

SIEMENS

Ausgabe 1980/81

**Monitor –
Editor –
Betriebssystem
Personal Computer
PC 100**

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Personal Computer PC100**

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Technische Dokumentation geben wir mit dem Ziel heraus, Sie beim Einsatz unserer Produkte zu unterstützen. Bei der Erarbeitung von Form und Inhalt der benötigten Information sind wir jedoch auch auf Ihre Hilfe angewiesen.

Wertvolle Mitarbeit bei der Verbesserung unserer Produktinformation können Sie durch Hinweise zu folgenden Fragen leisten:

1. Welche Begriffe oder Beschreibungen sind unverständlich?
2. Welche Ergänzungen und Erweiterungen schlagen Sie vor?
3. Wo haben sich inhaltliche Fehler eingeschlichen?
4. Welche Druckfehler haben Sie gefunden?

Antworten und sonstige Anregungen richten Sie bitte an:

Siemens Aktiengesellschaft
Unternehmensbereich Bauelemente
Vertrieb/Produktinformation
Balanstraße 73
8000 München 80

Zugehörige Druckschriften

Benötigen Sie zur Ergänzung Ihrer Informationen weitere technische Unterlagen, so fordern Sie bitte die aktuelle Angebotsliste „Produktinformation zum Thema Mikrocomputer“ an.

Die halbjährlich neu erscheinende Angebotsliste mit anhängender Bestellkarte bekommen Sie bei Ihrer nächstgelegenen Siemens-Dienststelle (siehe Geschäftsstellenverzeichnis).

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Balanstraße 73, D 8000 München 80**

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Monitor – Programmliste

LINE	#	LOC	CODE	LINE
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0003 0000 ;*****
0004 0000 ;*****
0005 0000 ;**
0006 0000 ;** PL-PA00-J004A **
0007 0000 ;**
0008 0000 ;**
0009 0000 ;**
0010 0000 ;**
0011 0000 ;** MONITOR PROGRAM LISTING **
0012 0000 ;**
0013 0000 ;**
0014 0000 ;**
0015 0000 ;**
0016 0000 ;** REVISION A JAN 11, 1979 **
0017 0000 ;**
0018 0000 ;*****
0019 0000 ;*****

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0021  0000
0022  0000
0023  0000
0024  0000
0025  0000
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LINE #	LOC	CODE	LINE
0027	0000	;	*****
0028	0000	;	* USER 6522 ADDRESSES (A000-A00F) *
0029	0000	;	*****
0030	0000		*=\$A000
0031	A000	UDRB	*=*+1 ;DATA REG B
0032	A001	UDRAH	*=*+1 ;DATA REG A
0033	A002	UDDBE	*=*+1 ;DATA DIR REG B
0034	A003	UDDRA	*=*+1 ;DATA DIR REG A
0035	A004	UT1L	*=*+1 ;TIMER 1 COUNTER LOW
0036	A005	UT1CH	*=*+1 ;TIMER 1 COUNTER HIGH
0037	A006	UT1LL	*=*+1 ;TIMER 1 LATCH LOW
0038	A007	UT1LH	*=*+1 ;TIMER 1 LATCH HIGH
0039	A008	UT2L	*=*+1 ;TIMER 2 LATCH & COUNTER LOW
0040	A009	UT2H	*=*+1 ;TIMER 2 COUNTER HIGH
0041	A00A	USR	*=*+1 ;SHIFT REGISTER
0042	A00B	UACR	*=*+1 ;AUX CONTROL REGISTER
0043	A00C	UPCR	*=*+1 ;PERIPHERAL CONTROL REGISTER
0044	A00D	UIFR	*=*+1 ;INTERRUPT FLAG REGISTER
0045	A00E	UIER	*=*+1 ;INTERRUPT ENABLE REGISTER
0046	A00F	UDRA	*=*+1 ;DATA REGISTER A

MONITOR VARIABLES PA00-J004APAGE 0003

LINE #	LOC	CODE	LINE
0048	A010	ASSEM	=\$D000 ;ASSEMBLER ENTRY
0049	A010	BASIE	=\$B000 ;BASIC ENTRY (COLD)
0050	A010	BASIRE	=\$E003 ;BASIC REENTRY (WARM)
0052	A010		; MONITOR RAM
0053	A010		;TEXT EDITOR EQUATES (PAG 0)
0054	A010		;OVERLAPS TABUF2+50 (TAPE OUTPUT BUFFER \$AD-\$FF)
0055	A010		X=\$00DF
0056	00DF	NOWL	N *X+2 ;CURRENT LINE
0057	00E1	BOTL	N *X+2 ;LAST ACTIVE , SO FAR
0058	00E3	TEXT	N *X+2 ;LIMITS OF BUFFER (START)
0059	00E5	END	N *X+2 ;LIMITS OF BUFFER (END)
0060	00E7	SAVE	N *X+2 ;USED BY REPLACE
0061	00E9	OLDLEN	N *X+1 ;ORIG LENGTH
0062	00EA	LENGTH	N *X+1 ;NEW LENGTH
0063	00EB	STRING	N *X+20 ;FIND STRING
0065	00FF		X=\$0100
0066	0100		;BREAKPOINTS AND USER I/O HANDLERS
0067	0100	BKS	N *X+8 ;BRK LOCATIONS
0068	0108	UIN	N *X+2 ;USER INPUT HANDLER (VECTOR)
0069	010A	UOUT	N *X+2 ;USER OUTPUT HANDLER (VECTOR)
0071	010C		;UNUSED KEYS TO GO TO USER ROUTINE
0072	010C	KEYF1	N *X+3 ;USER PUTS A JMP INSTRUCTION TO...
0073	010F	KEYF2	N *X+3 ;GO TO HIS ROUTINE ON EITHER KEY...
0074	0112	KEYF3	N *X+3 ;ENTRY
0076	0115		;EQUATES FOR DISASSEMBLER (PAG 1)
0077	0115		X=\$0116 ;SAME AS TAPE BUFFER I/O (TABUFF)
0078	0116	FORM	N *X+1
0079	0117	LMNEM	N *X+1
0080	0118	RMNEM	N *X+14
0082	0126		;EQUATES FOR MNEMONIC ENTRY
0083	0126	MOVAD	N *X+8
0084	012E	TYPE	N *X+2
0085	0130	TMASK1	=MOVAD
0086	0130	TMASK2	=MOVAD+1
0087	0130	CH	N *X+3
0088	0133	ADFLD	N *X+20
0089	0147	HISTM	=\$A42E ;SHARE WITH NAME & HIST
0090	0147	BYTESM	=HISTM+1
0091	0147	TEMPX	=HISTM+3
0092	0147	TEMPA	=HISTM+5
0093	0147	OPCODE	=HISTM+6
0094	0147	CODFLG	=HISTM+9
0096	0147		; *****
0097	0147		; * 6532 ADDRESSES (A400-A7FF) *
0098	0147		; *****
0099	0147		X=\$A400
0100	A400	MONRAM	N *X
0101	A400		;JUMP VECTORS
0102	A400	IRQV4	N *X+2 ;IRQ AFTER MONITOR (NO BRK)

MONITOR VARIABLES PA00-J004A PAGE 0004

LINE #	LOC	CODE	LINE
0103	A402	NMIV2	*==X+2 ;NMI
0104	A404	IRGV2	*==X+2 ;IRQ
0106	A406	;I/O DEVICES	
0107	A406	DILINK	*==X+2 ;DISPL LINKAGE (TO ECHO TO DISP)
0108	A408	TSPEED	*==X+1 ;TAPE SPEED (C7,5B,5A)
0109	A409	GAP	*==X+1 ;TIMING GAP BETWEEN BLOCKS
0110	A40A	;END OF USER ALTERABLE LOCATIONS	
0111	A40A	NPUL	*==X+1 ;# OF HALF PULSES...
0112	A40B	TIMG	*==X+3 ;FOR TAPE
0113	A40E	REGF	*==X+1 ;REGS FLG FOR SINGLE STEP MODE
0114	A40F	DISFLG	*==X+1 ;DISASSEM FLG FOR SINGLE STEP MODE
0115	A410	BKFLG	*==X+1 ;ENABLE OR DIS BREAKPOINTS
0116	A411	PRIFLG	*==X+1 ;ENABLE OR DIS PRINTER
0117	A412	INFLG	*==X+1 ;INPUT DEVICE
0118	A413	OUTFLG	*==X+1 ;OUTPUT DEVICE
0119	A414	HISTP	*==X+1 ;HISTORY PTR (SINGLE STEP) (Y)
0120	A415	CURPO2	*==X+1 ;DISPLAY POINTER
0121	A416	CURPOS	*==X+1 ;PRINTER POINTER
0122	A417	CNTH30	*==X+1 ;BAUD RATE &...
0123	A418	CNTL30	*==X+1 ;DELAY FOR TTY
0124	A419	COUNT	*==X+1 ;# OF LINES (0-99)
0125	A41A	S1	*==X+2 ;START ADDRESS
0126	A41C	ADDR	*==X+2 ;END ADDRESS
0127	A41E	CKSUM	*==X+2 ;CHECKSUM
0128	A420	S2	=BKS+6 ;VERTICAL COUNT (ONLY ON DUMP)
0130	A420	;MONITOR REGISTERS	
0131	A420	SAVPS	*==X+1 ;STATUS
0132	A421	SAVA	*==X+1 ;ACCUM
0133	A422	SAVX	*==X+1 ;X REG
0134	A423	SAVY	*==X+1 ;Y REG
0135	A424	SAVS	*==X+1 ;STACK POINTER
0136	A425	SAVPC	*==X+2 ;PROGR COUNTER
0138	A427	;WORK AREAS FOR PAGE ZERO SIMULATION	
0139	A427	;SIMULATE LDA (NNNN),Y ,WHERE NNNN IS ABSOLUTE	
0140	A427	STIY	*==X+3 ;STA NM,Y
0141	A42A	CPIY	*==X+3 ;CMP NM,Y OR LDA NM,Y
0142	A42D		*==X+1 ;RTS
0143	A42E	LDIY	=CPIY ;LDA NM,Y
0145	A42E	;VARIABLES FOR TAPE	
0146	A42E	NAME	*==X+6 ;FILE NAME
0147	A434	TAPIN	*==X+1 ;IN FLG (TAPE 1 OR 2)
0148	A435	TAPOUT	*==X+1 ;OUT FLG (TAPE 1 OR 2)
0149	A436	TAPTR	*==X+1 ;TAPE BUFF POINTER
0150	A437	TAPTR2	*==X+1 ;TAPE OUTPUT BUFF PTR
0151	A438	HIST	=NAME ;FOUR LAST ADDR + NEXT (SINGL STEP)
0152	A438	BLK	=0115 ;BLOCK COUNT
0153	A438	TABUFF	=0116 ;TAPE BUFFER (I/O)
0154	A438	BLKO	=0168 ;OUTPUT BLOCK COUNT
0155	A438	TABUF2	=00AD ;OUTPUT BUFF WHEN ASSEMB (PAG0)
0156	A438	DIBUFF	*==X+40 ;DISPLAY BUFFER

MONITOR VARIABLES PA00-J004APAGE 0005

LINE #	LOC	CODE	LINE
0158	A460		;VARIABLES USED IN PRINTING
0159	A460	IBUFM *:=*+20	;PRINTER BUFFER
0160	A474	IDIR *:=*+1	;DIRECTION == 0=>+ , FF=>-
0161	A475	ICOL *:=*+1	;COLUMN LEFTMOST=0,RIGHTMOST=4
0162	A476	IOFFST *:=*+1	;OFFSET 0=LEFT DGT,1=RIGHT DGT
0163	A477	IDOT *:=*+1	;# OF LAST DOT ENCOUNTERED
0164	A478	IOUTL *:=*+1	;LOWER 8 OUTPUTS(8 COLS ON RIGHT)
0165	A479	IOUTU *:=*+1	;UPPER 2 DIGITS
0166	A47A	IBITL *:=*+1	;1 BIT MSK FOR CURRENT OUTPUT
0167	A47B	IBITU *:=*+1	
0168	A47C	IMASK *:=*+1	;MSK FOR CURRENT ROW
0169	A47D	JUMP *:=*+2	;INDIR & ADDR OF TABL FOR CURR ROW
0171	A47F		;VARIABLES FOR KEYBOARD
0172	A47F	ROLLFL *:=*+1	;SAVE LAST STROBE FOR ROLLOVER
0173	A480	KMASK =CPIY	;TO MASK OFF CTRL OR SHIFT
0174	A480	STEKEY =CPIY+1	;STROBE KEY (1-8 COLUMNS)
0176	A480		; I/O ASSIGNMENT
0177	A480	*:=\$A480	
0178	A480	DRA2 *:=*+1	;DATA REG A
0179	A481	DDRA2 *:=*+1	;DATA DIR REG A
0180	A482	DRE2 *:=*+1	;DATA REG B
0181	A483	DDRE2 *:=*+1	;DATA DIR REG B
0183	A484		; WRITE EDGE DETECT CONTROL (NOT USED BECAUSE KB)
0184	A484	*:=\$A484	
0185	A484	DNPA7 *:=*+1	;DISABLE PA7 INT ,NEG EDG DET
0186	A485	DPFA7 *:=*+1	;DIS PA7 INT ,POS EDGE DETE
0187	A486	ENPA7 *:=*+1	;ENA PA7 INT ,NEG EDG DETE
0188	A487	EPFA7 *:=*+1	;ENA PA7 INT ,POS EDG DET
0190	A488		; READ AND CLEAR INTERRUPT
0191	A488	*:=\$A485	
0192	A485	RINT *:=*+1	;BIT 7=TIMER FLG , BIT 6=PA7 FLG
0194	A486		; TIMER INTERRUPT
0195	A486	*:=\$A494	
0196	A494		;WRITE COUNT TO INTERVAL TIMER
0197	A494		;INTERRUPT DISABLE FOR THESE ADDR
0198	A494	DIV1 *:=*+1	;DIV BY 1 (DISABLE);ADD 8 TO ENA
0199	A495	DIV8 *:=*+1	;DIV BY 8 (DIS) ; ADD 8 TO ENA
0200	A496	DIV64 *:=*+1	;DIV BY 64 (DIS) ; ADD 8 TO ENA
0201	A497	DI1024 *:=*+1	;DIV BY 1024 (DIS) ; ADD 8 TO ENA
0203	A498		; *****
0204	A498	; *	4522 ADDRESSES (MONIT) (A800-ABFF) *
0205	A498	; *****	
0206	A498	*:=\$A800	
0207	A800	DRE *:=*+1	;DATA REG B
0208	A801	DRAH *:=*+1	;DATA REG A
0209	A802	DDRB *:=*+1	;DATA DIR REG B
0210	A803	DDRA *:=*+1	;DATA DIR REG A
0211	A804	TIL *:=*+1	;TIMER 1 COUNTER LOW
0212	A805	TICH *:=*+1	;TIMER 1 COUNTER HIGH

LINE #	LOC	CODE	LINE
0213	A806	TILL	*==*+1 ;TIMER 1 LATCH LOW
0214	A807	TILH	*==*+1 ;TIMER 1 LATCH HIGH
0215	A808	T2L	*==*+1 ;TIMER 2 LATCH & COUNTER LOW
0216	A809	T2H	*==*+1 ;TIMER 2 COUNTER HIGH
0217	A80A	SR	*==*+1 ;SHIFT REGISTER
0218	A80E	ACR	*==*+1 ;AUX CONTROL REGISTER
0219	A80C	PCR	*==*+1 ;PERIPHERAL CONTROL REGISTER
0220	A80D	IFR	*==*+1 ;INTERRUPT FLAG REGISTER
0221	A80E	IER	*==*+1 ;INTERRUPT ENABLE REGISTER
0222	A80F	DRA	*==*+1 ;DATA REGISTER A
0224	A810		;DEFINE I/O CONTROL FOR PCR (CA1,CA2,CB1,CB2)
0225	A810	DATIN	=\$0E ;DATA IN CA2=1
0226	A810	DATOUT	=\$0C ;DATA OUT CA2=0
0227	A810	PRST	=\$00 ;PRINT START (CB1),NEG DETEC
0228	A810	SP12	=\$01 ;STROBE P1,P2 (CA1),POS DETEC
0229	A810	MON	=\$C0 ;MOTOR ON (CB2=0)
0230	A810	MOFF	=\$E0
0231	A810		;MSKS TO OBTAIN EACH INTERRUPT
0232	A810	MFRST	=\$10 ;INT FLG FOR CB1
0233	A810	MSP12	=\$02 ;INT FLG FOR CA1
0234	A810	MT2	=\$20 ;INT FLG FOR T2
0236	A810		;DEFINE I/O CONTROL FOR ACR (TIMERS,SR)
0237	A810	PRTIME	=1700 ; PRINTING TIME =1.7 MSEC
0238	A810	DEBTIM	=5000 ; DEBOUNCE TIME (5 MSEC)
0239	A810	T2I	=\$00 ;T2 AS ONE SHOT (PRI,KB,TTY,TAPE)
0240	A810	T1I	=\$00 ;T1 AS ONE SHOT,PB7 DIS (TAPES)
0241	A810	T1FR	=\$C0 ;T1 IN FREE RUNNING (TAPE)
0243	A810		; *****
0244	A810		; * DISPLAY (AC00-AFFF) *
0245	A810		; *****
0246	A810		; REGISTERS FOR DISPLAY (6520)
0247	A810		*=\$AC00
0248	AC00	RA	*==*+1 ;REGISTER A
0249	AC01	CRA	*==*+1 ;CONTROL REG A
0250	AC02	RB	*==*+1 ;REG B
0251	AC03	CRB	*==*+1 ;CONTROL REG B
0253	AC04		;CHR 00-03 ENA BY \$AC04-AC07
0254	AC04		;CHR 04-07 ENA BY \$AC08-AC0B
0255	AC04		;CHR 08-11 ENA BY \$AC10-AC13
0256	AC04		;CHR 12-15 ENA BY \$AC20-AC23
0257	AC04		;CHR 16-19 ENA BY \$AC40-AC43
0259	AC04	NULLC	=\$FF
0260	AC04	CR	=\$0D
0261	AC04	LF	=\$0A
0262	AC04	ESCAPE	=\$1B
0263	AC04	RUB	=\$08
0264	AC04	EQS	=\$E0
0265	AC04		.FILE A1

MONITOR MESSAGES PA00-J004A.....PAGE 0007

LINE	#	LOC	CODE	LINE
0267	AC04			; E=ENTER EDITOR
0268	AC04			; T=RE-ENTER EDITOR TO RE-EDIT SOURCE
0269	AC04			; R=SHOW REGISTERS
0270	AC04			; M=DISPLAY MEMORY
0271	AC04			; =SHOW NEXT 4 ADDRESSES
0272	AC04			; G=GO AT CURRENT P.C. <COUNT>
0273	AC04			; /=ALTER CURRENT MEMORY
0274	AC04			; L=LOAD OBJECT
0275	AC04			; D=DUMP OBJECT
0276	AC04			; N=ASSEMBLE
0277	AC04			; *=ALTER P.C.
0278	AC04			; A=ALTER ACCUMULATOR
0279	AC04			; X=ALTER X REGISTER
0280	AC04			; Y=ALTER Y REGISTER
0281	AC04			; F=ALTER PROCESSOR STATUS
0282	AC04			; S=ALTER STACK POINTER
0283	AC04			; B=SET BREAK ADDR
0284	AC04			; ?=SHOW BREAK ADDRESSES
0285	AC04			; #=CLEAR BREAK ADDRESSES
0286	AC04			; H=SHOW TRACE HISTORY STACK
0287	AC04			; V=TOGGLE REGISTER PRINT WITH DIS.
0288	AC04			; Z=TOGGLE DISASSEMBLER TRACE
0289	AC04			; \=TURN ON/OFF PRINTER
0290	AC04			; =ADV PAPER
0291	AC04			; I=MNEMONIC ENTRY
0292	AC04			; K=DISASSEMBLE MEMORY
0293	AC04			; 1=TOGGLE TAPE 1 CONTRL (ON OR OFF)
0294	AC04			; 2=TOGGLE TAPE 2 CONTRL
0295	AC04			; 3=VERIFY CKSUM FOR TAPES
0296	AC04			; 4=ENABLE BREAKS
0297	AC04			; 5=BASIC ENTRY (COLD)
0298	AC04			; 6=BASIC REENTRY (WARM)
0299	AC04			;
0300	AC04			; FOLLOWING KEYS ARE UNUSED BUT 'HOOKS'
0301	AC04			; ARE PROVIDED IN LOCATIONS 010C-0114
0302	AC04			;
0303	AC04			; KEYF1,KEYF2,KEYF3
0305	AC04			x=\$E000
0306	E000			; ALL MSGS HAVE MSB=1 OF LAST CHAR TO END IT
0307	E004	46 52		M1 .BYT 'FROM',EQS
0308	E005	54 4F		M3 .BYT 'TO',EQS
0308	E007	ED		
0309	E008	20 2A		M4 .BYT ' **** PS AA XX YY S',\$D3
0309	E018	D3		
0310	E01C	4D 4F		M5 .BYT 'MORE',\$BF
0310	E020	BF		
0311	E021	4F 4E		M6 .BYT 'ON',\$A0 ;'ON '
0311	E023	A0		
0312	E024	4F 46		M7 .BYT 'OF',\$C6 ;'OFF'
0312	E026	C6		
0313	E027	42 52		M8 .BYT 'BR',\$CB ;'BRK'
0313	E029	CB		

MONITOR MESSAGES PA00-J004A PAGE 0008

LINE #	LOC	CODE	LINE	
0314	E02A	49 4E	M9	.BYT 'IN',EQS
0314	E02C	BD		
0315	E02D	4F 55 54	M10	.BYT 'OUT',EQS
0315	E030	BD		
0316	E031	20 4D	M11	.BYT ' MEM FAIL',%A0
0316	E03A	A0		
0317	E03B	20 50	M12	.BYT ' PRINTER DOW',%CE
0317	E047	CE		
0318	E048	20 53	TMSG0	.BYT ' SRCH'
0319	E04D	20 46	TMSG1	.BYT ' F',EQS
0319	E04F	BD		
0320	E050	54	TMSG2	.BYT 'T',EQS
0320	E051	BD		
0321	E052	A0	TMSG3	.BYT %A0,%C5,%D2,%D2 ;PRINT ' ERROR' ,MSB=1
0321	E053	C5		
0321	E054	D2		
0321	E055	D2		
0322	E056	CF		.BYT %CF,%D2,%A0,%A0,%A0,%A0,%A0,%A0,','
0322	E057	D2		
0322	E058	A0		
0322	E059	A0		
0322	E05A	A0		
0322	E05B	A0		
0322	E05C	A0		
0322	E05D	A0		
0322	E05E	3B		
0323	E05F	41	TMSG5	.BYT 'A',EQS
0323	E060	BD		
0324	E061	42 4C	TMSG6	.BYT 'BLK=',%A0
0324	E065	A0		
0325	E066	A0	TMSG7	.BYT %A0,%CC,%CF,%C1,%C4,','
0325	E067	CC		
0325	E068	CF		
0325	E069	C1		
0325	E06A	C4		
0325	E06B	3B		
0326	E06C	45 44	EMSG1	.BYT 'EDIT0',%D2 ;EDITOR MESSAGES
0326	E071	D2		
0327	E072	45 4E	EMSG2	.BYT 'EN',%C4
0327	E074	C4		

INTERRUPT HANDLING PA00-J004A.....PAGE 0009

LINE #	LOC	CODE	LINE
0329	E075		;VECTORS COME HERE FIRST AFTER JUMP THRU FFFA-FFFF
0330	E075	6C 02 A4	NMI01 JMP (NMI02) ;NMI02 IS A VECTOR TO NMI03
0331	E078	6C 04 A4	IRQ01 JMP (IRQ02) ;IRQ02 IS A VECTOR TO IRQ03
0333	E078		;SINGLE STEP ENTRY POINT (NMI)
0334	E07B	8D 21 A4	NMI03 STA SAVA ;SAVE ACCUM
0335	E07E	60	PLA
0336	E07F	8D 20 A4	STA SAVPS ;SAVE PROCESSOR STATUS
0337	E082	D8	CLD
0338	E083	8E 22 A4	STX SAVX ;SAVE X
0339	E086	8C 23 A4	STY SAVY
0340	E089	68	PLA
0341	E08A	8D 25 A4	STA SAVPC ;PROGRAM COUNTER
0342	E08D	68	PLA
0343	E08E	8D 26 A4	STA SAVPC+1
0344	E091	8A	TSX ;GET STACK PTR & SAVE IT
0345	E092	8E 24 A4	STX SAVS
0346	E095		;TRACE THE ADDRESS
0347	E095	AC 14 A4	LDY HISTP ;GET POINTER TO HISTORY STACK
0348	E098	AD 26 A4	LDA SAVPC+1 ;SAVE HALT ADDR IN HISTORY STACK
0349	E09E	99 2E A4	STA HIST,Y
0350	E09E	AD 25 A4	LDA SAVPC
0351	E0A1	99 2F A4	STA HIST+1,Y
0352	E0A4	20 88 E6	JSR NHIS ;UPDATE POINTER
0353	E0A7	AD 10 A4	LDA BKFLG ;SOFT BREAKS ON?
0354	E0AA	F0 08	BEG NMIS ;NO ,DONT CHK BKRPNT LIST
0355	E0AC	20 68 E7	JSR CKE ;CHECK BREAKPOINT LIST
0356	E0AF	90 03	BCC NMIS ;DID NOT HIT BREAKPOINT
0357	E0B1	4C 7F E1	NMI4 JMP IRQ02 ;HIT A BREAK-TRAP TO MONITOR
0358	E0B4	20 90 E7	NMI5 JSR DONE ;COUNT =0 ?
0359	E0B7	F0 F8	BEG NMI4 ;YES,TRAP TO MONITOR
0360	E0B9	20 87 E9	JSR RCHK ;CHK IF HE WANTS TO INTERR
0361	E0BC	4C 6D E2	JMP G0BK ;NOT DONE-RESUME EXECUTION
0363	E0EF		;POWER UP AND RESET ENTRY POINT (RST TRANSFERS HERE)
0364	E0EF	D8	RST CLD ;CLEAR DEC MODE
0365	E0F0	78	SEI ;DISABLE INTERRUPT
0366	E0F1	A2 FF	LDX #FFF ;INIT STACK PTR
0367	E0F3	9A	TXS
0368	E0F4	8E 24 A4	STX SAVS ;ALSO INIT SAVED STACK PTR
0369	E0F7		;INITIALIZE 6522
0370	E0C7	A2 0E	LDX #14
0371	E0C9	8D 43 E7	RS1 LDA INTAB1,X ;PB1-PB0,PA2-PA0 FOR PRNTR
0372	E0CC	9D 00 A8	STA DRB,X ;PB2=ITO,PB6=TTI
0373	E0CF	CA	DEX ;PB4-PB5=TAPE CONTROL,PB7=DATA
0374	E0D0	10 F7	BPL RS1 ;PB3 =SWITCH KB/TTY
0375	E0D2		;INITIALIZE 6532
0376	E0D2	A2 03	LDX #3 ;PORTS USED FOR KB
0377	E0D4	8D 52 E7	RS2 LDA INTAB2,X ;PA0-PA7 AS OUTPUT
0378	E0D7	9D 80 A4	STA DRA2,X ;PB0-PB7 AS INPUT
0379	E0DA	CA	DEX
0380	E0DC	10 F7	BPL RS2
0381	E0DD		;INITIALIZE MONITOR RAM (6532)
0382	E0DD	AD 56 E7	LDA INTAB3 ;CHECK IF NMI02 HAS BEEN CHANGED

INTERRUPT HANDLING PA00-J004APAGE 0010

LINE	#	LOC	CODE	LINE	
0383	E0E0	CD 02 A4		CMF NMIV2	IF IT HAS THEN ASSUME A COLD
0384	E0E3	D0 0C		BNE RS3A	START AND INITIALIZE EVERYTHING
0385	E0E5	AD 57 E7		LDA INTAB3+1	
0386	E0E8	CD 03 A4		CMF NMIV2+1	
0387	E0EB	D0 04		BNE RS3A	
0388	E0ED	A2 10		LDX #16	THEY ARE EQUAL ,IT'S A WARM RESET
0389	E0EF	D0 02		BNE RS3	
0390	E0F1	A2 00	RS3A	LDX #0	INIT EVERYTHING (POWER UP)
0391	E0F3	ED 56 E7	RS3	LDA INTAB3+X	
0392	E0F6	9D 02 A4		STA NMIV2+X	
0393	E0F9	E8		INX	
0394	E0FA	E0 15		CFX #21	
0395	E0FC	9D F5		BCC RS3	
0396	E0FE				INITIALIZE DISPLAY (6520)
0397	E0FE	A9 00		LDA #0	SET CONTR REG FOR DATA DIR REG
0398	E100	A2 01		LDX #1	
0399	E102	20 13 E1		JSR SETREG	
0400	E105	A9 FF		LDA #FF	SET DATA DIR REG FOR OUTPUT
0401	E107	CA		DEX	
0402	E108	20 13 E1		JSR SETREG	
0403	E10B	A9 04		LDA #404	SET CONTR REG FOR PORTS
0404	E10D	E8		INX	
0405	E10E	20 13 E1		JSR SETREG	
0406	E111	D0 07		BNE RS3B	
0407	E113	9D 00 AC	SETREG	STA RA+X	
0408	E116	9D 02 AC		STA RB+X	
0409	E119	60		RTS	
0410	E11A	58	RS3B	CLI	CLEAR INTERRUPT
0412	E11B				KB/TTY SWITCH TEST AND BIT RATE MEASUREMENT
0413	E11B	A9 08		LDA #08	PB3=SWITCH KB/TTY
0414	E11D	2C 00 A8	RS4	BIT DRB	AM ,PB6-> V (OVERFLOW FLG)
0415	E120	D0 22		BNE RS7	BRNCH ON KB
0416	E122	70 F9		BVS RS4	START BIT=PB6=0?
0417	E124	A9 FF		LDA #FF	YES ,INITIALIZE TIMER T2
0418	E126	8D 09 A8		STA T2H	
0419	E129	2C 00 A8	RS5	BIT DRB	END OF START BIT ?
0420	E12C	50 FB		BVC RS5	NO ,WAIT UNTIL PB6 BACK TO 1
0421	E12E	AD 09 A8		LDA T2H	STORE TIMING
0422	E131	49 FF		EOR #FF	COMPLEMENT
0423	E133	8D 17 A4		STA CNTH30	
0424	E136	AD 08 A8		LDA T2L	
0425	E139	49 FF		EOR #FF	
0426	E13B	20 7C FE		JSR PATCH1	ADJUST IT
0427	E13E	20 13 EA	RS6	JSR CRL0W	CLEAR DISPLAY
0428	E141	4C 72 FF		JMP PAT21	
0429	E144	A2 13	RS7	LDX #19	CLEAR HARDWARE CURSORS
0430	E146	8A	RS8	TXA	
0431	E147	48		PHA	
0432	E148	A9 00		LDA #0	
0433	E14A	20 7B EF		JSR OUTDD1	
0434	E14D	68		PLA	
0435	E14E	AA		TAX	
0436	E14F	CA		DEX	
0437	E150	10 F4		BPL RS8	

INTERRUPT HANDLING PA00-J004A.....PAGE 0011

LINE #	LOC	CODE	LINE
0438	E152	30 EA	BMI RS6
0440	E154		;BRK INSTR (00) OR IRQ ENTRY POINT
0441	E154	8D 21 A4	IRQV3 STA SAVA
0442	E157	68	PLA
0443	E158	48	PHA ;GET STATUS
0444	E159	29 10	AND #\$10 ;SEE IF 'BRK' , ISOLATE B FLG
0445	E15B	D0 06	BNE IRQ1 ;TRAP WAS CAUSED BY 'BRK' INSTRU
0446	E15D	AD 21 A4	LDA SAVA ;TRAP CAUSED BY IRQ SO TRANSFER
0447	E160	6C 00 A4	JMP (IRQV4) ;CONTROL TO USER THRU VECTOR
0448	E163		;IS 'BRK' INSTR ,SHOW PC & DATA
0449	E163		;PC IS OFF BY ONE , SO ADJUST IT
0450	E163	68	IRQ1 PLA
0451	E164	8D 20 A4	STA SAVPS ;SAVE PROCESSOR STATUS
0452	E167	8E 22 A4	STX SAVX
0453	E16A	8C 23 A4	STY SAVY
0454	E16D	D8	CLD
0455	E16E	68	PLA ;PROGR CNTR
0456	E16F	38	SEC ;SUBTRACT ONE FROM RETURN ADDR
0457	E170	E9 01	SEC #1
0458	E172	8D 25 A4	STA SAVPC
0459	E175	68	PLA
0460	E176	E9 00	SEC #0
0461	E178	8D 26 A4	STA SAVPC+1
0462	E17B	EA	TSX ;GET STACK PTR & SAVE IT
0463	E17C	8E 24 A4	STX SAVS
0464	E17F		;SHOW PC AND DATA
0465	E17F	20 61 F4	IRQ2 JSR REGQ ;SHOW NEXT INSTRUCTION & CONTINUE

LINE #	LOC	CODE	LINE
0467	E182		;THIS ROUTINE WILL GET A CHR WITH "< >" FROM
0468	E182		;KB/TTY & THEN WILL GO TO THE RESPECTIVE COMMAND
0469	E182	4C 59 FF	START JMP PAT19 ;CLEAR DEC MODE & <CR>
0470	E185	A9 BC	STA1 LDA #BC ;'<' CHR WITH MSB=1 FOR DISP
0471	E187	20 7A E9	JSR OUTPUT
0472	E18A	20 96 FE	JSR RED1 ;GET CHR & ECHO FROM KB/TTY
0473	E18D	48	PHA
0474	E18E	A9 3E	LDA #'>
0475	E190	20 7A E9	JSR OUTPUT
0476	E193	68	PLA
0477	E194	A2 20	LDX #MCNT ;SCAN LIST OF CMDS FOR ENTERED CHR
0478	E196	DD C4 E1	MCM2 CMP COMB,X ;COUNT OF COMMANDS
0479	E199	F0 11	BEQ MCM3 ;CHECK NEXT COMMAND IN LIST
0480	E19B	CA	DEX ;MATCH , SO PROCESS THIS COMMAND
0481	E19C	10 F8	BFL MCM2
0482	E19E		;IS BAD COMMAND
0483	E19E	20 D4 E7	JSR RM
0484	E1A1	D8	COMIN CLD
0485	E1A2	20 FE E8	JSR LL
0486	E1A5	AE 24 A4	LDX SAVS
0487	E1A8	9A	TXS
0488	E1A9	4C 82 E1	JMP START
0489	E1AC		;HAVE VALID COMMAND
0490	E1AC	8A	MCM3 TXA ;CONVERT TO WORD (MULT BY 2)
0491	E1AD	0A	ASL A ;2 BYTES (ADDR)
0492	E1AE	AA	TAX
0493	E1AF	8D E5 E1	LDA MONCOM,X ;GET ADDRESS OF COMMAND PROCESSOR
0494	E1B2	8D 7D A4	STA JUMP
0495	E1B5	8D E6 E1	LDA MONCOM+1,X
0496	E1B8	8D 7E A4	STA JUMP+1
0497	E1BB	20 C1 E1	JSR JMPR ;CMD PROCESSORS CAN EXIT WITH 'RTS
0498	E1BE	4C 92 E1	JMP START
0499	E1C1	6C 7D A4	JMPR JMP (JUMP) ;GO TO COMMAND
0501	E1C4		;VALID COMMANDS
0502	E1C4		MCNT=32 ;COUNT
0503	E1C4	45 54	COMB ,BYT 'ETRMG/LDN*XYPS '
0504	E1D4	42 3F	,BYT 'B?#HVZIK123456C J', \$5E
0504	E1E4	5E	
0506	E1E5	39 F6	MONCOM ,WOR EDIT,REENTR,REG,MEM,GO
0506	E1E7	CF F6	
0506	E1E9	27 E2	
0506	E1EB	48 E2	
0506	E1ED	61 E2	
0507	E1EF	A0 E2	,WOR CHNGG,LOAD,DUMP,ASSEM,CGFC,CGA
0507	E1F1	E6 E2	
0507	E1F3	3B E4	
0507	E1F5	00 D0	
0507	E1F7	D4 E5	
0507	E1F9	EE E5	
0508	E1FB	F2 E5	,WOR CGX,CGY,CGFS,CGS,NXTS,BRKA
0508	E1FD	F6 E5	
0508	E1FF	EA E5	

LINE	* LOC	CODE	LINE
0508	E201	FA E5	
0508	E203	0D E6	
0508	E205	1B E6	
0509	E207	4D E6	.WOR SHOW,CLREK,SHIS,REGT,TRACE
0509	E209	FE E6	
0509	E20B	65 E6	
0509	E20D	D9 E6	
0509	E20F	DD E6	
0510	E211	9E FB	.WORD MNEENT,KDISA,TOGTA1,TOGTA2,VECKSM
0510	E213	0A E7	
0510	E215	BD E6	
0510	E217	CB E6	
0510	E219	94 E6	
0511	E21B	E5 E6	.WORD BRKK,BASIEB,BASIRE
0511	E21D	00 B0	
0511	E21F	03 B0	
0512	E221		;USER DEFINED FUNCTIONS
0513	E221	0C 01	.WOR KEYF1,KEYF2,KEYF3
0513	E223	0F 01	
0513	E225	12 01	

LINE	* LOC	CODE	LINE
0515	E227		***** R COMMAND-DISPLAY REGISTERS *****
0516	E227	20 13 EA	REG JSR CRL0W ;CLEAR DISP IF KB
0517	E22A	A0 08	LDY #M4-M1 ;MESSAG & <CR>
0518	E22C	20 AF E7	JSR KEP
0519	E22F	20 24 EA	JSR CRCK
0520	E232	20 3E E8	REG1 JSR BLANK
0521	E235	A0 09	LDY #SAVPC-ADDR ;OUTPUT PGR CNTR (SAVPC+1,SAVPC)
0522	E237	20 DD E2	JSR WRITAD
0523	E23A	A9 20	LDA #<SAVPS ;NOW THE OTHER 5 REGS
0524	E23C	8D 1C A4	STA ADDR
0525	E23F	A9 A4	LDA #>SAVPS
0526	E241	8D 1D A4	STA ADDR+1
0527	E244	A2 05	LDX #5 ;COUNT
0528	E246	D0 07	BNE MEM1 ;SHARE CODE
0530	E248		***** M COMMAND-DISPLAY MEMORY *****
0531	E248	20 AE EA	MEM JSR ADDIN ;GET START ADDRESS IN ADDR
0532	E24E	B0 13	BCC MEM3
0533	E24D	A2 04	MEIN LDX #4
0534	E24F	A0 00	MEM1 LDY #0
0535	E251	20 3E E8	MEM2 JSR BLANK
0536	E254	A9 1C	LDA #<ADDR
0537	E256	20 58 E8	JSR LDAY ;LOAD CONTENTS OF CURR LOCATION
0538	E259	20 46 EA	JSR NUMA ;AND DISPLAY IT AS 2 HEX DIGITS
0539	E25C	C8	INY
0540	E25D	CA	DEX ;DECR COUNTER
0541	E25E	D0 F1	BNE MEM2
0542	E260	60	MEM3 RTS ;GET NEXT COMMAND
0544	E261		***** G COMMAND-RESTART PROCESSOR *****
0545	E261	20 37 E8	GO JSR PSL1 ;"/"
0546	E264	20 85 E7	JSR GCNT ;GET COUNT
0547	E267	20 F0 E9	JSR CRLF
0548	E26A	4C 86 E2	JMP GOBK1 ;RESUME EXECUTION
0549	E26D	AD 0E A4	GOBK LDA REGF ;DISPLAY REGISTERS ?
0550	E270	F0 06	BEQ GOBK0 ;NO,BRANCH
0551	E272	20 32 E2	JSR REG1 ;SHOW THE SIX REG
0552	E275	20 24 EA	JSR CRCK ;<CR>
0553	E278	20 07 E9	GOBK0 JSR RCHEK ;SEE IF HE WANTS TO INTERRUPT
0554	E27B	AD 0F A4	LDA DISFLG ;DISASSEMBLE CURRENT INSTR ?
0555	E27E	F0 06	BEQ GOBK1 ;NO,BRANCH
0556	E280	20 6C F4	JSR DISASM ;DISASM THIS INSTRUCTION
0557	E283	20 13 EA	JSR CRL0W
0558	E286	AE 24 A4	GOBK1 LDX SAVS ;RESTORE SAVED REGS FOR RTI
0559	E289	9A	TXS
0560	E28A	AC 23 A4	LDY SAVY
0561	E28D	AE 22 A4	LDX SAVX
0562	E290	AD 26 A4	LDA SAVPC+1
0563	E293	48	PHA ;PUT PC ON STACK
0564	E294	AD 25 A4	LDA SAVPC
0565	E297	48	PHA
0566	E298	AD 20 A4	LDA SAVPS ;STATUS ALSO
0567	E29B	48	PHA
0568	E29C	AD 21 A4	LDA SAVA
0569	E29F	40	RTI ;AND AWAY WE GO...

LINE #	LOC	CODE	LINE
0571	E2A0		***** / COMMAND-ALTER MEMORY *****
0572	E2A0	20 3E E8	CHNGG JSR BLANK
0573	E2A3	20 DB E2	JSR WRITAZ ;WRITE ADDR
0574	E2A6	20 3E E8	CHNG1 JSR BLANK
0575	E2A9	20 5D EA	JSR RD2 ;GET VALUE
0576	E2AC	90 0A	BCC CH2 ;ISN'T SKIP OR DONE
0577	E2AE	C9 20	CMP #'
0578	E2B0	D0 13	BNE CH3 ;NOT BLANK SO MUST BE DONE
0579	E2B2		;SKIP THIS LOCATION
0580	E2B2	20 3E E8	JSR BLANK
0581	E2B5	4C C0 E2	JMP CH4
0582	E2B8		;IS ALTER
0583	E2B8	20 78 EB	CH2 JSR SADDR ;STORE ENTERED VALUE INTO MEMORY
0584	E2BB	F0 03	BEQ CH4 ;NO ERROR IN STORE
0585	E2BD	4C 33 EB	JMP MEMERR ;MEMORY WRITE ERROR
0586	E2C0	C8	CH4 INY
0587	E2C1	C0 04	CFY #4
0588	E2C3	D0 E1	BNE CHNG1 ;GO AGAIN
0589	E2C5		;HAVE DONE LINE OR HAVE <CR>
0590	E2C5	20 CD E2	CH3 JSR NXTADD ;UPDATE THE ADDRESS
0591	E2C8	A9 0D	LDA #CR ;CLEAR DISPL
0592	E2CA	4C E9 FE	JMP PATC10 ;ONLY ONE <CR> & BACK TO MONITOR
0594	E2CD	98	NXTADD TYA ;ADD Y TO ADDR+1, ADDR
0595	E2CE	18	CLC
0596	E2CF	6D 1C A4	ADC ADDR
0597	E2D2	8D 1C A4	STA ADDR
0598	E2D5	90 03	BCC NXTA1
0599	E2D7	EE 1D A4	INC ADDR+1
0600	E2DA	60	NXTA1 RTS
0602	E2DB		;WRITE CURRENT VALUE OF ADDR
0603	E2DB		;PART OF / & SPACE COMM
0604	E2DB	A0 00	WRITAZ LDY #0
0605	E2DD	B9 1D A4	WRITAD LDA ADDR+1, Y
0606	E2E0	BE 1C A4	LDX ADDR, Y
0607	E2E3	4C 42 EA	JMP WRAX
0609	E2E6		***** L COMMAND-GENERAL LOAD *****
0610	E2E6		;LOAD OBJECT FROM TTY, USER, TAPE OR TAPE IN KIM-1 FORMAT
0611	E2E6	20 48 E8	LOAD JSR WHEREI ;WHERE INPUT
0612	E2E9		;GET ':", # OF BYTES AND SA
0613	E2E9	20 93 E9	LOAD1 JSR INALL ;GET FIRST CHAR
0614	E2EC	C9 3B	CMP #' ;
0615	E2EE	D0 F9	BNE LOAD1 ;IGNORE ALL CHARS BEFORE ';"
0616	E2F0	20 4D EB	JSR CLCK ;CLEAR CHECKSUM
0617	E2F3	20 4B E5	JSR CHEKAR ;READ RECORD LENGTH
0618	E2F6	AA	TAX ;SAVE IN X THE # BYTES
0619	E2F7	20 4B E5	JSR CHEKAR ;READ UPPER HALF OF ADDRESS
0620	E2FA	8D 1D A4	STA ADDR+1
0621	E2FD	20 4B E5	JSR CHEKAR ;READ LOWER HALF OF ADDRESS
0622	E300	8D 1C A4	STA ADDR
0623	E303	8A	TXA
0624	E304	F0 1B	BEQ LOAD4 ;LAST RECORD (RECORD LENGTH=0)

LINE #	LOC	CODE	LINE	
0625	E306			;GET DATA
0626	E306	20 FD E3	LOAD2	JSR RBYTE ;READ NEXT BYTE OF DATA
0627	E309	20 13 E4		JSR STBYTE ;STORE AT LOC (ADDR+1,ADDR)
0628	E30C	CA		DEX ;DECR RECORD LENGTH
0629	E30D	D0 F7		BNE LOAD2
0630	E30F			;COMPARE CKSUM
0631	E30F	20 FD E3		JSR RBYTE ;READ UPPER HALF OF CKSUM
0632	E312	CD 1F A4		CMP CKSUM+1 ;COMPARE TO COMPUTED VALUE
0633	E315	D0 6E		BNE CKERR ;CKSUM ERROR
0634	E317	20 FD E3		JSR RBYTE ;READ LOWER HALF OF CHECKSUM
0635	E31A	CD 1E A4		CMP CKSUM
0636	E31D	D0 66		BNE CKERR
0637	E31F	F0 C8		BEQ LOAD1 ;UNTIL LAST RECORD
0638	E321	A2 05	LOAD4	LDX #5 ;READ 4 MORE ZEROS
0639	E323	20 FD E3	LOAD5	JSR RBYTE
0640	E326	CA		DEX
0641	E327	D0 FA		BNE LOAD5
0642	E329	20 93 E9		JSR INALL ;READ LAST <CR>
0643	E32C	4C 20 E5		JMP DU13 ;SET DEFAULT DEV & GO BACK
0645	E32F			;LOAD ROUTINE FROM TAPE BY BLOCKS
0646	E32F			;CHECK FOR RIGHT FILE & LOAD FIRST BLOCK
0647	E32F	A9 00	LOADTA	LDA ##00 ;CLEAR BLOCK COUNT
0648	E331	8D 15 01		STA BLK
0649	E334	20 53 ED		JSR TIBY1 ;LOAD BUFFER WITH A BLOCK
0650	E337	CA		DEX ;SET X=0
0651	E338	8E 15 A4		STX CURPO2 ;CLEAR DISPLAY PTR
0652	E33B	8D 16 01		LDA TABUFF,X ;BLK COUNT SHOULD BE ZERO
0653	E33E	D0 EF		BNE LOADTA ;NO, READ ANOTHER BLOCK
0654	E340	E8		INX
0655	E341			;AFTER FIRST BLOCK OUTPUT FILE NAME
0656	E341	EE 11 A4		INC PRIFLG ;SO DO NOT GO TO PRINTER
0657	E344	A0 48		LDY #MSG0-M1 ;PRINT 'F='
0658	E346	20 AF E7		JSR KEP
0659	E349	8D 16 01	LOAD1A	LDA TABUFF,X ;OUTPUT FILE NAME
0660	E34C	20 7A E9		JSR OUTPUT ;ONLY TO DISPLAY
0661	E34F	E8		INX
0662	E350	E0 06		CPX #6
0663	E352	D0 F5		BNE LOAD1A
0664	E354	20 3E E8		JSR BLANK
0665	E357	A0 61		LDY #MSG6-M1 ;PRINT 'BLK= '
0666	E359	20 AF E7		JSR KEP
0667	E35C	CE 11 A4		DEC PRIFLG ;RESTORE PRINTR FLG
0668	E35F	20 8D ED		JSR ADDBK1 ;JUST OUTPUT BLK CNT
0669	E362	A2 01		LDX #1 ;RESTORE X
0670	E364			;CHECK IF FILE IS CORRECT
0671	E364	8D 16 01	LOADT2	LDA TABUFF,X ;NOW CHCK FILE NAME
0672	E367	DD 2D A4		CMP NAME-1,X
0673	E36A	D0 C3		BNE LOADTA ;IF NO FILENAME GET
0674	E36C	E8		INX ;ANOTHER BLOCK
0675	E36D	E0 06		CPX #6 ;FILENAME=5 CHRS
0676	E36F	D0 F3		BNE LOADT2
0677	E371	8E 36 A4		STX TAPTR ;SAVE TAPE BUFF PTR
0678	E374	EE 11 A4		INC PRIFLG ;OUTPUT MSG ONLY TO DISPLAY

LINE #	LOC	CODE	LINE	
0679	E377	A9 00	LDA #0	;CLEAR DISPLAY POINTER
0680	E379	8D 15 A4	STA CURP02	
0681	E37C	A0 66	LDY #TMSG7-M1	;PRINT "LOAD " WITHOUT CLR DISPL
0682	E37E	20 96 E3	JSR CKER1	
0683	E381	CE 11 A4	DEC PRIFLG	
0684	E384	60	RTS	
0686	E385		;LINE CKSUM ERROR	
0687	E385	20 8E E3	CKERR JSR CKER0	;SUBR SO MNEM ENTRY CAN USE IT
0688	E388	20 DB E2	JSR WRITAZ	;WRITE ADDR
0689	E388	4C A1 E1	JMP COMIN	
0690	E38E	20 FE E8	CKER0 JSR LL	;SET DEFAULT DEVICES
0691	E391	20 24 EA	JSR CRCK	;<CR>
0692	E394	A0 52	CKER00 LDY #TMSG3-M1	;PRINT "ERROR"
0693	E396	B9 00 E0	CKER1 LDA M1,Y	;DONT CLR DISPLAY TO THE RIGHT
0694	E399	C9 3B	CMF #'	
0695	E39B	F0 06	BEQ CKER2	
0696	E39D	20 7A E9	JSR OUTPUT	;ONLY TO TERMINAL
0697	E3A0	C8	INY	
0698	E3A1	D0 F3	BNE CKER1	
0699	E3A3	60	CKER2 RTS	
0701	E3A4		;LOAD ROUTINE FROM TAPE WITH KIM-1 FORMAT	
0702	E3A4	20 4D EB	LOADKI JSR CLRCK	;CLEAR CKSUM
0703	E3A7	20 EA ED	LOADK1 JSR TAISRT	;SET TAPE FOR INPUT
0704	E3AA	20 29 EE	LOADK2 JSR GETTAP	;READ CHARACTER FROM TAPE
0705	E3AD	C9 2A	CMF #'*	;BEGINNING OF FILE?
0706	E3AF	F0 06	BEQ LOADK3	;YES,ERNCH
0707	E3B1	C9 16	CMF #'*16	;IF NOT * SHOULD BE SYN
0708	E3B3	D0 F2	BNE LOADK1	
0709	E3B5	F0 F3	BEQ LOADK2	
0710	E3B7	20 FD E3	LOADK3 JSR RBYTE	;READ ID FROM TAPE
0711	E3BA	8D 21 A4	STA SAVA	;SAVE ID
0712	E3BD		;NOW GET ADDR TO DISPLAY	
0713	E3BD		;& COMPARE ID AFTERWARDS	
0714	E3BD	20 4B E5	JSR CHEKAR	;GET START ADDR LOW
0715	E3C0	8D 1C A4	STA ADDR	
0716	E3C3	20 4B E5	JSR CHEKAR	;GET START ADDR HIGH
0717	E3C6	8D 1D A4	STA ADDR+1	
0718	E3C9	20 25 E4	JSR GETID	;ID FROM HIM
0719	E3CC	CD 21 A4	CMF SAVA	;DO IDS MATCH?
0720	E3CF	D0 D3	BNE LOADKI	;NO ,GET ANOTHER FILE
0721	E3D1	A2 02	LOADK5 LDX #*02	;GET 2 CHARS
0722	E3D3	20 29 EE	LOADK6 JSR GETTAP	;1 CHAR FROM TAPE
0723	E3D6	C9 2F	CMF #'/'	;LAST CHAR ?
0724	E3D8	F0 0E	BEQ LOADK7	;YES,ERNCH
0725	E3DA	20 84 EA	JSR PACK	;CONVERT TO HEX
0726	E3DD	B0 A6	BCS CKERR	;NOT HEX CHAR SO ERROR
0727	E3DF	CA	DEX	
0728	E3E0	D0 F1	BNE LOADK6	
0729	E3E2	20 13 E4	JSR STBYTE	;STORE & CHCK MEM FAIL
0730	E3E5	4C D1 E3	JMP LOADK5	;NEXT
0731	E3E8	20 FD E3	LOADK7 JSR RBYTE	;END OF DATA CMP CKSUM
0732	E3EB	CD 1E A4	CMF CKSUM	;LOW

LINE	* LOC	CODE	LINE
0733	E3EE	D0 95	BNE CKERR
0734	E3F0	20 FD E3	JSR RBYTE
0735	E3F3	CD 1F A4	CMF CKSUM+1 ;HIGH
0736	E3F6	D0 BD	BNE CKERR
0737	E3F8	68	PLA ;CORRECT RTN INSTEAD OF WHEREI
0738	E3F9	68	PLA
0739	E3FA	4C 20 E5	JMP DU13 ;TELL HIM & GO BACK TO COMMAN
0741	E3FD		;GET 2 ASCII CHRS INTO 1 BYTE
0742	E3FD		;FOR TAPE (T) GET ONLY ONE HEX CHR
0743	E3FD	AD 12 A4	RBYTE LDA INFLG ;INPUT DEVICE
0744	E400	C9 54	CMF #'T
0745	E402	D0 03	BNE RBYT1
0746	E404	4C 93 E9	JMP INALL ;ONLY ONE BYTE FOR T (INPUT DEV)
0747	E407	20 93 E9	RBYT1 JSR INALL
0748	E40A	20 84 EA	JSR PACK
0749	E40D	20 93 E9	JSR INALL
0750	E410	4C 84 EA	JMP PACK
0752	E413		;STORE AND CHECK MEMORY FAIL
0753	E413	20 4E E5	STBYTE JSR CHEKA ;ADD TO CKSUM
0754	E416	A0 00	LDY #0
0755	E418	20 78 EB	JSR SADDR ;STORE AND CHCK
0756	E418	F0 03	BEQ *+5
0757	E41D	4C 33 EB	JMP MEMERR ;MEMORY WRITE ERROR
0758	E420	A0 01	LDY #1 ;INC ADDR+1,ADDR BY 1
0759	E422	4C CD E2	JMP NXTADD
0761	E425		;GET ID FROM LAST 2 CHR OF FILENAM
0762	E425	A2 04	GETID LDX #4 ;SEE WHAT HE GAVE US
0763	E427	BD 2E A4	GID1 LDA NAME,X ;GET LAST 2 CHARS
0764	E42A	CA	DEX
0765	E42B	C9 20	CMF ##20 ;<SPACE> ?
0766	E42D	F0 F8	BEQ GID1
0767	E42F	BD 2E A4	LDA NAME,X ;CONVERT TO BINARY
0768	E432	20 84 EA	JSR PACK
0769	E435	BD 2F A4	LDA NAME+1,X
0770	E438	4C 84 EA	JMP PACK ;ID IS IN STIY
0772	E43B		***** D COMMAND-GENERAL DUMP *****
0773	E43B		;TO TTY,PRINTR,USER,X ,TAPE,TAKIM-1
0774	E43B	AD 10 A4	DUMP LDA BKFLG ;SAVE IT TO USE IT
0775	E43E	48	PHA
0776	E43F	A9 00	LDA #00
0777	E441	BD 10 A4	STA BKFLG
0778	E444	20 24 EA	JSR CRCK ;<CR>
0779	E447	20 A3 E7	JSR FROM ;GET START ADDR
0780	E44A	B0 FB	BCS DU0 ;IN CASE OF ERROR DO IT AGAIN
0781	E44C	20 3E EB	JSR BLANK
0782	E44F	20 10 F9	JSR ADDR\$1 ;TRANSFER ADDR TO \$1
0783	E452	20 A7 E7	DU1B JSR TO ;GET END ADDR
0784	E455	B0 FB	BCS DU1B
0785	E457	20 13 EA	JSR CRLW
0786	E45A	AD 10 A4	LDA BKFLG ;EXECUTE WHERE0 ONLY ONCE

LINE #	LOC	CODE	LINE	
0787	E45D	D0 0E	BNE DU1A	
0788	E45F	20 71 E8	JSR WHEREO	;WHICH DEV (OUTFLG)
0789	E462	A9 00	LDA #0	
0790	E464	8D 06 01	STA S2	;CLEAR RECORD COUNT
0791	E467	8D 07 01	STA S2+1	
0792	E46A	EE 10 A4	INC BKFLG	;SET FLG
0793	E46D		;CHECK OUTPUT DEV	
0794	E46D	AD 13 A4	DU1A LDA OUTFLG	
0795	E470	C9 4B	CMF #'K	;TAPE FOR KIM?
0796	E472	D0 04	BNE *+6	
0797	E474	68	PLA	;FULL FLG
0798	E475	4C 87 E5	JMP DUMPKI	;YES, GO OUTPUT WHOLE FILE
0799	E478	A0 01	LDY #1	;OUTPUT ONE MORE BYTE
0800	E47A	20 CD E2	JSR NXTADD	
0801	E47D	20 F0 E9	DU2 JSR CRLF	
0802	E480	20 07 E9	JSR RCHEK	;SEE IF HE WANTS TO INTERRUPT
0803	E483		;CALCULATE # OF BYTES YET TO BE DUMPED	
0804	E483	20 4D E8	JSR CLRCK	;CLEAR CKSUM
0805	E486	AD 1C A4	LDA ADDR	;END ADDRESS-CURRENT ADDRESS
0806	E489	3B	SEC	
0807	E48A	ED 1A A4	SEC S1	
0808	E48D	4B	PHA	;# OF BYTES LOW
0809	E48E	AD 1D A4	LDA ADDR+1	
0810	E491	ED 1B A4	SEC S1+1	
0811	E494	D0 09	BNE DU6	;# OF BYTES HIGH
0812	E496		;SEE IF 24 OR MORE BYTES TO GO	
0813	E496	68	PLA	;# BYTES HIGH WAS ZERO
0814	E497	F0 42	BEQ DU10	;ARE DONE
0815	E499	C9 1B	CMF #24	;# BYTES > 24 ?
0816	E49B	90 05	BCC DU8	;NO ,ONLY OUTPUT REMAINING BYTES
0817	E49D	B0 01	BCS DU7	;YES ,24 BYTES IN NEXT RECORD
0818	E49F	68	DU6 PLA	
0819	E4A0	A9 1B	DU7 LDA #24	
0820	E4A2		;OUTPUT *; ,# OF BYTES AND SA	
0821	E4A2	4B	DUB PHA	
0822	E4A3	20 BA E9	JSR SEMI	;SEMICOLON
0823	E4A6	68	PLA	
0824	E4A7	8D 19 A4	STA COUNT	;SAVE # OF BYTES
0825	E4AA	20 3B E5	JSR OUTCK	;OUTPUT # OF BYTES
0826	E4AD	AD 1B A4	LDA S1+1	;OUTPUT ADDRESS
0827	E4B0	20 3B E5	JSR OUTCK	
0828	E4B3	AD 1A A4	LDA S1	
0829	E4B6	20 3B E5	JSR OUTCK	
0830	E4B9		;OUTPUT DATA	
0831	E4B9	20 31 E5	DU9 JSR OUTCKS	;GET CHAR SPEC BY S1 (NO PAG 0)
0832	E4BC	A9 00	LDA #0	;CLEAR DISP PTR
0833	E4BE	8D 15 A4	STA CURP02	
0834	E4C1	20 5D E5	JSR ADDS1	;INCR S1+1,S1
0835	E4C4	CE 19 A4	DEC COUNT	;DECREMENT BYTE COUNT
0836	E4C7	D0 F0	BNE DU9	;NOT DONE WITH THIS RECORD
0837	E4C9		;OUTPUT CKSUM	
0838	E4C9	AD 1F A4	LDA CKSUM+1	
0839	E4CC	20 3B E5	JSR OUTCK1	;WITHOUT CHEKA
0840	E4CF	AD 1E A4	LDA CKSUM	
0841	E4D2	20 3B E5	JSR OUTCK1	

LINE #	LOC	CODE	LINE	
0842	E4D5	20 66 E5	JSR INCS2	;INC VERTICAL COUNT
0843	E4D8	4C 7D E4	JMP DU2	;NEXT RECORD
0844	E4DB		;ALL DONE	
0845	E4DB	A0 1C	DU10 LDY #M5-M1	;PRINT *MORE ?#
0846	E4DD	20 70 E9	JSR KEPR	;OUTPUT MSG AND GET AN ANSWER
0847	E4E0	C9 59	CMF #'Y	
0848	E4E2	D0 03	BNE *+5	
0849	E4E4	4C 44 E4	JMP DU1	;DUMP MORE DATA
0850	E4E7	68	FLA	;RESTORE FLG
0851	E4E8	8D 10 A4	STA BKFLG	
0852	E4EB		;OUTPUT LAST RECORD	
0853	E4EB	20 66 E5	JSR INCS2	
0854	E4EE	20 BA E9	JSR SEMI	;OUTPUT ';
0855	E4F1	A2 02	LDX #2	
0856	E4F3	A9 00	LDA #0	;OUTPUT # OF BYTES (0=LAST RECORD)
0857	E4F5	20 3B E5	JSR OUTCK1	
0858	E4F8	AD 07 01	DU10A LDA S2+1	;OUTPUT RECORD COUNT
0859	E4F8	20 3B E5	JSR OUTCK1	;CHECKSUM IS THE SAME
0860	E4FE	AD 06 01	LDA S2	
0861	E501	20 3B E5	JSR OUTCK1	
0862	E504	CA	DEX	
0863	E505	D0 F1	BNE DU10A	
0864	E507	20 F0 E9	JSR CRLF	
0865	E50A		;CLOSE TAPE BLOCK IF ACTIVE	
0866	E50A	AD 13 A4	DU11 LDA OUTFLG	
0867	E50D	C9 54	CMF #'T	
0868	E50F	D0 0F	BNE DU13	;NO ,BRANCH
0869	E511	AD 37 A4	DU12 LDA TAPTR2	;TAP OUTPUT BUFF PTR
0870	E514	C9 01	CMF #1	;BECAUSE FIRST ONE IS BLK CNT
0871	E516	F0 08	BEQ DU13	;NO DATA TO WRITE
0872	E518	A9 00	LDA #0	;FILL REST BUFF ZEROS
0873	E51A	20 8B F1	JSR TOBYTE	;OUTPUT TO BUFF
0874	E51D	4C 11 E5	JMP DU12	;FINISH THIS BLOCK
0875	E520	20 13 EA	DU13 JSR CRLW	
0876	E523	18	CLC	;ENABL INTERR
0877	E524	A9 00	LDA #T1I	;T1 FROM FREE RUNNING TO 1 SHOT
0878	E526	8D 0B AB	STA ACR	
0879	E529	A9 34	DU14 LDA ##34	;SET BOTH TAPES ON
0880	E52B	8D 00 AB	STA DRB	
0881	E52E	4C FE E8	JMP LL	
0883	E531		;GET CHAR SPECIFIED BY START ADDR (S1)	
0884	E531	A9 1A	OUTCKS LDA #<S1	
0885	E533	A0 00	LDY #0	
0886	E535	20 58 EB	JSR LDAY	
0888	E538		;ADD TO CHECKSUM AND PRINT	
0889	E538	20 4E E5	OUTCK JSR CHEKA	;CHKSUM
0890	E53B	48	OUTCK1 PHA	
0891	E53C	AD 13 A4	LDA OUTFLG	;IF TAPE DO NOT CNVRT
0892	E53F	C9 54	CMF #'T	;TO TWO ASCII CHRS
0893	E541	D0 04	BNE OUTCK2	
0894	E543	68	FLA	
0895	E544	4C 8B F1	JMP TOBYTE	;OUTPUT TO TAP BUFF
0896	E547	68	OUTCK2 PLA	

LINE #	LOC	CODE	LINE		
0897	E54B	4C 46 EA		JMP NUMA	;TWO ASCII REPRE
0899	E54B	20 FD E3	CHEKAR	JSR RBYTE	;TWO ASCII CHR----> 1 BYTE
0900	E54E	4B	CHEKA	PHA	;ADD TO CHECKSUM
0901	E54F	1B		CLC	
0902	E550	6D 1E A4		ADC CKSUM	
0903	E553	8D 1E A4		STA CKSUM	
0904	E556	9D 03		BCC *+5	
0905	E558	EE 1F A4		INC CKSUM+1	
0906	E55B	6B		PLA	
0907	E55C	60		RTS	
0909	E55D				;ADD ONE TO START ADDR (S1)
0910	E55D	EE 1A A4	ADDS1	INC S1	
0911	E560	D0 03		BNE ADD1	
0912	E562	EE 1B A4		INC S1+1	
0913	E565	60	ADD1	RTS	
0915	E566	EE 06 01	INCS2	INC S2	;INCR VERTICAL COUNT
0916	E569	D0 03		BNE *+5	
0917	E56B	EE 07 01		INC S2+1	
0918	E56E	60		RTS	
0920	E56F				;OPEN A FILE FOR OUTPUT TO TAPE BY BLOCKS
0921	E56F				;OUTPUT FILENAME GIVEN BY JSR WHERE TO TAPE BUFF
0922	E56F	A2 00	DUMPTA	LDX #0	;INITIALIZE TAPTR
0923	E571	8A		TXA	;TO OUTPUT
0924	E572	8E 6B 01		STX BLK0	;BLOCK COUNTER
0925	E575	8E 37 A4		STX TAPTR2	;TAP OUTPUT BUFF PTR
0926	E578	20 8B F1		JSR T0BYTE	;TWO START OF FILE CHRS
0927	E57B	BD 2E A4	DUMPT1	LDA NAME,X	;OUTPUT FILENAME
0928	E57E	20 8B F1		JSR T0BYTE	
0929	E581	EB		INX	
0930	E582	E0 05		CPX #5	;5 FILENAME CHRS ?
0931	E584	D0 F5		BNE DUMPT1	
0932	E586	60		RTS	
0934	E587				;DUMP ROUTINE TO TAPE WITH KIM-1 FORMAT
0935	E587	20 1D F2	DUMPKI	JSR TAPSET	;SET TAPE FOR OUTPUT
0936	E58A	A9 2A		LDA #'*	;TO EITHER 1 OR 2
0937	E58C	20 4A F2		JSR OUTTAP	;DIRECTLY TO TAPE
0938	E58F				;ID FROM LAST 2 CHRS OF FILENAME
0939	E58F	20 25 E4		JSR GETID	
0940	E592	20 3B E5		JSR OUTCK1	
0941	E595	20 4D EB		JSR CLCK	
0942	E598				;STARTING ADDR
0943	E598	AD 1A A4		LDA S1	
0944	E59B	20 3B E5		JSR OUTCK	;WITH CHECKSUM
0945	E59E	AD 1B A4		LDA S1+1	
0946	E5A1	20 3B E5		JSR OUTCK	
0947	E5A4				;OUTPUT DATA
0948	E5A4	20 31 E5	DUK2	JSR OUTCKS	;OUTPUT CHR SPECIFIED BY S1+1,S1
0949	E5A7	20 5D E5		JSR ADDS1	;INCREM S1+1,S1

LINE #	LOC	CODE	LINE
0950	E5AA	AD 1A A4	LDA S1 ;CHKC FOR LAST BYTE
0951	E5AD	CD 1C A4	CMF ADDR ;LSB OF END ADDR
0952	E5B0	AD 1B A4	LDA S1+1
0953	E5B3	ED 1D A4	SBC ADDR+1
0954	E5B6	90 EC	BCC DUK2 ;NEXT CHR
0955	E5B8		;NOW SEND END CHR "/"
0956	E5B8	A9 2F	LDA ##2F
0957	E5BA	20 4A F2	JSR OUTTAP ;DIRECTLY TO TAPE
0958	E5BD		;CHECKSUM
0959	E5BD	AD 1E A4	LDA CKSUM
0960	E5C0	20 46 EA	JSR NUMA ;ASCII REPRES
0961	E5C3	AD 1F A4	LDA CKSUM+1
0962	E5C6	20 46 EA	JSR NUMA
0963	E5C9		;TWO EOT CHRS
0964	E5C9	A9 04	LDA ##04
0965	E5CB	20 4A F2	JSR OUTTAP
0966	E5CE	20 4A F2	JSR OUTTAP
0967	E5D1		;TURN TAPES ON
0968	E5D1	4C 20 E5	JMP DU13
0970	E5D4		***** * COMMAND-ALTER PROGRAM COUNTER *****
0971	E5D4	20 AE EA	CGPC JSR ADDIN ;ADDR <=ADDRESS ENTERED FROM KB
0972	E5D7	20 DD E5	CGPC0 JSR CGPC1 ;TRANSFER ADDR TO SAVPC
0973	E5DA	4C 13 EA	JMP CRLDW
0974	E5DD	AD 1D A4	CGPC1 LDA ADDR+1 ;THIS WAY MNEMONICS CAN USE IT
0975	E5E0	8D 26 A4	STA SAVPC+1
0976	E5E3	AD 1C A4	LDA ADDR
0977	E5E6	8D 25 A4	STA SAVPC
0978	E5E9	60	RTS
0980	E5EA		***** P COMMAND-ALTER PROCESSOR STATUS *****
0981	E5EA	A2 00	CGPS LDX #0
0982	E5EC	F0 0E	BEG CGALL
0984	E5EE		***** A COMMAND-ALTER ACCUMULATOR *****
0985	E5EE	A2 01	CGA LDX #1
0986	E5F0	D0 0A	BNE CGALL
0988	E5F2		***** X COMMAND-ALTER X REGISTER *****
0989	E5F2	A2 02	CGX LDX #2
0990	E5F4	D0 06	BNE CGALL
0992	E5F6		***** Y COMMAND-ALTER Y REGISTER *****
0993	E5F6	A2 03	CGY LDX #3
0994	E5F8	D0 02	BNE CGALL
0996	E5FA		***** S COMMAND-ALTER STACK POINTER *****
0997	E5FA	A2 04	CGS LDX #4
0998	E5FC	20 DB E7	CGALL JSR EQUAL ;PRINT PROMPT
0999	E5FF	20 5D EA	JSR RDZ ;GET VALUE FROM KEYBOARD
1000	E602	E0 04	BCC GOERR
1001	E604	9D 20 A4	STA SAVPS,X
1002	E607	60	RTS
1003	E608	20 D4 E7	GOERR JSR QM
1004	E60E	D0 EF	BNE CGALL

LINE #	LOC	CODE	LINE
1006	E60D		;***** <SPACE> COMMAND-SHOW NEXT 5 MEMORY LOC *****
1007	E60D	20 3E E8	NXT5 JSR BLANK
1008	E610	A0 04	LDY #4 ;UPDATE ADDR FROM
1009	E612	20 CD E2	JSR NXTADD ;<M>=XXXX
1010	E615	20 DB E2	JSR WRITAZ ;OUTPUT ADDRESS
1011	E618	4C 4D E2	JMP MEIN ;DISPLAY CONTENTS OF NEXT 4 LOCS
1013	E61B		;***** B: COMMAND-SET BREAKPOINT ADDR *****
1014	E61B	A0 27	BRKA LDY #M8-M1 ;PRINT "BRK"
1015	E61D	20 AF E7	JSR KEP
1016	E620	20 37 E8	BRK1 JSR PSL1 ;PRINT "/"
1017	E623	20 73 E9	JSR REDOUT ;GET BREAK NUMBER
1018	E626	38	SEC
1019	E627	E9 30	SBC #130 ;0 THRU 3
1020	E629	30 04	BMI BKERR ;CHARACTER < '0' -ILLEGAL
1021	E62B	C9 04	CMF #4 ;FOUR BRK POINTS
1022	E62D	30 05	BMI BKOK ;0 < CHARACTER < 4 -OK
1023	E62F	20 D4 E7	BKERR JSR RM ;ERROR
1024	E632	D0 EC	BNE BRK1 ;ALLOW REENTRY OF BREAK NUMBER
1025	E634	0A	BKOK ASL A ;*2 TO FORM WORD OFFSET
1026	E635	48	PHA ;SAVE IT
1027	E636	20 AE EA	JSR ADDIN ;GET ADDRESS FOR BREAKPOINT
1028	E639	68	PLA
1029	E63A	E0 10	BCS BK02 ;BAD ADDRESS ENTERED
1030	E63C	20 3D FF	JSR PATC18 ;<CR> & CLR BUFFERS
1031	E63F	AA	TAX ;# OF BRK
1032	E640	AD 1C A4	LDA ADDR ;STORE ENTERED ADDR IN BRKPT LIST
1033	E643	9D 00 01	STA BKS,X
1034	E646	AD 1D A4	LDA ADDR+1
1035	E649	9D 01 01	STA BKS+1,X
1036	E64C	60	BK02 RTS ;ALL DONE
1038	E64D		;***** ? COMMAND-SHOW CURRENT BREAKPOINTS *****
1039	E64D	A0 00	SHOW LDY #0
1040	E64F	20 13 EA	JSR CRLOW
1041	E652	20 3E E8	SH1 JSR BLANK
1042	E655	EE 00 01	LDX BKS,Y ;ADDRESS OF NEXT BREAKPOINT
1043	E658	B9 01 01	LDA BKS+1,Y
1044	E65B	20 42 EA	JSR WRAX ;SHOW BREAKPOINT ADDRESS
1045	E65E	C8	INY
1046	E65F	C8	INY
1047	E660	C0 08	CPY #8
1048	E662	D0 EE	BNE SH1
1049	E664	60	RTS
1051	E665		;***** H COMMAND-SHOW TRACE STACK HISTORY *****
1052	E665		;LAST FIVE INSTR ADDRS
1053	E665	A2 05	SHIS LDX #5 ;NUMBER OF ENTRIES
1054	E667	8E 29 A4	STX STIY+2
1055	E66A	AC 14 A4	LDY HISTP ;POINTER TO LATEST ENTRY
1056	E66D	20 13 EA	JSR CRLOW
1057	E670	20 3E E8	JSR BLANK
1058	E673	E9 2E A4	LDA HIST,Y ;OUTPUT ADDRESS OF ENTRY
1059	E676	20 46 EA	JSR NUMA
1060	E679	B9 2F A4	LDA HIST+1,Y

LINE #	LOC	CODE	LINE
1061	E67C	20 46 EA	JSR NUMA
1062	E67F	20 88 E6	JSR NHIS ;UPDATE POINTER
1063	E682	CE 29 A4	DEC STIY+2
1064	E685	D0 E3	BNE SH11
1065	E687	60	RTS
1067	E688		;UPDATE HISTORY POINTER (PART OF H)
1068	E688	C8	NHIS INY
1069	E689	C8	INY
1070	E68A	C0 0A	CPY #10
1071	E68C	D0 02	BNE NH1
1072	E68E	A0 00	LDY #0 ;WRAPAROUND AT 10
1073	E690	8C 14 A4	NH1 STY HISTP
1074	E693	60	RTS
1076	E694		***** 3 COMMAND-VERIFY TAPES *****
1077	E694		;VERIFY CKSUM OF BLOCKS
1078	E694	20 48 E8	VECKSM JSR WHEREI ;GET THE FILE
1079	E697	20 93 E9	JSR INALL ;CHKC OBJ OR SOURCE
1080	E69A	C9 0D	CMF #CR ;FIRST CHR IS <CR> IF OBJ
1081	E69C	D0 0E	BNE VECK2 ;ASSUME SOURCE CODE
1082	E69E	20 93 E9	VECK1 JSR INALL ;OBJECT FILE
1083	E6A1	C9 3B	CMF #';
1084	E6A3	D0 F9	BNE VECK1 ;IGNORE ALL CHARS BEFORE '
1085	E6A5	20 93 E9	JSR INALL
1086	E6A8	4C 60 FF	JMP PAT20
1087	E6AB	EA	NOP
1088	E6AC	20 93 E9	VECK2 JSR INALL ;IT IS TEXT
1089	E6AF	C9 0D	CMF #CR
1090	E6B1	D0 F9	BNE VECK2
1091	E6B3	20 93 E9	JSR INALL ;NEED TWO <CR> TO FINISH
1092	E6B6	C9 0D	CMF #CR
1093	E6B8	D0 F2	BNE VECK2
1094	E6BA	4C 20 E5	JMP DU13 ;CLOSE FILE, IT IS OK
1096	E6BD		***** 1 COMMAND-TOGGLE TAPE 1 CONTROL *****
1097	E6BD	AD 00 AB	TOGTA1 LDA DRB
1098	E6C0	49 10	EOR #\$10 ;INVERT PB4
1099	E6C2	8D 00 AB	STA DRB
1100	E6C5	29 10	AND #\$10
1101	E6C7	F0 2B	BEQ BRK3 ;IF 0 TAPE CNTRL IS ON
1102	E6C9	D0 2F	BNE BRK4 ;IF \$10 TAPE CNTRL IS OFF
1104	E6CB		***** 2 COMMAND-TOGGLE TAPE 2 CONTROL *****
1105	E6CB	AD 00 AB	TOGTA2 LDA DRB
1106	E6CE	49 20	EOR #\$20 ;INVERT PB5
1107	E6D0	8D 00 AB	STA DRB
1108	E6D3	29 20	AND #\$20
1109	E6D5	F0 1A	BEQ BRK3
1110	E6D7	D0 21	BNE BRK4
1112	E6D9		***** V COMMAND-TOGGLE REGISTER DISP FLG *****
1113	E6D9		;DISPLAY REGIST BEFORE EXEC
1114	E6D9	A2 0E	REGT LDX #<REG#
1115	E6DB	D0 0A	BNE TOGL

LINE	#	LOC	CODE	LINE		
1117	E6DD			;	***** Z COMMAND-TOGGLE DIS TRACE FLG *****	
1118	E6DD			;	DISPL NEXT INSTR BEFORE EXEC	
1119	E6DD	A2 0F		TRACE	LDX #<DISFLG	
1120	E6DF	D0 06			BNE TOGL	
1122	E6E1			;	***** \ COMMAND-TOGGLE PRINTER FLAG *****	
1123	E6E1	A2 11		PRITR	LDX #<PRIFLG	
1124	E6E3	D0 02			BNE TOGL	
1126	E6E5			;	***** 4 COMMAND-TOGGLE SOFT BRK ENABL FLG *****	
1127	E6E5	A2 10		BRKK	LDX #<BKFLG	
1129	E6E7	BD 00 A4		TOGL	LDA MONRAM,X	;LOAD FLAG
1130	E6EA	F0 0A			BEQ TOGL1	;FLAG IS OFF ,SO TURN ON
1131	E6EC	A9 00			LDA #0	;FLAG IS ON ,SO TURN OFF
1132	E6EE	9D 00 A4			STA MONRAM,X	
1133	E6F1	A0 24		BRK3	LDY #M7-M1	;PRINT "OFF"
1134	E6F3	4C AF E7		BRK2	JMP KEP	
1135	E6F6	38		TOGL1	SEC	;TURN FLAG ON BY SETTING NON-ZERO
1136	E6F7	7E 00 A4			ROR MONRAM,X	;FLAG IS ON MSB
1137	E6FA	A0 21		BRK4	LDY #M6-M1	;PRINT "ON"
1138	E6FC	D0 F5			BNE BRK2	
1140	E6FE			;	***** # COMMAND-CLEAR ALL BREAKS *****	
1141	E6FE	A9 00		CLREK	LDA #0	;STORE ZEROS INTO BRKPT LIST
1142	E700	A2 07			LDX #7	
1143	E702	9D 00 01		RS20	STA BKS,X	
1144	E705	CA			DEX	
1145	E706	10 FA			BFL RS20	
1146	E708	30 E7			BMI BRK3	;PRINT "OFF"
1148	E70A			;	***** K COMMAND-DISASSEMBLE MEMORY *****	
1149	E70A	A9 2A		KDISA	LDA #'*	;GET START ADDRESS
1150	E70C	20 7A E9			JSR OUTPUT	
1151	E70F	20 AE EA			JSR ADDIN	
1152	E712	B0 F6			BCS KDISA	;IF ERROR DO IT AGAIN
1153	E714	20 D7 E5			JSR CGPC0	;GET IT INTO PROG CNTR
1154	E717	20 37 E8			JSR FSL1	;PRINT "/"
1155	E71A	20 85 E7			JSR GCNT	;GET COUNT
1156	E71D	20 24 EA			JSR CRCK	
1157	E720	4C 2B E7			JMP JD2	
1158	E723	20 07 E9		JD1	JSR RCHEK	;SEE IF HE WANTS TO INTERRUPT
1159	E726	20 90 E7			JSR DONE	
1160	E729	F0 17			BEQ JD4	
1161	E72B	20 6C F4		JD2	JSR DISASM	;GO TO DISASSEMBLER
1162	E72E	AD 25 A4			LDA SAVPC	;POINT TO NEXT INSTRUC LOCAT
1163	E731	38			SEC	;ONE MORE TO PROG CNTR
1164	E732	65 EA			ADC LENGTH	
1165	E734	8D 25 A4			STA SAVPC	
1166	E737	90 03			BCC JD3	
1167	E739	EE 26 A4			INC SAVPC+1	
1168	E73C	20 24 EA		JD3	JSR CRCK	;<CR>
1169	E73F	4C 23 E7			JMP JD1	
1170	E742	60		JD4	RTS	

LINE #	LOC	CODE	LINE
1172	E743		;INITIALIZATION TABLE FOR 6522
1173	E743	34	INTAB1 .BYT \$34,\$00,\$37,\$FF,\$25,\$FF,\$25,\$FF
1173	E744	00	
1173	E745	37	
1173	E746	FF	
1173	E747	25	
1173	E748	FF	
1173	E749	25	
1173	E74A	FF	
1174	E74E	FF	.BYT \$FF,\$FF,\$00,T1I+T2I
1174	E74C	FF	
1174	E74D	00	
1174	E74E	00	
1175	E74F	E1	.BYT MOFF+PRST+SP12,\$FF,\$7F
1175	E750	FF	
1175	E751	7F	
1176	E752		;INITIALIZATION TABLE FOR 6532
1177	E752	FF	INTAB2 .BYT \$FF,\$FF,\$00,\$00
1177	E753	FF	
1177	E754	00	
1177	E755	00	
1178	E756		;INITIALIZATION TABLE FOR MONITOR RAM
1179	E756	7B E0	INTAB3 .WORD NMIV3,IRQV3,OUTDIS
1179	E758	54 E1	
1179	E75A	05 EF	
1180	E75C	C7	.BYT \$C7,\$08,\$02,\$CA,\$03,\$80,\$00,\$00
1180	E75D	08	
1180	E75E	02	
1180	E75F	CA	
1180	E760	03	
1180	E761	80	
1180	E762	00	
1180	E763	00	
1181	E764	00	.BYT \$00,\$80,\$0D,\$0D,\$00,\$00,\$00
1181	E765	80	
1181	E766	0D	
1181	E767	0D	
1181	E768	00	
1181	E769	00	
1181	E76A	00	
1182	E76B		;SEE IF WE HIT A SOFT BREAKPOINT (PART OF NMV3)
1183	E76B	A2 07	CKB LDX #7 ;COMPARE BRKPT LIST TO TRAP ADDR
1184	E76D	BD 00 01	CKB2 LDA BKS,X ;GET ADDRESS OF NEXT BREAKPOINT
1185	E770	CA	DEX
1186	E771	CD 26 A4	CMF SAVPC+1 ;COMPARE TO SAVED PROGRAM COUNTER
1187	E774	D0 0A	BNE CKB1
1188	E776	BD 00 01	LDA BKS,X
1189	E779	CD 25 A4	CMF SAVPC
1190	E77C	D0 02	BNE CKB1 ;NO MATCH SO TRY NEXT BREAKPOINT
1191	E77E	38	SEC ;MATCH-SET MATCH FLAG
1192	E77F	60	RTS
1193	E780	CA	CKB1 DEX
1194	E781	10 EA	BPL CKB2 ;MORE TO GO
1195	E783	18	CLC ;NO MATCH -RESET MATCH FLAG
1196	E784	60	RTS

LINE	#	LOC	CODE	LINE
1198	E785			;GET # OF LINES COUNT FOR GO-COMMAND+LIST-COMM
1199	E785	20 5D EA	GCNT JSR RD2	
1200	E788	98 02	BCC GCN1	
1201	E78A	49 0C	EOR ##0C	; <SPACE>----> \$2C , <CR>----> \$01
1202	E78C	8D 19 A4	GCN1 STA COUNT	
1203	E78F	60	RTS	
1205	E790			;CHECK IF COUNT HAS REACHED ZERO
1206	E790			;COUNT=\$2C MEANS FOREVER
1207	E790	AD 19 A4	DONE LDA COUNT	;IF COUNT=0 WE ARE DONE
1208	E793	C9 2C	CMP ##2C	;THIS MEANS FOR EVER
1209	E795	F0 09	BEQ DON1	;SET ACC DIFF FROM ZERO
1210	E797	F8	SED	;DECREMENT COUNT IN DECIMAL
1211	E798	38	SEC	
1212	E799	E9 01	SEC #1	
1213	E79B	D8	CLD	
1214	E79C	8D 19 A4	STA COUNT	
1215	E79F	60	RTS	
1216	E7A0	A9 2C	DON1 LDA ##2C	
1217	E7A2	60	RTS	
1219	E7A3	A0 00	FROM LDY #0	;PRINT "FR="
1220	E7A5	F0 02	BEQ T01	
1222	E7A7	A0 05	TO LDY ##3-M1	;PRINT "TO="
1223	E7A9	20 AF E7	T01 JSR KEP	
1224	E7AC	4C B1 EA	JMP ADDNE	;GET ADDRESS
1226	E7AF			;PRINT MSG POINTED TO BY Y REG
1227	E7AF	B9 00 C0	KEP LDA M1,Y	
1228	E7B2	48	PHA	
1229	E7B3	29 7F	AND ##7F	;STRIP OFF MSB
1230	E7B5	20 7A E9	JSR OUTPUT	
1231	E7B8	C8	INY	
1232	E7B9	68	PLA	
1233	E7BA	10 F3	BPL KEP	;MSB =1 ?
1234	E7BC	60	RTS	
1236	E7BD			;PRINT "*" ,BUT NOT TO TAPE RECORDER, NOR LOADING....
1237	E7BD			;PAPER TAPE OR TO DISPLAY
1238	E7BD	AD 12 A4	PROMPT LDA INFLG	;WHICH DEV (FOR EDITOR)
1239	E7C0	C9 54	CMP #'T	;NO PROMPT IF 'T' OR 'L'
1240	E7C2	4C EF FE	JMP PATC11	
1241	E7C5	20 42 E8	PROMPT1 JSR TTYTST	;PROMPT ONLY TO TTY
1242	E7C8	D0 05	BNE PR2	;BRANCH ON KB
1243	E7CA	A9 2A	LDA #'X	
1244	E7CC	4C 7A E9	PR1 JMP OUTPUT	;ONLY TO TERMIN
1245	E7CF	A9 0D	PR2 LDA #CR	;CLR DISP
1246	E7D1	4C 05 EF	JMP OUTDIS	
1248	E7D4	A9 3F	QM LDA #'?	;PRINT "?"
1249	E7D6	D0 F4	BNE PR1	
1251	E7D8	A9 3D	EQUAL LDA #'=	;PRINT "="
1252	E7DA	D0 F0	BNE PR1	

LINE #	LOC	CODE	LINE	
1254	E7DC			;ON DELETE KEY OUTPUT SLASH IF TTY & ...
1255	E7DC			;BACK UP CURSOR IF KB (MAY NEED SCROLLING)
1256	E7DC	20 42 E8	PSLS	JSR TTYTST ;TTY OR KB ?
1257	E7DF	F0 56	BEQ PSL1	;BRANCH ON TTY
1258	E7E1	20 9E EB	JSR PHXY	;SAVE X,Y
1259	E7E4	CE 15 A4	DEC CURP02	;DECR DISP PNTR
1260	E7E7	AE 15 A4	LDX CURP02	
1261	E7EA	E0 14	CPX #20	;IF MORE THAN 20 JUST SCROLL THEM
1262	E7EC	B0 0D	BCS PSL0	
1263	E7EE	A9 20	LDA #'	; < 20 ,SO CLR CUR
1264	E7F0	20 02 EF	JSR OUTDP1	
1265	E7F3	CE 15 A4	DEC CURP02	
1266	E7F6	4C 02 EB	JMP PSL00	
1267	E7F9	EA	NOP	
1268	E7FA	EA	NOP	
1269	E7FB	20 F8 FE	PSL0	JSR PATC12 ;CLR PRI0FLG
1270	E7FE	CA	DEX	;ONE CHR LESS
1271	E7FF	20 2F EF	JSR OUTD2A	;SCROLL THEM
1272	E802	AD 15 A4	PSL00	LDA CURP02 ;DISBUF--> PRI0BUF
1273	E805	C9 15	CMF #21	
1274	E807	90 13	BCC PSL0B	
1275	E809	C9 29	CMF #41	
1276	E80B	90 07	BCC PSL0A	
1277	E80D	A0 2B	LDY #40	;CHR 40-59
1278	E80F	E9 2B	SBC #40	
1279	E811	4C 1E EB	JMP PSL0C	
1280	E814	A0 14	PSL0A	LDY #20 ;CHR 20-39
1281	E816	3B	SEC	
1282	E817	E9 14	SEC #20	
1283	E819	4C 1E EB	JMP PSL0C	
1284	E81C	A0 00	PSL0B	LDY #0 ;CHR 00-19
1285	E81E	8D 16 A4	PSL0C	STA CURPOS
1286	E821	A2 00	LDX #0	
1287	E823	B9 3B A4	PSL0D	LDA DISBUF,X ;TRANSFER THEM
1288	E826	9D 60 A4	STA ISUFM,X	
1289	E829	EB	INX	
1290	E82A	C8	INY	
1291	E82B	EC 16 A4	CPX CURPOS	;PRI PNTR
1292	E82E	90 F3	BCC PSL0D	
1293	E830	20 3B F0	JSR OUTPR	;CLR PRI BUFF TO THE RIGHT
1294	E833	20 AC EB	JSR PLXY	;RESTORE X,Y
1295	E836	60	RTS	
1296	E837	A9 2F	PSL1	LDA #' ;PRINT '"/
1297	E839	D0 91	BNE PR1	
1299	E83B	20 3E EB	BLANK2	JSR BLANK ;TWO SPACES
1300	E83E	A9 20	BLANK	LDA #'
1301	E840	D0 8A	BNE PR1	
1303	E842			;CHECK TTY/KB SWITCH (Z=1 FOR TTY)
1304	E842	A9 08	TTYTST	LDA #08 ;CHECK IF TTY OR KB
1305	E844	2C 00 AB	BIT DRB	;TTY OR KB SWIETH =PE0
1306	E847	60	RTS	
1308	E84B			;WHERE IS INPUT COMING FROM?

LINE #	LOC	CODE	LINE
1309	E848		;SET UP FOR INPUT ACTIVE DEVICE
1310	E848	A0 2A	WHEREI LDY #M9-M1 ;PRINT "IN"
1311	E84A	20 70 E9	JSR KEPR ;OUTPUT MSG AND INPUT CHR
1312	E84D	8D 12 A4	STA INFLG
1313	E850	C9 54	CMP #'T
1314	E852	D0 08	BNE WHE1
1315	E854	A2 00	LDX #0 ;FOR INPUT FILE FLG
1316	E856	20 A2 E8	JSR FNAM ;OPEN FILE FOR TAPE (1 OR 2)
1317	E859	4C 2F E3	JMP LOADTA ;GET FILE
1318	E85C	C9 48	WHE1 CMP #'K ;TAPE WITH KIM FORMAT
1319	E85E	D0 08	BNE WHE2
1320	E860	A2 00	LDX #0 ;FOR INPUT FILE FLG
1321	E862	20 A2 E8	JSR FNAM ;OPEN FILE FOR TAP (1 OR 2)
1322	E865	4C A4 E3	JMP LOADKI ;THE WHOLE FILE
1323	E868	C9 55	WHE2 CMP #'U ;USER RTN?
1324	E86A	D0 04	BNE WHE3
1325	E86C	18	CLC ;SET FLG FOR INITIALIZATION
1326	E86D	6C 0B 01	JMP (UIN) ;USER INPUT SETUP
1327	E870	60	WHE3 RTS
1329	E871		;WHERE IS OUTPUT GOING TO?
1330	E871		;SET UP FOR OUTPUT ACTIVE DEVICE
1331	E871	A0 2D	WHEREO LDY #M10-M1 ;PRINT "OUT"
1332	E873	20 70 E9	JSR KEPR ;OUTPUT MSG & INPUT CHR
1333	E876	8D 13 A4	STA OUTFLG ;DEVICE FLG
1334	E879		;TAPES
1335	E879	C9 54	CMP #'T
1336	E87E	D0 08	BNE WHRO1
1337	E87D	A2 01	LDX #1 ;FOR OUTPUT FILE FLG
1338	E87F	20 A2 E8	JSR FNAM ;FILENAME & TAPE (1 OR 2)
1339	E882	4C 6F E5	JMP DUMPTA ;INITIALIZE FILE
1340	E885	C9 48	WHRO1 CMP #'K ;TAPE WITH KIM FORMAT
1341	E887	D0 05	BNE WHRO2
1342	E889	A2 01	LDX #1 ;FOR OUTPUT FILE FLG
1343	E88B	4C A2 E8	JMP FNAM
1344	E88E		;PRINTER
1345	E88E	C9 50	WHRO2 CMP #'P ;PRINTER?
1346	E890	D0 05	BNE WHRO3
1347	E892	A9 0D	LDA #CR ;OUTPUT LAST LINE IF ON
1348	E894	4C 00 F0	JMP OUTPRI ;& CLEAR PRINTER PTR
1349	E897		;USER SET UP
1350	E897	C9 55	WHRO3 CMP #'U ;USER RTN?
1351	E899	D0 04	BNE WHRO4
1352	E89B	18	CLC ;CLR FLG FOR INITIALIZATION
1353	E89C	6C 0A 01	JMP (UOUT) ;USER OUTPUT SETUP
1354	E89F		;ANY OTHER
1355	E89F	4C 13 EA	WHRO4 JMP CRLOW
1357	E8A2		;GET FILE NAME & TAPE UNIT
1358	E8A2	20 9E E8	FNAM JSR PHXY ;SAVE IN/OUT FLG (X)
1359	E8A5	20 CF E8	JSR NAMO ;GET NAME
1360	E8A8	A0 50	WHICHT LDY #TMSG2-M1 ;PRINT "T="
1361	E8AA	20 70 E9	JSR KEPR ;OUTPUT MSG & INPUT CHR
1362	E8AD	C9 0D	CMP #CR
1363	E8AF	D0 02	BNE TAP1

LINE #	LOC	CODE	LINE
1364	E8B1	A9 31	LDA ##31 ;<CR> ==> TAPE 1
1365	E8B3	38	TAP1 SEC
1366	E8B4	E9 31	SEC ##31 ;SUBTRACT 31
1367	E8B6	30 04	BMI TAP2 ;ONLY 1,2 OK
1368	E8B8	C9 02	CMF #2
1369	E8BA	30 04	BMI TAP3 ;OK
1370	E8BC	20 D4 E7	TAP2 JSR QM ;ERROR
1371	E8BF	4C A8 E8	JMP WHICHT
1372	E8C2	20 AC E8	TAP3 JSR PLXY ;IN/OUT FLG
1373	E8C5	9D 34 A4	STA TAPIN,X ;IF X=0 -->TAPIN (TAPE 1 OR 2)
1374	E8C8	20 B3 FE	JSR CUREAD ;GET ANYTHING
1375	E8CB	20 24 EA	JSR CRCK ;<CR>
1376	E8CE	60	RTS ;IF X=1 -->TAPOUT (TAPE 1 OR 2)
1378	E8CF		;GET FILE NAME
1379	E8CF	A0 4D	NAM0 LDY #MSG1-M1 ;PRINT "F="
1380	E8D1	20 AF E7	JSR KEF ;NO CRLF
1381	E8D4	A0 00	LDY #0
1382	E8D6	20 5F E9	NAM01 JSR RDRUB ;GET CHAR
1383	E8D9	C9 0D	CMF #CR ;DONE?
1384	E8DB	F0 0C	BEG NAM02
1385	E8DD	C9 20	CMF #1
1386	E8DF	F0 08	BEG NAM02
1387	E8E1	99 2E A4	STA NAME,Y ;STORE
1388	E8E4	C8	INY
1389	E8E5	C0 05	CPY #5
1390	E8E7	D0 ED	BNE NAM01
1391	E8E9		;BLANK REST OF NAME
1392	E8E9	A9 20	NAM02 LDA #1
1393	E8EB	C0 05	NAM03 CPY #5
1394	E8ED	F0 06	BEG NAM04
1395	E8EF	99 2E A4	STA NAME,Y
1396	E8F2	C8	INY
1397	E8F3	D0 F6	BNE NAM03
1398	E8F5	4C 3E E8	NAM04 JMP BLANK
1400	E8F8		;SET INPUT FROM TERMINAL (KB OR TTY)
1401	E8F8	A9 0D	INLOW LDA #CR
1402	E8FA	8D 12 A4	STA INFLG
1403	E8FD	60	RTS
1405	E8FE		;SET I/O TO TERMINAL (KB & D/P ,OR TTY)
1406	E8FE	20 F8 E8	LL JSR INLOW
1408	E901		;SET OUTPUT TO TERMINAL (D/P OR TTY)
1409	E901	A9 0D	OUTLOW LDA #CR
1410	E903	8D 13 A4	STA OUTFLG
1411	E906	60	OUTL1 RTS
1413	E907		;ON <ESCAPE> STOPS EXECUTION & BACK TO MONITOR
1414	E907		;ON <SPACE> STOPS EXECUTION & CONTINUE ON ANY OTHER KEY
1415	E907	20 42 E8	RCHEK JSR TTYTST ;TTY OR KB ?
1416	E90A	F0 1A	BEG RCHTTY
1417	E90C	20 EF EC	JSR ROONEK ;CLR MSK & GET A KEY
1418	E90F	88	DEY

LINE	* LOC	CODE	LINE		
1419	E910	30 13	BMI RCH3		;RTN ON NO KEY
1420	E912	A2 00	LDX #0		
1421	E914	20 82 EC	JSR GETK2		;GET THE KEY
1422	E917	C9 1B	CMP #ESCAPE		
1423	E919	F0 3E	BEQ REA1		;TO COMMAN & SET I/O TO TERMINAL
1424	E91B	C9 20	CMP #'		;WAIT KEY
1425	E91D	D0 06	BNE RCH3		;RTN, IGNORE OTHER KEYS
1426	E91F	20 EF EC	JSR ROONEK	RCH2	;WAIT TILL HE RELEASE IT &
1427	E922	88	DEY		;QUIT WAITING ON NEXT KEY
1428	E923	30 FA	BMI RCH2		
1429	E925	60	RTS	RCH3	
1430	E926	70 13	BVS RCHT1	RCHTTY	;TTI=PB4 ----> V (OVERFL FLG)
1431	E928	2C 00 AB	BIT DRB	RCHT2	;WAIT TILL HE RELEASE IT
1432	E92B	50 FB	BVC RCHT2		
1433	E92D	20 0F EC	JSR DELAY		
1434	E930	20 DB EB	JSR GETTTY		;GET A CHAR
1435	E933	C9 1B	CMP #ESCAPE		
1436	E935	F0 1F	BEQ REA1		;TO COMMAN
1437	E937	C9 20	CMP #'		
1438	E939	D0 ED	BNE RCHT2		
1439	E93B	60	RTS	RCHT1	;QUIT WAITING ON ANY KEY
1441	E93C				;READ ONE CHAR FROM KB/TTY & PRESERVE X,Y
1442	E93C	20 9E EB	JSR PHXY	READ	;PUSH X & Y
1443	E93F	20 42 EB	JSR TTYTST		;TTY OR KB ?
1444	E942	D0 06	BNE READ1		
1445	E944	20 DB EB	JSR GETTTY		
1446	E947	4C 4D E9	JMP READ2		
1447	E94A	20 40 EC	JSR GETKEY	READ1	
1448	E94D	20 AC EB	JSR PLXY	READ2	;PULL X & Y
1449	E950	29 7F	AND #7F		;STRIP PARITY
1450	E952	C9 1B	CMP #ESCAPE		
1451	E954	D0 E5	BNE RCHT1		;RTN
1452	E956	20 3D FF	JSR PATC18	REA1	;CR> & CLR BUFFERS
1453	E959	4C A1 E1	JMP COMIN		;BOTH I/O TO TERMINAL
1455	E95C				;READ WITH RUBOUT OR DELETE POSSIBLE
1456	E95C	20 DC E7	JSR PSL5	RB2	;SLASH OR BACK SPACE
1457	E95F	20 83 FE	JSR CUREAD	RDRUB	
1458	E962	C9 08	CMP #RUB		;RUBOUT
1459	E964	F0 04	BEQ RDR1		
1460	E966	C9 7F	CMP #7F		;ALSO DELETE
1461	E968	D0 0C	BNE RED2		;ECHO IF NOT <CR>
1462	E96A				;RUBOUT TO DELETE CHAR
1463	E96A	88	DEY	RDR1	
1464	E96B	10 EF	BPL RB2		
1465	E96D	C8	INY		
1466	E96E	F0 EF	BEQ RDRUB		
1468	E970				;OUTPUT MESSAGE THEN INPUT CHR
1469	E970	20 AF E7	JSR KEP	KEPR	
1471	E973				;READ AND ECHO A CHAR FROM KB OR TTY
1472	E973	20 83 FE	JSR CUREAD	REDOUT	
1473	E976	C9 0D	CMP #CR	RED2	

LINE #	LOC	CODE	LINE	
1474	E97B	F0 C1	BEG RCHT1	;DO NOT ECHO <CR>
1476	E97A			;OUTPUTS A CHAR TO EITHER TTY OR D/P
1477	E97A	4B	OUTPUT PHA	;SAVE IT
1478	E97B	AD 11 A4	OUT1 LDA PRIFLG	;IF LSB=1 OUTPUT ONLY TO DISP
1479	E97E	29 01	AND #01	
1480	E980	F0 04	BEG OUT1A	
1481	E982	6B	PLA	
1482	E983	4C 02 EF	JMP OUTDP1	;ONLY TO DISPL
1483	E986	20 42 E8	OUT1A JSR TTYTST	;TTY OR KB ?
1484	E989	D0 04	BNE OUT2	
1485	E98B	6B	PLA	
1486	E98C	4C AB EE	JMP OUTTTY	;TO TTY
1487	E98F	6B	OUT2 PLA	
1488	E990	4C FC EE	JMP OUTDP	;TO DISP & PRINTR
1490	E993			;GET A CHR FROM CURRENT INPUT DEVICE (SET ON INFLG)
1491	E993	AD 12 A4	INALL LDA INFLG	
1492	E996	C9 54	CMF #1T	
1493	E998	D0 03	BNE *+5	
1494	E99A	4C 3B ED	JMP TIBYTE	;CHAR FROM BUFFER
1495	E99D	C9 4B	CMF #1K	;WITH KIM FORMAT
1496	E99F	D0 03	BNE *+5	
1497	E9A1	4C 29 EE	JMP GETTAP	;DIRECTLY FROM TAPE
1498	E9A4	C9 4D	CMF #1M	;MEMORY FOR ASM?
1499	E9A6	D0 03	BNE *+5	
1500	E9AB	4C D0 FA	JMP MREAD	
1501	E9AB	C9 55	CMF #1U	;USER ROUTINE?
1502	E9AD	D0 04	BNE *+6	
1503	E9AF	3B	SEC	;SET FLG FOR NORMAL INPUT
1504	E9B0	6C 0B 01	JMP (UIN)	
1505	E9B3	C9 4C	CMF #1L	;TO LOAD PPR TAPE
1506	E9B5	D0 AB	BNE RDRUB	
1507	E9B7	4C DB EB	JMP GETTTY	; FROM TTY
1509	E9BA		.FILE A2	
1510	E9BA	A9 3B	SEMI LDA #1;	;OUTPUT A ";
1511	E9BC			;WRITE A CHR TO OUTPUT DEVICE (SET ON OUTFLG)
1512	E9BC	4B	OUTALL PHA	
1513	E9BD	AD 13 A4	LDA OUTFLG	
1514	E9C0		;TAPE BY BLOCKS	
1515	E9C0	C9 54	CMF #1T	;TAPES ?
1516	E9C2	D0 04	BNE OUTA1	
1517	E9C4	6B	PLA	
1518	E9C5	4C 8B F1	JMP TOBYTE	;OUTPUT ONE CHAR TO TAPE BUFFER
1519	E9C8		;TAPE KIM FORMAT	
1520	E9C8	C9 4B	OUTA1 CMF #1K	;KIM-1 ?
1521	E9CA	D0 04	BNE OUTA2	
1522	E9CC	6B	PLA	
1523	E9CD	4C 4A F2	JMP OUTTAP	
1524	E9D0		;PRINTER	
1525	E9D0	C9 50	OUTA2 CMF #1P	;PRINTER ?
1526	E9D2	D0 0E	BNE OUTA3	
1527	E9D4	3B	SEC	;TURN PRINTR ON
1528	E9D5	6E 11 A4	ROR PRIFLG	

LINE #	LOC	CODE	LINE
1529	E9D8	68	PLA
1530	E9D9	08	PHF
1531	E9DA	20 00 F0	JSR OUTPRI
1532	E9DD	28	PLP
1533	E9DE	2E 11 A4	ROL PRIFLG ;RESTORE FLG
1534	E9E1	60	RTS
1535	E9E2		;USER DEFINED
1536	E9E2	C9 55	OUTA3 CMP #'U ;USER ROUTINE?
1537	E9E4	D0 04	BNE OUTA4
1538	E9E6	38	SEC
1539	E9E7	6C 0A 01	JMP (UOUT) ;SET FLG FOR NORMAL OUTPUT
1540	E9EA		;NOWHERE OR TO TTY ,D/P
1541	E9EA	C9 58	OUTA4 CMP #'X ;EAT IT?
1542	E9EC	D0 8D	BNE OUT1 ;OUTPUT TO TTY OR D/P
1543	E9EE	68	PLA
1544	E9EF	60	RTS
1546	E9F0		;THIS ROUTINE OUTPUTS A CRLF TO ANY OUTPUT DEV
1547	E9F0		;LF AND NULL IS SENT ONLY TO TTY
1548	E9F0	A9 0D	CRLF LDA #CR
1549	E9F2	20 BC E9	JSR OUTALL
1550	E9F5	20 42 E8	JSR TTYTST ;TTY OR KB ?
1551	E9F8	D0 29	BNE CR2J
1552	E9FA	AD 13 A4	LDA OUTFLG ;LF ONLY TO TTY
1553	E9FD	C9 54	CMF #'T
1554	E9FF	F0 22	BEQ CR2J
1555	EA01	C9 4E	CMF #'K
1556	EA03	F0 1E	BEQ CR2J
1557	EA05	C9 50	CMF #'P
1558	EA07	F0 1A	BEQ CR2J
1559	EA09	A9 0A	LDA #LF
1560	EA0B	20 BC E9	JSR OUTALL
1561	EA0E	A9 FF	LDA #NULLC
1562	EA10	4C BC E9	JMP OUTALL
1564	EA13		;CRLF TO TERMINAL (TTY OR D/P) ONLY
1565	EA13	48	CRLOW PHA ;SAVE A
1566	EA14	AD 13 A4	LDA OUTFLG
1567	EA17	48	PHA
1568	EA18	20 01 E9	JSR OUTLOW
1569	EA1B	20 F0 E9	JSR CRLF
1570	EA1E	68	PLA
1571	EA1F	8D 13 A4	STA OUTFLG
1572	EA22	68	PLA
1573	EA23	60	CR2J RTS
1575	EA24		;OUTPUT <CR> TO TTY IF SWITCH ON TTY & INFLG NOT L
1576	EA24		;DONT CLR DISPLAY BUT CLEARS PNTRS FOR NEXT LINE
1577	EA24		;IF PNTR HAS PRINTED ON 21ST CHR DONT OUTPUT <CR>
1578	EA24	AD 12 A4	CRCK LDA INFLG ;NO <CR> IF 'L'
1579	EA27	C9 4C	CMF #'L
1580	EA29	D0 01	BNE CRCK1
1581	EA2B	60	RTS
1582	EA2C	20 42 E8	CRCK1 JSR TTYTST ;CHECK IF TTY OR KB
1583	EA2F	F0 E2	BEG CRLOW ;BRNCH IF TTY

LINE #	LOC	CODE	LINE
1584	EA31		;IF PRINTR PTR=0 ,DO NOT CLR PRI
1585	EA31	AD 16 A4	LDA CURPOS
1586	EA34	F0 05	BEQ CRCK2 ;IF PTR=0 ,NO <CR>
1587	EA36	A9 0D	LDA #CR
1588	EA38	20 00 F0	JSR OUTPRI
1589	EA38	A9 8D	CRCK2 LDA ##8D ;<CR> ONLY FOR TV
1590	EA3D	4C 02 EF	JMP OUTDP1
1591	EA40	EA	NOP
1592	EA41	EA	NOP
1594	EA42		;WRITE A THEN X IN ASCII TO THE OUTPUT DEV
1595	EA42	20 46 EA	WRAX JSR NUMA
1596	EA45	8A	TXA
1598	EA46		;PRINT ONE BYTE=TWO ASCII CHARS TO OUTPUT DEVICE
1599	EA46	48	NUMA PHA
1600	EA47	4A	LSR A
1601	EA48	4A	LSR A
1602	EA49	4A	LSR A
1603	EA4A	4A	LSR A
1604	EA4B	20 51 EA	JSR NOUT
1605	EA4E	68	PLA
1606	EA4F	29 0F	AND ##F
1607	EA51	18	NOUT CLC
1608	EA52	69 30	ADC ##30
1609	EA54	C9 3A	CMF ##3A
1610	EA56	90 02	BCC LT10
1611	EA58	69 06	ADC #6 ;CARRY IS SET
1612	EA5A	4C BC E9	LT10 JMP OUTALL
1614	EA5D		;READ TWO CHR & PACK THEM INTO ONE BYTE
1615	EA5D		;PART OF ALTER MEMORY , / COMM
1616	EA5D	20 73 E9	RD2 JSR REDOUT
1617	EA60	C9 0D	CMF ##D ;<CR>?
1618	EA62	F0 17	BEQ RSPAC
1619	EA64	C9 20	CMF #' ;FOR MEMORY ALTER
1620	EA66	F0 13	BEQ RSPAC
1621	EA68	C9 2E	CMF #'. ;TREAT ". AS <SPACE>
1622	EA6A	D0 04	BNE RD1
1623	EA6C	A9 20	LDA ##20
1624	EA6E	D0 0B	BNE RSPAC
1625	EA70	20 84 EA	RD1 JSR PACK
1626	EA73	80 06	BCS RSPAC
1627	EA75	20 73 E9	JSR REDOUT
1628	EA78	4C 84 EA	JMP PACK
1629	EA7B		;WAS SPACE OR <CR>
1630	EA7B	38	RSPAC SEC
1631	EA7C	60	RTS
1633	EA7D		;CONVERT ACC IN ASCII TO ACC IN HEX (4 MSB=0)
1634	EA7D	48	HEX PHA ;SAVE A
1635	EA7E	A9 00	LDA #0 ;CLEAR STIY IF HEX
1636	EA80	8D 29 A4	STA STIY+2 ;BECAUSE ONLY ONCE
1637	EA83	68	PLA
1638	EA84		;PACK TWO ASCII INTO ONE HEX (CALL SUBR TWO TIMES)

LINE #	LOC	CODE	LINE
1639	EA84		;RESULT IS GIVEN ON ACC WITH FIRST CHR INTO 4 MSB
1640	EA84	C9 30	PACK CMP ##30 ; < 30 ?
1641	EA86	90 F3	BCC RSPAC
1642	EA88	C9 47	CMP ##47 ; > 47 ?
1643	EA8A	B0 EF	BCS RSPAC
1644	EA8C	C9 3A	CMP ##3A ; < #10
1645	EA8E	90 06	BCC PAK1
1646	EA90	C9 40	CMP ##40 ; > #10 ?
1647	EA92	90 E7	BCC RSPAC
1648	EA94	69 08	ADC #8 ;ADD 9 IF LETTER (C IS SET)
1649	EA96	2A	ROL A ;SHIFT A 4 TIMES
1650	EA97	2A	ROL A
1651	EA98	2A	ROL A
1652	EA99	2A	ROL A
1653	EA9A	8E 2D A4	STX CPIY+3 ;SAVE X
1654	EA9D	A2 04	LDX #4
1655	EA9F	2A	ROL A ;TRANSFER A TO STIY
1656	EAAD	2E 29 A4	ROL STIY+2 ; THRU CARRY
1657	EAAD	CA	DEX
1658	EAAD	D0 F9	BNE PAK2
1659	EAAD	AE 2D A4	LDX CPIY+3 ;REST X
1660	EAAD	AD 29 A4	LDA STIY+2
1661	EAAD	18	CLC
1662	EAAD	60	RTS
1664	EAAE		;GET FOUR BYTE ADDR ,TAKE LAST FOUR CHR TO...
1665	EAAE		;CALULATE ADDR ,ALLOW DELETE ALSO
1666	EAAE	20 DB E7	ADDIN JSR EQUAL
1667	EAB1	AD 15 A4	ADDNE LDA CURF02 ;SAVE POSITION
1668	EAB4	48	PHA
1669	EAB5	A0 00	LDY #0
1670	EAB7	20 5F E9	ADDN1 JSR RDRUB
1671	EABA	C9 0D	CMP #CR
1672	EABC	F0 09	BEQ ADDN2
1673	EABE	C9 20	CMP #'
1674	EAC0	F0 05	BEQ ADDN2
1675	EAC2	C8	INY
1676	EAC3	C0 0B	CPY #11 ;ALLOW 10
1677	EAC5	90 F0	BCC ADDN1
1678	EAC7	68	ADDN2 PLA
1679	EAC8	8D 2D A4	STA CPIY+3 ;SAVE
1680	EACB	C0 00	CPY #0 ;IF FIRST CHR PUT DEFAULT VALUES
1681	EACD	D0 0D	BNE ADDN3
1682	EACF	A9 02	LDA ##02
1683	EAD1	8D 1D A4	STA ADDR+1 ;DEFAULT OF 0200
1684	EAD4	8D 1E A4	STA CKSUM ;DEFAULT
1685	EAD7	8C 1C A4	STY ADDR
1686	EADA	18	CLC
1687	EADB	60	RTS
1688	EADC	A2 00	ADDN3 LDX #0
1689	EADF	88	DEY ;Y-4
1690	EADF	88	DEY
1691	EAE0	88	DEY
1692	EAE1	88	DEY
1693	EAE2	10 13	BPL ADDN5 ;BRNCH IF > 4 CHR

LINE	* LOC	CODE	LINE	
1694	EAE4	98		TYA
1695	EAE5	49 FF		EOR #\$FF
1696	EAE7	A8		TAY
1697	EAE8	A9 30	ADDN4	LDA #\$30
1698	EAEA	9D 1C A4		STA ADDR,X
1699	EAE9	E8		INX
1700	EAE8	88		DEY
1701	EAEF	10 F7		BPL ADDN4
1702	EAF1	AC 2D A4		LDY CFIY+3
1703	EAF4	4C FD EA		JMP ADDN6
1704	EAF7	98	ADDN5	TYA
1705	EAF8	18		CLC
1706	EAF9	6D 2D A4		ADC CFIY+3
1707	Eafc	A8		TAY
1708	EAFD	B9 3B A4	ADDN6	LDA DIBUFF,Y
1709	EB00	9D 1C A4		STA ADDR,X
1710	EB03	C8		INX
1711	EB04	E8		INX
1712	EB05	E0 04		CPX #4
1713	EB07	D0 F4		BNE ADDN6
1714	EB09	A2 01		LDX #1
1715	EB08	A0 00		LDY #0
1716	EB0D	B9 1C A4	ADDN7	LDA ADDR,Y
1717	EB10	20 7D EA		JSR HEX
1718	EB13	B0 16		BCS ADDN8
1719	EB15	C8		INX
1720	EB16	B9 1C A4		LDA ADDR,Y
1721	EB19	C8		INX
1722	EB1A	20 84 EA		JSR PACK
1723	EB1D	B0 0C		BCS ADDN8
1724	EB1F	9D 1C A4		STA ADDR,X
1725	EB22	CA		DEX
1726	EB23	10 E8		BPL ADDN7
1727	EB25	E8		INX
1728	EB26	BE 1E A4		STX CKSUM
1729	EB29	18		CLC
1730	EB2A	60		RTS
1731	EB2B	20 94 E3	ADDN8	JSR CKER00
1732	EB2E	20 24 EA		JSR CRCK
1733	EB31	38		SEC
1734	EB32	60		RTS
1736	EB33			;MEMORY FAIL TO WRITE MSG & SPECIFIC ADDRESS
1737	EB33	20 24 EA	MEMERR	JSR CRCK
1738	EB36	20 CD E2		JSR NXTADD
1739	EB39	A0 31		LDY #M11-M1
1740	EB3B	20 AF E7		JSR KEP
1741	EB3E	20 DB E2		JSR WRITAZ
1742	EB41	4C A1 E1		JMP COMIN
1744	EB44			;CLEAR DISPLAY & PRINTER POINTERS
1745	EB44	A9 00	CLR	LDA #0
1746	EB46	8D 15 A4		STA CURPO2
1747	EB49	8D 16 A4		STA CURPOS
1748	EB4C	60		RTS

LINE #	LOC	CODE	LINE
1750	EB4D		;CLEAR CKSUM
1751	EB4D	A9 00	CLRCK LDA #0
1752	EB4F	8D 1F A4	STA CKSUM+1
1753	EB52	8D 1E A4	STA CKSUM
1754	EB55	60	RTS
1756	EB56		;CODE FOR PAGE ZERO SIMULATION
1757	EB56		;SUBR LDAY-SIMULATES LDA (N),Y INSTR WITHOUT PAG 0
1758	EB56		;BY PUTTING INDIR ADDR INTO RAM & THEN EXEC LDA NM,Y
1759	EB56	A9 25	PCLLD LDA #<SAVPC ;FOR DISASSEMBLER
1760	EB58	8C 2D A4	LDAY STY CPIY+3 ;SAVE Y
1761	EB58	A8	TAY
1762	EB5C	E9 00 A4	LDA MONRAM,Y ;MONRAM=MONITOR RAM
1763	EB5F	8D 2B A4	STA LDY+1
1764	EB62	E9 01 A4	LDA MONRAM+1,Y
1765	EB65	8D 2C A4	STA LDY+2
1766	EB68	AC 2D A4	LDY CPIY+3 ;REST Y
1767	EB68	A9 E9	LDA #E9 ;INST FOR LDA NM,Y
1768	EB6D	8D 2A A4	STA LDY
1769	EB70	A9 60	LDA #60 ;RTS
1770	EB72	8D 2D A4	STA LDY+3
1771	EB75	4C 2A A4	JMP LDY ;START EXECUTING LDA (),Y
1773	EB78		;SUBR STORE AT ADDR & CMP WITHOUT PAG 0
1774	EB78		;REPLACES STA (ADDR),Y & CMP (ADDR),Y
1775	EB78		;LOOK THAT ADDR & ADDR+1 ARE NOT ON PAG 0
1776	EB78	48	SADDR PHA
1777	EB79	AD 1C A4	LDA ADDR
1778	EB7C	8D 28 A4	STA STY+1
1779	EB7F	8D 2B A4	STA CPIY+1
1780	EB82	AD 1D A4	LDA ADDR+1
1781	EB85	8D 29 A4	STA STY+2
1782	EB88	8D 2C A4	STA CPIY+2
1783	EB8B	A9 99	LDA #99 ;STA INSTR
1784	EB8D	8D 27 A4	STA STY
1785	EB90	A9 D9	LDA #D9 ;CMP INSTR
1786	EB92	8D 2A A4	STA CPIY
1787	EB95	A9 60	LDA #60 ;RTS
1788	EB97	8D 2D A4	STA CPIY+3
1789	EB9A	68	PLA
1790	EB9B	4C 27 A4	JMP STY ;START EXECUTING STA (),Y
1792	EB9E		;PUSH X & Y WITHOUT CHANGING THE REGS
1793	EB9E	8D 2D A4	PHXY STA CPIY+3 ;SAVE ACC
1794	EBA1	98	TYA
1795	EBA2	48	PHA ;PUSH Y
1796	EBA3	8A	TXA
1797	EBA4	48	PHA ;PUSH X
1798	EBA5	20 BA EB	JSR SWSTAK ;SWAP X , Y WITH RTRN ADDR FROM SUBR
1799	EBA8	AD 2D A4	LDA CPIY+3
1800	EBA8	60	RTS
1802	EBA8		;PULL X & Y WITHOUT CHANGING ACC
1803	EBA8		;IT HAS TO BE CALLED BY JSR & NOT BY JMP INSTR
1804	EBA8		;SINCE IT SWAPS THE STACK

LINE #	LOC	CODE	LINE		
1805	EBAC	BD 2D A4	PLXY	STA CPIY+3	
1806	EBAF	20 BA EB		JSR SWSTAK	;SWAP X , Y WITH RTRN ADDR FROM SUBR
1807	EBB2	68		PLA	
1808	EBB3	AA		TAX	;PULL X
1809	EBB4	68		PLA	
1810	EBB5	A8		TAY	;PULL Y
1811	EBB6	AD 2D A4		LDA CPIY+3	
1812	EBB9	60		RTS	
1814	EBBA			;SWAP STACK	
1815	EBBA	BA		SWSTAK TSX	
1816	EBB8	A9 02		LDA #2	
1817	EBBD	48	SWST1	PHA	
1818	EBBE	BD 06 01		LDA #0106,X	;GET PCH OR PCL
1819	EBB1	BC 04 01		LDY #0104,X	;GET Y OR X REGS
1820	EBB4	9D 04 01		STA #0104,X	
1821	EBB7	98		TYA	
1822	EBB8	9D 06 01		STA #0106,X	
1823	EBB8	CA		DEX	
1824	EBCC	68		PLA	
1825	EBCD	38		SEC	
1826	EBCE	E9 01		SBC #1	
1827	EBD0	D0 EB		BNE SWST1	
1828	EBD2	BD 08 01		LDA #0108,X	;RESTORE Y & X FROM STACK
1829	EBD5	A8		TAY	
1830	EBD6	BD 07 01		LDA #0107,X	
1831	EBD9	AA		TAX	
1832	EBDA	60		RTS	

LINE	#	LOC	CODE	LINE	
1834	EBDB			1834	EBDB
1835	EBDB			1835	EBDB
1836	EBDB	8A		1836	EBDB
1837	EBDC	4B		1837	EBDC
1838	EBDD	A2 07		1838	EBDD
1839	EBDF	8E 2A A4		1839	EBDF
1840	EBE2	2C 00 AB		1840	EBE2
1841	EBE5	70 FB		1841	EBE5
1842	EBE7	20 0F EC		1842	EBE7
1843	EBEA	20 23 EC		1843	EBEA
1844	EBED	AD 00 AB		1844	EBED
1845	EBF0	29 40		1845	EBF0
1846	EBF2	4E 2A A4		1846	EBF2
1847	EBF5	0D 2A A4		1847	EBF5
1848	EBF8	8D 2A A4		1848	EBF8
1849	EBFB	20 0F EC		1849	EBFB
1850	EBFE	CA		1850	EBFE
1851	EBFF	D0 EC		1851	EBFF
1852	EC01	20 0F EC		1852	EC01
1853	EC04	20 23 EC		1853	EC04
1854	EC07	68		1854	EC07
1855	EC08	AA		1855	EC08
1856	EC09	AD 2A A4		1856	EC09
1857	EC0C	29 7F		1857	EC0C
1858	EC0E	60		1858	EC0E
1860	EC0F			1860	EC0F
1861	EC0F	AD 1B A4		1861	EC0F
1862	EC12	8D 0B AB		1862	EC12
1863	EC15	AD 17 A4		1863	EC15
1864	EC18	8D 09 AB		1864	EC18
1865	EC1B	AD 0D AB		1865	EC1B
1866	EC1E	29 20		1866	EC1E
1867	EC20	F0 F9		1867	EC20
1868	EC22	60		1868	EC22
1870	EC23			1870	EC23
1871	EC23			1871	EC23
1872	EC23	AD 17 A4		1872	EC23
1873	EC26	4A		1873	EC26
1874	EC27	AD 1B A4		1874	EC27
1875	EC2A	6A		1875	EC2A
1876	EC2B	8D 0B AB		1876	EC2B
1877	EC2E	AD 17 A4		1877	EC2E
1878	EC31	4A		1878	EC31
1879	EC32	8D 09 AB		1879	EC32
1880	EC35	4C 1B EC		1880	EC35
1882	EC38			1882	EC38
1883	EC38	A9 00		1883	EC38
1884	EC3A	8D 77 A4		1884	EC3A
1885	EC3D	20 50 F0		1885	EC3D
1887	EC40			1887	EC40
1888	EC40			1888	EC40

LINE #	LOC	CODE	LINE	
1889	EC40			;X=CTRL OR SHIFT ,OTHERWISE X=0
1890	EC40	20 EF EC	GETKEY JSR ROONEK	;WAIT IF LAST KEY STILL DOWN
1891	EC43	20 2A ED	GETKY JSR DEBKEY	;DEBOUNCE KEY (5 MSEC)
1892	EC46		;CTRL OR SHIFT ?	
1893	EC46	A9 8F	LDA #8F	;CHK CLMN 5,6,7
1894	EC48	8D 80 A9	STA DRA2	
1895	EC48	AD 82 A9	LDA DRB2	;CHK ROW 1
1896	EC4E	4A	LSR A	
1897	EC4F	B0 20	BCS GETK1	;IF=1 ,NO CTRL OR SHIFT
1898	EC51	A2 03	LDX #3	;CLMN 5,6,7 (CNTRL,SHIFTL,SHIFTR)
1899	EC53	A9 7F	LDA #7F	;CTRL OR SHIFT ,GO WHICH ONE ?
1900	EC55	38	GETK0 SEC	
1901	EC56	6A	ROR A	
1902	EC57	48	PHA	
1903	EC58	20 08 ED	JSR ONEK2	;LETS GET CTRL OR SHIFT INTO X
1904	EC58	AD 82 A9	LDA DRB2	
1905	EC5E	4A	LSR A	;ONLY ROW 1
1906	EC5F	90 06	BCC GETK00	;GOT YOU
1907	EC61	68	PLA	
1908	EC62	CA	DEX	
1909	EC63	D0 F0	BNE GETK0	
1910	EC65	F0 DC	BEQ GETKY	;THERE IS A MISTAKE CHECK AGAIN
1911	EC67	68	GETK00 PLA	;NOW GET STEKEY INTO X
1912	EC68	AD 2B A9	LDA STEKEY	;CLMN INTO X
1913	EC68	49 FF	EOR #FF	;COMPLEMENT BECAUSE STRBS ARE 0
1914	EC6D	AA	TAX	;CTRL OR SHIFT TO X
1915	EC6E	EE 2A A9	INC KMASK	;SET MSK=#01
1916	EC71		;NOW GET ANY KEY	
1917	EC71	20 05 ED	GETK1 JSR ONEKEY	;GET A KEY
1918	EC74	88	DEY	;CHK THE ROW (1-8)
1919	EC75	D0 09	BNE GETK1B	;CHK IF CTRL OR SHIFT
1920	EC77	AD 2B A9	LDA STEKEY	;WERE ENTERED AT THE LAST MOMENT
1921	EC7A	C9 F7	CMP #F7	;IF CLMN 5,6,7,8 DO IT AGAIN
1922	EC7C	B0 04	BCS GETK2	
1923	EC7E	90 C3	BCC GETKY	;SEND IT TO GET CTRL OR SHIFT
1924	EC80	30 C1	GETK1B BMI GETKY	;NO KEY ,CLEAR MSK
1925	EC82		;WE HAVE A KEY ,DECODE IT	
1926	EC82	20 2C ED	GETK2 JSR DEBK1	;DEBOUNCE KEY (5 MSEC)
1927	EC85	98	TYA	;MULT BY 8
1928	EC86	0A	ASL A	
1929	EC87	0A	ASL A	
1930	EC88	0A	ASL A	
1931	EC89	A8	TAY	;NOW Y HAS ROW ADDR FROM ROW 1
1932	EC8A	AD 2B A9	LDA STEKEY	;ADD COLUMN TO Y
1933	EC8D	4A	GETK3 LSR A	
1934	EC8E	90 03	BCC GETK4	
1935	EC90	C8	INY	
1936	EC91	D0 FA	BNE GETK3	
1937	EC93	B9 21 F4	GETK4 LDA ROW1,Y	;GET THE CHR
1938	EC96	48	PHA	
1939	EC97	8A	TXA	;SEE IF CTRL OR SHIFT WAS USED
1940	EC98	F0 24	BEQ GETK7	;BRCH IF NO CTRL OR SHIFT
1941	EC9A	29 10	AND #10	;CTRL ?
1942	EC9C	F0 06	BEQ GETK5	;NO ,GO GETK5
1943	EC9E	68	PLA	

LINE	#	LOC	CODE	LINE		
1944	EC9F	29	3F		AND #3F	;MSK OFF 2 MSB FOR CONTROL
1945	ECA1	4C	BF.EC		JMP GETK8	;EXIT
1946	ECA4	68		GETK5	PLA	
1947	ECA5	48			PHA	;SAVE IT
1948	ECA6	29	40		AND #40	;IF ALPHA CHARS DO NOT SHIFT
1949	ECA8	D0	14		BNE GETK7	
1950	ECAA	68			PLA	
1951	ECAB	48			PHA	
1952	ECAC	29	0F		AND #0F	;ONLY LSB
1953	ECAD	F0	0E		BEQ GETK7	;DO NOT INTERCHANGE <SPACE> OR 0
1954	ECB0	C9	0C		CMF #0C	;ACC=#0C ?
1955	ECB2	B0	05		BCS GETK6	;YES ACC=#0C
1956	ECB4	68			PLA	;NO, ACC#0C
1957	ECB5	29	EF		AND #EF	;STRIP OFF BIT 4
1958	ECB7	D0	06		BNE GETK8	;EXIT
1959	ECB9	68		GETK6	PLA	;ACC=#0C
1960	ECBA	09	10		ORA #10	;BIT 4= 1
1961	ECBC	D0	01		BNE GETK8	;EXIT
1962	ECBE	68		GETK7	PLA	
1963	ECBF					;CHECK FOR "ADV PAF", "PRI LINE", OR "TOGL PRIFLG"
1964	ECBF					;IN THIS WAY WE DONT HAVE TO CHCK FOR THIS COMM
1965	ECBF	C9	60	GETK8	CMF #60	;ADV PAPER COMM
1966	ECC1	D0	06		BNE GETK11	
1967	ECC3	E0	00		CPX #0	;IF SHIFT IS NOT ADV PAPER
1968	ECC5	F0	25		BEQ GETK10	;NO SHIFT ,SO ADV PAPER
1969	ECC7	29	4F		AND #4F	;CONVRT TO "0"
1970	ECC9	C9	1C	GETK11	CMF #1C	;SEE IF TOGGL PRIFLG (CONTRL PRI)
1971	ECCB	D0	14		BNE GETK13	
1972	ECCD	20	E1 E6		JSR PRITR	;GO TOGGLE FLG
1973	ECD0	A0	01		LDY #1	;GET THE PTRS BACK 3 SPACES
1974	ECD2	B9	15 A4	GETK12	LDA CURP02,Y	
1975	ECD5	38			SEC	
1976	ECD6	E9	03		SBC #3	;BECAUSE "ON ,OFF" MSGS
1977	ECD8	99	15 A4		STA CURP02,Y	
1978	ECD8	88			DEY	
1979	ECCD	10	F4		BPL GETK12	
1980	ECDE	4C	40 EC		JMP GETKEY	
1981	ECDE	C9	5C	GETK13	CMF #1\	;PRINT LINE COMMAND
1982	ECE3	D0	06		BNE GETK14	
1983	ECE5	20	4A F0		JSR IPS0	;PRINT WHATEVER IS IN BUFFER
1984	ECE8	4C	40 EC		JMP GETKEY	
1985	ECE8	60		GETK14	RTS	
1986	ECEC	4C	38 EC		GETK10 JMP GETKD0	
1988	ECEF					;WAIT IF LAST KEY STILL DOWN (ROLLOVER)
1989	ECEF	AD	82 A4	ROONEK	LDA DRB2	;SEE IF KEY STILL DOWN
1990	ECF2	C9	FF		CMF #FF	
1991	ECF4	F0	0A		BEQ ROO1	;NO KEY AT ALL, CLR ROLLFL
1992	ECF6	0D	7F A4		ORA ROLLFL	;ACCEPT ONLY LAST KEY
1993	ECF9	49	FF		EOR #FF	;STRBS ARE ZEROS SO INVER
1994	ECFB	D0	F2		BNE ROONEK	
1995	ECFD	20	2A ED		JSR DEEKEY	;CLR KMASK & DEBOUNCE RELEASE
1996	ED00	A9	00	ROO1	LDA #0	;CLR KMASK
1997	ED02	8D	2A A4		STA KMASK	
1998	ED05					;GO THRU KB ONCE AND RTN ,IF ANY

LINE #	LOC	CODE	LINE	
1999	ED05			;KEY Y=ROW (1-8) & STEKEY=CLMN
2000	ED05			;IF NO KEY Y=0 ,STEKEY=FF
2001	ED05	A9 7F	ONEKEY	LDA #7F ;FIRST STROBE TO MSB
2002	ED07	D0 02		BNE ONEK2 ;START AT ONEK2
2003	ED09	38	ONEK1	SEC ;ONLY ONE PULSE (ZERO)
2004	ED0A	6A		ROR A ;SHIFT TO RIGHT
2005	ED0B	8D 80 A4	ONEK2	STA DRA2 ;OUTPUT CLMN STROBE
2006	ED0E	8D 2B A4		STA STEKEY ;SAVE IT
2007	ED11	A0 08		LDY #8 ;CHECK 8 ROWS
2008	ED13	AD 82 A4		LDA DRB2 ;ANY KEY ?
2009	ED16	0D 2A A4		ORA KMASK ;DISABLE ROW 1 IF CTRL OR SHIFT
2010	ED19	8D 7F A4		STA ROLLFL ;SAVE WHICH KEY IT WAS
2011	ED1C	0A	ONEK3	ASL A
2012	ED1D	90 0A		BCC ONEK4 ;JUMP IF KEY (ZERO)
2013	ED1F	88		DEY
2014	ED20	D0 FA		BNE ONEK3
2015	ED22	AD 2B A4		LDA STEKEY
2016	ED25	C9 FF		CMP #FF ;LAST CLMN ?
2017	ED27	D0 E0		BNE ONEK1 ;NO ,DO NEXT CLMN
2018	ED29	60	ONEK4	RTS
2020	ED2A	A2 00	DEBKEY	LDX #0 ;CLEAR CNTRL OR SHIFT
2021	ED2C	A9 00	DEBK1	LDA #0 ;CLR KMASK
2022	ED2E	8D 2A A4		STA KMASK
2023	ED31	A9 88		LDA #<DEBTIM ;DEBOUNCE TIME FOR KEYBOARD
2024	ED33	8D 08 A8		STA T2L
2025	ED36	A9 13		LDA #>DEBTIM
2026	ED38	4C 18 EC		JMP DE1 ;WAIT FOR 5 MSEC
2028	ED3B			;;;
2029	ED3B			;GET A CHAR FROM TAPE SUBROUTINE
2030	ED3B			;A BUFFER IS USED TO GET BLOCKS OF DATA
2031	ED3B			;FROM TAPE ,EXCEPT WHEN FORMAT EQUAL TO
2032	ED3B			;KIM-1 (THE WHOLE FILE IS LOADED AT ONE TIME)
2033	ED3B	20 9E EB	TIBYTE	JSR PHXY ;PUSH X
2034	ED3E	AE 36 A4		LDX TAPTR ;POINTER FOR BUFFER
2035	ED41	E0 50		CPX #80 ;IS BUFFER EMPTY ?
2036	ED43	D0 03		BNE TIB1
2037	ED45	20 53 ED		JSR TIBY1 ;LOAD ANOTHER BLOCK
2038	ED48	8D 16 01	TIB1	LDA TABUFF,X
2039	ED4B	E8		INX
2040	ED4C	8E 36 A4		STX TAPTR
2041	ED4F	20 AC EB		JSR PLXY ;PULL X
2042	ED52	60		RTS
2043	ED53			;LOAD A BLOCK FROM TAPE INTO BUFFER
2044	ED53	20 EA ED	TIBY1	JSR TAISET ;SET TAPE FOR INPUT
2045	ED56	20 29 EE	TIBY3	JSR GETTAP ;GET A CHAR FROM TAPE
2046	ED59	C9 23		CMP #' ;CHECK FIRST CHR FOR
2047	ED5B	F0 06		BEQ TIBY4 ;START OF BLOCK
2048	ED5D	C9 16		CMP #16 ;IF NOT # SHOULD BE SYN
2049	ED5F	D0 F2		BNE TIBY1
2050	ED61	F0 F3		BEQ TIBY3
2051	ED63	A2 00	TIBY4	LDX #0
2052	ED65	20 29 EE	TIBY5	JSR GETTAP ;NOW LOAD INTO BUFFER

LINE #	LOC	CODE	LINE
2053	ED68	9D 16 01	STA TABUFF,X
2054	ED6E	E8	INX
2055	ED6C	E0 52	CPX #82
2056	ED6E	D0 F5	BNE TIBY5
2057	ED70	AD 00 A8	LDA DRB
2058	ED73	29 CF	AND #1CF
2059	ED75	8D 00 A8	STA DRB ;TURN OFF TAPES
2060	ED78	58	CLI ;ENABL INTERR
2061	ED79	20 BD ED	JSR ADDBK1 ;DISPLAY BLK COUNT
2062	ED7C	A2 00	LDX #0 ;TO CLEAR PTR IN TIBYTE
2063	ED7E	AD 15 01	LDA BLK ;CHECK THE BLOCK COUNT
2064	EDB1	F0 05	BEQ TIBY5A ;IF FIRST BLK ,DO NOT CMP
2065	EDB3	DD 16 01	CMF TABUFF,X
2066	EDB6	D0 28	BNE TIBY7 ;BRANCH IF WE MISSED ONE BLOCK
2067	EDB8	E8	TIBY5A INX
2068	EDB9	8E 36 A4	STX TAPTR
2069	EDBC	EE 15 01	INC BLK ;INCR BLK CONT
2070	EDBF	AD 67 01	LDA TABUFF+81 ;STORE THIS BLK CKSUM
2071	ED92	48	PHA
2072	ED93	AD 66 01	LDA TABUFF+80
2073	ED96	48	PHA
2074	ED97	CE 12 A4	DEC INFLG ;SET INFLG DIFF FROM OUTFLG
2075	ED9A	20 E7 F1	JSR BKCKSM ;COMPUT BLK CKSUM FOR THIS BLK
2076	ED9D	68	PLA
2077	ED9E	CD 66 01	CMF TABUFF+80 ;DO THEY AGREE ?
2078	EDA1	D0 0C	BNE TIBY6
2079	EDA3	68	PLA
2080	EDA4	CD 67 01	CMF TABUFF+81
2081	EDA7	D0 07	BNE TIBY7
2082	EDA9	EE 12 A4	INC INFLG ;RESTORE INPUT DEVICE
2083	EDAC	A2 01	LDX #1 ;TO GET FIRST CHR IN TIBYTE
2084	EDAE	60	RTS
2085	EDAF	68	TIBY6 PLA ;RESTORE STACK PTR
2086	EDB0	68	TIBY7 PLA
2087	EDB1	68	PLA
2088	EDB2	68	PLA
2089	EDB3	68	PLA
2090	EDB4	20 8E E3	JSR CKERO
2091	EDB7	9C A1 E1	JMP COMIN
2093	EDBA		;ADD 1 TO BLK COUNT AND OUTPUT IT
2094	EDBA	EE 15 01	ADDBLK INC BLK ;INCR BLK CNT
2095	EDBD	EE 11 A4	ADDBK1 INC PRIFLG ;SO DONT OUTPUT TO PRINTR
2096	EDC0	A9 12	LDA #18 ;ONLY OUTPUT IN THIS POSITION
2097	EDC2	BD 15 A4	STA CURP02
2098	EDC5	AD 4A A4	LDA DIBUFF+18 ;SAVE DISBUFF (FOR EDIT)
2099	EDC8	48	PHA
2100	EDC9	AD 4B A4	LDA DIBUFF+19
2101	EDCC	48	PHA
2102	EDCD	AE 13 A4	LDX OUTFLG ;SAVE OUTFLG
2103	EDD0	A9 0D	LDA #CR
2104	EDD2	8D 13 A4	STA OUTFLG ;TO OUTPUT TO TERMINAL
2105	EDD5	AD 16 01	LDA BLK+1 ;BLK CNT COMING FROM TAPE
2106	EDD8	20 46 EA	JSR NUMA ;OUTPUT IN ASCII
2107	EDDB	8E 13 A4	STX OUTFLG ;RESTORE OUTFLG

LINE	* LOC	CODE	LINE
2108	EDDE	68	FLA
2109	EDDF	8D 4B A4	STA DIBUFF+19
2110	EDE2	68	FLA
2111	EDE3	8D 4A A4	STA DIBUFF+18
2112	EDE6	CE 11 A4	DEC PRIFLG ;RESTORE PRI FLG
2113	EDE9	60	RTS
2115	EDEA		;SET TAPE (1 OR 2) FOR INPUT
2116	EDEA	A9 37	TAISET LDA ##37 ;SET PB7 FOR INPUT
2117	EDEC	8D 02 AB	STA DDRB
2118	EDEF	AD 3A A4	LDA TAPIN ;INPUT FLG (TAP 1=0 OR TAP 2=1)
2119	EDF2	20 1C EE	JSR TIOSET ;RESET PB4 OR PB5
2120	EDF5	A9 EE	LDA #MOFF+DATIN ;SET CA2=1 (DATA IN)
2121	EDF7	8D 0C AB	STA PCR
2122	EDFA	A9 FF	LDA ##FF ;PREPARE T2
2123	EDFC	8D 08 AB	STA T2L ;LACTH
2124	EDFF		;CHCK BIT BY BIT UNTIL #16
2125	EDFF	20 3B EE	SYNC JSR RDBIT ;GET A BIT IN MSB
2126	EE02	4E 2A A4	LSR CPIY ;MAKE ROOM FOR BIT
2127	EE05	0D 2A A4	ORA CPIY ;PUT BIT INTO MSB
2128	EE08	8D 2A A4	STA CPIY
2129	EE0B	C9 16	CMP ##16 ;SYN CHAR ?
2130	EE0D	D0 F0	BNE SYNC
2131	EE0F	A2 05	LDX ##05 ;TEST FOR 5 SYN CHARS
2132	EE11	20 29 EE	SYNC1 JSR GETTAP
2133	EE14	C9 16	CMP ##16
2134	EE16	D0 E7	BNE SYNC ;IF NOT 2 CHAR RE-SYNC
2135	EE18	CA	DEX
2136	EE19	D0 F6	BNE SYNC1
2137	EE1B	60	RTS
2139	EE1C		;SET PB4 OR PB5 OFF
2140	EE1C		;USED BY IN/OUT SET UPS
2141	EE1C	D0 04	TIOSET BNE TIOS1 ;BRCH IF TAP1
2142	EE1E	A9 14	LDA ##14 ;SET TAPE 2 OFF (PB5=0)
2143	EE20	D0 02	BNE TIOS2
2144	EE22	A9 24	TIOS1 LDA ##24 ;SET TAPE 1 OFF (PB4=0)
2145	EE24	8D 00 AB	TIOS2 STA DRB
2146	EE27	78	SEI ;DISABLE INTERRUPT WHILE TAP
2147	EE28	60	RTS
2149	EE29		;GET 1 CHAR FROM TAPE AND RETURN
2150	EE29		;WITH CHR IN ACC, USE CPIY TO ASM CHR ,USES Y
2151	EE29	A0 08	GETTAP LDY ##08 ;READ 8 BITS
2152	EE2B	20 3B EE	GETA1 JSR RDBIT ;GET NEXT DATA BIT
2153	EE2E	4E 2A A4	LSR CPIY ;MAKE ROOM FOR MSB
2154	EE31	0D 2A A4	ORA CPIY ;OR IN SIGN BIT
2155	EE34	8D 2A A4	STA CPIY ;REPLACE CHAR
2156	EE37	88	DEY
2157	EE38	D0 F1	BNE GETA1
2158	EE3A	60	RTS
2159	EE3B		;GET ONE BIT FROM TAPE AND
2160	EE3B		;RETURN IT IN SIGN OF A (MSB)
2161	EE3B	AD 08 A4	RDBIT LDA TSPEED ;ARE WE IN C7 OR 5B,5A FREQUENCIES
2162	EE3E	30 27	BMI RDBIT4 ;JUMP TO C7 FREQ FORMAT

LINE #	LOC	CODE	LINE	
2163	EE40	20 75 EE	JSR CKFREQ	;START BIT IN HIGH FREQ
2164	EE43	20 75 EE	RDBIT1 JSR CKFREQ	;HIGH TO LOW FREQ TRANS
2165	EE46	80 FB	BCS RDBIT1	
2166	EE48	AD 96 A4	LDA DIV64	;GET HIGH FREQ TIMING
2167	EE4B	48	PHA	
2168	EE4C	A9 FF	LDA #FF	;SET UP TIMER
2169	EE4E	8D 96 A4	STA DIV64	
2170	EE51	20 75 EE	RDBIT2 JSR CKFREQ	;LOW TO HIGH FREQ TRANS
2171	EE54	90 FB	BCC RDBIT2	;WAIT TILL FREQ IS HIGH
2172	EE56	68	PLA	
2173	EE57	38	SEC	
2174	EE58	ED 96 A4	SBC DIV64	; (256-T1) - (256-T2) = T2-T1
2175	EE5B	48	PHA	;LOW FREQ TIME-HIGH FREQ TIME
2176	EE5C	A9 FF	LDA #FF	
2177	EE5E	8D 96 A4	STA DIV64	;SET UP TIMER
2178	EE61	68	PLA	
2179	EE62	A9 FF	EOR #FF	
2180	EE64	29 80	AND #80	
2181	EE66	60	RTS	
2182	EE67			;EACH BIT STARTS WITH HALF PULSE OF 2400 & THEN
2183	EE67			;3 HALF PULSES OF 1200 HZ FOR 0 ,3 PULSES OF 2400 FOR 1
2184	EE67			;THE READING IS MADE ON THE FOURTH 1/2 PULSE ,WHERE
2185	EE67			;THE SIGNAL HAS STABILIZED
2186	EE67	20 75 EE	RDBIT4 JSR CKFREQ	;SEE WHICH FREQ
2187	EE6A	90 FB	BCC RDBIT4	
2188	EE6C	20 75 EE	JSR CKFREQ	
2189	EE6F	20 75 EE	JSR CKFREQ	
2190	EE72	4C B5 FF	JMP PATC24	;NOW READ THE BIT
2192	EE75	2C 00 AB	CKFREQ BIT DRB	;ARE WE HIGH OR LOW ?
2193	EE78	30 27	BMI CKF4	
2194	EE7A	2C 00 AB	CKF1 BIT DRB	;WAIT TILL HIGH
2195	EE7D	10 FB	BPL CKF1	
2196	EE7F	65 00	ADC #00	;EQUALIZER
2197	EE81	AD 09 AB	CKF2 LDA T2H	;SAVE CNTR
2198	EE84	48	PHA	
2199	EE85	AD 08 AB	LDA T2L	
2200	EE88	48	PHA	
2201	EE89	A9 FF	LDA #FF	
2202	EE8B	8D 09 AB	STA T2H	;START CNTR
2203	EE8E	AD 08 A4	LDA TSPEED	
2204	EE91	30 06	BMI CKF3	;SUPER SPEED ?
2205	EE93	68	PLA	
2206	EE94	CD 08 A4	CMF TSPEED	;HIGH OR LOW FREQ
2207	EE97	68	PLA	;C=1 IF HIGH ,C=0 IF LOW
2208	EE98	60	RTS	
2209	EE99	68	CKF3 PLA	
2210	EE9A	CD 08 A4	CMF TSPEED	;CENTER FREQ
2211	EE9D	68	CKF3A PLA	
2212	EE9E	E9 FE	SBC #FE	
2213	EEA0	60	RTS	
2214	EEA1	2C 00 AB	CKF4 BIT DRB	;WAIT TILL LOW
2215	EEA4	30 FB	BMI CKF4	
2216	EEA6	10 D9	BPL CKF2	;GO GET TIMING

LINE	#	LOC	CODE	LINE
2218	EEA8			;;;
2219	EEA8			;OUTPUT ACC TO TTY SUBROUTINE
2220	EEA8			;X,Y ARE PRESERVED
2221	EEA8	48		OUTTTY PHA ;SAVE A
2222	EEA9	20 9E EB		JSR PHXY ;PUSH X
2223	EEAC	8D 27 A4		STA STIY ;PUT CHAR HERE
2224	EEAF	20 0F EC		JSR DELAY ;STOP BIT FROM LAST CHAR
2225	EEB2	AD 00 AB		LDA DRB
2226	EEB5	29 FB		AND #\$FB ;START BIT PB2=0
2227	EEB7	8D 00 AB		STA DRB ;TTO=PB2
2228	EEBA	8D 2B A4		STA STIY+1 ;SAVE THIS PATTERN
2229	EEBD	20 0F EC		JSR DELAY
2230	EEC0	A2 08		LDX #\$08 ;8 BITS
2231	EEC2	2E 27 A4		ROL STIY ;GET FIRST LSB INTO BIT 2
2232	EEC5	2E 27 A4		ROL STIY
2233	EEC8	2E 27 A4		ROL STIY
2234	EECB	6E 27 A4	OUTT1	ROR STIY
2235	EECE	AD 27 A4		LDA STIY
2236	EED1	29 04		AND #\$04 ;GET ONLY BIT 2 FOR PB2
2237	EED3	0D 2B A4		ORA STIY+1 ;PUT BIT INTO PATTERN
2238	EED6	8D 00 AB		STA DRB ;NOW TO TTY
2239	EED9	08		PHP ;PRESERVE CARRY FOR ROTATE
2240	EEDA	20 0F EC		JSR DELAY
2241	EEDD	28		PLP
2242	EEDE	CA		DEX
2243	EEDF	D0 EA		BNE OUTT1
2244	EEE1	A9 04		LDA #\$04 ;STOP BIT
2245	EEE3	0D 2B A4		ORA STIY+1
2246	EEE6	8D 00 AB		STA DRB
2247	EEE9	20 0F EC		JSR DELAY ;STOP BIT
2248	EEEC	20 AC EB		JSR PLXY ;PULL X
2249	EEEF	68		PLA
2250	EEF0	C9 0A		CMP #LF
2251	EEF2	F0 07		BEQ OUTT2
2252	EEF4	C9 FF		CMP #NULLC
2253	EEF6	F0 03		BEQ OUTT2
2254	EEF8	4C 05 EF		JMP OUTDIS ;USE THAT BUFF
2255	EEFB	60	OUTT2	RTS
2257	EEFC			;;;
2258	EEFC			;OUTPUT A CHR TO D/P SUBR (SINGLE ENTRY FOR BOTH SUBR)
2259	EEFC			;IF CHAR=<CR> CLEAR DISPLAY & PRINTER
2260	EEFC	20 00 F0	OUTDP	JSR OUTPRI ;FIRST TO PRI THEN TO DISP
2261	EEFF	EA		NOP
2262	EF00	EA		NOP
2263	EF01	EA		NOP
2264	EF02	6C 06 A4	OUTDP1	JMP (DILINK) ;HERE HE COULD ECHO SOMEWHERE ELSE
2266	EF05			;;;
2267	EF05			;OUTPUT ACC TO DISPLAY SUBROUTINE
2268	EF05			;IF SIGN BIT (MSB)=1 DISP DO NOT CLR TO THE RIGHT
2269	EF05	48	OUTDIS	PHA ;SAVE A
2270	EF06	20 9E EB		JSR PHXY ;PUSH X
2271	EF09	C9 0D		CMP #CR ;<CR> ?
2272	EF0B	D0 07		BNE OUTD1

LINE	#	LOC	CODE	LINE	
2273	EF0D	A2 00		LDX #0	;YES
2274	EF0F	8E 15 A4		STX CURP02	;CLEAR DISP POINTER
2275	EF12	F0 42		BEQ OUTD5	;GO CLEAR DISP
2276	EF14	4C 9C FE	OUTD1	JMP PATCH4	
2277	EF17	E0 3C	OUTD1A	CPX #60	;LAST CHAR FOR DISP?
2278	EF19	90 05		BCC OUTD2	
2279	EF1B	20 AC EB		JSR PLXY	;GO BACK
2280	EF1E	68		PLA	;DO NOT STORE
2281	EF1F	60		RTS	
2282	EF20	9D 38 A4	OUTD2	STA DIBUFF,X	;PUT CHAR IN BUFF
2283	EF23	EE 15 A4		INC CURP02	;INC POINTER
2284	EF26	E0 14		CPX #20	;DISPLAY FULL?
2285	EF28	90 1E		BCC OUTD4	
2286	EF2A	20 2F EF		JSR OUTD2A	;THIS WAY SCROLL IS A SUBR
2287	EF2D	30 47		EMI OUTD7	;EXIT DISP
2288	EF2F			;YES, SCROLL CHARS TO THE LEFT	
2289	EF2F	8A	OUTD2A	TXA	;X---> Y
2290	EF30	A8		TAY	
2291	EF31	A2 13		LDX #19	;ADDR FOR DISP DO NOT
2292	EF33	8E 27 A4	OUTD3	STX STIY	;DECREM IN BINARY
2293	EF36	E9 38 A4		LDA DIBUFF,Y	;FROM BUFFER TO DISP
2294	EF39	09 80		ORA #80	;NO CURSOR
2295	EF3B	20 7B EF		JSR OUTDD1	;CONVERT X INTO REAL ADDR
2296	EF3E	88		DEY	
2297	EF3F	CE 27 A4		DEC STIY	
2298	EF42	AE 27 A4		LDX STIY	
2299	EF45	10 EC		BPL OUTD3	;AGAIN UNTIL WHOLE DISP
2300	EF47	60		RTS	
2301	EF48	48	OUTD4	PHA	
2302	EF49	09 80		ORA #80	;NO CURSOR
2303	EF4B	20 7B EF		JSR OUTDD1	;X=<#19 ,CONVRT TO REAL ADDR
2304	EF4E	68		PLA	
2305	EF4F	29 80		AND #80	;IF MSB=0 CLEAR REST OF DISPLAY
2306	EF51	D0 23		BNE OUTD7	
2307	EF53	AE 15 A4		LDX CURP02	
2308	EF56			;CLEAR DISP TO THE RIGHT	
2309	EF56	E0 14	OUTD5	CPX #20	
2310	EF58	B0 1C		BCS OUTD7	
2311	EF5A	8E 27 A4		STX STIY	
2312	EF5D	A9 A0		LDA #A0	; <SPACE>
2313	EF5F	20 7B EF		JSR OUTDD1	;CONVRT TO REAL ADDR
2314	EF62	EE 27 A4		INC STIY	
2315	EF65	AE 27 A4		LDX STIY	
2316	EF68	D0 EC		BNE OUTD5	;GO NEXT
2317	EF6A	4C 76 EF		JMP OUTD7	
2318	EF6D	EA		NOP	
2319	EF6E	EA		NOP	
2320	EF6F	EA		NOP	
2321	EF70	EA		NOP	
2322	EF71	EA		NOP	
2323	EF72	EA		NOP	
2324	EF73	EA		NOP	
2325	EF74	EA		NOP	
2326	EF75	EA		NOP	
2327	EF76	20 AC EB	OUTD7	JSR PLXY	;REST ,SO PRINTR INDEPEN

LINE #	LOC	CODE	LINE
2328	EF79	68	PLA
2329	EF7A	60	RTS
2331	EF7B		;CONVERT X INTO REAL ADDR FOR DISPLAY
2332	EF7B		;AND OUTPUT IT PB=DATA ; PA=W,CE ,A0 A1 (6520)
2333	EF7B	48	OUTDD1 PHA ;SAVE DATA
2334	EF7C	8A	TXA
2335	EF7D	48	PHA ;SAVE X
2336	EF7E	4A	LSR A ;DIVIDE X BY 4
2337	EF7F	4A	LSR A ;TO GET CHIP SELECT
2338	EF80	AA	TAX ;BACK TO X
2339	EF81	A9 04	LDA #4 ;FIRST CHIP SELECT
2340	EF83	E0 00	CPX #0 ;FIRST CHIP ?
2341	EF85	F0 04	BEQ OUTDD3
2342	EF87	0A	OUTDD2 ASL A
2343	EF88	CA	DEX
2344	EF89	D0 FC	BNE OUTDD2 ;BACK TILL RIGH CS
2345	EF8B	8D 28 A4	OUTDD3 STA STIY+1 ;SAVE CS TEMPORARILY
2346	EF8E	68	PLA ;GET X AGAIN FOR CHAR
2347	EF8F	29 03	AND #\$03 ;IN THAT CHIP
2348	EF91	0D 28 A4	ORA STIY+1 ;OR IN CS AND CHAR
2349	EF94		;STORE ADDR AND DATA INTO DISPL
2350	EF94	49 FF	EOR #\$FF ;W=1 , CE=0 & A1,A0
2351	EF96	8D 00 AC	STA RA
2352	EF99	AA	TAX ;SAVE A IN X
2353	EF9A	68	PLA ;GET DATA
2354	EF9B	48	PHA
2355	EF9C	8D 02 AC	STA RB
2356	EF9F	BA	TXA
2357	EFA0	49 80	EOR #\$80 ;SET W=0
2358	EFA2	8D 00 AC	STA RA
2359	EFA5	EA	NOP
2360	EFA6	09 7C	ORA #\$7C ;SET CE=1
2361	EFA8	8D 00 AC	STA RA
2362	EFAE	A9 FF	LDA #\$FF ;SET W=1
2363	EFAD	8D 00 AC	STA RA
2364	EFB0	68	PLA ;RETURN DATA
2365	EFB1	60	RTS
2367	EFB2		*=\$EFF9
2368	EFF9	EA	.BYT \$EA
2369	EFFA		*=\$F000
2370	F000		#####
2371	F000		;OUTPUT ACC TO PRINTER SUBROUTINE
2372	F000		;PRINTS ON 21ST CHAR OR WHEN <CR>
2373	F000		;IT WILL PUT IT ON BUFFER BUT WONT PRINT IF
2374	F000		;PRIFLG=0
2375	F000	48	OUTPRI PHA ;SAVE CHR TO BE OUTPUT
2376	F001	20 9E EB	JSR PHXY ;SAVE X
2377	F004	C9 0D	CMF #\$0D ;SEE IF CR
2378	F006	F0 07	BEQ OUT01 ;YES SO PRINT THE BUFF
2379	F008	AE 16 A4	LDX CURPOS ;PTR TO NEXT POS IN BUFF
2380	F00B	E0 14	CPX #20 ;SEE IF BUFF FULL

LINE #	LOC	CODE	LINE
2381	F00D	D0 16	BNE OUT04 ;NOT FULL SO RETURN
2382	F00F		; <CR> SO FILL REST OF BUFFER WITH BLANKS
2383	F00F	48	OUT01 PHA
2384	F010	A9 00	LDA #0 ;CURPOS = 0
2385	F012	AE 16 A4	LDX CURPOS ;SEE IF ANYTHING IN BUFFER
2386	F015	BD 16 A4	STA CURPOS
2387	F018	20 38 F0	JSR OUTPR ;CLEAR PRIBUF TO THE RIGHT
2388	F018		; BUFFER FILLED SO PRINT IT
2389	F01B	20 45 F0	JSR IPST ;START THE PRINT
2390	F01E	A2 00	LDX #0 ;STORE CHR IN BUFF (FIRST LOC)
2391	F020	68	PLA ;GET IT
2392	F021	C9 0D	CMP #CR ;DONT STORE IF <CR>
2393	F023	F0 0E	BEQ OUT05
2394	F025	9D 60 A4	OUT04 STA IBUFM,X ;STORE CHR IN BUFF
2395	F028	EE 16 A4	INC CURPOS ;INCR BUFF PNTR
2396	F02B	EB	INX
2397	F02C	29 80	AND #\$80
2398	F02E	D0 03	BNE OUT05 ;DONT CLR IF MSB=1
2399	F030	20 38 F0	JSR OUTPR ;CLEAR PRIEUFF TO THE RIGHT
2400	F033	20 AC EB	OUT05 JSR PLXY ;RESTORE REGS
2401	F036	68	PLA
2402	F037	60	RTS
2403	F038	A9 20	OUTPR LDA #\$20 ;FILL REST OF BUFF WITH BLANKS
2404	F03A	E0 14	OUTPR1 CPX #20 ;SEE IF END OF BUFF
2405	F03C	F0 06	BEQ OUTPR2
2406	F03E	9D 60 A4	STA IBUFM,X ;NO SO STORE BLANK
2407	F041	EB	INX ;INCR BUFF PNTR
2408	F042	10 F6	BPL OUTPR1
2409	F044	60	OUTPR2 RTS
2411	F045		; SUB TO OUTPUT BUFFER, 70 DOTS (10 DOTS AT
2412	F045		; A TIME BY 7 ROWS) FOR EACH LINE OF PRINTING
2413	F045	2C 11 A4	IPST BIT PRIFLG ;PRINT FLG ON ?
2414	F048	10 2E	BPL IP04
2415	F04A	20 CB F0	IP50 JSR PINT ;INITIALIZE VALUES
2416	F04D	20 E3 F0	JSR IPSU ;SET UP FIRS OUTPUT PATTERN
2417	F050	A9 C1	IP00 LDA #PRST+SP12+MON ;TURN MOTOR ON
2418	F052	8D 0C A8	STA PCR
2419	F055	20 A0 FF	JSR PAT23 ;TIME OUT?
2420	F058	D0 0C	BNE IP02 ;NO, START SIGNAL RECEIVED
2421	F05A	20 A0 FF	JSR PAT23 ;YES, TRY AGAIN
2422	F05D	D0 07	BNE IP02 ;OK
2423	F05F	4C 79 F0	JMP PRIERR ;TWO TIME OUTS - ERROR
2424	F062	EA	NOF
2425	F063	EA	NOF
2426	F064	EA	NOF
2427	F065	EA	NOF
2428	F066	20 87 F0	IP02 JSR PRNDOT ;STRB P1=1 PRINT DOTS (1.7MSEC)
2429	F069	20 87 F0	JSR PRNDOT ;STRB P2=1 PRINT DOTS (1.7MSEC)
2430	F06C		;CHECK FOR 90, WHEN 70 PRNDOT WILL OUTPUT ZEROS
2431	F06C	AD 77 A4	LDA IDOT
2432	F06F	C9 5A	CMP #90
2433	F071	90 F3	BCC IP02 ;L.T. 90 THEN GO STROB P1
2434	F073	A9 E1	IP03 LDA #PRST+SP12+MOFF ;TURN MOTOR OFF
2435	F075	8D 0C A8	STA PCR

LINE #	LOC	CODE	LINE	
2436	F078	60	IP04	RTS
2438	F079	20 44 EB	PRIERR	JSR CLR ;CLEAR PRI PNTR
2439	F07C	20 B1 FE		JSR PATCH5 ;TURN PRI OFF
2440	F07F	A0 3B		LDY #M12-M1
2441	F081	20 AF E7		JSR KEP
2442	F084	4C A1 E1		JMP COMIN ;BACK WHERE SUBR WAS CALLED
2444	F087			;SUBR TO INCR DOT COUNTER,WHEN
2445	F087			;NEG TRANS OUTPUT CHR FOR 1.7 MSEC
2446	F087			;CLEAR & SET UP NEXT PATTERN
2447	F087	A9 00	PRNDOT	LDA #0 ;CLR INTERRUPTS
2448	F089	8D 01 A8		STA DRAH
2449	F08C	AD 0D AB	PRDOT0	LDA IFR
2450	F08F	29 02		AND #MSP12 ;ANY STROBES ?
2451	F091	F0 F9		BEG PRDOT0
2452	F093	AD 0C AB		LDA PCR
2453	F096	49 01		EOR #01
2454	F098	8D 0C AB		STA PCR
2455	F09B	EE 77 A4		INC IDOT
2456	F09E	AD 79 A9		LDA IOUTU ;2 LEFT ELEM
2457	F0A1	0D 00 AB		ORA DRB ;DO NOT TURN ITTY OUTPUT OFF
2458	F0A4	8D 00 AB		STA DRB
2459	F0A7	AD 78 A4		LDA IOUTL ;7 RIGHT ELEM, CLR CA1 INTER FLG
2460	F0AA	8D 01 AB		STA DRAH
2461	F0AD	A9 A4		LDA #<PRTIME
2462	F0AF	8D 08 AB		STA T2L
2463	F0B2	A9 06		LDA #>PRTIME ;START T2 FOR 1.7 MSEC
2464	F0B4	8D 09 AB		STA T2H
2465	F0B7	20 E3 F0		JSR IPSU ;SET NEXT PATTERN WHILE WAITING
2466	F0BA	20 1B EC		JSR DE2 ;WAIT TILL TIME OUT
2467	F0BD	A9 00		LDA #0 ;THERMAL ELEM OFF
2468	F0BF	8D 01 AB		STA DRAH
2469	F0C2	AD 00 AB		LDA DRB ;BUT DONT CHANGE TAPE CONTROLS
2470	F0C5	29 FC		AND #FC
2471	F0C7	8D 00 AB		STA DRB
2472	F0CA	60		RTS
2474	F0CB			; SUBROUTINE PINT --- INIT VARS FOR PRINTER
2475	F0CB	A9 FF	PINT	LDA #FF
2476	F0CD	8D 74 A4		STA IDIR ;DIRECTION <= -
2477	F0D0	A9 05		LDA #5
2478	F0D2	8D 75 A4		STA ICOL ;COLUMN <= LEFTMOST +1
2479	F0D5	A9 01		LDA #1
2480	F0D7	8D 76 A4		STA IOFFST ;OFFSET <= LEFT CHARACTER
2481	F0DA	8D 7C A4		STA IMASK
2482	F0DD	A9 00		LDA #0
2483	F0DF	8D 77 A4		STA IDOT ;DOT COUNTER <= 0
2484	F0E2	60		RTS
2486	F0E3			;THE VARIABLES FOR THE PRINTER ARE AS FOLLOWS:
2487	F0E3			;
2488	F0E3			;IDIR DIRECT HEAD IS CURRENTLY MOVING (0=+, \$FF=-)
2489	F0E3			;ICOL CLMN TO BE PRINTED NEXT (LEFTMOST=0,RIGHTMOST=4)
2490	F0E3			;IOFFST OFFSET N PRINT BUFF (0=LEFT CHR, 1=RIGHT CHR)

LINE	#	LOC	CODE	LINE
2491	F0E3			;IDOT COUNT OF NUMBER OF DOTS PRINTED THUS FAR
2492	F0E3			;IOUTL SOLENOID PATTERN (8 CHRS ON RIGHT)
2493	F0E3			;IOUTU SOLENOID PATTERN (2 CHRS ON LEFT)
2494	F0E3			;IBITL 1 BIT MSK USED IN SETTING NEXT SOLENOID VALUE
2495	F0E3			;IBITU UPPER PART OF MASK
2496	F0E3			;IBUFM START OF PRINT BUFFER (LEFTMOST CHR FIRST)
2497	F0E3			;IMASK MASK FOR CURRENT ROW BEING PRINTED
2498	F0E3			;JUMP ADDRESS OF TABLE FOR CURRENT COLUMN
2499	F0E3			;
2500	F0E3			; THE DOT PATTERNS FOR THE CHRS ARE STORED SO THAT...
2501	F0E3			;EACH BYTE CONTAINS THE DOTS FOR ONE COLUMN OF ONE...
2502	F0E3			;CHR. SINCE EACH COLUMN CONTAINS SEVEN DOTS ,
2503	F0E3			;THIS MEANS THAT ONE BIT PER BYTE IS UNUSED.
2504	F0E3			; THE PATTERNS ARE ORGANIZED INTO 5 TABLES OF 64...
2505	F0E3			;BYTES WHERE EACH TABLE CONTAINS ALL THE DOT...
2506	F0E3			;PATTERNS FOR A PARTICULAR COLUMN. THE BYTES IN EACH...
2507	F0E3			;TABLE ARE ORDERED ACCORDING TO THE CHR CODE OF...
2508	F0E3			;THE CHR BEING REFERENCED. THE CHR CODE CAN...
2509	F0E3			;THUS BE USED TO DIRECTLY INDEX INTO THE TABLE.
2511	F0E3			;SUBROUTINE IPSU --- SET UP OUTPUT PATTERN FOR PRINTER
2512	F0E3			; THIS ROUTINE IS CALLED IN ORDER TO
2513	F0E3			;SET UP THE NEXT GROUP OF SOLENOIDS TO
2514	F0E3			;BE OUTPUT TO THE PRINTER.
2515	F0E3			; ON ENTRY THE CONTENTS OF ALL REGISTERS
2516	F0E3			;ARE ARBITRARY
2517	F0E3			; ON EXIT THE CONTENTS OF A,X,Y ARE UNDEFINED
2518	F0E3	A2 00	IPSU LDX #0	;X POINTS TO VAR BLOCK FOR PRNTR
2519	F0E5	20 21 F1	JSR INCF	;ADVANCE PTRS TO NXT DOT POSITION
2520	F0E8		;X NOW	CONTAINS INDEX INTO PRINT BUFFER
2521	F0E8	ED 60 A4	IPSI LDA IBUFM,X	;LOAD NEXT CHAR FROM BUFFER
2522	F0E8	29 3F	AND #*3F	
2523	F0ED	A8	TAY	
2524	F0EE	A9 7D	LDA #*JUMP	;A<= DOT PATTERN FOR CHAR & COL
2525	F0F0	20 58 EB	JSR LDAY	
2526	F0F3	2C 7C A4	BIT IMASK	;SEE IF DOT IS SET
2527	F0F6	F0 16	BEQ IPS2	;NO SO GO ON TO NEXT CHAR
2528	F0F8	AD 7A A4	LDA IBITL	;DOT ON SO SET THE CURR SOLENOID
2529	F0FB	F0 08	BEQ IPS3	;LSB OF SOL MASK IS 0 , DO MSB
2530	F0FD	0D 78 A4	ORA IOUTL	;SET THE SOLENOID IN THE PATTERN
2531	F100	8D 78 A4	STA IOUTL	
2532	F103	D0 09	BNE IPS2	;BRANCH ALWAYS
2533	F105	AD 78 A4	IPSI LDA IBITU	;SOLENOID IS ONE OF THE 2 MSB
2534	F108	0D 79 A4	ORA IOUTU	;SET THE BIT IN THE PATTERN
2535	F10B	8D 79 A4	STA IOUTU	
2536	F10E	0E 7A A4	IPSI ASL IBITL	;SHIFT MSK TO NXT CHR POSITION
2537	F111	2E 7B A4	ROL IBITU	
2538	F114	CA	DEX	;DECR PTR INTO BUFFER
2539	F115	CA	DEX	
2540	F116	10 D0	BPL IPS1	;NOT END YET
2541	F118		;SOLENOID PATTERN IS SET UP IN IOUTU,IOUTL	
2542	F118	AD 79 A4	LDA IOUTU	;LEFTMOST 2
2543	F118	29 03	AND #*03	;DISABLE FOR SEGMENTS
2544	F11D	8D 79 A4	STA IOUTU	
2545	F120	60	RTS	

LINE #	LOC	CODE	LINE
2547	F121		; SUBROUTINE INCF
2548	F121		;THIS SUBROUTINE IS USED TO UPDATE THE PRINTER VARIABLES
2549	F121		;TO POINT TO THE NEXT DOT POSITION TO BE PRINTED
2550	F121		;X REG IS USED TO POINT TO THE VARIABLE BLOCK OF
2551	F121		;BEING UPDATED
2552	F121		;ON EXIT X CONTAINS THE POINTER TO THE LAST CHARACTER IN
2553	F121		;THE PRINT BUFFER
2554	F121		;CONTENTS OF A,Y ON EXIT ARE ARBITRARY
2555	F121	BD 74 A4	INCF LDA IDIR,X ;EXAMINE DIRECTION(+ OR -)
2556	F124	10 1E	BPL OP03 ;DIRECTION = +
2557	F126		;*DIRECTION = -
2558	F126	BD 75 A4	LDA ICOL,X ;SEE WHAT THE COLUMN IS
2559	F129	F0 05	BEQ OP04 ;COLUMN = 0 SO END OF DIGIT
2560	F128		;**COLUMN # 0 SO JUST DECREMENT COLUMN
2561	F128	DE 75 A4	DEC ICOL,X
2562	F12E	10 33	BPL NEWCOL ;BRANCH ALWAYS
2563	F130		;**COLUMN = 0 SO SEE IF EVEN OR ODD DIGIT
2564	F130	BD 76 A4	OP04 LDA IOFFST,X
2565	F133	F0 0A	BEQ OP07 ;OFFSET = 0 SO DIRECTION CHANGE
2566	F135		;***OFFSET = 1 SO MOVE TO RIGHT DIGIT
2567	F135	DE 76 A4	DEC IOFFST,X ;OFFSET <= 0 (LEFT CHARACTER)
2568	F138	A9 04	LDA #4 ;COLUMN <= 4
2569	F13A	9D 75 A4	STA ICOL,X
2570	F13D	10 24	BPL NEWCOL ;BRANCH ALWAYS
2571	F13F		;***OFFSET = 0 SO CHANGE DIRECTION TO +
2572	F13F	FE 74 A4	OP07 INC IDIR,X ;DIRECTION <= \$00 (+)
2573	F142	10 1C	BPL NEWROW ;BRANCH ALWAYS
2574	F144		;*DIRECTION = +
2575	F144	BD 75 A4	OP03 LDA ICOL,X ;SEE IF LAST COLUMN IN DIGIT
2576	F147	C9 04	CMP #4
2577	F149	F0 05	BEQ OP05 ;COLUMN = 4 SO GO TO NEXT DIGIT
2578	F148	FE 75 A4	INC ICOL,X ;JUST INCR COLUMN-NOT END OF DIGIT
2579	F14E	10 13	BPL NEWCOL ;BRANCH ALWAYS
2580	F150		;**AT COLUMN 4 -- SEE IF LEFT OR RIGHT DIGIT
2581	F150	BD 76 A4	OP05 LDA IOFFST,X
2582	F153	D0 08	BNE OP06 ;OFFSET # 0 SO RIGHT DIGIT
2583	F155	9D 75 A4	STA ICOL,X ;COLUMN <= 0
2584	F158	FE 76 A4	INC IOFFST,X ;OFFSET <= 1 (RIGHT CHARACTER)
2585	F158	10 06	BPL NEWCOL ;BRANCH ALWAYS
2586	F15D		;***OFFSET = 1 SO DIRECTION CHANGE
2587	F15D	DE 74 A4	OP06 DEC IDIR,X ;DIRECTION <= \$FF (-)
2589	F160		;START OF NEW PRINT ROW
2590	F160	1E 7C A4	NEWROW ASL IMASK,X ;UPDATE ROW MASK FOR DOT PATTERNS
2591	F163		;START OF NEW PRINT COLUMN
2592	F163	A9 00	NEWCOL LDA #0 ;CLEAR OUTPUT PATTERN
2593	F165	9D 78 A4	STA IOUOL,X ;PATTERN FOR 8 RIGHT CHRS
2594	F168	9D 79 A4	STA IOUOU,X ;PATTERN FOR 2 LEFT SOLEN
2595	F168	9D 78 A4	STA IBITU,X ;OUTPUT MSK FOR LEFTMOST SOLEN
2596	F16E	A9 01	LDA #1
2597	F170	9D 7A A4	STA IBITL,X ;OUTPUT MSK FOR RIGHTMOST SOLEN
2598	F173		;GET ADDRESS OF DOT PATTERN TABLE FOR NEXT COLUMN
2599	F173	BD 75 A4	LDA ICOL,X ;GET COLUMN NUMBER (0-4)
2600	F176	0A	ASL A ;*2 ,INDEX INTO TBL OF TBL ADDRS
2601	F177	AB	TAY

LINE	* LOC	CODE	LINE		
2602	F17B	B9 D7 F2		LDA MTBL,Y	;LSB OF ADDR OF TABLE
2603	F17B	9D 7D A4		STA JUMP,X	;PTR TO TBL WITH DOT PATTERNS
2604	F17E	B9 0B F2		LDA MTBL+1,Y	;MSB OF TABLE ADDRESS
2605	F181	9D 7E A4		STA JUMP+1,X	
2606	F184	A9 12		LDA #18	;COMPUTE INDEX INTO PRNTR BUFFER
2607	F186	1D 76 A4		ORA IOFFST,X	;+1 IF RIGHT CHR
2608	F189	AA		TAX	
2609	F18A	60		RTS	
2611	F18B			;;;	
2612	F18B			;OUTPUT ACC TO TAPE BUFFER SUBROUTINE	
2613	F18B			; & WHEN FULL OUTPUT BUFF TO TAPE.	
2614	F18B			; IF INFLG=OUTFLG= T USE TWO BUFFERS	
2615	F18B			;OTHERWISE USE SAME BUFFER FOR INPUT	
2616	F18B			;AND OUTPUT (MONIT BUFFER)	
2617	F18B	20 9E EB		TOBYTE JSR PHXY	;SAVE X
2618	F18E	AE 37 A4		LDX TAPTR2	;TAPE BUFFER POINTER FOR OUTPUT
2619	F191	20 0F F2		JSR BKCK2	;STORE IN BUFFER
2620	F194	EB		INX	
2621	F195	8E 37 A4		STX TAPTR2	;FOR NEXT
2622	F198	E0 50		CFX #80	;BUFFER FULL?
2623	F19A	D0 32		BNE TABY3	;NO , GO BACK
2624	F19C			;OUTPUT A BLOCK FROM BUFFER TO TAPE	
2625	F19C	20 E7 F1		JSR BKCKSM	;COMPUTE BLOCK CHECKSUM
2626	F19F	20 1D F2		JSR TADSET	;SET TAPE FOR OUTPUT
2627	F1A2	A9 23		LDA #'*	;CHAR FOR BEGINNING
2628	F1A4	20 4A F2		JSR OUTTAP	;OF BLOCK
2629	F1A7			;OUTPUT CHRS FROM ACTIVE BUFFER	
2630	F1A7	20 D2 F1		TABY2 JSR CKBUFF	;LOAD CHR FROM ACTIVE BUFFER
2631	F1AA	20 4A F2		JSR OUTTAP	; FROM BUFFER
2632	F1AD	EB		INX	
2633	F1AE	E0 53		CFX #83	;2 BLOCK CKSUM CHR + 1 EXTRA CHR...
2634	F1B0	D0 F5		BNE TABY2	;OTHERWISE ERROR
2635	F1B2	AD 00 A8		LDA DRB	
2636	F1B5	29 CF		AND #'CF	;TURN TAPES OFF PB5,PB4
2637	F1B7	8D 00 A8		STA DRB	
2638	F1BA	58		CLI	;ENABLE INTERRUPT
2639	F1BB	A9 00		LDA #0	
2640	F1BD	8D 37 A4		STA TAPTR2	;CLR TAPE BUFF PTR
2641	F1C0	A9 00		LDA #TII	;RESET FREE RUNNING TO 1 SHOT
2642	F1C2	8D 0B A8		STA ACR	
2643	F1C5	20 9A FF		JSR PAT22	;ADD 1 TO BLK COUNT & OUTPUT
2644	F1C8	AD 68 01		LDA BLK0	;PUT BLK CNT IN FIRST LOC (TABUFF)
2645	F1CB	20 8B F1		JSR TOBYTE	
2646	F1CE	20 AC EB		TABY3 JSR PLXY	
2647	F1D1	60		RTS	
2649	F1D2			;CHK ACTIVE BUFFER AND LOAD A CHR	
2650	F1D2			;CARRY=0 IF ONLY 1 BUFFER ,C=1 IF 2 BUFFERS	
2651	F1D2	AD 12 A4		CKBUFF LDA INFLG	
2652	F1D5	CD 13 A4		CMF OUTFLG	
2653	F1D8	D0 08		BNE CBUFF1	
2654	F1DA	C9 54		CMF #'T	;SEE IF INFLG=OUTFLG = T
2655	F1DC	D0 04		BNE CBUFF1	

LINE #	LOC	CODE	LINE	
2656	F1DE	38	SEC	;USE PAGE 1 FOR OUTPUT BUFFER
2657	F1DF	B5 AD	LDA TABUF2,X	
2658	F1E1	60	RTS	
2659	F1E2	18	CLC	;USE SAME BUFFER FOR I/O
2660	F1E3	BD 16 01	LDA TABUFF,X	
2661	F1E6	60	RTS	
2663	F1E7			;COMPUTE BLOCK CHECKSUM & PUT IT
2664	F1E7			;AT THE END OF ACTIVE BUFFER
2665	F1E7	A9 00	BKCKSM LDA #0	;CLEAR BLK CKSUM LOCAT
2666	F1E9	8D 66 01	STA TABUFF+80	
2667	F1EC	8D 67 01	STA TABUFF+81	
2668	F1EF	A2 4F	LDX #79	
2669	F1F1	20 D2 F1	BKCK1 JSR CKBUFF	;GET CHR FROM EITHER BUFFER
2670	F1F4	18	CLC	
2671	F1F5	6D 66 01	ADC TABUFF+80	;ADD TO CKSUM
2672	F1F8	8D 66 01	STA TABUFF+80	
2673	F1FB	70 03	BCC *+5	
2674	F1FD	EE 67 01	INC TABUFF+81	
2675	F200	CA	DEX	
2676	F201	10 EE	BPL BKCK1	;DO THE WHOLE BUFFER
2677	F203	A2 50	LDX #80	
2678	F205	A0 66 01	LDA TABUFF+80	;PUT CKSUM INTO RIGHT BUFFER
2679	F208	20 0F F2	JSR BKCK2	
2680	F20B	E8	INX	
2681	F20C	AD 67 01	LDA TABUFF+81	
2682	F20F	48	PHA	;OUTPUT A CHAR TO RIGHT BUFFER
2683	F210	20 D2 F1	JSR CKBUFF	;GET WHICH BUFFER
2684	F213	68	PLA	
2685	F214	B0 04	BCS BKCK3	;BRNCH TO SECOND BUFFER
2686	F216	7D 16 01	STA TABUFF,X	
2687	F219	60	RTS	
2688	F21A	95 AD	BKCK3 STA TABUF2,X	;TO PAG 1
2689	F21C	60	RTS	
2691	F21D			;SET TAPE (1 OR 2) FOR OUTPUT
2692	F21D	20 C0 F2	TAOSET JSR SETSPD	;SET UP SPEED (# OF HALF PULSES)
2693	F220	AD 35 A4	LDA TAPOUT	;OUTPUT FLG (TAPE 1 OR 2)
2694	F223	20 1C EE	JSR TIOSET	;SET PB4 OR PB5 TO ZERO
2695	F226	A9 EC	LDA #DATOUT+MOFF	;SET CA2=0 (DATA OUT)
2696	F228	8D 0C A8	STA PCR	
2697	F22E	A9 C0	LDA #T1FR	;SET TIMER IN FREE RUNNING
2698	F22D	8D 0B A8	STA ACK	
2699	F230	A9 00	LDA #00	
2700	F232	8D 05 A8	STA T1CH	;START TIMER T1
2701	F235	AE 09 A4	LDX GAP	;OUTPUT 4*GAP SYN BYTES
2702	F238	A9 16	TAOS1 LDA #*16	;SYN CHAR
2703	F23A	20 4A F2	JSR OUTTAP	;TO TAPE
2704	F23D	20 4A F2	JSR OUTTAP	
2705	F240	20 4A F2	JSR OUTTAP	
2706	F243	20 4A F2	JSR OUTTAP	
2707	F246	CA	DEX	
2708	F247	D0 EF	BNE TAOS1	
2709	F249	60	RTS	

LINE #	LOC	CODE	LINE	
2711	F24A			;OUTPUT ACC TO TAPE
2712	F24A	8E 2D A4	OUTTAP	STX CPIY+3 ;SAVE X
2713	F24D	A0 07		LDY ##07 ;FOR THE 8 BITS
2714	F24F	8C 27 A4		STY STIY
2715	F252	AE 08 A4		LDX TSPEED
2716	F255	30 39		BMI OUTTA1 ;IF ONE IS SUPER HIPER
2717	F257	48		PHA
2718	F258	A0 02	TRY	LDY #2 ;SEND 3 UNITS
2719	F25A	8C 28 A4		STY STIY+1 ;STARTING AT 3700 HZ
2720	F25D	8E 0A A4	ZON	LDX NPUL,Y ;#OF HALF CYCLES
2721	F260	48		PHA
2722	F261	B9 0B A4	ZON1	LDA TIMG,Y ;SET UP LACTH FOR NEXT
2723	F264	8D 06 A8		STA T1LL ;PULSE (80 OR CA) (FREQ)
2724	F267	A9 00		LDA #0
2725	F269	8D 07 A8		STA T1LH
2726	F26C	2C 0D A8	ZON2	BIT IFR ;WAIT FOR PREVIOUS
2727	F26F	50 FB		BVC ZON2 ;CYCLE (T1 INT FLG)
2728	F271	AD 04 A8		LDA T1L ;CLR INTERRU FLG
2729	F274	CA		DEX
2730	F275	D0 EA		BNE ZON1 ;SEND ALL CYCLES
2731	F277	68		PLA
2732	F278	CE 28 A4		DEC STIY+1
2733	F27B	F0 05		BEQ SETZ ;BRCH IF LAST ONE
2734	F27D	30 07		BMI ROUT ;BRCH IF NO MORE
2735	F27F	4A		LSR A ;TAKE NEXT BIT
2736	F280	90 DB		BCC ZON ;...IF IT'S A ONE...
2737	F282	A0 00	SETZ	LDY #0 ;SWITCH TO 2400 HZ
2738	F284	F0 D7		BEQ ZON ;UNCONDITIONAL BRCH
2739	F286	CE 27 A4	ROUT	DEC STIY ;ONE LESS BIT
2740	F289	10 CD		BPL TRY ;ANY MORE? GO BACK
2741	F28B	68	ROUT1	PLA ;RECOVER CHR
2742	F28C	AE 2D A4		LDX CPIY+3 ;RESTORE X
2743	F28F	60		RTS
2745	F290			;OUTPUT HALF PULSE FOR 0 (1200 HZ) &
2746	F290			;TWO HALF PULSES FOR 1 (2400 HZ) (00 TSPEED)
2747	F290	48	OUTTA1	PHA
2748	F291	8D 2B A4		STA STIY+1 ;STORE ACC
2749	F294	A2 02	OUTTA2	LDX #2 ;# OF HALF PULSES
2750	F296	A9 D0		LDA ##D0 ;1/2 PULSE OF 2400
2751	F298	8D 06 A8		STA T1LL
2752	F29B	A9 00		LDA #00
2753	F29D	8D 07 A8		STA T1LH
2754	F2A0	20 BC FF		JSR PATC25 ;WAIT TILL COMPLETED
2755	F2A3	4E 28 A4		LSR STIY+1 ;GET BITS FROM CHR
2756	F2A6	B0 0A		BCC OUTTA3
2757	F2A8	A9 A0		LDA ##A0 ;BIT=0 ,OUTPUT 1200 HZ
2758	F2AA	8D 06 A8		STA T1LL
2759	F2AD	A9 01		LDA ##01
2760	F2AF	8D 07 A8		STA T1LH
2761	F2B2	20 BC FF	OUTTA3	JSR PATC25
2762	F2B5	CA		DEX
2763	F2B6	10 FA		BPL OUTTA3 ;OUTPUT 3 HALF PULSES
2764	F2B8	88		DEY
2765	F2B9	10 D9		BPL OUTTA2 ;ALL BITS ?

LINE #	LOC	CODE	LINE
2766	F2BB	4C 0B F2	JMP ROUT1 ;RESTORE REGS
2767	F2BE	EA	NOP
2768	F2BF	EA	NOP
2770	F2C0		;SET SPEED FROM NORMAL TO 3 TIMES NORMAL
2771	F2C0	AD 0B A4	SETSP0 LDA TSPEED ;SPEED FLG
2772	F2C3	6A	ROR A ;NORMAL OR 3* NORM
2773	F2C4	A9 0C	LDA #12
2774	F2C6	90 02	BCC SETSP1
2775	F2C8	A9 04	LDA #4
2776	F2CA	8D 0A A4	SETSP1 STA NPUL
2777	F2CD	A9 12	LDA #18
2778	F2CF	90 02	BCC SETSP2
2779	F2D1	A9 06	LDA #6
2780	F2D3	8D 0C A4	SETSP2 STA TIMG+1
2781	F2D6	60	RTS
2782	F2D7		.FILE A3/2

LINE	* LOC	CODE	LINE
2784	F2D7		; ADDRESS TABLE FOR EACH PRINT COLUMN.
2785	F2D7		; EACH TEL CONTAINS DOT PATTERNS FOR 1 OF THE 5 COLUMNS.
2786	F2D7		; DATA ARE STORED WITH EACH BYTE DEFINING ONE COLUMN...
2787	F2D7		; OF A CHARACTER, WITH THE TOP DOT CORRESPONDING TO THE..
2788	F2D7		; LSB IN THE BYTE
2789	F2D7	E1 F2	MTBL .WOR COL0,COL1,COL2,COL3,COL4
2789	F2D9	21 F3	
2789	F2DB	61 F3	
2789	F2DD	A1 F3	
2789	F2DF	E1 F3	
2791	F2E1		;DOT PATTERNS FOR COLUMN ZERO (LEFTMOST COLUMN)
2792	F2E1	3E	COL0 .BYT \$3E,\$7E,\$7F,\$3E,\$7F,\$7F,\$7F,\$3E @ -- G
2792	F2E2	7E	
2792	F2E3	7F	
2792	F2E4	3E	
2792	F2E5	7F	
2792	F2E6	7F	
2792	F2E7	7F	
2792	F2E8	3E	
2793	F2E9	7F	.BYT \$7F,\$00,\$20,\$7F,\$7F,\$7F,\$7F,\$3E H -- 0
2793	F2EA	00	
2793	F2EB	20	
2793	F2EC	7F	
2793	F2ED	7F	
2793	F2EE	7F	
2793	F2EF	7F	
2793	F2F0	3E	
2794	F2F1	7F	.BYT \$7F,\$3E,\$7F,\$46,\$01,\$3F,\$07,\$7F P -- W
2794	F2F2	3E	
2794	F2F3	7F	
2794	F2F4	46	
2794	F2F5	01	
2794	F2F6	3F	
2794	F2F7	07	
2794	F2F8	7F	
2795	F2F9	63	.BYT \$63,\$07,\$61,\$7F,\$03,\$00,\$02,\$40 X -- <
2795	F2FA	07	
2795	F2FB	61	
2795	F2FC	7F	
2795	F2FD	03	
2795	F2FE	00	
2795	F2FF	02	
2795	F300	40	
2796	F301	00	.BYT \$00,\$00,\$00,\$14,\$24,\$63,\$60,\$00 -- '
2796	F302	00	
2796	F303	00	
2796	F304	14	
2796	F305	24	
2796	F306	63	
2796	F307	60	
2796	F308	00	
2797	F309	00	.BYT \$00,\$00,\$14,\$08,\$40,\$08,\$40,\$60 (-- /
2797	F30A	00	
2797	F30B	14	

LINE #	LOC	CODE	LINE
2797	F30C	08	
2797	F30D	40	
2797	F30E	08	
2797	F30F	40	
2797	F310	60	
2798	F311	3E	.BYT \$3E,\$44,\$62,\$41,\$18,\$27,\$3C,\$01 0 --- 7
2798	F312	44	
2798	F313	62	
2798	F314	41	
2798	F315	18	
2798	F316	27	
2798	F317	3C	
2798	F318	01	
2799	F319	36	.BYT \$36,\$46,\$00,\$40,\$08,\$14,\$41,\$02 8 --- ?
2799	F31A	46	
2799	F31B	00	
2799	F31C	40	
2799	F31D	08	
2799	F31E	14	
2799	F31F	41	
2799	F320	02	
2801	F321		;DOT PATTERNS FOR COLUMN 1
2802	F321	41	COL1 .BYT \$41,\$09,\$49,\$41,\$41,\$49,\$09,\$41 @ --- G
2802	F322	09	
2802	F323	49	
2802	F324	41	
2802	F325	41	
2802	F326	49	
2802	F327	09	
2802	F328	41	
2803	F329	08	.BYT \$08,\$41,\$40,\$08,\$40,\$02,\$06,\$41 H --- D
2803	F32A	41	
2803	F32B	40	
2803	F32C	08	
2803	F32D	40	
2803	F32E	02	
2803	F32F	06	
2803	F330	41	
2804	F331	09	.BYT \$09,\$41,\$09,\$49,\$01,\$40,\$18,\$20 P --- W
2804	F332	41	
2804	F333	09	
2804	F334	49	
2804	F335	01	
2804	F336	40	
2804	F337	18	
2804	F338	20	
2805	F339	14	.BYT \$14,\$0B,\$51,\$41,\$04,\$00,\$01,\$40 X --- <
2805	F33A	08	
2805	F33B	51	
2805	F33C	41	
2805	F33D	04	
2805	F33E	00	
2805	F33F	01	
2805	F340	40	

LINE	#	LOC	CODE	LINE
2806	F341	00		.BYT \$00,\$00,\$07,\$7F,\$2A,\$13,\$4E,\$09 ---
2806	F342	00		
2806	F343	07		
2806	F344	7F		
2806	F345	2A		
2806	F346	13		
2806	F347	4E		
2806	F348	04		
2807	F349	1C		.BYT \$1C,\$41,\$08,\$08,\$30,\$08,\$00,\$10 (-- /
2807	F34A	41		
2807	F34B	08		
2807	F34C	08		
2807	F34D	30		
2807	F34E	08		
2807	F34F	00		
2807	F350	10		
2808	F351	51		.BYT \$51,\$42,\$51,\$41,\$14,\$45,\$4A,\$71 0 --- 7
2808	F352	42		
2808	F353	51		
2808	F354	41		
2808	F355	14		
2808	F356	45		
2808	F357	4A		
2808	F358	71		
2809	F359	49		.BYT \$49,\$49,\$00,\$34,\$14,\$14,\$41,\$01 8 --- ?
2809	F35A	49		
2809	F35E	00		
2809	F35C	34		
2809	F35D	14		
2809	F35E	14		
2809	F35F	41		
2809	F360	01		
2811	F361			;DOT PATTERNS FOR COLUMN 2
2812	F361	5D		COL2 .BYT \$5D,\$09,\$49,\$41,\$41,\$49,\$09,\$41 @ --- G
2812	F362	09		
2812	F363	49		
2812	F364	41		
2812	F365	41		
2812	F366	49		
2812	F367	09		
2812	F368	41		
2813	F369	08		.BYT \$08,\$7F,\$41,\$14,\$40,\$0C,\$08,\$41 H --- 0
2813	F36A	7F		
2813	F36B	41		
2813	F36C	14		
2813	F36D	40		
2813	F36E	0C		
2813	F36F	08		
2813	F370	41		
2814	F371	09		.BYT \$09,\$51,\$19,\$49,\$7F,\$40,\$60,\$18 P --- W
2814	F372	51		
2814	F373	19		
2814	F374	49		
2814	F375	7F		

LINE #	LOC	CODE	LINE
2814	F376	40	
2814	F377	60	
2814	F378	18	
2815	F379	08	.BYT \$0B,\$7B,\$49,\$41,\$0B,\$41,\$01,\$40 X -- <
2815	F37A	78	
2815	F37B	49	
2815	F37C	41	
2815	F37D	08	
2815	F37E	41	
2815	F37F	01	
2815	F380	40	
2816	F381	00	.BYT \$00,\$4F,\$00,\$14,\$7F,\$0B,\$59,\$02 --- '
2816	F382	4F	
2816	F383	00	
2816	F384	14	
2816	F385	7F	
2816	F386	08	
2816	F387	59	
2816	F388	02	
2817	F389	22	.BYT \$22,\$22,\$3E,\$3E,\$00,\$0B,\$00,\$0B (--- /
2817	F38A	22	
2817	F38B	3E	
2817	F38C	3E	
2817	F38D	00	
2817	F38E	08	
2817	F38F	00	
2817	F390	08	
2818	F391	49	.BYT \$49,\$7F,\$51,\$49,\$12,\$45,\$49,\$09 0 --- 7
2818	F392	7F	
2818	F393	51	
2818	F394	49	
2818	F395	12	
2818	F396	45	
2818	F397	49	
2818	F398	09	
2819	F399	49	.BYT \$49,\$49,\$44,\$00,\$22,\$14,\$22,\$51 8 --- ?
2819	F39A	49	
2819	F39B	44	
2819	F39C	00	
2819	F39D	22	
2819	F39E	14	
2819	F39F	22	
2819	F3A0	51	
2821	F3A1		;DOT PATTERNS FOR COLUMN 3
2822	F3A1	55	COL3 .BYT \$55,\$09,\$49,\$41,\$22,\$49,\$09,\$49 @ --- G
2822	F3A2	09	
2822	F3A3	49	
2822	F3A4	41	
2822	F3A5	22	
2822	F3A6	49	
2822	F3A7	09	
2822	F3A8	49	
2823	F3A9	08	.BYT \$0B,\$41,\$3F,\$22,\$40,\$02,\$30,\$41 H --- 0
2823	F3AA	41	

DOT PATTERNS PA00-J004A.....PAGE 0061

LINE #	LOC	CODE	LINE
2823	F3AB	3F	
2823	F3AC	22	
2823	F3AD	40	
2823	F3AE	02	
2823	F3AF	30	
2823	F3B0	41	
2824	F3B1	09	.BYT \$09,\$21,\$29,\$49,\$01,\$40,\$10,\$20 P --- W
2824	F3B2	21	
2824	F3B3	29	
2824	F3B4	49	
2824	F3B5	01	
2824	F3B6	40	
2824	F3B7	18	
2824	F3B8	20	
2825	F3B9	14	.BYT \$19,\$00,\$45,\$00,\$10,\$41,\$01,\$40 X --- <
2825	F3BA	08	
2825	F3BB	45	
2825	F3BC	00	
2825	F3BD	10	
2825	F3BE	41	
2825	F3BF	01	
2825	F3C0	40	
2826	F3C1	00	.BYT \$00,\$00,\$07,\$7F,\$2A,\$69,\$26,\$01 --- :
2826	F3C2	00	
2826	F3C3	07	
2826	F3C4	7F	
2826	F3C5	2A	
2826	F3C6	64	
2826	F3C7	26	
2826	F3C8	01	
2827	F3C9	41	.BYT \$41,\$1C,\$08,\$08,\$00,\$08,\$00,\$04 (--- /
2827	F3CA	1C	
2827	F3CB	08	
2827	F3CC	08	
2827	F3CD	00	
2827	F3CE	08	
2827	F3CF	00	
2827	F3D0	04	
2828	F3D1	45	.BYT \$45,\$40,\$49,\$55,\$7F,\$45,\$49,\$05 0 --- 7
2828	F3D2	40	
2828	F3D3	49	
2828	F3D4	55	
2828	F3D5	7F	
2828	F3D6	45	
2828	F3D7	49	
2828	F3D8	05	
2829	F3D9	49	.BYT \$49,\$29,\$00,\$00,\$41,\$14,\$14,\$09 8 --- ?
2829	F3DA	29	
2829	F3DB	00	
2829	F3DC	00	
2829	F3DD	41	
2829	F3DE	14	
2829	F3DF	14	
2829	F3E0	09	
2830	F3E1		;DOT PATTERNS FOR COLUMN 4

LINE #	LOC	CODE	LINE
2831	F3E1	1E	COL4 .BYT \$1E,\$7E,\$36,\$22,\$1C,\$41,\$01,\$7A @ -- G
2831	F3E2	7E	
2831	F3E3	36	
2831	F3E4	22	
2831	F3E5	1C	
2831	F3E6	41	
2831	F3E7	01	
2831	F3E8	7A	
2832	F3E9	7F	.BYT \$7F,\$00,\$01,\$41,\$40,\$7F,\$7F,\$3E H -- 0
2832	F3EA	00	
2832	F3EB	01	
2832	F3EC	41	
2832	F3ED	40	
2832	F3EE	7F	
2832	F3EF	7F	
2833	F3F0	3E	.BYT \$06,\$5E,\$46,\$31,\$01,\$3F,\$07,\$7F P -- W
2833	F3F1	06	
2833	F3F2	5E	
2833	F3F3	46	
2833	F3F4	31	
2833	F3F5	01	
2833	F3F6	3F	
2833	F3F7	07	
2833	F3F8	7F	
2834	F3F9	63	.BYT \$63,\$07,\$43,\$00,\$60,\$7F,\$02,\$40 X -- <
2834	F3FA	07	
2834	F3FB	43	
2834	F3FC	00	
2834	F3FD	60	
2834	F3FE	7F	
2834	F3FF	02	
2834	F400	40	
2835	F401	00	.BYT \$00,\$00,\$00,\$14,\$12,\$63,\$50,\$00 --- '
2835	F402	00	
2835	F403	00	
2835	F404	14	
2835	F405	12	
2835	F406	63	
2835	F407	50	
2835	F408	00	
2836	F409	00	.BYT \$00,\$00,\$14,\$08,\$00,\$08,\$00,\$03 (--- /
2836	F40A	00	
2836	F40B	14	
2836	F40C	08	
2836	F40D	00	
2836	F40E	08	
2836	F40F	00	
2836	F410	03	
2837	F411	3E	.BYT \$3E,\$40,\$46,\$22,\$10,\$39,\$31,\$03 0 -- 7
2837	F412	40	
2837	F413	46	
2837	F414	22	
2837	F415	10	
2837	F416	39	
2837	F417	31	

LINE #	LOC	CODE	LINE
2837	F418	03	
2838	F419	36	.BYT \$36,\$1E,\$00,\$00,\$41,\$19,\$0B,\$06 8 --- ?
2838	F41A	1E	
2838	F41B	00	
2838	F41C	00	
2838	F41D	41	
2838	F41E	14	
2838	F41F	08	
2838	F420	06	
2840	F421		ASCII CHARACTERS FOR KB
2841	F421	20	ROW1 .BYT \$20,\$08,\$00,\$0D,\$00,\$00,\$00,\$00
2841	F422	08	
2841	F423	00	
2841	F424	0D	
2841	F425	00	
2841	F426	00	
2841	F427	00	
2841	F428	00	
2842	F429	00	ROW2 .BYT \$00,\$60,'\',\$00,\$00,\$00,\$7F,\$00
2842	F42A	60	
2842	F42B	5C	
2842	F42C	00	
2842	F42D	00	
2842	F42E	00	
2842	F42F	7F	
2842	F430	00	
2843	F431	2E 4C	ROW3 .BYT '.LF--:0;/'
2844	F439	4D 4A	ROW4 .BYT 'MJIO98K,'
2845	F441	42 47	ROW5 .BYT 'BGYU76HN'
2846	F449	43 44	ROW6 .BYT 'CDRT54FV'
2847	F451	5A 41	ROW7 .BYT 'ZANE32SX'
2848	F459	00	ROW8 .BYT \$00,\$00,\$1B,'Q1',\$5E,'IC'
2848	F45A	00	
2848	F45B	1B	
2848	F45C	51 31	
2848	F45E	5E	
2848	F45F	5D 5B	

LINE #	LOC	CODE	LINE
2850	F461		;DISASSEMBLE INSTRUCTION AND SHOW REGS IS REGF SET
2851	F461	AD 0E A4	REGQ LDA REGF ;GET FLAG
2852	F464	F0 06	BEQ DISASH
2853	F466	20 32 E2	JSR REG1 ;SHOW THE SIX REGS
2854	F469	20 24 EA	JSR CRCK ;<CR>
2856	F46C	20 45 F5	DISASM JSR PREL2
2857	F46F	20 3C F5	JSR PRPC ;OUTPUT PROG COUNTR
2858	F472	A0 00	LDY #0
2859	F474	20 56 EB	JSR PCLLD
2860	F477	A8	TAY
2861	F478	4A	LSR A
2862	F479	90 0B	BCC IEVEN
2863	F47B	4A	LSR A
2864	F47C	80 17	BCS ERR
2865	F47E	C9 22	CMF ##22
2866	F480	F0 13	BEQ ERR
2867	F482	29 07	AND #7
2868	F484	09 80	ORA ##80
2869	F486	4A	IEVEN LSR A
2870	F487	AA	TAX
2871	F488	BD 5B F5	LDA MODE,X
2872	F48B	B0 04	BCS RTMODE
2873	F48D	4A	LSR A
2874	F48E	4A	LSR A
2875	F48F	4A	LSR A
2876	F490	4A	LSR A
2877	F491	29 0F	RTMODE AND ##F
2878	F493	D0 04	BNE GETFMT
2879	F495	A0 80	ERR LDY ##80
2880	F497	A9 00	LDA #0
2881	F499	AA	GETFMT TAX
2882	F49A	BD 9F F5	LDA MODE2,X
2883	F49D	BD 16 01	STA FORMA
2884	F4A0	29 03	AND #3
2885	F4A2	85 EA	STA LENGTH
2886	F4A4	98	TYA ;OPCODE
2887	F4A5	29 8F	AND ##8F
2888	F4A7	AA	TAX
2889	F4A8	98	TYA ;OPCODE IN A AGAIN
2890	F4A9	A0 03	LDY #3
2891	F4AB	E0 8A	CPX ##8A
2892	F4AD	F0 0B	BEQ MNNDX3
2893	F4AF	4A	MNNDX1 LSR A
2894	F4B0	90 0B	BCC MNNDX3
2895	F4B2	4A	LSR A
2896	F4B3	4A	MNNDX2 LSR A
2897	F4B4	09 20	ORA ##20
2898	F4B6	88	DEY
2899	F4B7	D0 FA	BNE MNNDX2
2900	F4B9	C8	INY
2901	F4BA	88	MNNDX3 DEY
2902	F4BB	D0 F2	BNE MNNDX1
2903	F4BD	48	PHA ;SAVE MNEMONIC TABLE INDEX
2904	F4BE	20 56 EB	JSR PCLLD

LINE	#	LOC	CODE	LINE	
2905	F4C1	20 46	EA	JSR	NUMA
2906	F4C4	20 45	F5	JSR	PREL2 ;PRINT LAST BLANK
2907	F4C7	68		PLA	
2908	F4C8	A8		TAY	
2909	F4C9	B9 B9	F5	LDA	MNEML,Y
2910	F4CC	8D 17	01	STA	LMNEM
2911	F4CF	B9 F9	F5	LDA	MNEMR,Y
2912	F4D2	8D 18	01	STA	RMNEM
2913	F4D5	A2 03		LDX	#3 ;MUST BE
2914	F4D7	A9 00		PRMN1 LDA	#0
2915	F4D9	A0 05		LDY	#5
2916	F4DB	0E 18	01	PRMN2 ASL	RMNEM
2917	F4DE	2E 17	01	ROL	LMNEM
2918	F4E1	2A		ROL	A
2919	F4E2	88		DEY	
2920	F4E3	D0 F6		BNE	PRMN2
2921	F4E5	69 BF		ADC	##BF ;ADD "?" OFFSET
2922	F4E7	20 8C	E9	JSR	OUTALL
2923	F4EA	CA		DEX	
2924	F4EB	D0 EA		BNE	PRMN1
2925	F4ED	20 45	F5	JSR	PREL2
2926	F4F0	A2 06		LDX	#6
2927	F4F2	A9 00		LDA	#0
2928	F4F4	8D 29	A4	STA	STIY+2 ;FLAG
2929	F4F7	E0 03		PRADR1 CPX	#3
2930	F4F9	D0 1E		BNE	PRADR3 ;IF X=3 PRINT ADDR VALUE
2931	F4FB	A4 EA		LDY	LENGTH
2932	F4FD	F0 1A		BEQ	PRADR3 ;1 BYTE INSTR
2933	F4FF	AD 16	01	PRADR2 LDA	FORMA
2934	F502	C9 E8		CMP	##EB ;RELATIVE ADDRESSING
2935	F504	20 56	EB	JSR	PCLLD
2936	F507	B0 27		BCS	RELADR
2937	F509			;SEE IF SYMBOL	
2938	F509	48		PHA	
2939	F50A	AD 29	A4	LDA	STIY+2
2940	F50D	D0 03		BNE	MR11A
2941	F50F	EE 29	A4	INC	STIY+2 ;SHOW WE WERE HERE
2943	F512	68		MR11A PLA	
2944	F513	20 46	EA	JSR	NUMA
2945	F516	88		DEY	
2946	F517	D0 E6		BNE	PRADR2
2947	F519	0E 16	01	PRADR3 ASL	FORMA
2948	F51C	90 0E		BCC	PRADR4
2949	F51E	BD AC	F5	LDA	CHAR1-1,X
2950	F521	20 BC	E9	JSR	OUTALL
2951	F524	BD B2	F5	LDA	CHAR2-1,X
2952	F527	F0 03		BEQ	PRADR4
2953	F529	20 BC	E9	JSR	OUTALL
2954	F52C	CA		PRADR4 DEX	
2955	F52D	D0 C8		BNE	PRADR1
2956	F52F	60		RTS	
2957	F530	20 4D	F5	RELADR JSR	PCADJ3
2958	F533	AA		TAX	
2959	F534	EB		INX	

LINE	* LOC	CODE	LINE
2960	F535	D0 01	BNE PRNTYX
2961	F537	C8	INY
2962	F538	98	PRNTYX TYA
2963	F539	4C 42 EA	JMP WRAX ;PRINT A &X
2964	F53C	AD 26 A4	PRFC LDA SAVPC+1 ;PRINT PC
2965	F53F	AE 25 A4	LDX SAVPC
2966	F542	20 42 EA	JSR WRAX
2967	F545	A9 20	PRBL2 LDA ##20
2968	F547	4C BC E9	JMP OUTALL
2969	F54A	A5 EA	LDA LENGTH
2970	F54C	38	SEC
2971	F54D	AC 26 A4	PCADJ3 LDY SAVPC+1 ;PRG CNTR HIGH
2972	F550	AA	TAX
2973	F551	10 01	BFL PCADJ4
2974	F553	88	DEY
2975	F554	6D 25 A4	PCADJ4 ADC SAVPC ;PROG CNTR LOW
2976	F557	90 01	BCC RTS1
2977	F559	C8	INY
2978	F55A	60	RTS1 RTS
2980	F55B	40	MODE .BYT \$40,2,\$45,3,\$D0,8,\$40,9
2980	F55C	02	
2980	F55D	45	
2980	F55E	03	
2980	F55F	D0	
2980	F560	08	
2980	F561	40	
2980	F562	09	
2981	F563	30	.BYT \$30,\$22,\$45,\$33,\$D0,8,\$40,9
2981	F564	22	
2981	F565	45	
2981	F566	33	
2981	F567	D0	
2981	F568	08	
2981	F569	40	
2981	F56A	09	
2982	F56B	40	.BYT \$40,2,\$45,\$33,\$D0,8,\$40,9
2982	F56C	02	
2982	F56D	45	
2982	F56E	33	
2982	F56F	D0	
2982	F570	08	
2982	F571	40	
2982	F572	09	
2983	F573	40	.BYT \$40,2,\$45,\$B3,\$D0,8,\$40,9
2983	F574	02	
2983	F575	45	
2983	F576	B3	
2983	F577	D0	
2983	F578	08	
2983	F579	40	
2983	F57A	09	
2984	F57B	00	.BYT 0,\$22,\$44,\$33,\$D0,\$8C,\$44,0
2984	F57C	22	

LINE	#	LOC	CODE	LINE
2984	F57D	44		
2984	F57E	33		
2984	F57F	D0		
2984	F580	8C		
2984	F581	44		
2984	F582	00		
2985	F583	11	.BYT \$11,\$22,\$44,\$33,\$D0,\$8C,\$44,\$9A	
2985	F584	22		
2985	F585	44		
2985	F586	33		
2985	F587	D0		
2985	F588	8C		
2985	F589	44		
2985	F58A	9A		
2986	F58B	10	.BYT \$10,\$22,\$44,\$33	
2986	F58C	22		
2986	F58D	44		
2986	F58E	33		
2987	F58F	D0	.BYT \$D0,8,\$40,9	
2987	F590	08		
2987	F591	40		
2987	F592	09		
2988	F593	10	.BYT \$10,\$22,\$44,\$33,\$D0,8,\$40,9	
2988	F594	22		
2988	F595	44		
2988	F596	33		
2988	F597	D0		
2988	F598	08		
2988	F599	40		
2988	F59A	09		
2989	F59B	62	.BYT \$62,\$13,\$7B,\$A9	
2989	F59C	13		
2989	F59D	7B		
2989	F59E	A9		
2991	F59F	00	MODE2 .BYT 0,\$21,1,2,0,\$80,\$59,\$4D	
2991	F5A0	21		
2991	F5A1	01		
2991	F5A2	02		
2991	F5A3	00		
2991	F5A4	80		
2991	F5A5	59		
2991	F5A6	4D		
2992	F5A7	11	.BYT \$11,\$12,6,\$4A,5,\$1D	
2992	F5A8	12		
2992	F5A9	06		
2992	F5AA	4A		
2992	F5AB	05		
2992	F5AC	1D		
2994	F5AD	2C	CHAR1 .BYT ',',\$29,',#(','.','	
2994	F5AE	29		
2994	F5AF	2C 23 28		
2994	F5B2	2E		
2995	F5B3	59	CHAR2 .BYT 'Y',0,'X',0,0,'A'	

LINE	#	LOC	CODE	LINE
2995	F5B4	00		
2995	F5B5	58		
2995	F5B6	00		
2995	F5B7	00		
2995	F5B8	41		
2997	F5B9	1C	MNEML	.BYT \$1C,\$8A,\$1C,\$23,\$5D,\$8B,\$1B
2997	F5BA	8A		
2997	F5BB	1C		
2997	F5BC	23		
2997	F5BD	5D		
2997	F5BE	8B		
2997	F5BF	1B		
2998	F5C0	A1		.BYT \$A1
2999	F5C1	9D		.BYT \$9D,\$8A,\$1D,\$23,\$9D,\$8B,\$1D,\$A1
2999	F5C2	8A		
2999	F5C3	1D		
2999	F5C4	23		
2999	F5C5	9D		
2999	F5C6	8B		
2999	F5C7	1D		
2999	F5C8	A1		
3000	F5C9	00		.BYT 0,\$29,\$19,\$AE,\$69,\$AB,\$19,\$23
3000	F5CA	29		
3000	F5CB	19		
3000	F5CC	AE		
3000	F5CD	69		
3000	F5CE	AB		
3000	F5CF	19		
3000	F5D0	23		
3001	F5D1	24		.BYT \$24,\$53,\$1B,\$23,\$24,\$53,\$19,\$A1
3001	F5D2	53		
3001	F5D3	1B		
3001	F5D4	23		
3001	F5D5	24		
3001	F5D6	53		
3001	F5D7	19		
3001	F5D8	A1		
3002	F5D9	00		.BYT 0,\$1A,\$5B,\$5B,\$A5,\$69,\$24,\$24
3002	F5DA	1A		
3002	F5DB	5B		
3002	F5DC	5B		
3002	F5DD	A5		
3002	F5DE	69		
3002	F5DF	24		
3002	F5E0	24		
3003	F5E1	AE		.BYT \$AE,\$AE,\$AB,\$AD,\$29,0,\$7C,0
3003	F5E2	AE		
3003	F5E3	AB		
3003	F5E4	AD		
3003	F5E5	29		
3003	F5E6	00		
3003	F5E7	7C		
3003	F5E8	00		
3004	F5E9	15		.BYT \$15,\$9C,\$6D,\$9C,\$A5,\$69,\$29,\$53

LINE	#	LOC	CODE	LINE
3004	F5EA	9C		
3004	F5EB	6D		
3004	F5EC	9C		
3004	F5ED	A5		
3004	F5EE	69		
3004	F5EF	29		
3004	F5F0	53		
3005	F5F1	84	.BYT \$84,\$13,\$34,\$11,\$A5,\$69,\$23,\$A0	
3005	F5F2	13		
3005	F5F3	34		
3005	F5F4	11		
3005	F5F5	A5		
3005	F5F6	69		
3005	F5F7	23		
3005	F5F8	A0		
3007	F5F9	DB	MNEMR .BYT \$D8,\$62,\$5A,\$4B,\$26,\$62,\$74	
3007	F5FA	62		
3007	F5FB	5A		
3007	F5FC	4B		
3007	F5FD	26		
3007	F5FE	62		
3007	F5FF	94		
3008	F600	88	.BYT \$88	
3009	F601	54	.BYT \$54,\$44,\$C8,\$54,\$6B,\$44,\$E8,\$74	
3009	F602	44		
3009	F603	C8		
3009	F604	54		
3009	F605	6B		
3009	F606	44		
3009	F607	E8		
3009	F608	94		
3010	F609	00	.BYT 0,\$B4,8,\$84,\$74,\$B4,\$2B,\$6E	
3010	F60A	B4		
3010	F60B	08		
3010	F60C	B4		
3010	F60D	74		
3010	F60E	B4		
3010	F60F	2B		
3010	F610	6E		
3011	F611	74	.BYT \$74,\$F4,\$CC,\$4A,\$72,\$F2,\$A4,\$8A	
3011	F612	F4		
3011	F613	CC		
3011	F614	4A		
3011	F615	72		
3011	F616	F2		
3011	F617	A4		
3011	F618	8A		
3012	F619	00	.BYT 0,\$AA,\$A2,\$A2,\$74,\$74,\$74,\$72	
3012	F61A	AA		
3012	F61B	A2		
3012	F61C	A2		
3012	F61D	74		
3012	F61E	74		
3012	F61F	74		

LINE #	LOC	CODE	LINE
3012	F620	72	
3013	F621	44	.BYT \$44,\$68,\$82,\$32,\$B2,0,\$22,0
3013	F622	68	
3013	F623	B2	
3013	F624	32	
3013	F625	B2	
3013	F626	00	
3013	F627	22	
3013	F628	00	
3014	F629	1A	.BYT \$1A,\$1A,\$26,\$26,\$72,\$72,\$88,\$C8
3014	F62A	1A	
3014	F62B	26	
3014	F62C	26	
3014	F62D	72	
3014	F62E	72	
3014	F62F	88	
3014	F630	C8	
3015	F631	C4	.BYT \$C4,\$CA,\$26,\$48,\$44,\$44,\$A2,\$C8
3015	F632	CA	
3015	F633	26	
3015	F634	48	
3015	F635	44	
3015	F636	44	
3015	F637	A2	
3015	F638	C8	

LINE	#	LOC	CODE	LINE
3017	F639			*****
3018	F639			*** AIM TEXT EDITOR ***
3019	F639			*** 05/01/78 ***
3020	F639			*****
3022	F639			; R=READ FROM ANY INPUT DEVICE
3023	F639			; I=INSERT A LINE FROM INPUT DEV
3024	F639			; K=DELETE A LINE
3025	F639			; U=GO UP ONE LINE
3026	F639			; D=GO DOWN ONE LINE
3027	F639			; L=LIST LINES TO OUTPUT DEV
3028	F639			; T=GO TO TOP OF TEXT
3029	F639			; B=GO TO BOTTOM OF TEXT
3030	F639			; F=FIND STRING
3031	F639			; C=CHANGE STRING TO NEW STRING
3032	F639			; Q=QUIT EDITOR
3033	F639			; <SPACE>=DISPLAY CURRENT LINE
3035	F639			***** E COMMAND-EDITOR ENTRY (FROM MONITOR) *****
3036	F639	20 13 EA	EDIT	JSR CRLW
3037	F63C	A0 6C		LDY #MSG1-M1
3038	F63E	20 AF E7		JSR KEP ;START UP MSG
3039	F641	20 13 EA		JSR CRLW
3040	F644	20 A3 E7	EDI0	JSR FROM
3041	F647	B0 FB		BCC EDI0
3042	F649	AD 1E A4		LDA CKSUM ;IS CLR IF ADDR WAS INPUTTED
3043	F64C	F0 03		BEQ *+5
3044	F64E	20 DB E2		JSR WRITAZ ;OUTPUT DEFAULT ADDR (0200)
3045	F651	A2 01		LDX #1
3046	F653	BD 1C A4	EDI1	LDA ADDR,X
3047	F656	95 E3		STA TEXT,X
3048	F658	95 E1		STA BOTLN,X
3049	F65A	9D 1A A4		STA S1,X ;FOR MEMORY TEST
3050	F65D	CA		DEX
3051	F65E	10 F3		BPL EDI1
3052	F660	20 3B E8		JSR BLANK2
3053	F663	20 A7 E7	EDI2	JSR TO ;END
3054	F666	B0 FB		BCC EDI2
3055	F668	20 BC F8		JSR TOPND ;TRANSF TEXT TO ADDR FOR RAM CHECK
3056	F66B	AD 1E A4		LDA CKSUM ;IS CLR IF ADDR WAS INPUTTED
3057	F66E	F0 10		BEQ EDI4 ;BRNCH IF NOT DEFAULT VALUE
3058	F670	20 34 F9		JSR SAVNOW
3059	F673	20 B6 F6	EDI3	JSR EDI ;CARRY IS SET IF NO RAM THERE
3060	F676	90 FB		BCC EDI3
3061	F678	A9 00		LDA #0 ;SET UPPER LIMIT TO BEGINNING...
3062	F67A	9D 1C A4		STA ADDR ;OF PAGE
3063	F67D	20 DB E2		JSR WRITAZ ;OUTPUT DEFAULT VALUE ,UPPER LIMIT
3064	F680	AD 1C A4	EDI4	LDA ADDR
3065	F683	85 E5		STA END
3066	F685	AD 1D A4		LDA ADDR+1
3067	F688	85 E6		STA END+1
3068	F68A	20 34 F9		JSR SAVNOW
3069	F68D			;NOW SEE IF MEMORY IS THERE

LINE #	LOC	CODE	LINE
3070	F68D	20 B6 F6	EDI5 JSR EDI
3071	F690	90 FB	BCC EDI5
3072	F692	A5 E6	LDA END+1 ;CMP WITH END
3073	F694	CD 1D A4	CMP ADDR+1
3074	F697	F0 11	BEQ EDI7
3075	F699	B0 13	BCS EDI8
3076	F69B	20 BC F8	EDI6 JSR TOPNO ;RESTORE NOWLN
3077	F69E	A9 00	LDA #0
3078	F6A0	91 DF	STA (NOWLN)Y ;END OF TEXT MARKER
3079	F6A2	20 13 EA	JSR CRL0W
3080	F6A5	A9 52	LDA #'R ;FORCE READ COMMAND
3081	F6A7	4C BD FA	JMP ENTRY
3082	F6AA	A5 E5	EDI7 LDA END ;IF ZERO MEM IS OK
3083	F6AC	F0 ED	BEQ EDI6
3084	F6AE	A9 00	EDI8 LDA #0
3085	F6B0	BD 1C A4	STA ADDR
3086	F6B3	4C 33 EB	JMP MEMERR ;NO MEMORY FOR THOSE LIMITS
3088	F6B6	A0 00	EDI LDY #0 ;CHCK IF MEMORY WRITES
3089	F6B8	20 B7 FE	JSR PATCH6 ;GET BYTE ADDR BY ADDR,ADDR+1
3090	F6BB	4B	PHA ;SAVE IT
3091	F6BC	A9 AA	LDA #*AA ;SET THIS PATTERN
3092	F6BE	20 7B EB	JSR SADDR ;CHCK IT
3093	F6C1	D0 09	BNE EDI2B
3094	F6C3	68	PLA
3095	F6C4	20 7B EB	JSR SADDR ;RESTORE CHR
3096	F6C7	EE 1D A4	INC ADDR+1 ;NEXT PAG
3097	F6CA	1B	CLC ;IT WROTE
3098	F6CB	60	RTS
3099	F6CC	3B	EDI2B SEC ;DIDNT WRITE
3100	F6CD	68	PLA
3101	F6CE	60	RTS
3103	F6CF		***** T COMMAND-REENTRY EDITOR *****
3104	F6CF		;RE-ENTRY POINT,TEXT ALREADY THERE
3105	F6CF	20 24 EA	REENTR JSR CRCK ;<CR> IF PRI ON
3106	F6D2	20 BC F8	TP JSR TOPNO ;GO TO TOP
3107	F6D5	4C B9 F7	JMP IN03A ;DISPLAY LINE
3109	F6D8		***** U COMMAND-UP LINE *****
3110	F6D8		;GO UP ONE LINE BUT...
3111	F6D8		;DOWN IN ADDRESSING MEMORY
3112	F6D8	20 DB F8	DNND JSR ATT0P ;THIS RTN DOESNT PRINT
3113	F6DB	90 06	BCC DOW1 ;NOT TOP
3114	F6DD	20 27 F7	JSR PLNE ;ARE AT TOP
3115	F6E0	4C 7B FA	JMP ERR0
3116	F6E3	A0 00	DOW1 LDY #0
3117	F6E5	20 1D F9	JSR SUB ;DECREMENT NOWLN PAST <CR>
3118	F6E8	20 1D F9	DOW2 JSR SUB
3119	F6EB	20 DB F8	JSR ATT0P
3120	F6EE	B0 30	BCS UP4
3121	F6F0	B1 DF	LDA (NOWLN)Y
3122	F6F2	C9 0D	CMP #CR
3123	F6F4	D0 F2	BNE DOW2
3124	F6F6	4C 2B F9	JMP AD1

LINE #	LOC	CODE	LINE
3126	F6F9		;***** D COMMAND-DOWN LINE *****
3127	F6F9		;GO DOWN ONE LINE BUT...
3128	F6F9		;UP IN ADDRESSING MEMORY
3129	F6F9	20 09 F7	UP JSR UPNO
3130	F6FC	20 27 F7	JSR PLNE ;DISPLAY LINE & CHCK BOTTOM
3131	F6FF	20 E9 F8	JSR ATBOT
3132	F702	90 1C	BCC UP4
3133	F704	A0 72	LDY #MSG2-M1 ;PRINT "END"
3134	F706	4C AF E7	JMP KEP
3135	F709	A0 00	UPNO LDY #0
3136	F70B	20 E9 F8	JSR ATBOT
3137	F70E	90 03	BCC UP1
3138	F710	4C 5C FA	JMP ENDERR
3139	F713	B1 DF	UP1 LDA (NOWLN)Y
3140	F715	F0 09	BEQ UP4
3141	F717	C8	INY
3142	F718	C9 0D	CMP #CR
3143	F71A	D0 F7	BNE UP1
3144	F71C	98	TYA
3145	F71D	20 2A F9	JSR ADDA ;ADD LENGTH TO CURRENT LINE
3146	F720	60	UP4 RTS
3148	F721		;***** B COMMAND-GO TO BOTTOM *****
3149	F721	20 C5 F8	BT JSR SETBOT
3150	F724		;START U-COMMAND HERE
3151	F724	20 DB F6	DOWN JSR DNNO ;U COMMAND
3153	F727		;***** <SPACE> COMMAND-DISPLAY CURRENT LINE *****
3154	F727	A0 00	PLNE LDY #0 ;PRINT CURRENT LINE
3155	F729	B1 DF	P02 LDA (NOWLN)Y
3156	F72B	F0 0E	BEQ P01 ;FAST END ?
3157	F72D	C9 0D	CMP #CR ;DONE?
3158	F72F	F0 0A	BEQ P01
3159	F731	20 BC E9	JSR OUTALL ;PUT IT SOMEWHERE
3160	F734	99 38 A4	STA DIBUFF,Y
3161	F737	C8	INY
3162	F738	4C 29 F7	JMP P02
3163	F73B	84 EA	P01 STY LENGTH
3164	F73D	84 E9	STY OLDLEN
3165	F73F	AC 13 A4	P03 LDY OUTFLG ;ONE MORE <CR> FOR TAPE
3166	F742	C0 0D	CPY #CR
3167	F744	F0 03	BEQ P00
3168	F746	4C F0 E9	JMP CRLF ;TO OUTPUT DEV
3169	F749	4C 24 EA	P00 JMP CRCK ;<CR>, & DONT CLR DISPL
3171	F74C		;***** K COMMAND-KILL LINE *****
3172	F74C		;DELETE CURRENT LINE
3173	F74C	20 B6 F8	DLNE JSR KIFLG ;CLR K OR I COMM FLG
3174	F74F	EA	NOP
3175	F750	EA	NOP
3176	F751	EA	NOP
3177	F752	20 27 F7	JSR PLNE
3178	F755	20 E9 F8	JSR ATBOT
3179	F758	B0 CD	BCS PLNE ;AT END OF TEXT
3180	F75A	A0 00	LDY #0

LINE #	LOC	CODE	LINE
3181	F75C	84 EA	STY LENGTH
3182	F75E	20 3F F9	JSR REPLAC ;KILL LINE
3183	F761	4C 27 F7	JMP PLNE
3185	F764		***** I COMMAND-INSERT LINE *****
3186	F764	20 6D F7	IN JSR INL
3187	F767	20 F9 F6	JSR UP ;DISPLAY NEXT LINE DOWN
3188	F76A	4C 78 FA	JMP ERR0 ;IF AT BOTTOM PRINT "END"
3189	F76D	20 B6 F8	INL JSR KIFLG ;CLR K OR I COMM FLG
3190	F770	A0 00	LDY #0 ;GET LINE INTO DIBUFF
3191	F772	84 E9	STY OLDLEN
3192	F774	20 BD E7	JSR PROMPT
3193	F777	20 44 EB	JSR CLR
3194	F77A	20 93 E9	IN02 JSR INALL
3195	F77D	20 F8 FE	JSR PATC12 ;CLR, SO WE CAN OUTPUT TO PRI
3196	F780	C9 7F	CMF #7F ;RUB
3197	F782	4C 2A FF	JMP PATC17 ;NO ZEROS IN CASE OF PAPER TAPE
3198	F785	C9 0A	IN02A CMF #1F
3199	F787	F0 F1	BEQ IN02
3200	F789	C9 0D	CMF #CR
3201	F78B	F0 1B	BEQ IN03
3202	F78D	C0 3C	CPY #60 ;DO NOT INCR Y IF 60
3203	F78F	B0 0B	BCS IN03B
3204	F791	99 3B A4	STA DIBUFF,Y
3205	F794	C8	INY
3206	F795	C0 3C	CPY #60
3207	F797	D0 E1	BNE IN02 ;CONTIN , DISP WONT ALLOW > 60 CHR
3208	F799	A0 3C	IN03B LDY #60 ;SET Y TO MAX OF 60
3209	F79B	A9 01	LDA #01
3210	F79D	0D 11 A4	ORA PRIFLG ;DO NOT OUTPUT TO PRI ANY MORE
3211	F7A0	8D 11 A4	STA PRIFLG ;OTHERWISE CLOBBERS THE BUFFER
3212	F7A3	8C 15 A4	STY CURP02
3213	F7A6	D0 D2	BNE IN02 ;GO BACK
3214	F7A8	84 EA	IN03 STY LENGTH
3215	F7AA	C0 00	CPY #0 ;FIRST CHAR?
3216	F7AC	D0 17	BNE IN05
3217	F7AE	AD 19 A4	LDA COUNT
3218	F7B1	D0 12	BNE IN05 ;BRANCH IF C COMMAND
3219	F7B3	20 24 EA	JSR CRCK ;<CR> IF PRI PNTR DIFF FROM 0
3220	F7B6	20 03 FF	JSR PATC13 ;TURN ON TAPES & SET DEFAULT DEV
3221	F7B9	20 27 F7	IN03A JSR PLNE ;DISPLAY NEXT LINE DOWN
3222	F7BC	20 09 F7	JSR UPNO ;PRINT "END" IF BOTTOM
3223	F7BF	20 D8 F6	JSR DNNO
3224	F7C2	4C 78 FA	JMP ERR0
3225	F7C5	20 3F F9	IN05 JSR REPLAC ;INSERT THE LINE
3226	F7C8	4C 24 EA	JMP CRCK ;<CR> IF PRI PTR NOT 0
3228	F7CB		***** R COMMAND-READ LINE *****
3229	F7CB		;READ TEXT FROM ANY INPUT DEVICE UNTIL
3230	F7CB		;TWO CONSECUTIVE <CR> ARE ENCOUNTER,
3231	F7CB	20 48 E8	INPU JSR WHEREI
3232	F7CE	AC 12 A4	LDY INFLG ;IF TAPE DO NOT ERRASE BUFFER
3233	F7D1	C0 54	CPY #T
3234	F7D3	F0 03	BEQ INPU1
3235	F7D5	20 13 EA	JSR CRL0W

LINE #	LOC	CODE	LINE
3236	F7D8	20 6D F7	INPU1 JSR INL
3237	F7DB	20 09 F7	JSR UPNO ;NEXT LINE
3238	F7DE	4C DB F7	JMP INPU1
3240	F7E1		;***** L COMMAND-LIST LINES *****
3241	F7E1		;PRINT FROM HERE N LINES TO ACTIVE OUTPUT DEV
3242	F7E1	20 37 E8	LST JSR PSL1 ;PRINT "/"
3243	F7E4	20 85 E7	JSR GCNT ;GET LINES COUNT
3244	F7E7	20 13 EA	JSR CRLW
3245	F7EA	20 71 E8	JSR WHEREO ;WHERE TO
3246	F7ED	4C F8 F7	JMP LST02 ;ONE MORE LINE
3247	F7F0	20 07 E9	LST01 JSR RCHEK
3248	F7F3	20 90 E7	JSR DONE
3249	F7F6	F0 0B	BEG LST3
3250	F7F8	20 27 F7	LST02 JSR FLNE
3251	F7FB	20 09 F7	JSR UPNO ;NEXT LINE
3252	F7FE	20 E9 F8	JSR ATBOT
3253	F801	90 ED	BCC LST01 ;NO
3254	F803	20 3F F7	LST3 JSR P03 ;ONE MORE CRLF FOR TAPE
3255	F806	20 0D FF	JSR PATC14 ;CLOSE TAPE IF NEEDED
3256	F809	4C 5C FA	JMP ENDERR
3258	F80C		;***** F COMMAND-FIND STRING *****
3259	F80C		;FIND STRING AND PRINT LINE TO TERMINAL
3260	F80C	20 1E F8	FCHAR JSR FCH
3261	F80F	AD 15 A4	FCHA1 LDA CURPO2 ;SAVE BUFFER PNTR
3262	F812	48	PHA
3263	F813	20 44 E8	JSR CLR ;CLEAR DISP PNTR
3264	F816	20 27 F7	JSR FLNE
3265	F819	68	PLA
3266	F81A	8D 15 A4	STA CURPO2
3267	F81D	60	RTS
3268	F81E		;FIND A CHARACTER STRING
3269	F81E	A0 00	FCH LDY #0
3270	F820	20 BD E7	JSR PROMPT
3271	F823	20 5F E9	FC1 JSR RDRUB ;GET THE CHARACTER
3272	F826	C9 0D	CMP #0D ;REUSE OLD ARGUMENT??
3273	F828	D0 0A	BNE FC3
3274	F82A	C0 00	CPY #0 ;FIRST CHAR?
3275	F82C	D0 06	BNE FC3
3276	F82E	20 09 F7	FC2 JSR UPNO ;NEXT LINE DOWN
3277	F831	4C 49 F8	JMP FC5
3278	F834	C9 0D	FC3 CMP #CR ;DONE
3279	F836	F0 0B	BEG FC4
3280	F838	99 EB 00	STA STRING,Y
3281	F83B	C8	INY
3282	F83C	C0 14	CPY #20 ;MAX LENGTH
3283	F83E	D0 E3	BNE FC1
3284	F840	4C 72 FA	JMP ERROR
3285	F843	20 24 EA	FC4 JSR CRCK ;CLEAR DISPLAY
3286	F846	8C 29 A4	STY STIY+2 ;COUNT OF CHARACTERS
3287	F849	A0 00	FC5 LDY #0
3288	F84B	8C 15 A4	STY CURPO2 ;START AT BEGINNING OF LINENTR IS
3289	F84E	AC 15 A4	FC6 LDY CURPO2 ;CLOBBER
3290	F851	A2 00	LDX #0

LINE #	LOC	CODE	LINE
3291	F853	B1 DF	FC7 LDA (NOWLN)Y ;GET THE CHARACTER
3292	F855	D0 03	BNE FC8 ;NOT AT END
3293	F857	4C 5C FA	JMP ENDERR
3294	F85A	C9 0D	FC8 CMP #CR ;END OF LINE
3295	F85C	F0 D0	BEQ FC2
3296	F85E	D5 EB	CMP STRING,X
3297	F860	F0 06	BEQ FC9
3298	F862	EE 15 A4	INC CURPO2
3299	F865	4C 4E F8	JMP FC6
3300	F868	C8	FC9 INY
3301	F869	E8	INX
3302	F86A	EC 29 A4	CPX STIY+2 ;DONE?
3303	F86D	D0 E4	BNE FC7
3304	F86F	60	RTS
3306	F870		;***** Q COMMAND-EXIT EDITOR *****
3307	F870		; EXIT THE TEXT EDITOR NEATLY
3308	F870	20 13 EA	STOP
3309	F873	4C A1 E1	JMP COMIN
3311	F876		;***** C COMMAND-CHANGE STRING *****
3312	F876		;CHANGE STRING TO ANOTHER STRING IN A LINE
3313	F876	20 B2 F8	CHNG JSR CFLG ;SET C COMMAND FLG
3314	F879	20 0C F8	JSR FCHAR ;FIND CORRECT LINE
3315	F87C	20 3C E9	CHN1 JSR READ ;IS <CR> IF OK
3316	F87F	C9 0D	CMP #CR
3317	F881	F0 09	BEQ CHN2
3318	F883	20 2E F8	JSR FC2 ;TRY NEXT ONE
3319	F886	20 0F F8	JSR FCHA1 ; SHOW LINE
3320	F889	4C 7C F8	JMP CHN1
3321	F88C	AD 29 A4	CHN2 LDA STIY+2 ;GET CHAR COUNT
3322	F88F	85 E9	STA OLDLEN ;GET READY FOR REPLAC
3323	F891	AD 15 A4	LDA CURPO2 ;PNTR TO BEGINNING OF STRING
3324	F894	48	PHA ;SAVE IT
3325	F895	20 2A F9	JSR ADDA ;ADD TO NOWLN (LINE PNTR)
3326	F898	20 44 EB	JSR CLR ;CLEAR DISP
3327	F89B	A0 05	LDY #M3-M1 ;PRINT "TO"
3328	F89D	20 AF E7	JSR KEP
3329	F8A0	A0 00	LDY #0
3330	F8A2	20 7A F7	JSR IN02 ;GET NEW STRING & REPLAC
3331	F8A5	68	PLA
3332	F8A6	AA	TAX
3333	F8A7	F0 06	BEQ CHN4
3334	F8A9	20 1D F9	CHN3 JSR SUB ;RESTORE NOWLN WHERE IT WAS
3335	F8AC	CA	DEX
3336	F8AD	D0 FA	BNE CHN3
3337	F8AF	4C 27 F7	CHN4 JMP FLNE ;DISPLAY THE CHANGED LINE
3339	F8B2		;THE FOLLOWING ARE SUBROUTINES USED BY COMMANDS
3340	F8B2	A9 01	CFLG LDA #1 ;SET FLG FOR C COMMAND
3341	F8B4	D0 02	BNE K12
3342	F8B6	A9 00	K1FLG LDA #0 ;CLR K OR I COMMAND FLG

LINE #	LOC	CODE	LINE
3343	F8B8	8D 19 A4	KI2 STA COUNT
3344	F8BB	60	RTS
3346	F8BC	A5 E3	TOPND LDA TEXT ;SET CURRENT LINE TO TOP
3347	F8BE	A6 E4	LDX TEXT+1
3348	F8C0	85 DF	TP01 STA NOWLN
3349	F8C2	86 E8	STX NOWLN+1
3350	F8C4	60	RTS
3352	F8C5	A5 E1	SETBOT LDA BOTLN ;SET CURRENT LINE TO BOTTOM
3353	F8C7	A6 E2	LDX BOTLN+1
3354	F8C9	85 E7	STA SAVE
3355	F8CB	86 E8	STX SAVE+1
3356	F8CD	4C C0 F8	JMP TP01
3358	F8D0	AD 1C A4	RESNOW LDA ADDR ;RESTORE CURRENT LINE ADDRESS
3359	F8D3	85 DF	STA NOWLN
3360	F8D5	AD 1D A4	LDA ADDR+1
3361	F8D8	85 E0	STA NOWLN+1
3362	F8DA	60	RTS
3364	F8DB		; SEE IF CURRENT LINE AT TOP (C SET IF SO)
3365	F8DB	A5 DF	ATTOP LDA NOWLN
3366	F8DD	C5 E3	CMF TEXT
3367	F8DF	D0 16	BNE AT01
3368	F8E1	A5 E0	LDA NOWLN+1
3369	F8E3	C5 E4	CMF TEXT+1
3370	F8E5	D0 10	BNE AT01
3371	F8E7	38	SEC
3372	F8E8	60	RTS
3374	F8E9		; SEE IF CURRENT LINE AT BOTTOM (C SET IF SO)
3375	F8E9	A5 DF	ATBOT LDA NOWLN
3376	F8EB	A6 E0	LDX NOWLN+1
3377	F8ED	C5 E1	CMF BOTLN
3378	F8EF	D0 06	BNE AT01
3379	F8F1	E4 E2	CPX BOTLN+1
3380	F8F3	D0 02	BNE AT01
3381	F8F5	38	AT02 SEC
3382	F8F6	60	RTS
3383	F8F7	18	AT01 CLC
3384	F8F8	60	RTS
3386	F8F9		;SEE IF WE RAN PAST END OF BUFFER LIMIT
3387	F8F9	A5 E1	ATEND LDA BOTLN
3388	F8FB	A6 E2	LDX BOTLN+1
3389	F8FD	E4 E6	CPX END+1 ;HIGH BYTE > OR = ?
3390	F8FF	90 F6	BCC AT01
3391	F901	D0 F2	BNE AT02
3392	F903	C5 E5	CMF END ;LOW BYTE > OR = ?
3393	F905	90 F0	BCC AT01
3394	F907	E0 EC	BCS AT02
3396	F909		; SAVE CURRENT LINE (NOWLN) IN S1
3397	F909	A5 DF	NOWS1 LDA NOWLN

LINE #	LOC	CODE	LINE
3398	F90B	A6 E0	LDX NOWLN+1
3399	F90D	4C 16 F9	JMP ADDS1A
3401	F910		; MOVE ADDR INTO S1
3402	F910	AD 1C A4	ADDRS1 LDA ADDR
3403	F913	AE 1D A4	LDX ADDR+1
3404	F916	8D 1A A4	ADDS1A STA S1
3405	F919	8E 1B A4	STX S1+1
3406	F91C	60	RTS
3408	F91D		; SUBTRACT ONE FROM CURRENT LINE (NOWLN)
3409	F91D	C6 DF	SUB DEC NOWLN
3410	F91F	A5 DF	LDA NOWLN
3411	F921	C9 FF	CMF *%FF
3412	F923	D0 02	BNE SUB1
3413	F925	C6 E0	DEC NOWLN+1
3414	F927	60	SUB1 RTS
3416	F928		; ADD ACC TO CURRENT LINE (NOWLN)
3417	F928	A9 01	AD1 LDA #1
3418	F92A	18	ADDA CLC
3419	F92B	65 DF	ADC NOWLN
3420	F92D	85 DF	STA NOWLN
3421	F92F	90 02	BCC ADDA1
3422	F931	E6 E0	INC NOWLN+1
3423	F933	60	ADDA1 RTS
3425	F934	A5 DF	SAVNOW LDA NOWLN ;SAVE CURRENT LINE INTO ADDR
3426	F936	8D 1C A4	STA ADDR
3427	F939	A5 E0	LDA NOWLN+1
3428	F93B	8D 1D A4	STA ADDR+1
3429	F93E	60	REP2 RTS

LINE #	LOC	CODE	LINE
3431	F93F		;MOVE CURRENT TEXT AROUND TO HAVE
3432	F93F		;SPACE TO PUT IN THE NEW BUFFER
3433	F93F	A4 EA	REPLAC LDY LENGTH
3434	F941	C4 E9	CPY OLDLEN
3435	F943	D0 1A	BNE R2W
3436	F945	F0 07	BEQ R87
3437	F947	A9 0D	R8 LDA #CR
3438	F949	91 DF	STA (NOWLN)Y
3439	F94B	20 4A FA	JSR GOGO
3441	F94E		;LENGTH = OLDLEN
3442	F94E	88	R87 DEY
3443	F94F	C0 FF	CPY #FF
3444	F951	F0 EB	BEQ REP2
3445	F953	B9 3B A4	R8B LDA DIBUFF,Y
3446	F956	91 DF	STA (NOWLN)Y
3447	F958	20 4A FA	JSR GOGO
3448	F95B	08	DEY
3449	F95C	10 F5	BFL R8B
3450	F95E	60	RTS
3451	F95F	B0 6E	R2W BCS R100
			;LENGTH > OLDLEN
3453	F961		;LENGTH < OLDLEN
3454	F961	20 34 F9	JSR SAVNOW
3455	F964	20 10 F9	JSR ADDRS1
3456	F967	A5 E9	LDA OLDLEN
3457	F969	38	SEC
3458	F96A	E5 EA	SBC LENGTH
3459	F96C	A4 EA	LDY LENGTH
3460	F96E	D0 07	BNE RQP
3461	F970	AE 19 A4	LDX COUNT
3462	F973	D0 02	BNE RRP
3463	F975	69 00	ADC #0
3464	F977	48	RQP PHA
3465	F978	18	CLC
3466	F979	6D 1A A4	ADC S1
3467	F97C	8D 1A A4	STA S1
3468	F97F	90 03	BCC R6
3469	F981	EE 1B A4	INC S1+1
3470	F984	A9 1A	R6 LDA #<S1
3471	F986	20 58 EB	JSR LDAY
3472	F989	91 DF	STA (NOWLN)Y
3473	F98B	20 4A FA	JSR GOGO
3474	F98E	AA	TAX
3475	F98F	AD 1A A4	LDA S1
3476	F992	C5 E1	CMF BOTLN
3477	F994	D0 07	BNE R5
3478	F996	AD 1B A4	LDA S1+1
3479	F999	C5 E2	CMF BOTLN+1
3480	F99E	F0 0E	BEQ R7
3481	F99D	20 28 F9	R5 JSR AD1
3482	F9A0	EE 1A A4	INC S1
3483	F9A3	D0 03	BNE R55
3484	F9A5	EE 1B A4	INC S1+1
3485	F9A8	4C 04 F9	R55 JMP R6

MAIN MEMORY MOVER PA00-J004A.....PAGE 0080

LINE #	LOC	CODE	LINE		
3486	F9A8	20 D0 F8	R7	JSR RESNOW	;RESTORE NOWLN
3487	F9AE	68		PLA	;RESTORE DIFFERENCE
3488	F9AF	8D 2A A4		STA CPIY	;SAVE IT
3489	F9B2	A5 E1		LDA BOTLN	
3490	F9B4	38		SEC	
3491	F9B5	ED 2A A4		SEC CPIY	;AND SUBTRACT IT FROM BOTTOM
3492	F9B8	85 E1		STA BOTLN	
3493	F9BA	B0 02		BCC R9	
3494	F9BC	C6 E2		DEC BOTLN+1	
3495	F9BE	AD 19 A4	R9	LDA COUNT	;C COMM OR K ,I COMM ?
3496	F9C1	D0 04		BNE R10	
3497	F9C3	A4 EA		LDY LENGTH	
3498	F9C5	D0 05		BNE R11	
3499	F9C7	A4 EA	R10	LDY LENGTH	
3500	F9C9	D0 83		BNE R87	
3501	F9CB	60		RTS	
3502	F9CC	4C 47 F9	R11	JMP R8	
3504	F9CF			;LENGTH > OLDLEN	
3505	F9CF	A5 EA	R100	LDA LENGTH	;NEW LINE IS LONGER
3506	F9D1	38		SEC	
3507	F9D2	E5 E9		SEC OLDLEN	
3508	F9D4	A4 E9		LDY OLDLEN	
3509	F9D6	D0 02		BNE R101	;ALREADY HAVE ROOM FOR CR
3510	F9D8	69 00		ADC #0	;ADD ONE TO DIFFERENCE
3511	F9DA	48	R101	PHA	
3512	F9DB	20 34 F9		JSR SAVNOW	;NOWLN INTO S1
3513	F9DE	20 C5 F8		JSR SETBOT	
3514	F9E1	A0 00		LDY #0	
3515	F9E3	B1 DF	R102	LDA (NOWLN)Y	
3516	F9E5	C9 00		CMF #0	
3517	F9E7	F0 06		BEG R108	
3518	F9E9	20 28 F9		JSR AD1	
3519	F9EC	4C E3 F9		JMP R102	
3520	F9EF	68	R108	PLA	
3521	F9F0	48		PHA	
3522	F9F1	18		CLC	
3523	F9F2	65 E1		ADC BOTLN	;ADD DIFFERENCE TO END
3524	F9F4	85 E1		STA BOTLN	;STORE NEW END
3525	F9F6	90 02		BCC R103	
3526	F9F8	E6 E2		INC BOTLN+1	
3527	F9FA	20 F9 F8	R103	JSR ATEND	
3528	F9FD	90 08		BCC R107	
3529	F9FF	A5 E7		LDA SAVE	;RESTORE OLD BOTTOM
3530	FA01	85 E1		STA BOTLN	
3531	FA03	A5 E8		LDA SAVE+1	
3532	FA05	85 E2		STA BOTLN+1	
3533	FA07	4C 5C FA		JMP ENDERR	;RAN PAST BUFFER END
3534	FA0A	20 09 F9	R107	JSR NOWS1	;SAVE CURRENT END
3535	FA0D	68		PLA	
3536	FA0E	18		CLC	
3537	FA0F	65 DF		ADC NOWLN	
3538	FA11	85 DF		STA NOWLN	
3539	FA13	90 02		BCC R104	
3540	FA15	E6 E0		INC NOWLN+1	

MAIN MEMORY MOVER PA00-J004A PAGE 0081

LINE #	LOC	CODE	LINE		
3541	FA17	A9 1A	R104	LDA #CS1	
3542	FA19	20 58 EB		JSR LDAY	
3543	FA1C	91 DF		STA (NOWLN)Y	
3544	FA1E	20 4A FA		JSR GOGO	
3545	FA21	AD 1A A4		LDA S1	
3546	FA24	CD 1C A4		CMP ADDR	
3547	FA27	D0 08		BNE R105	
3548	FA29	AD 1B A4		LDA S1+1	
3549	FA2C	CD 1D A4		CMP ADDR+1	;BACK WHERE WE STARTED ??
3550	FA2F	F0 13		BEQ R106	;BRANCH IF DONE
3551	FA31	20 1D F9	R105	JSR SUB	
3552	FA34	CE 1A A4		DEC S1	
3553	FA37	AD 1A A4		LDA S1	
3554	FA3A	C9 FF		CMP #\$FF	
3555	FA3C	D0 03		BNE R1051	
3556	FA3E	CE 1B A4		DEC S1+1	
3557	FA41	4C 17 FA	R1051	JMP R104	
3558	FA44	20 D0 F8	R106	JSR RESNOW	
3559	FA47	4C BE F9		JMP R9	
3561	FA4A				;SEE IF IT WROTE INTO MEMORY
3562	FA4A	01 DF	GOGO	CMP (NOWLN)Y	
3563	FA4C	F0 0D		BEQ GOGO1	
3564	FA4E				;MOVE ADDRESS
3565	FA4E	A5 DF		LDA NOWLN	
3566	FA50	8D 1C A4		STA ADDR	
3567	FA53	A5 E0		LDA NOWLN+1	
3568	FA55	8D 1D A4		STA ADDR+1	
3569	FA58	4C 33 EB		JMP MEMERR	
3570	FA5B	60	GOGO1	RTS	;OK

LINE #	LOC	CODE	LINE
3572	FA5C	20 44 EB	ENDERR JSR CLR ;CLEAR PNTR
3573	FA5F	A0 72	LDY #MSG2-M1 ;PRINT "END"
3574	FA61	20 AF E7	JSR KEF
3575	FA64	20 DB F6	JSR DNNO ;BACK UP TO LAST LINE
3576	FA67	20 42 E8	JSR TTYTST ;IF TTY <CR>
3577	FA6A	D0 03	BNE ENDE2
3578	FA6C	20 13 EA	JSR CRLW
3579	FA6F	4C 78 FA	ENDE2 JMP ERR0
3580	FA72	20 FE EB	ERROR JSR LL
3581	FA75	20 D4 E7	JSR QM
3582	FA78	20 44 EB	ERR0 JSR CLR
3583	FA7B	A2 FF	LDX #FF
3584	FA7D		COM=ERR0
3585	FA7D	9A	TXS
3586	FA7E	20 FE EB	JSR LL ;I/O TO TERMINAL (KB,D/P OR TTY)
3587	FA81	D8	CLD
3588	FA82	20 8B FA	JSR COMM
3589	FA85	4C 78 FA	JMP COM
3591	FA88		;GET EDITOR COMMANDS & DECODE
3592	FA88	A2 00	COMM LDX #0
3593	FA8A	20 BC FE	JSR PATCHB ;READ A CHAR WITH "< >"
3594	FA8D	A2 0B	ENTRY LDX #COMCN1
3595	FA8F	DD AC FA	CD02 CMP COMTEL,X ;COMPARE WITH ALLOWABLE COMMANDS
3596	FA92	F0 0C	BEG CFND1 ;MATCH ,SO PROCESS COMMAND
3597	FA94	CA	DEX
3598	FA95	10 F8	BPL CD02
3599	FA97	20 D4 E7	JSR QM ;NOT IN LIST ,SO NOT LEGAL COMMAND
3600	FA9A	20 24 EA	JSR CRCK
3601	FA9D	4C 78 FA	JMP ERR0
3602	FAA0	20 17 FF	CFND1 JSR PATC15 ;<CR> & START DECODING COMMAND
3603	FAA3	8D B9 FA	LDA JTEL+1,X
3604	FAA6	8D 1B A4	STA S1+1
3605	FAA9	6C 1A A4	JMP (S1)
3607	FAAC		COMCN1=11
3608	FAAC		;COMMAND TABLE
3609	FAAC	4B 20	COMTEL .BYT 'K RIUDLTBQC'
3610	FAB8	4C F7	JTEL .WOR DLNE,PLNE,INPU,IN,DOWN,UP
3610	FABA	27 F7	
3610	FABC	CB F7	
3610	FABE	64 F7	
3610	FAC0	24 F7	
3610	FAC2	F9 F6	
3611	FAC4	E1 F7	.WOR LST,TP,BT,FCHAR,STOP,CHNG
3611	FAC6	D2 F6	
3611	FAC8	21 F7	
3611	FACA	0C F8	
3611	FACC	70 F8	
3611	FACE	76 F8	
3613	FAD0		;READ FROM MEMORY FOR ASSEMBLER
3614	FAD0	9B	MREAD TYA
3615	FAD1	4B	PHA

LINE #	LOC	CODE	LINE
3616	FAD2	A0 00	LDY #0
3617	FAD4	E1 DF	LDA (NOWLNDY
3618	FAD6	8D 2A A9	STA CFIY
3619	FAD9	20 2B F9	JSR AD1
3620	FADC	68	PLA
3621	FADD	A8	TAY
3622	FADE	AD 2A A9	LDA CFIY
3623	FAE1	60	RTS

OP CODE CONVERSION PA00-J004A.....PAGE 0084

LINE #	LOC	CODE	LINE
3625	FAE2		;THIS PROGRAM CONVERTS MNEMONIC INSTRUCTIONS INTO MACHINE
3626	FAE2		;CODE AND STORES IT IN THE DESIGNATED MEMORY AREA
3628	FAE2		;FROM TABLE LOCATIONS:
3629	FAE2	00	TYPTR1 .BYT 00,02,00,00,00,\$F2,\$FF,\$80,01
3629	FAE3	02	
3629	FAE4	00	
3629	FAE5	08	
3629	FAE6	F2	
3629	FAE7	FF	
3629	FAE8	80	
3629	FAE9	01	
3630	FAEA	C0	.BYT \$C0,\$E2,\$C0,\$C0,\$FF,00,00
3630	FAEB	E2	
3630	FAEC	C0	
3630	FAED	C0	
3630	FAEE	FF	
3630	FAEF	00	
3630	FAF0	00	
3631	FAF1	08	TYPTR2 .BYT 08,00,\$10,\$80,\$40,\$C0,60,\$C0
3631	FAF2	00	
3631	FAF3	10	
3631	FAF4	80	
3631	FAF5	40	
3631	FAF6	C0	
3631	FAF7	00	
3631	FAF8	C0	
3632	FAF9	00	.BYT \$00,\$40,00,00,\$E4,\$20,\$80
3632	FAFA	40	
3632	FAFB	00	
3632	FAFC	00	
3632	FAFD	E4	
3632	FAFE	20	
3632	FAFF	80	
3633	FB00	00	CORR .BYT 00,\$FC,00,08,08,\$FB,\$FC,\$F4
3633	FB01	FC	
3633	FB02	00	
3633	FB03	08	
3633	FB04	08	
3633	FB05	F8	
3633	FB06	FC	
3633	FB07	F4	
3634	FB08	0C	.BYT \$0C,\$10,04,\$F4,00,\$20,\$10
3634	FB09	10	
3634	FB0A	04	
3634	FB0B	F4	
3634	FB0C	00	
3634	FB0D	20	
3634	FB0E	10	
3635	FB0F	00	SIZEM .BYT 00,00,\$0F,01,01,01,\$11,\$11
3635	FB10	00	
3635	FB11	0F	
3635	FB12	01	
3635	FB13	01	
3635	FB14	01	

LINE #	LOC	CODE	LINE
3635	FB15	11	
3635	FB16	11	
3636	FB17	02	.BYT 02,02,\$11,\$11,02,\$12,00
3636	FB18	02	
3636	FB19	11	
3636	FB1A	11	
3636	FB1E	02	
3636	FB1C	12	
3636	FB1D	00	
3638	FB1E	00	STCODE .BYT \$00,\$08,\$10,\$18,\$20,\$28,\$30,\$38
3638	FB1F	08	
3638	FB20	10	
3638	FB21	18	
3638	FB22	20	
3638	FB23	28	
3638	FB24	30	
3638	FB25	38	
3639	FB26	40	.BYT \$40,\$48,\$50,\$58,\$60,\$68,\$70,\$78
3639	FB27	48	
3639	FB28	50	
3639	FB29	58	
3639	FB2A	60	
3639	FB2B	68	
3639	FB2C	70	
3639	FB2D	78	
3640	FB2E	80	.BYT \$80,\$88,\$90,\$98,\$AC,\$AB,\$E0,\$EB
3640	FB2F	88	
3640	FB30	90	
3640	FB31	98	
3640	FB32	AC	
3640	FB33	AB	
3640	FB34	E0	
3640	FB35	EB	
3641	FB36	CC	.BYT \$CC,\$CB,\$D0,\$DB,\$EC,\$EB,\$F0,\$FB
3641	FB37	C8	
3641	FB38	D0	
3641	FB39	D8	
3641	FB3A	EC	
3641	FB3B	EB	
3641	FB3C	F0	
3641	FB3D	F8	
3642	FB3E	0C	.BYT \$0C,\$2C,\$4C,\$4C,\$8C,\$AC,\$CC,\$EC
3642	FB3F	2C	
3642	FB40	4C	
3642	FB41	4C	
3642	FB42	8C	
3642	FB43	AC	
3642	FB44	CC	
3642	FB45	EC	
3643	FB46	8A	.BYT \$8A,\$9A,\$AA,\$EA,\$CA,\$DA,\$EA,\$FA
3643	FB47	9A	
3643	FB48	AA	
3643	FB49	8A	
3643	FB4A	CA	

OP CODE CONVERSION PA00-J004A PAGE 0086

LINE #	LOC	CODE	LINE
3643	FB4B	DA	
3643	FB4C	EA	
3643	FB4D	FA	
3644	FB4E	0E	.BYT \$0E,\$2E,\$4E,\$6E,\$8E,\$AE,\$CE,\$EE
3644	FB4F	2E	
3644	FB50	4E	
3644	FB51	6E	
3644	FB52	8E	
3644	FB53	AE	
3644	FB54	CE	
3644	FB55	EE	
3645	FB56	0D	.BYT \$0D,\$2D,\$4D,\$6D,\$8D,\$AD,\$CD,\$ED
3645	FB57	2D	
3645	FB58	4D	
3645	FB59	6D	
3645	FB5A	8D	
3645	FB5B	AD	
3645	FB5C	CD	
3645	FB5D	ED	
3646	FB5E	0D	TYPTB .BYT 13,13,12,13,14,13,12,13
3646	FB5F	0D	
3646	FB60	0C	
3646	FB61	0D	
3646	FB62	0E	
3646	FB63	0D	
3646	FB64	0C	
3646	FB65	0D	
3647	FB66	0D	.BYT 13,13,12,13,13,13,12,13
3647	FB67	0D	
3647	FB68	0C	
3647	FB69	0D	
3647	FB6A	0D	
3647	FB6B	0D	
3647	FB6C	0C	
3647	FB6D	0D	
3648	FB6E	0F	.BYT 15,13,12,13,9,13,12,13
3648	FB6F	0D	
3648	FB70	0C	
3648	FB71	0D	
3648	FB72	09	
3648	FB73	0D	
3648	FB74	0C	
3648	FB75	0D	
3649	FB76	08	.BYT 8,13,12,13,8,13,12,13
3649	FB77	0D	
3649	FB78	0C	
3649	FB79	0D	
3649	FB7A	08	
3649	FB7B	0D	
3649	FB7C	0C	
3649	FB7D	0D	
3650	FB7E	0F	.BYT 15,6,11,11,4,10,8,8
3650	FB7F	06	
3650	FB80	08	
3650	FB81	08	

93

OP CODE CONVERSION PA00-J004APAGE 0088

LINE #	LOC	CODE	LINE	
3681	FBDC	C0 0D	CPY ##0D	
3682	FBDE	D0 05	BNE RDADDR	
3683	FBE0	A2 00	LDX #00	
3684	FBE2	4C CB FC	JMP OFCOMP	
3686	FBES		;INPUT ADDRESS FIELD	
3687	FBES	A0 06	RDADDR LDY #06	;CLEAR ADDRESS FIELD (NON HEX)
3688	FBE7	A9 51	LDA #'0'	
3689	FBE9	99 32 01	CLRLUP STA ADFLD-1,Y	
3690	FBEC	88	DEY	
3691	FBED	D0 FA	BNE CLRLUP	; (LEAVES Y = 0 FOR NEXT PHASE)
3692	FBEF	20 5F E9	JSR RDRUB	;WITH RUBOUT
3693	FBF2	C9 20	CMP ##20	;IGNORE SPACE CHARACTERS
3694	FBF4	F0 EF	BEQ RDADDR	
3695	FBF6	99 33 01	STORCH STA ADFLD,Y	;STORE ADDRESS CHARACTER
3696	FBF9	C8	INY	
3697	FBFA	C0 07	CPY #07	
3698	FBFC	80 5C	BCC TRY56	
3699	FBFE	20 5F E9	JSR RDRUB	;READ REMAINDER OF ADDRESS CHARS
3700	FC01	C9 20	CMP ##20	;THRU WHEN <SPACE> OR <CR>
3701	FC03	D0 05	BNE STOR1	
3702	FC05	EE 37 A4	INC CODFLG	;SET CODE FLG
3703	FC08	D0 04	BNE EVAL	
3704	FC0A	C9 0D	STOR1 CMP ##0D	;CHECK FOR <CR>
3705	FC0C	D0 E8	BNE STORCH	
3707	FC0E		;SEPARATE ADDRESSING MODE FROM ADDRESS FIELD	
3708	FC0E	8C 31 A4	EVAL STY TEMFX	;TEMFX NOW HAS NUMBER OF CHAR
3709	FC11	AD 33 01	LDA ADFLD	;CHECK FIRST CHAR FOR # OR (
3710	FC14	C9 23	CMP #'#'	
3711	FC16	F0 25	BEQ HATCJ	
3712	FC18	C9 28	CMP #'('	
3713	FC1A	F0 5A	BEQ PAREN	
3714	FC1C	AD 31 A4	LDA TEMFX	;CHECK FOR ACCUMULATOR MODE
3715	FC1F	C9 01	CMP #01	
3716	FC21	D0 05	BNE TRYZF	
3717	FC23	A2 01	ACCUM LDX #01	
3718	FC25	4C CB FC	JMP OFCOMP	
3719	FC28	C9 02	TRYZF CMP #02	;CHECK FOR ZERO PAGE MODE
3720	FC2A	D0 14	BNE TRY34	
3721	FC2C	AD 2E 01	LDA TYPE	;CHK FOR BRNCH WITH RELATIVE ADDR
3722	FC2F	C9 0C	CMP ##0C	
3723	FC31	D0 05	BNE ZPAGE	
3724	FC33	A2 02	LDX #02	
3725	FC35	4C CB FC	JMP OFCOMP	
3726	FC38	A2 05	ZPAGE LDX #05	
3727	FC3A	4C CB FC	JMP OFCOMP	
3728	FC3D	4C B6 FC	HATCJ JMP HATCH	
3729	FC40	A9 04	TRY34 LDA #04	;CHECK FOR ABSOLUTE OR ZP,X ORZP,Y
3730	FC42	CD 31 A4	CMP TEMFX	
3731	FC45	90 15	BCC ABSIND	
3732	FC47	A2 02	LDX #02	
3733	FC49	20 F1 FD	JSR XORYZ	;CC = X, CS = Y, NE = ABSOLUTE
3734	FC4C	D0 58	BNE ABSOL	
3735	FC4E	90 05	BCC ZPX	

OP CODE CONVERSION PA00-J004APAGE 0089

LINE	#	LOC	CODE	LINE		
3736	FC50	A2 03		ZPY	LDX #03	;CARRY SET SO ZP+Y MODE
3737	FC52	9C 0B FC			JMP OPCOMP	
3738	FC55	A2 04		ZPX	LDX #04	;CARRY CLEAR SO ZP+X MODE
3739	FC57	4C 0B FC			JMP OPCOMP	
3740	FC5A	B0 69		TRY56	BCS ERRORM	
3741	FC5C	20 EF FD		ABSIND	JSR XDRY	;CC=ABS+X CS=ABS+Y NE=ERROR
3742	FC5F	D0 64			BNE ERRORM	
3743	FC61	90 0F			BCC ABSX	
3744	FC63	A9 09		ABSY	LDA #09	
3745	FC65	CD 2E 01			CMP TYPE	
3746	FC68	D0 04			BNE ABSY1	
3747	FC6A	A2 0E			LDX #40E	
3748	FC6C	D0 5D			BNE OPCOMP	
3749	FC6E	A2 0B		ABSY1	LDX #40B	
3750	FC70	D0 59			BNE OPCOMP	
3751	FC72	A2 09		ABSX	LDX #09	;CARRY CLEAR SO ABS+X MODE
3752	FC74	D0 55			BNE OPCOMP	
3753	FC76	AD 36 01		PAREN	LDA ADFLD+3	;SEE IF (HH,X),(HH,Y) OR (HHHH)
3754	FC79	C9 2C			CMP #' '	; (HHX) (HH),Y ARE OK TOO
3755	FC7B	F0 04			BEQ INDX	;COMMA IN 4TH POSITION = (HH,X)
3756	FC7D	C9 58			CMP #'X'	;X IN 4TH POSITION = (HHX)
3757	FC7F	D0 04			BNE TRYINY	
3758	FC81	A2 0B		INDX	LDX #40B	
3759	FC83	D0 46			BNE OPCOMP	
3760	FC85	C9 29		TRYINY	CMP #') '	; ") " IN 4TH POS = (HH),Y OR (HH),Y
3761	FC87	D0 0B			BNE TRYJMP	
3762	FC89	20 EF FD			JSR XDRY	;CHECK TO SEE IF Y INDEX REG DESIRED
3763	FC8C	D0 37			BNE ERRORM	
3764	FC8E	90 35			BCC ERRORM	
3765	FC90	A2 0A			LDX #40A	
3766	FC92	D0 37			BNE OPCOMP	
3767	FC94	AD 38 01		TRYJMP	LDA ADFLD+5	;CHECK FOR FINAL PAREN
3768	FC97	C9 29			CMP #') '	
3769	FC99	D0 2A			BNE ERRORM	
3770	FC9B	AD 2E 01			LDA TYPE	;CONFIRM CORRECT ADDRESS TYPE
3771	FC9E	C9 0B			CMP #40E	
3772	FCA0	D0 23			BNE ERRORM	
3773	FCA2	A2 0D			LDX #40D	;OK, FORM IS JMP (HHHH)
3774	FCA4	D0 25			BNE OPCOMP	
3775	FCA6	AD 2E 01		ABSOL	LDA TYPE	;CHECK FOR BRANCH TO ABSOLUTE LOC
3776	FCA9	C9 0C			CMP #40C	
3777	FCA8	D0 05			BNE ABSOL1	
3778	FCA0	A2 02			LDX #02	
3779	FCAF	4C 0B FC			JMP OPCOMP	
3780	FCB2	A2 0C		ABSOL1	LDX #40C	
3781	FCB4	D0 15			BNE OPCOMP	
3782	FCB6					;SELECT IMMEDIATE ADDRESSING TYPE
3783	FCB6	AD 2E 01		HATCH	LDA TYPE	
3784	FCB9	C9 01			CMP #01	
3785	FCBB	F0 04			BEQ IMMED1	
3786	FCBD	A2 07			LDX #07	
3787	FCBF	D0 0A			BNE OPCOMP	
3788	FCC1	A2 06		IMMED1	LDX #06	
3789	FCC3	D0 06			BNE OPCOMP	
3790	FCC5	20 94 E3		ERRORM	JSR CRER00	;OUTPUT ERROR MESSAGE

OP CODE CONVERSION PA00-J004A.....PAGE 0090

LINE #	LOC	CODE	LINE
3791	FCC8	4C AA FB	JMP STARTM
3793	FCCB		;COMPUTE FINAL OF CODE FOR DEFINED ADDRESSING MODE
3794	FCCB	BD E2 FA	OPCOMP LDA TYPTR1,X ;MATCH TYPE MASK WITH VALID MODE
3795	FCCE	F0 05	BEQ OPCMP1 ;PATTERNS & SKIP 1ST WORD TEST IF
3796	FCD0	2D 26 01	AND TMASK1 ;ALREADY ZERO
3797	FCD3	D0 08	BNE VALID
3798	FCD5	BD F1 FA	OPCMP1 LDA TYPTR2,X ;TEST 2ND PART
3799	FCD8	2D 27 01	AND TMASK2
3800	FCDE	F0 E8	BEQ ERRORM ;INST DOES NOT HAVE SPECIFIED MODE
3801	FCD0	18	VALID CLC ;FORM FINAL OF CODE
3802	FCDE	BD 00 FB	LDA CORR,X
3803	FCE1	BD 34 A4	ADC OPCODE
3804	FCE4	BD 34 A4	STA OPCODE
3806	FCE7		;PROCESS ADDRESSES TO FINAL FORMAT
3807	FCE7	BD 0F FB	LDA SIZE,X ;OBTAIN ADDRESS FORMAT FROM TABLE
3808	FCEA	C9 00	CMF #00
3809	FCEC	F0 50	BEQ ONEBYT
3810	FCCE	C9 0F	CMF #00F ;NEED BRANCH COMPUTATION?
3811	FCF0	F0 1D	BEQ BRNCHC
3812	FCF2	BD 33 A4	STA TEMPA ;SAVE START POINT & CHAR COUNT
3813	FCF5	29 0F	AND #00F ;SEPARATE CHARACTER COUNT
3814	FCF7	A8	TAY ;LOAD ADDR BYTES INTO Y (0,1,OR 2)
3815	FCF8	BD 2F A4	STA BYTESM ;SAVE IN BYTES
3816	FCFB	EE 2F A4	INC BYTESM ;TO INSTR LENGTH (1,2,OR 3 BYTES)
3817	FCFE	AD 33 A4	LDA TEMPA ;SEPARATE STARTING POINT
3818	FD01	29 F0	AND #F0
3819	FD03	4A	LSR A
3820	FD04	4A	LSR A
3821	FD05	4A	LSR A
3822	FD06	4A	LSR A
3823	FD07	AA	TAX ;AND PUT IT IN X
3824	FD08	20 12 FD	JSR CONVRT ;CONVERT ASCII ADDRESS TO HEX
3825	FD0B	B0 EB	BCS ERRORM ;SKIP OUT IF ERROR IN INPUT
3826	FD0D	90 1D	BCC STASH
3827	FD0F	4C 86 FD	BRNCHC JMP BRCOMP
3829	FD12		***** SUBROUTINE *****
3830	FD12		;CONVERT FORMATTED ADDRESS INTO PROPER HEX ADDRESS
3831	FD12	BD 33 01	CONVRT LDA ADFLD,X ;PICK UP 1ST ADDR CHARACTER
3832	FD15	20 7D EA	JSR HEX ;CONVERT TO MOST SIG HEX
3833	FD18	B0 11	BCS ERRFLG
3834	FD1A	E8	INX ;GET NEXT ASCII CHARACTER
3835	FD1B	ED 33 01	LDA ADFLD,X
3836	FD1E	E8	INX ;POINT TO NEXT CHARACTER, IF ANY
3837	FD1F	20 84 EA	JSR PACK
3838	FD22	B0 07	BCS ERRFLG
3839	FD24	99 34 A4	STA OPCODE,Y ;SAVE IN MOST SIG. BYTE LOCATION
3840	FD27	88	DEY ;SET UP FOR NEXT ADDR BYTE, IF ANY
3841	FD28	D0 EB	BNE CONVRT ;IF NECESSARY, FORM NEXT ADDR BYTE
3842	FD2A	18	CLC
3843	FD2B	60	ERRFLG RTS ;NON HEX CLEARED CARRY
3844	FD2C		*****

LINE #	LOC	CODE	LINE		
3846	FD2C	AC 2F A4	STASH	LDY BYTESM	;SET UP TO STORE COMMAND
3847	FD2F	88		DEY	
3848	FD30	E9 34 A4	STSHLP	LDA OPCODE,Y	
3849	FD33	20 78 EB		JSR SADDR	;STORE ONE BYTE OF COMMAND
3850	FD36	C0 00		CPY #00	
3851	FD38	F0 0B		BEG FORMDS	
3852	FD3A	88		DEY	
3853	FD3E	E8		CLV	
3854	FD3C	50 F2		EVC STSHLP	;REPEAT TILL THRU
3856	FD3E	A9 01	ONEBYT	LDA #01	;SET BYTES = 1
3857	FD40	8D 2F A4		STA BYTESM	
3858	FD43	D0 E7		BNC STASH	
3860	FD45				;FORMAT FOR SYSTEM 65 DISPLAY (REFORMAT FOR AIN)
3861	FD45	20 44 EB	FORMDS	JSR CLR	
3862	FD48	20 DD E5		JSR CGPC1	;ADDR TO SAVPC FOR DISASSEMBLY
3863	FD4B	20 42 EB		JSR TTYTST	;IF TTY DO NOT GO TO DISASS
3864	FD4E	D0 0B		BNE FORMD1	
3865	FD50	20 3B EB		JSR BLANK2	;IT IS TTY
3866	FD53	20 3B EB		JSR BLANK2	
3867	FD56	D0 11		BNE FORMD2	;OUTPUT OPCODE
3868	FD58	20 6C F4	FORMD1	JSR DISASM	
3869	FD5B	20 24 EA		JSR CRCK	;CRCK IF PRI PTR DIFF FROM 0
3870	FD5E	AD 37 A4		LDA CODFLG	;SEE IF HE WANTS CODE ALSO
3871	FD61	F0 1A		BEG FORM1	
3872	FD63	20 3E EB		JSR BLANK	
3873	FD66	20 3C F5		JSR PRPC	;PRGC CNTR
3874	FD69				;OUTPUT OPCODE
3875	FD69	AE 2F A4	FORMD2	LDX BYTESM	
3876	FD6C	A0 00		LDY #00	
3877	FD6E	A9 1C	DISPLY	LDA #<ADDR	;DO LDA (ADDR),Y ,WHITOUT PAG 0
3878	FD70	20 58 EB		JSR LDAY	
3879	FD73	20 46 EA		JSR NUMA	
3880	FD76	20 3E EB		JSR BLANK	
3881	FD79	C8		INY	
3882	FD7A	CA		DEX	
3883	FD7B	D0 F1		BNE DISPLY	
3885	FD7D				;POINT TO NEXT INSTRUCTION LOCATION
3886	FD7D	AC 2F A4	FORM1	LDY BYTESM	;ADD BYTESM TO ADDR
3887	FD80	20 CD E2		JSR NXTADD	
3888	FD83	4C 24 FF		JMP PATC16	;UPDATE PC
3890	FD86				;RELATIVE BRANCH ADDRESS COMPUTATION
3891	FD86	AD 31 A4	BRCOMP	LDA TEMFX	
3892	FD89	C9 02		CMP #02	;IF REL BRANCH INPUT, USE IT
3893	FD8B	D0 11		BNE COMPER	
3894	FD8D	A2 00		LDX #00	
3895	FD8F	A0 01		LDY #01	
3896	FD91	20 12 FD		JSR CONVRT	
3897	FD94	B0 40		BEG ERRJMP	
3898	FD96	A9 02		LDA #02	
3899	FD9B	8D 2F A4		STA BYTESM	;SET PROPER BYTES
3900	FD9B	4C 2C FD		JMP STASH	

LINE #	LOC	CODE	LINE
3901	FD9E	A2 00	COMPER LDX #00
3902	FDA0	A0 02	LDY #02
3903	FDA2	20 12 FD	JSR CONVRT
3904	FDA5	E0 2F	BCS ERRJMP
3905	FDA7	AD 1D A4	LDA ADDR+1 ;ADD BRANCH OFFSET
3906	FDA8	8D 27 01	STA MOVAD+1
3907	FDA9	AD 1C A4	LDA ADDR
3908	FDB0	18	CLC
3909	FDB1	69 02	ADC #02
3910	FDB3	8D 26 01	STA MOVAD
3911	FDB6	90 03	BCC CMPBR1
3912	FDB8	EE 27 01	INC MOVAD+1
3913	FDBB	38	CMPBR1 SEC ;COMPUTE BRANCH RELATIVE ADDRESS
3914	FDBC	AD 35 A4	LDA OPCODE+1
3915	FDBF	ED 26 01	SEC MOVAD
3916	FDC2	8D 35 A4	STA OPCODE+1
3917	FDC5	AD 36 A4	LDA OPCODE+2
3918	FDC8	ED 27 01	SEC MOVAD+1
3919	FDCB	8D 36 A4	STA OPCODE+2
3920	FDCE	C9 00	CMF #00
3921	FD00	F0 0E	BEQ FORWRD
3922	FD02	C9 FF	CMF #4FF
3923	FDD4	F0 03	BEQ BACKWD
3924	FDD6	4C C5 FC	ERRJMP JMP ERRORM
3925	FDD9	AD 35 A4	BACKWD LDA OPCODE+1 ;CHECK IN RANGE
3926	FD0C	30 09	BMI OK
3927	FDDE	10 F6	BPL ERRJMP
3928	FDE0	AD 35 A4	FORWRD LDA OPCODE+1
3929	FDE3	10 02	BPL OK
3930	FDES	30 EF	BMI ERRJMP
3931	FDE7	A9 02	OK LDA #02 ;SET UP FOR STASH
3932	FDE9	8D 2F A4	STA BYTESM
3933	FDEC	4C 2C FD	JMP STASH
3935	FDEF		***** SUBROUTINE *****
3936	FDEF		;SUBROUTINE FOR DETERMINING X OR Y OR NEITHER
3937	FDEF	A2 04	XORY LDX #04
3938	FDF1	8D 33 01	XORYZ LDA ADFLD+X
3939	FDf4	C9 2C	CMF #'Y'
3940	FDf6	D0 04	BNE XORY1
3941	FDf8	E8	INX
3942	FDF9	8D 33 01	LDA ADFLD+X
3943	FDFC	C9 58	XORY1 CMF #'X'
3944	FDfE	F0 0C	BEG ISX
3945	FE00	C9 59	CMF #'Y'
3946	FE02		XORYRT
3947	FE02	68	RTS; NOT ZERO IS NOT X OR NOT Y
3948	FE03	18	ISX ,CLC ;CARRY SET IS Y
3949	FE04	90 FC	BCC XORYRT ; CARRY CLEAR IS X
3950	FE06		***** END OF SUB *****
3952	FE06		; INPUT FOR MNEMONIC CODE
3953	FE06	A0 00	MNEM LDY #00
3954	FE08	8C 34 A4	STY OPCODE
3955	FE08	8C 35 A4	STY OPCODE+1

LINE #	LOC	CODE	LINE
3956	FE0E	8C 36 A9	STY OPCODE+2 ;CLEARs OPCODE FOR NEW INPUT
3957	FE11	8C 26 01	STY MOVAD ;CLEARs UNUSED BIT IN FINAL FORMAT
3958	FE14	20 5F E9	RDLUP JSR RDRUB
3959	FE17	C9 2A	CMF #'*' ;COMMAND TO LOAD POINTER
3960	FE19	F0 58	BEQ STLOAD ;GO TO SET CURRENT ADDRESS POINTER
3961	FE1B	C9 20	CMF ##20 ;IGNORE SPACE BAR INPUT
3962	FE1D	F0 F5	BEQ RDLUP
3963	FE1F	29 1F	AND ##1F ;MASK OFF UPPER 3 BITS
3964	FE21	99 30 01	STA CH,Y
3965	FE24	98	TYA
3966	FE25	AA	TAX ;Y-----> X
3967	FE26	FE 30 01	INC CH,X ;FORMAT TO MATCH DISASSEMBLER TBL
3968	FE29	C8	INY
3969	FE2A	C0 03	CPY #03 ;REPEAT FOR EACH OF 3 CHARACTERS
3970	FE2C	D0 E6	BNE RDLUP
3972	FE2E		;COMPRESS 3 FORMATTED CHARACTERS TO MOVAD & MOVAD+1
3973	FE2E	A0 03	LDY #03 ;SET UP OUTER LOOP
3974	FE30	E9 2F 01	OUTLUP LDA CH-1,Y ;COMPRESS 3 CHARACTERS
3975	FE33	A2 05	LDX #05 ;SET UP INNER LOOP
3976	FE35	9A	INLUP LSR A ;SHIFT 5 BITS ACC TO MOVAD,MOVAD+1
3977	FE36	6E 26 01	ROR MOVAD
3978	FE39	6E 27 01	ROR MOVAD+1
3979	FE3C	CA	DEX
3980	FE3D	D0 F6	BNE INLUP
3981	FE3F	88	DEY
3982	FE40	D0 EE	BNE OUTLUP
3984	FE42		;SEARCH FOR MATCHING COMPRESSED CODE
3985	FE42	A2 40	LDX ##40
3986	FE44	AD 26 01	SRCHLP LDA MOVAD
3987	FE47	DD 8B F5	SRCHM CMP MNEML-1,X ;MATCH LEFT HALF
3988	FE4A	F0 05	BEQ MATCH
3989	FE4C	CA	DEX
3990	FE4D	D0 F8	BNE SRCHM ;IF NO - TRY AGAIN
3991	FE4F	F0 0B	BEQ MATCH1
3992	FE51	AD 27 01	MATCH LDA MOVAD+1 ;ALSO MATCH RIGHT HALF
3993	FE54	DD F8 F5	CMF MNEHR-1,X
3994	FE57	F0 06	BEQ GOTIT
3995	FE59	CA	DEX
3996	FE5A	D0 E8	BNE SRCHLP
3997	FE5C	9C C5 FC	MATCH1 JMP ERRORH
3999	FE5F		;GET INSTRUCTION TYPE FROM TYPE TABLE
4000	FE5F	BD 5D FB	GOTIT LDA TYPTB-1,X
4001	FE62	8D 2E 01	STA TYPE
4003	FE65		;GET OPCODE FROM OP CODE UE
4004	FE65	BD 1D FB	LDA STCODE-1,X
4005	FE68	BD 34 A4	STA OPCODE
4006	FE6B	9C C1 FB	JMP MODEM
4008	FE6E		;THIS SECTION SETs THE CURRENT ADDRESS POINTER
4009	FE6E	A9 2A	STLO LDA #'*

LINE #	LOC	CODE	LINE		
4010	FE70	20 7A E9		JSR OUTPUT	
4011	FE73	20 AE EA	STLOAD	JSR ADDIN	;GET ADDR
4012	FE76	B0 F6		BCC STLO	;IN CASE OF ERROR
4013	FE78	4C 24 FF		JMP PATC16	;ADDR TO PC WHEN TO STARTIN
4015	FE7B				
4016	FE7B				;PATCHES TO CORRECT PROBLEMS WITHOUT
4017	FE7B	41		.BYT 'A'	;CHANGING ENTRY POINTS TO THE ROUTINES
4018	FE7C	38	PATCH1	SEC	;ADJUST BAUD
4019	FE7D	E9 2C		SEC #44	
4020	FE7F	8D 18 A4		STA CNTL30	
4021	FE82	60		RTS	
4023	FE83	8A	CUREAD	TXA	;SAVE X , OUTPUT CUR
4024	FE84	48		PHA	
4025	FE85	AE 15 A4		LDX CURP02	
4026	FE88	E0 14		CPX #20	;ONLY IF < 20
4027	FE8A	E0 05		BCC PAT2A	
4028	FE8C	A9 DE		LDA #DE	
4029	FE8E	20 7B EF		JSR OUTDD1	
4030	FE91	68	PAT2A	PLA	
4031	FE92	AA		TAX	
4032	FE93	4C 3C E9		JMP READ	;CONTINUE
4034	FE96	20 3C E9	RED1	JSR READ	;READ & ECHO WITHOUT CURSOR
4035	FE99	4C 76 E9		JMP RED2	
4037	FE9C	AE 15 A4	PATCH4	LDX CURP02	;DONT DO ANYTHING IF "8D"
4038	FE9F	C9 8D		CMF #8D	;SO <CR> FOR TV & NOT FOR DISP
4039	FEA1	D0 08		BNE PAT4A	
4040	FEA3	A9 A0		LDA #A0	;CLR CURSOR
4041	FEA5	20 7B EF		JSR OUTDD1	
4042	FEA8	20 44 EB		JSR CLR	;CLR PNTRC
4043	FEAB	4C 76 EF		JMP OUTD7	;EXIT
4044	FEAE	4C 17 EF	PAT4A	JMP OUTD1A	;CONTINUE
4046	FEB1	8D 11 A4	PATCH5	STA PRIFLG	;TURN PRI OFF
4047	FEB4	4C 73 F0		JMP IF03	
4049	FEB7	A9 1C	PATCH6	LDA #<ADDR	;SIMULATE LDA (ADDR),Y
4050	FEB9	4C 58 EB		JMP LDAY	
4052	FEBC	20 3C E9	PATCH8	JSR READ	;READ & ECHO WITH CARROTS
4053	FEBF	48		PHA	
4054	FEC0	20 D8 E7		JSR EQUAL	
4055	FEC3	A9 3C		LDA #<	
4056	FEC5	20 7A E9		JSR OUTPUT	
4057	FEC8	68		PLA	
4058	FEC9	48		PHA	
4059	FECA	C9 0D		CMF #CR	
4060	FECB	F0 03		BEG PATC8C	
4061	FECE	20 7A E9		JSR OUTPUT	
4062	FED1	A9 3E	PATC8C	LDA #>	

LINE #	LOC	CODE	LINE	
4063	FED3	20 7A E9		JSR OUTPUT
4064	FED6	68		PLA
4065	FED7	60		RTS
4067	FED8	C9 F7	PATCH9	CMF ##F7 ;CHECK LOWER TRANSITION OF TIMER
4068	FEDA	B0 06		BOS PAT9A
4069	FEDC	CD 08 A4		CMF TSPEED
4070	FEDF	4C 9D EE		JMP CKF3A
4071	FEE2	CD 08 A4	PAT9A	CMF TSPEED
4072	FEE5	68		PLA
4073	FEE6	C9 FF		CMF ##FF
4074	FEE8	60	PAT9B	RTS
4076	FEE9	20 F0 E9	PATC10	JSR CRLF ;CLR DISP (ONLY 1 CURS)
4077	FEEC	4C 85 E1		JMP STA1
4079	FEF	F0 F7	PATC11	BEQ PAT9B ;GO OUTPUT PROMPT
4080	FEF1	C9 4C		CMF #1L ;NO PROMPT FOR "I" OR "L"
4081	FEF3	F0 F3		BEQ PAT9B
4082	FEF5	4C C5 E7		JMP PRUMP1
4084	FEF8	98	PATC12	FMA ;CLEAR PRIFLG SO WE CAN OUTPUT
4085	FEF9	AD 11 A4		LDA PRIFLG ;TO PRINTER IF FLG WAS ON (MSB)
4086	FEFC	29 F0		AND ##F0
4087	FEFE	8D 11 A4		STA PRIFLG
4088	FF01	68		PLA
4089	FF02	60		RTS
4091	FF03	AD 12 A4	PATC13	LDA INFLG ;TURN TAPES ON ONLY IF TAPES
4092	FF06	C9 54		CMF #1T
4093	FF08	D0 DE		BNE PAT9B
4094	FF0A	4C 29 E5		JMP DU14 ;TURN ON TAPES & SET DEF DEV
4096	FF0D	AD 13 A4	PATC14	LDA OUTFLG ;TURN ON TAPES ONLY IF TAPES
4097	FF10	C9 54		CMF #1T
4098	FF12	D0 D4		BNE PAT9B
4099	FF14	4C 0A E5		JMP DU11
4101	FF17	20 F0 E9	PATC15	JSR CRLF ;DECODE COMMAND
4102	FF1A	8A		TXA ;SAVE INDEX
4103	FF1B	0A		ACL A
4104	FF1C	AA		TAX
4105	FF1D	8D 88 FA		LDA JIBL+X ;PART OF ENTRY
4106	FF20	8D 1A A4		STA S1
4107	FF23	60		RTS
4109	FF24	20 DD E5	PATC16	JSR CGPC1 ;ADDR TO PC
4110	FF27	4C AA FB		JMP STARTM ;BACK TO MNEMONIC START
4112	FF2A	F0 0E	PATC17	BEQ PAT17B ;RUB ,SO READ ANOTHER
4113	FF2C	C9 00		CMF #0
4114	FF2E	F0 03		BEQ PAT17A
4115	FF30	4C B5 F7		JMP IN02A ;NEITHER ,CONTINUE
4116	FF33	20 93 E9	PAT17A	JSR INALL ;SKIP ON ZEROS
4117	FF36	C9 7F		CMF ##7F ;UNTILL RUB

LINE #	LOC	CODE	LINE	
4118	FF38	D0 F9	BNE PAT17A	
4119	FF3A	4C 7A F7	PAT17B JMP I#02	;GO BACK
4121	FF3D	20 F8 FE	PATC18 JSR PATC12	;RESET PRIFLG
4122	FF40	48	PHA	
4123	FF41	20 42 E8	JSR TTYTST	;IF TTY JUST RTN
4124	FF44	D0 02	BNE PAT18A	
4125	FF46	68	PLA	
4126	FF47	60	RTS	
4127	FF48	20 FC E8	PAT18A JSR LL	;SET TO LOW SPEED
4128	FF4B	20 45 F0	JSR IPST	;PRINT WHAT IS IN BUFFER
4129	FF4E	20 44 E8	JSR CLR	;CLR PRINTER BUFFER BY OUTPUTTING
4130	FF51	20 3E E8	JSR BLANK	;AN SPACE
4131	FF54	20 44 E8	JSR CLR	
4132	FF57	68	PLA	;RTN ACC
4133	FF58	60	RTS	
4135	FF59	D8	PAT19 CLD	
4136	FF5A	20 24 EA	JSR CRCK	
4137	FF5D	4C 85 E1	JMP STA1	
4139	FF60	F0 0D	PAT20 BEQ VECK4	;END (DATA BYTES=0)
4140	FF62	18	CLC	
4141	FF63	69 04	ADC #4	
4142	FF65	AA	TAX	
4143	FF66	20 93 E9	VECK5 JSR INALL	;SKIP OVER DATA
4144	FF69	CA	DEX	
4145	FF6A	D0 FA	BNE VECK5	
4146	FF6C	4C 9E E6	JMP VECK1	;PROCESS NEXT RCD
4147	FF6F	4C 20 E5	VECK4 JMP DU13	
4149	FF72	A0 00	PAT21 LDY #0	
4150	FF74	E9 88 FF	PAT21A LDA POMSG,Y	;RESET MSG
4151	FF77	F0 06	BEQ PAT21B	
4152	FF79	20 7A E9	JSR OUTPUT	
4153	FF7C	C8	INY	
4154	FF7D	D0 F5	BNE PAT21A	
4155	FF7F	20 F0 E9	PAT21B JSR CRLF	
4156	FF82	20 F0 E9	JSR CRLF	
4157	FF85	4C 82 E1	JMP START	
4159	FF88	20 20	POMSG .BYT ' SIEMENS PC 100'	
4160	FF99	00	.BYT 0	
4162	FF9A	EE 68 01	PAT22 INC BLK0	
4163	FF9D	4C BD ED	JMP ADDEK1	
4164	FFA0			
4165	FFA0	A9 FF	PAT23 LDA #\$FF	;START TIMER
4166	FFA2	8D 97 A4	STA DI1024	
4167	FFA5	AD 85 A4	PAT23A LDA RINT	;TIME OUT?
4168	FFA8	30 08	BMI PAT23B	;YES
4169	FFAA	AD 0D A8	LDA IFR	;START SIGNAL?
4170	FFAD	29 10	AND #MPRST	
4171	FFAF	F0 F4	BEQ PAT23A	;NO
4172	FFB1	60	RTS	;YES

LINE #	LOC	CODE	LINE	
4173	FFB2	A9 00	PAT23B	LDA #0 ;TIME OUT RETURN
4174	FFB4	60		RTS
4176	FFB5	20 75 EE	PATC24	JSR OFFRD ;READ BIT FROM FOURTH HALF PULSE
4177	FFB8	6A		ROL A
4178	FFB9	29 80		AND #180
4179	FFBB	60		RTS
4181	FFBC	2C 0D A8	PATC25	BIT JFR ;WAIT TILL TIMES OUT
4182	FFBF	50 FB		BVC PATC25
4183	FFC1	AD 04 A8		LDA TIL ;CLR INTERRUPT FLAG
4184	FFC4	60		RTS
4186	FFC5			*=4FFF9
4187	FFF9			;INTERRUPT VECTORS
4188	FFF9	FA		.BYT \$FA
4189	FFFA	75 E0		.WORD NMIV1,RSET,IRRV1 ;SET UP VECTORS
4189	FFFC	BF E0		
4189	FFFE	78 L0		
4190	0000			.END A071

ERRORS = 0000 <0000>

Symboltabelle

SYMBOL	VALUE						
ABSIND	FC5C	ABSOL	FCA6	ABSOL1	FCB2	ABSX	FC72
ABSY	FC63	ABSY1	FC6E	ACCUM	FC23	ACR	A88E
AD1	F92B	ADD1	ES65	ADDA	F92A	ADDA1	F933
ADDEK1	EDED	ADDEBK	EDBA	ADDIN	EAAE	ADDN1	EAB7
ADDN2	EAC7	ADDN3	EADC	ADDN4	EAE8	ADDN5	EAF7
ADDN6	EAFD	ADDN7	EB0D	ADDN8	EB2E	ADDNE	EAB1
ADDR	A41C	ADDRS1	F910	ADD51	E55D	ADD51A	F916
ADFLD	0133	ASSEM	D000	AT01	F8F7	AT02	F8F5
ATB01	F8E9	ATEND	F8F9	ATTOP	F8D8	BACKWD	FD09
BASIEH	B000	BASIRE	B003	BKCK1	F1F1	BKCK2	F20F
BKCK3	F21A	BKCKSM	F1E7	BKERR	E62F	BKFLG	A410
BK02	E64C	BKOK	E634	BKS	0100	BLANK	E83E
BLANK2	E03B	BLK	0115	BLKO	0168	BOTLN	00E1
BRCOMP	FD86	BRK1	E620	BRK2	E6F3	BRK3	E6F1
BRK4	E6FA	BRKA	E61B	BRKK	E6E5	BRNCHC	FD0F
BT	F721	BYTESM	A42F	CBUFF1	F1E2	CD02	FA8F
CFLG	F8E2	CFND1	FAA0	CGA	E5EE	CGALL	E5FC
CGPC	ESD4	CGPC0	ESD7	CGPC1	ESDD	CGPS	E5EA
CGS	ESFA	CGX	ESF2	CGY	E5F6	CH	0130
CH2	E2B8	CH3	E2C5	CH4	E2C0	CHAR1	F5AD
CHAK2	F5B3	CHEKA	E54E	CHEKAR	E54B	CHN1	F87C
CHN2	F88C	CHN3	F8A9	CHN4	F8AF	CHNG	F876
CHNG1	E2A6	CHNGG	E2A0	CKB	E768	CKB1	E780
CKB2	E76D	CKBUFF	F1D2	CKER0	E38E	CKER00	E394
CKER1	E396	CKER2	E3A3	CKERR	E385	CKF1	EE7A
CKF2	EE81	CKF3	EE99	CKF3A	EE9D	CKF4	EEA1
CKFREQ	EE75	CKSUM	A41E	CLR	EB44	CLREK	E6FE
CLREK	EB4D	CLRLUP	F8E9	CMFER1	FD8B	CNTH30	A417
CNTL30	A410	CODFLG	A437	COL0	F2E1	COL1	F321
COL2	F361	COL3	F3A1	COL4	F3E1	CON	FA78
COMB	E1C1	COMCH1	000B	COMIN	E1A1	COMH	FA5B
COMPER	FD0E	CONTEL	FAAC	CONVK1	FD12	CONR	FB88
COUNT	A119	CPIY	A42A	CR	000D	CRZJ	EA23
CRA	AC01	CRB	AC03	CRCK	EA24	CRCK1	EA2C
CRCK2	EA3B	CRLF	E9F0	CRL0W	EA13	CUKEAD	FE83
CURPD2	A415	CURPOS	A416	DATIN	000E	DATOUT	000C
DDRA	A803	DDRA2	A481	DDR8	A802	DDR82	A483
DE1	EC18	DE2	EC1B	DEBK1	ED2C	DEKEY	ED2A
DEBTIN	1388	DEHALF	EC23	DELAY	EC0F	DI1024	A497
DIBUFF	A438	DILINK	A406	DISASM	F46C	DISFLG	A40F
DISPLY	FD6E	DIV1	A494	DIV64	A496	DIV8	A495
DLNE	F74C	DNN0	F6D8	DNPA7	A484	DON1	E7A0
DONE	E790	DOW1	F6E3	DOW2	F6E8	DOWN	F724
DPPA7	A485	DRA	A80F	DRA2	A480	DRAH	A801
DRB	A800	DRB2	A482	DU0	E447	DU1	E444
DU10	E4DE	DU10A	E4F8	DU11	E50A	DU12	E511
DU13	E520	DU14	E529	DU1A	E46D	DU1E	E452
DU2	E47D	DU6	E49F	DU7	E4A0	DUB	E4A2
DU9	E4E9	DUK2	E5A4	DUMP	E43B	DUMPKI	E587
DUMPT1	E57E	DUMPTA	E56F	EDI	F6B6	EDI0	F644
EDI1	F653	EDI2	F663	EDI2B	F6CC	EDI3	F673
EDI4	F680	EDI5	F68D	EDI6	F69E	EDI7	F6AA
EDI8	F6AE	EDIT	F639	EMSG1	E06C	EMSG2	E072
END	00E5	ENDE2	FA6F	ENDERR	FA5C	ENPA7	A486
ENTRY	FA8D	ENPA7	A487	ERS	00BD	EQUAL	E7D8
ERR	F495	ERR0	FA78	ERRFLG	FD2B	ERRJMP	FDD6

SYMBOL TABLE PA00-J004A.....PAGE 0099

SYMBOL	VALUE						
ERROR	FA72	ERRORM	FCC5	ESCAPE	001E	EVAL	FC0E
FC1	F823	FC2	F82E	FC3	F834	FC4	F843
FC5	F849	FC6	F84E	FC7	F853	FC8	F85A
FC9	F868	FCH	F81E	FCHA1	F80F	FCHAR	F88C
FNAM	EBA2	FORM1	FD7D	FORMA	0116	FORMD1	FD58
FORMD2	FD69	FORMDS	FD45	FORWRD	FDE0	FROM	E7A3
GAP	A409	GCN1	E78C	GENT	E795	GET1	EBE2
GET3	EBED	GETA1	EE2B	GETFMT	F499	GETID	E425
GETK0	EC55	GETK00	EC67	GETK1	EC71	GETK10	ECEC
GETK11	ECC9	GETK12	ECD2	GETK13	ECE1	GETK14	ECEB
GETK18	EC80	GETK2	EC82	GETK3	EC8D	GETK4	EC93
GETK5	ECA4	GETK6	ECB9	GETK7	ECBE	GETK8	ECBF
GETKD0	EC38	GETKEY	EC40	GETKY	EC43	GETTAP	EE29
GETTTY	EBDB	GID1	E427	GO	E261	GGBK	E26D
GGBK0	E27B	GGBK1	E286	GOERR	E608	GOCO	FA4A
GOG01	FA5B	GOTIT	FE5F	HATCH	FCB6	HATCHJ	FC3D
HEX	EA7D	HIST	A42E	HISTM	A42E	HISTP	A414
IBITL	A47A	IBITU	A47B	IBUFM	A468	ICOL	A475
IDIR	A474	IDOT	A477	IER	A80E	IEVEN	F486
IFR	A80D	IMASK	A47C	IMMED1	FCC1	IN	F764
IN02	F77A	IN02A	F785	IN03	F7A8	IN03A	F7B9
IN03B	F799	IN05	F7C5	INALL	E993	INCP	F121
INC92	E566	INDX	FC81	INFLG	A412	INL	F76D
INLOW	EBF8	INLUP	FE35	INPU	F7CB	INPU1	FZD8
INTAB1	E743	INTAB2	E752	INTAB3	E756	IOFFST	A476
IOUTL	A47B	IOUTU	A479	IP00	F050	IP02	F066
IP03	F073	IP04	F078	IP50	F04A	IPS1	F0EB
IP52	F10E	IP53	F105	IPST	F045	IPSU	F0E3
IRQ1	E163	IRQ2	E17F	IRQV1	E07B	IRQV2	A404
IRQV3	E154	IRQV4	A400	ISX	FE03	JD1	E723
JD2	E72B	JD3	E73C	JD4	E742	JMPR	E1C1
JTBL	FAB8	JUMP	A47D	KDISA	E70A	KEP	E74F
KEPR	E970	KEYF1	010C	KEYF2	010F	KEYF3	0112
KI2	F888	KIFLG	F8B6	KMASK	A42A	LDAY	EB58
LDIY	A42A	LENGTH	00EA	LF	000A	LL	EBFE
LMNEM	0117	LOAD	E2E6	LOAD1	E2E9	LOAD1A	E349
LOAD2	E306	LOAD4	E321	LOAD5	E323	LOADK1	E3A7
LOADK2	E3AA	LOADK3	E3B7	LOADK5	E3D1	LOADK6	E3D3
LOADK7	E3E8	LOADKI	E3A4	LOADT2	E364	LOADTA	E32F
LST	F7E1	LST01	F7F0	LST02	F7F8	LST3	F803
LT10	EA5A	M1	E000	M10	E02D	M11	E031
M12	E03B	M3	E005	M4	E008	M5	E01C
M6	E021	M7	E024	M8	E027	M9	E02A
MATCH	FE51	MATCH1	FE5C	MCM2	E196	MCM3	E1AC
MCNT	0020	MEIN	E24D	MEM	E248	MEM1	E24F
MEM2	E251	MEM3	E260	MEMERR	EB33	MNEENT	FB9E
MNEM	FE06	MNEML	F5B9	MNEMR	F5F9	MNNDX1	F4AF
MNNDX2	F4B3	MNNDX3	F4BA	MODE	F55B	MODE2	F59F
MODEM	FBC1	MOFF	00E0	MON	00C0	MONCOM	E1E5
MONRAM	A400	MOVAD	0126	NPRST	0010	MR11A	F512
MREAD	FAD0	MSP12	0002	MT2	0020	MTBL	F2D7
NAME	A42E	NAM0	EBCF	NAM01	EBD6	NAM02	EBE9
NAM03	EBEE	NAM04	EBF5	NEWCOL	F163	NEWROW	F168
NH1	E690	NH15	E688	NH14	E0B1	NH15	E0E4
NMIV1	E075	NMIV2	A402	NMIV3	E07B	NOUT	EA51
NOWLN	00DF	NOWS1	F909	NPUL	A40A	NULLC	00FF

SYMBOL TABLE PA00-J004APAGE 0100

SYMBOL	VALUE						
NUMA	EA46	NXT5	E60D	NXTA1	E2DA	NXTADD	E2CD
OK	FDE7	GLDLEN	00E9	ONEBYT	FD3E	ONEK1	ED09
ONCK2	ED0B	ONEK3	ED1C	ONEK4	ED29	ONEKEY	ED05
OP03	F144	OP04	F130	OP05	F150	OP06	F15D
OP07	F13F	OPCMP1	FC05	OPCODE	A434	OPCOMP	FC08
OUT01	F00F	OUT04	F025	OUT05	F033	OUT1	E97B
OUT1A	E986	OUT2	E98F	OUTA1	E9C8	OUTA2	E9D0
OUTA3	E9E2	OUTA4	E9LA	OUTALL	E9EC	OUTCK	E538
OUTCK1	E53B	OUTCK2	E547	OUTCK3	E531	OUTD1	EF14
OUTD1A	EF17	OUTD2	EF20	OUTD2A	EF2F	OUTD3	EF33
OUTD4	EF48	OUTD5	EF56	OUTD7	EF76	OUTDD1	EF7B
OUTDD2	EF87	OUTDD3	EF98	OUTDIS	EF05	OUTDP	EEFC
OUTDP1	EF02	OUTFLG	A413	OUTL1	E906	OUTLOW	E901
OUTLUP	FE30	OUTPR	F038	OUTPR1	F03A	OUTPR2	F044
OUTPRI	F000	OUTPUT	E97A	OUTT1	EECB	OUTT2	EEFB
OUTTA1	F290	OUTTA2	E294	OUTTA3	F2B2	OUTTAP	F2A6
OUTTTY	EEA8	P00	F749	P01	F73B	P02	F729
P03	F73F	PACK	EA84	PAK1	EA96	PAK2	CA9F
PAREN	FC76	PAT17A	FF33	PAT17B	FF3A	PAT18A	FF48
PAT19	FF59	PAT20	FF60	PAT21	FF72	PAT21A	FF74
PAT21B	FF7F	PAT22	FF9A	PAT23	FFA0	PAT23A	FFA5
PAT23B	FFB2	PAT2A	FE91	PAT4A	FEAE	PAT9A	FE22
PAT9B	FEEB	PATC10	FEED	PATC11	FEED	PATC12	FEFB
PATC13	FE03	PATC14	FF00	PATC15	FF17	PATC16	FF24
PATC17	FF2A	PATC18	FF30	PATC24	FFB5	PATC25	FFBC
PATC8C	FE01	PATCH1	FE7C	PATCH4	FE9C	PATCH5	FE81
PATCH6	FEED	PATCH8	FEBC	PATCH9	FE0B	PCADJ3	F54D
PCADJ4	F554	PCLLD	EB56	PCR	AB0C	PHXY	EB9E
PINT	F0CB	PLNE	F727	PLXY	EBAC	PNTLUP	FB0D
PMSG	FF88	PR1	E7CC	PR2	E7CF	PRADR1	F4F7
PRADR2	F4FF	PRADR3	F519	PRADR4	F52C	PREL2	F545
PRADT0	F0BC	PRIECK	F079	PRIFLG	A411	PRLTR	E6C1
PRMN1	F4D7	PRMN2	F4DB	PRNDOT	F087	PRNTYX	F538
PROMP1	E7C5	PROMPT	E7BD	PRPC	F53C	PRST	0000
PRTIME	06A4	PSL0	E7FB	PSL00	E802	PSL0A	EB14
PSL0B	E81C	PSL0C	E81E	PSL0D	E823	PSL1	EB37
PSLS	E7DC	Q0	E7D4	R10	F9C7	R100	F9CF
R101	F9DA	R162	F9E3	R103	F9FA	R104	FA17
R105	FA31	R1051	FA41	R106	FA44	R167	FA0A
R108	F9EF	R11	F9CC	R2W	F95F	R5	F9D0
R55	F9AB	R6	F984	R7	F9AB	R8	F947
R87	F94E	R88	F953	R9	F9BE	RA	AC00
RB	AC02	RB2	E95C	RBYT1	E407	RBYTE	E3FD
RCH2	E91F	RCH3	E925	RCHK	E907	RCHT1	E93D
RCHT2	E928	RCHTTY	E926	RD1	EA70	RD2	EA5D
RDADDR	FBES	RDBIT	EE3B	RDBIT1	EE43	RDB1T2	EE51
RDBIT4	EE67	RDLUP	FE14	RDR1	E96A	RDRUB	E95F
REA1	E956	READ	E93C	READ1	E94A	READ2	E94D
RED1	FE96	RED2	E976	REDOUT	E973	REENTR	F6CF
REG	E227	REG1	E232	REGF	A40E	REGG	F461
REGT	E6D9	RELADR	F530	REF2	F93E	REPLAC	F93F
RESNGW	F8D0	RINT	A485	RMNEM	0118	ROLLFL	A47F
ROD1	ED00	ROONEK	ECEB	ROUT	F286	ROUT1	F28B
ROW1	F421	ROW2	F429	ROW3	F431	ROW4	F439
ROW5	F441	ROW6	F439	ROW7	F451	ROW8	F459
ROP	F977	RS1	E0C9	RS2	E0D4	RS20	E702

SYMBOL TABLE PA00-J004A.....PAGE 0101

SYMBOL	VALUE						
RS3	E0F3	RS3A	E0F1	RS3B	E11A	RS4	E11D
RS5	E129	RS6	E13E	RS7	E144	RS8	E146
RSET	E0BF	RSPAC	EA7B	RTMODE	F491	RISJ	F55A
RUB	0008	S1	A41A	S2	0106	SAADR	LB70
SAVA	A421	SAVE	00E7	SAVNOV	F934	SAVPC	A425
SAVFS	A420	SAVS	A424	SAVX	A422	SAVY	A423
SEMI	E9BA	SETBOT	F8C5	SETREG	E113	SETSP1	F4CA
SETSP2	F2D3	SETSPD	F2C0	SETZ	F2B2	SHL	E65C
SH11	E66A	SHIS	E665	SHOW	E64D	SIZEH	F89F
SP12	0001	SR	A60A	SRCHLP	FE34	SRCHM	F147
STA1	E185	START	E182	STARTM	FBAA	STASH	F02C
STBKEY	A42E	STBYTE	E413	STCODE	FB1C	STLY	A427
STLO	FE6E	STLOAD	FE73	STOF	F870	STOR1	FCA6
STORCH	FBF6	STRING	00EB	STSHLP	FD30	SUB	F91D
SUB1	F927	SWST1	EBED	SWSTAK	EBDA	SYNC	EDFF
SYNC1	EE11	TICH	A805	TIFR	00C0	TII	0000
TIL	A804	TILH	A807	TILL	A806	TIZ	A809
TZ1	0000	TZL	A808	TABUF2	00AD	TABUFF	0116
TABY2	F1A7	TABY3	F1CE	TATSET	EDEA	TAGS1	F23B
TABSET	F21D	TAP1	EBE3	TAP2	E9BC	TAP3	E0C2
TAPIN	A434	TAPOUT	A435	TAPTR	A436	TAPTR2	A437
TEMPA	A433	TEMPX	A431	TEXT	00E3	TIB1	ED48
TIBY1	ED53	TIBY3	ED56	TIBY4	ED63	TIBY5	ED65
TIBY5A	ED08	TIBY6	EDAF	TIBY7	EDB0	TIBYIC	ED3B
TIMG	A40E	TIOS1	EE22	TIOS2	EE24	TIOSET	EE1C
TMASK1	0126	TMASK2	0127	TMSG0	E04B	TMSG1	E04D
TMSG2	E050	TMSG3	E052	TMSG5	E05F	TMSG6	E061
TMSG7	E066	TO	E7A7	TO1	E7A9	TOPYTC	F18B
TOGL	E6E7	TOGL1	E6F6	TOGTA1	E6BD	TOGTA2	E6CB
TOPNO	F8BC	TP	F6D2	TP01	F8C0	TRACE	E6DD
TRY	F25B	TRY34	FC40	TRY56	FC5A	TRYINY	FC85
TRYJNF	FC94	TRYZF	FC28	TSPEED	A40B	TYTST	E332
TYPE	012E	TYPTB	FB5E	TYPTR1	FAE2	TYPTR2	FAF1
UDCR	A00E	UDRA	A003	UDRB	A002	UDRA	A00F
UDRAH	A001	UDRB	A000	UIER	A00E	UIFR	A00D
UIN	0105	UOUT	010A	UP	F6F9	UP1	F713
UP4	F720	UPCR	A00C	UPNO	F709	USR	A00A
UT1CH	A005	UT1L	A004	UT1LH	A007	UT1LL	A006
UT2H	A009	UT2L	A00B	VALID	FCDD	VECK1	E69E
VECK2	E6AC	VECK4	FF6F	VECK5	FF66	VECKSH	E694
WHE1	E85C	WHE2	E86B	WHE3	E870	WHEREI	E840
WHEREO	E871	WHICHT	E8AB	WHRO1	E8B5	WHRO2	E8BE
WHRO3	E897	WHRO4	E89F	WRAX	EA42	WRTAD	E2DD
WRITAZ	E2DB	XGRY	FDEF	XURY1	FDFC	XORYK1	F237
XORYZ	FDF1	ZON	F25D	ZOR1	F261	ZON2	F26C
ZPAGE	FC3B	ZPX	FC55	ZPY	FC50		
END OF ASSEMBLY							

Symbol-Cross-Referenzliste

SYMBOL CROSS REFERENCE PA00-J004A.....PAGE 0098

SYMBOL DEFINED REFERENCES

A	0000	4177 4103 3976 3822 3821 3820 3819 2918 2896 2895 2893 2876
		2875 2874 2873 2869 2863 2861 2772 2735 2600 2342 2337 2336
		2011 2004 1933 1930 1929 1928 1905 1901 1896 1878 1875 1873
		1655 1652 1651 1650 1649 1603 1602 1601 1600 1025 0491
ABSIND	3741	3731
ABSOL	3775	3734
ABSOL1	3780	3777
ABSX	3751	3743
ABSY	3744	
ABSY1	3749	3746
ACCUM	3717	
ACR	0218	2698 2642 0878
AD1	3417	3619 3518 3481 3124
ADD1	0913	0911
ADDA	3418	3325 3145
ADDA1	3423	3421
ADDEK1	2095	4163 2061 0668
ADDEBK	2094	
ADDIN	1666	4011 1151 1027 0971 0531
ADDN1	1670	1677
ADDN2	1678	1674 1672
ADDN3	1688	1681
ADDN4	1697	1701
ADDN5	1704	1693
ADDN6	1708	1713 1703
ADDN7	1716	1726
ADDN8	1731	1723 1718
ADDNE	1667	1224
ADDR	0126	4049 3907 3905 3877 3659 3657 3568 3566 3549 3546 3428 3426
		3403 3402 3360 3358 3096 3085 3073 3066 3064 3062 3046 1780
		1777 1724 1720 1716 1709 1698 1685 1683 1034 1032 0976 0974
		0953 0951 0809 0805 0717 0715 0622 0620 0606 0605 0599 0597
		0596 0536 0526 0524 0521
ADDRS1	3402	3455 0782
ADD51	0910	0949 0834
ADD51A	3404	3399
ADFLD	0088	3942 3938 3835 3831 3767 3753 3709 3695 3689
ASSEM	0048	0507
AT01	3383	3393 3390 3380 3378 3370 3367
AT02	3381	3394 3391
ATBOT	3375	3252 3178 3136 3131
ATEND	3387	3527
ATTOP	3365	3119 3112
BACKWD	3925	3923
BASIEH	0049	0511
BASIRE	0050	0511
BKCK1	2669	2676
BKCK2	2682	2679 2619
BKCK3	2688	2685
BKCKSM	2665	2625 2075
BKERR	1023	1020
BKFLG	0115	1127 0851 0792 0786 0777 0774 0353
BK02	1036	1029
BK0K	1025	1022

SYMBOL CROSS REFERENCE PA00-J004A PAGE 0099

SYMBOL	DEFINED	REFERENCES
BKS	0067	1188 1184 1143 1043 1042 1035 1033 0128
BLANK	1300	4130 3880 3872 3671 3663 1398 1299 1057 1041 1007 0781 0664
		0580 0574 0572 0535 0520
BLANK2	1299	3866 3865 3666 3665 3052
BLK	0152	2105 2094 2069 2063 0648
BLKO	0154	4162 2644 0924
BOTLN	0057	3532 3530 3526 3524 3523 3494 3492 3489 3479 3476 3388 3387
		3379 3377 3353 3352 3048
BRCOMP	3891	3827
BRK1	1016	1024
BRK2	1134	1138
BRK3	1133	1146 1109 1101
BRK4	1137	1110 1102
BRKA	1014	0508
BRKK	1127	0511
BRNCHC	3827	3811
BT	3149	3611
BYTESM	0090	3932 3899 3886 3875 3857 3846 3816 3815
CBUFF1	2659	2655 2653
CD02	3595	3598
CFLG	3340	3313
CFND1	3602	3596
CGA	0985	0507
CGALL	0998	1004 0994 0990 0986 0982
CGPC	0971	0507
CGFC0	0972	1153
CGFC1	0974	4109 3862 0972
CGFS	0981	0508
CGS	0997	0508
CGX	0989	0508
CGY	0993	0508
CH	0087	3974 3967 3964
CH2	0583	0576
CH3	0590	0578
CH4	0586	0584 0581
CHAR1	2994	2949
CHAR2	2995	2951
CHEKA	0700	0689 0753
CHEKAR	0699	0716 0714 0621 0612 0617
CHN1	3315	3320
CHN2	3321	3317
CHN3	3334	3336
CHN4	3337	3333
CHNG	3313	3611
CHNG1	0574	0588
CHNGG	0572	0507
CKB	1183	0355
CKB1	1193	1190 1187
CKB2	1184	1194
CKBUFF	2651	2683 2669 2630
CKER0	0690	2090 0687
CKER00	0692	3790 1731
CKER1	0693	0698 0682
CKER2	0699	0695
CKERR	0687	0736 0733 0726 0636 0633

SYMBOL CROSS REFERENCE PA00-J004A.....PAGE 0100

SYMBOL DEFINED REFERENCES

[illegible]

SYMBOL CROSS REFERENCE PA00-J004A.....PAGE 0101

SYMBOL DEFINED REFERENCES

DDRB	0209	2117
DDRB2	0181	
DE1	1864	2026
DE2	1865	2466 1880 1867
DEBK1	2021	1926
DEBKLY	2020	1995 1891
DEBTIM	0238	2025 2023
DEHALF	1872	1853 1843
DELAY	1861	2247 2240 2229 2224 1852 1849 1842 1433
DI1024	0201	4166
DIBUFF	0156	3445 3204 3160 2293 2282 2111 2109 2100 2098 1700 1207
DILINK	0107	2264
DISASM	2856	3868 2852 1161 0556
DISFLG	0114	1119 0554
DISPLY	3877	3883
DIV1	0190	
DIV64	0200	2177 2174 2169 2166
DIV8	0199	
DLNE	3173	3610
DNNO	3112	3575 3223 3151
DNFA7	0185	
DON1	1216	1209
DONE	1207	3248 1159 0358
DOW1	3116	3113
DOW2	3118	3123
DOWN	3151	3610
DPTA7	0186	
DRA	0222	
DRA2	0178	2005 1894 0378
DRAM	0208	2468 2460 2448
DRB	0207	2637 2635 2471 2469 2458 2457 2246 2238 2227 2225 2214 2194 2192 2145 2059 2057 1844 1840 1431 1305 1107 1105 1099 1097 0880 0419 0414 0372
DRB2	0180	2008 1989 1904 1895
DU0	0779	0780
DU1	0778	0849
DU10	0845	0814
DU10A	0858	0863
DU11	0866	4099
DU12	0869	0874
DU13	0875	4147 1094 0968 0871 0868 0739 0643
DU14	0879	4094
DU1A	0794	0787
DU1B	0783	0784
DU2	0801	0843
DU6	0818	0811
DU7	0819	0817
DU8	0821	0816
DU9	0831	0836
DUK2	0948	0954
DUMP	0774	0507
DUMPKI	0935	0798
DUMPT1	0927	0931
DUMPTA	0922	1339
EDI	3088	3070 3059

SYMBOL CROSS REFERENCE PA00-J004A PAGE 0102

SYMBOL DEFINED REFERENCES

EDI0	3040	3041							
EDI1	3046	3051							
EDI2	3053	3054							
EDI2B	3099	3093							
EDI3	3059	3060							
EDI4	3064	3057							
EDI5	3070	3071							
EDI6	3076	3083							
EDI7	3082	3074							
EDI8	3084	3075							
EDIT	3036	0506							
EMSG1	0326	3037							
EMSG2	0327	3573	3133						
END	0059	3392	3389	3082	3072	3067	3065		
ENDE2	3579	3577							
ENDERR	3572	3533	3293	3256	3138				
ENPA7	0187								
ENTRY	3594	3081							
EPPA7	0188								
EQS	0264	0323	0320	0319	0315	0314	0308	0307	
EQUAL	1251	4054	1666	0998					
ERR	2879	2866	2864						
ERR0	3582	3601	3584	3579	3224	3188	3115		
ERRFLG	3843	3838	3833						
ERRJMP	3924	3930	3927	3904	3897				
ERROR	3580	3284							
ERRORM	3790	3997	3924	3825	3800	3772	3769	3764	3763
ESCAPE	0262	1450	1435	1422					
EVAL	3708	3703							
FC1	3271	3283							
FC2	3276	3318	3295						
FC3	3278	3275	3273						
FC4	3285	3279							
FC5	3287	3277							
FC6	3289	3299							
FC7	3291	3303							
FC8	3294	3292							
FC9	3300	3297							
FCH	3269	3260							
FCHA1	3261	3319							
FCHAR	3260	3611	3314						
FNAM	1358	1343	1338	1321	1316				
FORM1	3886	3871							
FORMA	0078	2947	2933	2883					
FORMD1	3868	3864							
FORMD2	3875	3867							
FORMDS	3861	3851							
FORWRD	3928	3921							
FROM	1219	3040	0779						
GAP	0109	2701							
GCR1	1202	1200							
GCNT	1199	3243	1155	0546					
GET1	1840	1841							
GET3	1844	1851							
GETA1	2152	2157							

SYMBOL CROSS REFERENCE PA00-J004A PAGE 0103

SYMBOL DEFINED REFERENCES

GETFMT	2881	2878							
GETID	0762	0939	0718						
GETK0	1900	1909							
GETK00	1911	1906							
GETK1	1917	1897							
GETK10	1986	1948							
GETK11	1970	1966							
GETK12	1974	1979							
GETK13	1981	1971							
GETK14	1985	1982							
GETK1B	1924	1919							
GETK2	1926	1922	1421						
GETK3	1933	1936							
GETK4	1937	1934							
GETK5	1946	1942							
GETK6	1959	1955							
GETK7	1962	1953	1949	1940					
GETK8	1965	1961	1958	1945					
GETK00	1883	1986							
GETKEY	1890	1984	1980	1447					
GETKY	1891	1924	1923	1910					
GETTAP	2151	2132	2052	2045	1497	0722	0704		
GETTTY	1836	1507	1445	1434					
GID1	0763	0766							
GO	0545	0506							
GOBK	0549	0361							
GOBK0	0553	0550							
GOBK1	0558	0555	0548						
GOERR	1003	1000							
GOGO	3562	3544	3473	3447	3439				
GOG01	3570	3563							
GOTIT	4000	3994							
HATCH	3783	3728							
HATCJ	3728	3711							
HEX	1634	3832	1717						
HIST	0151	1060	1058	0351	0349				
HISTM	0089	0094	0093	0092	0091	0090			
HISTP	0119	1073	1055	0347					
IBITL	0166	2597	2536	2528					
IBITU	0167	2595	2537	2533					
IBUFM	0159	2521	2406	2394	1288				
ICOL	0161	2599	2583	2578	2575	2569	2561	2558	2478
IDIR	0160	2587	2572	2555	2476				
IDOT	0163	2483	2455	2431	1884				
IEN	0221								
IEVEN	2869	2862							
IFR	0220	4181	4169	2726	2449	1865			
IMASK	0168	2590	2526	2481					
IMMED1	3788	3785							
IN	3186	3610							
IN02	3194	4119	3330	3213	3207	3199			
IN02A	3198	4115							
IN03	3214	3201							
IN03A	3221	3107							
IN03B	3208	3203							

SYMBOL CROSS REFERENCE PA00-J004A PAGE 0104

SYMBOL	DEFINED	REFERENCES
IN05	3225	3218 3216
INALL	1491	4143 4116 3194 1091 1088 1085 1082 1079 0749 0747 0746 0642
		0613
INCP	2555	2519
INCSZ	0915	0853 0842
INDX	3758	3755
INFLG	0117	4091 3232 2651 2082 2074 1578 1491 1402 1312 1238 0743
INL	3189	3236 3186
INLOW	1401	1406
INLUP	3976	3980
INPU	3231	3610
INPU1	3236	3238 3234
INTAB1	1173	0371
INTAB2	1177	0377
INTAB3	1179	0391 0385 0382
IOFFST	0162	2607 2584 2581 2567 2564 2480
IOUTL	0164	2593 2531 2530 2459
IOUTU	0165	2594 2544 2542 2535 2534 2456
IP00	2417	1885
IP02	2428	2433 2422 2420
IP03	2434	4047
IP04	2436	2414
IPS0	2415	1983
IPS1	2521	2540
IPS2	2536	2532 2527
IPS3	2533	2529
IPST	2413	4128 2389
IPSU	2518	2465 2416
IR01	0450	0445
IR02	0465	0357
IR0V1	0331	4189
IR0V2	0104	0331
IR0V3	0441	1179
IR0V4	0102	0447
ISX	3948	3944
JD1	1158	1169
JD2	1161	1157
JD3	1163	1166
JD4	1170	1160
JMPR	0499	0497
JTBL	3610	4105 3603
JUMP	0169	2605 2603 2524 0499 0496 0494
KDISA	1149	1152 0510
KEP	1227	3574 3328 3134 3038 2441 1740 1469 1380 1233 1223 1134 1015
		0666 0658 0518
KEPR	1469	1361 1332 1311 0846
KEYF1	0072	0513
KEYF2	0073	0513
KEYF3	0074	0513
KI2	3343	3341
KIFLG	3342	3189 3173
KMASK	0173	2022 2009 1997 1915
LDAY	1760	4050 3878 3542 3471 2525 0886 0537
LDIY	0143	1771 1770 1768 1765 1763
LENGTH	0062	3505 3499 3497 3459 3458 3433 3214 3181 3163 2969 2931 2885

SYMBOL CROSS REFERENCE PA00-J004A PAGE 0105

SYMBOL DEFINED REFERENCES

		1164	
LF	0261	3198 2250 1559	
LL	1406	4127 3586 3589 0801 0670 0985	
LMEM	0079	2917 2910	
LOAD	0611	0507	
LOAD1	0613	0637 0615	
LOAD1A	0659	0663	
LOAD2	0626	0629	
LOAD4	0638	0624	
LOAD5	0639	0641	
LOADK1	0703	0708	
LOADK2	0704	0709	
LOADK3	0710	0706	
LOADK5	0721	0730	
LOADK6	0722	0728	
LOADK7	0731	0724	
LOADKI	0702	1322 0720	
LOADT2	0671	0676	
LOADTA	0647	1317 0673 0653	
LST	3242	3611	
LST01	3247	3253	
LST02	3250	3246	
LST3	3254	3249	
LT10	1612	1610	
M1	0307	3573 3327 3133 3037 2440 1739 1379 1360 1341 1310 1227 1222	
		1137 1133 1014 0845 0693 0692 0681 0665 0657 0517	
M10	0315	1331	
M11	0316	1739	
M12	0317	2440	
M3	0308	3327 1222	
M4	0309	0517	
M5	0310	0845	
M6	0311	1137	
M7	0312	1133	
M8	0313	1014	
M9	0314	1310	
MATCH	3992	3988	
MATCH1	3997	3991	
MCM2	0478	0481	
MCM3	0490	0479	
MCNT	0502	0477	
MEIN	0533	1011	
MEM	0531	0506	
MEM1	0534	0528	
MEM2	0535	0541	
MEM3	0542	0532	
MEMERR	1737	3569 3086 0757 0585	
MNEENT	3656	0510	
MNEM	3953	3667	
MNEML	2997	3987 2909	
MNEMR	3007	3993 2911	
MNNDX1	2893	2902	
MNNDX2	2896	2899	
MNNDX3	2901	2894 2892	
MODE	2980	2871	

SYMBOL CROSS REFERENCE PA00-J004A.....PAGE 0106

SYMBOL DEFINED		REFERENCES																		
MODE2	2991	2882																		
MODEM	3668	4006																		
MOFF	0230	2695	2434	2120	1175															
MON	0229	2417																		
MONCOM	0506	0495	0493																	
MONRAM	0100	1764	1762	1136	1132	1129														
MOVAD	0083	3992	3986	3978	3977	3957	3918	3915	3912	3910	3906	0086	0085							
MPKST	0232	4170																		
MR11A	2943	2940																		
MREAD	3614	1500																		
MSF12	0233	2450																		
MT2	0234	1866																		
MTBL	2789	2604	2602																	
NAME	0146	1395	1387	0927	0769	0767	0763	0672	0151											
NAM0	1379	1359																		
NAM01	1382	1390																		
NAM02	1392	1386	1384																	
NAM03	1393	1397																		
NAM04	1398	1394																		
NEWCOL	2592	2585	2579	2570	2562															
NEWROW	2590	2573																		
NH1	1073	1071																		
NHIS	1068	1062	0352																	
NMI4	0357	0359																		
NMIS	0358	0356	0354																	
NMIV1	0330	4189																		
NMIV2	0103	0392	0386	0383	0330															
NMIV3	0334	1179																		
NOUT	1607	1604																		
NOWLN	0056	3617	3567	3565	3562	3543	3540	3538	3537	3515	3472	3446	3438							
		3427	3425	3422	3420	3419	3413	3410	3409	3398	3397	3376	3375							
		3368	3365	3361	3359	3349	3348	3291	3155	3139	3121	3078								
NOWS1	3397	3534																		
NFUL	0111	2776	2720																	
NULLC	0259	2252	1561																	
NUMA	1599	3879	2944	2905	2106	1595	1061	1059	0962	0960	0897	0538								
NXT5	1007	0508																		

SYMBOL CROSS REFERENCE PA00-J004A.....PAGE 0107

SYMBOL DEFINED REFERENCES

DFCOMP	3794	3789 3787 3781 3779 3774 3766 3759 3752 3750 3748 3739 3737
		3727 3725 3718 3684
OUT01	2383	2378
OUT04	2394	2381
OUT05	2400	2398 2393
OUT1	1478	1542
OUT1A	1483	1480
OUT2	1487	1484
OUTA1	1520	1516
OUTA2	1525	1521
OUTA3	1536	1526
OUTA4	1541	1537
OUTALL	1512	3159 2968 2953 2950 2922 1612 1562 1560 1549
OUTCK	0889	0946 0944 0829 0827 0825
OUTCK1	0890	0940 0861 0859 0857 0841 0839
OUTCK2	0896	0893
OUTCKS	0884	0948 0831
OUTD1	2276	2272
OUTD1A	2277	4044
OUTD2	2282	2278
OUTD2A	2289	2286 1271
OUTD3	2292	2299
OUTD4	2301	2285
OUTD5	2309	2316 2275
OUTD7	2327	4043 2317 2310 2306 2287
OUTDD1	2333	4041 4029 2313 2303 2295 0433
OUTDD2	2342	2344
OUTDD3	2345	2341
OUTDIS	2269	2254 1246 1179
OUTDP	2260	1488
OUTDP1	2264	1590 1482 1264
OUTFLG	0118	4096 3165 2652 2107 2104 2102 1571 1566 1552 1513 1410 1333
		0891 0866 0794
OUTL1	1411	
OUTLOW	1409	1568
OUTLUP	3974	3982
OUTPR	2403	2399 2387 1293
OUTPR1	2404	2408
OUTPR2	2409	2405
OUTPRI	2375	2260 1588 1531 1348
OUTPUT	1477	4152 4063 4061 4056 4010 1244 1230 1150 0696 0660 0475 0471
OUTT1	2234	2243
OUTT2	2255	2253 2251
OUTTA1	2747	2716
OUTTA2	2749	2765
OUTTA3	2761	2763 2756
OUTTAF	2712	2706 2705 2704 2703 2631 2628 1523 0966 0965 0957 0937
OUTTTY	2221	1486
P00	3169	3167
P01	3163	3158 3156
P02	3155	3162
P03	3165	3254
PACK	1640	3837 1722 1628 1625 0770 0768 0750 0748 0725
PAK1	1649	1645
PAK2	1655	1658

SYMBOL		DEFINED	REFERENCES
PAREN	3753	3713	
PAT17A	4116	4118	4114
PAT17B	4119	4112	
PAT18A	4127	4124	
PAT19	4135	0469	
PAT20	4139	1086	
PAT21	4149	0428	
PAT21A	4150	4154	
PAT21B	4155	4151	
PAT22	4162	2643	
PAT23	4165	2421	2419
PAT23A	4167	4171	
PAT23B	4173	4168	
PAT2A	4030	4027	
PAT4A	4044	4039	
PAT9A	4071	4068	
PAT9B	4074	4098	4093 4081 4079
PATC10	4076	0592	
PATC11	4079	1240	
PATC12	4084	4121	3195 1269
PATC13	4091	3220	
PATC14	4096	3255	
PATC15	4101	3602	
PATC16	4109	4013	3888
PATC17	4112	3197	
PATC18	4121	1452	1030
PATC24	4176	2190	
PATC25	4181	4182	2761 2754
PATC8C	4062	4060	
PATCH1	4018	0426	
PATCH4	4037	2276	
PATCH5	4046	2439	
PATCH6	4049	3089	
PATCH8	4052	3593	
PATCH9	4067		
PCADJ3	2971	2957	
PCADJ4	2975	2973	
PCLLD	1759	2935	2904 2859
PCR	0219	2696	2454 2452 2435 2418 2121
PHXY	1793	2617	2376 2270 2222 2033 1442 1958 1258
PINT	2475	2415	
PLNE	3154	3610	3337 3264 3250 3221 3183 3179 3177 3130 3114
PLXY	1805	2646	2400 2327 2279 2248 2041 1448 1372 1294
PNTLUF	3674	3677	
POMSG	4159	4150	
PR1	1244	1301	1297 1252 1249
PR2	1245	1242	
PRADR1	2929	2955	
PRADR2	2933	2946	
PRADR3	2947	2932	2930
PRADR4	2954	2952	2948
PRBL2	2967	2925	2906 2856
PRDOT0	2449	2451	
PRERR	2438	2423	
PRIFLG	0116	4087	4085 4046 3211 3210 2413 2112 2095 1533 1528 1478 1123

SYMBOL CROSS REFERENCE PA00-J004A.....PAGE 0109

SYMBOL DEFINED REFERENCES

		0683 0678 0667 0656
PRITR	1123	1972
PRMN1	2914	2924
PRMN2	2916	2920
PRNDOT	2447	2429 2428
PRNTYX	2962	2960
PROMP1	1241	4082
PROMPT	1238	3270 3192
PRPC	2964	3873 2857
PRST	0227	2434 2417
PRTIME	0237	2463 2461
PSL0	1269	1262
PSL00	1272	1266
PSL0A	1280	1276
PSL0B	1284	1274
PSL0C	1285	1283 1279
PSL0D	1287	1292
PSL1	1296	3242 1257 1154 1016 0545
PSLS	1256	1456
QM	1248	3599 3581 1370 1023 1003 0483
R10	3499	3496
R100	3505	3451
R101	3511	3509
R102	3515	3519
R103	3527	3525
R104	3541	3557 3539
R105	3551	3547
R1051	3557	3555
R106	3558	3550
R107	3534	3528
R108	3520	3517
R11	3502	3498
R2W	3451	3435
R5	3481	3477
R55	3485	3483
R6	3470	3485 3468
R7	3486	3480
R8	3437	3502
R87	3442	3500 3436
R88	3445	3449
R9	3495	3559 3493
RA	0248	2363 2361 2358 2351 0407
RB	0250	2355 0408
RB2	1456	1464
RBYT1	0747	0745
RBYTE	0743	0899 0734 0731 0710 0639 0634 0631 0626
RCH2	1426	1428
RCH3	1429	1425 1419
RCHEK	1415	3247 1158 0802 0553 0360
RCHT1	1439	1474 1451 1430
RCHT2	1431	1438 1432
RCHTTY	1430	1416
RD1	1625	1622
RD2	1616	1199 0999 0575
RDADDR	3687	3694 3682

SYMBOL CROSS REFERENCE PA00-J004A.....PAGE 0110

SYMBOL DEFINED REFERENCES

RDBIT	2161	2152	2125
RDBIT1	2164	2165	
RDBIT2	2170	2171	
RDBIT4	2186	2187	2162
RDLUP	3958	3970	3962
RDR1	1463	1459	
RDRUB	1457	3958	3699 3692 3271 1670 1506 1466 1382
REA1	1452	1436	1423
READ	1442	4052	4034 4032 3315
READ1	1447	1444	
READ2	1448	1446	
RED1	4034	0472	
RED2	1473	4035	1461
REDOUT	1472	1627	1616 1017
REENTR	3105	0506	
REG	0516	0506	
REG1	0520	2853	0551
REGF	0113	2851	1114 0549
REGQ	2851	0465	
REGT	1114	0509	
RELADR	2957	2936	
REF2	3429	3444	
REPLAC	3433	3225	3182
RESNOW	3358	3558	3486
RINT	0192	4167	
RMNEM	0080	2916	2912
ROLLFL	0172	2010	1992
ROD1	1996	1991	
ROONEK	1989	1994	1890 1426 1417
ROUT	2739	2734	
ROUT1	2741	2766	
ROW1	2841	1937	
ROW2	2842		
ROW3	2843		
ROW4	2844		
ROW5	2845		
ROW6	2846		
ROW7	2847		
ROW8	2848		
RQP	3464	3462	3460
RS1	0371	0374	
RS2	0377	0380	
RS20	1143	1145	
RS3	0391	0395	0389
RS3A	0390	0387	0384
RS3B	0410	0406	
RS4	0414	0416	
RS5	0419	0420	
RS6	0427	0438	
RS7	0429	0415	
RS8	0430	0437	
RSET	0364	4189	
RSPAC	1630	1647	1643 1641 1626 1624 1620 1618
RTMODE	2877	2872	
RTS1	2978	2976	

SYMBOL CROSS REFERENCE PA00-J004A.....PAGE 0111

SYMBOL DEFINED REFERENCES

[illegible]

SYMBOL CROSS REFERENCE PA00-J004A.....PAGE 0112

SYMBOL DEFINED REFERENCES

T1CH	0212	2700
T1FR	0241	2697
T1I	0240	2641 1174 0877
T1L	0211	4183 2728
T1LH	0214	2760 2753 2725
T1LL	0213	2758 2751 2723
T2H	0216	2464 2202 2197 1879 1864 0421 0418
T2I	0239	
T2L	0215	2462 2199 2123 2024 1876 1862 0424
TABUF2	0155	2688 2657
TABUFF	0153	2686 2681 2678 2674 2672 2671 2667 2666 2660 2080 2077 2072
		2070 2065 2053 2038 0671 0659 0652
TABY2	2630	2634
TABY3	2646	2623
TAISET	2116	2044 0703
TAOS1	2702	2708
TAOSET	2692	2626 0935
TAP1	1365	1363
TAP2	1370	1367
TAP3	1372	1369
TAPIN	0147	2118 1373
TAPOUT	0148	2693
TAPTR	0149	2068 2040 2034 0677
TAPTR2	0150	2640 2621 2618 0925 0869
TEMPA	0092	3817 3812
TEMPX	0091	3891 3730 3714 3708
TEXT	0058	3369 3366 3347 3346 3047
TIB1	2038	2036
TIBY1	2044	2049 2037 0649
TIBY3	2045	2050
TIBY4	2051	2047
TIBY5	2052	2056
TIBY5A	2067	2064
TIBY6	2085	2078
TIBY7	2086	2081 2066
TIBYTE	2033	1494
TIMG	0112	2780 2722
TIOS1	2144	2141
TIOS2	2145	2143
TIOSET	2141	2694 2119
TMASK1	0085	3796 3674 3669
TMASK2	0086	3799 3675 3670
TMSG0	0318	0657
TMSG1	0319	1379
TMSG2	0320	1360
TMSG3	0321	0692
TMSG5	0323	
TMSG6	0324	0665
TMSG7	0325	0681
TO	1222	3053 0783
TO1	1223	1220
TOBYTE	2617	2645 1518 0928 0926 0895 0873
TOGL	1129	1124 1120 1115
TOGL1	1135	1130
TOGTA1	1097	0510

SYMBOL CROSS REFERENCE PA00-J004A PAGE 0113

SYMBOL DEFINED REFERENCES

TOGTA2	1105	0510	
TOPNO	3346	3106 3076 3055	
TF	3106	3611	
TF01	3348	3356	
TRACE	1119	0509	
TRY	2718	2740	
TRY34	3729	3720	
TRY56	3740	3698	
TRYINY	3760	3757	
TRYJMP	3767	3761	
TRYZP	3719	3716	
TSPEED	0108	4071 4069 2771 2715 2210 2206 2203 2161	
TTYTST	1304	4123 3863 3576 1582 1550 1483 1443 1415 1256 1241	
TYPE	0084	4001 3783 3775 3770 3745 3721 3680 3672	
TYPTB	3646	4000	
TYPTR1	3629	3794	
TYPTR2	3631	3798	
UACR	0042		
UDDRA	0034		
UDDRB	0033		
UDRA	0046		
UDRAH	0032		
UDRB	0031		
UIER	0045		
UIFR	0044		
UIN	0068	1504 1326	
UOUT	0069	1539 1353	
UP	3129	3610 3187	
UP1	3139	3143 3137	
UP4	3146	3140 3132 3120	
UPCR	0043		
UPNO	3135	3276 3251 3237 3222 3129	
USR	0041		
UT1CH	0036		
UT1L	0035		
UT1LH	0038		
UT1LL	0037		
UT2H	0040		
UT2L	0039		
VALID	3801	3797	
VECK1	1082	4146 1084	
VECK2	1088	1093 1090 1081	
VECK4	4147	4139	
VECK5	4143	4145	
VECKSM	1078	0510	
WHE1	1318	1314	
WHE2	1323	1319	
WHE3	1327	1324	
WHEREI	1310	3231 1078 0611	
WHEREO	1331	3245 0788	
WHICHT	1360	1371	
WHRO1	1340	1336	
WHRO2	1345	1341	
WHRO3	1350	1346	
WHRO4	1355	1351	

SYMBOL DEFINED REFERENCES

WRAX	1595	2966 2963 1044 0607
WRITAD	0605	0522
WRITAZ	0604	3664 3063 3044 1741 1010 0688 0573
X	0000	4105 4004 4000 3993 3987 3967 3942 3938 3835 3831 3807 3802
		3798 3794 3603 3595 3296 3049 3048 3047 3046 2951 2949 2882
		2871 2688 2686 2660 2657 2607 2605 2603 2599 2597 2595 2594
		2593 2590 2587 2584 2583 2581 2578 2575 2572 2569 2567 2564
		2561 2558 2555 2521 2406 2394 2282 2065 2053 2038 1830 1828
		1822 1820 1819 1818 1724 1709 1698 1373 1288 1188 1184 1143
		1136 1132 1129 1035 1033 1001 0927 0769 0767 0763 0672 0671
		0659 0652 0495 0493 0478 0408 0407 0392 0391 0378 0377 0372
		0371
XORY	3937	3762 3741
XORY1	3943	3940
XORYRT	3946	3949
XORYZ	3938	3733
Y	0000	4150 3974 3964 3848 3839 3695 3689 3617 3562 3543 3515 3472
		3446 3445 3438 3291 3280 3204 3160 3155 3139 3121 3078 2911
		2909 2722 2720 2604 2602 2293 1977 1974 1937 1764 1762 1720
		1716 1708 1395 1387 1287 1227 1060 1058 1043 1042 0693 0606
		0605 0351 0349
ZON	2720	2738 2736
ZON1	2722	2730
ZON2	2726	2727
ZPAGE	3726	3723
ZPX	3738	3735
ZPY	3736	

SYMBOL DEFINED REFERENCES

A	0000	4177	4103	3976	3822	3821	3820	3819	2918	2896	2895	2893	2876
		2875	2874	2873	2869	2863	2861	2772	2735	2600	2342	2337	2336
		2011	2004	1933	1930	1929	1928	1905	1901	1896	1878	1875	1873
		1655	1652	1651	1650	1649	1603	1602	1601	1600	1025	0491	
ABSIND	3741	3731											
ABSOL	3775	3734											
ABSOL1	3780	3777											
ABSX	3751	3743											
ABSY	3744												
ABSY1	3749	3746											
ACCUM	3717												
ACR	0218	2698	2642	0878									
AD1	3417	3619	3518	3481	3124								
ADD1	0913	0911											
ADDA	3418	3325	3145										
ADDA1	3423	3421											
ADDEK1	2095	4163	2061	0668									
ADDEBLK	2094												
ADDIN	1666	4011	1151	1027	0971	0531							
ADDN1	1670	1677											
ADDN2	1678	1674	1672										
ADDN3	1688	1681											
ADDN4	1697	1701											
ADDN5	1704	1693											
ADDN6	1708	1713	1703										
ADDN7	1716	1726											
ADDN8	1731	1723	1718										
ADDNE	1667	1224											
ADDR	0126	4049	3907	3905	3877	3659	3657	3568	3566	3549	3546	3428	3426
		3403	3402	3360	3358	3096	3085	3073	3066	3064	3062	3046	1780
		1777	1724	1720	1716	1709	1698	1685	1683	1034	1032	0976	0974
		0953	0951	0809	0805	0717	0715	0622	0620	0606	0605	0599	0597
		0596	0536	0526	0524	0521							
ADDRS1	3402	3455	0782										
ADDs1	0910	0949	0834										
ADDs1A	3404	3399											
ADFLD	0088	3942	3938	3835	3831	3767	3753	3709	3695	3689			
ASSEM	0048	0507											
AT01	3383	3393	3390	3380	3378	3370	3367						
AT02	3381	3394	3391										
ATEOT	3375	3252	3178	3136	3131								
ATEND	3387	3527											
ATTOP	3365	3119	3112										
BACKWD		3925	3923										
BASIEN	0049	0511											
BASIRE	0050	0511											
BKCK1	2669	2676											
BKCK2	2682	2679	2619										
BKCK3	2688	2685											
BKCKSM	2665	2625	2075										
BKERR	1023	1020											
BKFLG	0115	1127	0851	0792	0786	0777	0774	0353					
BK02	1036	1029											
BK0K	1025	1022											

SYMBOL CROSS REFERENCE PA00-J004A PAGE 0103

SYMBOL DEFINED REFERENCES

BKS	0067	1188	1184	1143	1043	1042	1035	1033	0128				
BLANK	1300	4130	3880	3872	3671	3663	1398	1299	1057	1041	1007	0781	0664
		0580	0574	0572	0535	0520							
BLANK2	1299	3866	3865	3666	3665	3052							
BLK	0152	2105	2094	2069	2063	0648							
BLKO	0154	4162	2644	0924									
BOTLN	0057	3532	3530	3526	3524	3523	3494	3492	3489	3479	3476	3388	3387
		3379	3377	3353	3352	3048							
BRCOMP	3891	3827											
BRK1	1016	1024											
BRK2	1134	1138											
BRK3	1133	1146	1109	1101									
BRK4	1137	1110	1102										
BRKA	1014	0508											
BRKK	1127	0511											
BRNCHC	3827	3811											
BT	3149	3611											
BYTESM	0090	3932	3899	3886	3875	3857	3846	3816	3815				
CBUFF1	2659	2655	2653										
CD02	3595	3598											
CFLG	3340	3313											
CFND1	3602	3596											
CGA	0985	0507											
CGALL	0998	1004	0994	0990	0986	0982							
CGPC	0971	0507											
CGPC0	0972	1153											
CGPC1	0974	4109	3862	0972									
CGPS	0981	0508											
CGS	0997	0508											
CGX	0989	0508											
CGY	0993	0508											
CH	0087	3974	3967	3964									
CH2	0583	0576											
CH3	0590	0578											
CH4	0586	0584	0581										
CHAR1	2994	2949											
CHAR2	2995	2951											
CHEKA	0900	0889	0753										
CHEKAR	0899	0716	0714	0621	0619	0617							
CHN1	3315	3320											
CHN2	3321	3317											
CHN3	3334	3336											
CHN4	3337	3333											
CHNG	3313	3611											
CHNG1	0574	0588											
CHNGG	0572	0507											
CKB	1183	0355											
CKB1	1193	1190	1187										
CKB2	1184	1194											
CKEUFF	2651	2683	2669	2630									
CKER0	0690	2090	0687										
CKER00	0692	3790	1731										
CKER1	0693	0698	0682										
CKER2	0699	0695											
CKERR	0687	0736	0733	0726	0636	0633							

SYMBOL CROSS REFERENCE PA00-J004A PAGE 0105

SYMBOL DEFINED REFERENCES

DDRB	0209	2117
DDRB2	0181	
DE1	1864	2026
DE2	1865	2466 1880 1867
DEBK1	2021	1926
DEBKEY	2020	1995 1891
DEBTIM	0238	2025 2023
DEHALF	1872	1853 1843
DELAY	1861	2247 2240 2229 2224 1852 1849 1842 1433
DI1024	0201	4166
DIBUFF	0156	3445 3204 3160 2293 2282 2111 2109 2100 2098 1708 1287
DILINK	0107	2264
DISASM	2856	3868 2852 1161 0556
DISFLG	0114	1119 0554
DISPLY	3877	3883
DIV1	0198	
DIV64	0200	2177 2174 2169 2166
DIV8	0199	
DLNE	3173	3610
DNNO	3112	3575 3223 3151
DNFA7	0185	
DON1	1216	1209
DONE	1207	3248 1159 0358
DOW1	3116	3113
DOW2	3118	3123
DOWN	3151	3610
DPPA7	0186	
DRA	0222	
DRA2	0178	2005 1894 0378
draH	0208	2468 2460 2448
DRE	0207	2637 2635 2471 2469 2458 2457 2246 2238 2227 2225 2214 2194 2192 2145 2059 2057 1844 1840 1431 1305 1107 1105 1099 1097 0880 0419 0414 0372
DRB2	0180	2008 1989 1904 1895
DU0	0779	0780
DU1	0778	0849
DU10	0845	0814
DU10A	0858	0863
DU11	0866	4099
DU12	0869	0874
DU13	0875	4147 1094 0968 0871 0868 0739 0643
DU14	0879	4094
DU1A	0794	0787
DU1B	0783	0784
DU2	0801	0843
DU6	0818	0811
DU7	0819	0817
DUB	0821	0816
DU9	0831	0836
DUK2	0948	0954
DUMP	0774	0507
DUMPKI	0935	0798
DUMFT1	0927	0931
DUMPTA	0922	1339
EDI	3088	3070 3059

SYMBOL CROSS REFERENCE PA00-J004APAGE 0106

SYMBOL DEFINED REFERENCES

EDI0	3040	3041							
EDI1	3046	3051							
EDI2	3053	3054							
EDI2B	3099	3093							
EDI3	3059	3060							
EDI4	3064	3057							
EDI5	3070	3071							
EDI6	3076	3083							
EDI7	3082	3074							
EDI8	3084	3075							
EDIT	3036	0506							
EMSG1	0326	3037							
EMSG2	0327	3573	3133						
END	0059	3392	3389	3082	3072	3067	3065		
ENDE2	3579	3577							
ENDERR	3572	3533	3293	3256	3138				
ENPA7	0187								
ENTRY	3594	3081							
EPFA7	0188								
EQS	0264	0323	0320	0319	0315	0314	0308	0307	
EQUAL	1251	4054	1666	0998					
ERR	2879	2866	2864						
ERR0	3582	3601	3584	3579	3224	3188	3115		
ERRFLG	3843	3838	3833						
ERRJMP	3924	3930	3927	3904	3897				
ERROR	3580	3284							
ERRORM	3790	3997	3924	3825	3800	3772	3769	3764	3763
ESCAPE	0262	1450	1435	1422					
EVAL	3708	3703							
FC1	3271	3283							
FC2	3276	3318	3295						
FC3	3278	3275	3273						
FC4	3285	3279							
FC5	3287	3277							
FC6	3289	3299							
FC7	3291	3303							
FC8	3294	3292							
FC9	3300	3297							
FCH	3269	3260							
FCHA1	3261	3319							
FCHAR	3260	3611	3314						
FNAM	1358	1343	1338	1321	1316				
FORM1	3886	3871							
FORMA	0078	2947	2933	2883					
FORMD1	3868	3864							
FORMD2	3875	3867							
FORMDS	3861	3851							
FORWRD	3928	3921							
FROM	1219	3040	0779						
GAP	0109	2701							
GCN1	1202	1200							
GCNT	1199	3243	1155	0546					
GET1	1840	1841							
GET3	1844	1851							
GETA1	2152	2157							

SYMBOL DEFINED REFERENCES

GETFMT	2881	2878			
GETID	0762	0939	0718		
GETK0	1900	1909			
GETK00	1911	1906			
GETK1	1917	1897			
GETK10	1986	1968			
GETK11	1970	1966			
GETK12	1974	1979			
GETK13	1981	1971			
GETK14	1985	1982			
GETK18	1924	1919			
GETK2	1926	1922	1421		
GETK3	1933	1936			
GETK4	1937	1934			
GETK5	1946	1942			
GETK6	1959	1955			
GETK7	1962	1953	1949	1940	
GETK8	1965	1961	1958	1945	
GETKD0	1883	1986			
GETKEY	1890	1984	1980	1447	
GETKY	1891	1924	1923	1910	
GETTAP	2151	2132	2052	2045	1497 0722 0704
GETTTY	1836	1507	1445	1434	
GID1	0763	0766			
GO	0545	0506			
GOBK	0549	0361			
GOBK0	0553	0550			
GOBK1	0558	0555	0548		
GOERR	1003	1000			
GOGO	3562	3544	3473	3447	3439
GOGO1	3570	3563			
GOTIT	4000	3994			
HATCH	3783	3728			
HATCJ	3728	3711			
HEX	1634	3832	1717		
HIST	0151	1060	1058	0351	0349
HISTM	0089	0094	0093	0092	0091 0090
HISTP	0119	1073	1055	0347	
IBITL	0166	2597	2536	2528	
IBITU	0167	2595	2537	2533	
IBUFM	0159	2521	2406	2394	1288
ICOL	0161	2599	2583	2578	2575 2569 2561 2558 2478
IDIR	0160	2587	2572	2555	2476
IDOT	0163	2483	2455	2431	1884
IER	0221				
IEVEN	2869	2862			
IFR	0220	4181	4169	2726	2449 1865
IMASK	0168	2590	2526	2481	
IMMED1	3788	3785			
IN	3186	3610			
IN02	3194	4119	3330	3213	3207 3199
IN02A	3198	4115			
IN03	3214	3201			
IN03A	3221	3107			
IN03B	3208	3203			

SYMBOL CROSS REFERENCE PA00-J004A PAGE 0108

SYMBOL	DEFINED	REFERENCES
IN05	3225	3218 3216
INALL	1491	4143 4116 3194 1091 1088 1085 1082 1079 0749 0747 0746 0642 0613
INCP	2555	2519
INCS2	0915	0853 0842
INDX	3758	3755
INFLG	0117	4091 3232 2651 2082 2074 1578 1491 1402 1312 1238 0743
INL	3189	3236 3186
INLOW	1401	1406
INLUP	3976	3980
INPU	3231	3610
INPU1	3236	3238 3234
INTAB1	1173	0371
INTAB2	1177	0377
INTAB3	1179	0391 0385 0382
IOFFST	0162	2607 2584 2581 2567 2564 2480
IOUTL	0164	2593 2531 2530 2459
IOUTU	0165	2594 2544 2542 2535 2534 2456
IP00	2417	1885
IP02	2428	2433 2422 2420
IP03	2434	4047
IP04	2436	2414
IPS0	2415	1983
IPS1	2521	2540
IPS2	2536	2532 2527
IPS3	2533	2529
IPST	2413	4128 2389
IPSU	2518	2465 2416
IRQ1	0450	0445
IRQ2	0465	0357
IRQV1	0331	4189
IRQV2	0104	0331
IRQV3	0441	1179
IRQV4	0102	0447
ISX	3948	3944
JD1	1158	1169
JD2	1161	1157
JD3	1168	1166
JD4	1170	1160
JMFR	0499	0497
JTBL	3610	4105 3603
JUMP	0169	2605 2603 2524 0499 0496 0494
KDISA	1149	1152 0510
KEP	1227	3574 3328 3134 3038 2441 1740 1469 1380 1293 1223 1134 1015 0666 0658 0518
KEPR	1469	1361 1332 1311 0846
KEYF1	0072	0513
KEYF2	0073	0513
KEYF3	0074	0513
KI2	3343	3341
KIFLG	3342	3189 3173
KMASK	0173	2022 2009 1997 1915
LDAY	1760	4050 3878 3542 3471 2525 0886 0537
LDIY	0143	1771 1770 1768 1765 1763
LENGTH	0062	3505 3499 3497 3459 3458 3433 3214 3181 3163 2969 2931 2885

SYMBOL CROSS REFERENCE PA00-J004A.....PAGE 0109

SYMBOL DEFINED REFERENCES

[illegible]

SYMBOL CROSS REFERENCE PA00-J004A.....PAGE 0110

SYMBOL DEFINED REFERENCES

[illegible]

SYMBOL CROSS REFERENCE PA00-J004APAGE 0111

SYMBOL DEFINED REFERENCES

OPCOMP	3794	3789 3787 3781 3779 3774 3766 3759 3752 3750 3748 3739 3737
		3727 3725 3718 3684
OUT01	2383	2378
OUT04	2394	2381
OUT05	2400	2398 2393
OUT1	1478	1542
OUT1A	1483	1480
OUT2	1487	1484
OUTA1	1520	1516
OUTA2	1525	1521
OUTA3	1536	1526
OUTA4	1541	1537
OUTALL	1512	3159 2968 2953 2950 2922 1612 1562 1560 1549
OUTCK	0889	0946 0944 0829 0827 0825
OUTCK1	0890	0940 0861 0859 0857 0841 0839
OUTCK2	0896	0893
OUTCKS	0884	0948 0831
OUTD1	2276	2272
OUTD1A	2277	4044
OUTD2	2282	2278
OUTD2A	2289	2286 1271
OUTD3	2292	2299
OUTD4	2301	2285
OUTD5	2309	2316 2275
OUTD7	2327	4043 2317 2310 2306 2287
OUTDD1	2333	4041 4029 2313 2303 2295 0433
OUTDD2	2342	2344
OUTDD3	2345	2341
OUTDIS	2269	2254 1246 1179
OUTDF	2260	1488
OUTDF1	2264	1590 1482 1264
OUTFLG	0118	4096 3165 2652 2107 2104 2102 1571 1566 1552 1513 1410 1333
		0891 0866 0794
OUTL1	1411	
OUTLOW	1409	1568
OUTLUP	3974	3982
OUTFR	2403	2399 2387 1293
OUTFR1	2404	2408
OUTFR2	2409	2405
OUTPRI	2375	2260 1588 1531 1348
OUTPUT	1477	4152 4063 4061 4056 4010 1244 1230 1150 0696 0660 0475 0471
OUTT1	2234	2243
OUTT2	2255	2253 2251
OUTTA1	2747	2716
OUTTA2	2749	2765
OUTTA3	2761	2763 2756
OUTTAP	2712	2706 2705 2704 2703 2631 2628 1523 0966 0965 0957 0937
OUTTTY	2221	1486
F00	3169	3167
F01	3163	3158 3156
F02	3155	3162
F03	3165	3254
PACK	1640	3837 1722 1628 1625 0770 0768 0750 0748 0725
PAK1	1649	1645
PAK2	1655	1658

SYMBOL CROSS REFERENCE PA00-J004A PAGE 0112

SYMBOL DEFINED REFERENCES

PAREN	3753	3713
PAT17A	4116	4118 4114
PAT17B	4119	4112
PAT18A	4127	4124
PAT19	4135	0469
PAT20	4139	1086
PAT21	4149	0428
PAT21A	4150	4154
PAT21B	4155	4151
PAT22	4162	2643
PAT23	4165	2421 2419
PAT23A	4167	4171
PAT23B	4173	4168
PAT2A	4030	4027
PAT 4	4044	4039
PAT9A	4071	4068
FAT9B	4074	4098 4093 4081 4079
PATC10	4076	0592
PATC11	4079	1240
PATC12	4084	4121 3195 1269
PATC13	4091	3220
PATC14	4096	3255
PATC15	4101	3602
PATC16	4109	4013 3888
PATC17	4112	3197
PATC18	4121	1452 1030
PATC24	4176	2190
PATC25	4181	4182 2761 2754
PATC8C	4062	4060
PATCH1	4018	0426
PATCH4	4037	2276
PATCH5	4046	2439
PATCH6	4049	3089
PATCH8	4052	3593
PATCH9	4067	
PCADJ3	2971	2957
PCADJ4	2975	2973
PCLLD	1759	2935 2904 2859
PCR	0219	2696 2454 2452 2435 2418 2121
PHXY	1793	2617 2376 2270 2222 2033 1442 1358 1258
PINT	2475	2415
PLNE	3154	3610 3337 3264 3250 3221 3183 3179 3177 3130 3114
PLXY	1805	2646 2400 2327 2279 2248 2041 1448 1372 1294
PNTLUF	3674	3677
POMSG	4159	4150
PR1	1244	1301 1297 1252 1249
PR2	1245	1242
PRADR1	2929	2955
PRADR2	2933	2946
PRADR3	2947	2932 2930
PRADR4	2954	2952 2948
PREL2	2967	2925 2906 2856
PRDOT0	2449	2451
PRIERR	2438	2423
PRIFLG	0116	4087 4085 4046 3211 3210 2413 2112 2095 1533 1528 1478 1123

SYMBOL CROSS REFERENCE PA00-J004A.....PAGE 0113

SYMBOL DEFINED REFERENCES

		0683 0678 0667 0656
PRITR	1123	1972
PRMN1	2914	2924
PRMN2	2916	2920
PRNDOT	2447	2429 2428
PRNTYX	2962	2960
PROMF1	1241	4082
PROMPT	1238	3270 3192
PRPC	2964	3873 2857
PRST	0227	2434 2417
PRTIME	0237	2463 2461
PSL0	1269	1262
PSL00	1272	1266
PSL0A	1280	1276
PSL0B	1284	1274
PSL0C	1285	1283 1279
PSL0D	1287	1292
PSL1	1296	3242 1257 1154 1016 0545
PSLS	1256	1456
QM	1248	3599 3581 1370 1023 1003 0483
R10	3499	3496
R100	3505	3451
R101	3511	3509
R102	3515	3519
R103	3527	3525
R104	3541	3557 3539
R105	3551	3547
R1051	3557	3555
R106	3558	3550
R107	3534	3528
R108	3520	3517
R11	3502	3498
R2W	3451	3435
R5	3481	3477
R55	3485	3483
R6	3470	3485 3468
R7	3486	3480
R8	3437	3502
RB7	3442	3500 3436
RB8	3445	3449
R9	3495	3559 3493
RA	0248	2363 2361 2358 2351 0407
RB	0250	2355 0408
RB2	1456	1464
RBYT1	0747	0745
RBYTE	0743	0899 0734 0731 0710 0639 0634 0631 0626
RCH2	1426	1428
RCH3	1429	1425 1419
RCEK	1415	3247 1158 0802 0553 0360
RCHT1	1439	1474 1451 1430
RCHT2	1431	1438 1432
RCHTY	1430	1416
RD1	1625	1622
RD2	1616	1199 0999 0575
ROADDR	3687	3694 3682

SYMBOL DEFINED REFERENCES

RDBIT	2161	2152 2125
RDBIT1	2164	2165
RDBIT2	2170	2171
RDBIT4	2186	2187 2162
RDLUP	3958	3970 3962
RDR1	1463	1459
RDRUB	1457	3958 3699 3692 3271 1670 1506 1466 1382
REA1	1452	1436 1423
READ	1442	4052 4034 4032 3315
READ1	1447	1444
READ2	1448	1446
RED1	4034	0472
RED2	1473	4035 1461
REDOUT	1472	1627 1616 1017
REENTR	3105	0506
REG	0516	0506
REG1	0520	2853 0551
REGF	0113	2851 1114 0549
REGQ	2851	0465
REGT	1114	0509
RELADR	2957	2936
REP2	3429	3444
REPLAC	3433	3225 3182
RESNOW	3358	3558 3486
RINT	0192	4167
RMNEM	0080	2916 2912
ROLLFL	0172	2010 1992
ROO1	1996	1991
ROONEK	1989	1994 1890 1426 1417
ROUT	2739	2734
ROUT1	2741	2766
ROW1	2841	1937
ROW2	2842	
ROW3	2843	
ROW4	2844	
ROW5	2845	
ROW6	2846	
ROW7	2847	
ROW8	2848	
RQP	3464	3462 3460
RS1	0371	0374
RS2	0377	0380
RS20	1143	1145
RS3	0391	0395 0389
RS3A	0390	0387 0384
RS3B	0410	0406
RS4	0414	0416
RS5	0419	0420
RS6	0427	0438
RS7	0429	0415
RS8	0430	0437
RSET	0364	4189
RSPAC	1630	1647 1643 1641 1626 1624 1620 1618
RTMODE	2877	2872
RTS1	2978	2976

SYMBOL CROSS REFERENCE PA00-J004A.....PAGE 0115

SYMBOL DEFINED REFERENCES

RUE	0263	1458	
S1	0125	4106 3605 3604 3556 3553 3552 3548 3545 3541 3484 3482 3478	
		3475 3470 3469 3467 3466 3405 3404 3049 0952 0950 0945 0943	
		0912 0910 0884 0828 0826 0810 0807	
S2	0128	0917 0915 0860 0858 0791 0790	
SADDR	1776	3849 3895 3092 0755 0583	
SAVA	0132	0719 0711 0568 0446 0441 0334	
SAVE	0060	3531 3529 3355 3354	
SAVROW	3425	3512 3454 3068 3058	
SAVPC	0136	3658 3656 2975 2971 2965 2964 1759 1189 1186 1167 1165 1162	
		0977 0975 0564 0562 0521 0461 0458 0350 0348 0343 0341	
SAVPS	0131	1001 0566 0525 0523 0451 0336	
SAVS	0135	0558 0486 0463 0368 0345	
SAVX	0133	0561 0452 0338	
SAVY	0134	0560 0453 0339	
SEMI	1510	0854 0822	
SETEOT	3352	3513 3149	
SETREG	0407	0405 0402 0399	
SETSF1	2776	2774	
SETSF2	2780	2778	
SETSPD	2771	2692	
SETZ	2737	2733	
SH1	1041	1048	
SH11	1055	1064	
SHIS	1053	0509	
SHOW	1039	0509	
SIZEM	3635	3807	
SPIZ	0228	2434 2417	
SR	0217		
SRCHLP	3986	3996	
SRCHM	3987	3990	
STA1	0470	4137 4077	
START	0469	4157 0498 0488	
STARTM	3660	4110 3791	
STASH	3846	3933 3900 3858 3826	
STKEY	0174	2015 2006 1932 1928 1912	
STRYTE	0753	0729 0627	
STCODE	3638	4004	
STLY	0140	3321 3302 3286 2941 2939 2928 2755 2748 2739 2732 2719 2714	
		2348 2345 2315 2314 2311 2298 2297 2292 2245 2237 2235 2234	
		2233 2232 2231 2228 2223 1798 1784 1781 1778 1660 1656 1636	
		1663 1054	
STLO	4009	4012	
STLOAD	4011	3960	
STOR	3303	3611	
STOR1	3704	3701	
STORCH	3695	3705	
STORCH	0063	3296 3280	
STCHLP	3848	3854	
SUB	3409	3551 3334 3118 3117	
SUB1	3414	3412	
SUB11	1817	1827	
SUBTAK	1815	1806 1793	
SYNO	2125	2134 2130	
SYNO1	2132	2136	

SYMBOL DEFINED REFERENCES

T1CH	0212	2700							
T1FR	0241	2697							
T1I	0240	2641	1174	0877					
T1L	0211	4183	2728						
T1LH	0214	2760	2753	2725					
T1LL	0213	2758	2751	2723					
T2H	0216	2464	2202	2197	1879	1864	0421	0418	
T2I	0239								
T2L	0215	2462	2199	2123	2024	1876	1862	0424	
TABUF2	0155	2688	2657						
TABUFF	0153	2686	2681	2678	2674	2672	2671	2667	2666
		2070	2065	2053	2038	0671	0659	0652	2660
									2080
									2077
									2072
TABY2	2630	2634							
TABY3	2646	2623							
TAISET	2116	2044	0703						
TAOS1	2702	2788							
TAOSET	2692	2626	0735						
TAF1	1365	1363							
TAF2	1376	1367							
TAF3	1372	1369							
TAFIN	0147	2118	1373						
TAFOUT	0148	2693							
TAPTR	0149	2068	2040	2034	0677				
TAPTR2	0150	2640	2621	2618	0925	0869			
TEMPA	0092	3817	3812						
TEMPX	0091	3891	3730	3714	3708				
TEXT	0058	3369	3366	3347	3346	3047			
TIB1	2038	2036							
TIBY1	2044	2049	2037	0649					
TIBY3	2045	2050							
TIBY4	2051	2047							
TIBY5	2052	2056							
TIBY5A	2067	2064							
TIBY6	2085	2078							
TIBY7	2086	2081	2066						
TIBYTE	2033	1494							
TIMG	0112	2780	2722						
TIOS1	2144	2141							
TIOS2	2145	2143							
TIOSET	2141	2694	2119						
TMASK1	0085	3796	3674	3669					
TMASK2	0086	3799	3675	3670					
TMSG0	0318	0657							
TMSG1	0319	1379							
TMSG2	0320	1360							
TMSG3	0321	0692							
TMSG5	0323								
TMSG6	0324	0665							
TMSG7	0325	0681							
TO	1222	3053	0783						
TO1	1223	1220							
TOBYTE	2617	2645	1518	0928	0926	0895	0873		
TOGL	1129	1124	1120	1115					
TOGL1	1135	1130							
TOGTA1	1097	0510							

SYMBOL CROSS REFERENCE PA-0-J004A PAGE 0117

SYMBOL DEFINED REFERENCES

TOGTA2	1105	0510	
TOPND	3346	3106 3076 3055	
TP	3106	3611	
TP01	3348	3356	
TRACE	1119	0509	
TRY	2718	2740	
TRY34	3729	3720	
TRY56	3740	3698	
TRYINY	3760	3757	
TRYJMP	3767	3761	
TRYZF	3719	3716	
TSPEED	0108	4071 4069 2771 2715 2210 2206 2203 2161	
TTYTST	1304	4123 3863 3576 1582 1550 1483 1443 1415 1256 1241	
TYPE	0084	4001 3783 3775 3770 3745 3721 3680 3672	
TYPTB	3646	4000	
TYPTR1	3629	3794	
TYPTR2	3631	3798	
UACR	0042		
UDDRA	0034		
UDDRB	0033		
UDRA	0046		
UDRAH	0032		
UDRB	0031		
UIER	0045		
UIFR	0044		
UIN	0068	1504 1326	
UOUT	0069	1539 1353	
UP	3129	3610 3187	
UP1	3139	3143 3137	
UP4	3146	3140 3132 3120	
UPCR	0043		
UPNO	3135	3276 3251 3237 3222 3129	
USR	0041		
UT1CH	0036		
UT1L	0035		
UT1LH	0038		
UT1LL	0037		
UT2H	0040		
UT2L	0039		
VALID	3801	3797	
VECK1	1082	4146 1084	
VECK2	1088	1093 1090 1081	
VECK4	4147	4139	
VECK5	4143	4145	
VECKSM	1078	0510	
WHE1	1318	1314	
WHE2	1323	1319	
WHE3	1327	1324	
WHEREI	1310	3231 1078 0611	
WHEREO	1331	3245 0788	
WHICHT	1360	1371	
WHRO1	1340	1336	
WHRO2	1345	1341	
WHRO3	1350	1346	
WHRO4	1355	1351	

SYMBOL CROSS REFERENCE PA00-J004A.....PAGE 0118

SYMBOL DEFINED REFERENCES

WRAX	1595	2946 2963 1044 0607
WRITAD	0605	0522
WRITAZ	0604	3664 3063 3044 1741 1010 0688 0573
X	0000	4105 4004 4000 3993 3987 3967 3942 3938 3835 3831 3807 3802
		3798 3794 3603 3595 3296 3049 3048 3047 3046 2951 2949 2882
		2871 2688 2686 2660 2657 2607 2605 2603 2599 2597 2595 2594
		2593 2590 2587 2584 2583 2581 2578 2575 2572 2569 2567 2564
		2561 2558 2555 2521 2406 2394 2282 2065 2053 2038 1830 1828
		1822 1820 1819 1818 1724 1709 1698 1373 1288 1188 1184 1143
		1136 1132 1129 1035 1033 1001 0927 0769 0767 0763 0672 0671
		0659 0652 0495 0493 0478 0408 0407 0392 0391 0378 0377 0372
		0371
XORY	3937	3762 3741
XORY1	3943	3940
XORYRT	3946	3949
XORYZ	3938	3733
Y	0000	4150 3974 3964 3848 3839 3695 3689 3617 3562 3543 3515 3472
		3446 3445 3438 3291 3280 3204 3160 3155 3139 3121 3078 2911
		2909 2722 2720 2604 2602 2293 1977 1974 1937 1764 1762 1720
		1716 1708 1395 1387 1287 1227 1060 1058 1043 1042 0693 0606
		0605 0351 0349
ZON	2720	2738 2736
ZON1	2722	2730
ZON2	2726	2727
ZPAGE	3726	3723
ZPX	3738	3735
ZPY	3736	

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Symbol-Cross-Referenzliste

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