN 094	KAAN 095	KAAN 096	KAAN 097	KAAN 098	KAAN 104	KAAN 105	-0EE0-
	3F27	D5E6	3F13	5EEF	9E98	EA5E	3E00	1210	
-0EF0-	KAAN 106	KAAN 107	KAAN 108	KAAN 109	KAAN 110	KAAN 111	KAAN 112	KAAN 113	-0EF0-
	2725	4D7F	2715	4B7F	0340	3763	0E04	2E08	

CONTROL ADDRESS   0E--

ADDRESS LIST   DATE 11/08/68   OF--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0F00-	KAAN 114 4F7F	KAAN 115 3D00	KAAN 116 3443	KAAN 117 3490	KAAN 118 2807	KAAN 119 2943	KAAN 120 5A32	KAAN 121 288B	-0F00-
-0F10-	KAAN 122 8F10	MBBB 043 1645	MBBB 044 3685	MBBB 045 1633	MBBB 046 3623	MBBB 047 5AE2	MBBB 048 8978	BDIA 423 EE9E	-0F10-
-0F20-	BDIA 424 1212	BDIA 425 5EFF	BDIA 426 C4A4	BDIA 427 2800	BDIA 428 2020	BDIA 434 9876	KBBB 056 1485	KBBB 057 27D3	-0F20-
-0F30-	KBBB 058 F437	KBBB 059 3765	KBBB 060 E071	KBBB 061 3725	KBBB 062 3445	KBBB 063 8F7A	KBBB 023 1485	KBBB 024 2753	-0F30-
-0F40-	KBBB 025 F544	KBBB 026 271B	KBBB 027 E538	KBBB 028 271D	KBBB 029 278B	KBBB 030 4F7F	KBBB 031 3D00	KBBB 032 3490	-0F40-
-0F50-	KBBB 033 2807	KBBB 034 2915	KBBB 035 5A32	KBBB 036 3480	KBBB 037 F56A	KBBB 038 3490	KBBB 039 6CA4	KBBB 040 5DC9	-0F50-
-0F60-	KBBB 041 6DB1	KBBB 042 C4E9	KBBB 043 5CD9	KBBB 044 8F60	KBBB 048 9800	KBBB 045 5224	KBBB 046 2F07	KBBB 047 9E06	-0F60-
-0F70-	KBBB 064 5A42	KBBB 065 2B6B	KBBB 066 F4F8	KBBB 067 2A1B	KBBB 068 42A6	KBBB 069 4F7F	KBBB 070 3D00	KBBB 071 A8BC	-0F70-

0F8-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-0F80-	JEND 043 6223	JEND 044 6223	JEND 045 6223	JEND 046 5249	JEND 047 6237	JEND 048 C494	JEND 049 6345	JEND 050 7300	-0F80-
-0F90-	JEND 051 3515	JEND 052 75C0	JEND 053 5C62	JEND 054 1CE5	JEND 055 6CE1	JEND 056 C49F	JEND 057 8FE6	JEND 058 A94C	-0F90-
-0FA0-	JEND 008 2B40	JEND 009 CDAB	JEND 010 DDA3	JEND 011 2B00	JEND 012 0204	JEND 013 2B00	JEND 014 5FEF	JEND 015 2B02	-0FA0-
-0FB0-	JEND 016 FDB0	JEND 017 5FFF	JEND 018 2B08	JEND 019 2C07	JEND 020 2D85	JEND 021 57C0	JEND 022 5731	JEND 023 63E1	-0FB0-
-0FC0-	JEND 024 E094	JEND 025 2D7B	JEND 026 55C0	JEND 027 5559	JEND 028 C494	JEND 029 7FC0	JEND 030 FB14	JEND 031 47D5	-0FC0-
-0FD0-	JEND 032 1D83	JEND 033 55C0	JEND 034 C710	JEND 035 2007	JEND 036 2195	JEND 037 3163	JEND 038 5300	JEND 039 2215	-0FD0-
-0FE0-	JEND 040 D764	JEND 041 5221	JEND 042 871F	JEND 147 5C72	JEND 148 6CE1	JEND 149 C4F4	JEND 150 5C82	JEND 151 1C85	-0FE0-
-0FF0-	JEND 152 7C82	JEND 153 A97A	JEND 154 6DE1	JEND 155 C4F2	JEND 156 5C82	JEND 157 1C13	JEND 158 8FF0	5007	-0FF0-

CONTROL ADDRESS   OF--

ADDRESS LIST   DATE 11/08/68   10--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1000-	IMPY 104 7DFF	IMPY 105 7DFF	IMPY 106 7DFF	IMPY 107 7DFF	IMPY 108 7DFF	IMPY 109 7DFF	IMPY 110 9016	IMPY 111 CA1C	-1000-
-1010-	IMPY 112 1E83	IMPY 113 7DFF	IMPY 114 9000	IMPY 115 CA1C	IMPY 116 7DFF	IMPY 117 9010	IMPY 118 5CAD	IMPY 119 7DAF	-1010-
-1020-	IMPY 120 4DC5	IMPY 121 5850	IMPY 122 E1AA	IMPY 123 2002	IMPY 124 0020	IMPY 125 5DDD	IMPY 126 5BAD	IMPY 127 7DAF	-1020-
-1030-	IMPY 128 E0B5	IMPY 129 2020	IMPY 130 4DBD	IMPY 131 57D9	IMPY 132 7B5A	IMPY 133 DE44	IMPY 134 9526	IMPY 167 2C07	-1030-
-1040-	IMPY 169 2607	IMPY 170 8D7C	IMPY 136 0002	IMPY 137 5B50	IMPY 138 E1CE	IMPY 139 2002	IMPY 140 0020	IMPY 141 5BAD	-1040-
-1050-	IMPY 142 5CDD	IMPY 143 7DAF	IMPY 144 4DBD	IMPY 145 7B5A	IMPY 156 DC3F	IMPY 157 5422	IMPY 158 5446	IMPY 159 7422	-1050-
-1060-	IMPY 161 9508	LPTR 008 FAEC	LPTR 009 5BFF	LPTR 010 5ACF	LPTR 011 A213	LPTR 012 9074	LPTR 049 3485	LPTR 050 1F80	-1060-
-1070-	LPTR 051 2635	LPTR 052 266B	LPTR 053 2215	LPTR 054 2307	LPTR 055 5F2C	LPTR 056 0208	MJJJ 003 8205	 5007	-1070-

108-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1080-	IBCH 088 8160	IBCH 090 909C	IBCH 091 8A30	IBCH 092 8270	IBCH 093 8D7C	IBCH 094 810C	IBCH 095 8D7C	IBCH 096 8900	-1080-
-1090-	IBCH 097 90BC	IBCH 098 57F9	IBCH 099 3F63	IBCH 100 8902	IBCH 061 C722	IBCH 062 8890	IBCH 063 2D95	IBCH 064 3D43	-1090-
-10A0-	IBCH 065 52C0	IBCH 066 8D7C	IBCH 067 CF22	IBCH 068 9E72	IBCH 069 DF22	IBCH 070 9E72	IBCH 071 EF22	IBCH 072 9E72	-10A0-
-10B0-	IBCH 073 FF22	IBCH 074 9E72	IBCH 075 CB22	IBCH 076 9E72	IBCH 077 DB22	IBCH 078 9E72	IBCH 079 EB22	IBCH 080 9E72	-10B0-
-10C0-	IBCH 081 FB22	IBCH 082 9E72	IBCH 083 C748	IBCH 084 B311	IBCH 101 07CB	IBCH 102 F0B5	IBCH 103 0705	IBCH 104 F08C	-10C0-
-10D0-	IBCH 105 5EF9	IBCH 106 90C0	JODE 007 20E5	JODE 008 31F5	JODE 009 2793	JODE 010 37D5	JODE 011 2040	JODE 012 937E	-10D0-
-10E0-	IBCH 043 81D0	 5007	IBCH 044 CE7E	IBCH 045 9E72	IBCH 046 DE7E	IBCH 047 9E72	IBCH 048 EE7E	IBCH 049 9E72	-10E0-
-10F0-	IBCH 050 FE7E	IBCH 051 9E72	IBCH 052 CA7E	IBCH 053 9E72	IBCH 054 DA7E	IBCH 055 9E72	IBCH 056 EA7B	IBCH 057 8D7C	-10F0-

CONTROL ADDRESS   10--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1100-	LRTR 013	LRTR 014	LRTR 015	LRTR 016	LRTR 017	LRTR 018	LRTR 019	LRTR 020	-1100-
	5F00	7D08	CD8E	201D	7D00	30FB	3465	6CF1	
-1110-	LRTR 021	LRTR 022	LRTR 023	LRTR 024	LRTR 025	LRTR 026	LRTR 027	LRTR 028	-1110-
	C4A3	CDA3	3B00	2E15	57FD	3FF5	5DE0	6DC5	
-1120-	LRTR 029	LRTR 030	LRTR 031	LRTR 032	LRTR 033	LRTR 034	LRTR 035	LRTR 036	-1120-
	7DE0	271B	C4B8	CDC5	7400	1465	0206	5BDF	
-1130-	LRTR 037	LRTR 038	LRTR 039	LRTR 040	LRTR 041	LRTR 042	LRTR 043	LRTR 044	-1130-
	3445	30C9	21A5	2745	F0C4	3763	07A1	C4C4	
-1140-	LRTR 045	LRTR 046	LRTR 047	LRTR 009	LRTR 010	LRTR 011	LRTR 012	ISAB 039	-1140-
	CDC5	0D04	0206	EAAE	5BDF	A303	0206	0060	
-1150-	ISAB 040	ISAB 041	ISAB 042	ISAB 043	ISAB 037	ISAB 038	ISAB 044	ISAB 045	-1150-
	4426	A304	CE5C	AAA6	2BE5	AAAA	DE59	AA88	
-1160-	LPXF 021	LPXF 022	LPXF 023	LPXF 024	LPXF 025	LPXF 026	LPXF 027	LPXF 028	-1160-
	2DAB	2DAB	2DAB	2DAB	2DAB	2DAB	9474	9480	
-1170-	MAAA 090	MAAA 091	MAAA 092	MAAA 093	MAAA 094	MAAA 095	MAAA 096	MAAA 097	-1170-
	2A95	2B05	021E	5EA2	56F9	7EA2	2C05	817C	

118-

	0	2	4	6	8	A	C	E	
-1180-	LPTR 013	LPTR 014	LPTR 015	LPTR 016	LPTR 017	LPTR 018	LPTR 019	LPTR 020	-1180-
	5F2C	C607	D638	33BB	D00C	DF9D	238D	337B	
-1190-	LPTR 021	LPTR 022	LPTR 023	LPTR 024	LPTR 025	LPTR 026	LPTR 027	LPTR 028	-1190-
	5D20	7F20	337F	5F20	6DF7	7D20	2235	5F20	
-11A0-	LPTR 029	LPTR 030	LPTR 031	LPTR 032	LPTR 033	LPTR 034	LPTR 035	LPTR 036	-11A0-
	6CF1	C4B5	CAB4	3F40	2E55	56FD	3FF5	5DE0	
-11B0-	LPTR 037	LPTR 038	LPTR 039	LPTR 040	LPTR 041	LPTR 042	LPTR 043	LPTR 044	-11B0-
	6DC5	7DE0	2215	23CB	261B	C4C2	0D80	1495	
-11C0-	LPTR 045	LPTR 046	LPTR 047	LPTR 048	IOCM 011	IOCM 002	IOCM 003	IOCM 004	-11C0-
	0208	F0C6	266B	0208	8D15	F659	51D9	DD54	
-11D0-	IOCM 005	IOCM 006	IOCM 007	IOCM 008	IOCM 009	IOCM 010	IERR 030	IERR 031	-11D0-
	5DD9	DD49	2A35	817A	2A53	817C	2A13	A068	
-11E0-	JTPE 053	JTPE 054	JTPE 055	JTPE 056	JTPE 057	MPRT 413	MPRT 414	MPRT 411	-11E0-
	6003	6003	6003	5EC2	9462	1E45	91FC	DE6B	
-11F0-	MPRT 412	MPRT 404	MPRT 405	MPRT 406	MPRT 407	MPRT 408	MPRT 409	MPRT 410	-11F0-
	8D7C	1080	07CB	F0EE	EE70	1E25	7E62	9E72	

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1200-	MJJJ 004 8D28	5007	MJJJ 005 8A88	MJJJ 006 8D28	MJJJ 007 5F49	MJJJ 008 5E62	MJJJ 009 1473	MJJJ 013 5FB9	-1200-
-1210-	MJJJ 014 CF2A	MJJJ 015 6BB3	MJJJ 016 3F23	MJJJ 017 0B9D	MJJJ 018 E0B9	MJJJ 019 0BCD	MJJJ 020 E0BF	MJJJ 021 CC33	-1210-
-1220-	MJJJ 022 0B1D	MJJJ 023 E0B3	MJJJ 024 FB2F	MJJJ 025 3433	MJJJ 026 9F26	MJJJ 027 1F23	MJJJ 028 9234	MJJJ 029 3413	-1220-
-1230-	MJJJ 030 9F26	MJJJ 031 1E65	MJJJ 032 7E62	MJJJ 033 9224	MJJJ 034 3E45	MJJJ 035 1E25	MJJJ 036 9234	MJJJ 037 3E25	-1230-
-1240-	MJJJ 038 1E45	MJJJ 039 9234	JTYP 512 32F3	JTYP 513 5B28	JTYP 514 81B6	JTYP 515 9252	JTYP 502 F253	JTYP 503 D145	-1240-
-1250-	JTYP 504 4B28	JTYP 505 5BB1	JTYP 506 5BF9	JTYP 507 5FAD	JTYP 508 8118	JTYP 509 5AF9	JTYP 510 161B	JTYP 511 896C	-1250-
-1260-	MAAA 161 9286	5007	MAAA 162 AE80	MAAA 163 9286	IRST 065 0604	IRST 066 2607	IRST 067 81E6	IRST 068 A150	-1260-
-1270-	IRST 072 C3FB	IRST 097 1600	IRST 098 1210	IRST 099 98EA	IRST 100 ABC6	IRST 101 9D04	5007	5007	-1270-

128-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1280-	IOCM 012 928C	IOCM 013 9286	IOCM 014 929C	IOCM 015 5AF2	IOCM 016 2A53	IOCM 017 817C	IOCM 018 C907	IOCM 019 E906	-1280-
-1290-	IOCM 020 D917	IOCM 021 F907	IOCM 022 937C	IOCM 023 F91B	IOCM 025 99EC	IOCM 029 88EA	IOCM 030 0DD1	IOCM 031 F0AB	-1290-
-12A0-	IOCM 032 0DC1	IOCM 033 F0AD	IOCM 034 0D81	IOCM 035 F086	IOCM 036 9EFC	IOCM 037 A3E2	IOCM 038 937C	MPRT 243 2AF3	-12A0-
-12B0-	MPRT 244 3A65	MPRT 245 5AB9	MPRT 246 5032	MPRT 247 7AF2	MPRT 248 7C62	MPRT 249 3400	MPRT 250 8258	MPRT 251 ACBC	-12B0-
-12C0-	JODE 060 6883	JODE 061 6883	JODE 062 6883	JODE 063 6897	JODE 064 C4CF	JODE 065 3433	JODE 066 92D0	JODE 067 34B3	-12C0-
-12D0-	JODE 068 47F3	JODE 069 55E9	JODE 070 7E52	JODE 071 D562	JODE 072 C1E2	JODE 073 E1E2	JODE 074 3645	JODE 075 544D	-12D0-
-12E0-	JODE 076 3415	JODE 077 15C5	JODE 078 0020	JODE 079 D66B	JODE 080 5549	JODE 081 977E	JTYP 142 3F22	JTYP 143 3C95	-12E0-
-12F0-	JTYP 144 5C5B	JTYP 145 16F3	JTYP 146 7C92	JTYP 147 10C0	JTYP 148 2E05	JTYP 149 2F73	JTYP 150 7EE2	JTYP 151 A416	-12F0-

CONTROL ADDRESS   12--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-13C0-	IBCH 024 9098	IBCH 025 90A8	IBCH 026 90B0	IBCH 027 90AC	IBCH 028 90A4	IBCH 029 8104	IBCH 030 8104	IBCH 031 8104	-1300-
-1310-	IBCH 032 8104	IBCH 033 DB27	IBCH 034 8D7C	IBCH 035 8D7C	IBCH 036 8D7C	IBCH 037 8D7C	IBCH 038 810A	IBCH 039 8D7C	-1310-
-1320-	IBCH 040 6DD3	IBCH 041 FD1F	IBCH 042 B971	IBCH 058 1F43	IBCH 059 7E82	IBCH 060 9E72	KAAA 091 2E07	KAAA 092 F332	-1320-
-1330-	KAAA 093 3E15	KAAA 094 F236	KAAA 095 3E43	KAAA 096 87EC	KAAA 088 EA2C	KAAA 089 2E13	KAAA 090 932E	5007	-1330-
-1340-	IBCH 015 9320	IBCH 016 90C4	IBCH 017 B307	IBCH 018 079B	IBCH 019 F0E6	IBCH 020 8900	IBCH 002 D250	IBCH 003 9E72	-1340-
-1350-	IBCH 004 C663	IBCH 005 06F9	IBCH 006 F4D8	IBCH 007 81DA	IBCH 008 5F3A	IBCH 009 6F71	IBCH 010 0F45	IBCH 011 C4CF	-1350-
-1360-	IBCH 012 8D7C	IBCH 013 5E82	IBCH 014 8747	IBCH 021 07CB	IBCH 022 F0E0	IBCH 023 8900	IERR 061 F676	IERR 067 91DC	-1360-
-1370-	IERR 051 2A23	IERR 052 A068	IERR 039 E671	IERR 041 8D00	IERR 053 E671	IERR 054 8D06	JTPE 002 10EE	JTPE 003 01F1	-1370-

138-

	0	2	4	6	8	A	C	E	
-1380-	JTPE 004 F489	JTPE 005 2A53	JTPE 006 7AF2	JTPE 007 A044	JTPE 018 0191	JTPE 019 F483	JTPE 020 8258	JTPE 021 5EC2	-1380-
-1390-	JTPE 022 16F5	JTPE 023 2DE5	JTPE 024 E154	JTPE 025 07CD	JTPE 026 E0E3	JTPE 027 07DD	JTPE 028 E0A9	JTPE 029 2D4B	-1390-
-13A0-	JTPE 030 6D71	JTPE 031 C4DE	JTPE 032 25F3	JTPE 033 93B2	JTPE 043 074B	JTPE 044 F0BD	JTPE 045 079B	JTPE 046 F0DE	-13A0-
-13B0-	JTPE 047 2573	JTPE 048 51E9	JTPE 049 2015	JTPE 050 DA3A	JTPE 051 5001	JTPE 052 8A73	JTPE 064 35E9	JTPE 065 36C5	-13B0-
-13C0-	JTPE 066 9462	JTPE 061 159B	JTPE 062 2020	JTPE 063 9462	JTPE 058 259B	JTPE 059 3625	JTPE 060 9462	JTPE 015 079B	-13C0-
-13D0-	JTPE 016 F0DE	JTPE 017 941A	JTPE 008 07DD	JTPE 009 E0CF	JTPE 010 2D6B	JTPE 011 6D71	JTPE 012 C4D3	JTPE 013 2A95	-13D0-
-13E0-	JTPE 014 9384	JTPE 034 071B	JTPE 035 F0C9	JTPE 036 072B	JTPE 037 F0C3	JTPE 038 0758	JTPE 039 F0DE	JTPE 040 3F25	-13E0-
-13F0-	JTPE 041 7EC2	JTPE 042 8D7C	LRDR 028 0D04	LRDR 029 1B00	LRDR 030 3406	LRDR 031 98EA	LRDR 032 3AB9	LRDR 033 8EBA	-13F0-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1400-	JODE 050	JODE 051	JODE 052	JODE 053	JODE 054	JODE 055	JODE 056	JODE 057	-1400-
	3545	ED09	FE09	3585	58D2	24C5	2815	D812	
-1410-	JODE 058	JODE 059	JODE 047	JODE 048	JODE 049	JODE 002	JODE 003	JODE 004	-1410-
	5881	8B55	0020	3F25	943C	F75B	36C5	EF25	
-1420-	JODE 005	JODE 006	JODE 020	JODE 021	JODE 022	JODE 023	JODE 024	JODE 025	-1420-
	2513	9428	2515	3573	2D85	41DD	5FE9	5FC0	
-1430-	JODE 026	JODE 027	JODE 028	JODE 029	JODE 030	JODE 031	JODE 032	JODE 033	-1430-
	5D19	7042	E195	EF3C	2020	1F25	7FC0	1DF3	
-1440-	JODE 034	JODE 035	JODE 036	JODE 037	JODE 038	JODE 039	JODE 040	JODE 041	-1440-
	16E3	1F35	57C0	5D32	0FCD	E081	3645	5F4B	
-1450-	JODE 042	JODE 043	JODE 044	JODE 045	JODE 046	JODE 013	JODE 014	JODE 015	-1450-
	ED57	258D	3435	3425	92CE	2080	3B43	72A0	
-1460-	JODE 016	JODE 017	JODE 018	JODE 019	MPRT 399	MPRT 400	MPRT 401	MPRT 402	-1460-
	2523	1F25	7EC2	9428	5EEF	0E93	F0F1	954C	
-1470-	MPRT 403		LPXF 029	LPXF 030	LPXF 031	LPXF 032	LPXF 033	LPXF 034	-1470-
	A650	5007	2D1D	2DEB	5BC0	6B41	7BC0	58D5	

148-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1480-	LPXF 035	LPXF 036	LPXF 037	LPXF 038	LPXF 039	LPXF 040	LPXF 041	LPXF 042	-1480-
	C504	6141	D508	6741	E50C	6941	F510	6F41	
-1490-	LPXF 043	LPXF 044	LPXF 045	LPXF 046	LPXF 047	LPXF 048	LPXF 049	LPXF 050	-1490-
	C114	6E41	282B	F0C6	71C0	2DAB	77C0	2DAB	
-14A0-	LPXF 051	LPXF 052	LPXF 053	LPXF 054	LPXF 055	LPXF 056	LPXF 057	LPXF 058	-14A0-
	79C0	2D5D	7FC0	2DAB	5EF9	7FC0	58D5	08AD	
-14B0-	LPXF 059	LPXF 060	LPXF 061	LPXF 062	LPXF 002	LPXF 004	LPXF 008	LPXF 009	-14B0-
	C4BC	83B0	98EA	A74E	2807	2A65	21F7	5179	
-14C0-	LPXF 010	LPXF 011	LPXF 012	LPXF 013	LPXF 014	LPXF 015	LPXF 016	LPXF 017	-14C0-
	51F9	51E9	5199	58BD	3B85	54A0	5B38	3845	
-14D0-	LPXF 018	LPXF 019	LPXF 020	MAAA 160	MAAA 137	MAAA 138	MAAA 139	MAAA 140	-14D0-
	55A0	157B	9163	9265	C9D9	4FAF	2B04	2B44	
-14E0-	MAAA 141	MAAA 142	MAAA 143	MAAA 151	MAAA 152	MAAA 144	MAAA 145	MAAA 146	-14E0-
	C9EB	DDE1	8628	C256	907C	2B40	CDEC	5FBF	
-14F0-	MAAA 147	MAAA 148	MAAA 149	MAAA 150			IMPY 050	IMPY 051	-14F0-
	6AB1	C4E7	2A85	9172	5007	5007	5D50	5DDD	
CONTROL ADDRESS									14--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1500-	IMPY 052 F204	IMPY 053 3D15	IMPY 054 3DC5	IMPY 055 7D50	IMPY 063 5032	IMPY 064 1CF3	IMPY 065 5422	IMPY 067 5D30	-1500-
-1510-	IMPY 068 DD15	IMPY 069 3C45	IMPY 070 5DBB	IMPY 071 5D79	IMPY 072 3BB5	IMPY 073 7B3A	IMPY 074 CD21	IMPY 081 8442	-1510-
-1520-	IMPY 083 1DF5	IMPY 084 F0A6	IMPY 085 901C	IMPY 086 5DE9	IMPY 088 5D1A	IMPY 089 CD2F	IMPY 096 8442	IMPY 098 0002	-1520-
-1530-	IMPY 099 4DEB	IMPY 100 1E7B	IMPY 101 5DDD	IMPY 102 5DFD	IMPY 103 9A01	MPRT 347 5CA2	MPRT 348 5D69	MPRT 349 5C62	-1530-
-1540-	MPRT 350 5622	MPRT 351 FC47	MPRT 352 1C13	MPRT 353 1D43	MPRT 354 F84D	MPRT 355 A908	MPRT 326 D93B	MPRT 327 5E92	-1540-
-1550-	MPRT 328 3E13	MPRT 329 7E92	MPRT 330 5EC2	MPRT 331 CE5F	MPRT 332 FC5F	MPRT 333 1C13	MPRT 334 A908	MPRT 335 2E65	-1550-
-1560-	MPRT 336 3EF3	MPRT 337 2F05	MPRT 338 7EF2	MPRT 339 3D43	MPRT 340 7C62	MPRT 341 5CA2	MPRT 342 56D9	MPRT 343 7CA2	-1560-
-1570-	MPRT 344 3400	MPRT 345 2C05	MPRT 346 A044	5007	IEDT 028 5EC2	IEDT 030 571A	IEDT 031 57D9	IEDT 032 3D45	-1570-

158-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1580-	IEDT 033 C519	IEDT 034 2585	IEDT 035 5DC0	IEDT 036 ED0C	IEDT 037 FD0D	IEDT 038 3545	IEDT 039 5DDD	IEDT 040 5DC0	-1580-
-1590-	IEDT 046 FE14	IEDT 048 3613	IEDT 049 EE18	IEDT 050 3513	IEDT 051 5F30	IEDT 052 5FB9	IEDT 053 3B45	IEDT 054 0B5D	-1590-
-15A0-	IEDT 055 F0D7	IEDT 056 C151	IEDT 057 2A33	IEDT 058 3AC5	IEDT 059 6AB1	IEDT 060 C4CD	IEDT 061 2A93	IEDT 062 3AD5	-15A0-
-15B0-	IEDT 063 6AB1	IEDT 064 C4CD	IEDT 065 2AB3	IEDT 066 3A65	IEDT 067 F23C	IEDT 068 1A25	IEDT 069 6AB1	IEDT 070 C4C2	-15B0-
-15C0-	IEDT 071 2B45	IEDT 072 7B3A	IEDT 073 DF19	IEDT 074 D14B	IEDT 075 8D7C	IEDT 076 A67C	IEDT 077 D543	IEDT 078 95C0	-15C0-
-15D0-	IEDT 079 F142	IEDT 080 E0EE	IEDT 081 A97E	IEDT 090 E0C1	IEDT 091 0BFD	IEDT 092 C4DE	IEDT 093 A996	IEDT 094 0B6D	-15D0-
-15E0-	IEDT 095 C4E6	IEDT 096 C14C	IEDT 097 95C2	IEDT 098 0B4D	IEDT 099 C4C2	IEDT 100 E143	IEDT 101 A99E	IEDT 082 2A45	-15E0-
-15F0-	IEDT 083 3AB3	IEDT 084 F276	IEDT 085 3A25	IEDT 086 6AB1	IEDT 087 C4C2	IEDT 088 1525	IEDT 089 95C2	KAAH 018 5EDF	-15F0-

CONTROL ADDRESS   15--

ADDRESS LIST   DATE 11/08/68

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1600-	KAAH 019	KAAH 020	KAAH 021	KAAH 022	KAAH 023	KAAH 024	KAAH 025	KAAH 026	-1600-
	C1B4	2C07	4BCF	1D00	DFDB	E110	1210	A854	
-1610-	KAAH 027	KAAH 028	KAAH 080	KAAH 081	KAAH 082	KAAH 083	KAAH 084	KAAH 085	-1610-
	A5D0	8EC8	3480	2D07	2C07	3E08	4BCF	4FCF	
-1620-	KAAH 086	KAAH 087	KAAH 088	KAAH 089	KAAH 090	KAAH 091	KAAH 092	KAAH 093	-1620-
	4DCF	021E	5CC4	C4A2	220E	F8AA	9B62	AD16	
-1630-	KAAH 078	KAAH 079	KAAH 036	KAAH 037	KAAH 038	KAAH 039	KAAH 040	KAAH 041	-1630-
	2F07	9EA6	1D00	1210	D059	C8D1	FDCF	C44C	
-1640-	KAAH 042	KAAH 043	KAAH 044	KAAH 045	KAAH 046	KAAH 047	KAAH 048	KAAH 049	-1640-
	F148	C048	F048	8F2C	3D00	AD2C	AB82	A722	
-1650-	KAAQ 005	KAAQ 006	KAAQ 007	KAAQ 008	KAAH 050	KAAH 058	KAAH 059	KAAH 060	-1650-
	2F23	1423	1525	9EAA	9C6A	1210	2613	4E6F	
-1660-	KAAH 061	KAAH 062	KAAH 063	KAAH 064	KAAH 065	KAAH 066	KAAH 067	KAAH 068	-1660-
	263D	4F6F	2653	26FF	C4E6	2613	4B6F	4BCF	
-1670-	KAAH 069	KAAH 070	KAAH 071	KAAH 072	KAAH 073	KAAH 074	KAAH 075	KAAH 076	-1670-
	2643	4E6F	DAB1	3462	E995	3480	2615	4B6F	

168-

	0	2	4	6	8	A	C	E	
-1680-	KAAH 077	INRU 009	INRU 010	INRU 011	INRU 012	INRU 013	INRU 014	INRU 015	-1680-
	9680	2206	D416	5EFF	EF17	0216	3600	DB97	
-1690-	INRU 016	INRU 017	INRU 018	INRU 019	INRU 020	INRU 021	INRU 022	INRU 023	-1690-
	5F90	0F59	F4F2	0216	2D07	7CF2	00A0	3600	
-16A0-	INRU 024	INRU 025	INRU 026	INRU 027	INRU 028	INRU 029	INRU 030	INRU 031	-16A0-
	5A4F	EFE8	FFE2	CBFD	DBE1	CFDE	5EF2	2C07	
-16B0-	INRU 032	INRU 033	INRU 034	INRU 035	INRU 036	INRU 037	INRU 038	INRU 039	-16B0-
	DFC3	E1AD	C1FA	0FFB	F0FA	0004	4FFF	EFE8	
-16C0-	INRU 040	INRU 060	INRU 061	INRU 062	INRU 063	INRU 064	INRU 065	INRU 066	-16C0-
	96AC	3404	EAC8	82DA	EECD	E1DB	3406	EBD3	
-16D0-	INRU 067	INRU 069	INRU 077	INRU 078	INRU 079	INRU 080	INRU 081	INRU 057	-16D0-
	E9D4	9A60	3482	FADA	9C14	3400	96AC	A044	
-16E0-	INRU 058	INRU 059	INRU 053	INRU 054	INRU 056	INRU 045	INRU 046	INRU 047	-16E0-
	ABC6	9FDE	F0F2	FE73	8990	FFE2	DBAD	CFAC	
-16F0-	INRU 048	INRU 049	INRU 050	INRU 051	INRU 052	INRU 041	INRU 042	INRU 043	-16F0-
	C1F5	8082	0EFF	C4E4	9E72	CBEA	50EF	51FF	

CONTROL ADDRESS   16--

ADDRESS LIST   DATE 11/08/68

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1700-	INRU 044 A378	IADD 004 3585	IADD 005 10EE	IADD 006 571A	IADD 007 C711	IADD 008 57D9	IADD 009 8442	IADD 010 5D79	-1700-
-1710-	IADD 011 E717	IADD 012 F716	IADD 013 158D	IADD 014 5D30	IADD 015 CD1D	IADD 016 8442	IADD 017 ED25	IADD 018 FD24	-1710-
-1720-	IADD 019 158D	IADD 020 2040	IADD 021 57AD	IADD 022 5DFD	IADD 023 C530	IADD 024 3000	IADD 030 7222	IADD 032 A4DC	-1720-
-1730-	IADD 035 3A95	IADD 036 7FAF	IADD 037 4DFB	IADD 038 3FC5	IADD 039 0F1B	IADD 040 F0C2	IADD 041 0FED	IADD 042 E0C2	-1730-
-1740-	IADD 043 1F8D	IADD 044 DD73	IADD 045 F5CC	IADD 054 5A82	IADD 055 3B43	IADD 056 7A82	IADD 058 1F45	IADD 059 7F3A	-1740-
-1750-	IADD 060 8D7C	IADD 062 571A	IADD 063 C75D	IADD 064 57D9	IADD 065 8442	IADD 066 5D79	IADD 067 5D30	IADD 068 CD63	-1750-
-1760-	IADD 069 8442	IADD 070 47AD	IADD 071 5DFD	IADD 072 7FAF	IADD 073 DD71	IADD 074 C5EF	IADD 075 AA52	IADD 076 AD60	-1760-
-1770-	IADD 077 3FF5	IADD 078 7F3A	IADD 079 D753	IADD 080 E1DD	IADD 081 2020	IADD 082 27B5	IADD 083 975C	JCHL 088 5FB9	-1770-

178-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1780-	JCHL 089 3486	JCHL 090 221E	JCHL 091 2D85	JCHL 092 57C0	JCHL 093 4FFF	JCHL 094 2B04	JCHL 095 2B44	JCHL 096 C9DB	-1780-
-1790-	JCHL 097 FDA5	JCHL 098 DD8F	JCHL 099 2A27	JCHL 100 3A23	JCHL 101 7AF2	JCHL 102 021E	JCHL 103 0214	JCHL 104 3400	-1790-
-17A0-	JCHL 105 98EA	JCHL 106 A044	JCHL 107 2B04	JCHL 108 FDA7	JCHL 109 C9A9	JCHL 110 2B00	JCHL 111 021E	JCHL 112 2D2B	-17A0-
-17B0-	JCHL 113 E0AE	JCHL 114 9782	JCHL 129 044B	JCHL 130 C4BA	JCHL 131 88D8	JCHL 132 5FFF	JCHL 133 5842	JCHL 134 E645	-17B0-
-17C0-	JCHL 135 C646	JCHL 136 3983	JCHL 137 2F07	JCHL 138 3D73	JCHL 139 7FC0	JCHL 140 4973	JCHL 141 2D85	JCHL 142 77C8	-17C0-
-17D0-	JCHL 143 0EC3	JCHL 144 C4D6	JCHL 145 A238	JCHL 146 2B08	JCHL 147 A212	JCHL 115 2B40	JCHL 116 021E	JCHL 117 CDDE	-17D0-
-17E0-	JCHL 118 5FAF	JCHL 119 6AF1	JCHL 120 C494	JCHL 121 4F4F	JCHL 122 2B42	JCHL 123 FDEA	JCHL 124 5FEF	JCHL 125 FE34	-17E0-
-17F0-	JCHL 126 2B00	JCHL 127 2B08	JCHL 128 97A6	JYPE 059 0080	JYPE 060 0F11	JYPE 061 F0FF	JYPE 062 1600	JYPE 063 9FDA	-17F0-

CONTROL ADDRESS   17--

ADDRESS LIST   DATE 11/08/68

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1800-	KBBD 008	KBBD 009	KBBD 010	KBBD 011	KBBD 012	KBBD 013	KBBD 014	KBBD 015	-1800-
	3400	5242	2CF5	D10A	2CB5	5F30	6FC5	1FF3	
-1810-	KBBD 016	KBBD 017	KBBD 018	KBBD 019	KBBD 020	KBBD 021	KBBD 022	KBBD 023	-1810-
	7F38	5632	5A78	5864	278B	6BB3	67B3	5A70	
-1820-	KBBD 024	KBBD 025	KBBD 026	KBBD 027	KBBD 028	KBBD 029	KBBD 030	KBBD 031	-1820-
	5F30	6FC5	56E2	10EE	76AF	46FD	7F38	5F30	
-1830-	KBBD 032	KBBD 033	KBBD 034	KBBD 035	KBBD 036	KBBD 037	KBBD 038	KBBD 039	-1830-
	6FC5	4AF5	7F38	5D98	5F90	3F0D	5F79	2002	
-1840-	KBBD 040	KBBD 041	KBBD 042	KBBD 043	KBBD 044	KBBD 045	KBBD 046	KBBD 047	-1840-
	3F9B	E0C9	10EE	57F9	2A95	4DAD	7DAF	F4D2	
-1850-	KBBD 048	KBBD 049	KBBD 050	KBBD 051	KBBD 052	KBBD 053	KBBD 054	KBBD 055	-1850-
	2B1B	5730	67C5	4B7D	7738	5730	67C5	4D7D	
-1860-	KBBD 056	KBBD 057	KBBD 058	KBBD 059	KBBD 060	KBBD 061	KBBD 062	KEND 033	-1860-
	7738	5730	67C5	4F7D	7738	E56E	A8C4	3480	
-1870-	KEND 034	KEND 035	KEND 036	IRST 004	IRST 005	IRST 006	IRST 007	IRST 008	-1870-
	5006	5242	9EE2	3210	3460	2493	2507	2605	

188-

	0	2	4	6	8	A	C	E	
-1880-	IRST 009	IRST 010	IRST 011	IRST 012	IRST 013	IRST 014	IRST 015	IRST 016	-1880-
	2705	34E0	4F6F	4D6F	4B6F	4E6F	1E00	2100	
-1890-	IRST 017	IRST 018	IRST 019	IRST 020	IRST 021	IRST 022	IRST 023	IRST 024	-1890-
	0E08	3400	5C82	1C85	1C13	2D05	7C82	5C92	
-18A0-	IRST 025	IRST 026	IRST 027	IRST 028	IRST 029	IRST 030	IRST 031	IRST 040	-18A0-
	5CCB	1C35	3C85	7C92	5CB2	2D05	7CB2	5CC2	
-18B0-	IRST 041	IRST 043	IRST 045	IRST 046	IRST 047	IRST 048	IRST 049	IRST 050	-18B0-
	1D25	3D83	7CC2	D95C	2E05	2F95	3F63	2D07	
-18C0-	IRST 051	IRST 052	IRST 053	IRST 054	IRST 055	IRST 056	IRST 057	IRST 058	-18C0-
	7DEA	3F4B	7DEA	2C05	7CF2	44FF	1F83	2745	
-18D0-	IRST 059	IRST 060	IRST 061	IRST 062	IRST 063	IRST 064	IRST 102	IRST 103	-18D0-
	77E0	2F1D	3482	5FE0	49FF	A9EC	5C62	5CCB	
-18E0-	IRST 104	IRST 105	IRST 106	IRST 107	IRST 108	IREG 016	IREG 017	IREG 018	-18E0-
	1C75	3C43	2D07	7C62	98B8	5222	5032	5812	
-18F0-	IREG 019	IREG 020	IREG 021	IREG 022	IREG 023	IREG 024			-18F0-
	2E15	2FF5	56E8	54E8	2C07	128E	5007	5007	

CONTROL ADDRESS   18--

ADDRESS LIST   DATE 11/08/68

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1900-	KAAA 236	KAAA 237	KAAA 238	KAAA 239	KAAA 240	KAAA 241	KAAA 242	KAAA 243	-1900-
	2485	5E59	4026	EB1F	DF14	3415	EF15	3413	
-1910-	KAAA 244	KAAA 245	KAAA 246	KAAA 247	KAAA 248	KAAA 249	KAAA 250	KAAA 251	-1910-
	FF15	143B	5224	6224	DB1E	3525	FA21	1513	
-1920-	KAAA 252	KAAA 253	KAAA 254	KAAA 255	KAAA 256	KAAA 257	KAAA 258	KAAA 259	-1920-
	2707	77B8	2607	2725	CB2E	26B3	274D	274F	
-1930-	KAAA 260	KAAA 261	KAAA 262	KAAA 263	KAAA 264	KAAA 265	KAAA 266	KAAA 200	-1930-
	76BA	D163	CB60	26A3	2775	27AB	9962	F944	
-1940-	KAAA 201	KAAA 202	KAAA 203	KAAA 204	KAAA 205	KAAA 206	KAAA 207	KAAA 208	-1940-
	2040	1D13	E1C8	3D13	5D7D	3775	5960	78B8	
-1950-	KAAA 209	KAAA 210	KAAA 211	KAAA 212	KAAA 213	KAAA 214	KAAA 215	KAAA 221	-1950-
	5D38	5DDD	D1D8	2DAB	2D1B	7DB8	E500	9D6A	
-1960-	KAAA 267	KAAA 268	KAAA 269	KAAA 270	KAAA 271	KAAA 272	KAAA 273	KAAA 274	-1960-
	379B	76F2	FB68	3483	6AA6	56B0	7242	3480	
-1970-	KAAA 280	KAAA 281			MPRT 063	MPRT 064	MPRT 065	MPRT 066	-1970-
	519F	A800	5007	5007	56F2	1000	2C05	5062	

198-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1980-	MPRT 067	MPRT 068	MPRT 069	MPRT 070	MPRT 071	MPRT 072	MPRT 073	MPRT 074	-1980-
	5EC2	1183	6D15	1F33	4FD3	C58E	128E	54A9	
-1990-	MPRT 075	MPRT 076	MPRT 077	MPRT 078	MPRT 079	MPRT 080	MPRT 033	MPRT 034	-1990-
	1A83	0A3B	F098	A938	CD59	99E4	5EC2	CB23	
-19A0-	MPRT 035	MPRT 036	MPRT 037	MPRT 038	MPRT 039	MPRT 040	MPRT 041	MPRT 042	-19A0-
	9286	7032	5062	1000	5149	2D05	F034	1113	
-19B0-	MPRT 043	MPRT 044	MPRT 045	MPRT 046	MPRT 047	MPRT 048	MPRT 049	MPRT 050	-19B0-
	1463	99B6	2493	0677	C4BC	9980	2BC3	3B45	
-19C0-	MPRT 051	MPRT 052	MPRT 053	MPRT 054	MPRT 055	MPRT 056	MPRT 057	MPRT 058	-19C0-
	6B71	C4C8	2C23	9980	2B23	3BE5	6B71	C480	
-19D0-	MPRT 059	MPRT 060	MPRT 061	MPRT 062	MPRT 081	MPRT 082	MPRT 083	MPRT 084	-19D0-
	3123	1113	2413	9980	5202	2BC7	1B5B	2A05	
-19E0-	MPRT 085	MPRT 086	MPRT 087	MPRT 088	MPRT 089		KAAA 020	KAAA 021	-19E0-
	63BB	62AD	2B67	1B23	A922	5007	7622	7812	
-19F0-	KAAA 022	KAAA 023	KAAA 024	KAAA 025	KAAA 026	KAAA 027	KAAA 028	KAAA 029	-19F0-
	5C02	3C0D	2D07	7D52	7C32	6C24	2053	2E45	
CONTROL ADDRESS									19--

ADDRESS LIST   DATE 11/08/68

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1A00-	KAAA 030	KAAA 031	KAAA 032	KAAA 033	KAAA 034	KAAA 035	KAAA 036	KAAA 037	-1A00-
	5FD8	3F45	6FE1	C48C	4026	A70A	300D	C480	
-1A10-	KAAA 038	KAAA 039	KAAA 040	KAAA 041	KAAA 042	KAAA 043	KAAA 044	KAAA 045	-1A10-
	2407	25A5	3513	5F40	5FE9	5530	6224	7242	
-1A20-	KAAA 046	KAAA 047	KAAA 048	KAAA 049	KAAA 050	KAAA 051	KAAA 052	KAAA 053	-1A20-
	E525	5530	1513	555D	35A5	C12E	25EB	5C40	
-1A30-	KAAA 054	KAAA 055	KAAA 056	KAAA 057	KAAA 058	KAAA 059	KAAA 060	KAAA 087	-1A30-
	2455	5D55	C4BD	35B5	5F40	EF40	9CEA	9338	
-1A40-	KAAA 061	KAAA 062	KAAA 063	KAAA 064	KAAA 065	KAAA 066	KAAA 067	KAAA 068	-1A40-
	FA4F	5530	555D	1513	7C51	C4CF	2C85	515D	
-1A50-	KAAA 069	KAAA 070	KAAA 071	KAAA 084	KAAA 085	KAAA 086	LREQ 023	LREQ 006	-1A50-
	4026	253D	5F40	CC3E	CF3F	9CEA	96DA	1FB0	
-1A60-	LREQ 007	LREQ 008	LREQ 009	LREQ 010	LREQ 011	LREQ 012	LREQ 013	LREQ 014	-1A60-
	E9E8	5A82	1A85	7A82	2A07	2B07	0B30	6AA4	
-1A70-	LREQ 015	LREQ 016	LREQ 017	LREQ 018	LREQ 019	LREQ 020	LREQ 021	LREQ 022	-1A70-
	C4EC	EBDF	C1DC	3E99	6EF1	C4DD	F0DC	8B4E	

1A8-

	0	2	4	6	8	A	C	E	
-1A80-	JEND 094	JEND 095	JEND 096	JEND 097	JEND 077	JEND 078	JEND 079	JEND 080	-1A80-
	5EC2	CF47	3523	9AC6	7222	2B08	2A55	9796	
-1A90-	JEND 081	JEND 082	JEND 083	JEND 084	JEND 085	JEND 086	JEND 087	JEND 088	-1A90-
	31B9	7138	2007	2185	3173	5752	C743	D422	
-1AA0-	JEND 089	JEND 098	JEND 099	JEND 100	JEND 101	JEND 102	JEND 103	JEND 104	-1AA0-
	9AC4	D744	F100	7500	5042	2007	5700	3715	
-1AB0-	JEND 105	JEND 106	JEND 107	JEND 108	JEND 109	JEND 110	JEND 111	JEND 112	-1AB0-
	7700	5022	E138	3000	5510	F23E	3545	2007	
-1AC0-	JEND 113	JEND 090	JEND 091	JEND 092	JEND 093	JEND 059	JEND 060	JEND 061	-1AC0-
	8A62	D423	F127	7500	9AB2	5F5F	0D04	C188	
-1AD0-	JEND 062	JEND 063	JEND 064	JEND 065	JEND 066	JEND 067	JEND 068	JEND 069	-1AD0-
	1623	D191	5130	01FB	C493	11B7	F261	2145	
-1AE0-	JEND 070	JEND 071	JEND 072	JEND 073	JEND 074	JEND 075	JEND 076		-1AE0-
	31F3	E213	F112	3135	7138	3623	9AD4	5007	
-1AF0-			LPCB 003	LPCB 004	LPCB 005	LPCB 006	LPCB 007	LPCB 008	-1AF0-
	5007	5007	2807	27F7	5799	57E9	57F9	40E6	
CONTROL ADDRESS									1A--

ADDRESS LIST   DATE 11/08/68

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1BC0-	LPCB 010	LPCB 014	LPCB 015	LPCB 016	LPCB 017	LPCB 018	LPCB 019	LPCB 020	-1B00-
	2A65	58BD	3B85	54A0	5838	3B45	2A07	55A0	
-1B10-	LPCB 021	LPCB 022	LPCB 023	LPCB 024	LPCB 025	LPCB 026	LPCB 027	LPCB 028	-1B10-
	E514	6741	F518	6941	C11C	6E41	D120	6F41	
-1B20-	LPCB 029	LPCB 030	LPCB 031	LPCB 032	LPCB 033	LPCB 034	LPCB 035	LPCB 036	-1B20-
	E124	6041	F128	6141	282B	F080	77C0	2DAB	
-1B30-	LPCB 037	LPCB 038	LPCB 039	LPCB 040	LPCB 041	LPCB 042	LPCB 043	LPCB 044	-1B30-
	79C0	2DAB	5E79	77C0	2DAB	7FC0	2DAB	5079	
-1B40-	LPCB 045	LPCB 046	LPCB 047	LPCB 048	LPCB 049	LPCB 050	LPCB 051	LPCB 061	-1B40-
	77C0	2DAB	71C0	08AD	C4D1	3D3D	9AF6	A74E	
-1B50-	LPCB 052	LPCB 053	LPCB 054	LPCB 055	LPCB 056	LPCB 057	LPCB 058	LPCB 059	-1B50-
	DD4F	2D1B	83B0	2B15	2B3B	2A07	63B9	62AD	
-1B60-	LPCB 060	KAAA 325	KAAA 326	KAAA 327	KAAA 328	KAAA 329	KAAA 330	KAAA 331	-1B60-
	9AF4	2D43	4EDF	6DD3	FD66	4BDF	2D65	4DDF	
-1B70-	KAAA 332	KAAA 333					IMAD 002	IMAD 003	-1B70-
	1445	128E	5007	5007	5007	5007	16F3	1002	

1B8-

-1B80-	IMAD 004	IMAD 005	IMAD 006	IMAD 013	IMAD 015	IMAD 016	IMAD 017	IMAD 018	-1B80-
	5D1A	3D45	CD09	8442	5D79	1613	5D30	DD13	
-1B90-	IMAD 019	IMAD 020	IMAD 027	IMAD 029	IMAD 030	IMAD 031	IMAD 032	IMAD 033	-1B90-
	3613	CD17	8442	2A95	3D45	4DAD	57BD	7BAF	
-1BA0-	IMAD 034	IMAD 035	IMAD 036	IMAD 037	IMAD 038	IMAD 039	IMAD 040	IMAD 041	-1BA0-
	E229	3623	86F8	9BB6	D230	3683	86F8	9BB6	
-1BB0-	IMAD 042	IMAD 043	IMAD 044	IMAD 045	IMAD 046	IMAD 047	IMAD 048	IMAD 049	-1BB0-
	4DBB	3B85	3643	0B1B	F0C7	F23E	1B45	7B3A	
-1BC0-	IMAD 050	IMAD 051	IMAD 052	IMAD 053	IMAD 054	IMAD 055	IMAD 056	IMAD 057	-1BC0-
	C200	E24F	8D7C	0BED	E0BA	1B8D	9BBA	DF44	
-1BD0-	IMAD 058	IMAD 059	IMAD 060	IMAD 061	IMAD 062	IMAD 063	IMAD 064	IMAD 065	-1BD0-
	6224	5224	5B30	1613	5B79	2DF5	2002	D763	
-1BE0-	IMAD 066	IMAD 067	IMAD 068	IMAD 069	IRST 165	IRST 166	IRST 167	IRST 168	-1BE0-
	3613	86F8	1623	9BB6	062B	C4F2	078D	C4F2	
-1BF0-	IRST 169	IRST 170	IRST 171	IRST 172	IRST 173			MPRT 283	-1BF0-
	274D	4260	6A21	6831	128E	5007	5007	3000	

CONTROL ADDRESS

ADDRESS LIST   DATE 11/08/68   1C--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1C00-	MPRT 284	MPRT 285	MPRT 286	MPRT 287	MPRT 288	MPRT 289	MPRT 290	MPRT 291	-1C00-
	3C43	1C83	E94F	5EC2	CB0C	1C65	EECD	FECE	
-1C10-	MPRT 292	MPRT 293	MPRT 265	MPRT 266	MPRT 267	MPRT 268	MPRT 269	MPRT 270	-1C10-
	3C25	9C4E	5EC2	DB1E	0D08	3400	9C4A	CAAC	
-1C20-	MPRT 271	MPRT 272	MPRT 273	MPRT 274	MPRT 275	MPRT 276	MPRT 277	MPRT 278	-1C20-
	5EF2	2E65	3EF3	6EF1	C4AC	9E62	5C62	1000	
-1C30-	MPRT 279	MPRT 280	MPRT 281	MPRT 282	MPRT 309	MPRT 310	MPRT 311	MPRT 312	-1C30-
	CE81	CAD2	1C65	9C00	C5C4	997E	1000	C943	
-1C40-	MPRT 313	MPRT 314	MPRT 315	MPRT 316	MPRT 317	MPRT 318	MPRT 294	MPRT 295	-1C40-
	A91E	998E	7C62	3400	2C05	96AC	3C45	DAD3	
-1C50-	MPRT 296	MPRT 297	MPRT 298	MPRT 299	MPRT 300	MPRT 301	MPRT 302	MPRT 303	-1C50-
	EADA	3C13	5E92	3E13	7E92	0D0A	D1B8	0040	
-1C60-	MPRT 304	MPRT 305	MPRT 306	MPRT 307	MPRT 308	KAAN 130	KAAN 131	KAAN 132	-1C60-
	4EC6	7C62	3400	2C05	ADCA	58E2	519F	78E2	
-1C70-	KAAN 133	KAAN 134	KAAN 135	KAAN 136	KAAN 137				-1C70-
	5E32	2F8B	58F8	56F0	A7E6	5007	5007	5007	

1C8-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1C80-	IMVE 060	IMVE 061	IMVE 073	IMVE 074	IMVE 075	IMVE 081	IMVE 083	IMVE 084	-1C80-
	3745	9CE2	3000	5710	71BD	70CD	5F30	DF22	
-1C90-	IMVE 085	IMVE 086	IMVE 087	IMVE 088	IMVE 089	IMVE 013	IMVE 014	IMVE 015	-1C90-
	D732	773A	C584	1002	9C86	773A	571A	5F30	
-1CA0-	IMVE 016	IMVE 017	IMVE 018	IMVE 019	IMVE 005	IMVE 006	IMVE 007	IMVE 008	-1CA0-
	D71B	1745	773A	8D7C	773A	571A	5F30	DF22	
-1CB0-	IMVE 009	IMVE 010	IMVE 011	IMVE 012	IMVE 028	IMVE 034	IMVE 035	IMVE 037	-1CB0-
	D729	3745	773A	8D7C	E22A	5FC2	CB2A	2B65	
-1CC0-	IMVE 038	IMVE 039	IMVE 040	IMVE 041	IMVE 042	IMVE 043	IMVE 044	IMVE 045	-1CC0-
	2B3B	37CD	C485	071B	C4AA	3000	571A	5F30	
-1CD0-	IMVE 046	IMVE 047	IMVE 048	IMVE 049	IMVE 055	IMVE 057	IMVE 058	IMVE 059	-1CD0-
	DF60	D700	7730	73BD	72CD	C5CA	1002	9CCC	
-1CE0-	IMVE 062	IMVE 063	IMVE 064	IMVE 070	IMVE 072	KEND 002	KEND 003	KEND 004	-1CE0-
	1745	7730	73BD	72CD	8D7C	2665	5412	6446	
-1CF0-	KEND 005	KEND 006	KEND 007	KEND 008	KEND 009				-1CF0-
	6446	6446	6446	7412	9F72	5007	5007	5007	

CONTROL ADDRESS   1C--

ADDRESS LIST   DATE 11/08/68

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1D00-	IPLS 057 A57A	IPLS 061 90D4	IPLS 005 AD84	IPLS 006 51FF	IPLS 007 5202	IPLS 008 5224	IPLS 009 4826	IPLS 010 50EF	-1D00-
-1D10-	IPLS 011 6679	IPLS 012 67F1	IPLS 013 C4D5	IPLS 014 E0CF	IPLS 015 1E25	IPLS 016 E0A2	IPLS 017 5771	IPLS 018 6E71	-1D10-
-1D20-	IPLS 019 F0A7	IPLS 020 2625	IPLS 021 91D8	IPLS 022 5E11	IPLS 023 9D3C	IPLS 038 2E55	IPLS 039 2D07	IPLS 040 7D38	-1D20-
-1D30-	IPLS 041 2D45	IPLS 042 2EFF	IPLS 043 C4AE	IPLS 044 EB3C	IPLS 045 2DF3	IPLS 046 7D30	IPLS 047 0620	IPLS 048 2607	-1D30-
-1D40-	IPLS 049 2507	IPLS 050 1210	IPLS 051 4286	IPLS 052 0F4D	IPLS 053 E082	IPLS 054 F081	IPLS 055 890C	IPLS 024 0F23	-1D40-
-1D50-	IPLS 025 F0A2	IPLS 026 2E1F	IPLS 027 3E1D	IPLS 028 5661	IPLS 029 6E61	IPLS 030 C4A2	IPLS 031 EB2B	IPLS 032 5DC2	-1D50-
-1D60-	IPLS 033 F92A	IPLS 034 23EB	IPLS 035 4826	IPLS 036 2E37	IPLS 037 9D2C	KAAF 048 3490	KAAF 049 5BD9	KAAF 050 2D8B	-1D60-
-1D70-	KAAF 051 5DC9	KAAF 052 5CD9	KAAF 053 6DB1	KAAF 054 C4F2	KAAF 055 A8BC	5007	5007	JTYP 422 3F45	-1D70-

1D8-

	0	2	4	6	8	A	C	E	
-1D80-	JTYP 423 CF12	JTYP 424 0FFD	JTYP 425 E088	JTYP 426 9DB6	JTYP 427 F08F	JTYP 428 1F45	JTYP 429 9DB6	JTYP 430 3F73	-1D80-
-1D90-	JTYP 431 9DB6	JTYP 432 D216	JTYP 433 8370	JTYP 434 C115	JTYP 435 0F4D	JTYP 436 C4D0	JTYP 437 CFC9	JTYP 438 F550	-1D90-
-1DA0-	JTYP 439 2FC5	JTYP 440 3F63	JTYP 441 9DB6	JTYP 459 5DF9	JTYP 460 CFC1	JTYP 461 F537	JTYP 462 6DA9	JTYP 463 F0B6	-1DA0-
-1DB0-	JTYP 464 FD37	JTYP 465 2F15	JTYP 466 3F53	JTYP 467 CFBA	JTYP 468 85CC	JTYP 469 F13F	JTYP 470 5224	JTYP 471 896C	-1DB0-
-1DC0-	JTYP 472 5ACF	JTYP 473 0CDB	JTYP 474 F0B3	JTYP 475 9DB6	JTYP 442 5AEF	JTYP 443 CE50	JTYP 444 1EC5	JTYP 445 C4A0	-1DC0-
-1DD0-	JTYP 447 2A75	JTYP 451 2F4D	JTYP 452 5FB9	JTYP 453 D55A	JTYP 454 188B	JTYP 455 5CA0	JTYP 456 FB27	JTYP 457 5CF9	-1DD0-
-1DE0-	JTYP 458 9DB6	JDTA 054 7222	JDTA 055 C9E5	JDTA 056 3400	JDTA 057 0214	JDTA 058 0210	JDTA 059 021E	JDTA 060 98EA	-1DE0-
-1DF0-	JDTA 061 2D85	JDTA 062 3D73	JDTA 063 C1F9	JDTA 064 E17D	JDTA 065 2DDB	JDTA 066 72C0	JDTA 067 8D7C	5007	-1DF0-

CONTROL ADDRESS   1D--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1E00-	KAAA 150	KAAA 151	KAAA 152	KAAA 158	KAAA 159	KAAA 160	KAAA 161	KAAA 162	-1E00-
	6F65	76B2	2507	3400	5738	5769	5738	58E2	
-1E10-	KAAA 163	KAAA 164	KAAA 165	KAAA 166	KAAA 167	KAAA 168	KAAA 169	KAAA 170	-1E10-
	568D	1813	78E2	10EE	F31E	2040	1713	F222	
-1E20-	KAAA 171	KAAA 172	KAAA 173	KAAA 174	KAAA 175	KAAA 176	KAAA 177	KAAA 178	-1E20-
	3713	2655	577D	272D	5960	5D38	5D89	F934	
-1E30-	KAAA 179	KAAA 180	KAAA 181	KAAA 182	KAAA 183	KAAA 184	KAAA 185	KAAA 186	-1E30-
	2020	1D13	01BA	3D13	0040	5D7D	3775	5B60	
-1E40-	KAAA 187	KAAA 188	KAAA 189	KAAA 195	KAAA 141	KAAA 142	KAAA 143	KAAA 144	-1E40-
	69B9	5D38	CF5A	A43E	CF4E	3685	9E02	FB01	
-1E50-	KAAA 145	KAAA 146	KAAA 147	KAAA 148	KAAA 149	KAAA 196	KAAA 197	KAAA 198	-1E50-
	5F69	FE03	DF03	3785	9E02	5A32	2807	78B8	
-1E60-	KAAA 199	MPRT 255	MPRT 256	MPRT 257	MPRT 258	MPRT 259	MPRT 260	MPRT 261	-1E60-
	993E	98EA	2E07	5EF9	7EF2	5C62	3D83	0080	
-1E70-	MPRT 262	IUBR 002	IUBR 008	IUBR 009	IUBR 011	IUBR 012	IUBR 013	IUBR 014	-1E70-
	9BFE	E678	2A23	817C	4286	1615	4806	8D7C	

1E8-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1E80-	KAAN 177	KAAN 178	KAAN 186	KAAN 187	KAAN 188	KAAN 189	KAAN 190	KAAN 191	-1E80-
	F516	EF17	56B2	C217	5E32	2F4B	5DF0	FD17	
-1E90-	KAAN 192	KAAN 193	KAAN 194	KAAN 195	KAAN 145	KAAN 146	KAAN 147	KAAN 148	-1E90-
	3725	3743	76B2	85EE	CE22	DE22	EE23	FA23	
-1EA0-	KAAN 149	KAAN 150	KAAN 151	KAAN 152	KAAN 153	KAAN 154	KAAN 155	KAAN 156	-1EA0-
	9EA4	3F13	DA2A	3F83	3F25	2E25	4DEF	2E07	
-1EB0-	KAAN 157	KAAN 158	KAAN 159	KAAN 160	KAAN 161	KAAN 162	KAAN 163	KAAN 164	-1EB0-
	4FEF	3F43	56B2	D73A	3F45	5F79	76B2	1E00	
-1EC0-	KAAN 165	KAAN 166	KAAN 167	KAAN 168	KAAN 169	KAAN 170	KAAN 171	KAAN 172	-1EC0-
	1D00	1210	C54C	F5C7	0E08	8236	E501	D559	
-1ED0-	KAAN 173	KAAN 174	KAAN 175	KAAN 176	KAAN 199	KAAN 200	KAAN 201	KAAN 202	-1ED0-
	C056	F457	E017	986E	3400	6206	6226	6226	
-1EE0-	KAAN 203	KEND 037	KEND 038	KEND 039	KEND 040	KEND 041	KEND 042	KEND 043	-1EE0-
	9804	5652	D66D	F46F	C16E	E66F	82C2	82C4	
-1EF0-							MKKK 017	MKKK 018	-1EF0-
	5007	5007	5007	5007	5007	5007	5EC2	7812	
CONTROL ADDRESS									1E--

ADDRESS LIST   DATE 11/08/68

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1F00-	MKKK 019 CB04	MKKK 020 9286	MKKK 021 07ED	MKKK 022 E08B	MKKK 023 9170	MKKK 024 072B	MKKK 025 F0B1	MKKK 026 076B	-1F00-
-1F10-	MKKK 027 F095	MKKK 028 9170	MKKK 036 5E62	MKKK 037 FB1C	MKKK 038 76F2	MKKK 039 9208	MKKK 040 2493	MKKK 041 5A62	-1F10-
-1F20-	MKKK 042 1B23	MKKK 043 7A62	MKKK 044 76F2	MKKK 045 2683	MKKK 046 5AC2	MKKK 047 1BB3	MKKK 048 F0BE	MKKK 049 9978	-1F20-
-1F30-	MKKK 029 5A62	MKKK 030 3B23	MKKK 031 0BE3	MKKK 032 F094	MKKK 033 7A62	MKKK 034 2413	MKKK 035 9F24	MKKK 050 5AC2	-1F30-
-1F40-	MKKK 051 0B73	MKKK 052 F0C7	MKKK 053 3C85	MKKK 054 5A92	MKKK 055 1A13	MKKK 056 7A92	MKKK 057 5E62	MKKK 058 2753	-1F40-
-1F50-	MKKK 059 3765	MKKK 060 CE56	MKKK 061 272D	MKKK 062 5EA9	MKKK 063 1AE5	MKKK 064 7AE2	MKKK 065 8978	JTYP 129 CEEA	-1F50-
-1F60-	JTYP 130 FFEB	JTYP 131 5C82	JTYP 132 3D23	JTYP 133 7C82	JTYP 134 0F10	JTYP 135 128E	KEND 010 1E00	KEND 011 3400	-1F60-
-1F70-	KEND 012 2615	KEND 013 76F2	KEND 014 5622	KEND 015 5812	KEND 016 A044	5007	JYPE 008 5E08	JYPE 009 5032	-1F70-

1F8-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-1F80-	JYPE 010 F827	JYPE 011 D1A3	JYPE 012 FB0D	JYPE 013 4FAF	JYPE 014 1F1B	JYPE 015 A416	JYPE 016 4FBF	JYPE 017 C596	-1F80-
-1F90-	JYPE 018 4A46	JYPE 019 1000	JYPE 020 9F88	JYPE 021 C19D	JYPE 022 1C1B	JYPE 023 A416	JYPE 035 2D45	JYPE 036 1C1B	-1F90-
-1FA0-	JYPE 037 A416	JYPE 057 0040	JYPE 058 ABD8	JYPE 024 C1CD	JYPE 025 5A92	JYPE 026 3A25	JYPE 027 1A83	JYPE 028 7A92	-1FA0-
-1FB0-	JYPE 029 D235	JYPE 030 2080	JYPE 031 4FCF	JYPE 032 A416	JYPE 047 F247	JYPE 048 E241	JYPE 049 5EF2	JYPE 050 97F6	-1FB0-
-1FC0-	JYPE 054 5E52	JYPE 055 1623	JYPE 056 9FDA	JYPE 051 5E42	JYPE 052 1613	JYPE 053 9FDA	JYPE 038 4FDF	JYPE 039 1C1B	-1FC0-
-1FD0-	JYPE 040 3400	JYPE 041 CBB8	JYPE 042 1602	JYPE 043 0080	JYPE 044 4E86	JYPE 045 3040	JYPE 046 A416	INTP 006 3404	-1FD0-
-1FE0-	INTP 007 3F22	INTP 008 16F3	INTP 009 2080	INTP 010 3643	INTP 011 1040	INTP 012 A416	KAAQ 060 C179	KAAQ 061 3583	-1FE0-
-1FF0-	KAAQ 062 5E52	KAAQ 063 5EF9	KAAQ 064 3F25	KAAQ 065 7F52	KAAQ 066 128E	5007	BDIA 087 2810	BDIA 088 D57F	-1FF0-

CONTROL ADDRESS

ADDRESS LIST   DATE 11/08/68

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-2000-	BDIA 091	BDIA 092	BDIA 096	BDIA 097	BDIA 101	BDIA 102	BDIA 103	JDTA 008	-2000-
	2810	25F5	E504	2810	F508	2810	A040	5F4F	
-2010-	JDTA 009	JDTA 010	JDTA 011	JDTA 012	JDTA 013	JDTA 014	JDTA 015	JDTA 016	-2010-
	2848	5419	5530	05FB	C4B1	E234	1145	5709	
-2020-	JDTA 017	JDTA 018	JDTA 019	JDTA 020	JDTA 021	JDTA 024	JDTA 025	JDTA 026	-2020-
	6041	C4AB	1623	7138	0240	E227	3623	0240	
-2030-	JDTA 022	JDTA 023	JDTA 027	JDTA 028	JDTA 029	JDTA 030	JDTA 031	JDTA 032	-2030-
	D19B	0240	3145	F21E	D527	1145	7138	0240	
-2040-	BDIA 106	BDIA 111	IDIS 003	IDIS 004	IDIS 005	IDIS 006	IDIS 007	IDIS 008	-2040-
	2810	C55F	3404	5CF2	5E82	1E13	5ED9	7CF2	
-2050-	IDIS 009							BDIA 114	-2050-
	ACBE	5007	5007	5007	5007	5007	5007	2810	
-2060-	BDIA 119	IERR 055	IERR 056	IERR 057	IERR 059	IERR 060	IERR 028	IERR 029	-2060-
	D57F	2AF5	D268	2AF7	E56D	817C	2A43	817C	
-2070-								BDIA 125	-2070-
	5007	5007	5007	5007	5007	5007	5007	2800	

208-

	0	2	4	6	8	A	C	E	
-2080-	BDIA 131	BDIA 132	BDIA 133	BDIA 134	BDIA 135	BDIA 136	BDIA 137	BDIA 138	-2080-
	3E09	C483	F085	E087	F489	6EE5	A0DA	2E0D	
-2090-	BDIA 142	BDIA 143	BDIA 147	BDIA 148	BDIA 149	BDIA 150	BDIA 151	BDIA 152	-2090-
	A0DA	7EE1	F494	7EE1	6EE3	2E5F	6EE3	6EE9	
-20A0-	BDIA 153	BDIA 154	BDIA 155	BDIA 156	BDIA 157	BDIA 158	BDIA 159	BDIA 160	-20A0-
	0E5F	C4A2	2E87	3E27	2EEF	2E77	1E87	1E87	
-20B0-	BDIA 161	BDIA 162	BDIA 163	BDIA 164	BDIA 165	BDIA 166	BDIA 167	BDIA 171	-20B0-
	2EF7	0E11	F0B4	E0B6	1EFB	A0E2	1EF3	A0E2	
-20C0-	BDIA 172	BDIA 176	BDIA 177	BDIA 181	BDIA 182	BDIA 183	BDIA 184	BDIA 188	-20C0-
	3E15	A0E2	3E0D	2E1D	2FF5	A0DA	0FFD	C4CE	
-20D0-	BDIA 189	BDIA 190	BDIA 191	BDIA 192	BDIA 193	BDIA 195	BDIA 196	BDIA 197	-20D0-
	1FF5	C4D2	2EF5	A0E2	A0E8	0EFF	C4E1	2810	
-20E0-	BDIA 198	BDIA 201	BDIA 202	BDIA 203	BDIA 207	BDIA 208	BDIA 209	BDIA 210	-20E0-
	128E	0EFD	C4DE	128E	24F6	578F	1887	087F	
-20F0-	BDIA 211	BDIA 212	BDIA 213	BDIA 214	BDIA 215	BDIA 216	BDIA 217	BDIA 221	-20F0-
	E0F0	F0F2	2400	574F	0487	E0FA	F0FC	2EF7	

CONTROL ADDRESS

ADDRESS LIST

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-2100-	BDIA 222	BDIA 223	BDIA 224	BDIA 225	BDIA 226	BDIA 227	BDIA 228	BDIA 229	-2100-
	2FF7	6E02	2E05	2F05	4E02	0FFF	E08C	F08E	
-2110-	BDIA 230	BDIA 231	BDIA 232	BDIA 233	BDIA 234	BDIA 235	BDIA 236	BDIA 237	-2110-
	1EFF	C492	2E33	2F87	6FE8	6FEA	44E8	2F13	
-2120-	BDIA 238	BDIA 239	BDIA 240	BDIA 241	BDIA 242	BDIA 243	BDIA 244	BDIA 245	-2120-
	048F	E0A2	F0A4	257F	C4A8	2E05	55EA	C4AE	
-2130-	BDIA 246	BDIA 247	BDIA 248	BDIA 249	BDIA 251	BDIA 252	BDIA 254	BDIA 255	-2130-
	2E45	3FE9	25F7	75E0	2505	55EA	05FF	C4BE	
-2140-	BDIA 256	BDIA 257	BDIA 258	BDIA 259	BDIA 260	BDIA 261	BDIA 262	BDIA 263	-2140-
	FB34	44E6	044D	C4C6	75F1	C4CA	0060	88EC	
-2150-	INIZ 047	INIZ 048	INIZ 049	INIZ 050	INIZ 051	INIZ 052	INIZ 053	INIZ 054	-2150-
	5E02	3E0D	2FC3	76F8	272B	07AB	C4D6	2707	
-2160-	INIZ 055	INIZ 056	INIZ 057	INIZ 058	INIZ 059	INIZ 060	INIZ 061	INIZ 062	-2160-
	2610	06AD	E0D6	F26D	2613	F257	2623	76F0	
-2170-	INIZ 063	INIZ 064	INIZ 065	MPRT 209	MPRT 210	MPRT 211	MPRT 212	MPRT 213	-2170-
	2607	2707	128E	4F6F	2D04	51E0	4B1F	2BFF	

218-

	0	2	4	6	8	A	C	E	
-2180-	MPRT 214	MPRT 215	MPRT 216	MPRT 217	MPRT 235	MPRT 236	MPRT 237	MPRT 238	-2180-
	C498	27FF	C488	8188	CC0C	A19E	3D25	CD15	
-2190-	MPRT 239	MPRT 240	MPRT 241	MPRT 242	MPRT 218	MPRT 219	MPRT 220	MPRT 221	-2190-
	2BC3	A1A2	2B25	A1A2	27FF	C4A2	CD06	3C13	
-21A0-	MPRT 222	MPRT 223	MPRT 227	MPRT 228	MPRT 229	MPRT 230	MPRT 231	MPRT 232	-21A0-
	8188	5E11	6163	F4AD	66A3	A1AE	6603	ED3E	
-21B0-	MPRT 233	MPRT 234	MPRT 204	MPRT 205	MPRT 206	MPRT 207	MPRT 208	MPRT 190	-21B0-
	2F45	A1CA	0FFB	C4C6	3D25	2F45	A1CA	5F38	
-21C0-	MPRT 191	MPRT 192	MPRT 193	MPRT 194	MPRT 195	MPRT 196	MPRT 197	MPRT 199	-21C0-
	CD45	DF34	E851	0F75	C4CC	3FA3	3FC5	A176	
-21D0-	MPRT 200	MPRT 201	MPRT 202	MPRT 203	ICLR 002	ICLR 003	ICLR 004	ICLR 005	-21D0-
	DF3B	2FF5	3F13	A176	4426	A304	2545	3002	
-21E0-	ICLR 006	ICLR 007	ICLR 008	ICLR 009	ICLR 010	ICLR 011	ICLR 012	ICLR 013	-21E0-
	2A13	0F05	C4ED	753A	7FAF	C4E6	753A	0E05	
-21F0-	ICLR 014	ICLR 022	ICLR 024	ICLR 025	ICLR 026	ICLR 027	ICLR 028		-21F0-
	C4F6	52A2	23F7	F27B	D27C	8D7C	9E72	5007	

CONTROL ADDRESS   21--

ADDRESS LIST   DATE 11/08/68

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-2200-	JCHL 207	JCHL 168	JCHL 169	JCHL 170	JCHL 171	JCHL 172	JCHL 173	JCHL 174	-2200-
	9DE2	C593	5EC2	EF10	1F25	7EC2	98EA	937C	
-2210-	JCHL 175	JCHL 176	JCHL 177	JCHL 190	JCHL 191	JCHL 192	JCHL 193	JCHL 194	-2210-
	843A	2443	A25C	76F2	34F6	56F2	5752	2065	
-2220-	JCHL 195	JCHL 196	JCHL 197	JCHL 198	JCHL 199	JCHL 200	JCHL 201	JCHL 202	-2220-
	30D3	2143	5222	C72E	5111	D72E	1045	5079	
-2230-	JCHL 203	JCHL 204	JCHL 205	JCHL 206	JCHL 148	JCHL 149	JCHL 150	JCHL 151	-2230-
	021E	2D04	EC80	A234	CA4D	2B48	FDBD	D616	
-2240-	JCHL 152	JCHL 153	JCHL 154	JCHL 155	JCHL 156	JCHL 157	JCHL 158	JCHL 159	-2240-
	2D1F	5DC0	4FDF	EDC6	2B48	FDCA	2B00	2B08	
-2250-	JCHL 160	JCHL 161	JCHL 162	JCHL 163	JCHL 164	JCHL 165	JCHL 166	JCHL 167	-2250-
	FDD1	C9D3	0214	D602	5549	1645	5BF9	9782	
-2260-								IMZS 004	-2260-
	5007	5007	5007	5007	5007	5007	5007	571A	
-2270-	IMZS 005	IMZS 006	IMZS 007	IMZS 008	IMZS 009	IMZS 010	IMZS 011	IMZS 020	-2270-
	57D9	3D45	5DC0	5DDD	5DC0	1D45	7D3A	5EC2	

228-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-2280-	IMZS 021	IMZS 023	IMZS 024	IMZS 025	IMZS 026	IMZS 027	IMZS 028	IMZS 029	-2280-
	FE04	3613	D712	A28A	7D3A	5D1A	DD09	3D45	
-2290-	IMZS 030	IMZS 031	IMZS 032	IMZS 033	IMZS 034	IMZS 035	IMZS 036	IMZS 037	-2290-
	7D3A	5224	C145	5F30	DF1F	3F45	3583	0FFD	
-22A0-	IMZS 038	IMZS 039	IMZS 040	IMZS 041	IMZS 042	IMZS 043	IMZS 044	IMZS 045	-22A0-
	C4C7	E0C1	CF3B	F0AC	0F5D	E0BB	0FBB	F0BC	
-22B0-	IMZS 046	IMZS 047	IMZS 048	IMZS 049	IMZS 050	IMZS 051	IMZS 052	IMZS 053	-22B0-
	0F6D	F238	0F4D	A2B8	E0C7	3515	7F38	A294	
-22C0-	IMZS 059	IMZS 060	IMZS 054	IMZS 055	IMZS 056	IMZS 057	IMZS 058	IRAD 027	-22C0-
	1515	A2BC	8D7C	F53C	2F45	7F38	A294	1D45	
-22D0-	IRAD 028	IRAD 029	IRAD 005	IRAD 006	IRAD 007	IRAD 008	IRAD 009	IRAD 010	-22D0-
	7D3A	8D7C	571A	57D9	3D45	5DC0	ED61	3D35	
-22E0-	IRAD 011	IRAD 012	IRAD 013	IRAD 014	IRAD 015	IRAD 016	IRAD 017	IRAD 018	-22E0-
	F164	1D1D	5DC0	5F30	DF4E	7D3A	2DF5	D766	
-22F0-	IRAD 019	IRAD 020	IRAD 021	IRAD 022	IRAD 023	IRAD 024	IRAD 025	IRAD 026	-22F0-
	571A	6D75	C767	57D9	3D45	5DC0	5DDD	A2E4	

CONTROL ADDRESS

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-2300-	ICTD 019 54A2	ICTD 020 35F7	ICTD 021 5A02	ICTD 022 2C07	ICTD 023 2E25	ICTD 025 2002	ICTD 026 75B9	ICTD 027 74A9	-2300-
-2310-	ICTD 028 F580	ICTD 029 6443	ICTD 030 54D9	ICTD 031 6443	ICTD 032 6D4B	ICTD 033 6D53	ICTD 034 F4A4	ICTD 035 244B	-2310-
-2320-	ICTD 036 2D6B	ICTD 037 F49F	ICTD 038 F5AC	ICTD 039 244B	ICTD 040 2D6B	ICTD 041 F4A7	ICTD 042 5DF5	ICTD 043 2FBD	-2320-
-2330-	ICTD 044 55E0	ICTD 045 1002	ICTD 046 2F07	ICTD 047 5FE9	ICTD 048 D03E	ICTD 049 2F55	ICTD 050 2E23	ICTD 051 CD42	-2330-
-2340-	ICTD 052 2E1B	ICTD 053 F148	ICTD 054 2E1B	ICTD 058 2002	ICTD 059 C04C	ICTD 060 2E5B	ICTD 065 C952	ICTD 066 2F8B	-2340-
-2350-	ICTD 067 1D83	ICTD 068 5DDD	ICTD 069 7FDF	ICTD 071 7F5F	ICTD 078 7ECF	ICTD 080 544B	ICTD 081 6E43	ICTD 082 128E	-2350-
-2360-	5007	5007	5007	5007	5007	5007	5007	5007	-2360-
-2370-	5007	5007	5007	5007	ISIC 008 4AE6	ISIC 009 0042	ISIC 010 2791	ISIC 011 6A7F	-2370-

238-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-2380-	ISIC 012 F48D	ISIC 013 5BA1	ISIC 014 6B7F	ISIC 015 F48D	ISIC 016 6A7F	ISIC 017 F496	ISIC 018 2EF7	ISIC 019 5EF9	-2380-
-2390-	ISIC 020 48E6	ISIC 021 20A0	ISIC 022 ABC8	ISIC 023 5202	ISIC 024 0E0D	ISIC 025 C4BB	ISIC 026 F0A6	ISIC 027 2C33	-2390-
-23A0-	ISIC 028 2DE5	ISIC 029 2D8B	ISIC 030 F82D	ISIC 031 2C07	ISIC 032 2D65	ISIC 033 2D4B	ISIC 034 63DB	ISIC 035 62CD	-23A0-
-23B0-	ISIC 036 DD3A	ISIC 037 2EFF	ISIC 038 F818	ISIC 039 1EF3	ISIC 040 F819	ISIC 041 0F0D	ISIC 042 C4CD	ISIC 043 E0C9	-23B0-
-23C0-	ISIC 044 2C07	ISIC 045 2DA3	ISIC 046 2FFD	ISIC 047 F4AD	ISIC 048 63FB	ISIC 049 62ED	ISIC 050 CBD1	ISIC 051 128E	-23C0-
-23D0-	ISIC 052 4826	ISIC 053 42A6	ISIC 054 ABC6	5007	5007	5007	5007	5007	-23D0-
-23E0-	5007	JTYP 004 3404	JTYP 005 5553	JTYP 006 1545	JTYP 007 00C0	JTYP 008 5C92	JTYP 009 1C35	JTYP 010 6C55	-23E0-
-23F0-	JTYP 011 5C5B	JTYP 012 1C87	JTYP 013 7C92	JTYP 014 16F3	JTYP 015 5C82	JTYP 016 1D83	JTYP 017 7C82	JTYP 018 079B	-23F0-

CONTROL ADDRESS   23--

ADDRESS LIST

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-2400-	JTYP 019	JTYP 020	JTYP 021	JTYP 022	JTYP 023	JTYP 024	JTYP 051	JTYP 052	-2400-
	F092	1D23	7C82	0F08	3F20	A416	0F20	3400	
-2410-	JTYP 053	JTYP 025	JTYP 026	JTYP 027	JTYP 029	JTYP 033	JTYP 034	JTYP 035	-2410-
	96AC	1F00	2F08	7032	2075	2145	7208	7608	
-2420-	JTYP 036	JTYP 037	JTYP 038	JTYP 039	JTYP 040	JTYP 041	JTYP 042	JTYP 043	-2420-
	7408	7808	7A08	7C08	7E08	2020	EE8C	5FFF	
-2430-	JTYP 044	JTYP 045	JTYP 046	JTYP 047	JTYP 048	JTYP 049	JTYP 050	KBBE 008	-2430-
	7F00	2FF3	1F28	3400	0004	4FFF	96AC	0DBB	
-2440-	KBBE 009	KBBE 010	KBBE 011	KBBE 012	KBBE 013	KBBE 014	KBBE 015	KBBE 016	-2440-
	F0E6	1E23	390D	58B9	3B45	2A07	57A0	3480	
-2450-	KBBE 017	KBBE 018	KBBE 019	KBBE 020	KBBE 021	KBBE 022	KBBE 023	KBBE 024	-2450-
	516F	3400	10EE	E75C	F75D	3002	769D	C5E4	
-2460-	KBBE 025	KBBE 026	KBBE 027	KBBE 028	KBBE 029	KBBE 030	KBBE 037	KBBE 038	-2460-
	F5E5	16FF	5699	2713	EA6D	A800	3480	3523	
-2470-	KBBE 039	KBBE 040	KBBE 041	KBBE 042	KBBE 043				-2470-
	2D23	4EDF	2D15	4BDF	A478	5007	5007	5007	

248-

	0	2	4	6	8	A	C	E	
-2480-	INTP 098	INTP 099	INTP 100	INTP 101	INTP 102	INTP 103	INTP 104	INTP 105	-2480-
	3000	0FA1	F4A9	4FFF	4FAD	A4B4	0F81	F4A9	
-2490-	INTP 106	INTP 107	INTP 014	INTP 015	INTP 016	INTP 017	INTP 018	INTP 019	-2490-
	4FFF	ADFC	F239	3613	2EA5	3E13	6EF1	E0AB	
-24A0-	INTP 020	INTP 025	INTP 026	INTP 027	INTP 040	INTP 050	INTP 052	INTP 053	-24A0-
	F0A9	2E77	6EF9	F4B0	8370	0F3B	F0A8	3623	
-24B0-	INTP 054	INTP 055	INTP 056	INTP 057	INTP 058	INTP 064	INTP 065	INTP 066	-24B0-
	5FA3	4FFF	7AE2	A416	5AE2	0FFD	E0A8	E24B	
-24C0-	INTP 067	INTP 068	INTP 069	INTP 087	INTP 088	INTP 089	INTP 090	INTP 091	-24C0-
	0FE1	F4A9	4FFF	4FAD	887A	C58D	D181	F0A9	
-24D0-	INTP 092	INTP 093	INTP 094	INTP 095	INTP 096	INTP 097	IADD 086	IADD 087	-24D0-
	0F91	F4A9	4FFF	5FA3	2040	A4B4	2002	7FAF	
-24E0-	IADD 088	IADD 089	IADD 090	IADD 091	IADD 092	IADD 093	IADD 094	IADD 095	-24E0-
	5FFD	D1E6	3F15	3FC5	DD6C	9772	F5F0	974C	
-24F0-	IADD 096	IADD 097	IADD 098	IADD 099	IADD 100	IADD 101	IADD 102	JTYP 186	-24F0-
	1F1D	5FB9	2002	2F07	7FBF	4BFB	974C	0FFD	

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-2500-	JTYP 187	JTYP 188	JTYP 189	JTYP 190	JTYP 191	JTYP 192	JTYP 193	JTYP 194	-2500-
	E0A3	2C75	3C93	6CF3	F48C	8370	E125	F21D	
-2510-	JTYP 195	JTYP 196	JTYP 197	JTYP 198	JTYP 199	JTYP 200	JTYP 201	JTYP 202	-2510-
	D197	2040	A518	3613	4FFF	A416	C123	D1A3	
-2520-	JTYP 203	JTYP 204	JTYP 205	JTYP 206	JTYP 207	JTYP 208	JTYP 209	JTYP 210	-2520-
	8370	0040	5FE1	6EF9	E12C	814E	5CE2	D93F	
-2530-	JTYP 211	JTYP 212	JTYP 213	JTYP 214	JTYP 235	JTYP 236	JTYP 237	JTYP 219	-2530-
	E939	F951	3523	8CD8	4EC0	1D2B	AE2A	5EC3	
-2540-	JTYP 220	JTYP 221	JTYP 223	JTYP 230	JTYP 231	JTYP 232	JTYP 233	JTYP 234	-2540-
	1D4B	D148	CC3C	8370	C13C	0CC9	F4BC	8370	
-2550-	JTYP 238	JTYP 239	JTYP 240	MPRT 364	MPRT 365	MPRT 366	MPRT 367	MPRT 368	-2550-
	4ED3	1D1B	AE2A	8216	5E62	DA6E	CA6F	8D7C	
-2560-	MPRT 369	MPRT 370	MPRT 359	MPRT 360	MPRT 361	MPRT 362	MPRT 363	MPRT 376	-2560-
	2080	ADDC	8216	C960	5E62	DE6F	8D7C	9E72	
-2570-	MPRT 371	MPRT 372	MPRT 373	MPRT 374	MPRT 375	LOPD 011	LOPD 012	LOPD 013	-2570-
	8216	C960	5E62	EE6F	8D7C	2513	1613	0677	

258-

	0	2	4	6	8	A	C	E	
-2580-	LOPD 014	LOPD 015	LOPD 016	LOPD 017	LOPD 018	LOPD 019	LOPD 020	LOPD 021	-2580-
	C4A1	2BC5	2B3B	6B71	C494	5EC2	CA14	055B	
-2590-	LOPD 022	LOPD 023	LOPD 024	LOPD 025	LOPD 026	LOPD 027	LOPD 028	LOPD 029	-2590-
	F095	3613	2BD5	2B9B	6B71	C4A0	F139	3585	
-25A0-	LOPD 030	LOPD 031	LOPD 032	LOPD 033	LOPD 034	LOPD 035	LOPD 036	LOPD 037	-25A0-
	8258	F13B	D137	C137	98EA	1615	2C07	D235	
-25B0-	LOPD 038	LOPD 039	LOPD 040	LOPD 041	LOPD 053	LOPD 042	LOPD 043	LOPD 044	-25B0-
	C635	8D7C	9E72	8B80	91D8	5202	2155	2925	
-25C0-	LOPD 045	LOPD 046	LOPD 047	LOPD 048	LOPD 049	LOPD 050	LOPD 051	LOPD 052	-25C0-
	5EC2	FA4C	23EB	2935	29CB	2137	2845	8994	
-25D0-	KAAN 029	KAAN 030	KAAN 031	KAAN 032	KAAN 033	KAAN 034	KAAN 035	KAAN 036	-25D0-
	2E07	2FB5	5612	76E8	5A6F	5E7F	1723	76E8	
-25E0-	KAAN 037	KAAN 038	KAAN 039	KAAN 040	KAAN 041	KAAN 042	KAAN 043	KAAN 044	-25E0-
	507F	1783	556F	1635	476D	5C7F	577D	1713	
-25F0-	KAAN 045	KAAN 046	KAAN 047	KAAN 048	KAAN 049	KAAN 050	KAAN 051	MQQQ 019	-25F0-
	76E0	0683	F0FD	1E00	3202	8222	128E	5E62	

CONTROL ADDRESS   0   2   4   6   8   A   C   E

-2600-	MQQQ 020	MQQQ 021	MQQQ 022	MQQQ 023	MQQQ 024	MQQQ 025	MQQQ 026	MQQQ 027	-2600-
	DB2D	5492	E135	DE0B	8D7C	54C2	C113	1E45	
-2610-	MQQQ 028	MQQQ 029	MQQQ 003	MQQQ 004	MQQQ 005	MQQQ 006	MQQQ 007	MQQQ 008	-2610-
	7E62	9E72	5EC2	CB20	5E62	DB2D	5492	E135	
-2620-	MQQQ 009	MQQQ 010	MQQQ 011	MQQQ 012	MQQQ 013	MQQQ 014	MQQQ 038	MQQQ 039	-2620-
	5E92	FA27	8D7C	1E13	7E92	9E72	5E62	DB2D	
-2630-	MQQQ 040	MQQQ 041	MQQQ 042	MQQQ 043	MQQQ 015	MQQQ 016	MQQQ 017	MQQQ 018	-2630-
	5E92	EB38	26A3	9F4C	5886	5790	D739	8D7C	
-2640-	MQQQ 030	MQQQ 031	MQQQ 032	MQQQ 033	MQQQ 034	MQQQ 035	MQQQ 036	MQQQ 037	-2640-
	5E62	DB2D	EE49	8D7C	54C2	C113	1E25	A610	
-2650-	MPRT 126	MPRT 127	MPRT 128	MPRT 129	MPRT 130	MPRT 131	MPRT 132	MPRT 133	-2650-
	5E92	1E13	7E92	CD64	1D23	041B	C4E3	C472	
-2660-	MPRT 134	MPRT 135	MPRT 136	MPRT 137	MPRT 138	MPRT 139	MPRT 140	MPRT 141	-2660-
	1C65	3D23	04ED	E0EA	3C25	04CD	E0F2	C072	
-2670-	MPRT 142	MPRT 143	MPRT 144	MPRT 145	MPRT 146	MPRT 147	IEDT 138	IEDT 139	-2670-
	3C45	E077	8126	4D4F	1D00	818C	1523	5224	

268-

-2680-	IEDT 140	IEDT 141	IEDT 142	IEDT 143	IEDT 144	IEDT 145	IEDT 146	IEDT 147	-2680-
	5F30	5FB9	3B45	0BFD	E0BB	0B4D	C4C3	0BBB	
-2690-	IEDT 148	IEDT 149	IEDT 150	IEDT 151	IEDT 152	IEDT 153	IEDT 154	IEDT 155	-2690-
	F0A3	3543	7B38	DF01	F11D	8D7C	05D7	C49B	
-26A0-	IEDT 156	IEDT 157	IEDT 158	IEDT 159	IEDT 160	IEDT 161	IEDT 162	IEDT 163	-26A0-
	A79E	0B6D	F228	0B4D	E0C3	0B4D	F230	0B6D	
-26B0-	IEDT 164	IEDT 165	IEDT 166	IEDT 167	IEDT 168	IEDT 169	IEDT 170	IEDT 171	-26B0-
	E092	D114	F13E	3523	A6BE	F0C3	1523	1543	
-26C0-	IEDT 172	IEDT 173	IEDT 174	IEDT 175	IEDT 176	IEDT 177	IEDT 178	ICMP 021	-26C0-
	A694	D114	2B45	F514	2BC3	3B55	A694	DF76	
-26D0-	ICMP 022	ICMP 023	ICMP 024	ICMP 025	ICMP 034	ICMP 035	ICMP 036	ICMP 038	-26D0-
	2EC3	DA59	F25F	2E13	5A82	4EB3	7A82	8D7C	
-26E0-	ICMP 005	ICMP 006	ICMP 007	ICMP 008	ICMP 009	ICMP 010	ICMP 011	ICMP 012	-26E0-
	7F71	C4ED	F4EB	2E63	A6EC	2EC3	571A	5F3A	
-26F0-	ICMP 013	ICMP 014	ICMP 015	ICMP 016	ICMP 017	ICMP 018	ICMP 019	ICMP 020	-26F0-
	D74E	DF61	3F45	7F71	C4D3	F4D1	2E63	A6D8	

CONTROL ADDRESS   26--

ADDRESS LIST   DATE 11/08/68

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-2700-	KAAH 191 C421	KAAH 192 3583	KAAH 193 2C07	KAAH 194 4DCF	KAAH 195 AB82	KAAQ 009 2F25	KAAQ 010 9EAA	KAAH 174 C015	-2700-
-2710-	KAAH 175 3425	KAAH 176 8F3C	KAAH 177 152D	KAAH 178 3433	KAAH 179 AD20	KAAH 187 F401	KAAH 188 C010	KAAH 189 C408	-2710-
-2720-	KAAH 190 8F2C	KAAH 152 E51A	KAAH 153 F10F	KAAH 154 3E08	KAAH 155 5632	KAAH 156 5664	KAAH 157 5EE2	KAAH 158 C535	-2720-
-2730-	KAAH 159 51FF	KAAH 160 7EE2	KAAH 161 F140	KAAH 162 2C13	KAAH 163 6CF3	KAAH 164 5D70	KAAH 165 6CD1	KAAH 166 C48B	-2730-
-2740-	KAAH 167 7F70	KAAH 168 273B	KAAH 169 2F07	KAAH 170 7F70	KAAH 171 3513	KAAH 172 0E04	KAAH 173 AD20	LPCH 002 3462	-2740-
-2750-	LPCH 003 1F80	LPCH 004 3485	LPCH 005 C158	LPCH 006 2F02	LPCH 007 D15C	LPCH 008 2F04	LPCH 009 2F08	LPCH 010 2507	-2750-
-2760-	LPCH 011 3400	LPCH 012 98EA	LPCH 013 5555	LPCH 014 152F	LPCH 015 5EC2	LPCH 016 DA71	LPCH 017 3400	LPCH 018 A5A0	-2760-
-2770-	LPCH 019 3462	LPCH 020 C471	LPCH 021 FFEC	LPCH 022 3400	LPCH 023 3AA9	LPCH 024 7AF2	LPCH 025 A044	5007	-2770-

278-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-2780-	IEDT 198 2F45	IEDT 199 F508	IEDT 200 2FC3	IEDT 201 3F55	IEDT 202 7F3A	IEDT 203 F142	IEDT 204 A7A0	IEDT 208 0F6D	-2780-
-2790-	IEDT 209 F214	IEDT 210 0F4D	IEDT 211 E0B6	IEDT 212 A780	IEDT 205 1513	IEDT 206 1525	IEDT 207 A780	IEDT 179 5226	-2790-
-27A0-	IEDT 180 5F30	IEDT 181 0F4D	IEDT 182 C4C5	IEDT 183 E11E	IEDT 184 2AB3	IEDT 185 3A45	IEDT 186 F230	IEDT 187 3A25	-27A0-
-27B0-	IEDT 188 6AF1	IEDT 189 C499	IEDT 190 F08F	IEDT 191 0FFD	IEDT 192 E09E	IEDT 193 C481	IEDT 194 7F3A	IEDT 195 1523	-27B0-
-27C0-	IEDT 196 E521	IEDT 197 8D7C	IEDT 213 E101	IEDT 214 1537	IEDT 215 2FB3	IEDT 216 A786	KAAQ 034 9FEC	KAAQ 035 58E2	-27C0-
-27D0-	KAAQ 036 5E32	KAAQ 037 2F3B	KAAQ 038 57F0	KAAQ 039 57F9	KAAQ 040 C4E6	KAAQ 041 DFE6	KAAQ 042 5EB2	KAAQ 043 3F25	-27D0-
-27E0-	KAAQ 044 3FC3	KAAQ 045 7EB2	KAAQ 046 9FEC	KAAQ 047 F5E7	KAAQ 048 3E08	KAAQ 049 021E	KAAQ 050 2F07	KAAQ 051 4BFF	-27E0-
-27F0-	KAAQ 052 4DFF	KAAQ 053 C1F8	KAAQ 054 A5D0	KAAQ 055 8390	KAAQ 056 2F1B	KAAQ 057 DF78	KAAQ 058 2F07	KAAQ 059 A800	-27F0-

CONTROL ADDRESS   27--

ADDRESS LIST   DATE 11/08/68

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-2800-	KAAA 287	KAAA 288	KAAA 289	KAAA 290	KAAA 291	KAAA 292	KAAA 293	KAAA 294	-2800-
	3480	518F	3785	7893	F490	1785	281B	18FF	
-2810-	KAAA 295	KAAA 296	KAAA 297	KAAA 298	KAAA 299	KAAA 300	KAAA 301	KAAA 302	-2810-
	2D15	2C07	4EDF	4BDF	4BCF	4E9F	2D45	4BDF	
-2820-	KAAA 303	KAAA 304	KAAA 305	KAAA 306	KAAA 307	KAAA 308	KAAA 309	KAAA 310	-2820-
	4BCF	4E7F	2D25	4BDF	4BCF	4E8F	0811	F4B6	
-2830-	KAAA 311	KAAA 312	KAAA 313	KAAA 314	KAAA 315	KAAA 316	KAAA 317	KAAA 318	-2830-
	CF49	9B62	AD0C	2D85	4BDF	4BCF	2D25	4EDF	
-2840-	KAAA 319	KAAA 320	KAAA 321	KAAA 322	KAAA 323	KAAA 324	KBBG 019	KBBG 020	-2840-
	2D13	4BDF	C54B	D04B	82C0	A854	C56A	1585	
-2850-	KBBG 021	KBBG 022	KBBG 008	KBBG 009	KBBG 010	KBBG 011	KBBG 012	KBBG 013	-2850-
	9B62	AD0C	CEE1	EEDD	FADD	A854	A5D0	8390	
-2860-	KBBG 014	KBBG 015	KBBG 016	KBBG 017	KBBG 018	KBBG 023	KBBG 024	KBBG 025	-2860-
	8BF0	E166	A800	C14C	9ECC	1443	3585	9B62	
-2870-	KBBG 026		MPPP 003	MPPP 004	MPPP 005	MPPP 006	MPPP 007	MPPP 008	-2870-
	AD0C	5007	0020	76F2	7032	57F9	2E05	5FE0	

288-

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-2880-	MPPP 009	MPPP 010	MPPP 011	MPPP 012	MPPP 013	MPPP 014	MPPP 015	MPPP 016	-2880-
	EF2E	FF28	2020	3F15	6FF3	6FF3	6FF3	5A62	
-2890-	MPPP 017	MPPP 018	MPPP 019	MPPP 020	MPPP 021	MPPP 022	MPPP 023	MPPP 024	-2890-
	1BF5	1B83	6BF5	E1B7	1B13	7A62	56C2	26B3	
-28A0-	MPPP 025	MPPP 026	MPPP 027	MPPP 035	MPPP 036	MPPP 037	MPPP 038	MPPP 031	-28A0-
	C324	3C85	9208	2020	1FC3	1F35	A888	FF27	
-28B0-	MPPP 032	MPPP 033	MPPP 034	MPPP 028	MPPP 029	MPPP 030	KBBC 009	KBBC 010	-28B0-
	0FF5	F086	8D0C	3B13	7A62	8D10	3400	2CB5	
-28C0-	KBBC 011	KBBC 012	KBBC 013	KBBC 014	KBBC 015	KBBC 016	KBBC 017	KBBC 018	-28C0-
	D145	2CF5	2D07	5718	5918	5B10	67C5	69C5	
-28D0-	KBBC 019	KBBC 020	KBBC 021	KBBC 022	KBBC 023	KBBC 024	KBBC 025	KBBC 026	-28D0-
	6BC5	57FD	596D	5BED	10EE	3000	7EDF	76DF	
-28E0-	KBBC 027	KBBC 028	KBBC 029	KBBC 030	KBBC 031	KBBC 032	KBBC 033	KBBC 034	-28E0-
	7FDF	4EBD	469D	4F7D	7B1A	791A	7710	E5F9	
-28F0-	KBBC 035	KBBC 036	KBBC 037	KBBC 038	KBBC 039	KBBC 040	KBBC 041	KBBC 042	-28F0-
	3583	3480	2D25	4DDF	7242	3490	5A42	58F2	

CONTROL ADDRESS   28--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-2900-	KBBC 043	KBBC 045	MPRT 125	MPRT 111	MPRT 112	MPRT 113	MPRT 114	MPRT 115	-2900-
	53BC	A900	A650	6C05	3482	0040	DE9B	92AE	
-2910-	MPRT 120	MPRT 121	MPRT 122	MPRT 123	MPRT 124	MPRT 116	MPRT 117	MPRT 118	-2910-
	C815	9468	CE90	DE8E	9BFE	D81F	A910	F804	
-2920-	MPRT 119	MPRT 090	MPRT 091	MPRT 092	MPRT 093	MPRT 094	MPRT 095	MPRT 096	-2920-
	954C	0075	E0A9	1BED	CD33	0075	E0B2	2B75	
-2930-	MPRT 097	MPRT 098	MPRT 099	MPRT 100	MPRT 101	MPRT 102	MPRT 103	MPRT 104	-2930-
	3B83	DD45	C442	CD42	54E9	1E85	2E9F	F4C2	
-2940-	MPRT 105	MPRT 106	MPRT 107	MPRT 108	MPRT 109	MPRT 110	JEND 159	JEND 160	-2940-
	3C17	DD06	7062	3C85	1615	9F24	5C92	5662	
-2950-	JEND 161	JEND 162	JEND 163	JEND 164	JEND 165	JEND 166	JEND 167	JEND 168	-2950-
	D85E	54C2	C15A	E35B	1665	1F43	1743	FB64	
-2960-	JEND 169	JEND 170	JEND 171	JEND 172	JEND 173	JEND 174	JEND 175	JEND 176	-2960-
	3625	1F13	7662	6DF5	7C92	5CF2	6CD1	C4FA	
-2970-	JEND 177	JEND 178	JEND 179	JEND 180	JEND 181	JEND 182		IEDT 102	-2970-
	0D6D	E0FA	0DFB	F0FA	2010	0204	5007	0BCB	

298-

	0	2	4	6	8	A	C	E	
-2980-	IEDT 103	IEDT 104	IEDT 105	IEDT 106	IEDT 107	IEDT 108	IEDT 133	IEDT 134	-2980-
	F0AA	0B5D	E0AA	E515	3515	A9A0	DF14	D115	
-2990-	IEDT 135	IEDT 136	IEDT 137	IEDT 120	IEDT 121	IEDT 122	IEDT 123	IEDT 124	-2990-
	3543	1B45	95C2	E10D	D121	1D45	3543	3583	
-29A0-	IEDT 125	IEDT 126	IEDT 127	IEDT 128	IEDT 129	IEDT 109	IEDT 110	IEDT 111	-29A0-
	7D3A	DF27	95C6	D740	957A	0BBB	F094	0B5D	
-29B0-	IEDT 112	IEDT 113	IEDT 114	IEDT 115	IEDT 116	IEDT 117	IEDT 118	IEDT 119	-29B0-
	E094	D73C	C13C	F515	3525	A9A0	1525	A9A0	
-29C0-	IEDT 130	IEDT 131	IEDT 132	IRST 164	IRST 146	IRST 147	IRST 148	IRST 149	-29C0-
	1583	3523	9598	9268	4282	4626	4A60	27EB	
-29D0-	IRST 150	IRST 151	IRST 152	IRST 153	IRST 154	IRST 155	IRST 156	IRST 157	-29D0-
	9BE8	6664	D650	42A6	C4C7	26E3	27C5	3763	
-29E0-	IRST 158	IRST 159	IRST 160	IRST 161	IRST 162	IRST 163	IRST 127	IRST 128	-29E0-
	C9E5	2820	2610	9BE8	6A60	A9F0	3404	FAC8	
-29F0-	IRST 129	IRST 130	IRST 134	IRST 135	IRST 136	IRST 137	IRST 138	IRST 139	-29F0-
	2007	2183	4208	21C5	20E3	4E08	4A08	7A42	
CONTROL ADDRESS									29--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-2A00-	IRST 140	IRST 141	IRST 142	IRST 143	IRST 144	IRST 145	ITRP 024	ITRP 025	-2A00-
	7252	6208	4200	72F2	2080	ACE0	3444	10C5	
-2A10-	ITRP 026	ITRP 027	ITRP 028	ITRP 029	ITRP 030	ITRP 031	ITRP 032	ITRP 033	-2A10-
	1113	6006	7052	7042	3400	5812	5EEF	2F13	
-2A20-	ITRP 034	ITRP 035	ITRP 036	ITRP 037	ITRP 038	ITRP 039	ITRP 040	ITRP 041	-2A20-
	5282	1213	5279	2663	C1B0	261B	7E42	5EF2	
-2A30-	ITRP 042	ITRP 043	ITRP 044	ITRP 045	ITRP 046	ITRP 047	ITRP 048	ITRP 049	-2A30-
	76F2	1613	3404	5092	3085	7092	26FB	1F2E	
-2A40-	ITRP 050	ITRP 051	ITRP 052	ITRP 053	ITRP 054	ITRP 055	ITRP 056	ITRP 057	-2A40-
	2F08	EAC2	4F6F	0F20	EAC8	1F2E	C1D1	ACDE	
-2A50-	ITRP 058	IADD 129	IADD 130	IADD 131	IADD 132	IADD 133	IADD 142	IADD 143	-2A50-
	ACE0	4FDD	3D45	5FC0	F5E2	2F1D	5A82	3B43	
-2A60-	IADD 144	IADD 146	IADD 147	IADD 148	IADD 149	IADD 150	IADD 151	IADD 152	-2A60-
	7A82	E1F1	5C49	5759	3545	5540	555B	6F53	
-2A70-	IADD 153	IADD 154	IADD 155	IADD 156	IADD 157	IADD 158			-2A70-
	1FC5	5CE9	5DE0	1D45	7D3A	8D7C	5007	5007	

2A8-

	0	2	4	6	8	A	C	E	
-2A80-	ISAB 021	ISAB 022	ISAB 023	ISAB 024	ISAB 002	ISAB 003	ISAB 020	ISAB 030	-2A80-
	2020	EE21	FE08	9158	2BF5	AAAA	8D7C	DD15	
-2A90-	ISAB 031	ISAB 032	ISAB 033	ISAB 034	ISAB 035	ISAB 036	ISAB 028	ISAB 029	-2A90-
	0BAD	AA96	0BED	E0B8	1B85	AAB8	4EBD	AAAE	
-2AA0-	ISAB 025	ISAB 026	ISAB 027	ISAB 004	ISAB 005	ISAB 006	ISAB 007	ISAB 008	-2AA0-
	FE29	2BD5	AAAA	DE22	2BC5	E19D	4FBD	5D10	
-2AB0-	ISAB 009	ISAB 010	ISAB 011	ISAB 012	ISAB 013	ISAB 014	ISAB 015	ISAB 016	-2AB0-
	DD35	1B45	0B1B	F08F	7B1A	E18D	D181	2BF5	
-2AC0-	ISAB 017	ISAB 018	ISAB 019	KBBH 008	KBBH 009	KBBH 010	KBBH 011	KBBH 012	-2AC0-
	4FB5	2040	AAAE	5E32	2F4B	57F0	F768	D368	
-2AD0-	KBBH 013	KBBH 014	KBBH 015	KBBH 016	KBBH 017	KBBH 018	KBBH 019	KBBH 020	-2AD0-
	2713	26B5	3613	4F6F	77FA	57F0	079B	C4E8	
-2AE0-	KBBH 021	KBBH 022	KBBH 023	KBBH 024	KBBH 025	KBBH 026	KBBH 027	KBBH 028	-2AE0-
	2707	77F0	6EE6	57F0	271B	77F0	3545	AD00	
-2AF0-						INIZ 002	INIZ 003	INIZ 004	-2AF0-
	5007	5007	5007	5007	5007	2D45	2A07	3B89	
CONTROL ADDRESS									2A--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-2B00-	INIZ 008	INIZ 010	INIZ 011	INIZ 012	INIZ 013	INIZ 014	INIZ 015	INIZ 016	-2B00-
	2C75	5AA4	0D8D	C493	5FC8	0F4D	C481	7FA0	
-2B10-	INIZ 017	INIZ 018	INIZ 020	INIZ 021	INIZ 022	INIZ 029	INIZ 030	INIZ 031	-2B10-
	AB00	5002	5BA2	6B05	7BA2	2C25	2D15	7012	
-2B20-	INIZ 032	INIZ 033	INIZ 034	INIZ 035	INIZ 036	INIZ 037	INIZ 038	INIZ 039	-2B20-
	58C0	691B	680D	78C8	0DBD	C4A0	2607	81E6	
-2B30-	INIZ 040	INIZ 041	INIZ 042	INIZ 043	INIZ 044	INIZ 045	INIZ 046	KAAQ 109	-2B30-
	2645	2745	5DA2	7618	7D01	F4B5	8240	F45D	
-2B40-	KAAQ 110	KAAQ 111	KAAQ 112	KAAQ 113	KAAQ 114	KAAQ 099	KAAQ 100	KAAQ 101	-2B40-
	C65A	D65A	C056	FDD7	ABC2	F075	CF73	AB74	
-2B50-	KAAQ 093	KAAQ 094	KAAQ 095	KAAQ 096	KAAQ 097	KAAQ 098	KAAQ 115	KAAQ 116	-2B50-
	3E00	0E04	E75B	2F07	9EBE	8CBA	D660	ABA4	
-2B60-	KAAQ 076	KAAQ 077	KAAQ 078	KAAQ 079	KAAQ 080	KAAQ 081	KAAQ 082	KAAQ 083	-2B60-
	2725	3583	2F15	FDF3	2F65	E96E	2FC5	E04A	
-2B70-	KAAQ 084	KAAQ 085	KAAQ 086	KAAQ 087	KAAQ 088	KAAQ 089	KAAQ 090	KAAQ 091	-2B70-
	EF74	3583	5C82	4FDB	7C82	C151	6204	5224	

2B8-

	0	2	4	6	8	A	C	E	
-2B80-	KAAQ 092	KAAH 105	KAAH 106	KAAH 107	KAAH 108	KAAH 109	KAAH 110	KAAH 111	-2B80-
	AD20	3490	7A42	2F07	4C86	C48E	2F85	5DB0	
-2B90-	KAAH 112	KAAH 113	KAAH 114	KAAH 115	KAAH 116	KAAH 117	KAAH 118	KAAH 119	-2B90-
	0DFB	C496	3F45	7F52	3480	5242	5652	C141	
-2BA0-	KAAH 120	KAAH 121	KAAH 122	KAAH 123	KAAH 124	KAAH 125	KAAH 133	KAAH 134	-2BA0-
	D630	F42E	C628	AB60	2707	AB64	C63B	8CBA	
-2BB0-	KAAH 127	KAAH 128	KAAH 129	KAAH 130	KAAH 131	KAAH 132	KAAH 135	KAAH 136	-2BB0-
	E53D	F427	C02C	C62E	FDC2	AD20	C62E	8F4C	
-2BC0-	KAAH 126	KAAQ 011	KAAQ 012	ISTP 002	ISTP 003	ISTP 004	ISTP 005	ISTP 006	-2BC0-
	AB3E	2F23	9EAA	00E0	3643	E1D7	CBD2	C1D7	
-2BD0-	ISTP 007	ISTP 008	ISTP 009	ISTP 010	ISTP 012	ISTP 013	ISTP 014	ISTP 015	-2BD0-
	2080	4486	A304	3000	2C15	3C43	5FAD	8118	
-2BE0-	ISTP 016	ISTP 017	ISTP 018	ISTP 019	ISTP 020	ISTP 021	ISTP 022	ISTP 023	-2BE0-
	5A59	5FA5	8118	5A49	5EAD	8118	5AB9	5EA5	
-2BF0-	ISTP 024	ISTP 025	ISTP 026	ISTP 027	ISTP 028	ISTP 029	ISTP 030	ISTP 031	-2BF0-
	8118	5E92	3E83	7E92	2F05	3404	2F08	A416	
CONTROL ADDRESS									2B--

ADDRESS LIST   DATE 11/08/68   2C--

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-2C00-	JTYP 179	JTYP 180	JTYP 181	JTYP 182	JTYP 183	JTYP 184	JTYP 185	JTYP 152	-2C00-
	D18A	35C3	8538	3623	D1AB	3643	8538	DAAB	
-2C10-	JTYP 153	JTYP 154	JTYP 155	JTYP 156	JTYP 169	JTYP 170	JTYP 171	JTYP 172	-2C10-
	F214	8B6E	CFAD	A406	D1AA	E21F	C9AA	3583	
-2C20-	JTYP 173	JTYP 174	JTYP 175	JTYP 176	JTYP 177	JTYP 178	JTYP 157	JTYP 158	-2C20-
	8538	0E4B	F087	0E1B	F081	8370	5AEF	0E3F	
-2C30-	JTYP 159	JTYP 160	JTYP 161	JTYP 162	JTYP 163	JTYP 164	JTYP 165	JTYP 166	-2C30-
	C499	E0A3	D1AA	2F25	3F73	6FE1	C4AA	2E7D	
-2C40-	JTYP 167	JTYP 168	MLLL 043	MLLL 044	MLLL 045	MLLL 012	MLLL 013	MLLL 014	-2C40-
	5EF9	A516	2FF5	3F13	AC5E	EDEB	FDCA	8E02	
-2C50-	MLLL 032	MLLL 033	MLLL 034	MLLL 035	MLLL 030	MLLL 031	MLLL 036	MLLL 037	-2C50-
	0FF5	F0F4	2FAB	AC74	2B42	AC4A	E865	27FF	
-2C60-	MLLL 038	MLLL 039	MLLL 040	MLLL 041	MLLL 042	MLLL 015	MLLL 016	MLLL 017	-2C60-
	C4D9	AC72	DF44	2F45	AC5E	5F38	CC5D	0FFB	
-2C70-	MLLL 018	MLLL 019	MLLL 020	MLLL 022	MLLL 026	MLLL 027	MLLL 028	MLLL 029	-2C70-
	C4D9	CF50	1FC5	2E75	5BE0	4FBF	2B48	AC4A	

2C8-

	0	2	4	6	8	A	C	E	
-2C80-	MMMM 018	MMMM 019	MMMM 020	MMMM 021	MMMM 022	MMMM 023	MMMM 024	MMMM 025	-2C80-
	5A92	2B05	7A92	CC0A	D90D	FD12	5A92	3A13	
-2C90-	MMMM 026	MMMM 027	MMMM 028	MMMM 029	MMMM 030	MMMM 031	MMMM 032	MMMM 033	-2C90-
	7A92	F92E	5E62	3E45	7E62	DD31	3400	021E	
-2CA0-	MMMM 034	MMMM 035	MMMM 043	MMMM 044	MMMM 045	MMMM 046	MMMM 047	MMMM 036	-2CA0-
	2C05	A638	5EC2	CE1C	0AE3	F09D	8B78	DD24	
-2CB0-	MMMM 037	MMMM 038	MMMM 039	MMMM 040	MMMM 041	MMMM 042	IDIS 010	IDIS 011	-2CB0-
	3A99	5AB9	7AF2	021E	2C05	ACBC	3404	74E2	
-2CC0-	IDIS 012	IDIS 013	IDIS 014	IDIS 015	IDIS 016	IDIS 017	IDIS 018	IDIS 019	-2CC0-
	2CF7	5CD9	E648	7C42	F650	7C52	E65F	F657	
-2CD0-	IDIS 020	IDIS 021	IDIS 022	IDIS 023	IDIS 024	IDIS 025	IDIS 026	IDIS 027	-2CD0-
	4426	A304	7E52	E65F	4406	A304	7E42	0080	
-2CE0-	IDIS 028	IDIS 029	IDIS 030	IDIS 031	IDIS 032	IDIS 033	IDIS 034	IDIS 035	-2CE0-
	3633	1643	0040	FFF2	0F02	54E2	C170	7252	
-2CF0-	IDIS 036	IDIS 037							-2CF0-
	5222	ABCE	5007	5007	5007	5007	5007	5007	

CONTROL ADDRESS   2C--

CONTROL ADDRESS   0   2   4   6   8   A   C   E

-2D00-   KAAF 036   KAAF 037   KAAF 038   KAAF 035   KAAF 033   KAAF 034   KAAF 012   KAAF 013   -2D00-
          DFAC   C52C   A7CE   AAC6   C521   A728   3462   0435

-2D10-   KAAF 014   KAAF 015   KAAF 016   KAAF 017   KAAF 018   KAAF 019   KAAF 020   KAAF 021   -2D10-
          E08E   3480   220E   0E04   0340   D11E   2340   F109

-2D20-   KAAF 022   KAAF 023   KAAF 024   KAAF 025   KAAF 026   KAAF 027   KAAF 028   KAAF 029   -2D20-
          2717   272D   4F7F   3D00   3485   D407   3490   2807

-2D30-   KAAF 030   KAAF 031   KAAF 032   JDTA 040   JDTA 041   JDTA 042   JDTA 043   JDTA 050   -2D30-
          2953   5A32   AD34   F257   3623   4F0F   AD5C   2B00

-2D40-   JDTA 051   JDTA 052   JDTA 053   JDTA 033   JDTA 034   JDTA 035   JDTA 036   JDTA 037   -2D40-
          2B02   0D04   0240   E255   5538   05FB   C4BF   D536

-2D50-   JDTA 038   JDTA 039   JDTA 044   JDTA 045   JDTA 046   JDTA 047   JDTA 048   JDTA 049   -2D50-
          517B   AD58   1623   5173   6571   4F5F   2B48   0240

-2D60-   IADD 104   IADD 105   IADD 106   IADD 107   IADD 113   IADD 115   IADD 116   IADD 117   -2D60-
          3FB5   7F3A   F5E8   8D7C   5222   5530   151D   2002

-2D70-   IADD 118   IADD 119   IADD 120   IADD 121   IADD 122   IADD 123   IADD 124   IADD 125   -2D70-
          2007   55BD   7DBF   45DB   D57F   7D3A   8D7C   7D3A

                                                     2D8-

-2D80-   IADD 126   IADD 127   IMEM 002   IMEM 003   IMEM 004   IMEM 005   IMEM 006   IMEM 007   -2D80-
          5530   AD70   2400   3779   2E07   5A02   5AA6   77B8

-2D90-   IMEM 008   IMEM 009   IMEM 010   IMEM 011   IMEM 012   IMEM 013   IMEM 014   IMEM 015   -2D90-
          2745   5DA2   7DA1   F4A2   5F88   3F45   55E0   D50D

-2DA0-   IMEM 016   IMEM 017   IMEM 018   IMVZ 004   IMVZ 005   IMVZ 006   IMVZ 007   IMVZ 008   -2DA0-
          D512   3400   128E   5D1A   5D79   3D45   5BC0   5D30

-2DB0-   IMVZ 009   IMVZ 010   IMVZ 011   IMVZ 012   IMVZ 013   IMVZ 014   IMVZ 015   IMVZ 016   -2DB0-
          5D49   3D45   5DC0   F13C   4BDB   ADBE   4BDD   5BC0

-2DC0-   IMVZ 017   IMVZ 018   IMVZ 019   IMVZ 020   MPRT 393   MPRT 386   MPRT 387   MPRT 388   -2DC0-
          D445   1845   7B3A   8D7C   8D7C   C1CE   91F2   5E92

-2DD0-   MPRT 389   MPRT 390   MPRT 391   MPRT 392   MPRT 377   MPRT 378   MPRT 379   MPRT 380   -2DD0-
          FA48   1E13   7E92   9E72   0080   8216   5E62   DA48

-2DE0-   MPRT 381   MPRT 382   MPRT 383   MPRT 384   MPRT 385   -2DE0-
          CA4A   3482   2040   4CE6   A914   5007   5007   5007

-2DF0-   INTP 150   INTP 151   -2DF0-
          5007   5007   5007   5007   5007   5007   2C05   5AE3

CONTROL ADDRESS   2D--

ADDRESS LIST

CONTROL ADDRESS	0	2	4	6	8	A	C	E	
-2EC0-	INTP 152	INTP 153	INTP 154	INTP 155	INTP 156	INTP 157	INTP 158	INTP 159	-2E00-
	E084	3E13	5AD5	3D85	7CE2	5BC0	0E4D	E092	
-2E10-	INTP 160	INTP 161	INTP 162	INTP 163	INTP 164	INTP 165	INTP 166	JTYP 254	-2E10-
	8E82	4FBD	2DA3	3DB5	5FC8	4B6D	8E76	2F53	
-2E20-	JTYP 255	JTYP 256	JTYP 257	JTYP 258	JTYP 259	JTYP 215	JTYP 216	JTYP 217	-2E20-
	3F15	4FFF	16DB	E23B	A406	7CE2	4FFF	E133	
-2E30-	JTYP 218	JTYP 247	JTYP 248	JTYP 249	JTYP 250	JTYP 251	JTYP 252	JTYP 253	-2E30-
	A416	7222	4EC6	C13D	A396	A412	42C6	A412	
-2E40-	LSSO 002	LSSO 003	LSSO 004	LSSO 005	LSSO 006	LSSO 007	LSSO 008	LSSO 009	-2E40-
	57D9	5DC0	5DB9	E0DC	7C52	2206	5C52	65D5	
-2E50-	LSSO 010	LSSO 011	LSSO 012	LSSO 013	LSSO 014	LSSO 015	LSSO 016	LSSO 017	-2E50-
	5ECF	EC5D	E958	2B02	F95C	2B04	0216	A5B0	
-2E60-	IMRC 015	IMRC 016	IMRC 017	IMRC 018	IMRC 019	IMRC 004	IMRC 005	IMRC 006	-2E60-
	3745	DF67	1745	7738	8D7C	7738	5718	5F30	
-2E70-	IMRC 007	IMRC 008	IMRC 009	IMRC 010	IMRC 011	IMRC 012	IMRC 013	IMRC 014	-2E70-
	07FB	C4E1	3745	07ED	C4E1	DF6B	1745	AE6A	

2E8-

	0	2	4	6	8	A	C	E	
-2E80-	MDDD 019	MDDD 020	MDDD 021	MDDD 022	MDDD 023	MDDD 024	MDDD 025	MDDD 055	-2E80-
	2A43	4FAF	2B42	FD86	5FDF	FD10	8F1A	9286	
-2E90-	MDDD 026	MDDD 027	MDDD 028	MDDD 029	MDDD 030	MDDD 031	MDDD 032	MDDD 033	-2E90-
	2B48	ED92	5FDF	2B48	FD98	2B08	C20E	AC80	

ADDRESS LIST   DATE 11/08/68

AUX STORAGE   0   2   4   6   8   A   C   E

	0	2	4	6	8	A	C	E	
-0000-	MZZZ 005 40F1	MZZZ 005 F2F3	MZZZ 005 F4F5	MZZZ 005 F6F7	MZZZ 005 F8F9	MZZZ 005 F07B	MZZZ 005 7C7D	MZZZ 005 7E7F	-0000-
-0010-	MZZZ 006 7A61	MZZZ 006 E2E3	MZZZ 006 E4E5	MZZZ 006 E6E7	MZZZ 006 E8E9	MZZZ 006 E06B	MZZZ 006 6C6D	MZZZ 006 6E6F	-0010-
-0020-	MZZZ 007 60D1	MZZZ 007 D2D3	MZZZ 007 D4D5	MZZZ 007 D6D7	MZZZ 007 D8D9	MZZZ 007 D05B	MZZZ 007 5C5D	MZZZ 007 5E5F	-0020-
-0030-	MZZZ 008 50C1	MZZZ 008 C2C3	MZZZ 008 C4C5	MZZZ 008 C6C7	MZZZ 008 C8C9	MZZZ 008 C04B	MZZZ 008 4C4D	MZZZ 008 4E4F	-0030-
-0040-	MZZZ 009 0040	MZZZ 009 4040	MZZZ 009 4040	MZZZ 009 4040	MZZZ 009 4040	MZZZ 009 403B	MZZZ 009 3C3D	MZZZ 009 3E3F	-0040-
-0050-	MZZZ 010 3040	MZZZ 010 4040	MZZZ 010 4040	MZZZ 010 4040	MZZZ 010 4040	MZZZ 010 402B	MZZZ 010 2C2D	MZZZ 010 2E2F	-0050-
-0060-	MZZZ 011 2011	MZZZ 011 5240	MZZZ 011 4040	MZZZ 011 4040	MZZZ 011 4040	MZZZ 011 401B	MZZZ 011 1C1D	MZZZ 011 1E1F	-0060-
-0070-	MZZZ 012 4A70	MZZZ 012 4040	MZZZ 012 4040	MZZZ 012 4040	MZZZ 012 4040	MZZZ 012 100B	MZZZ 012 0C0D	MZZZ 012 0E0F	-0070-

008-

	0	2	4	6	8	A	C	E	
-0080-	MZZZ 014 08C0	MZZZ 014 C1C2	MZZZ 014 C3C4	MZZZ 014 C540	MZZZ 014 0180	MZZZ 014 0000	MZZZ 014 0000	MZZZ 014 0000	-0080-
-0090-	MZZZ 018 0000	MZZZ 018 0000	MZZZ 018 0000	MZZZ 018 0004	MZZZ 018 0000	MZZZ 018 0000	MZZZ 018 8E00	MZZZ 018 0A00	-0090-
-00A0-	MZZZ 020 0081	MZZZ 020 0240	MZZZ 020 0420	MZZZ 020 0610	MZZZ 020 0000	MZZZ 020 8000	MZZZ 020 3F00	MZZZ 020 0000	-00A0-
-00B0-	MZZZ 024 0000	MZZZ 024 0000	MZZZ 024 0000	MZZZ 024 0800	MZZZ 024 E800	MZZZ 024 FF00	MZZZ 024 0000	MZZZ 024 0000	-00B0-
-00C0-	MZZZ 025 3A31	MZZZ 025 3233	MZZZ 025 3435	MZZZ 025 3637	MZZZ 025 3839	MZZZ 025 4040	MZZZ 025 4048	MZZZ 025 455C	-00C0-
-00D0-	MZZZ 026 2A21	MZZZ 026 2223	MZZZ 026 2425	MZZZ 026 2627	MZZZ 026 2829	MZZZ 026 4040	MZZZ 026 4040	MZZZ 026 465D	-00D0-
-00E0-	MZZZ 027 1A51	MZZZ 027 1213	MZZZ 027 1415	MZZZ 027 1617	MZZZ 027 1819	MZZZ 027 4040	MZZZ 027 4049	MZZZ 027 4F56	-00E0-
-00F0-	MZZZ 028 0A01	MZZZ 028 0203	MZZZ 028 0405	MZZZ 028 0607	MZZZ 028 0809	MZZZ 028 4040	MZZZ 028 4040	MZZZ 028 445F	-00F0-

AUX STORAGE   00--

ADDRESS LIST   DATE 11/08/68

AUX STORAGE	0	2	4	6	8	A	C	E	
-2000-	MZZZ 033	MZZZ 033	MZZZ 033	MZZZ 033	MZZZ 033	MZZZ 033	MZZZ 033	MZZZ 033	-2000-
	000A	141E	2832	3C46	505A	0101	0101	0101	
-2010-	MZZZ 034	MZZZ 034	MZZZ 034	MZZZ 034	MZZZ 034	MZZZ 034	MZZZ 034	MZZZ 034	-2010-
	0059	0000	0000	044C	0BB8	07D0	03E8	0000	
-2020-	MZZZ 035	MZZZ 035	MZZZ 035	MZZZ 035	MZZZ 035	MZZZ 035	MZZZ 035	MZZZ 035	-2020-
	005E	0000	0000	0000	0C1C	0834	044C	0064	
-2030-	MZZZ 036	MZZZ 036	MZZZ 036	MZZZ 036	MZZZ 036	MZZZ 036	MZZZ 036	MZZZ 036	-2030-
	0063	0000	0000	0000	0C80	0898	04B0	00C8	
-2040-	MZZZ 037	MZZZ 037	MZZZ 037	MZZZ 037	MZZZ 037	MZZZ 037	MZZZ 037	MZZZ 037	-2040-
	0000	0000	0000	0000	0CE4	08FC	0514	012C	
-2050-	MZZZ 038	MZZZ 038	MZZZ 038	MZZZ 038	MZZZ 038	MZZZ 038	MZZZ 038	MZZZ 038	-2050-
	0000	0000	0000	0000	0D48	0960	0578	0190	
-2060-	MZZZ 039	MZZZ 039	MZZZ 039	MZZZ 039	MZZZ 039	MZZZ 039	MZZZ 039	MZZZ 039	-2060-
	0000	0000	0000	0000	0DAC	09C4	05DC	01F4	
-2070-	MZZZ 040	MZZZ 040	MZZZ 040	MZZZ 040	MZZZ 040	MZZZ 040	MZZZ 040	MZZZ 040	-2070-
	0000	0000	0000	0000	0E10	0A28	0640	0258	

208-

	0	2	4	6	8	A	C	E	
-2080-	MZZZ 041	MZZZ 041	MZZZ 041	MZZZ 041	MZZZ 041	MZZZ 041	MZZZ 041	MZZZ 041	-2080-
	0000	0000	0000	0000	0E74	0A8C	06A4	02BC	
-2090-	MZZZ 042	MZZZ 042	MZZZ 042	MZZZ 042	MZZZ 042	MZZZ 042	MZZZ 042	MZZZ 042	-2090-
	0000	0000	0000	0000	0ED8	0AF0	0708	0320	
-20A0-	MZZZ 043	MZZZ 043	MZZZ 043	MZZZ 043	MZZZ 043	MZZZ 043	MZZZ 043	MZZZ 043	-20A0-
	0000	0000	0000	0000	0F3C	0B54	076C	0384	
-20B0-	MZZZ 044	MZZZ 044	MZZZ 044	MZZZ 044	MZZZ 044	MZZZ 044	MZZZ 044	MZZZ 044	-20B0-
	0016	3248	6480	9611	2844	6076	9207	2339	
-20C0-	MZZZ 045	MZZZ 045	MZZZ 045	MZZZ 045	MZZZ 045	MZZZ 045	MZZZ 045	MZZZ 045	-20C0-
	1C18	0B1F	1216	2A34	B134	3402	1534	3434	
-20D0-	MZZZ 046	MZZZ 046	MZZZ 046	MZZZ 046	MZZZ 046	MZZZ 046	MZZZ 046	MZZZ 046	-20D0-
	1D34	2990	8006	341E	F134	3434	3434	3434	
-20E0-	MZZZ 047	MZZZ 047	MZZZ 047	MZZZ 047	MZZZ 047	MZZZ 047	MZZZ 047	MZZZ 047	-20E0-
	3405	1934	200E	0F34	1317	3404	1B34	3434	
-20F0-	MZZZ 048	MZZZ 048	MZZZ 048	MZZZ 048	MZZZ 048	MZZZ 048	MZZZ 048	MZZZ 048	-20F0-
	3421	2223	2425	2627	0606	3414	1A34	3434	

AUX STORAGE   20--

ADDRESS LIST   DATE 11/08/68   50--

AUX STORAGE   0   2   4   6   8   A   C   E

	0	2	4	6	8	A	C	E	
-5000-	MZZZ 053	MZZZ 053	MZZZ 053	MZZZ 053	MZZZ 053	MZZZ 053	MZZZ 053	MZZZ 053	-5000-
	0000	0000	0000	0000	0000	0000	0000	0000	
-5010-	MZZZ 054	MZZZ 054	MZZZ 054	MZZZ 054	MZZZ 054	MZZZ 054	MZZZ 054	MZZZ 054	-5010-
	0000	0000	0000	0000	0000	0000	0000	0000	
-5020-	MZZZ 055	MZZZ 055	MZZZ 055	MZZZ 055	MZZZ 055	MZZZ 055	MZZZ 055	MZZZ 055	-5020-
	0032	0A3C	1446	1E50	285A	0000	0000	0000	
-5030-	MZZZ 056	MZZZ 056	MZZZ 056	MZZZ 056	MZZZ 056	MZZZ 056	MZZZ 056	MZZZ 056	-5030-
	8000	0801	0002	0440	5060	0000	0C00	0000	
-5040-	MZZZ 057	MZZZ 057	MZZZ 057	MZZZ 057	MZZZ 057	MZZZ 057	MZZZ 057	MZZZ 057	-5040-
	F900	0000	0000	0000	E900	0000	0000	0000	
-5050-	MZZZ 058	MZZZ 058	MZZZ 058	MZZZ 058	MZZZ 058	MZZZ 058	MZZZ 058	MZZZ 058	-5050-
	D900	0000	0000	0000	0000	0000	0000	0000	
-5060-	MZZZ 059	MZZZ 059	MZZZ 059	MZZZ 059	MZZZ 059	MZZZ 059	MZZZ 059	MZZZ 059	-5060-
	C900	0000	0000	0000	0000	0000	0000	0000	
-5070-	MZZZ 060	MZZZ 060	MZZZ 060	MZZZ 060	MZZZ 060	MZZZ 060	MZZZ 060	MZZZ 060	-5070-
	0005	0106	0207	0308	0409	0000	0000	0000	

508-

	0	2	4	6	8	A	C	E	
-5080-	MZZZ 061	MZZZ 061	MZZZ 061	MZZZ 061	MZZZ 061	MZZZ 061	MZZZ 061	MZZZ 061	-5080-
	F800	7A7B	7C7D	7E7F	E800	E06B	6C6D	6E6F	
-5090-	MZZZ 062	MZZZ 062	MZZZ 062	MZZZ 062	MZZZ 062	MZZZ 062	MZZZ 062	MZZZ 062	-5090-
	D800	005B	5C5D	5E5F	0000	0000	0000	0000	
-50A0-	MZZZ 063	MZZZ 063	MZZZ 063	MZZZ 063	MZZZ 063	MZZZ 063	MZZZ 063	MZZZ 063	-50A0-
	C800	004B	4C4D	4E4F	0000	0000	0000	0000	
-50B0-	MZZZ 064	MZZZ 064	MZZZ 064	MZZZ 064	MZZZ 064	MZZZ 064	MZZZ 064	MZZZ 064	-50B0-
	0003	0230	0130	3030	0030	3030	3030	3030	
-50C0-	MZZZ 065	MZZZ 065	MZZZ 065	MZZZ 065	MZZZ 065	MZZZ 065	MZZZ 065	MZZZ 065	-50C0-
	40F1	F2F3	F4F5	F6F7	F061	E2E3	E4E5	E6E7	
-50D0-	MZZZ 066	MZZZ 066	MZZZ 066	MZZZ 066	MZZZ 066	MZZZ 066	MZZZ 066	MZZZ 066	-50D0-
	60D1	D2D3	D4D5	D6D7	D000	0000	0000	0000	
-50E0-	MZZZ 067	MZZZ 067	MZZZ 067	MZZZ 067	MZZZ 067	MZZZ 067	MZZZ 067	MZZZ 067	-50E0-
	50C1	C2C3	C4C5	C6C7	C000	0000	0000	0000	
-50F0-									-50F0-

AUX STORAGE   50--

ADDRESS LIST   DATE 11/08/68   60--

AUX STORAGE	0	2	4	6	8	A	C	E	
-60C0-	MZZZ 078 407E	MZZZ 078 4C5E	MZZZ 078 7A6C	MZZZ 078 7D6E	MZZZ 078 5C4D	MZZZ 078 5D7B	MZZZ 078 7F40	MZZZ 078 406F	-6000-
-6010-	MZZZ 079 7C61	MZZZ 079 E2E3	MZZZ 079 E4E5	MZZZ 079 E6E7	MZZZ 079 E8E9	MZZZ 079 006B	MZZZ 079 4F6C	MZZZ 079 EEE0	-6010-
-6020-	MZZZ 080 60D1	MZZZ 080 D2D3	MZZZ 080 D4D5	MZZZ 080 D6D7	MZZZ 080 D8D9	MZZZ 080 6D5B	MZZZ 080 007C	MZZZ 080 7BD0	-6020-
-6030-	MZZZ 081 50C1	MZZZ 081 C2C3	MZZZ 081 C4C5	MZZZ 081 C6C7	MZZZ 081 C8C9	MZZZ 081 4E4B	MZZZ 081 5F4C	MZZZ 081 40C0	-6030-
-6040-	MZZZ 082 0000	MZZZ 082 0000	MZZZ 082 0000	MZZZ 082 0000	MZZZ 082 0000	MZZZ 082 0093	MZZZ 082 9495	MZZZ 082 9697	-6040-
-6050-	MZZZ 083 8000	MZZZ 083 0000	MZZZ 083 0000	MZZZ 083 0000	MZZZ 083 0000	MZZZ 083 0053	MZZZ 083 5455	MZZZ 083 5657	-6050-
-6060-	MZZZ 084 4021	MZZZ 084 0000	MZZZ 084 0000	MZZZ 084 0000	MZZZ 084 0000	MZZZ 084 0033	MZZZ 084 3435	MZZZ 084 3637	-6060-
-6070-	MZZZ 085 0000	MZZZ 085 0000	MZZZ 085 0000	MZZZ 085 0000	MZZZ 085 0000	MZZZ 085 2013	MZZZ 085 1415	MZZZ 085 1617	-6070-

608-

AUX STORAGE	0	2	4	6	8	A	C	E	
-6080-	MZZZ 086 8000	MZZZ 086 4000	MZZZ 086 2000	MZZZ 086 1000	MZZZ 086 0800	MZZZ 086 0400	MZZZ 086 0200	MZZZ 086 0100	-6080-
-6090-	MZZZ 087 0000	MZZZ 087 0000	MZZZ 087 0000	MZZZ 087 0000	MZZZ 087 0000	MZZZ 087 0000	MZZZ 087 0000	MZZZ 087 0000	-6090-
-60A0-	MZZZ 088 0000	MZZZ 088 0000	MZZZ 088 0000	MZZZ 088 0000	MZZZ 088 0000	MZZZ 088 0000	MZZZ 088 0000	MZZZ 088 0000	-60A0-
-60B0-	MZZZ 089 0000	MZZZ 089 0000	MZZZ 089 0000	MZZZ 089 0000	MZZZ 089 0000	MZZZ 089 0000	MZZZ 089 0000	MZZZ 089 0000	-60B0-
-60C0-	MZZZ 090 A081	MZZZ 090 8283	MZZZ 090 8485	MZZZ 090 8687	MZZZ 090 9088	MZZZ 090 0000	MZZZ 090 0000	MZZZ 090 0000	-60C0-
-60D0-	MZZZ 091 6041	MZZZ 091 4243	MZZZ 091 4445	MZZZ 091 4647	MZZZ 091 5048	MZZZ 091 0000	MZZZ 091 0000	MZZZ 091 0000	-60D0-
-60E0-	MZZZ 098 3200	MZZZ 098 2223	MZZZ 098 2425	MZZZ 098 2627	MZZZ 098 3028	MZZZ 098 0000	MZZZ 098 0000	MZZZ 098 0000	-60E0-
-60F0-	MZZZ 100 2001	MZZZ 100 0203	MZZZ 100 0405	MZZZ 100 0607	MZZZ 100 1008	MZZZ 100 0000	MZZZ 100 0000	MZZZ 100 0000	-60F0-

AUX STORAGE   60--

ADDRESS LIST   DATE 11/08/68   70--

AUX STORAGE	0	2	4	6	8	A	C	E	
-7000-	MZZZ 111 4EC1	MZZZ 111 C2C3	MZZZ 111 C4C5	MZZZ 111 C6C7	MZZZ 111 C8C9	MZZZ 111 404B	MZZZ 111 4C40	MZZZ 111 4040	-7000-
-7010-	MZZZ 112 7DD1	MZZZ 112 D2D3	MZZZ 112 D4D5	MZZZ 112 D6D7	MZZZ 112 D8D9	MZZZ 112 505B	MZZZ 112 5C40	MZZZ 112 4040	-7010-
-7020-	MZZZ 113 7E61	MZZZ 113 E2E3	MZZZ 113 E4E5	MZZZ 113 E6E7	MZZZ 113 E8E9	MZZZ 113 606B	MZZZ 113 6C40	MZZZ 113 4040	-7020-
-7030-	MZZZ 114 F0F1	MZZZ 114 F2F3	MZZZ 114 F4F5	MZZZ 114 F6F7	MZZZ 114 F8F9	MZZZ 114 407B	MZZZ 114 7C40	MZZZ 114 4040	-7030-
-7040-	MZZZ 115 4040	MZZZ 115 4040	MZZZ 115 4040	MZZZ 115 4040	MZZZ 115 4040	MZZZ 115 4040	MZZZ 115 4040	MZZZ 115 4040	-7040-
-7050-	MZZZ 116 4040	MZZZ 116 4040	MZZZ 116 4040	MZZZ 116 4040	MZZZ 116 4040	MZZZ 116 4040	MZZZ 116 4040	MZZZ 116 4040	-7050-
-7060-	MZZZ 117 4040	MZZZ 117 4040	MZZZ 117 4040	MZZZ 117 4040	MZZZ 117 4040	MZZZ 117 4040	MZZZ 117 4040	MZZZ 117 4040	-7060-
-7070-	MZZZ 118 4040	MZZZ 118 4040	MZZZ 118 4040	MZZZ 118 4040	MZZZ 118 4040	MZZZ 118 4040	MZZZ 118 4040	MZZZ 118 4040	-7070-

708-

AUX STORAGE	0	2	4	6	8	A	C	E	
-7080-	MZZZ 119 0000	MZZZ 119 004B	MZZZ 119 C57F	MZZZ 119 C67A	MZZZ 119 0000	MZZZ 119 004B	MZZZ 119 4E7F	MZZZ 119 6C7A	-7080-
-7090-	MZZZ 120 7C00	MZZZ 120 005B	MZZZ 120 7D4F	MZZZ 120 4C4A	MZZZ 120 7C00	MZZZ 120 005B	MZZZ 120 7D4F	MZZZ 120 4C4A	-7090-
-70A0-	MZZZ 121 5061	MZZZ 121 006B	MZZZ 121 E56E	MZZZ 121 5C6D	MZZZ 121 5061	MZZZ 121 006B	MZZZ 121 5D6E	MZZZ 121 5C6D	-70A0-
-70B0-	MZZZ 122 0000	MZZZ 122 5FD6	MZZZ 122 D55E	MZZZ 122 4D7E	MZZZ 122 0000	MZZZ 122 5F7B	MZZZ 122 605E	MZZZ 122 4D7E	-70B0-
-70C0-	MZZZ 123 1625	MZZZ 123 2627	MZZZ 123 2829	MZZZ 123 2A2B	MZZZ 123 2C2D	MZZZ 123 002F	MZZZ 123 3000	MZZZ 123 0000	-70C0-
-70D0-	MZZZ 124 2219	MZZZ 124 1A1B	MZZZ 124 1C1D	MZZZ 124 1E1F	MZZZ 124 2021	MZZZ 124 1623	MZZZ 124 2400	MZZZ 124 0000	-70D0-
-70E0-	MZZZ 125 2E0D	MZZZ 125 0E0F	MZZZ 125 1011	MZZZ 125 1213	MZZZ 125 1415	MZZZ 125 2217	MZZZ 125 1800	MZZZ 125 0000	-70E0-
-70F0-	MZZZ 126 0A01	MZZZ 126 0203	MZZZ 126 0405	MZZZ 126 0607	MZZZ 126 0809	MZZZ 126 2E0B	MZZZ 126 0C00	MZZZ 126 0000	-70F0-

THERE ARE NO DUPLICATE ASSIGNMENTS IN THIS RUN.

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                                    MAS/
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ERROR MESSAGES

NO BOUNDARY ERRORS
 NO STRING CONTROL BLOCK ERRORS

System/360 Model 25 Microprogram Listing 1401/1460 Emulator - *E40 Supplementary Course Material Printed in U.S.A. R25-5401-0