

000.000
000.000

```
1 HB4IO EQU 0 ASSEMBLE FOR HB-4 CARD
2 IF HB4IO
4 ELSE
5 TITLE 'ATDUD - AT: DEVICE DRIVER, FOR HB-5 SERIAL I/O'
6 ENDIF
```

```

8 *** ATDVD - AT DEVICE DRIVER.
9 *
10 * J.G. LETWIN
11 *
12 * G. Chandler 78.10
13 * 79.11
14 * 79.12
    
```

```

16 ** ATDVD IS THE DEVICE DRIVER FOR THE DEVICE
17 *
18 * AT!
19 *
20 * IF HB4IO=0
21 * THEN
22 * PORT = 374-5
23 * ELSE
24 * PORT = 320-7
25 *
26 *
27 *
000.000 28 XTEXT ASCII
    
```

```

30X ** ASCII CHARACTER EQUIVALENCES.
31X
000.015 32X CR EQU 13 CARRIAGE RETURN
000.012 33X LF EQU 10 LINE FEED
000.200 34X NULL EQU 2000 PAD CHARACTER
000.000 35X NUL2 EQU 0
000.007 36X BELL EQU 7 BELL CHARACTER
000.177 37X RUBOUT EQU 1770
000.010 38X BKSP EQU 100 CTL-H
000.026 39X C.SYN EQU 260 SYNC
000.002 40X C.STX EQU 2 STX
000.047 41X QUOTE EQU 470
000.011 42X TAB EQU 110
000.033 43X ESC EQU 330
000.012 44X NL EQU 120 NEW LINE (HDOS SYSTEMS)
000.212 45X ENL EQU NL+2000 NL + END-OF-LINE-FLAG
000.014 46X FF EQU 140 FORM FEED
000.001 47X CTLA EQU 010 CTL-A
000.002 48X CTLB EQU 020 CTL-B
000.003 49X CTLC EQU 030 CTL-C
000.004 50X CTLD EQU 040 CTL-D
000.017 51X CTLO EQU 170 CTL-O
000.020 52X CTLP EQU 200 CTL-P
000.021 53X CTLQ EQU 210 CTL-Q
000.023 54X CTLS EQU 230 CTL-S
000.032 55X CTLZ EQU 320 CTL-Z
000.000 56 XTEXT DDEF
    
```

	58X **	DEVICE DRIVER COMMUNICATION FLAGS.			
	59X *				
	60X				
000.000	61X	ORG	0		
	62X				
000.000	63X	DC.REA	DS	1	READ
000.001	64X	DC.WRI	DS	1	WRITE
000.002	65X	DC.RER	DS	1	READ REGARDLESS
000.003	66X	DC.OPR	DS	1	OPEN FOR READ
000.004	67X	DC.OPW	DS	1	OPEN FOR WRITE
000.005	68X	DC.OPU	DS	1	OPEN FOR UPDATE
000.006	69X	DC.CLO	DS	1	CLOSE
000.007	70X	DC.ABT	DS	1	ABORT
000.010	71X	DC.MOU	DS	1	MOUNT DEVICE
000.011	72X	DC.LOD	DS	1	LOAD DEVICE DRIVER
000.012	73X	DC.MAX	DS	1	MAXIMUM ENTRY INDEX
000.013	74	XTEXT	MTR		

77X ** MTR - PAM/8 EQUIVALENCES.

78X *

79X * THIS DECK CONTAINS SYMBOLIC DEFINITIONS USED TO

80X * MAKE USE OF THE PAM/8 CODE AND CONTROL BYTES.

82X ** IO PORTS

83X

000.360	84X	IP.PAD	EQU	3600	PAD INPUT PORT
000.360	85X	OP.CTL	EQU	3600	CONTROL OUTPUT PORT
000.360	86X	OP.DIG	EQU	3600	DIGIT SELECT OUTPUT PORT
000.361	87X	OP.SEG	EQU	3610	SEGMENT SELECT OUTPUT PORT

89X ** FRONT PANEL CONTROL BITS.

90X

000.020	91X	CB.SSI	EQU	00010000B	SINGLE STEP INTERRUPT
000.040	92X	CB.MTL	EQU	00100000B	MONITOR LIGHT
000.100	93X	CB.CLI	EQU	01000000B	CLOCK INTERRUPT ENABLE
000.200	94X	CB.SPK	EQU	10000000B	SPEAKER ENABLE

96X ** MONITOR MODE FLAGS.

97X

000.000	98X	DM.MR	EQU	0	MEMORY READ
000.001	99X	DM.MW	EQU	1	MEMORY WRITE
000.002	100X	DM.RR	EQU	2	REGISTER READ
000.003	101X	DM.RW	EQU	3	REGISTER WRITE

103X ** USER OPTION BITS.

104X *

105X * THESE BITS ARE SET IN CELL .MFLAG.

106X

000.200	107X	UO.HLT	EQU	10000000B	DISABLE HALT PROCESSING
000.100	108X	UO.NFR	EQU	CB.CLI	NO REFRESH OF FRONT PANEL
000.002	109X	UO.IDU	EQU	00000010B	DISABLE DISPLAY UPDATE
000.001	110X	UO.CLK	EQU	00000001B	ALLOW PRIVATE INTERRUPT PROCESSING

112X ** MONITOR IDENTIFICATION FLAGS

113X *

114X * THESE BYTES IDENTIFY THE ROM MONITOR.

115X * THEY ARE THE VARIOUS VALUES OF LOCATION .IDENT

116X

000.021	117X	M.PAMB	EQU	0210	'LXI' INSTRUCTION AT 000.000 IN PAM-8
000.303	118X	M.FOX	EQU	3030	'JMP' INSTRUCTION AT 000.000 IN FOX ROM

ENTRY

120X ** ROUTINE ENTRY POINTS.

121X *

122X

000.000	123X	.IDENT	EQU	0000A	IDENTIFICATION LOCATION
000.003	124X	.DLY	EQU	0053A	DELAY
001.267	125X	.LOAD	EQU	1267A	TAPE LOAD
001.374	126X	.DUMP	EQU	1374A	TAPE DUMP
002.136	127X	.ALARM	EQU	2136A	ALARM ROUTINE
002.140	128X	.HORN	EQU	2140A	HORN
002.172	129X	.CTC	EQU	2172A	CHECK TAPE CHECKSUM
002.205	130X	.TPERR	EQU	2205A	TAPE ERROR ROUTINE
002.264	131X	.PCHL	EQU	2264A	PCHL INSTRUCTION
002.265	132X	.SRS	EQU	2265A	SCAN RECORD START
002.325	133X	.RNP	EQU	2325A	READ NEXT PAIR
002.331	134X	.RNB	EQU	2331A	READ NEXT BYTE
002.347	135X	.CRC	EQU	2347A	CRC-16 CALCULATOR
003.017	136X	.WNP	EQU	3017A	WRITE NEXT PAIR
003.024	137X	.WNB	EQU	3024A	WRITE NEXT BYTE
003.122	138X	.DOD	EQU	3122A	DECODE FOR OCTAL DISPLAY
003.260	139X	.RCK	EQU	3260A	READ CONSOLE KEYS
003.356	140X	.DODA	EQU	3356A	SEGMENT CODE TABLE

142X ** RAM CELLS USED BY HBMTX.

143X *

144X

040.000	145X	.START	EQU	40000A	START DUMP ADDRESS
040.002	146X	.IDWRK	EQU	40002A	IN OR OUT INSTRUCTION
040.005	147X	.REGI	EQU	40005A	DISPLAYED REGISTER INDEX
040.006	148X	.DSPROT	EQU	40006A	PERIOD FLAG BYTE
040.007	149X	.DSPMOD	EQU	40007A	DISPLAY MODE
040.010	150X	.MFLAG	EQU	40010A	USER OPTION BYTE
040.011	151X	.CTLFLG	EQU	40011A	PANEL CONTROL BYTE
040.013	152X	.ALEDS	EQU	40013A	ABUSS LEDS
040.021	153X	.DLEDS	EQU	40021A	DBUSS LEDS
040.024	154X	.ABUSS	EQU	40024A	ABUSS REGISTER
040.027	155X	.CRCSUM	EQU	40027A	CRCSUM WORD
040.031	156X	.TPERRX	EQU	40031A	TAPE ERROR EXIT VECTOR
040.033	157X	.TICNT	EQU	40033A	CLOCK TICK COUNTER
040.035	158X	.REGPTR	EQU	40035A	REGISTER POINTER
040.037	159X	.UIVEC	EQU	40037A	USER INTERRUPT VECTORS
000.013	160	XTEXT	HOSEQ		

162X ** HDOS SYSTEM EQUIVALENCES.

163X *

164X

024.000	165X	S.GRT0	EQU	24000A	SYSTEM AREA FOR GRT0
025.000	166X	S.GRT1	EQU	25000A	SYSTEM AREA FOR GRT1
026.000	167X	S.GRT2	EQU	26000A	SYSTEM AREA FOR GRT2
	168X				
030.000	169X	ROMBOOT	EQU	30000A	ROM BOOT ENTRY
	170X				

040.100	171X	ORG	40100A	FREE SPACE FROM PAM-8
	172X			
040.100	173X	DS	8	JUMP TO SYSTEM EXIT
040.110	174X	D.CON	16	DISK CONSTANTS
040.130	175X	SYDD	*	SYSTEM DISK ENTRY POINT
040.130	176X	D.VEC	24*3	SYSTEM ROM ENTRY VECTORS
040.240	177X	D.RAM	31	SYSTEM ROM WORK AREA
040.277	178X	S.VAL	36	SYSTEM VALUES
040.343	179X	S.INT	115	SYSTEM INTERNAL WORK AREAS
041.126	180X	DS	16	
041.146	181X	S.SOVR	2	STACK OVERFLOW WARNING
041.150	182X	DS	42200A-*	SYSTEM STACK
001.032	183X	STACKL	*-S.SOVR	STACK SIZE
	184X			
042.200	185X	STACK	*	LWA+1 SYSTEM STACK
042.200	186X	USERFWA	*	USER FWA
042.200	187	XTEXT	ESVAL	

189X ** S.VAL - SYSTEM VALUE DEFINITIONS.

190X *

191X * THESE VALUES ARE SET AND MAINTAINED BY THE SYSTEM.

192X *

193X * THE DECK HOSEQU MUST BE MODIFIED WHEN THIS IS MODIFIED.

194X

195X

040.277	196X	ORG	S.VAL	
	197X			

040.277	198X	S.DATE	DS	9	SYSTEM DATE (IN ASCII)
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040.310	199X	S.DATC	DS	2	CODED DATE
---------	------	--------	----	---	------------

040.312	200X	S.TIME	DS	4	TIME FROM MIDNIGHT (IN TICS)
---------	------	--------	----	---	------------------------------

040.316	201X	S.HIMEM	DS	2	HARDWARE HIGH MEMORY ADRES+1
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040.320	203X	S.SYSM	DS	2	FWA RESIDENT SYSTEM
---------	------	--------	----	---	---------------------

040.322	205X	S.USRM	DS	2	LWA USER MEMORY
---------	------	--------	----	---	-----------------

040.324	207X	S.OMAX	DS	2	MAX OVERLAY SIZE FOR SYSTEM
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208X

209X

210X ** THE FOLLOWING FIVE CELLS SHOULD BE MODIFIED/READ ONLY VIA THE .CONSL SYSCALL

211X

000.200	212X	CSL.ECH	EQU	10000000B	SUPPRESS ECHO
---------	------	---------	-----	-----------	---------------

000.002	213X	CSL.WRP	EQU	00000010B	WRAP LINES AT WIDTH
---------	------	---------	-----	-----------	---------------------

000.001	214X	CSL.CHR	EQU	00000001B	OPERATE IN CHARACTER MODE
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215X

000.000	216X	I.CSLMD	EQU	0	S.CSLMD IS FIRST BYTE
---------	------	---------	-----	---	-----------------------

040.326	217X	S.CSLMD	DS	1	CONSOLE MODE
---------	------	---------	----	---	--------------

218X

000.200	219X	CTP.BKS	EQU	10000000B	TERMINAL PROCESSES BACKSPACES
---------	------	---------	-----	-----------	-------------------------------

000.040	220X	CTP.MLI	EQU	00100000B	MAP LOWER CASE TO UPPER ON INPUT
---------	------	---------	-----	-----------	----------------------------------

000.020	221X	CTP.MLO	EQU	00010000B	MAP LOWER CASE TO UPPER ON OUTPUT
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000.010	222X	CTP.2SB	EQU	00001000B	TERMINAL NEEDS TWO STOP BITS
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000.002	223X	CTP.BKM	EQU	00000010B	MAP BKSP (UPON INPUT) TO SUBOUT
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000.001	224X	CTF.TAB	EQU	00000001B	TERMINAL SUPPORTS TAB CHARACTERS
	225X				
000.001	226X	I.CONTY	EQU	1	S.CONTY IS 2ND BYTE
000.000	227X		ERRNZ	*-S.CSLMD-I.CONTY	
040.327	228X	S.CONTY	DS	1	CONSOLE TYPE FLAGS
000.002	229X	I.CUSOR	EQU	2	S.CUSOR IS 3RD BYTE
000.000	230X		ERRNZ	*-S.CSLMD-I.CUSOR	
040.330	231X	S.CUSOR	DS	1	CURRENT CURSOR POSITION
000.003	232X	I.CONWI	EQU	3	S.CONWI IS 4TH BYTE
000.000	233X		ERRNZ	*-S.CSLMD-I.CONWI	
040.331	234X	S.CONWI	DS	1	CONSOLE WIDTH
	235X				
000.001	236X	CD.FLG	EQU	00000001B	CTL-D FLAG
000.200	237X	CS.FLG	EQU	10000000B	CTL-S FLAG
	238X				
000.004	239X	I.CONFL	EQU	4	S.CONFL IS 5TH BYTE
000.000	240X		ERRNZ	*-S.CSLMD-I.CONFL	
040.332	241X	S.CONFL	DS	1	CONSOLE FLAGS
	242X				
040.333	243X	S.CAADR	DS	2	ADDRESS FOR ABORT PROCESSING (>256 IF VALID)
040.335	244X	S.CCTAB	DS	6	ADDR FOR CTL-A, CTL-B, CTL-C PROCESSING
040.343	245		XTEXT	ECDEF	

247X ** ERROR CODE DEFINITIONS.

	248X				
000.000	249X		ORG	0	
000.000	250X		DS	1	NO ERROR #0
000.001	251X	EC.EOF	DS	1	END OF FILE
000.002	252X	EC.EOM	DS	1	END OF MEDIA
000.003	253X	EC.ILC	DS	1	ILLEGAL SYSCALL CODE
000.004	254X	EC.CNA	DS	1	CHANNEL NOT AVAILABLE
000.005	255X	EC.DNS	DS	1	DEVICE NOT SUITABLE
000.006	256X	EC.IDN	DS	1	ILLEGAL DEVICE NAME
000.007	257X	EC.IFN	DS	1	ILLEGAL FILE NAME
000.010	258X	EC.NRD	DS	1	NO ROOM FOR DEVICE DRIVER
000.011	259X	EC.FNO	DS	1	CHANNEL NOT OPEN
000.012	260X	EC.ILR	DS	1	ILLEGAL REQUEST
000.013	261X	EC.FUC	DS	1	FILE USAGE CONFLICT
000.014	262X	EC.FNF	DS	1	FILE NAME NOT FOUND
000.015	263X	EC.UND	DS	1	UNKNOWN DEVICE
000.016	264X	EC.ICN	DS	1	ILLEGAL CHANNEL NUMBER
000.017	265X	EC.DIF	DS	1	DIRECTORY FULL
000.020	266X	EC.IFC	DS	1	ILLEGAL FILE CONTENTS
000.021	267X	EC.NEM	DS	1	NOT ENOUGH MEMORY
000.022	268X	EC.RF	DS	1	READ FAILURE
000.023	269X	EC.WF	DS	1	WRITE FAILURE
000.024	270X	EC.WPV	DS	1	WRITE PROTECTION VIOLATION
000.025	271X	EC.WP	DS	1	DISK WRITE PROTECTED
000.026	272X	EC.FAP	DS	1	FILE ALREADY PRESENT
000.027	273X	EC.DDA	DS	1	DEVICE DRIVER ABORT
000.030	274X	EC.FL	DS	1	FILE LOCKED
000.031	275X	EC.FAO	DS	1	FILE ALREADY OPEN
000.032	276X	EC.IS	DS	1	ILLEGAL SWITCH
000.033	277X	EC.UUN	DS	1	UNKNOWN UNIT NUMBER

000.034	276X	EC.FNR	DS	1	FILE NAME REQUIRED
000.035	279X	EC.DIW	DS	1	DEVICE IS NOT WRITABLE (OR WRITE LOCKED)
000.036	280X	EC.UNA	DS	1	UNIT NOT AVAILABLE
000.037	281X	EC.ILV	DS	1	ILLEGAL VALUE
000.040	282X	EC.ILO	DS	1	ILLEGAL OPTION
000.041	283X	EC.VPM	DS	1	VOLUME PRESENTLY MOUNTED ON DEVICE
000.042	284X	EC.NVM	DS	1	NO VOLUME PRESENTLY MOUNTED
000.043	285X	EC.FOB	DS	1	FILE OPEN ON DEVICE
000.044	286X	EC.NPM	DS	1	NO PROVISIONS MADE FOR REMOUNTING MORE DISKS
000.045	287X	EC.DNI	DS	1	DISK NOT INITIALIZED
000.046	288X	EC.DNR	DS	1	DISK IS NOT READABLE
000.047	289X	EC.DSC	DS	1	DISK STRUCTURE IS CORRUPT
000.050	290X	EC.MCV	DS	1	NOT CORRECT VERSION OF HDOS
000.051	291X	EC.NOS	DS	1	NO OPERATING SYSTEM MOUNTED
000.052	292X	EC.YOI	DS	1	ILLEGAL OVERLAY INDEX
000.053	293X	EC.OTL	DS	1	OVERLAY TOO LARGE
000.054	294		XTEXT	PICDEF	

296X ** PIC FORMAT EQUIVALENCES:

000.000	297X				
	298X		ORG	0	
	299X				
000.000	300X	PIC.ID	DS	1	3770 = BINARY FILE FLAG
000.001	301X		DS	1	FILE TYPE (FT.PIC)
000.002	302X	PIC.LEN	DS	2	LENGTH OF ENTIRE RECORD
000.004	303X	PIC.PTR	DS	2	INDEX OF START OF PIC TABLE
	304X				
000.006	305X	PIC.COD	DS	0	CODE STARTS HERE
000.006	306		XTEXT	DEVDEF	

308X ** DEVICE TABLE ENTRIES.

000.000	309X				
	310X		ORG	0	
	311X				
000.000	312X	DEV.NAM	DS	2	DEVICE NAME
000.000	313X	DEV.EL	EQU	00000000B	END OF DEVICE LIST FLAG
000.001	314X	DEV.NU	EQU	00000001B	DEVICE ENTRY NOT IN USE
	315X				
000.002	316X	DEV.RES	DS	1	DRIVER RESIDENSE CODE
000.001	317X	DR.IM	EQU	00000001B	DRIVER IN MEMORY
000.002	318X	DR.FR	EQU	00000010B	DRIVER PERMINANTLY RESIDENT
	319X				
000.003	320X	DEV.JMP	DS	1	JMP TO PROCESSOR
000.004	321X	DEV.DDA	DS	2	DRIVER ADDRESS
000.006	322X	DEV.FLG	DS	1	FLAG BYTE
000.001	323X	DT.DD	EQU	00000001B	DIRECTORY DEVICE
000.002	324X	DT.CR	EQU	00000010B	CAPABLE OF READ OPERATION
000.004	325X	DT.CW	EQU	00000100B	CAPABLE OF WRITE OPERATION
	326X				
000.007	327X	DEV.SPG	DS	1	SECTORS PER GROUP THIS DEVICE
000.010	328X	DEV.HUM	DS	1	MOUNTED UNIT MASK

DEV

000.011	329X	DEV.MNU DS	1	MAXIMUM NUMBER OF UNITS
000.012	330X	DEV.UNT DS	2	ADDRESS OF UNIT SPECIFIC DATA TABLE
	331X			
000.014	332X	DEV.DVL DS	2	DRIVER BYTE LENGTH
000.016	333X	DEV.DVG DS	1	DRIVER ROUTINE GROUP ADDRESS
	334X			
000.017	335X	DEVELEN EQU	*	DEVICE TABLE ENTRY LENGTH

337X ** UNIT SPECIFIC DEVICE DATA TABLE ENTRIES

	338X			
000.000	339X	ORG	0	
	340X			
000.000	341X	UNT.FLG DS	1	UNIT SPECIFIC *DEV.FLG*
000.001	342X	UNT.GRT DS	2	ADDRESS OF GROUP RESERVATION TABLE (IF DT,DD)
000.003	343X	UNT.GTS DS	2	GRT SECTOR NUMBER
000.005	344X	UNT.DIS DS	2	DIRECTORY FIRST SECTOR NUMBER
	345X			
000.007	346X	UNT.SIZ EQU	*	SIZE OF UNIT SPECIFIC DATA TABLE PER UNIT
000.007	347	XTEXT	DVDDEF	

349X ** DEVICE DRIVER EQUIVALENCES.

	350X			
000.307	351X	DVDFLV EQU	307Q	DEVICE DRIVER FLAG VALUE
	352X			
000.006	353X	ORG	PIC.COD	STARTS AT PIC CODE AREA
	354X			
000.006	355X	DVD.DVD DS	1	MUST BE DVDFLV; FLAGS TO HDOS AS DRIVER
000.007	356X	DVD.CAP DS	1	DEVICE CAPABILITY FLAG
000.010	357X	DVD.MUM DS	1	MOUNTED UNIT MASK
000.011	358X	DVD.MNU DS	1	MAXIMUM NUMBER OF UNITS
000.012	359X	DVD.UFL DS	8	UNIT SUB-CAPABILITY FLAGS FOR UNITS 0-7
000.022	360X	DVD.SET DS	1	= DVDFLV IFF DRIVER WILL TAKE SET OPTIONS
000.023	361X	DS	24	RESERVED; MUST BE 0
000.053	362X	DVD.STE EQU	*	ENTRY FOR 'SET' INVOCATION
	363X			
002.000	364X	DVD.ENT EQU	2000A	DRIVER ENTRY POINT (MUST BE MULT OF 256)
000.053	365	XTEXT	SETCAL	

367X ** SETCAL - FIXED ADDRESS ROUTINES IN SET

	368X	*		
	369X	*		THESE VECTORS ARE FIXED ENTRY POINTS INTO THE
	370X	*		SET PROGRAM TO UTILIZED BY DEVICE DRIVERS IN
	371X	*		PROCESSING SET COMMANDS.
	372X	*		
	373X			
042.201	374X	ORG	USERFWA+1	
	375X			

042.201	376X \$SNA	DS	3	
	377X			
042.204	378X \$DCS	DS	3	
	379X			
042.207	380X \$CNA	DS	3	
	381X			
042.212	382X \$FST	DS	3	
	383X			
042.215	384X \$TBLS	DS	3	
	385X			
042.220	386X \$WTBLS	DS	3	
	387X			
042.223	388X \$LBB	DS	3	
	389X			
042.226	390X \$SOP	DS	3	
	391X			
042.231	392X \$PBF	DS	3	
	393X			
042.234	394X \$PBV	DS	3	
	395X			
042.237	396X	DS	60	RESERVED
042.333	397	XTEXT	U8250	

399X ** 8250 UART CONTROL AND BIT DEFINITIONS.

	400X			
000.350	401X SC.ACE	EQU	3500	SYSTEM CONSOLE PORT IF 8250 ACE
000.156	402X AC.DLY	EQU	110	220 MIL. SEC. DELAY FOR 8250
	403X			
000.000	404X UR.RBR	EQU	0	RECEIVER BUFFER REGISTER (READ ONLY)
	405X			
000.000	406X UR.THR	EQU	0	TRANSMITTER HOLDING REGISTER (WRITE ONLY)
	407X			
000.000	408X UR.DLL	EQU	0	DIVISOR LATCH (LEAST SIGNIFICANT)
	409X			
000.001	410X UR.DLM	EQU	1	DIVISOR LATCH (MOST SIGNIFICANT)
	411X			
000.001	412X UR.IER	EQU	1	INTERRUPT ENABLE REGISTER
000.001	413X UC.EDA	EQU	00000001B	ENABLE RECEIVED DATA AVAILABLE INTERRUPT
000.002	414X UC.TRE	EQU	00000010B	ENABLE TRANSMIT HOLD REGISTER EMPTY INTERRUPT
000.004	415X UC.RSI	EQU	00000100B	ENABLE RECEIVE STATUS INTERRUPT
000.010	416X UC.MSI	EQU	00001000B	ENABLE MODEM STATUS INTERRUPT
	417X			
000.002	418X UR.IIR	EQU	2	INTERRUPT IDENTIFICATION REGISTER
000.001	419X UC.IIP	EQU	00000001B	INVERTED INTERRUPT PENDING (0 MEANS PENDING)
000.006	420X UC.IID	EQU	00000110B	INTERRUPT ID
	421X			
000.003	422X UR.LCR	EQU	3	LINE CONTROL REGISTER
000.000	423X UC.5BW	EQU	00000000B	5 BIT WORDS
000.001	424X UC.6BW	EQU	00000001B	6 BIT WORDS
000.002	425X UC.7BW	EQU	00000010B	7 BIT WORDS
000.003	426X UC.8BW	EQU	00000011B	8 BIT WORDS
000.004	427X UC.2SB	EQU	00000100B	TWO STOP BITS SELECTED
000.010	428X UC.PEN	EQU	00001000B	PARITY COMPUTATION ENABLED

000.020	429X UC.EPS	EQU	00010000B	EVEN PARITY SELECT
000.040	430X UC.SKP	EQU	00100000B	STICK PARITY
000.100	431X UC.SB	EQU	01000000B	SET BREAK
000.200	432X UC.DLA	EQU	10000000B	DIVISOR LATCH ACCESS
000.004	434X UR.MCR	EQU	4	MODEM CONTROL REGISTER
000.001	435X UC.DTR	EQU	00000001B	DATA TERMINAL READY
000.002	436X UC.RTS	EQU	00000010B	REQUEST TO SEND
000.004	437X UC.0U1	EQU	00000100B	OUT 1
000.010	438X UC.0U2	EQU	00001000B	OUT 2
000.020	439X UC.L00	EQU	00010000B	LOOP
000.005	441X UR.LSR	EQU	5	LINE STATUS REGISTER
000.001	442X UC.DR	EQU	00000001B	DATA READY
000.002	443X UC.0R	EQU	00000010B	OVERRUN
000.004	444X UC.PE	EQU	00000100B	PARITY ERROR
000.010	445X UC.FE	EQU	00001000B	FRAMING ERROR
000.020	446X UC.BI	EQU	00010000B	BREAK INTERRUPT
000.040	447X UC.THE	EQU	00100000B	TRANSMITTER HOLDING REGISTER EMPTY
000.100	448X UC.TSE	EQU	01000000B	TRANSMITTER SHIFT REGISTER EMPTY
000.006	450X UR.MSR	EQU	6	MODEM STATUS REGISTER
000.001	451X UC.DCS	EQU	00000001B	DELTA CLEAR TO SEND
000.002	452X UC.DDR	EQU	00000010B	DELTA DATA SET READY
000.004	453X UC.TER	EQU	00000100B	TRAILING EDGE OF RING
000.010	454X UC.DRL	EQU	00001000B	DELTA RECEIVE LINE SIGNAL DETECT
000.020	455X UC.CTS	EQU	00010000B	CLEAR TO SEND
000.040	456X UC.DSR	EQU	00100000B	DATA SET READY
000.100	457X UC.RI	EQU	01000000B	RING INDICATOR
000.200	458X UC.RLS	EQU	10000000B	RECEIVED LINE SIGNAL DETECT
042.333	459	XTEXT	U8251	

```

462X **      B251 USART BIT DEFINITIONS.
463X *
464X
465X **      PORT ADDRESSES
466X
000.000     467X UDR   EQU    0          DATA REGISTER IS EVEN
000.001     468X USR   EQU    1          STATUS REGISTER IS NEXT
469X
000.372     470X SC.UART EQU   3720        CONSOLE USART ADDRESS (IFF B251)
471X
472X
473X **      MODE INSTRUCTION CONTROL BITS.
474X
000.100     475X UMI.1B EQU   01000000B        1 STOP BIT
000.200     476X UMI.HB EQU   10000000B        1 1/2 STOP BITS
000.300     477X UMI.2B EQU   11000000B        2 STOP BITS
000.040     478X UMI.PE EQU   00100000B        EVEN PARITY
000.020     479X UMI.PA EQU   00010000B        USE PARITY
000.000     480X UMI.L5 EQU   00000000B        5 BIT CHARACTERS
000.004     481X UMI.L6 EQU   00000100B        6 BIT CHARACTERS
000.010     482X UMI.L7 EQU   00001000B        7 BIT CHARACTERS
000.014     483X UMI.L8 EQU   00001100B        8 BIT CHARACTERS
000.001     484X UMI.1X EQU   00000001B        CLOCK X 1
000.002     485X UMI.16X EQU  00000010B        CLOCK X 16
000.003     486X UMI.64X EQU   00000011B        CLOCK X 64
487X
488X **      COMMAND INSTRUCTION BITS.
489X
000.100     490X UCI.IR EQU   01000000B        INTERNAL RESET
000.040     491X UCI.RD EQU   00100000B        READER-DN CONTROL FLAG
000.020     492X UCI.ER EQU   00010000B        ERROR RESET
000.004     493X UCI.RE EQU   00000100B        RECEIVE ENABLE
000.002     494X UCI.IE EQU   00000010B        ENABLE INTERRUPTS FLAG
000.001     495X UCI.TE EQU   00000001B        TRANSMIT ENABLE
496X
497X **      STATUS READ COMMAND BITS.
498X
000.040     499X USR.FE EQU   00100000B        FRAMING ERROR
000.020     500X USR.OE EQU   00010000B        OVERRUN ERROR
000.010     501X USR.PE EQU   00001000B        PARITY ERROR
000.004     502X USR.TXE EQU  00000100B        TRANSMITTER EMPTY
000.002     503X USR.RXR EQU   00000010B        RECEIVER READY
000.001     504X USR.TXR EQU   00000001B        TRANSMITTER READY
505
506
041.061     507 AIO.UNI EQU   041061A        ADDRESS OF I/O UNIT NUMBER
508
509
510 *      CODE HEADER
511
512      CODE   PIC
513
000.006 307  514      DB   DVDFLV        DEVICE DRIVER FLAG VALUE
000.007 006  515      DB   DT.CR+DT.CW    DEVICE CAPABILITY: READ AND WRITE
000.010 001  516      DB   00000001B      MOUNTED UNIT MASK
000.011 001  517      DB   1                ONLY 1 UNIT
    
```

000.012	008	518	DB	DT.CR+DT.CW	0:	CAPABLE OF WRITE
000.013		519	DS	7	1-7:	IGNORED
000.022	307	520	DB	DVDPLV		
		521				
000.000		522	ERRNZ	*-0230		
000.023		523	DS	DVD.STE-0230		RESERVED AREAS

```
526 *** ASSEMBLY CONSTANTS
527 *
528 *
529
530 ** DEFAULT DEVICE DEFINITIONS
531 *
532
533 IF HB410
000.000 534 DFLT.AT EQU 3200 PORT ADDRESS
000.320 535 DFLT.RD EQU 1200A 300 BAUD
001.200 536 ELSE
537 DFLT.AT EQU 3740 PORT ADDRESS
538 DFLT.RD EQU 000A
539 ENBIF
540
000.000 541 DFLT.PD EQU 0 DEFAULT NUMBER OF PAD CHARACTERS
000.120 542 DFLT.WD EQU 80 80 COLUMN WIDTH
000.001 543 DFLT.CX EQU 1 INITIAL COLUMN INDEX
000.000 544 DFLT.CS EQU 0 DEFAULT CTL-S SETTING
```

```
546 **
547 *
548
000.000 549 SB.1 EQU 00000000B ONE STOP BIT
000.200 550 SB.2 EQU 10000000B TWO STOP BITS
551
000.000 552 NLC EQU 00000000B MAP LOWER CASE
000.001 553 NDMLC EQU 00000001B NO MAP OF LOWER CASE
```

```

554 *** SET CODE ENTRY POINT
557 *
558 * SET COMMANDS ENTER HERE
559 *
560 *
561 * ENTRY: (DE) = LINE POINTER
562 * (A) = UNIT NUMBER
563 *
564 * EXIT: 'C' CLEAR IF OK
565 * 'C' SET IF ERROR
566 * (A) = ERROR CODE
567 *
568 * USES: ALL
569 *
570 *
000.053 571 SETNTR EQU *
000.000 572 ERRNZ *-DVD.STE
000.053 247 573 ANA A
000.054 302 103 060 574 JNZ SET1
000.057 102 575 MOV B,D
000.060 113 576 MOV C,E (BC) = PARAMETER LIST ADDRESS
000.061 021 250 001 577 LXI D,PRCTAB (DE) = PROCESSOR TABLE ADDRESS
000.064 041 114 001 578 LXI H,OPTTAB (HL) = OPTION TABLE ADDRESS
000.067 315 226 042 579 CALL $SOP
000.072 330 580 RC
000.073 315 201 042 581 CALL $SNA
000.076 310 582 RZ AT END OF LINE
000.077 076 040 583 MVI A,EC.ILO ILLEGAL OPTION SPECIFICATION
000.101 067 584 STC
000.102 311 585 RET
586
000.103 076 033 587 SET1 MVI A,EC.UUN UNKNOWN UNIT NUMBER
000.105 067 588 STC
000.106 311 589 RET
    
```

591 *** PROCESSORS
 592 *

594 ** FLAG - PROCESS FLAG OPTIONS
 595 *
 596 * ENTRY, EXIT, AND USE THE SAME AS PBF.
 597 *
 598
 000.107 303 231 042 599 FLAG JMP \$PBF

601 ** VAL - PROCESS VALUE OPTIONS
 602 *
 603 * ENTRY, EXIT, AND USE THE SAME AS PBV.
 604 *
 605
 000.112 303 234 042 606 VAL JMP \$PBV
 000.000 607 IF H84IO

609 ** BAUD - PROCESS BAUD RATE OPTION SPECIFICATION
 610 *
 611 *
 612 * ENTRY: (BC) = TEXT ADDRESS
 613 *
 614 * EXIT: (BC) = TEXT ADDRESS UPDATED
 615 * 'C' CLEAR IF OK
 616 * 'C' SET IF ERROR
 617 * (A) = ERROR CODE
 618 *
 619 * USES: ALL
 620 *

000.115 076 012 621
 000.117 315 207 042 622 BAUD MVI A,10 (A) = DEFAULT RADIX
 000.122 332 140 000 623 CALL \$CNA
 624 JC BAU1
 000.125 353 625 XCHG (DE) = BAUD RATE VALUE
 000.126 315 223 042 626 CALL \$LBD
 000.131 302 140 000 627 JNZ BAU1
 000.134 042 267 003 628 SHLD TAT.BAU SET BAUD RATE WORD
 000.137 311 629 RET
 630
 000.140 076 037 631 BAU1 MVI A,EC.ILV
 000.142 067 632 STC
 000.143 311 633 RET
 634 ENDIF

SET CODE

HELP

18:23:44 16-MAY-80

```

636 **      HELP - PROCESS HELP OPTION
637 *
638 *      TYPE VALID OPTIONS ON USER CONSOLE
639 *
640
000.144 315 136 031 641 HELP CALL $TYPTX
000.147 012 012 123 642 DB 'NL,NL;'Set Options';NL,NL
000.167 061 123 102 643 DB '1SB One stop bit',NL
000.211 062 123 102 644 DB '2SB Two stop bits',NL
000.234 115 114 103 645 DB 'MLC Map Lower Case',NL
000.260 116 117 115 646 DB 'NOMLC No mappings of Lower Case',NL
000.320 127 111 104 647 DB 'WIDTH n Page width',NL
000.343 120 101 104 648 DB 'PAD n Number of Pad characters for <CR>',NL
001.013 120 117 122 649 DB 'PORT n Port address',NL
000.000 650 IF HS4IO
001.037 102 101 125 651 DB 'BAUD n Baud rate',NL
652 ENDIF
001.060 110 105 114 653 DB 'HELP Type this message',NL
001.110 012 212 654 DB 'NL,ENL
001.112 257 655 XRA A CLEAR CARRY
001.113 311 656 RET

```



```
703 ** PRCTAB - PROCESSOR TABLE
704 *
705
001.250 706 PRCTAB DS 0
707
000.000 708 FLAGI EQU *-PRCTAB/2
001.250 107 000 709 DW FLAG
710
000.001 711 VALI EQU *-PRCTAB/2
001.252 112 000 712 DW VAL
713
000.000 714 IF HB410
000.002 715 BAUDI EQU *-PRCTAB/2
001.254 115 000 716 DW BAUD
717 ENDIF
718
000.003 719 HELPI EQU *-PRCTAB/2
001.256 144 000 720 DW HELP
721
000.000 722 IF HB410
723 ELSE
724 BS 0640 ACCOUNT FOR CONDITIONAL ASSEMBLY
725 ENDIF
726
001.260 727 SET 1260A
000.000 728 ERRNZ *-
001.260 729 BS DVD.ENT-
```

```

732 *** ATDVD ENTRY POINT.
733 *
734 * ENTRY (A) = PROCESS CODE
735 * (BC) = BYTE COUNT (USUALLY)
736 * (DE) = MEMORY ADDRESS (USUALLY)
737 * EXIT 'C' CLEAR IF OK
738 * 'C' SET IF ERROR
739 * (A) = ERROR CODE
740 * USES ALL
741
742
002.000 743 ATDVD EQU * ENTRY POINT
000.000 744 ERRNZ *-DVD.ENT
002.000 315 076 031 745 CALL $TBRA ENTER PROCESSOR
002.003 054 746 DB ATREAD-* READ
002.004 121 747 DB ATWRITE-* WRITE
002.005 010 748 DB ATABTR-* READR
002.006 021 749 DB ATOPE-* OPENR
002.007 020 750 DB ATOPE-* OPENW
002.010 005 751 DB ATABTR-* OPENU
002.011 041 752 DB ATNOP-* CLOSE
002.012 007 753 DB ATABT-* ABORT
002.013 002 754 DB ATABTR-* MOUNT
002.014 011 755 DB ATLOAD-* LOAD
  
```

```

757 ** ATABTR - ISSUE DEVICE DRIVER ABORT TO REQUEST.
758
002.015 076 027 759 ATABTR MVI A,EC.DDA DEVICE DRIVER ABORT
002.017 067 760 STC
002.020 311 761 RET
  
```

```

763 ** ATABT - ABORT DEVICE DRIVER
764 *
765
002.021 315 366 002 766 ATABT CALL CRLF
002.024 311 767 RET
  
```

```

769 ** ATLOAD - LOAD DEVICE DRIVER
770 *
771
002.025 772 ATLOAD EQU *
002.025 247 773 ANA A CLEAR CARRY
002.026 311 774 RET
  
```

```
776 ** ATOPE - OPEN (READ OR WRITE)
777 *
778
779
002.027 257 780 ATOPE XRA A
002.030 062 124 002 781 STA EOFFLG CLEAR EOF ON INPUT FLAG
002.033 072 266 003 782 LDA TAT.POR
002.036 052 267 003 783 LHLD TAT.BAU
000.000 784 IF H8410
002.041 315 122 003 785 CALL I8250
786 ELSE
787 CALL I8251
788 ENDIF
002.044 076 015 789 MVI A,CR
002.046 315 146 002 790 CALL TCH RESET COLUMN INDEX, AND RETURN CARRIAGE
002.051 311 791 RET
```

```
793 ** ATNOP - IGNORE REQUEST.
794
795
002.052 247 796 ATNOP ANA A
002.053 311 797 RET DO NOTHING
```

```

800 ** ATREAD - READ DATA FROM CONSOLE.
801 *
802 * ATREAD READS BYTES UNTIL THE REQUEST IS SATISFIED,
803 * OR A CTL-D IS STRUCK. THE CTL-D IS TAKEN AS EOF.
804
002.054 022 805 ATR2 STAX D STORE CHAR
002.055 023 806 INX D
002.056 013 807 DCX B
808
002.057 809 ATREAD EQU *
002.057 072 124 002 810 LDA EOFLG
002.062 037 811 RAR
002.063 330 812 RC IS EOF
813
002.064 170 814 MOV A,B
002.065 261 815 ORA C
002.066 310 816 RZ ALL DONE
817
818 * TAKE A CHAR
819
002.067 315 222 002 820 ATR1 CALL RCHAR READ CHARACTER
002.072 332 102 002 821 JC ATREOF
002.075 376 004 822 CPI 04
002.077 302 054 002 823 JNE ATR2 NOT CTL-D
824
825 * HAVE EOF CHARACTER. FILL THIS SECTOR WITH 0'S
826
002.102 076 003 827 ATREOF MVI A,EC.EOF*2+1
002.104 062 124 002 828 STA EOFLG FLAG EOF
002.107 257 829 ATR4 XRA A
002.110 022 830 STAX D STORE 0
002.111 023 831 INX D
002.112 013 832 DCX B
002.113 171 833 MOV A,C
002.114 261 834 ORA C
002.115 302 107 002 835 JNZ ATR4
002.120 076 001 836 MVI A,EC.EOF
002.122 067 837 STC SET EOF
002.123 311 838 RET
839
840
002.124 000 841 EOFLG DB 0 EOF FLAG
  
```

```

844
845 *** ATWRITE - WRITE TO AT DEVICE.
846 *
847 * ATWRITE WRITES THE DATA TO THE AT DEVICE.
848 *
849 * THE SPECIAL CHARACTERS:
850 *
851 * TAB
852 * FF
853 * NULL
854 * NL
855 *
856 * ARE TREATED SEPERATELY.
857 *
858 * IF AN ABORT IS POSTED BEFORE THE OPERATION COMPLETS,
859 * ATWRITE EXITS.
860
861
002.125 862 ATWRITE EQU *
002.125 072 334 040 863 LDA S,CAADR+1 SEE IF ADDRESS
002.130 247 864 ANA A
002.131 300 865 RNZ ABORT, CLAIM ALL DONE
002.132 170 866 MOV A,B
002.133 261 867 ORA C CHECK BYTE COUNT LEFT
002.134 310 868 RZ ALL DONE
869
870 * (A) = CHARACTER. SEE IF NEEDS SPECIAL PROCESSING:
871 *
872 * NULL
873 * NL
874 * TAB
875 * FF
876
002.135 032 877 LDAX D
002.136 315 146 002 878 CALL TCH TYPE CHARACTER
002.141 023 879 ATW2 INX B INCREMENT POINTER
002.142 013 880 DCX B DECREMENT COUNT
002.143 303 125 002 881 JMP ATWRITE

883 ** TCH - TYPE CHARACTER
884 *
885 * (A) = CHARACTER
886 * EXIT NONE
887 * USES A,F
888
002.146 247 889 TCH ANA A
002.147 310 890 RZ IS NULL
002.150 376 012 891 CPI NL
002.152 312 366 002 892 JE CRLF IS NEW LINE
002.155 376 014 893 CPI FF
002.157 302 176 002 894 JNE TCH2 IS NOT FF
002.162 076 006 895 MVI A,6
002.164 365 896 TCH1 PUSH PSW
  
```

TCH

002.165	315	366	002	897	CALL	CRLF	
002.170	361			898	POP	PSW	
002.171	075			899	DCR	A	
002.172	302	164	002	900	JNZ	TCH1	
002.175	311			901	RET		
				902			
002.176	376	011		903	TCH2	CPY	TAB
002.200	302	271	002	904	JNE	WCHAR	IS NOT TAB, JUST PRINT IT
002.203	076	040		905	WCH3	MVI	A,
002.205	315	271	002	906	CALL	WCHAR	WRITE BLANK
002.210	072	274	003	907	LDA	TAT,CX	
002.213	075			908	DCR	A	
002.214	346	007		909	ANI	7	
002.216	302	203	002	910	JNZ	WCH3	
002.221	311			911	RET		


```

915 **      RCHAR - READ CHARACTER.
916 *
917 *      ENTRY  NONE
918 *      EXIT   'C' CLEAR IF CHARACTER
919 *           (A) = CHARACTER
920 *           'C' SET IF USER CONSOLE INTERRUPT
921 *      USES   A,F
922
923
002,222 072 334 040 924 RCHAR LDA   S,CAADR+1
002,225 247          925      ANA   A
002,226 067          926      STC
002,227 300          927      RNZ          CONSOLE INTERRUPT
928
002,230 315 022 003 929      CALL  INCHAR
002,233 312 222 002 930      JZ    RCHAR
002,236 346 177          931      ANI   1770          MASK OUT HIGH ORDER BIT
932
002,240 376 015 933      CPI   CR
002,242 302 247 002 934      JNE   RCHAR2          NOT CR
002,245 076 012 935      MVI   A,NL
936
002,247 365          937 RCHAR2 PUSH  PSW
002,250 072 271 003 938      LDA   TAT,CON
002,253 346 001          939      ANI   MLCYNDRLC
002,255 302 265 002 940      JNZ   RCHAR3          NO MAPPING OF LOWER CASE
002,260 361          941      POP  PSW
002,261 315 254 003 942      CALL  $MCU
002,264 365          943      PUSH PSW
944
002,265 361          945 RCHAR3 POP  PSW
002,266 247          946      ANA   A          CLEAR CARRY
002,267 311          947      RET
  
```

```

949 **      WAIT - WAIT FOR THE HANDSHAKE
950 *
951
002,270          952 WAIT  EQU  *
002,270 311          953      RET
  
```

```

955 **      WCHAR - WRITE CHARACTER
956 *
957 *      ENTRY  (A) = CHARACTER
958 *      EXIT   NONE
959 *      USES   A,F
960
961
002,271 365          962 WCHAR PUSH  PSW
002,272 376 040 963      CPI   ,
002,274 332 315 002 964      JC    WCHARO          NOT PRINTABLE, SO SKIP COUNT CHECK!
  
```

```

002.277 072 274 003 965 LDA TAT.CX
002.302 075 966 BCR A
002.303 041 273 003 967 LXI H,TAT.WID
002.306 276 968 CMP M
002.307 332 315 002 969 JC WCHAR0
002.312 315 366 002 970 CALL WCHAR0 TAT.CX-1 < TAT.WID
002.315 072 271 003 971 WCHAR0 LDA TAT.CON
002.320 346 001 972 ANI MLCINOMLC
002.322 302 332 002 973 JNZ WCHAR1 NO MAPPING
002.325 361 974 POP PSW
002.328 315 254 003 975 CALL #KCU
002.331 365 976 PUSH PSW
977
002.332 361 978 WCHAR1 POP PSW
979
002.333 315 054 003 980 CALL OUTCHAR
981
002.336 376 015 982 CPI CR
002.340 312 360 002 983 JZ WCHAR2
002.343 376 040 984 CPI '
002.345 332 365 002 985 JC WCHAR3
002.350 072 274 003 986 LDA TAT.CX NOT PRINTABLE
002.353 074 987 INR A
002.354 062 274 003 988 STA TAT.CX
002.357 311 989 RET
990
002.360 076 001 991 WCHAR2 MVI A,1
002.362 062 274 003 992 STA TAT.CX
002.365 311 993 WCHAR3 RET
    
```

995 ** CRLF - TYPE CRLF.

996 *

997

998

```

002.366 076 015 999 CRLF MVI A,CR
002.370 315 271 002 1000 CALL WCHAR
002.373 076 012 1001 MVI A,LF
002.375 315 271 002 1002 CALL WCHAR
003.000 072 272 003 1003 LDA TAT.PAD
003.003 267 1004 ORA A
003.004 312 021 003 1005 CRLF1 JZ CRLF2
003.007 365 1006 PUSH PSW
003.010 257 1007 XRA A
003.011 315 271 002 1008 CALL WCHAR
003.014 361 1009 POP PSW
003.015 075 1010 BCR A
003.016 303 004 003 1011 JNP CRLF1
003.021 311 1012 CRLF2 RET
003.022 1013 XTEXT DUDID
    
```

```

1015X **      INCHAR - INPUT CHARACTER
1016X *
1017X *      INPUT CHARACTER FROM SPECIFIED DEVICE
1018X *
1019X *      ENTRY  NONE
1020X *
1021X *      EXIT  (PSW) = 'Z' CLEAR IF THERE IS A CHARACTER
1022X *              (A) = CHARACTER
1023X *              = 'Z' SET  IF THERE IS NOT A CHARACTER
1024X *
1025X *      USES  (PSW)
1026X *
1027X
003.022      1028X INCHAR EQU *
003.022 345   1029X      PUSH H
003.023 072 266 003 1030X      LDA  D,PORT
003.026 147   1031X      MOV  H,A
1032X
1033X *      CHECK FOR DATA
1034X
000.000      1035X      IF    H8410
1036X
003.027 056 005   1037X      MVI  L,UR.LSR
003.031 315 232 003 1038X      CALL IN
003.034 346 001   1039X      ANI  UC,DR          'Z' SET IF THERE IS DATA
003.036 312 051 003 1040X      JZ   INC1          NO DATA
003.041 056 000   1041X      MVI  L,UR.RBR
003.043 315 232 003 1042X      CALL IN
003.046 303 052 003 1043X      JMP  INC2
1044X
1045X      ELSE
1046X
1047X      MVI  L,USR
1048X      CALL IN
1049X      ANI  USR,RXR      'Z' SET IF THERE IS NO DATA
1050X      JZ   INC1          NO DATA
1051X      MVI  L,UDR
1052X      CALL IN
1053X      ANA  A          IGNORE NULL CHARACTERS
1054X      JMP  INC2
1055X
1056X      ENDIF
1057X
003.051 067   1058X INC1  STC
1059X
003.052 341   1060X INC2  POP  H
003.053 311   1061X      RET
    
```

OUTCHAR

```

1063X **      OUTCHAR - OUTPUT CHARACTER
1064X *
1065X *      OUTPUT CHARACTER TO SPECIFIED DEVICE
1066X *
1067X *      ENTRY (A) = CHARACTER
1068X *
1069X *      EXIT NONE
1070X *
1071X *      USES (PSW)
1072X *
1073X
003.054      1074X OUTCHAR EQU *
003.054 345   1075X PUSH H
1076X
003.055 365   1077X PUSH PSW
003.056 072 266 003 1078X LDA D,PORT
003.061 147   1079X MOV H,A
1080X
000.000      1081X IF H8410
1082X
003.062 056 005 1083X MVI L,UR,LSR
003.064 315 270 002 1084X CALL WAIT
003.067 072 334 040 1085X OUTC0 LDA S,CAADR+1
003.072 247   1086X ANA A
003.073 302 117 003 1087X JNZ OUTC1
003.076 315 232 003 1088X CALL IN
003.101 346 040 1089X ANI UC,THE
003.103 312 067 003 1090X JZ OUTC0
003.106 361   1091X POP PSW
003.107 056 000 1092X MVI L,UR,THR
003.111 315 242 003 1093X CALL OUT
003.114 303 120 003 1094X JMP OUTC2
1095X
1096X ELSE
1097X
1098X MVI L,USR
1099X CALL WAIT
1100X OUTC0 LDA S,CAADR+1
1101X ANA A
1102X JNZ OUTC1
1103X CALL IN
1104X ANI USR,THR
1105X JZ OUTC0
1106X POP PSW
1107X MVI L,USR
1108X CALL OUT
1109X JMP OUTC2
1110X
1111X ENDF
1112X
003.117 361   1113X OUTC1 POP PSW
1114X
003.120 341   1115X OUTC2 POP H
003.121 311   1116X RET
000.000      1117X IF H8410

```

```

1119X **      18250 - INITIALIZE 8250
1120X *
1121X *      INITIALIZE AN 8250 PORT.  STOLEN AS CAP FROM CONSL. DRIVER.
1122X *
1123X *      ENTRY (A) = PORT ADDRESS
1124X *      (HL)C0-14J = NEW BAUD RATE
1125X *      (HL)I15J = 1 IF TWO STOP BITS
1126X *
1127X *      EXIT NONE
1128X *
1129X *      USES (A)
1130X *
1131X
003.122      1132X 18250 EQU *
003.122 325  1133X PUSH D
1134X
003.123 353  1135X XCHG
003.124 147  1136X MOV H,A
003.125 056 001 1137X MVI L,UR,IER /79.02.GC/
003.127 257  1138X XRA A /79.02.GC/
003.130 315 242 003 1139X CALL OUT /79.02.GC/
003.133 056 004 1140X MVI L,UR,MCR /79.01.GC/
003.135 076 020 1141X MVI A,UC,LOD /79.01.GC/
003.137 315 242 003 1142X CALL OUT SET LOOP-BACK /79.01.GC/
003.142 056 003 1143X MVI L,UR,LCR
003.144 076 200 1144X MVI A,UC,DLA
003.146 315 242 003 1145X CALL OUT
003.151 056 000 1146X MVI L,UR,BLL
003.153 173  1147X MOV A,E
003.154 315 242 003 1148X CALL OUT
003.157 056 001 1149X MVI L,UR,DLH
003.161 172  1150X MOV A,D
003.162 346 177  1151X ANI 177H
003.164 315 242 003 1152X CALL OUT
003.167 056 003 1153X MVI L,UR,LCR
003.171 172  1154X MOV A,D
003.172 007  1155X RLC
003.173 007  1156X RLC
003.174 007  1157X RLC
000.000      1158X ERRNZ UC,25B-4
003.175 346 004  1159X ANI UC,25B
003.177 366 003  1160X ORI UC,8BH 8 BIT WORDS
003.201 315 242 003 1161X CALL OUT
003.204 056 000  1162X MVI L,UR,RBR
003.206 315 232 003 1163X CALL IN REMOVE GARBAGE
003.211 076 156  1164X MVI A,AC,BLY /79.01.GC/
003.213 315 053 000 1165X CALL ,BLY /79.01.GC/
003.216 056 004  1166X MVI L,UR,MCR /79.01.GC/
003.220 315 232 003 1167X CALL IN /79.01.GC/
003.223 346 357  1168X ANI 377H-UC,LOD /79.01.GC/
003.225 315 242 003 1169X CALL OUT TURN OFF LOOP-BACK /79.01.GC/
1170X
003.230 321  1171X POP D
003.231 311  1172X RET
1173X ELSE
1174X 18251 SPACE 4,10
    
```

```

1175X **      I8251 - INITIALIZE 8251
1176X *
1177X *      INITIALIZE AN 8251 PORT
1178X *
1179X *      ENTRY (A) = PORT ADDRESS
1180X *      (HL)[15] = 1 IF TWO STOP BITS
1181X *
1182X *      EXIT NONE
1183X *
1184X *      USES ALL
1185X *
1186X
1187X I8251 EQU *
1188X XCHG
1189X MOV H,A
1190X MVI L,USR
1191X MOV A,D
1192X ANI 2000 (A) = 2000 IF TWO STOP BITS
1193X ERRCNZ 2000+UMI.1B-UMI.2B
1194X ORI UMI.1B+UMI.LB+UMI.16X
1195X SYA I8251.B
1196X LXI B,I8251.A
1197X I8251.1 LDAX B
1198X CPI #3770
1199X JZ I8251.2
1200X CALL OUT
1201X INX B
1202X JMP I8251.1
1203X I8251.2 MVI A,UCI.ER+UCI.TE+UCI.RE
1204X CALL OUT
1205X MVI L,DDR
1206X CALL IN
1207X RET
1208X I8251.A DB 0,0,0,0,0,0
1209X DB UCI.IR
1210X I8251.B DB 0
1211X DB 3770 CONFIGURATION BYTE
1212X ENDBIF
    
```

```

1214X **      IN - INPUT
1215X *
1216X *      INPUT BYTE FROM SPECIFIED PORT
1217X *
1218X *      ENTRY (H) = PORT ADDRESS
1219X *      (L) = OFFSET
1220X *
1221X *      EXIT (A) = BYTE READ
1222X *
1223X *      USES (PSW)
1224X *
1225X
003.232 1226X IN EQU *
003.232 174 1227X MOV A,H
    
```

IN

```

003.233 205      1228X      ADD    L
003.234 062 240 003 1229X      STA   IN,ADD
003.237 333 000      1230X      IN    *-*
003.240      1231X IN,ADD EQU   *-1
003.241 311      1232X      RET
  
```

```

1234X **      OUT - OUTPUT
1235X *
1236X *      OUTPUT BYTE TO SPECIFIED PORT
1237X *
1238X *      ENTRY (A) = BYTE TO BE WRITTEN
1239X *      (H) = PORT ADDRESS
1240X *      (L) = OFFSET
1241X *
1242X *      EXIT  NONE
1243X *
1244X *      USES  NONE
1245X *
1246X
  
```

```

003.242      1247X OUT    EQU   *
003.242 365      1248X      PUSH  PSW
003.243 174      1249X      MOV   A,H
003.244 205      1250X      ADD   L
003.245 062 252 003 1251X      STA   OUT,ADD
003.250 361      1252X      POP   PSW
003.251 323 000      1253X      OUT   *-*
003.252      1254X OUT,ADD EQU   *-1
003.253 311      1255X      RET
003.254      1256X      XTEXT  MCU
  
```

```

1258X **      MCU - MAP LOWER CASE TO UPPER CASE.
1259X *
1260X *      MCU MAPS A LOWER CASE ALPHABETIC TO UPPER
1261X *      CASE.
1262X *
1263X *      ENTRY (A) = CHARACTER
1264X *      EXIT  (A) = CHARACTER RESULT
1265X *      USES  A,F
1266X
1267X
  
```

```

003.254 376 141      1268X $MCU  CFI   'a'
003.256 330      1269X      RC    NOT LOWER CASE
003.257 376 173      1270X      CFI   'z'+1
003.261 320      1271X      RNC   NOT LOWER CASE
003.262 326 040      1272X      SUI   'a'-'A'
003.264 311      1273X      RET
  
```

```

1275 *** TAT.UNT - TABLE AT: UNIT CONSTANTS
1276 *
1277
003.265 1278 TAT.UNA EQU *
1279
003.265 000 1280 TAT.UNT DB 0 UNIT NUMBER
1281
003.265 1282 TAT.AS EQU TAT.UNT [?] = 1 IF ASSIGNED
1283
003.266 320 1284 TAT.POR DB DFLT.AT PORT NUMBER
003.266 1285 D.PORT EQU TAT.POR
1286
003.267 200 001 1287 TAT.BAU DW DFLT.BD BAUD RATE
003.270 1288 TAT.SR EQU *-1 [?] = 1 IF TWO STOP BITS
1289
003.271 000 1290 TAT.CON BB MLC CONFIGURATION BYTE
1291
003.272 000 1292 TAT.PAD DB DFLT.PD NUMBER OF PAD CHAR. FOR <CR>
1293
003.273 120 1294 TAT.WID DB DFLT.WD TERMINAL WIDTH
1295
003.274 001 1296 TAT.CX BB DFLT.CX COLUMN INDEX
1297
003.275 000 1298 TAT.CTS DB BFLT.CS CTL-S FLAG
  
```


003.276

1301 XTEXT TBRA

1303X ** \$TBRA - BRANCH RELATIVE THOUGH TABLE.
 1304X *
 1305X * \$TBRA USES THE SUPPLIED INDEX TO SELECT A BYTE FROM THE
 1306X * JUMP TABLE; THE CONTENTS OF THIS BYTE ARE ADDED TO THE
 1307X * ADDRESS OF THE BYTE, YEILDING THE PROCESSOR ADDRESS.
 1308X *
 1309X * CALL \$TBRA
 1310X * DB LAB1-* INDEX = 0 FOR LAB1
 1311X * DB LAB2-* INDEX = 1 FOR LAB2
 1312X * DB LABN-* INDEX = N-1 FOR LABN
 1313X *
 1314X * ENTRY (A) = INDEX
 1315X * (RET) = TABLE FWA
 1316X * EXIT TO COMPUTED ADDRESS
 1317X * USES F,H,L
 1318X
 1319X

031.076
 003.276

1320X \$TBRA EQU 31076A IN H17 ROM
 1321 XTEXT TYPTX

1323X ** \$TYPTX - TYPE TEXT,
 1324X *
 1325X * \$TYPTX IS CALLED TO TYPE A BLOCK OF TEXT ON THE SYSTEM CONSOLE.
 1326X *
 1327X * IMBEDDED ZERO BYTES INDICATE A CARRIAGE RETURN LINE FEED,
 1328X * A BYTE WITH THE 2000 BIT SET IS THE LAST BYTE IN THE MESSAGE.
 1329X *
 1330X * ENTRY (RET) = TEXT
 1331X * EXIT TO (RET+LENGTH)
 1332X * USES A,F
 1333X
 1334X

031.136

1335X \$TYPTX EQU 31136A IN H17 ROM

031.144

1337X \$TYPTX EQU 31144A IN H17 ROM

003.276 114 122
 003.300

1338
 1339 DW 'RL' DUMY ADDRESS FOR RELOCATION
 1340 DS 64 PATCH AREA
 1341
 1342 LON G
 1343

004.000 055 000 062
 000 065 000
 123 000 132
 000 135 000
 114 001 125
 001 136 001
 147 001 162

1344 END

001 176 001
207 001 221
001 250 001
252 001 254
001 256 001
022 002 031
002 034 002
037 002 042
002 047 002
060 002 070
002 073 002
100 002 105
002 116 002
137 002 144
002 153 002
160 002 166
002 173 002
201 002 204
002 211 002
217 002 231
002 234 002
243 002 251
002 256 002
262 002 275
002 300 002
304 002 310
002 313 002
316 002 323
002 327 002
334 002 341
002 346 002
351 002 355
002 363 002
371 002 376
002 001 003
005 003 012
003 017 003
024 003 032
003 037 003
044 003 047
003 057 003
065 003 074
003 077 003
104 003 112
003 115 003
131 003 140
003 147 003
155 003 165
003 202 003
207 003 221
003 226 003
235 003 246
003 000 000

ASSEMBLY COMPLETE
1344 STATEMENTS

0 ERRORS DETECTED
12582 BYTES FREE

CROSS REFERENCE TABLE

\$CNA	042207	380L	623		
\$DCS	042204	378L			
\$FST	042212	382L			
\$LBD	042223	388L	626		
\$MCU	003254	942	975	1268L	
\$PBF	042231	392L	599		
\$PBV	042234	394L	606		
\$SNA	042201	376L	581		
\$SOP	042226	390L	579		
\$TBL5	042215	384L			
\$TBRA	031076	745	1320E		
\$TYPTX	031136	641	1335E		
\$TYPTX.	031144	1337E			
\$WTBL5	042220	386L			
.ABUSS	001260	727S	728	729	
.ALARM	040024	154E			
.ALEDS	002136	127E			
.ALRS	040013	152E			
.CRC	002347	135E			
.CRCSUM	040027	155E			
.CTC	002172	129E			
.CTLFLG	040011	151E			
.DLEDS	040021	153E			
.DLY	000053	124E	1165		
.DOD	003122	138E			
.DODA	003356	140E			
.DSPMOD	040007	149E			
.DSPROT	040006	148E			
.DUMP	001374	126E			
.HORN	002140	128E			
.IDENT	000000	123E			
.IOWRK	040002	146E			
.LOAD	001267	125E			
.MFLAG	040010	150E			
.PCHL	002264	131E			
.RCK	003260	139E			
.REBI	040005	147E			
.REGPTR	040035	158E			
.RNB	002331	134E			
.RNP	002325	133E			
.SRS	002265	132E			
.START	040000	145E			
.TICCNT	040033	157E			
.TPERR	002205	130E			
.TPERRX	040031	154E			
.UIVEC	040037	159E			
.WNB	003024	137E			
.WNP	003017	136E			
AC.DLY	000156	402E	1164		
AIO.UNI	041061	507E			
ATABT	002021	753	766L		
ATABTR	002015	748	751	754	759L
ATDVB	002000	743E			
ATLOAD	002025	755	772E		
ATNOP	002052	752	796L		
ATOPE	002027	749	750	780L	
ATR1	002067	820L			
ATR2	002054	805L	823		

CROSS REFERENCE TABLE

ATRA	002107'	829L	835			
ATREAD	002057'	746	809E			
ATREOF	002102'	821	827L			
ATW2	002141'	879L				
ATWRITE	002125'	747	862E	881		
BAU1	000140'	624	627	631L		
BAUD	000115'	622L	716			
BAUDI	000002	694	715E			
BELL	000007	36E				
BKSP	000010	38E				
C.STX	000002	40E				
C.SYN	000026	39E				
CB.CLI	000100	93E	108			
CB.MTL	000040	92E				
CB.SPK	000200	94E				
CB.SSI	000020	91E				
CD.FLG	000001	236E				
CR	000015	32E	789	933	982	999
CRLF	002366'	766	892	897	970	999L
CRLF1	003004'	1005L	1011			
CRLF2	003021'	1005	1012L			
CS.FLG	000200	237E				
CSL.CHR	000001	214E				
CSL.ECH	000200	212E				
CSL.WRP	000002	213E				
CTLA	000001	47E				
CTLB	000002	48E				
CTLC	000003	49E				
CTLD	000004	50E				
CTLQ	000017	51E				
CTLP	000020	52E				
CTLR	000021	53E				
CTLS	000023	54E				
CTLZ	000032	55E				
CTP.2SB	000010	222E				
CTP.BKM	000002	223E				
CTP.BKS	000200	219E				
CTP.MLI	000040	220E				
CTP.MLO	000020	221E				
CTP.TAB	000001	224E				
D.CON	040110	174L				
D.PORT	003266'	1030	1078	1285E		
D.RAM	040240	177L				
D.VEC	040130	176L				
DC.ART	000007	70L				
DC.CLO	000006	69L				
DC.LOD	000011	72L				
DC.MAX	000012	73L				
DC.MOU	000010	71L				
DC.OPR	000003	66L				
DC.OPU	000005	68L				
DC.DPW	000004	67L				
DC.REA	000000	63L				
DC.RER	000002	65L				
DC.WRI	000001	64L				
DEV.DDA	000004	321L				
DEV.DVG	000016	333L				
DEV.DVL	000014	332L				

CROSS REFERENCE TABLE

DEV.FLG	000006	322L		
DEV.JMP	000003	320L		
DEV.MNU	000011	329L		
DEV.MUM	000010	328L		
DEV.NAM	000000	312L		
DEV.RES	000002	316L		
DEV.SPG	000007	327L		
DEV.UMT	000012	330L		
DEVELEN	000017	335E		
DFLT.AT	000320	534E	1284	
DFLT.BD	001200	535E	1287	
DFLT.CS	000000	544E	1298	
DFLT.CX	000001	543E	1296	
DFLT.PD	000000	541E	1292	
DFLT.WD	000120	542E	1294	
DM.MR	000000	98E		
DM.MW	000001	99E		
DM.RR	000002	100E		
DM.RW	000003	101E		
DR.IM	000001	317E		
DR.PR	000002	318E		
DT.CR	000002	324E	515	518
DT.CW	000004	325E	515	518
DT.BD	000001	323E		
DV.EL	000000	313E		
DV.NU	000001	314E		
DVD.CAP	000007	356L		
DVD.DVD	000006	355L		
DVD.ENT	002000	364E	729	744
DVD.MNU	000011	358L		
DVD.MUM	000010	357L		
DVD.SET	000022	360L		
DVD.STE	000053	362E	523	572
DVD.UFL	000012	359L		
DVDFLV	000307	351E	514	520
EC.CNA	000004	254L		
EC.DBA	000027	273L	759	
EC.BIF	000017	265L		
EC.DIW	000035	279L		
EC.INI	000045	287L		
EC.DNR	000046	288L		
EC.DNS	000005	255L		
EC.DSC	000047	289L		
EC.EOF	000001	251L	827	836
EC.EOM	000002	252L		
EC.FAD	000031	275L		
EC.FAP	000026	272L		
EC.FL	000030	274L		
EC.FNF	000014	262L		
EC.FNO	000011	259L		
EC.FNR	000034	278L		
EC.FOD	000043	285L		
EC.FUC	000013	261L		
EC.ICN	000016	264L		
EC.IDN	000006	256L		
EC.IFC	000020	266L		
EC.IFN	000007	257L		
EC.ILC	000003	253L		

OUTC1	003117	1087	1113L				
OUTC2	003120	1094	1115L				
OUTCHAR	003054	980	1074E				
PIC.COD	000006	305L	353				
PIC.ID	000000	300L					
PIC.LEN	000002	302L					
PIC.PTR	000004	303L					
PRCTAB	001250	577	706L	708	711	715	719
QUOTE	000047	41E					
RCHAR	002222	820	924L	930			
RCHAR2	002247	934	937L				
RCHAR3	002265	940	945L				
ROMBOOT	030000	169E					
RUBDUT	000177	37E					
S.CAADR	040333	243L	863	924	1085		
S.CCTAB	040335	244L					
S.CONFL	040332	241L					
S.CONTY	040327	228L					
S.CONWI	040331	234L					
S.CSLMD	040326	217L	227	230	233	240	
S.CUSOR	040330	231L					
S.DATC	040310	199L					
S.DATE	040277	198L					
S.GRT0	024000	165E					
S.GRT1	025000	166E					
S.GRT2	026000	167E					
S.HIMEM	040316	201L					
S.INT	040343	179L					
S.DMAX	040324	207L					
S.SOVR	041146	181L	183				
S.SYSM	040320	203L					
S.TIME	040312	200L					
S.USRM	040322	205L					
S.VAL	040277	178L	196				
SB.1	000000	549E	668	668	672		
SB.2	000200	550E	668	672	672		
SC.ACE	000350	401E					
SC.UART	000372	470E					
SET1	000103	574	587L				
SETNTR	000053	571E					
STACK	042200	185E					
STACKL	001032	183E					
SYDD	040130	175E					
TAB	000011	42E	903				
TAT.AS	003265	1282E					
TAT.BAU	003267	628	783	1287L			
TAT.CON	003271	677	681	938	971	1290L	
TAT.CTS	003275	1298L					
TAT.CX	003274	907	965	984	988	992	1296L
TAT.PAD	003272	688	1003	1292L			
TAT.POR	003266	691	782	1284L	1285		
TAT.SB	003270	669	673	1288E			
TAT.UNA	003265	1278E					
TAT.UNT	003265	1280L	1282				
TAT.WID	003273	685	767	1294L			
TCH	002146	790	878	889L			
TCH1	002164	896L	900				
TCH2	002176	894	903L				

CROSS REFERENCE TABLE

UC.2SB	000004	427E	1158	1157
UC.5BW	000000	423E		
UC.6BW	000001	424E		
UC.7BW	000002	425E		
UC.8BW	000003	426E	1160	
UC.BI	000020	446E		
UC.CTS	000020	455E		
UC.DCS	000001	451E		
UC.DDR	000002	452E		
UC.DLA	000200	432E	1144	
UC.DR	000001	442E	1039	
UC.DRL	000010	454E		
UC.DSR	000040	456E		
UC.DTR	000001	435E		
UC.EDA	000001	413E		
UC.EFS	000020	429E		
UC.FE	000010	445E		
UC.IID	000006	420E		
UC.IIP	000001	419E		
UC.LOD	000020	439E	1141	1168
UC.MSI	000010	416E		
UC.OR	000002	443E		
UC.OU1	000004	437E		
UC.OU2	000010	438E		
UC.PE	000004	444E		
UC.PEN	000010	428E		
UC.RI	000100	457E		
UC.RLS	000200	458E		
UC.RSI	000004	415E		
UC.RTS	000002	436E		
UC.SB	000100	431E		
UC.SKF	000040	430E		
UC.TER	000004	453E		
UC.THE	000040	447E	1089	
UC.TRE	000002	414E		
UC.TSE	000100	448E		
UCI.ER	000020	492E		
UCI.IE	000002	494E		
UCI.IR	000100	490E		
UCI.RE	000004	493E		
UCI.RD	000040	491E		
UCI.TE	000001	495E		
UDR	000000	467E		
UMI.16X	000002	485E		
UMI.1B	000100	475E		
UMI.1X	000001	484E		
UMI.2B	000300	477E		
UMI.64X	000003	486E		
UMI.HR	000200	476E		
UMI.L5	000000	480E		
UMI.L6	000004	481E		
UMI.L7	000010	482E		
UMI.L8	000014	483E		
UMI.PA	000020	479E		
UMI.PE	000040	478E		
UNT.DIS	000005	344L		
UNT.FLG	000000	341L		
UNT.GRT	000001	342L		

CROSS REFERENCE TABLE

UNT.GTS	000003	343L					
UNT.SIZ	000007	346E					
UD.CLK	000001	110E					
UD.DDU	000002	109E					
UD.HLT	000200	107E					
UD.NFR	000100	108E					
UR.DLL	000000	408E	1146				
UR.DLM	000001	410E	1149				
UR.IER	000001	412E	1137				
UR.IIR	000002	418E					
UR.LCR	000003	422E	1143	1153			
UR.LSR	000005	441E	1037	1083			
UR.MCR	000004	434E	1140	1166			
UR.MSR	000006	450E					
UR.RBR	000000	404E	1041	1162			
UR.THR	000000	406E	1092				
USERFWA	042200	186E	374				
USR	000001	468E					
USR.FE	000040	499E					
USR.OE	000020	500E					
USR.PE	000010	501E					
USR.RXR	000002	503E					
USR.TXE	000004	502E					
USR.TXR	000001	504E					
VAL	000112	606L	712				
VALI	000001	684	687	690	711E		
WAIT	002270	952E	1084				
WCHAR	002203	905L	910				
WCHAR	002271	904	906	962L	1000	1002	1008
WCHAR0	002315	964	969	971L			
WCHAR1	002332	973	978L				
WCHAR2	002360	983	991L				
WCHAR3	002365	985	993L				

26984 BYTES FREE

