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190 F300
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210 F325
220 F349
230 F34A
240 F34B
250 F34C
260 F350
270 F351
280 F352
290 F353
300 F357
310 F359
320 F35A
330 F35B
340 F35F
350 F360
360 F363
370 F364
380 F365
390 F368
400 F36A
410 F36D
420 F370
430 F373
440 F376
450 F379
460 F37B
470 F37C
480 F37D
490 F37E
500 F37F
510 F380
520 F38A
530 F38B
540
550 F800=
560 F803=
570 F806=
580 F809=
590 F80C=


;***** BUSSMASTER EXECUTIVE *****
;* FOR CD-74/36
;* BY ARTHUR R HUGHES
;* 28 OCTOBER 82
;* 523768100
;*
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;*****



;***** VARIABLES AND CONSTANTS *****
;*****



;<<<<<<< $F300 >>>>>>>
;* = $F300

;

SEMAGL * = *+37   GLOBAL SEMAPHORE TABLE
SEMALC * = *+36   LOCAL SEMAPHORE TABLE
SEMACT * = *+1    SEMAPHORE BYTE COUNT
ABCSAT * = *+1    ARBITC LOCKOUT STATUS
PWRSAT * = *+1    POWER UP STATUS
LCKREG * = *+4    SEMAPHORE LOCK-UNLOCK REG.
MCHARB * = *+1    ARBIT MATCH TEMP STORE
INTXPT * = *+1    INTER-PROCESSOR COM. X REG STORE
HEADST * = *+1    INTER-PROCESSOR COM. HEADER STATUS
INPRC4 * = *+4    INTER-PROCESSOR COM. XFER PATCH
INPTMP * = *+2    I-P COM. TEMP ADD STORE
FRMPRC * = *+1    INTER-PROCESSOR COM. FROM PROCESSOR
TOPROC * = *+1    INTER-PROCESSOR COM. TO PROCESSOR
FRMADD * = *+4    INTER-PROCESSOR COM. XMIT FROM ADD.
PARMPS * = *+1    INTER-PROCESSOR COM. XMIT PARAMETERS
INTxcb * = *+3    "           "           "           "
ARBPRI * = *+1    RANDOM ARBIT PRIORITY STORE
BUSONL * = *+1    BUS ON LINE
INTUP2 * = *+3    INTERRUPT VECTOR POINTER
TIMECT * = *+2    SEC. TIMER COUNTER REG
CNTDNS * = *+3    SET SEMAPHORE TIME LIMIT
CNTDWN * = *+3    SEMAPHORE COUNTDOWN TIMER
FCERRX * = *+3    FUNCTION CALL ERR VECTOR
GETBTX * = *+3    GET ARG IN X REG VECTOR
CHRGTX * = *+3    GET TEXT CHAR VECTOR
PRETCT * = *+2    PRINTER RETRY COUNTER
CMDLOK * = *+1    CMD MODE SEMA CLEAR STATUS
TICK * = *+1      SEMA TIMER TICK STATUS
TIMER * = *+1    SEMA TIMER REG
STKTMP * = *+1    TEMP STACK REG
DKUNIT * = *+1    GLOBAL FLOPPY DISK UNIT#
DKBASE * = *+10   HARD DISK COMMON CONT STORE
DLYTMR * = *+1    DELAY TIMER

;

SEMCLR = $F800    USER SEMAPHORE CLEAR
IOSMCL = $F803    IO SEMAPHORE CLEAR
LOCK = $F806      INDIVIDUAL SEMAPHORE SET
UNLOCK = $F809    INDIVIDUAL SEMAPHORE CLEAR
ARBITS = $F80C    GET MASTER BUS

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600 F80F=	ARBITC = \$F80F	RELEASE MASTER BUS
610 F812=	START = \$F812	SYSTEM BOOTSTRAP
620 F815=	INTXMT = \$F815	INTER-PROCESSOR COM. XMIT
630 F818=	FNDSAT = \$F818	SEMAPHORE PNT SETUP
640 3EB8=	DELAY = \$3EB8	DELAY TIMER
650 F81B=	LOCK1 = \$F81B	SETUP SEMAPHORE BIT
660 3E25=	STALED = \$3E25	PRINTER STALLED SUB
670 3A64=	CRTIN = \$3A64	INPUT FROM CRT
680 00C0=	CHRGET = \$00C0	GET CHR FROM CMD BUF
690 00C6=	REGETC = \$00C6	REGET CHR FROM CMD BUF
700 1618=	GETBYT = \$1618	SETUP NUMBER AS BYTE
710 38B6=	PRNDAT = \$38B6	TMP PRINTER CHAR STORE
720 10D0=	FCERR = \$10D0	ORG. FUNCTION CALL ERROR
730 ;		
740 F38B 06	PAGCNT .BYTE 6	PRINTER PAGING LINE COUNT (DV 8)
750 F38C 06	.BYTE 6	(DV 3)
760 F38D 06	.BYTE 6	(DV 6)
770 F38E 06	.BYTE 6	(DV 5)
780 ;		
790 F38F 42	PAGSZE .BYTE 66	PRINTER PAGE SIZE IN LINES (DV 8)
800 F390 42	.BYTE 66	(DV 3)
810 F391 42	.BYTE 66	(DV 6)
820 F392 42	.BYTE 66	(DV 5)
830 ;		
840 F393 00	PAGSAT .BYTE 0	PRINTER PAGING STATUS (DV 8)
850 F394 00	.BYTE 0	0=OFF (DV 3)
860 F395 00	.BYTE 0	(DV 6)
870 F396 00	.BYTE 0	(DV 5)
880 ;		
890 F397 00	PRNPRT .BYTE 0	PRINTER PORT # (DV 8)
900 F398 01	.BYTE 1	(DV 3)
910 F399 02	.BYTE 2	(DV 6)
920 F39A 03	.BYTE 3	(DV 5)
930 ;		
940 F39B 00	LOCPRN .BYTE 0	LOCAL BUS PRINTER (DV 8)
950 F39C 00	.BYTE 0	0=NO (DV 3)
960 F39D 00	.BYTE 0	(DV 6)
970 F39E 00	.BYTE 0	(DV 5)
980 ;		
990 F39F 00CF	PRNTAD .WORD \$CF00	PRINTER DRIVER (CH 1)
1000 F3A1 00FB	.WORD \$FB00	ADDRESS TABLE (CH 2)
1010 F3A3 00F6	.WORD \$F600	(CH 3)
1020 F3A5 00F4	.WORD \$F400	(CH 4)
1030 F3A7 FBEE	PRNTJP .WORD PRNTZ3	EXTERNAL PRINT DRIVER ADD
1040 ;		
1050 F3A9 00	PRNTBL .BYTE 0	PRINTER MAPPING TABLE (DV 8)
1060 F3AA 00	.BYTE 0	(DV 3)
1070 F3AB 00	.BYTE 0	(DV 6)
1080 F3AC 03	.BYTE 3	(DV 5)
1090 ;		
1100 F3AD FF	FRMFED .BYTE \$FF	PRINTER FORM FEED STATUS (DV 8)
1110 F3AE FF	.BYTE \$FF	0=OFF (DV 3)
1120 F3AF FF	.BYTE \$FF	(DV 6)
1130 F3B0 FF	.BYTE \$FF	(DV 5)
1140 F3B1 FF	.BYTE \$FF	(AUG.)
1150 ;		
1160 F3B2 0C	FRMFTP .BYTE \$0C	PRINTER FORM FEED TYPE (DV 8)
1170 F3B3 0C	.BYTE \$0C	\$0C - STANDARD (DV 3)
1180 F3B4 0C	.BYTE \$0C	\$8C - FF BY LF (DV 6)

1190 F3B5 8C .BYTE \$8C (DV 5)
1200 ;
1210 F3B6 06 PAGMRG .BYTE 6 PRINTER PAGE MARGIN (DV 8)
1220 F3B7 06 .BYTE 6 (DV 3)
1230 F3B8 06 .BYTE 6 (DV 6)
1240 F3B9 06 .BYTE 6 (DV 5)
1250 ;
1260 F3BA 08 FLAGDV .BYTE 8 DEV# TABLE (CH 1)
1270 F3BB 03 .BYTE 3 (CH 2)
1280 F3BC 06 .BYTE 6 (CH 3)
1290 F3BD 05 .BYTE 5 (CH 4)
1300 ;
1310 F3BE 04 PRNTYP .BYTE 4 PARALLEL PRINTER MODE BREAK PNT
1320 ;
1330 F3BF 00 GETBUS .BYTE 0 GET BUS STATUS 0=DON'T GET BUS
1340 ;
1350 F3C0 11 XON .BYTE \$11,0,0,0,0,0,0,0,0,0 COMM START PROTOCOL
1350 F3C1 00
1350 F3C2 00
1350 F3C3 00
1350 F3C4 00
1350 F3C5 00
1350 F3C6 00
1350 F3C7 00
1350 F3C8 00
1350 F3C9 00
1360 ;
1370 F3CA 13 XOFF .BYTE \$13,0,0,0,0,0,0,0,0,0 COMM STOP PROTOCOL
1370 F3CB 00
1370 F3CC 00
1370 F3CD 00
1370 F3CE 00
1370 F3CF 00
1370 F3D0 00
1370 F3D1 00
1370 F3D2 00
1370 F3D3 00
1380 ;
1390 F3D4 4CA02E FHUNLD JMP \$2EA0 UNLOAD FLOPPY HEAD VECTOR
1395 F3D7 60 RTS
1400 ;
1410 ;<<<<<< \$EA80 >>>>>>>>
1420 ;
1430 EA80 * = \$EA80
1440 ;
1450 ;*****
1460 ;* EXTENDED FLAG COMMANDS *
1470 ;* \$4A0D WORD NEWFLG *
1480 ;* \$4985 JMP FLAGC *
1490 ;* \$1968 JSR FLAGX8 *
1500 ;*
1510 ;* FLAGS 100 & 101 *
1520 ;*
1530 ;* \$196B TXA *
1540 ;* TAY *
1550 ;*
1560 ;* \$1974 LDA #\$0A *
1570 ;* JSR \$2D39 *
1580 ;* JMP \$4469 *

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1590 ; *****
1600 ;
1610 EA80 20A3EA FLAGC JSR FLAGC2
1620 EA83 E032 CPX #50 FLAG 50 OR LARGER
1630 EA85 3021 BMI FLAGC4 -NO, ERROR
1640 EA87 E064 CPX #100 FLAG 100 ?
1650 EA89 F00C BEQ FLGC10 -YES, CONT
1660 EA8B E065 CPX #101 FLAG 101 ?
1670 EA8D F008 BEQ FLGC10 -YES, CONT
1680 EA8F E039 CPX #57 FLAG 57 ?
1690 EA91 F004 BEQ FLGC10 -YES, CONT
1700 EA93 E036 CPX #54 FLAG 53 OR LESS ?
1710 EA95 1011 BPL FLAGC4 -NO, ERROR
1720 EA97 4C8849 FLGC10 JMP $4988 DO FLAG CMD
1730 ;
1740 EA9A 20C000 FLAGC1 JSR CHRGET GET DATA
1750 EA9D 201816 JSR GETBYT
1760 EAA0 18 CLC
1770 EAA1 F019 BEQ FLAGC3
1780 EAA3 C92C FLAGC2 CMP '#,' SN ERR ?
1790 EAA5 38 SEC
1800 EAA6 F014 BEQ FLAGC3 -NO, EXIT
1810 EAA8 4C1EOE FLAGC4 JMP $OE1E GOTO SN ERROR
1820 EAAB 209AEA FLAGC5 JSR FLAGC1 GET DEV#
1830 EAAE 90F8 BCC FLAGC4 ERROR ON EOC
1840 EAB0 20BDEA JSR FLAGC9 GET DEV INDEX
1850 EAB3 8EBBEA STX FLAGC8+1 SAVE INDEX
1860 EAB6 209AEA JSR FLAGC1 GET NEXT DATA
1870 EAB9 8A TXA
1880 EABA A200 FLAGC8 LDX #0 EXIT
1890 EABC 60 FLAGC3 RTS
1900 ;
1910 EABD 8A FLAGC9 TXA
1920 EABE A203 LDX #3
1930 EAC0 DDBAF3 FLAGC6 CMP FLAGDV,X
1940 EAC3 D001 BNE FLAGC7 -NO, TEST NEXT TABLE ENTRY
1950 EAC5 60 RTS -YES, RETURN WITH MATCH
1960 ;
1970 EAC6 CA FLAGC7 DEX TEST NEXT TABLE ENTRY ?
1980 EAC7 10F7 BPL FLAGC6 -YES
1990 EAC9 3044 BMI FCER EXIT ON ERR
2000 ;
2010 EACB 48 FLAGX8 PHA REGETC
2020 EACC 20C600 JSR REGETC
2030 EACF F007 BEQ FLAGX9 EXIT IF EOC
2040 EAD1 209AEA JSR FLAGC1 GET DEV#
2050 EAD4 B00C BCS FLAGX2 ERR ON NOT EOC
2060 EAD6 68 PLA
2070 EAD7 60 RTS
2080 ;
2090 EAD8 68 FLAGX9 PLA GET LAST DEV#
2100 EAD9 AE6644 LDX $4466 AND EXIT
2110 EADC 60 RTS
2120 ;
2130 EADD 20ABEA FLAG50 JSR FLAGC5 GET DEV# AND PORT#
2140 EAE0 9003 BCC FLAGX1 CONT ON EOC
2150 EAE2 4CA8EA FLAGX2 JMP FLAGC4 GOTO SN ERROR
2160 EAE5 A8 FLAGX1 TAY PORT# OUT OF RANGE?
2170 EAE6 F027 BEQ FCER -YES

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2180 EAE8 88		DEY	SAVE PORT#
2190 EAE9 C010		CPY #16	AND EXIT
2200 EAEB 1022		BPL FCER	
2210 EAED 98		TYA	
2220 EAEE 9D97F3		STA PRNPRT, X	
2230 EAF1 60		RTS	
2240 ;			
2250 EAF2 20ABEA	FLAG51	JSR FLAGC5	GET DEV# AND FF STATUS
2260 EAF5 BOEB		BCS FLAGX2	ERROR ON NOT EOC
2270 EAF7 C900		CMP #0	FF STATUS \geq 0 ?
2280 EAF9 3014		BMI FCER	-NO, ERR
2290 EAFB F00E		BEQ FLAGX3	TURN OFF AUTO FF IF ZERO
2300 EAFD C902		CMP #2	FF STATUS \leq 2 ?
2310 EAFF F005		BEQ FLAGX4	-YES, CONT
2320 EB01 100C		BPL FCER	-NO, ERR
2330 EB03 A98C		LDA #\$8C	SETUP FF BY LF
2340 EB05 2C		.BYTE \$2C	
2350 EB06 A90C	FLAGX4	LDA #\$0C	SETUP STANDARD FF
2360 EB08 9DB2F3		STA FRMFTP, X	SAVE TYPE OF FF
2370 EB0B 9DADF3	FLAGX3	STA FRMFED, X	SAVE FF STATUS
2380 EB0E 60		RTS	
2390 ;			
2400 EB0F 68	FCER	PLA	GOTO FUNCTION CALL ERROR
2410 EB10 68		PLA	
2420 EB11 4CD010		JMP FCERR	
2430 ;			
2440 EB14 20ABEA	FLAG52	JSR FLAGC5	GET DEV# AND PAGE SIZE
2450 EB17 08		PHP	
2460 EB18 A8		TAY	PAGING OFF ?
2470 EB19 F020		BEQ FLAGX5	-YES, TURN IT OFF
2480 EB1B C8		INY	PAGING ON ?
2490 EB1C F01D		BEQ FLAGX5	-YES, TURN IT ON
2500 EB1E 8E36EB		STX FLAGX7+1	
2510 EB21 9D93F3		STA PAGSAT, X	TURN ON PAGING
2520 EB24 9D8FF3		STA PAGSZE, X	AND SAVE PAGE SIZE
2530 EB27 28		PLP	EOC ?
2540 EB28 9010		BCC FLAGX6	-YES, EXIT
2550 EB2A 209AEA		JSR FLAGC1	GET MARGIN
2560 EB2D B0B3		BCS FLAGX2	ERR IF NOT EOC
2570 EB2F 8A		TXA	ERR IF MARGIN
2580 EB30 F0DD		BEQ FCER	OUT OF RANGE
2590 EB32 E8		INX	
2600 EB33 F0DA		BEQ FCER	SAVE MARGIN SIZE
2610 EB35 A200	FLAGX7	LDX #0	
2620 EB37 9DB6F3		STA PAGMRG, X	
2630 EB3A 60	FLAGX6	RTS	
2640 ;			
2650 EB3B 28	FLAGX5	PLP	EOC ?
2660 EB3C B0A4		BCS FLAGX2	-NO, EXIT TO ERR
2670 EB3E 9D93F3		STA PAGSAT, X	SAVE PAGING STATUS
2680 EB41 60		RTS	
2690 ;			
2700 EB42 20ABEA	FLAG53	JSR FLAGC5	GET DEV# AND LOCAL PRINT STATUS
2710 EB45 B09B		BCS FLAGX2	ERR ON NOT EOC
2720 EB47 9D9BF3		STA LOCPRN, X	SAVE LOCAL PRINT STATUS
2730 EB4A 60		RTS	
2740 ;			
2750 EB4B A900	FLAG54	LDA #0	CLEAR ABCSAT
2760 EB4D 8D4AF3		STA ABCSAT	

2770 EB50 4C34ED	JMP CMDET8	UNLOCK ALL SEMAPHORES	0683 028E
2780 ;			
2790 EB53 209AEA	FLAG57 JSR FLAGC1	GET FLAG MODE	28 0682 028E
2800 EB56 908A	BCC FLAGX2	ERR ON EOC	00 0683 028E
2810 EB58 8E6BEB	STX FLAGS3+1		8558 0083 028E
2820 EB5B 209AEA	JSR FLAGC1	GET CH#	38 0083 028E
2830 EB5E 9082	BCC FLAGX2	ERR ON EOC	00 0083 028E
2840 EB60 CA	DEX	CH# IN RANGE?	00 0083 028E
2850 EB61 30AC	BMI FCER	-NO	00 0083 028E
2860 EB63 E005	CPX #5		00 0083 028E
2870 EB65 10A8	BPL FCER	-NO	00 0083 028E
2880 EB67 8E8BEB	STX FLAGS2+1		00 0083 028E
2890 EB6A A900	FLAGS3 LDA #0	MAP MODE?	00 0083 028E
2900 EB6C F02B	BEQ FLAGS1	-YES	00 0083 028E
2910 EB6E C901	CMP #1	ADDRESS MODE?	00 0083 028E
2920 EB70 D09D	BNE FCER	-NO, ERR	00 0083 028E
2930 EB72 20C000	JSR CHRGET	GET ADDRESS	00 0083 028E
2940 EB75 20B90C	JSR \$OCB9		00 0083 028E
2950 EB78 20C600	JSR REGETC		00 0083 028E
2960 EB7B D02F	BNE FLAGS4	ERR ON NOT EOC	00 0083 028E
2970 EB7D 20961B	JSR \$1B96		00 0083 028E
2980 EB80 A5B3	LDA \$B3	ADDRESS TO LARGE?	00 0083 028E
2990 EB82 302B	BMI FCERX	-YES	00 0083 028E
3000 EB84 A5AE	LDA \$AE		00 0083 028E
3010 EB86 C991	CMP #\$91		00 0083 028E
3020 EB88 B025	BCS FCERX	-YES	00 0083 028E
3030 EB8A A900	FLAGS2 LDA #0	SAVE ADDRESS	00 0083 028E
3040 EB8C 0A	ASL A		00 0083 028E
3050 EB8D AA	TAX		00 0083 028E
3060 EB8E A5B2	LDA \$B2		00 0083 028E
3070 EB90 9D9FF3	STA PRNTAD,X		00 0083 028E
3080 EB93 A5B1	LDA \$B1		00 0083 028E
3090 EB95 9DA0F3	STA PRNTAD+1,X		00 0083 028E
3100 EB98 60	RTS		00 0083 028E
3110 ;			
3120 EB99 209AEA	FLAGS1 JSR FLAGC1	GET CH#	00 0083 028E
3130 EB9C B00E	BCS FLAGS4	ERR ON NOT EOC	00 0083 028E
3140 ;			
3150 EB9E 20BDEA	FLAGS5 JSR FLAGC9	GET DEV#	00 0083 028E
3160 EBA1 AD8BEB	FLAGS6 LDA FLAGS2+1	MAP OUT OF RANGE?	00 0083 028E
3170 EBA4 C905	CMP #5		00 0083 028E
3180 EBA6 1007	BPL FCERX	-YES	00 0083 028E
3190 EBA8 9DA9F3	STA PRNTBL,X	MAP DEV# TO CH#	00 0083 028E
3200 EBAB 60	RTS		00 0083 028E
3210 ;			
3220 EBAC 4CA8EA	FLAGS4 JMP FLAGC4		00 0083 028E
3230 ;			
3240 EBAF 4C0FEB	FCERX JMP FCER		00 0083 028E
3250 ;			
3260 EBB2 B2	NEWFLG .BYTE 50+128,0 FLAG 50		00 0083 028E
3260 EBB3 00			00 0083 028E
3270 EBB4 DDEA	.WORD FLAG50		00 0083 028E
3280 ;			
3290 EBB6 B3	.BYTE 51+128,0 FLAG 51		00 0083 028E
3290 EBB7 00			00 0083 028E
3300 EBB8 F2EA	.WORD FLAG51		00 0083 028E
3310 ;			
3320 EBBA B4	.BYTE 52+128,0 FLAG 52		00 0083 028E
3320 EBBB 00			00 0083 028E

3330 EBBC 14EB00000000 .WORD FLAG52
 3340 ;
 3350 EBBE B5 .BYTE 53+128,0 FLAG 53
 3350 EBBF 00
 3360 EBC0 42EB .WORD FLAG53
 3370 ;
 3380 EBC2 B6 .BYTE 54+128,0 FLAG 54
 3380 EBC3 00
 3390 EBC4 4BEB .WORD FLAG54
 3400 ;
 3410 EBC6 37 .BYTE 55,0 FLAG 55
 3410 EBC7 00
 3420 EBC8 7BF3 .WORD CMDLOK
 3430 ;
 3440 EBCA 38 .BYTE 56,\$FF FLAG 56
 3440 EBCB FF
 3450 EBCC 7BF3 .WORD CMDLOK
 3460 ;
 3470 EBCE B9 .BYTE 57+128,0 FLAG 57
 3470 EBCF 00
 3480 EBDO 53EB .WORD FLAG57
 3490 ;
 3500 EBD2 FE .BYTE \$FE,0 CONTINUE WITH
 3500 EBD3 00
 3510 EBD4 9D3F .WORD \$3F9D FLAG CMD
 3520 ;
 3530 ;*****
 3540 ;* EXTENDED USER CALL *
 3550 ;* AND TM=WAIT FOR SM, TL *
 3560 ;* \$09AF JSR USER *
 3570 ;*****
 3580 ;
 3590 EBD6 20150E USER JSR \$0E15
 3600 EBD9 C992 CMP #\$92 WAIT TOLKEN?
 3610 EBDB D047 BNE USER4 -NO, EXIT
 3620 EBDD 20C000 JSR CHRGET GET NEXT TOLKEN
 3630 EBE0 C981 CMP #\$81 IS IT FOR?
 3640 EBE2 D044 BNE USER8 -NO, GOTO SN ERR
 3650 EBE4 20C000 JSR CHRGET GET SEMAPHORE#
 3660 EBE7 201816 JSR GETBYT
 3670 EBEA 8E4DF3 STX LCKREG+1 AND SAVE
 3680 EBED C92C CMP #', SN ERR?
 3690 EBEF D034 BNE USER5 -YES, GOTO SN ERR
 3700 EBF1 20C000 JSR CHRGET SETUP TIME LIMIT
 3710 EBF4 201816 JSR GETBYT
 3720 EBF7 E000 CPX #0 ZERO TIME LIMIT?
 3730 EBF9 D00A BNE USER9 -NO
 3740 EFBF A201 LDX #1 SET IT UP
 3750 Ebfd 8EB2EC STX CNTDN3+1
 3760 EC00 8E7DF3 STX TIMER
 3770 EC03 D008 BNE USER10
 3780 EC05 8E7DF3 USER9 STX TIMER
 3790 EC08 A24B LDX #75
 3800 ECOA 8EB2EC STX CNTDN3+1
 3810 EC0D AE4DF3 USER10 LDX LCKREG+1 GO LOCK SEMAPHORE
 3820 EC10 2006F8 USER6 JSR LOCK
 3830 EC13 68 PLA
 3840 EC14 68 PLA
 3850 EC15 A900 LDA #0 GET TIMEOUT STATUS

3860	EC17	AC7DF3	LDY	TIMER	
3870	EC1A	201812	JSR	\$1218	EXIT AND SAVE IN VAR
3880	EC1D	A696	LDX	\$96	
3890	EC1F	A497	LDY	\$97	
3900	EC21	4CD21A	JMP	\$1AD2	
3910		;			
3920	EC24	60	USER4	RTS	
3930		;			
3940	EC25	4C1EOE	USER5	JMP \$0E1E	GOTO SN ERR
3950		;			
3960	EC28	C997	USER8	CMP #\$97	PRINT TOLKEN?
3970	EC2A	D0F9		BNE USER5	-NO, EXIT TO ERR
3980	EC2C	20ABEA		JSR FLAGC5	GET DEV# AND TIME LIMIT
3990	EC2F	B0F4		BCS USER5	ERR ON NOT ECC
4000	EC31	48		PHA	
4010	EC32	BDA9F3		LDA PRNTBL,X	SET SEMA
4020	EC35	AA		TAX	
4030	EC36	OA		ASL A	
4040	EC37	A8		TAY	
4050	EC38	20E7EE		JSR PRNTZ1	
4060	EC3B	68		PLA	
4070	EC3C	D005		BNE USER7	
4080	EC3E	A901		LDA #1	
4090	EC40	8DB2EC		STA CNTDN3+1	
4100	EC43	8D7DF3	USER7	STA TIMER	
4110	EC46	DOC8		BNE USER6	
4120		;			
4130		;	*****		
4140		;	* EXTENDED PEEK *		
4150		;	* \$0E74 JSR PEEKST *		
4160		;	*****		
4170		;			
4180	EC48	E06C	PEEKST	CPX #\$6C	USER CALL?
4190	EC4A	F004		BEQ PEKST2	-YES
4200	EC4C	E082		CPX #\$82	IS TOLKEN PEEK?
4210	EC4E	D00A		BNE PEKST1	-NO, EXIT
4220	EC50	C923	PEKST2	CMP #'#	IS NEXT BYTE GET BUS?
4230	EC52	D006		BNE PEKST1	-NO, EXIT
4240	EC54	8DBFF3		STA GETBUS	SETUP TO GET BUS
4250	EC57	20C000		JSR CHRGET	GET NEXT BYTE
4260	EC5A	4C070E	PEKST1	JMP \$0E07	EXIT
4270		;			
4280		;	*****		
4290		;	* EXTENDED WAIT *		
4300		;	* \$2224 .WORD WAIT-1 *		
4310		;	*****		
4320		;			
4330	EC5D	C99A	WAIT	CMP #\$9A	CLEAR TOLKEN?
4340	EC5F	F029		BEQ WAIT1	-YES, CLEAR SEMA
4350	EC61	C981		CMP #\$81	FOR TOLKEN?
4360	EC63	F023		BEQ WAIT2	-YES, SET SEMA
4370	EC65	C923		CMP #'#	GLOBAL WAIT?
4380	EC67	D006		BNE WAIT4	-NO, CONT
4390	EC69	8DBFF3		STA GETBUS	SETUP GET BUS STATUS
4400	EC6C	20C000		JSR CHRGET	GET NEXT BYTE
4410	EC6F	20C600	WAIT4	JSR REGETC	REGET BYTE
4420	EC72	1003		BPL WAIT5	CONT. ON NO SN ERR
4430	EC74	4CF908		JMP \$08F9	GOTO ERR
4440	EC77	206616	WAIT5	JSR \$1666	GET DATA

4450	EC7A	8696		STX \$96	
4460	EC7C	8497		STY \$97	
4470	EC7E	F005		BEQ WAIT6	
4480	EC80	206C16		JSR \$166C	
4490	EC83	8697		STX \$97	
4500	EC85	4C4CF0	WAIT6	JMP WAIT8	
4510		;			
4520	EC88	A9FF	WAIT2	LDA #\$FF	LOCK
4530	EC8A	08	WAIT1	PHP	UNLOCK
4540	EC8B	A9FF		LDA #\$FF	SET FOR NO TIMEOUT
4550	EC8D	8D7DF3		STA TIMER	
4560	EC90	20C000		JSR CHRGET	
4570	EC93	201816		JSR GETBYT	GET CHANNEL#
4580	EC96	28		PLP	LOCK?
4590	EC97	D003		BNE WAIT3	-YES, LOCK SEMA
4600	EC99	4C09F8		JMP UNLOCK	ELSE UNLOCK SEMA
4610	EC9C	4C06F8	WAIT3	JMP LOCK	
4620		;			
4630		;	*****		
4640		;	* SEMAPHORE TIMER *		
4650		;	*****		
4660		;			
4670	EC9F	8CCDEC	CNTDN4	STY CNTDN2+1	SAVE Y REG
4680	ECA2	AD7DF3		LDA TIMER	TIMER LOCKOUT?
4690	ECA5	C93D		CMP #61	
4700	ECA7	B023		BCS CNTDN2	EXIT WITH NO TIMEOUT
4710	ECA9	AD03F7		LDA \$F703	ENABLE TIMER INTERRUPT
4720	ECAC	0903		ORA #3	
4730	ECAE	8D03F7		STA \$F703	
4740	ECB1	A04B	CNTDN3	LDY #75	WAIT FOR A TICK
4750	ECB3	AD7CF3		LDA TICK	
4760	ECB6	F0F9		BEQ CNTDN3	
4770	ECB8	A900		LDA #0	RESET TICK STATUS
4780	ECBA	8D7CF3		STA TICK	
4790	ECBD	CEB2EC		DEC CNTDN3+1	DEC TICK COUNT
4800	ECC0	D00A		BNE CNTDN2	EXIT IF NO SEC TICK
4810	ECC2	CE7DF3		DEC TIMER	DEC SEC COUNTER
4820	ECC5	F009		BEQ CNTDN1	EXIT ON TIMEOUT
4830	ECC7	A04B		LDY #75	RESTORE TICK COUNT
4840	ECC9	8CB2EC		STY CNTDN3+1	
4850	ECCC	A000	CNTDN2	LDY #0	EXIT WITH NO TIMEOUT
4860	ECCE	A9FF		LDA #\$FF	
4870	ECDO	08	CNTDN1	PHP	DISABLE TIMER INTERRUPT
4880	ECD1	AD03F7		LDA \$F703	
4890	ECD4	29FC		AND #\$FC	
4900	ECD6	8D03F7		STA \$F703	
4910	ECD9	28		PLP	
4920	ECDA	60		RTS	AND EXIT
4930		;			
4940		;	*****		
4950		;	* CMD ENTRY SEMA CLEAR *		
4960		;	* \$0476 JSR CMDENT *		
4970		;	*****		
4980		;			
4990	ECDB	AD7BF3	CMDENT	LDA CMDLOK	UNLOCK SEMAPHORES?
5000	ECDE	D003		BNE CMDE5	-NO, EXIT
5010	ECEO	2034ED		JSR CMDE8	
5020	ECE3	4C8144	CMDE5	JMP \$4481	
5030		;			

5040 ECE6 8DFBEC	CMDDET6 STA CMDET2+1	SETUP # OF PORTS-1
5050 ECE9 8EFOEC	STX CMDET1+1	STARTING SEMA#
5060 ECEC 8C09ED	STY CMDET3+1	DEVICE DRIVER#
5070 ECEF A200	CMDDET1 LDX #0	SET SEMA DATA
5080 ECF1 2018F8	JSR FNDSAT	
5090 ECF4 B925F3	LDA SEMALC, Y	
5100 ECF7 201BF8	JSR LOCK1	
5110 ECFA A000	CMDDET2 LDY #0	LOCKED?
5120 ECFC B00A	BCS CMDET3	-YES, OUTPUT FF
5130 ECFE CEFOEC	CMDDET7 DEC CMDET1+1	DEC SEMA#
5140 ED01 88	DEY	TEST NEXT SEMA?
5150 ED02 8CFBEC	STY CMDET2+1	
5160 ED05 10E8	BPL CMDET1	-YES
5170 ED07 60	RTS	EXIT
5180 ;	CMDDET3 LDX #0	GET DEV#
5190 ED08 A200	LDA FRMFED, X	
5200 EDOA BDADF3	BEQ CMDET4	
5210 EDOD F01D	LDA PRNPRT, X	SAVE OLD PORT#
5220 ED0F BD97F3	STA CMDET4+1	
5230 ED12 8D2DED	TYA	SETUP NEW PORT#
5240 ED15 98	STA PRNPRT, X	
5250 ED16 9D97F3	TXA	
5260 ED19 8A	LDX #\$0C	XMIT FF
5270 ED1A A20C	STX PRNDAT	
5280 ED1C 8EB638	LDX \$4466	
5290 ED1F AE6644	JSR PRNTNO	
5300 ED22 209AED	LDX CMDET3+1	RESTORE OLD PORT#
5310 ED25 AE09ED	LDA PRNPRT, X	
5320 ED28 BD97F3	TAY	
5330 ED2B A8	CMDDET4 LDA #0	
5340 ED2C A900	STA PRNPRT, X	
5350 ED2E 9D97F3	JMP CMDET7	
5360 ED31 4CFEEC	;	
5370 ;	CMDDET8 LDA #15	CLEAR CH# 0
5380 ED34 A90F	LDX #226	
5390 ED36 A2E2	LDY #0	
5400 ED38 A000	JSR CMDET6	
5410 ED3A 20E6EC	LDA #15	CLEAR CH# 1
5420 ED3D A90F	LDX #242	
5430 ED3F A2F2	LDY #1	
5440 ED41 A001	JSR CMDET6	
5450 ED43 20E6EC	LDA #0	CLEAR CH# 2
5460 ED46 A900	LDX #243	
5470 ED48 A2F3	LDY #2	
5480 ED4A A002	JSR CMDET6	
5490 ED4C 20E6EC	LDA #0	CLEAR CH# 3
5500 ED4F A900	LDX #244	
5510 ED51 A2F4	LDY #3	
5520 ED53 A003	JSR CMDET6	
5530 ED55 20E6EC	LDA #0	CLEAR CH# 4
5540 ED58 A900	LDX #245	
5550 ED5A A2F5	LDY #4	
5560 ED5C A004	STA DKLOKF+1	MARK DK SEMA CLR
5570 ED5E 8DDDF0	JSR CMDET6	
5580 ED61 20E6EC	JSR SEMCLR	CLEAR SEMAPHORES
5590 ED64 2000F8	JMP IOSMCL	AND EXIT
5600 ED67 4C03F8	;	*****
5610 ;	;	
5620 ;	;	

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5630      ;* PRINTER SEMAPHORE CLEAR (PRINT #DV!) *
5640      ;*
5650      ;* $4465 CPX #0          UNLOCK SEMAPHORE *
5660      ;* SEC
5670      ;* .BYTE $24
5680      ;* $4469 CLC           XMIT FF
5690      ;* JMP FMFED1
5700      ;***** ****
5710      ;
5720 ED6A 8E83ED FMFED1 STX FMFED4+1   UNLOCK SEMA IF CARRY SET
5730 ED6D B013     BCS FMFED4
5740 ED6F 20BDEA   JSR FLAGC9
5750 ED72 BDB6F3   LDA PAGMRG,X
5760 ED75 5D8BF3   EOR PAGCNT,X
5770 ED78 F002     BEQ FMFED2   -NO
5780 ED7A A90C     LDA #$0C   XMIT FF
5790 ED7C AE83ED   FMFED2 LDX FMFED4+1
5800 ED7F 4C392D   JMP $2D39
5810      ;
5820 ED82 A000     FMFED4 LDY #0       UNLOCK SEMA
5830 ED84 A9FF     LDA #$FF
5840 ED86 4C392D   JMP $2D39
5850      ;
5860      ;***** ****
5870      ;* PRINTER DRIVER *
5880      ;* $4D5B JMP PRNTN8 *
5890      ;* $3D55 JMP PRNTN3 *
5900      ;* $3E77 JMP PRNTN6 *
5910      ;* $3DFC JMP PRNTN5 *
5920      ;* $3E39 JMP PRNTX3 *
5930      ;*
5940      ;* $2DB0 .BYTE 0   *
5950      ;***** ****
5960      ;
5970 ED89 A900     PRNTN8 LDA #0       LOAD PRINTER
5980 ED8B 2C        .BYTE $2C
5990 ED8C A901     PRNTN3 LDA #1       MAPPING POINTER
6000 ED8E 2C        .BYTE $2C
6010 ED8F A902     PRNTN6 LDA #2
6020 ED91 2C        .BYTE $2C
6030 ED92 A903     PRNTN5 LDA #3
6040 ED94 209AED   PRNTX4 JSR PRNTNO  XMIT DATA
6050 ED97 4C2D3A   JMP $3A2D   AND EXIT
6060      ;
6070 ED9A 8EB1EE   PRNTNO STX PRNT6+1  SAVE REG
6080 ED9D 8CB4EE   STY PRNT8+1
6090 EDAO 8D92EE   STA PRNT7+1
6100 EDA3 8D6BEE   STA PRNTX7+1
6110 EDA6 AA        TAX
6120 EDA7 20E1EF   JSR SETDV
6130 EDA8 AA        TAX
6140 EDAB 8D23EE   STA PRNTX1+1
6150 EDAE 0A        ASL A
6160 EDAF A8        TAY
6170 EDB0 20E7EE   JSR PRNTZ1   GET SEMA INDEX
6180 EDB3 ADB638   LDA PRNDAT  RELEASE SEMA?
6190 EDB6 C9FF     CMP #$FF
6200 EDB8 D045     BNE PRNTX8  -NO, CONT
6210 EDBA 8CF4ED   STY PRNTF1+1 OUTPUT XOFF

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6220 EDBD 8E1EEE	STX PRNTF4+1	
6230 EDC0 2018F8	JSR FNDSAT	DID YOU SET SEMAPHORE?
6240 EDC3 B925F3	LDA SEMALC,Y	
6250 EDC6 201BF8	JSR LOCK1	
6260 EDC9 9020	BCC PRNTV4	-NO
6270 EDCB A000	LDY #0	
6280 EDCD B9CAF3	PRNTF3 LDA XOFF,Y	
6290 EDD0 20EEEED	JSR PRNTF2	
6300 EDD3 DOF8	BNE PRNTF3	
6310 EDD5 AE6BEE	LDX PRNTX7+1	
6320 EDD8 BDADF3	LDA FRMFED,X	XMIT FF?
6330 EDDB D005	BNE PRNTF5	-NO
6340 EDDD A90C	LDA #\$OC	XMIT FORM FEED
6350 EDDF 20EEEED	JSR PRNTF2	
6360 EDE2 ACF4ED	PRNTF5 LDY PRNTF1+1	
6370 EDE5 AE1EEE	LDX PRNTF4+1	
6380 EDE8 2009F8	JSR UNLOCK	CLEAR SEMA
6390 EDEB 4CBOEE	PRNTV4 JMP PRNT6	AND EXIT
6400 ;		
6410 EDEE 8CFCED	PRNTF2 STY PRNTF8+1	
6420 EDF1 F00B	BEQ PRNTF7	
6430 EDF3 A000	PRNTF1 LDY #0	
6440 EDF5 8DB638	STA PRNDAT	
6450 EDF8 2022EE	JSR PRNTX1	
6460 EDFB A000	PRNTF8 LDY #0	
6470 EDFD C8	INY	
6480 EDFE 60	PRNTF7 RTS	
6490 ;		
6500 EDFF 2016EF	PRNTX8 JSR DVLOCK	LOCK SEMA
6510 EE02 8E1EEE	STX PRNTF4+1	OUTPUT XON
6520 EE05 8CF4ED	STY PRNTF1+1	
6530 EE08 2018F8	JSR FNDSAT	
6540 EE0B B925F3	LDA SEMALC,Y	
6550 EE0E 201BF8	JSR LOCK1	
6560 EE11 B00A	BCS PRNTF4	
6570 EE13 A000	LDY #0	
6580 EE15 B9COF3	PRNTF6 LDA XON,Y	
6590 EE18 20EEEED	JSR PRNTF2	
6600 EE1B DOF8	BNE PRNTF6	
6610 EE1D A200	PRNTF4 LDX #0	
6620 EE1F ACF4ED	LDY PRNTF1+1	
6630 EE22 A200	PRNTX1 LDX #0	RESTORE INDEX PNT
6640 EE24 E004	CPX #4	EXTERNAL DRIVER?
6650 EE26 9003	BCC PRNTX5	-NO, CONT
6660 EE28 4C72F0	JMP PRNTA1	CALL EXTERNAL DRIVER
6670 EE2B B99FF3	PRNTX5 LDA PRNTAD,Y	SETUP DRIVER ADD
6680 EE2E 8DA0F0	STA PRNT1+1	
6690 EE31 CCBEF3	CPY PRNTYP	
6700 EE34 6901	ADC #1	
6710 EE36 8DB9F0	STA PRNT2+1	
6720 EE39 B9A0F3	LDA PRNTAD+1,Y	
6730 EE3C 8DA1F0	STA PRNT1+2	
6740 EE3F 8DBAF0	STA PRNT2+2	
6750 EE42 8D9BF0	STA PRNTP1+2	
6760 EE45 ADB638	LDA PRNDAT	FORM FEED?
6770 EE48 297F	AND #\$7F	
6780 EE4A C90C	CMP #\$OC	
6790 EE4C D034	BNE PRNT3	-NO, CONT
6800 EE4E AE92EE	LDX PRNT7+1	FF BY LF?

6810	EE51	BDB2F3	LDA	FRMFTP, X	
6820	EE54	8D50F3	STA	MCHARB	
6830	EE57	2C50F3	BIT	MCHARB	
6840	EE5A	1020	BPL	PRNTS5	-NO, XMIT NORMAL FF
6850	EE5C	8E6BEE	STX	PRNTX7+1	XMIT FF BY LF
6860	EE5F	A90A	LDA	#\$0A	
6870	EE61	8DB638	STA	PRNDAT	
6880	EE64	8C75EE	STY	PRNTXY+1	
6890	EE67	2082EE	JSR	PRNT3	
6900	EE6A	A200	PRNTX7	LDX #0	FF DONE?
6910	EE6C	BDB6F3		LDA PAGMRG, X	
6920	EE6F	DD8BF3		CMP PAGCNT, X	
6930	EE72	F03C		BEQ PRNT6	-YES, EXIT
6940	EE74	A000	PRNTXY	LDY #0	
6950	EE76	2082EE		JSR PRNT3	XMIT LF
6960	EE79	4C6AEE		JMP PRNTX7	
6970		;			
6980	EE7C	BDB6F3	PRNTS5	LDA PAGMRG, X	RESET LINE COUNT ON FF
6990	EE7F	9D8BF3		STA PAGCNT, X	
7000	EE82	A900	PRNT3	LDA #0	SETUP RETRY
7010	EE84	8D79F3		STA PRETCT	COUNTER
7020	EE87	A9E0		LDA #\$EO	
7030	EE89	8D7AF3		STA PRETCT+1	
7040	EE8C	A200	PRNT5	LDX #0	
7050	EE8E	4C82F0		JMP PRINTD	PRINT DATA
7060	EE91	A200	PRNT7	LDX #0	RESTORE X REG
7070	EE93	C90A	PRNTS3	CMP #\$0A	LINE FEED?
7080	EE95	D019		BNE PRNT6	-NO, EXIT
7090	EE97	FE8BF3		INC PAGCNT, X	INC LINE COUNT
7100	EE9A	BD8FF3		LDA PAGSZE, X	
7110	EE9D	20DBEF		JSR FFTEST	FORM FEED?
7120	EEAO	B00E		BCS PRNT6	-NO, EXIT
7130	EEA2	7DB6F3		ADC PAGMRG, X	SETUP PAGE MARGIN?
7140	EEA5	DD8BF3		CMP PAGCNT, X	
7150	EEA8	B00C		BCS PRNTS4	-NO, XMIT LF
7160	EEAA	BDB6F3		LDA PAGMRG, X	RESTORE PAGE COUNT
7170	EEAD	9D8BF3		STA PAGCNT, X	
7180	EEB0	A200	PRNT6	LDX #0	RESTORE X REG
7190	EEB2	EA		NOP	
7200	EEB3	A000	PRNT8	LDY #0	RESTORE Y REG
7210	EEB5	60		RTS	AND EXIT
7220		;			
7230	EEB6	BD93F3	PRNTS4	LDA PAGSAT, X	PAGING ON?
7240	EEB9	F0F5		BEQ PRNT6	-NO, EXIT
7250	EEBB	DOC5		BNE PRNT3	XMIT LF
7260		;			
7270	EEBD	20C4EE	PRINTR	JSR PRNTR1	
7280	EECO	DOCA		BNE PRNT5	
7290	EEC2	FOBE		BEQ PRNT3	
7300		;			
7310	EEC4	A901	PRNTR1	LDA #1	
7320	EEC6	20B83E		JSR DELAY	
7330	EEC9	EE79F3		INC PRETCT	
7340	EECC	D00A		BNE PRNTR2	
7350	EECE	EE7AF3		INC PRETCT+1	
7360	EED1	D005		BNE PRNTR2	
7370	EED3	20253E		JSR STALLED	OUTPUT STALLED
7380	EED6	A900		LDA #0	
7390	EED8	60	PRNTR2	RTS	

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7400          ;
7410 EED9 20643A PRNTX3 JSR CRTIN      GO WAIT FOR CRT INPUT
7420 EEDC 297F AND #$7F
7430 EEDE C903 CMP #$03
7440 EEE0 F057 BEQ DVLOK3
7450 EEE2 68 PLA
7460 EEE3 8DB638 STA PRNDAT
7470 EEE6 60 RTS

7480          ;
7490 EEE7 E004 PRNTZ1 CPX #4           EXTERNAL DRIVER?
7500 EEE9 3003 BMI PRNTZ5
7510 EEEB A2F5 LDX #245
7520 EEED 60 RTS

7530          ;
7540 EEEE CCBEF3 PRNTZ5 CPY PRNTYP     PARALLEL MODE?
7550 EEF1 9009 BCC PRNTZ2
7560 EEF3 8A TXA
7570 EEF4 A2F3 LDX #243
7580 EEF6 C902 CMP #2
7590 EEF8 F001 BEQ PRNTZ3
7600 EEFA E8 INX
7610 EEFB 60 PRNTZ3 RTS

7620          ;
7630 EEFC AE6BEE PRNTZ2 LDX PRNTX7+1   GET PORT#
7640 EEFF BD97F3 LDA PRNPRT,X
7650 EF02 0A ASL A
7660 EF03 8D8DEE STA PRNT5+1
7670 EF06 AE23EE LDX PRNTX1+1
7680 EF09 F003 BEQ PRNTZ4
7690 EF0B A9E3 LDA #227
7700 EF0D 2C .BYTE $2C
7710 EF0E A9D3 PRNTZ4 LDA #211
7720 EF10 18 CLC
7730 EF11 6D8DEE ADC PRNT5+1
7740 EF14 AA TAX
7750 EF15 60 RTS

7760          ;
7770          ;*****
7780          ;* I/O DEVICE LOCK *
7790          ;*****
7800          ;

7810 EF16 8E3AEF DVLOCK STX DVLOK3+1   SAVE SEMAPHORE #
7820 EF19 A901 DVLOK4 LDA #1           SETUP ZERO TIME LIMIT
7830 EF1B 8D7DF3 STA TIMER
7840 EF1E 8DB2EC STA CNTDN3+1
7850 EF21 2006F8 DVLOK2 JSR LOCK
7860 EF24 AD7DF3 LDA TIMER
7870 EF27 F001 BEQ DVLOK1
7880 EF29 60 RTS

7890          ;
7900 EF2A ADO0FC DVLOK1 LDA $FC00     INPUT FROM CRT?
7910 EF2D 4A LSR A
7920 EF2E 90E9 BCC DVLOK4
7930 EF30 AD01FC LDA $FC01
7940 EF33 297F AND #$7F
7950 EF35 C903 CMP #3
7960 EF37 DOE0 BNE DVLOK4
7970 EF39 A200 DVLOK3 LDX #0
7980 EF3B 2009F8 JSR UNLOCK

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