

PRINTER, CARD READER, AND PUNCH DRIVERS
STORAGE ALLOCATION.

COMPASS - VER 2.

08/11/71 19.10.18.

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ADDRESS	LENGTH	BINARY CONTROL CARDS.	
0	2172	IDENT	PDV
2172	(347)	END	

PRINTER, CARD READER, AND PUNCH DRIVERS

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PAGE 2

IDENT POV
PERIPH

*
*
*
*

CM REQUEST COMMANDS

1	ECTOCM	EQU	1B
2	CMTOEC	EQU	2B
4	CMRESP	EQU	4B
10	CMINI	EQU	10B
*			

*
*
*

CONVERTER CONSTANTS

13	CHAN	EQU	13B
7	CNVERR	EQU	0007B
*			

*
*
*

CM INTERFACE CONSTANTS

11	INTCHAN	EQU	0
22	I.POINTS	EQU	22B
2	SDVCPNTS	EQU	0
2	SDVINTX	EQU	0
*			

*
*
*

PRINTER CONSTANTS

2	PRNBSY	EQU	002B
400	PRNENDOP	EQU	0400B
6011	PRNERMSK	EQU	6011B
1	PRNERBITS	EQU	0001B
*			BITS TO TEST FOR PRINTER ERROR
*			DESIRED STATE OF PRINTER BITS

*
*
*

READER CONSTANTS

6171	RDRERMSK	EQU	6171B
1	RDRERBITS	EQU	0001B
1	RDRRDY	EQU	0001B
2	RDRBSY	EQU	0002B
120	RDRBYTCN	EQU	80
*			BITS TO TEST FOR READER ERROR
*			DESIRED BIT STATUS FOR TESTED BITS
*			READER READY BIT
*			READER BUSY BIT
*			MAX BYTE COUNT

*
*
*

SPECIAL CONSTANTS FOR LDCK, SETC, ETC.

1	ALPHA	EQU	1
0	TOBESET	EQU	0
*			

*
*
*

TIMEING LOOP CONSTANTS

1750	TLOOPC1	EQU	1000
12	TLOOPC2	EQU	10
*			11 OR 13 MILLISECONDS FOR XMIT OR YMIT RESPECTIELY
*			110 OR 130 MILLISECONDS

*
*
* PRINTER DEVICE DATA STRUCTURE
* AND READER DEVICE DATA STRUCTURE
*

	ORG	IN	
0			
0	DVCCHN	BSS	DEVICE CHAINING WD
1	PCNTR	BSS	CURRENT P COUNTER FOR THIS DEVICE
2	BUFFBS	BSS	LOCATION OF PPU BUFFER
3	BUFFPNT	BSS	CURRENT LOCATION IN PPU BUFFER
4	NXTACT	BSS	A NUMBER TO REPRESENT CURRENT ACTION
5			
5	CNNCT	BSS	CONNECT CODE FOR ACTUAL DEVICE
6	INTBIT	BSS	MASK FOR INTERRUPT BIT FOR THIS DEVICE
7	DVCNM	BSS	S DEVICE NUMBER FOR THIS DEVICE
10	DVCWCNT	BSS	CM WORD COUNT FOR CM XFRS
11	DVCERMSK	BSS	BITS TO TEST FOR DEVICE ERROR
12	DVCERETS	BSS	DESIRED STATE OF DEVICE BITS
13			
13	DATAFLG	BSS	ON IF DATA XFER TO DEVICE
14	OLDSTATE	BSS	- STATUS ON BEGIN OF LAST OPERATION
15	EJECTFLG	BSS	- AUTOMATIC ACTION OCCURRED FLAG
16	AUTOFLAG	BSS	- CHECK FOR AUTO ACTION FLAG
17			
17	PRNDTASZ	BSS	

*
*
0 0 ORG VFO 0 12/START-1
10 1507 ORG 108
*
*
10 X0 BSSZ
11 X1 BSSZ
12 X2 BSSZ
13 X3 BSSZ
14 X4 BSSZ
15 X5 BSSZ
*
*
16 CMREQ BSS 16
*
16 CMREQDVX BSSZ
17 CMREQDPS BSSZ
20 CMREQWCN BSSZ
21 CMREQACT BSSZ
*
*
23 ZRO BSSZ 16
*
*
30 DVCREQ BSS 16
*
30 DVCACT BSSZ
34 *
*
35 DVCRSP BSS 16
*
35 EFLAG BSSZ
36 BSSZ
37 DVSTAT BSSZ
40 CNVSTAT BSSZ
41 BSSZ
*
*
42 CM BSS 16
*
42 CM0 BSSZ
43 CM1 BSSZ
44 CM2 BSSZ
45 CM3 BSSZ
46 CM4 BSSZ
*
*
* DEVICE DATA INDEX
*
*
47 XDVC BSSZ 1 CURRENT DEVICE

*
*
LOC MACRO **LDCX,LOC**
ADC TOBESSET
RMT
ORG ALPHA
VFD **L2/.LOC**
RMT
ENDM

*
LOC MACRO **LDCX,LOC**
ADC TOBESSET
RMT
ORG ALPHA
VFD **L2/.LOC**
RMT
ENDM

*
VFD24XA MACRO **LRC1,LRC2**
IFC NE...ARG1,
*ARG2 EQU \$
VFD **L2/ARG1,L2/ARG2**
ENDM

*
VFD24X MACRO **L1,L1,A2,L2,A3,L3,A4,L4,A5,L5,A6,L6,A7,L7,A8,L8**
VFD24XA **L1,L1**
VFD24XA **L2,L2**
VFD24XA **L3,L3**
VFD24XA **L4,L4**
VFD24XA **L5,L5**
VFD24XA **L6,L6**
VFD24XA **L7,L7**
VFD24XA **L8,L8**
ENDIF
ENDM

100

ORG

T00B

 100 5047 0000
 102 0505
 103 0200 0301
 105 2000 2033

MLOOP

LDM

DVCCHN,XDVC
MLOOPX
RJM
GETCNVST
FIRSTDVCCAUSES DELAY WITHOUT RESETING
PCOUNTER
 107 3447
 110 5047 0007
 112 3411
 113 0111 0006

MLOOPX

STD

XDVC
LDM
BCNTR,XDVC
STD
LJM
A,X1
 115 5000 0115
 116 5447 0001
 120 0355

DELAY

BSSZ

I
LDM
STM
UJMCAUSES RELAY AND RETURN TO POINT OF
DELAY THIS CALL AFTER DELAYBCNTR,XDVC
MLOOP
 123 0100 0000
 125 5000 0124
 127 5447 0001
 131 0371

124 MSET

LJM

EQU
LDM
STM
UJMCAUSES NEXT DELAY TO RETURN TO POINT
OF THIS CALLBCNTR,XDVC
MSET-1
 132 0100 0000
 134 1702
 135 5447 0001
 137 0372

133 XSET

LJM

EQU
SBN
STM
UJMCAUSES NEXT DELAY TO RETURN TO
(A)-2BCNTR,XDVC
XSET-1
 140 1702
 141 5447 0001
 143 0100 0100

XDELAY

SBN

I
STM
LJMDELAYS, AND AFTER DELAY, RETURNS TO
(A)-2BCNTR,XDVC
MLOOP

145	0100 0000	146	GETCM	LJM	8-1	OBTAINS ACCESS TO CENTRAL BUFFERS
147	5000 0200			LDN	CMFLG	
151	0515			NJN	GETCM1	
152	1401			LDN		
153	5400 0200			STM	CMFLG	
155	5047 0007			LDN	SVCNM, XDVC	AND SETS UP CENTRAL CALLING
157	2417			STR		
160	1400			LDN	CMREQDVX	
161	3420			STD		
162	5047 0010			LDN	CMREQDPOS	
164	3421			STD	SVCHCNT, XDVC	
165	0357			UJN	CMREQDVON	
166	5000 0146		GETCM1	LDN	GETCM	CM BUSY
170	0100 0146			LJM	YDELAY	
172	0100 0000			LJM		
173		RLSCM	EQU		8-1	RELEASE ACCESS TO CM
174	1400			LDN		
175	5400 0200			STM	CMFLG	
177	0372			UJN	RLSCM-1	
200			CMFLG	BSSZ	1	CM ACCESS CONTROL
201	0100 0000			LJM		
203	2000 0000	202	CMWAIT	EQU	8-1	WAITS FOR CM REQUEST WORD TO CLEAR
205	6042		CMREG1	LOCK	FILLEBIN	
206	3046			CRD	CMD	
207	0471			LDD	CMA	
210	5000 0200			ZJN	CMWAIT-1	
212	0100 0146			LDN	CMWAIT	
214	0100 0000			LJM	YDELAY	
216	2000 0000	215	SNDCMRQ	EQU	8-1	SENDS A REQUEST TO CM
220	6042		CMREQ2	LOCK	FILLEBIN	
221	3046			CRD	CMD	
222	0507			LDD	CMA	
223	2000 0000		CMREG3	LOCK	SNDCMRQ1	
225	6216			CRD	FILLEBIN	
226	1402			LDN	CMREQ	
227	7211			OAN	SVINTX	
230	0363			UJN	TNTCHAN	
					SNDCMRQ-1	

PRINTER, CARD READER, AND PUNCH DRIVERS
CENTRAL REFERENCE SUBROUTINES

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*
231 5000 0215 SNDCLMRQ1 LDM
233 0100 0140 LJM XDELAY

235	0100 0000	236	INTWAIT	LJM	⁰ ⁻¹ WAIT FOR DEVICE INTERRUPT
237	5047 0006			LDM	INTBIT,XDVC
241	5400 0248			STM	INTWAIT1+1
243	3040			LDD	CNVSTAT ASSUMES CONVERTER STATUS OBTAINED
244	2200 0006	INTWAIT1	LPC		ATLEAST ONCE PER TRIP AROUND DEVICES
246	0566		NJN	INTWAIT-1	
247	5000 0236		LDM	INTWAIT	
251	0100 0146		LJM	XDELAY	
 *					
253	0100 0008	254	GETDVOST	LJM	⁰ ⁻¹ GET DEVICE STATUS
255	7713 1300			FNC	1300B,CHAN RETURNS 4000B IN A IF ERROR
257	7413			ACN	CHAN 0 IF NOT
260	7013			IAN	CHAN ASSUMES DEVICE ALREADY CONNECTED
261	7513			DCN	CHAN
262	3437			STD	DVCSTAT
263	5047 0017			LDM	DVCERMSK,XDVC
265	5400 0210			STM	GETDVOST1+1
267	3037			LDD	DVCSTAT
270	5347 0012			LMM	DVCERBITS,XDVC
272	2200 0008	GETDVOST1	LPC		TOBESET
274	0456			ZJN	GETDVOST-1
275	2000 4000			LDC	4000B
277	0353			UJN	GETDVOST-1
 *					
300	0100 0008	301	GETCNVST	LJM	⁰ ⁻¹ GET CONVERTER STATUS
302	7713 1200			FNC	1200B,CHAN (RETURNS 4000B IN A IF ERROR, ELSE 0)
304	7413			ACN	CHAN
305	7013			IAN	CHAN
306	3440			STD	CNVSTAT
307	7513			DCN	CHAN
310	2200 0007			LPC	CNVERR
312	0455			ZJN	GETCNVST-1
313	0200 0254			RJM	GETDVOST
315	2000 4000			LDC	4000B
317	0350			UJN	GETCNVST-1
 *					
TRANSMIT A MESSAGE OUT					
RETURNS WITH 0 IF OK, 1 IF NOT					
320	0100 0008	321	XMIT	LJM	⁰ ⁻¹
322	7713 1401			FNC	1601B,CHAN ASSUMES DEVICE ALREADY CONNECTED
324	7413			ACN	CHAN

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GETNERAL DEVICE ROUTINES

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325	5747 0004	XMITLP	SOM	NXTACT,XDVC	DECREMENT COUNT
327	0722		MJN	XMITFIN FINISHED	
330	5047 0004		LDM	RUFPNL,XDVC	
332	3411		STD	X1	PREPARE ADDRESS OF DATA WORD
333	5647 0003		AOM	RUFPNL,XDVC	STEP POINTER
335	0200 0454	*	RJM	SETKILLT	
337	6713 0366	XMITLP1	EJM	XMITLP2,CHAN	WAIT FOR CHANNEL TO GO EMPTY
341	0200 0467		RJM	KILLTIME	
343	0573	*	NJN	XMITLP1	
344	0100 0570	*	LJM	XMITFAIL	XMISSION FAILS
346	4011	XMITLP2	LDI	X1	
347	7213		OAN	CHAN	
350	0354	*	UJN	XMITLP	
351	0200 0456	XMITFIN	RJM	SETKILLT	
353	6713 0364	XMITFINL	EJM	XMITFIN1,CHAN	
355	6513 0365		IJM	XMITFIN2,CHAN	
357	0200 0467		RJM	KILLTIME	
361	0571	*	NJN	XMITFINL	
362	0100 0570		LJM	XMITFINL	
364	7513	XMITFIN1	DCN	XMITFAIL	
365	1400	XMITFIN2	LDN	CHAN	
366	0100 0320	*	LJM	XMIT-T	
370	6513 0570	XMITFAIL	IJM	XMITFL1,CHAN	
372	7513		DCN	CHAN	
373	2000 4000	XMITFL1	LDC	4000B	
375	0100 0320		LJM	XMIT-T	
	*	*		READ A LINE IN	
	*	*		RETURNS WITH 0 IN A IF OK	
	*	*		ELSE 4000B	
	*	*		ASSUMES MAX BYTE COUNT IN X1	
	*	*		ASSUMES CONNECTED	
377	0100 0005	400	YMIT	LJM	
401	7713 1400		EQU	0	
403	7413		FNC	-1	
	*		ACN	1400B,CHAN	
404	3711	YMITLP	SOD	X1	DECREM T COUNT
405	0724		MJN	XMITLP3 DONE	
406	5047 0003		LDM	RUFPNL,XDVC	
410	3412		STD	X2	PREPARE ADDRESS OF DATA WORD
411	5647 0003		AOM	RUFPNL,XDVC	STEP POINTER
413	0200 0454		RJM	SETKILLT	

415	6613 0426	YMITLP1	FJM	YMITLP2,CHAN	WAIT FOR DATA
417	6513 0446		IJM	YMITLP4,CHAN	OR INACTIVE
421	0200 0467		RJM	KILLTIME	
423	0571		NJN	YMITLP1	
424	0100 0456		LJM	YMITFAIL INPUT FAILS	
426	7013	YMITLP2	IAN	CHAN	INPUT A BYTE
427	4412		STI	X2	AND STORE IT
430	0363		UJN	YMITLP	
431	0200 0456	YMITLP3	RJM	SETKILLT	
433	6613 0444	YMITLP3A	FJM	YMITLP3B,CHAN	WAIT FOR DAT OR INACTIVE
435	6513 0445		IJM	YMITLP4,CHAN	
437	0200 0467		RJM	KILLTIME	
441	0571		NJN	YMITLP3A	
442	0100 0456		LJM	YMITFAIL	
444	7513	YMITLP3B	DCN	CHAN	
445	1400	YMITLP4	LON		
446	0100 0377		LJM	YMIT-I	
450	7513	YMITFAIL	DCN	CHAN	
451	2000 4000		LDC	4000B	
453	0100 0377		LJM	YMIT-I	
455	0100 0008			SET UP FOR TIMING LOOPS	
457	2000 1750	456	SETKILLT	LJM	*
461	3414		EQU		*
462	2000 0012		LDC		*
464	3418		STD		*
465	0367		LDA		*
			STD		*
			UJN		*
					SETKILLT-I
					TIMING LOOP
					NUMBER OF TIMES = TL0OPC1 * TL0OPC2
					TIME FOR KILLTIME IS 8 MICRO SECONDS
466	0100 0008	467	KILLTIME	LJM	*
470	3714		EQU		*
471	0574		S00		*
472	2000 1750		NJN		*
474	3414		KILLTIME-I		*
475	3715		LDC		*
476	0367		STD		*
			S05		*
			UJN		*
					KILLTIME-I

CONNECT A DEVICE
RETURNS WITH A NE 0 IF CONNECT ERROR

477	0100 0000	500	CONNECT	LJM	*
501	7713 2000			EQU	*-1
503	7713 1000			FNC	2000B,CHAN
505	7413			FNC	1000B,CHAN
506	5047 0008			ACN	CHAN
510	7213			LDM	CONNCT,XDVC
511	7513			OAN	CHAN
512	0200 0301			DCN	CHAN
514	0362			RJM	GETCNST
				UJN	CONNECT=1

WAIT FOR AN ERROR TO GO AWAY, OR FOR 16 TO 32 SECONDS.
IF ERROR DID NOT GO AWAY, ERROR RESPONSE
ELSE OK RESPONSE

SAVES PCOUNTER IN NXRACT
SAVES CLOCK AT BUFPNT

515	0100 0000	516	EWAIT	LJM	*
517	5000 0516			EQU	*-1
521	5447 0004			LDM	SWAIT
523	2000 0000		MCLOCK1	STM	NXRACT,XDVC
525	6042			LDCX	FILLEDIN
526	3044			CRD	CLOCK
527	1202			LDD	CLOCK STEPS ABOUT EVERY 16.8 SECONDS
530	5447 0003			ABN	1202
532	2176 7777			STM	BUFPNT,XDVC
534	0703			ADC	10000B
535	5447 0003			HJM	*+3
537	0200 0124			STM	BUFPNT,XDVC
				RJM	RESET PREPARE LOOP
541	0200 0000				CONNECT
543	0512				SWAIT1
544	0200 0254				GETDVFCST
546	0507				SWAIT1
547	5047 0004			LDM	NXRACT,XDVC
551	3411			STD	RESTORE P COUNTER
552	1400			LDM	X1
553	0111 0000			LJM	OK EXIT
					X1

555	2000 0000	555	EWAIT1	EQU	*
557	6042		MCLOCK2	LDCX	FILLEDIN
560	3044			CRD	CLOCK
561	5247 0003			LDD	CLOCK
563	0403			SBM	BUFPNT,XDVC
564	0100 0100			ZJM	*+3
566	5047 0004			LJM	MLOOP NO
				LDM	NXRACT,XDVC
					SEE IF TIME HAS EXPIRED
					YES, ASSUMES WILL TRY AT LEAST
					EVERY 10 SECONDS, SO WILL GET EXACT MATCH
					RESTORE P COUNTER

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GETNERAL DEVICE ROUTINES

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570 3411
571 2000 4000
573 0111 0000

STD X1
LDC 4000B RETURN WITH ERROR
LJM 0,X1

575	0200 0144	PRNTR	RJM	GETCM	
577	1410		LDN	CMINI	
600	3422		STD	CMREQACT	
601	0200 0215		RJM	SNDCMRQ	
603	0200 0200		RJM	CNWAIT	
605	0200 0173		RJM	RLSCM	
607	0200 0116	PRNTRLP	RJM	DELAY . RESET AND WAIT FOR OTHER DEVICES	
611	2000 0000	DVCREQ1	LDCK	FILLEDIN	
613	5147 0007		ADM	DVCNM,XDVOC	
615	6030		CRD	DVCREQ	SEE IF A NEW REQUEST YET
616	3034		LDD	DVCAC	
617	0503		NJN	*+3	
620	0100 0100		LJM	MLOOP	NO NEW REQUEST
622	2000 0000	DVCREQ2	LDCK	FILLEDIN	
624	5147 0007		ADM	DVCNM,XDVOC	
626	6223		CRD	ZRO	
627	3034		LDD	DVCAC	CHECK FOR ERROR TEST ACTION
630	2177 7577		ADC	-2008	
632	0505		NJN	*+5	NO SUCH ACTION
633	0200 0516		RJM	EWAIT	
635	0100 1157		LJM	BRNFINX	
637	0200 0144		RJM	GETCM	
641	1401		LDN	ECTOCH	
642	3422		STD	CMREQACT	
643	0200 0215		RJM	SNDCMRQ	
645	0200 0000		RJM	CNWAIT	
647	5047 0008		LDM	DUFBS,XDVOC	
651	5400 0000		STM	BRNTR1+1	
653	2000 0000	CMEUFI	LDCK	FILLEDIN	
655	6121 0000	PRNTR1	CRM	C+CMREQCN	COPY BUFFER LOAD TO PPU
657	0200 0173		RJM	RLSCM	
661	5047 0002		LDM	DUFBS,XDVOC	
663	5447 0000		STM	RUFPT,XDVOC	
665	0200 1202	PRNTR1A	RJM	BRNTR0Y	
667	0404		ZJN	*+4	
670	0200 0234		RJM	TNTWAIT	
672	0372		UJN	BRNTR1A	
673	5047 0014		LDM	OLDSTATE,XDVOC	GET OLD STATUS
675	1073		SHN	*4	POSITION LAST LINE OF FORMS BIT
676	5400 0703		STM	P.LOGICW . LOUSY PPU INSTR. SET	
700	5047 0016		LDM	AUTOFLAG,XDVOC	GET AUTO EJECT FLAG (0 OR 1)
702	2200 0000		LPC	*0	
703	P.LOGICW	EQU	STM	*-1 . PUT BITS HERE	
704	5447 0015		STM	EJECTFLG,XDVOC	SAVE EJECTED BIT

		*			
706	5047 0003	PRNTR2	LDM	BUFPNT,XDVC	
710	3411		STD	X1	
711	4011		LDI	X1	GET NEXT ACTION
712	0503		NJN	*3	
713	0100 0777		LJM	PRNTR10	END OF ACTIONS; SEE ABOUT PRINTING
715	1704		SBN	4	• PAGE EJECT
716	0514		NJN	PRNTR2A	• NOPE
717	5047 0015		LDM	EJECTELG,XDVC	DID WE JUST DO EJECT ?
721	0406		ZJN	PRNTR2A1	• NO, JUMP
722	1400		LDM		
723	5447 0015		STM	EJECTELG,XDVC	YES, CLEAR FLAG AND
725	0100 0773		LJM	PRNTR6	• SKIP THIS COMMAND
727	1404		LDM		
730	0100 0763	PRNTR2A1	LJM	PRNTR3	• GO DO THE EJECT INSTEAD.
		*			
732	1701	PRNTR2A	SBN	*4	• ELSE TRY SELECT AUTO EJECT
733	0507		NJN	PRNTR2B	• NOPE
734	1401		LDM		
735	5447 0016		STM	AUTOFLAG,XDVC	SET FLAG IN DESCRIPTOR
737	1405		LDM		
740	0100 0763		LJM	PRNTR3	• AND SEND THE CODE
		*			
742	1703	PRNTR2B	SBN	108-5	• NOW TRY FOR CLEAR FORMAT SELECTIONS
743	0503		NJN		
744	5447 0014		STM	*3	AUTOFLAG,XDVC • IF SO, CLEAR EJECT FLAG
		*			
746	1717		SBN	178-108	
747	0703		MJN		
750	0100 0773		LJM	PRNTR6	ACTION OUT OF RANGE, SKIP IT
752	1527		ADM		
753	5447 0004	PRNTR3	STM	278	
755	0200 1202	PRNTR3A	RJM	NXTACT,XDVC	
757	0404		ZJN	PRNTR0Y	• READY PRINTER
760	0200 0234		RJM		
762	0372		UJN	INTHATT	
		*		PRNTR3A	
		*			
763	7713 0031	PRNTR4	FNC	118-CHAN	RESELECT INTERRUPT
765	5047 0004		LDM	NXTACT,XDVC	
767	7613		FAN	CHAN	PERFORM SELECTED ACTION
770	1400		LDM		
771	5447 0013		STM	DATAFLG,XDVC	SIGNAL THAT NO PRINTING IN PROGRESS
		*			
773	5447 0004	PRNTR5	AOM	BUFPNT,XDVC	
775	0100 0704		LJM	PRNTR2	
		*			
777	3037	PRNTR10	LDD	EVOSTAT	
1000	5447 0014		STM	OLDESTATE,XDVC	SAVE FOR NEXT TIME AROUND
1002	5447 0003		AOM	BUFPNT,XDVC	
		*			
1004	3411		STD	X1	
1005	4011		LDI	X1	

PRINTER, CARD READER, AND PUNCH DRIVERS
PRINTER DRIVER CODE

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1006	0503		NJN	*+3	
1007	0100 1137		LJM	BRNFIN	ALL DONE, NO LINE TO OUTPUT
1011	5447 0004		STM	DATAFLG,XDVC	SAVE OUTPUT COUNT
1013	5647 0003		AOM	SUPFPNT,XDVC	STEP POINTER
1015	5047 0013		LDM	DATAFLG,XDVC	
1017	0503		NJN	BRNTR11	PRINTING WAS IN PROGRESS
1020	0100 1063		LJM	BRNTR12	. NO PRINTING, JUMP
1022	0200 0500	PRNTR11	RJM	CONNECT	
1024	0403		ZJN	*+3	
1025	0100 1157		LJM	BRNFINX	
1027	0200 0254		RJM	GETDVCAST	GET PRINTER STATUS
1031	0403		ZJN	*+3	
1032	0100 1157		LJM	BRNFINX	
1034	3037		LDD	DVCASTAT	
1035	1202		LPN	BRNBSY	CHECK PRINTER BUSY
1036	0503		NJN	*+3	
1037	0100 1111		LJM	BRNTR13	NOT BUSY, SO PROCEED
1041	0200 0254		RJM	INTWAIT	WAIT FOR INTERRUPT
1043	0200 0500		RJM	CONNECT	
1045	0403		ZJN	*+3	
1046	0100 1157		LJM	BRNFINX	
1050	0200 0254		RJM	GETDVCAST	GET PRINTER STATUS
1052	0403		ZJN	*+3	
1053	0100 1157		LJM	BRNFINX	
1055	3037		LDD	DVCASTAT	
1056	2200 0400		LPN	BRNENDOP	CHECK FOR END OF INTERRUPT
1060	0441		ZJN	BRNTR11	NOT ON
1061	0100 1111		LJM	BRNTR13	. NOW WE MAY PRINT
1062	0200 0500	PRNTR12	RJM	CONNECT	. CONNECT
1065	0403		ZJN	*+3	
1066	0100 1157		LJM	BRNFINX	
1070	7713 0031		FNC	31B.CHAN	. DE-SELECT INTERRUPT ON RDY/INT-RSY
1072	7713 0030		FNC	32B.CHAN	. AND SELECT IT
1074	0200 0254		RJM	GETDVCAST	
1076	0403		ZJN	*+3	
1077	0100 1157		LJM	BRNFINX	
1101	3037		LDD	DVCASTAT	
1102	1202		LPN	BRNBSY	
1103	0404		ZJN	BRNTR12A	. WAIT FOR INTERRUPT
1104	0200 0254		RJM	INTWAIT	. LOOP
1106	0354		ZJN	BRNTR12	
1107	7713 0031	PRNTR12A	FNC	31B.CHAN	. CLEAR INTERRUPT
1111	7713 0033	PRNTR13	FNC	33B.CHAN	DESELECT END OF INTERRUPT
1113	7713 0032		FNC	32B.CHAN	RESELECT INTERRUPT
1115	1401		LDN		
1116	5447 0013		STM	DATAFLG,XDVC	SIGNAL PRINTING IN PROGRESS
1120	0200 0500		RJM	CONNECT	. MAKE SURE CONNECTED

PRINTER, CARD READER, AND PUNCH DRIVERS
PRINTER DRIVER CODE

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1122	0403	ZJN	*+3
1123	0100 1157	LJM	BRNFINX
1125	0200 0254	RJM	GETDV CST
1127	0403	ZJN	*+3
1130	0100 1157	LJM	BRNFINX
1132	0200 0327	RJM	XMIT SEND A LINE
1134	0403	ZJN	*+3
1135	0100 1157	LJM	BRNFINX
1137	0200 0500	PRNFIN	RJM CONNECT
1141	0403	ZJN	*+3
1142	0100 1157	LJM	BRNFINX
1144	0200 0254	RJM	GETDV CST GET PRINTER STATUS
1146	0403	ZJN	*+3
1147	0100 1157	LJM	BRNFINX
1151	0200 0301	RJM	GETCNVST
1153	0403	ZJN	*+3
1154	0100 1157	LJM	BRNFINX
1155	1400	LON	*
1157	3435	PRNFINX	STD CFLAG
1160	2000 0006	DVCRSP1	LOCK FILLEDIN
1162	5147 0007		ADM DVCMN, XDVC
1164	6235	CWD	DVCRSP
1165	0200 0744	RJM	SETCM
1167	1404	LON	OKRESP
1170	3422	STD	ONREQUEST
1171	0200 0715	RJM	SENDCHMR
1173	0200 0802	RJM	ONWAIT
1175	0200 0772	RJM	BLSCM
1177	0100 0807	LJM	BRNTRDP

ROUTINE TO READY PRINTER FOR FUNCTION CODES

1201	0100 0000	LJM	*
1202	PRNTRDY	EQU	-1
1203	0200 0500	RJM	CONNECT
1205	0403	ZJN	*+3
1206	0100 1157	LJM	BRNFINX
1210	7713 0031	FNC	S1B-CHAN
1212	7713 0030	FNC	S0B-CHAN
1214	0200 0254	RJM	GETDV CST GET PRINTER STATUS
1216	0403	ZJN	*+3
1217	0100 1157	LJM	BRNFINX
1221	3037	LDD	DVSTAT
1222	1202	LPN	PRNBSY CHECK PRINTER BUSY
1223	0355	UJN	PRNTRDY-1 • RETURN ZERO ON NOT BUSY

1224	0200 0146	*	READR	RJM	GETCM	
1226	1410	*		LDN	CMINI	INITIALIZE CENTRAL FOR THIS CARD READER
1227	3422	*		STD	CMREQACT	
1230	0200 0215	*		RJM	SNDCMRQ	
1232	0200 0202	*		RJM	CMWAIT	
1234	0200 0173	*		RJM	RLSCM	
1236	0200 0116	*	READRSP	RJM	RELAY	. SET LOOP AND GIVE OTHERS A CHANCE
1240	2000 0000	*	DVCREG	LDCX	EILLEDIN	
1242	5147 0007	*		ADM	DVCNM,XDV	
1244	6030	*		CRD	DVCREG	SEE IF A NEW REQUEST YET
1245	3034	*		LDD	DVCACT	
1246	0503	*		NJN	*+3	
1247	0100 0100	*		LJM	MLOOP	NO NEW REQUEST YET
1251	2000 0005	*	DVCREG4	LDCX	EILLEDIN	
1253	5147 0007	*		ADM	DVCNM,XDV	
1255	6028	*		CWD	PRO	INDICATE ACCEPTANCE OF REQUEST
1256	3034	*		LDD	DVCACT	
1257	5447 0004	*		STM	NXTACT,XDV	
1261	1703	*		SBN	*+3	TEST FOR DIRECT READER FUNCTIONS
1262	0703	*		NJN	*+3	
1263	0100 1277	*		LJM	READRSP	NO DIRECT READER ACTIONS
1265	0200 0506	*		RJM	CONNECT	FUNCTION READER
1267	0403	*		ZJM	*+3	
1270	0100 1282	*		LJM	RDRFINX	
1272	5047 0008	*		ADM	NXTACT,XDV	
1274	7613	*		FAN	CHAN	SEND FUNCTION TO READER
1275	0100 1282	*		LJM	RDRFIN	
1277	1600	*	READRSP	ADM	*+3	OTHER ACTIONS
1300	2177 7877	*		ADC	-1008	
1302	0503	*		PJM	*+3	
1303	0100 1424	*		LJM	RDRFIN	BAD ACTION. SKIP IT
1305	0503	*		NJN	*+3	
1306	0100 1424	*		LJM	RDRFIN	ACTION CODE = 1008, STATUS REQUEST
1310	1701	*		SBN	*+3	
1311	0503	*		NJN	*+3	
1312	0100 1282	*		LJM	RDRYMT	ACTION CODE = 1018, READ
1314	5047 0008	*		LDM	NXTACT,XDV	
1316	2177 7877	*		ADC	-2008	TEST FOR ERROR WAIT ACTION
1320	0503	*		NJN	*+5	
1321	0200 0516	*		RJM	EWAIT	
1323	0100 1444	*		LJM	RDRFINX	
1325	0100 1424	*		LJM	RDRFIN	BAD ACTION. SKIP IT
1327	5047 0002	*	RDRYMT	LDM	RUFBS,XDV	
		*			READ A CARD	

PRINTER, CARD READER, AND PUNCH DRIVERS
CARD READER DRIVER CODE

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1331	3411		STD	*1	
1332	2000 1777		LDC	7777B	
1334	5411 0000		STM	0,X1	PREPARE FLAG FOR NO CARD READ
1336	0200 0124		RJM	MSET	
1340	0200 0500		RJM	CONNECT	
1342	0403		ZJN	*+3	
1343	0100 1446		LJM	RDRFINX	
1345	0200 0284		RJM	GETDVCST	GET STATUS
1347	3037		LDD	DVCSTAT	
1350	2200 0602		LPC	RDRBSY	CHECK BUSY BIT
1352	0403		ZJN	*+3	
1353	0100 0100		LJM	MLOOP	STILL BUSY
1355	3037		LDD	DVCSTAT	
1356	2200 0601		LPC	RDRRDY	CHECK READY
1360	0505		NJN	*+5	OK
1361	2000 4000		LDC	10000B	NOT READY, ERROR CONDITION
1363	0100 1446		LJM	RDRFINX	
1365	5047 0005		LDM	BUFBSD, XDVC	
1367	1605		ADN	SPACE FOR STATUS BITS	
1370	5447 0003		STM	BUFPNT, XDVC	
1372	2000 0120		LDC	RDRBYTCN	
1374	3411		STD	*1	
1375	0200 0403		RJM	YMIT	READ CARD IMAGE
1377	3410		STD	XO	SAVE YMIT RESPONSE
1400	5047 0002		LDM	BUFBSD, XDVC	
1402	3411		STD	*1	
1403	1400		LDM	*.X1	
1404	5411 0000		STM	*.X1	
1406	5411 0001		STM	*.X1	
1410	5411 0002		STM	*.X1	
1412	5640		LDD	CONVSTAT	
1413	5411 0003		STM	*.X1	
1415	3037		LDD	DVCSTAT	
1416	5411 0004		STM	*.X1	
1420	3030		LDD	*0	
1421	0402		ZJN	*+3	
1422	0100 1446		LJM	RDRFINX	
1424	0100 1424		LJM	RDRFIN	
1426	0200 0605	RDRFIN	RJM	CONNECT	FINISH UP READER ACTIONS
1430	0403		ZJN	*+3	
1431	0100 1446		LJM	RDRFINX	
1433	0200 0284		RJM	GETDVCST	GET READER STATUS
1435	0403		ZJN	*+3	
1436	0100 1446		LJM	RDRFINX	
1440	0200 0301		RJM	GETCNVST	GET CONVERTER STATUS
1442	0403		ZJN	*+3	
1443	0100 1446		LJM	RDRFINX	
1445	1400		LDM	*0	
1446	3435	RDRFINX	STD	EFLAG	
1447	2000 0005	DVCRSR2	LDCX	FILLEDIN	

PRINTER, CARD READER, AND PUNCH DRIVERS
CARD READER DRIVER CODE

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1451	5147 0007	ADM	DVCNM,XDVC
1453	6235	CWD	DVCRSP
1454	0200 0146	RJM	GETCM
1456	5047 0004	LDM	NXTACT,XDVC
1460	2177 7674	ADC	51018
1462	0404	ZJN	RDRFINY WAS A READ OF CARD ACTION
*			
1463	1404	LDN	CMRESP WAS NOT A READ OF CARD ACTION
1464	3422	STD	CMREQACT
1465	0313	UJN	RDRFINZ
*			
1466	1406	RDRFINY	LDN CMRESE+CMTOEC
1467	3422	STD	CMREQACT
1470	5047 0005	LDM	BUFB5,XDVC
1472	5400 1477	STM	RDRFINJ+1
1474	2000 0000	CMBUF2	LOCK
1476	6321 0600	RDRFINI	CWM
* CMREQCN COPY BUFFER TO CM			
1500	0200 0215	RDRFINZ	RJM SNDCMR0
1502	0200 0203	RJM	CMWAIT
1504	0200 0179	RJM	CMSCM
1506	0100 1235	LJM	READRLP

1510	1417	START	LDM	75	
1511	1701		SBN	7	
1512	0576		NJN	4-1	ALLOW ALL SPUS TO GET STARTED
1513	2000 0024	FILLIN	LOC	1.	POINTS+SDVCPNTS
1515	6042		CRD	CMD	
1516	3045		LOD	CMD3	
1517	1277		LPN	778	
1520	3445		STD	CMD3	
1521	3045		LOD	CMD4	
1522	5400 1000		STM	FILLINI+1	
1524	5000 1000		LDM	FILLINI	
1526	5000 7700		LDC	7700B	
1530	3145		ADD	CMD3	
1531	5400 1000		STM	FILLINI	
1533	2000 0030		LDC	NPairs-2	
1535	3445		STD	X1	
1536	2000 7777		LDC	7777B	
1540	3445		STD	X1	
1541	6000 1645	FILLIN	LDM	PAIRLIST,X2	
1543	6000 1645		SBD	X1	
1544	0431		ZJN	FILLIN2 ALREADY HAVE THIS ADDRESS SET UP	
1545	6000 1645		LDM	PAIRLIST,X2	
1547	2411		STD	X1	
1550	1711		SBN	X1	
1551	6003		NJN	FILLINX	
1552	1404		LDM	X1	
1553	6003		UJN	FILLINI	
1554	6011		LDD	X1	
1555	2400 0030	FILLIN	ADD	TORESET	
1557	6042		CRD	CMD	
1560	3045		LOD	CMD3	
1561	1277		LPN	778	
1562	3445		STD	CMD3	
1563	6011		LOD	X1	
1564	1711		SBN	X1	
1565	0510		NJN	FILLIN2	
1566	3045		LOD	CMD3	
1567	1014		SBN	X12	
1570	3145		ADD	CMD4	
1571	1701		SBN	X1	
1572	3445		STD	CMD4	
1573	1063		SBN	X12	
1574	3445		STD	CMD3	
1575	5012 1643	FILLIN	LDM	PAIRLIST+1,X2	
1577	3413		STD	X3	

PRINTER, CARD READER, AND PUNCH DRIVERS
INITIALIZING PACKAGE

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1600	4013		LDI	x3
1601	2200 7706		LPC	77008
1603	3145		ADD	xM3
1604	4413		STI	x3
1605	3046		LDD	xM4
1606	5413 0001		STM	1*x3
1610	1502		LCN	2
1611	3512		RAD	x2
1612	0703		MJN	*+3
1613	0100 1547		LJM	HILLING
	*			
	*			
1615	2000 2033		LDC	FIRSTDVC
1617	3447	XLOOP	STD	XDVC
1620	5047 0005		LDM	CONNCT,XDVC
1622	1068		SHN	9 COMPUTE EQUIPMENT NUMBER
1623	2100 1800		ADC	10008 (SHN)
1625	5400 1800		STM	XLOOP1
1627	1410		LDN	108 INTERRUPT MASK FOR EQUIPMENT 6
1630	1000	XLOOP1	SHN	109
1631	5447 0006		STM	INTBIT,XDVC FIX INTERRUPT BIT MASK
1633	5047 0006		LDM	DVCCHN,XDVC
1635	0561		MJN	XLOOP
1636	2000 2033		LDC	FIRSTDVC
1640	0100 0107		LJM	MLOOPX
	*			
	*			
1642	0000	PAIRLIST	VFD24X	0,DVCREQ1,0,DVCREQ2
1646	0000		VFD24X	0,DVCREQ3,0,DVCREQ4
1652	0001		VFD24X	1,DVCRSP1
1654	0001		VFD24X	1,DVCRSP2
1656	0002		VFD24X	2,MCLK1,2,MCLK2
1662	0011		VFD24X	0,CMREQ1,0,CMREQ2,0,CMREQ3
1670	0004		VFD24X	0,CMBUF1
1672	0004		VFD24X	0,CMBUF2
	*			

32. NPairs EQU &PAIRLIST

*

*

PRINTER MACRO

PRINTER	MACRO LOCAL	\$DVCNM,EQPNM 1,BUFFER	
L LASTDVC	VFD SET VFD VFD BSSZ BSSZ	12/LASTDVC 12/PRNTR 12/BUFFER 1 1	DEVICE CHAIN INITIAL P COUNTER ADDRESS OF BUFFER
	VFD BSSZ	3/EQPNM,9/0 1	CONNECT CODE
	VFD	12/\$DVCNM	DEVICE NUMBER FOR THIS DEVICE
	VFD	12/16	CM WORD COUNT
	VFD	12/PRNERMSK	BITS TO TEST FOR PRINTER ERROR
	VFD	12/PRNERBTS	DESIRED STATE OF PRINTER BITS
	BSSZ	1	
	BSSZ	3	. SPECIAL FLAG WORDS
	BUFFER	BSSZ	16*5
			ENOM

READER MACRO

READER	MACRO LOCAL	\$DVCNM,EQPNM 1,BUFFER	
L LASTDVC	VFD SET VFD VFD BSSZ BSSZ	12/LASTDVC 12/READR 12/READR 12/BUFFER 1 1	DEVICE CHAIN INITIAL P COUNTER ADDRESS OF BUFFER
	VFD BSSZ	3/EQPNM,9/0 1	CONNECT CODE
	VFD	12/\$DVCNM	DEVICE NUMBER FOR THIS DEVICE
	VFD	12/218	CM WORD COUNT
	VFD	12/RDRERMSK	BITS TO TEST FOR READER ERROR
	VFD	12/RDRERBTS	DESIRED STATE OF READER BITS
	BSSZ	1	
	BSSZ	3	. SPECIAL FLAG WORDS IN READER
	BUFFER	BSSZ	16*5

PRINTER, CARD READER, AND PUNCH DRIVERS
MACROS FOR DEVICE DATA AREAS

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*
ENOM

*
*
*
0 LASTDVC SET 6
*
1674 0000 1674 PRINTER 1,6 SDVCNM = 1, EQUIPMENT NUMBER = 6
2033 1674 READER 2,7 SDVCNM = 2, EQUIPMENT NUMBER = 7
*
2033 FIRSTDVC EQU LASTDVC
*
2172 END
35344 STORAGE USED 1157 STATEMENTS
6600 ASSEMBLY 5.518 SECONDS 178 SYMBOLS
741 REFERENCES 000004 INVENTED SYMBOLS

PRINTER, CARD READER, AND PUNCH DRIVERS
SYMBOLIC REFERENCE TABLE.

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ALPHA	1	3/39 D	26/11	26/11				
AUTOFLAG	16	4/34 L	15/50	16/20	16/26			
BUFB8	2	4/10 L	15/33	15/39	19/53	20/19	20/26	21/14
BUFPNT	3	4/11 L	11/05	11/52	13/34	15/40	16/45	17/04
		11/03	11/50	13/31	13/50	16/02	16/50	20/21
CHAN	13	3/12 D	10/35	11/15	11/45	12/14	13/10	17/46
		10/17	10/36	11/19	11/45	12/19	13/11	17/49
		10/18	10/38	11/20	12/02	12/24	16/39	17/50
		10/19	10/51	11/25	12/03	13/06	16/41	18/45
		10/20	10/52	11/29	12/08	13/07	17/35	18/46
		10/34	11/08	11/30	12/13	13/08	17/36	19/32
CM	42	5/43 L	13/28	13/48	22/09	22/36		
CMBUF1	653	15/35 L	23/35					
CMBUF2	1474	21/16 L	23/36					
CMFLG	200	8/06	8/09	8/25	8/29 L			
CMINI	10	3/08 D	15/05	19/05				
CMREQ	16	5/16 L	8/50					
CMREQACT	22	5/22 L	15/06	15/30	18/29	19/06	21/09	21/13
CMREQDVX	17	5/19 L	8/11					
CMREQPOS	20	5/20 L	8/13					
CMREQVCN	21	5/21 L	8/15	15/36	21/17			
CMREQ1	203	5/35 L	23/34					
CMREQ2	216	8/45 L	23/34					
CMREQ3	223	8/49 L	23/34					
CMRESP	4	3/07 D	18/28	21/08	21/12			
CMTOEC	2	3/06 D	21/12					
CMWAIT	202	8/34 D	8/38	8/39	15/08	15/32	18/31	19/08
CM0	42	5/45 L	8/36	8/46				21/26
CM1	43	5/46 L						
CM2	44	5/47 L	13/29	13/49				
CM3	45	5/48 L	22/12	22/37	22/44	23/03		
		22/10	22/17	22/39	22/50			
CM4	46	5/49 L	8/37	8/47	22/13	22/46	22/48	23/05
CNNCT	5	4/14 L	13/09	23/15				
CNVERR	7	3/13 D	10/39					
CNVSTAT	48	5/39 L	10/08	10/37	20/32			
CONNECT	500	13/05 D	13/37	17/20	17/52	18/42	20/05	
		13/13	17/09	17/32	18/11	19/28	20/41	
DATAFLG	13	4/21 L	16/43	17/05	17/52			
DELAY	115	7/18 L	7/19	15/11	19/11			
DVCACT	34	5/31 L	15/15	15/22	19/15	19/22		
DVCCHN	0	4/08 L	7/07	23/22				
DVCERBTS	12	4/19 L	10/25					
DVCERMSK	11	4/18 L	10/22					
DVCNM	7	4/16 L	8/10	15/13	15/19	18/25	19/13	19/20
DVCREQ	30	5/28 L	15/14	19/14				21/01
DVCREQ1	611	15/12 L	23/29					
DVCREQ2	622	15/18 L	23/29					
DVCREQ3	1240	19/12 L	23/30					
DVCREQ4	1251	19/19 L	23/30					
DVCRSP	35	5/34 L	18/26	21/02				
DVCRSP1	1160	18/24 L	23/31					
DVCRSP2	1447	20/53 L	23/32					

PRINTER, CARD READER, AND PUNCH DRIVERS
SYMBOLIC REFERENCE TABLE.

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DVCSTAT	37	5/38 L	10/24	17/15	17/46	20/09	20/34
DVCHCNT	10	10/21	16/48	17/26	18/56	20/13	
ECTOCM	1	4/17 L	8/14				
EFLAG	35	3/05 D	15/29				
EJECTFLG	15	5/36 L	18/23	20/52			
EWAIT	516	4/23 L	15/53	16/09	16/12		
EWAITI	555	13/24 D	13/25	15/25	19/47		
FILLIN	1513	13/38	13/40	13/46 D			
FILLINL	1541	22/08 L					
FILLINX	1554	22/24 L	23/10				
FILLINI	1555	22/31	22/34 L				
FILLINZ	1575	22/14	22/15	22/18	22/33	22/35 L	
FIRSTDVC	2033	22/26	22/42	22/52 L			
GETCM	146	7/10	23/13	23/24	26/09 D		
GETCMI	166	8/05 D	8/16	8/18	15/04	15/28	18/27
GETCNVST	301	8/07	8/18 L			19/04	21/04
GETDVCS7	254	7/09	10/33 D	10/40	15/43	13/12	18/17
GETDVCS1	272	10/16 D	10/29	13/39	17/23	18/03	18/47
INTBIT	6	10/16	10/41	17/12	17/37	18/14	20/08
INTCHAN	11	4/15 L	10/05	23/21			
INTWAIT	236	3/17 D	8/52				
INTWAIT1	244	10/05 D	10/10	10/11	15/44	16/35	17/19
I.POINTS	22	10/07	10/09 L				
KILLETIME	457	3/18 D	22/08				
KILLTIME	457	11/09	11/21	12/04	12/15	12/46 D	12/48
LASTDVC	2033	13/04 D	26/06	26/07 D	26/07	26/08 D	26/09
MCLK1	523	13/07 L	23/33				
MCLK2	565	13/47 L	23/33				
MLOOP	100	7/07 L	7/21	7/40	13/52	15/17	19/17
MLOOPX	107	7/08	7/12 L	23/26			
NSET	124	7/26 D	7/26	7/28	13/35	20/04	
NPairs	38	22/19	23/37 D				
NXTACT	4	4/12 L	13/26	13/53	15/40	19/23	19/44
OLDESTATE	14	11/01	13/41	16/32	17/33	19/31	21/04
PAIRLIST	1642	4/22 L	15/47	15/49			
PCNTR	1	22/24	22/28	22/52	23/28 L	23/37	
PRNBSY	2	4/09 L	7/13	7/20	7/27	7/34	7/39
PRNDTASZ	17	3/24 D	17/16	17/61	18/51		
PRNENDOP	420	4/26 L					
PRNERBTS	1	3/25 D	17/27				
PRNERMSK	6011	3/27 D	26/07				
PRNFIN	1137	3/26 D	26/07				
PRNFINX	1157	17/02	18/11 L				
PRNTR	575	15/26	17/14	17/25	17/39	18/05	18/13
PRNTRD0Y	1202	17/11	17/22	17/34	18/02	18/09	18/16
PRNTRLP	607	15/04 L	26/07				
PRNTR1	655	15/42 L	15/34	15/36 L			
PRNTRIA	665	15/45					
PRNTR10	777	16/06	16/48 L				
PRNTR11	1022	17/06	17/09 L	17/28			

**PRINTER, CARD READER, AND PUNCH DRIVERS
SYMBOLIC REFERENCE TABLE.**

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PRINTER, CARD READER, AND PUNCH DRIVERS
SYMBOLIC REFERENCE TABLE.

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XMITFINL	353	11/19 L	11/22						
XMITFIN1	364	11/19	11/25 L						
XMITFIN2	365	11/20	11/26 L						
XMITFL1	373	11/29	11/31 L						
XMITLP	325	11/01 L	11/16						
XMITLP1	337	11/08 L	11/10						
XMITLP2	346	11/08	11/14 L						
XSET	133	7/32 D	7/35						
X0	10	5/08 L	20/25	20/36					
X1	11	5/09 L	11/14	14/01	16/52	20/23	20/31	22/25	
		7/14	11/48	14/03	16/53	20/27	20/33	22/29	
		7/15	13/42	16/03	20/01	20/29	20/35	22/34	
		11/04	13/44	16/04	20/03	20/30	22/22	22/40	
X2	12	5/10 L	11/51	12/09	22/20	22/24	22/28	22/52	23/06
X3	13	5/11 L	22/53	23/01	23/04	23/06			
X4	14	5/12 L	12/34	12/47	12/50				
X5	15	5/13 L	12/36	12/51					
YMIT	400	11/44 D	12/22	12/26	20/24				
YMITFAIL	450	12/06	12/17	12/24 L					
YMITLP	404	11/48 L	12/10						
YMITLP1	415	12/02 L	12/05						
YMITLP2	426	12/02	12/08 L						
YMITLP3	431	11/49	12/12 L						
YMITLP3A	433	12/13 L	12/16						
YMITLP3B	444	12/13	12/19 L						
YMITLP4	445	12/03	12/14	12/21 L					
ZRO	23	5/25 L	15/20	19/21					
.CMBUF1	1670	23/34 D	26/11						
.CMBUF2	1672	23/35 D	26/11						
.CMREQ1	1662	23/33 D	26/11						
.CMREQ2	1664	23/34 D	26/11						
.CMREQ3	1666	23/34 D	26/11						
.DVCREQ1	1642	23/38 D	26/11						
.DVCREQ2	1644	23/29 D	26/11						
.DVCREQ3	1646	23/29 D	26/11						
.DVCREQ4	1650	23/30 D	26/11						
.DVCRSP1	1652	23/30 D	26/11						
.DVCRSP2	1654	23/31 D	26/11						
.MCLOCK1	1655	23/32 D	26/11						
.MCLOCK2	1650	23/33 D	26/11						

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19.09.59. 08/11/71 SCOP32C OF 08/01/71

19.10.05.S: CM=16384/040000R AT CP= 0 SEC

19.10.07.NOMPASS,I=PDV,S=0.

19.10.39. ASSEMBLY COMPLETE.

19.10.42.END

19.10.46.COPYL,PPUCODE,LGO,TMPPPP

19.10.55. PDV UPDATED

19.10.59.COPYL DONE

19.10.59.END

19.11.04.FIN

19.11.04.\$1 USER CPU = 5.463 SEC

19.11.04.\$1 SCOPE CPU = 3.522 SEC

19.11.04.\$1 SCOPE ECS = 4.594 SEC

19.11.05.\$1 SCOPE SWAP= 8.047 SEC