

APPENDIX A:

Machine Language Manager

Source Listing

ADDR	CODE	STMT	SOURCE	STATEMENT
		0001	*****	*****
		0002	*	*
		0003	*	BALLY ARCADE UTILITY PACKAGE
		0004	*	OR
		0005	*	"HOW TO GET STUFF IN AND OUT IN MACHINE LANGUAGE"
		0006	*	*
		0007	*	(C) 1981 ANDY GUEVARA JULY 29, 1981 *
		0008	*****	*****
		0009	;	
		0010	;	
		0011	;	
>0013		0012	SKYD EQU	0013H
>00D7		0013	DISP EQU	0D7H ;RST 10
>00DF		0014	STRING EQU	0DFH ;RST 18
>00FF		0015	SYSSUK EQU	0FFH
>00FF		0016	SYSTEM EQU	0FFH
>4F50		0017	UPRAM EQU	4F50H ;BEGINNING OF U.P. RAM
		0018		;ROOM FOR STACK
		0019	;	
>4FAC		0020	ORG	4FACH
*4FAC	00	0021	UPSTK DEFB	0 ;U.P.STACK-GROWS DOWNWARD
*4FAD	00	0022	MODE DEFB	0 ;MODE REGISTER
*4FAE	00	0023	IOB DEFB	0 ;I/O INFORMATION BYTE
*4FAF	00	0024	KEYN DEFB	0 ;KEY INPUT NUMBER
*4FB0	0000	0025	LPINT DEFW	0 ;LIGHT PEN INTERRUPT VECTOR
*4FB2	0000	0026	SCINT DEFW	0 ;SCREEN INTERRUPT VECTOR
*4FB3	00	0027	IN1 DEFB	0 ;INPUT REGISTERS
*4FB5	00	0028	IN2 DEFB	0
*4FB6	00	0029	ADRG1 DEFB	0 ;ADDRESS REGISTERS
*4FB7	00	0030	ADRG2 DEFB	0
*4FB8	0000	0031	SCRN DEFW	0 ;SCREEN SIZE-BYTES
*4FBA	00	0032	SCRNLN DEFB	0 ;SCRATCH AT THIS LINE AND BELOW
*4FBB	00	0033	HRZCB DEFB	0 ;HORIZONTAL COLOR BOUNDARY
*4FBC	00	0034	LFLG DEFB	0 ;LIST FLAG
*4FBD	00	0035	RFG DEFB	0 ;REGISTER FLAG
*4FBE	0000	0036	PWRUP DEFW	0 ;POWER UP SIGNATURE
*4FC0	00	0037	PW2 DEFB	0 ;3RD BYTE
*4FC1	0000	0038	END DEFW	0 ;END OF FILE MARKER
*4FC3	0000	0039	COORD DEFW	0 ;XY COORDS FOR SCREEN
		0040		;D IS Y COORDINATE
*4FC5	00	0041	POPT DEFB	0 ;PRINT OPTIONS BYTE
*4FC6	00	0042	COLORS DEFB	0 ;COLOR 3
*4FC7	00	0043	C2 DEFB	0 ;COLOR 2
*4FC8	00	0044	FCOL DEFB	0 ;FOREGROUND COLOR (1)
*4FC9	00	0045	BCOL DEFB	0 ;BACKGROUND COLOR (0)
*4FCA	0000	0046	M4BA DEFW	0 ;ENTRY ADDRESS FOR MODE 4
>2000		0047	ORG	2000H
*2000	C31020'	0048	START JP	INIT
>2003		0049	DEFS	03 ;EMPTY SPACE
*2006	17	0050	DEFB	23 ;BUP REVISION LEVEL 2.3
*2007	C36E25'	0051	BPE JP	BRKPT ;BREAKPOINT ENTRY
*2008	C35923'	0052	DEP JP	DISPLAY ;DISPLAY ENTRY POINT
*200D	C3B523'	0053	SEP JP	STRDIS ;STRING DISPLAY
*2010	F3	0054	INIT DI	;DISABLE INTERUPTS
*2011	31AC4F'	0055	LD	SP,UPSTK ;RESET STACK
*2014	2ABE4F'	0056	LD	HL,(PWRUP) ;CHECK IF BEEN AWAKE
*2017	1100AA	0057	LD	DE,0AA00H ;SIGNATURE VALUE
*201A	B7	0058	OR	A ;CLEAR CARRY

ADDR	CODE	STMT	SOURCE	STATEMENT
'201B	ED52	0059	SBC	HL,DE
'201D	2007	0060	JR	NZ,STSPC ;BEEN ASLEEP, SET VALUES
		0061	;OK SO FAR	
'201F	3AC04F'	0062	LD	A,(PW2) ;3RD BYTE
'2022	FEFA	0063	CP	OFAH
'2024	2828	0064	JR	Z,CONT ;JUMP IF OK
'2026	FF	0065	STSPC DEFB	SYSSUK ;ASLEEP, SET DEFAULT SPECS
'2027	00	0066	DEFB	00H ;START INTERPRETER
'2028	1B	0067	DEFB	1BH ;DO FILL
'2029	AD4F'	0068	DEFW	MODE ;SYSTEM RAM START
'202B	2300	0069	DEFW	23H ;HOW MANY
'202D	00	0070	DEFB	00H ;WITH WHAT
'202E	17	0071	DEFB	17H ;DO SETOUT
'202F	B4	0072	DEFB	90.SHL.1 ;BLANK LINE 90 DECIM. AND BELOW
		0073		;THIS ALLOWS 360 BYTES OF RAM
'2030	2C	0074	DEFB	2CH ;44 DECIMAL--MOVE R/L BOUNDARY
		0075		;TO FAR RIGHT
'2031	08	0076	DEFB	8H ;INTERRUPT MODE 8
'2032	5F	0077	DEFB	5FH ;MOVE BYTES
'2033	C64F'	0078	DEFW	COLORS ;TO WHERE
'2035	0400	0079	DEFW	04H ;HOW MANY
'2037	B926'	0080	DEFW	COLIST ;FROM WHERE
'2039	19	0081	DEFB	19H ;COLSET--SET COLORS
'203A	C64F'	0082	DEFW	COLORS ;ADDR OF COLOR LIST
'203C	03	0083	DEFB	03H ;EXIT INTERPRETER
'203D	21100E	0084	LD	HL,0E10H ;DEFAULT VALUE OF SCREEN SIZE
'2040	22B84F'	0085	LD	(SCRN),HL
'2043	3E5A	0086	LD	A,90 ;90 DEC.
'2045	32BA4F'	0087	LD	(SCRNLN),A ;VERT BLANK LINE
'2048	CD4723'	0088	CALL	CLEAR ;WIPE SCREEN CLEAN
'204B	CD7824'	0089	CALL	READY
'204E	FF	0090	CONT DEFB	SYSSUK
'204F	15	0091	DEFB	15H ;DO EMUSIC--STOP MUSIC
'2050	CDC524'	0092	CALL	ININT ;SET UP INTERRUPTS
'2053	2100AA	0093	LD	HL,0AA00H ;WRITE POWER UP SIGNATURE
'2056	22BE4F'	0094	LD	(PWRUP),HL
'2059	3EFA	0095	LD	A,OFAH
'205B	32C04F'	0096	LD	(PW2),A
'205E	218225'	0097	LD	HL,SCRSP ;SET UP CALL TO
'2061	22B44F'	0098	LD	(IN1),HL ;SCREEN SPEC PROGRAM
'2064	CD1921'	0099	CALL	INAD ;KEEPS LIST FROM RUNNING AWAY
'2067	AF	0100	XOR	A ;CLEAR FLAGS AND MODE
'2068	32AE4F'	0101	LD	(IOB),A ;CLEAR I/O BYTE
'206B	32AD4F'	0102	LD	(MODE),A
'206E	32C54F'	0103	LD	(POPT),A
'2071	32BC4F'	0104	LD	(LFLG),A
'2074	32BD4F'	0105	LD	(RFG),A
'2077	CD0524'	0106	CALL	CRLF
'207A	DF	0107	DEFB	STRING
'207B	B626'	0108	DEFW	OKM ;SYSTEM PROMPT
		0109	;	
'207D	217D20'	0110	MAIN LD	HL,MAIN ; MAIN LOOP
'2080	ES	0111	PUSH	HL ;THIS CAUSES RETURNS FROM
		0112		;MAIN ROUTINES TO RETURN HERE
'2081	CD9624'	0113	CALL	KEYGET ;RETURNS WITH KEY NO. IN A
		0114		;USED AS A
		0115	;	;DISPLACEMENT IN JUMP TABLE
'2084	FF	0116	DEFB	SYSSUK ;INTERPRETER CALL

ADDR	CODE	STMT	SOURCE	STATEMENT
*2075	5D	0117	DEFB	5DH ;INDEXB--BYTE TABLE LOOKUP
*2076	9720	0118	DEFW	TTT-1 ;RETURNS WITH KEY TYPE IN
		0119		; HI NIBBLE
		0120		;TRANSLATION IN LOW NIBBLE
		0121		;TYPE=0 MEANS NUMBER,
		0122		;=1 MEANS COMMAND
		0123	;NOTE: THE -1 IS FOR THE ZERO ENTRY THAT DOESN'T EXIST	
*2088	E60F	0124	AND	0FH ;ISOLATE TRANSLATION
*208A	4F	0125	LD	C,A ;COPY DIGIT TO C
*208B	AE	0126	XOR	(HL) ;PICK OUT TYPE
*208C	CAF220	0127	JP	Z,NUMBER ;IF TYPE 0, SKIP AHEAD
*208F	3AAD4F	0128	LD	A,(MODE) ;IF NOT THEN MUST BE TYPE 1
		0129		;FIND MODE
*2092	FF	0130	DEFB	SYSSUK
*2093	5B	0131	DEFB	5BH ;INDEXW--WORD TABLE LOOKUP
*2094	B020	0132	DEFW	MDTBL ;MODE TABLE
*2096	D5	0133	PUSH	DE
*2097	C9	0134	RET	;SNEAKY WAY TO JUMP TO COMMAND
		0135	;	
		0136	;	
		0137	*****TYPE-TRANSLATE TABLE*****	
		0138	;	
*2098	0D	0139	TTT DEFB	0DH ; 1 D
*2099	0E	0140	DEFB	0EH ; 2 E
*209A	0F	0141	DEFB	0FH ; 3 F
*209B	12	0142	DEFB	12H ; 4 CALL
*209C	0A	0143	DEFB	0AH ; 5 A
*209D	0B	0144	DEFB	0BH ; 6 B
*209E	0C	0145	DEFB	0CH ; 7 C
*209F	15	0146	DEFB	15H ; 8 REG (*TAPE DISPLAY)
*20A0	07	0147	DEFB	07H ; 9 7
*20A1	08	0148	DEFB	08H ; 10 8
*20A2	09	0149	DEFB	09H ; 11 9
*20A3	13	0150	DEFB	13H ; 12 LIST (*PRINT)
*20A4	04	0151	DEFB	04H ; 13 4
*20A5	05	0152	DEFB	05H ; 14 5
*20A6	06	0153	DEFB	06H ; 15 6
*20A7	17	0154	DEFB	17H ; 16 INS (*DELETE)
*20A8	01	0155	DEFB	01H ; 17 1
*20A9	02	0156	DEFB	02H ; 18 2
*20AA	03	0157	DEFB	03H ; 19 3
*20AB	11	0158	DEFB	11H ; 20 READ (*TAPE INPUT)
*20AC	16	0159	DEFB	16H ; 21 *
*20AD	00	0160	DEFB	00H ; 22 0
*20AE	14	0161	DEFB	14H ; 23 WRITE (*TAPE OUTPUT)
*20AF	10	0162	DEFB	10H ; 24 ADDR
		0163	;	
		0164	;	
		0165	*****MODE JUMP TABLE*****	
*20B0	0021	0166	MDTBL DEFW	MODE0 ;NORMAL COMMANDS
*20B1	0721	0167	DEFW	MODE1 ;REGISTER COMMANDS
*20B2	BB22	0168	DEFW	MODE2 ;STAR (2ND SET) COMMANDS
*20B6	9725	0169	DEFW	MODE3 ;SCREEN SPECIFICATIONS
*20B8	4323	0170	DEFW	MODE4 ;EXTERNAL (USER) COMMANDS
		0171	;	
		0172	;	
		0173	*****JUMP TABLE FOR MODE 0*****	
		0174	;	

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ADDR  CODE      STMT SOURCE STATEMENT

                                0175 ;
                                ROUTINE KEY VAL.
*20BA 0E21'      0176 MOJT   DEFW   ADDR   ; 0, ADDRESS
*20BC 2421'      0177         DEFW   READ    ; 1, READ AND INCREMENT
*20BE 8F21'      0178         DEFW   ACALL   ; 2, CALL
*20C0 AC21'      0179         DEFW   LIST    ; 3, LIST
*20C2 3321'      0180         DEFW   WRITE   ; 4, WRITE TO MEMORY
*20C4 0622'      0181         DEFW   REG     ; 5, LOAD REGISTERS
*20C6 9D21'      0182         DEFW   STARO   ; 6, SET OPTIONS FLAG
*20C8 4221'      0183         DEFW   INS     ; 7, INSERT IN MEMORY
                                0184 ;
                                0185 *****MODE 1 JUMP TABLE*****
                                0186 ;
                                0187 ;
                                ROUTINE KEY VAL.
*20CA 0D21'      0188 M1JT   DEFW   M1RT   ; 0, IGNORE 'ADDR' KEYPUSH
*20CC 5122'      0189         DEFW   RPLUS  ; 1, SKIP TO NEXT REGISTER
*20CE 0D21'      0190         DEFW   M1RT   ; 2, IGNORE 'CALL'
*20D0 7322'      0191         DEFW   RLIST  ; 3, LIST REGISTERS
*20D2 1B22'      0192         DEFW   RWRT   ; 4, CHANGE REGISTER CONTENTS
*20D4 0D21'      0193         DEFW   M1RT   ; 5, IGNORE 2ND 'REG'
*20D6 0D21'      0194         DEFW   M1RT   ; 6, IGNORE '*'
*20D8 0D21'      0195         DEFW   M1RT   ; 7, IGNORE 'INS'
                                0196 ;
                                0197 *****MODE 2 JUMP TABLE*****
                                0198 ;
*20DA 0E21'      0199 M2JT   DEFW   ADDR   ; 0
*20DC C222'      0200         DEFW   TAPIN  ; 1
*20DE 8F21'      0201         DEFW   ACALL   ; 2
*20E0 F822'      0202         DEFW   PRINT  ; 3
*20E2 DD22'      0203         DEFW   TAPOUT ; 4
*20E4 D222'      0204         DEFW   TADIS  ; 5
*20E6 1323'      0205         DEFW   STAR2  ; 6
*20E8 2523'      0206         DEFW   DEL    ; 7
                                0207 ;
                                0208 ;
                                0209 ;
                                0210 *****MODE 3 JUMP TABLE*****
*20EA A725'      0211 M3JT   DEFW   M30
*20EC CA25'      0212         DEFW   M31
*20EE DE25'      0213         DEFW   M32
*20F0 F225'      0214         DEFW   M33
                                0215 ;
                                0216 ; NUMBER INPUT
                                0217 ;
*20F2 21B44F'    0218 NUMBER LD     HL, IN1 ; SET UP IN1
*20F5 79         0219         LD     A, C   ; DIGIT IN LO HALF OF C
*20F6 ED6F      0220         RLD
                                0221 ; RLD: A 4-BIT SHIFT AS FOLLOWS--
                                0222 ; LOW A -> LOW IN1, LOW IN1 -> HI IN1, HI IN1 -> LOW A
                                0223 ; THE EFFECT IS TO SHIFT INDIVIDUAL HEX DIGITS INTO IN1.
                                0224 ; ONLY THE LAST 4 ARE REMEMBERED IN IN1 & IN2.
                                0225 ;
*20F8 23         0226         INC    HL     ; BINK POINTER (TO IN2)
*20F9 ED6F      0227         RLD    ; DO IT AGAIN
*20FB 79         0228         LD     A, C   ; RELOAD A WITH DIGIT
*20FC CDD423'    0229         CALL  NUMDIS ; DISPLAY IT
*20FF C9         0230         RET    ; AND GO HOME
                                0231 ;
                                0232 ;

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ADDR	CODE	STMT	SOURCE	STATEMENT
*2100	79	0233	MODE0	LD A,C ;MODE 0,GET DISPLACEMENT
*2	FF	0234		DEFB SYSSUK
*2102	5B	0235		DEFB 5BH ;INDEXW--WORD TABLE LOOKUP
*2103	BA20*	0236		DEFW MOJT ;JUMP TABLE ADDRESS
*2105	D5	0237		PUSH DE
*2106	C9	0238		RET ;JUMP TO COMMAND
		0239		;
*2107	79	0240	MODE1	LD A,C ;PUT DISPLACEMENT IN A
*2108	FF	0241		DEFB SYSSUK ;REG OPERATIONS
*2109	5B	0242		DEFB 5BH ;INDEXW
*210A	CA20*	0243		DEFW M1JT ;JUMP TABLE ADDRESS
*210C	D5	0244		PUSH DE ;JUMP TO PROCESS
*210D	C9	0245	M1RT	RET
		0246		;
		0247		;
		0248		;ADDRESS ROUTINE
		0249		;
*210E	CD1921*	0250	ADDR	CALL INAD ;MOVE DATA FROM INPUT TO ADDR REG
*2111	3E3A	0251		LD A,': ' ;COLON TO A
*2113	D7	0252		DEFB DISP
*2114	AF	0253		XOR A ;CLEAR LIST FLAG
*2115	32BC4F*	0254		LD (LFLG),A
*2118	C9	0255		RET ;AND GO HOME
		0256		;
*2119	11B64F*	0257	INAD	LD DE,ADRG1 ;MOVE ADDRESS TO ADRG1
*211C	21B44F*	0258		LD HL,IN1 ;FROM INPUT REGISTER 1
*2120	EDA0	0259		LDI ;SINGLE INSTRUCTION MOVE
*2121	EDA0	0260		LDI ;BETWEEN MEMORY LOCATIONS
		0261		;IT'S DONE TWICE BECAUSE TWO BYTES
		0262		;OF INFO ARE BEING MOVED
*2123	C9	0263		RET
		0264		;
*2124	2AB64F*	0265	READ	LD HL,(ADRG1) ;LOAD ADDRESS
*2127	7E	0266		LD A,(HL) ;LOAD CONTENTS TO A
*2128	23	0267		INC HL ;INCREMENT CONTENTS
*2129	22B64F*	0268		LD (ADRG1),HL ;STORE BACK
*212C	CD5E24*	0269		CALL RGDIS ;DISPLAY WHAT'S IN A
*212F	CD5124*	0270		CALL SPACE
*2132	C9	0271		RET
		0272		;
		0273		;WRITE TO MEMORY
		0274		;
*2133	2AB64F*	0275	WRITE	LD HL,(ADRG1) ;PICK UP ADDRESS
*2136	3AB44F*	0276		LD A,(IN1) ;PICK UP INPUT BYTE
*2139	77	0277		LD (HL),A ;STORE IT
*213A	23	0278		INC HL ;BINK ADDRESS
*213B	22B64F*	0279		LD (ADRG1),HL ;STORE IT BACK
*213E	CD5124*	0280		CALL SPACE ;OUTPUT A SPACE
*2141	C9	0281		RET ;GO HOME
		0282		;
		0283		;INSERT INTO MEMORY
		0284		;
		0285		;THIS ROUTINE MAKES USE OF AN END OF FILE MARKER (END)
		0286		;THAT SHOULD POINT TO THE LAST BYTE IN A PROGRAM +1.
		0287		;THE ROUTINE TESTS FOR ATTEMPTS TO WRITE INTO THE
		0288		;STACK, AND MAKES ALLOWANCES FOR ADDED MEMORY.
		0289		;IF 'END' IS LESS THAN THE PRESENT ADDRESS REGISTER
		0290		;CONTENTS, THE ROUTINE WILL UPDATE IT TO (ADRG1)+1.

ADDR	CODE	STMT	SOURCE STATEMENT
		0291 ;	
*2142	2AC14F'	0292 INS	LD HL,(END) ;GET ADDRESS
*2145	11504F'	0293	LD DE,UPRAM ;TEST IF PUSHING SYSTEM RAM
*2148	B7	0294	OR A ;CLEAR CARRY FLAG FOR SBC
*2149	ED52	0295	SBC HL,DE
*214B	381B	0296	JR C,INS2 ;ADDRESS IS LESS THAN UPRAM
*214D	200B	0297	JR NZ,INS1 ;ADDRESS IS GREATER
*214F	CDCB23'	0298	CALL RED ;IF THE SAME ISSUE WARNING
*2152	DF	0299	DEFB STRING
*2153	5926'	0300	DEFW WAM
*2155	CDD023'	0301	CALL NORM ;BACK TO NORMAL PRINT
*2158	180E	0302	JR INS2 ;AND GO ON
*215A	11FF4F'	0303 INS1	LD DE,4FFFH ;SEE IF INTO ADDED MEMORY
*215D	2AB64F'	0304	LD HL,(ADR61)
*2160	ED52	0305	SBC HL,DE
*2162	3004	0306	JR NC,INS2 ;OK IF POSITIVE
*2164	CD5524'	0307	CALL ERR ;OTHERWISE OOPS
*2167	C9	0308	RET
		0309 ;	
*2168	2AC14F'	0310 INS2	LD HL,(END) ;GET THE END OF FILE
*216B	ED5BB64F'	0311	LD DE,(ADR61) ;SEE IF END>ADR61
*216F	B7	0312	OR A ;CLEAR CARRY
*2170	ED52	0313	SBC HL,DE ;(HL)-(DE)
*2172	44	0314	LD B,H
*2173	4D	0315	LD C,L ;MOVE RESULT TO BC (COUNTER)
*2174	300B	0316	JR NC,INS3 ;ALL SET
*2176	EB	0317	EX DE,HL ;HL=(ADR61)
*2177	23	0318	INC HL ;OTHERWISE END=ADR6+1
*2178	22C14F'	0319	LD (END),HL
*217B	010100	0320	LD BC,01H ;SET COUNT TO 1
*217E	ED5BC14F'	0321 INS3	LD DE,(END)
*2182	D5	0322	PUSH DE
*2183	E1	0323	POP HL
*2184	2B	0324	DEC HL ;HL=END-1
*2185	EDB8	0325	LDDR ;COPY FROM (HL) TO (DE),
		0326	; (BC) TIMES
		0327	; AND DECREMENT EACH TIME.
*2187	CD3321'	0328	CALL WRITE ;STUFF THE INFO
*218A	21C14F'	0329	LD HL,END ;INC. END
*218D	34	0330	INC (HL)
*218E	C9	0331	RET ;AND GO HOME
		0332 ;	
		0333 ;	
		0334 ;	EXECUTE A PROGRAM
		0335 ;	NOTE: CALL AND TAPE INPUT ARE INCOMPATIBLE FOR USE
		0336 ;	AT THE SAME TIME BECAUSE BOTH USE ALTERNATE REGISTER
		0337 ;	SET.
		0338 ;	
*218F	219A21'	0339 ACALL	LD HL,CART ;SET UP RETURN PROCESS
*2192	E5	0340	PUSH HL ;ON STACK
*2193	2AB44F'	0341	LD HL,(IN1) ;GET ADDRESS OF PROGRAM
*2196	E5	0342	PUSH HL
*2197	0B	0343	EX AF,AF' ;EXCHANGE 'A' REGISTER
		0344	; FOR ITS ALTERNATE 'A' REGISTER
*2198	D9	0345	EXX ;EXCHANGE THE REST OF
		0346	; THE REGS FOR THEIR ALTERNATES
*2199	C9	0347	RET ;POP THE ADDRESS OFF THE STACK
		0348	; AND JUMP TO THE PROGRAM

ADDR	CODE	STMT	SOURCE	STATEMENT
		0349	;	
		0350	;	
*219A	08	0351	CART EX AF,AF'	;CALL RETURN PROCESS
*219B	D9	0352	EXX	;GET BACK ORIG. SET
*219C	C9	0353	RET	;ALL DONE, GO HOME
		0354	;	
		0355	;SET UP FOR MODE 2	
		0356	;	
*219D	3E02	0357	STARO LD A,02H	
*219F	32AD4F'	0358	LD (MODE),A	;SET MODE 2
*21A2	CDCB23'	0359	CALL RED	
*21A5	3E2A	0360	LD A,'*'	
*21A7	D7	0361	DEFB DISP	;TELL OPERATOR
*21A8	CDD023'	0362	CALL NORM	
*21AB	C9	0363	RET	
		0364	;	
		0365	;	
		0366	;LIST ROUTINE	
		0367	;	
		0368	;LFLAG INDICATES BEING IN THE MIDDLE OF SUCCESSIVE SINGLE	
		0369	;LIST OPERATIONS. IT'S CLEARED BY THE ADDRESS KEY.	
		0370	;	
*21AC	3ABC4F'	0371	LIST LD A,(LFLG)	;TEST THE FLAG
*21AF	A7	0372	AND A	
*21B0	201D	0373	JR NZ,OUTLN	;IF SET, DO A LINE AND GO HOME
		0374	;	
*21B1	3E0D	0375	LD A,ODH	;OTHERWISE END THIS LINE
*21B4	D7	0376	DEFB DISP	
*21B5	ED5BB44F'	0377	LD DE,(IN1)	;CHECK IF END ADDR WAS INPUT
*21B9	2AB64F'	0378	LD HL,(ADRG1)	
*21BC	ED52	0379	SBC HL,DE	
*21BE	280F	0380	JR Z,OUTLN	;IF SAME, DO A LINE AND GO HOME
		0381	;	
		0382	;MULTI-LINE LIST	
		0383	;	
*21C0	CDCF21'	0384	MLIST CALL OUTLN	;EA WAS INPUT, DO A LINE AND
		0385		;COME BACK.
		0386	;	
*21C3	2AB44F'	0387	LD HL,(IN1)	;ENDING ADDRESS
*21C6	ED5BB64F'	0388	LD DE,(ADRG1)	;NEW BEGINNING ADDRESS
*21CA	ED52	0389	SBC HL,DE	;SUBTRACT BA FROM EA
*21CC	30F2	0390	JR NC,MLIST	;IF POS, DO ANOTHER LINE
*21CE	C9	0391	RET	;ELSE, GO BACK
		0392	;	
		0393	;OUTPUT A LINE	
		0394	;	
*21CF	3EFF	0395	OUTLN LD A,OFFH	;SET FLAG
*21D1	32BC4F'	0396	LD (LFLG),A	
*21D4	2AB64F'	0397	LD HL,(ADRG1)	;PICK UP BEG. ADDR.
*21D7	CD6F24'	0398	CALL HLIST	;DISPLAY 1ST BYTE ADDRESS
*21DA	3E3A	0399	LD A,':'	
*21DB	D7	0400	DEFB DISP	
*21DD	CD5124'	0401	CALL SPACE	
*21E0	CD2421'	0402	DL1 CALL READ	;GET AND DISPLAY DATA
*21E3	7D	0403	LD A,L	;CHECK FOR END OF LINE
*21E4	E607	0404	AND 07H	;BIT MASK
		0405		;IF 00 OR 0BH,
		0406		; THE LAST 3 BITS ARE ZERO



ADDR	CODE	STMT	SOURCE	STATEMENT
*21E6	20F8	0407	JR	NZ,OL1 ; IF NOT, GO BACK
		0408		;END OF LINE
*21E8	3AAE4F	0409	LD	A,(IOB) ; CHECK IF TAPE OUT
*21EB	CB47	0410	BIT	O,A ; TURNED ON
*21ED	2802	0411	JR	Z,LASC ; IF NOT, DO ASCII PART
*21EF	1811	0412	JR	LA3 ; AND EXIT
		0413		;
		0414		;LIST ASCII INTERPRETATION
		0415		;
*21F1	010800	0416	LASC LD	BC,08H ; BACK UP POINTER 8 BYTES
*21F4	ED42	0417	SBC	HL,BC
*21F6	41	0418	LD	B,C ; B=8 AS A COUNTER
*21F7	7E	0419	LA1 LD	A,(HL) ; DISPLAY ASCII INTERPRETATION
*21F8	FE0D	0420	CP	ODH ; DON'T DISPLAY A CR
*21FA	2002	0421	JR	NZ,LA2
*21FC	3E2E	0422	LD	A,'.' ; DO A DOT INSTEAD
*21FE	D7	0423	LA2 DEFB	DISP
*21FF	23	0424	INC	HL ; INC. POINTER
*2200	10F5	0425	DJNZ	LA1 ; DECR. COUNT & LOOP
*2202	3E0D	0426	LA3 LD	A,ODH ; CARRIAGE RETURN
*2204	D7	0427	DEFB	DISP
*2205	C9	0428	RET	; GO HOME
		0429		;
		0430		;LOAD REGISTERS
		0431		;
*2206	3E01	0432	REG LD	A,01H
*2208	32AD4F	0433	LD	(MODE),A ; SET MODE TO 1
*220B	DF	0434	DEFB	STRING
*220C	2826	0435	DEFW	AFM ; PUT OUT MESSAGE
*220E	AF	0436	XOR	A
*220F	32BD4F	0437	LD	(RFG),A ; TABLE INITIALIZATION
*2212	C9	0438	RET	
		0439		;
		0440		;
		0441		*****REGISTER TABLE*****
		0442		;
		0443	RGTBL DEFW	AFG ; 0
*2213	2422	0443	DEFW	BCG ; 1
*2215	2C22	0444	DEFW	DEG ; 2
*2217	3822	0445	DEFW	HLG ; 3
*2219	4422	0446	DEFW	HLG ; 3
		0447		;
		0448		;RFG OFFSET DETERMINES WHICH REGS TO PULL
		0449		;
		0450		;REGISTER WRITE ROUTINE
		0451		;
*221B	3ABD4F	0452	RWRT LD	A,(RFG)
*221E	FF	0453	DEFB	SYSSUK
*221F	5B	0454	DEFB	5BH ; INDEXW--WORD TABLE LOOKUP
*2220	1322	0455	DEFW	RGTBL ; GET JUMP ADDRESS
*2222	D5	0456	PUSH	DE ; SET UP JUMP
*2223	C9	0457	RET	; POP, JUMP
*2224	3AB44F	0458	AFG LD	A,(IN1) ; LOAD NEW VALUE
*2227	08	0459	EX	AF,AF' ; PUT IN ALTERNATE A
*2228	CD5122	0460	CALL	RPLUS ; OUTPUT DESIGNATOR AND UPDATE RFL
*222B	C9	0461	RET	
*222C	ED4BB44F	0462	BCG LD	BC,(IN1) ; GET NEW VALUES
*2230	C5	0463	PUSH	BC
*2231	D9	0464	EXX	; EXCHANGE REGISTER SETS

ADDR	CODE	STMT	SOURCE	STATEMENT
2232	C1	0465		POP BC ;PUT IN NEW VALUES
2233	D9	0466		EXX ;SWAP BACK
2234	CD5122'	0467		CALL RPLUS
2237	C9	0468		RET
2238	ED5BB44F'	0469	DEG	LD DE, (IN1)
223C	D5	0470		PUSH DE
223D	D9	0471		EXX
223E	D1	0472		POP DE
223F	D9	0473		EXX
2240	CD5122'	0474		CALL RPLUS
2243	C9	0475		RET
2244	2AB44F'	0476	HLG	LD HL, (IN1)
2247	E5	0477		PUSH HL
2248	D9	0478		EXX
2249	E1	0479		POP HL
224A	D9	0480		EXX
224B	AF	0481		XOR A ;CLEAR A
224C	32BD4F'	0482		LD (RFG), A ;CLEAR FLAG
224F	1822	0483		JR RLIST ;LIST THE REG SET
		0484		;
2251	3ABD4F'	0485	RPLUS	LD A, (RFG)
2254	FE03	0486		CP 03H ;DONE YET?
2256	280C	0487		JR Z, RP1 ;SKIP AHEAD IF SO
2258	3C	0488		INC A
2259	32BD4F'	0489		LD (RFG), A
2270	FF	0490		DEFB SYSSUK
2271	5B	0491		DEFB 5BH ;INDEXW, GET MESSAGE ADDR
225E	6B22'	0492		DEFW RMTBL ;REGISTER MSG TABLE
2260	CDBB23'	0493		CALL STR1 ;PUT OUT MESSAGE
2263	C9	0494		RET
2264	AF	0495	RP1	XOR A
2265	32BD4F'	0496		LD (RFG), A ;CLEAR FLAG
2268	C38022'	0497		JP MODO ;GO HOME
		0498		;
		0499		;
226B	2826'	0500	RMTBL	DEFW AFM ;0
226D	2B26'	0501		DEFW BCM ;1
226F	3026'	0502		DEFW DEM ;2
2271	3526'	0503		DEFW HLM ;3
		0504		;
		0505		;OUTPUT REGISTER CONTENTS
		0506		;
2273	AF	0507	RLIST	XOR A
2274	32BD4F'	0508		LD (RFG), A ;CLR FLAG
2277	CD0524'	0509		CALL CRLF
227A	DF	0510		DEFB STRING
227B	2826'	0511		DEFW AFM ;OUTPUT DESIGNATOR
227D	08	0512		EX AF, AF' ;GET REG CONTENTS
227E	F5	0513		PUSH AF
227F	08	0514		EX AF, AF'
2270	F1	0515		POP AF
2271	CD5E24'	0516		CALL RGDIS
2284	CD5122'	0517		CALL RPLUS ;DESIGNATOR & RFG UPDATE
2287	D9	0518		EXX ;ALTERNATE SET
2288	C5	0519		PUSH BC ;SAVE REGISTER
2289	CDA422'	0520		CALL SWDIS ;SWAP AND DISPLAY
228C	D5	0521		PUSH DE
228D	CDA422'	0522		CALL SWDIS

ADDR	CODE	STMT	SOURCE	STATEMENT
' 2290	E5	0523	PUSH	HL
' 2291	CDA422'	0524	CALL	SWDIS
' 2294	D9	0525	EXX	;BACK TO NORMAL SET
' 2295	DF	0526	DEFB	STRING
' 2296	3A26'	0527	DEFW	ADM
' 2298	2AB64F'	0528	LD	HL, (ADRG1)
' 229B	CD6F24'	0529	CALL	HLIST ;DISPLAY ADDRESS REGISTER
' 229E	CD0524'	0530	CALL	CRLF
' 22A1	C3B022'	0531	JP	MODO
		0532		;
		0533		;SWAP AND DISPLAY A REGISTER
		0534		;
' 22A4	D9	0535	SWDIS	EXX ;NORMAL SET
' 22A5	D1	0536	POP	DE
' 22A6	E1	0537	POP	HL ;GET CONTENTS
' 22A7	D5	0538	PUSH	DE ;PUT BACK RETURN ADDR
' 22A8	CD6F24'	0539	CALL	HLIST ;SHOW CONTENTS
' 22AB	CD5122'	0540	CALL	RPLUS ;DESIG. AND RFG UPDATE
' 22AE	D9	0541	EXX	;ALTERNATE SET
' 22AF	C9	0542	RET	
		0543		;
		0544		;CLEAN UP AND RESET MODE 0
' 22B0	AF	0545	MODO	XOR A ;CLEAR A TO ZERO
' 22B1	32AD4F'	0546	LD	(MODE),A ;SET MODE TO 0
' 22B4	32BC4F'	0547	LD	(LFLG),A ;CLEAR LIST FLAG
' 22B7	32C54F'	0548	LD	(POPT),A ;CLEAR PRINT OPTONS
' 22BA	C9	0549	RET	;GO HOME
		0550		;
		0551		*****MODE 2 OPERATIONS*****
		0552		;
' >22BB		0553	MODE2	
' 22BB	79	0554	LD	A,C ;GET DISPLACEMENT
' 22BC	FF	0555	DEFB	SYSSUK
' 22BD	5B	0556	DEFB	5BH ;INDEXW
' 22BE	DA20'	0557	DEFW	M2JT ;JUMP TABLE
' 22C0	D5	0558	PUSH	DE
' 22C1	C9	0559	RET	;POP, JUMP
		0560		;
		0561		;
' >22C2		0562	TAPIN	
' 22C2	F3	0563	DI	;INITIALIZE INTERRUPTS
' 22C3	D9	0564	EXX	
' 22C4	06FC	0565	LD	B,OFCH ;SET COUNT
' 22C6	D9	0566	EXX	
' 22C7	3E18	0567	LD	A,18H ;INT. ENABLE AND MODE
' 22C9	D30E	0568	OUT	(0EH),A
' 22CB	FB	0569	EI	
' 22CC	CD0524'	0570	CALL	CRLF
' 22CF	C3B022'	0571	JP	MODO ;CLEAN UP AND GO HOME
		0572		;
' >22D2		0573	TADIS	
' 22D2	CDC222'	0574	CALL	TAPIN ;INIT INTERRUPTS
' 22D5	21AE4F'	0575	LD	HL,IOB ;SET TAPE DISPLAY BIT
' 22D8	CBDE	0576	SET	3,(HL)
' 22DA	C3B022'	0577	JP	MODO
		0578		;
		0579		;
		0580		;WRITE TO TAPE

ADDR	CODE	STMT	SOURCE	STATEMENT
		0581		;
>D		0582	TAPOUT	
22DD	21AE4F?	0583	LD	HL,IOB ;GET I/O INFO
22E0	CB46	0584	BIT	0,(HL) ;TAPE OUT SET?
22E2	2009	0585	JR	NZ,TO1 ;YES, CLEAR IT
22E4	CBC6	0586	SET	0,(HL) ;NO, SET IT
22E6	CB8E	0587	RES	1,(HL) ;CLEAR PRINT BIT
22E8	CDCB23?	0588	CALL	RED
22EB	1805	0589	JR	TO2
22ED	CB86	0590	RES	0,(HL)
22EF	CDC323?	0591	CALL	GREEN
22F2	3E54	0592	LD	A,'T'
22F4	D7	0593	DEFB	DISP
22F5	C3B022?	0594	JP	MOD0
		0595		;
		0596		;
>22F8		0597	PRINT	
22F8	21AE4F?	0598	LD	HL,IOB ;GET I/O BYTE
22FB	CB4E	0599	BIT	1,(HL) ;PRINT BIT CLEAR?
22FD	2807	0600	JR	Z,PR1 ;YES, SET IT
22FF	CB8E	0601	RES:	1,(HL) ;NO, CLEAR IT
2301	CDC323?	0602	CALL	GREEN
2304	1807	0603	JR	PR2
2306	CDCB23?	0604	CALL	RED
2309	CBCE	0605	SET	1,(HL) ;SET PRINT BIT
230B	CB86	0606	RES	0,(HL) ;CLEAR TAPE BIT
2	3E50	0607	LD	A,'P'
230F	D7	0608	DEFB	DISP
2310	C3B022?	0609	JP	MOD0 ;GO HOME
		0610		;
		0611		;
>2313		0612	STAR2	
2313	3E08	0613	LD	A,0BH ;DISABLE TAPE INPUT
2315	D30E	0614	OUT	(0EH),A
2317	21AE4F?	0615	LD	HL,IOB ;GET I/O INFO
231A	CB9E	0616	RES	3,(HL) ;CLEAR TAPE DISPLAY MODE
231C	CDC323?	0617	CALL	GREEN
231F	3E2A	0618	LD	A,'*'
2321	D7	0619	DEFB	DISP
2322	C3B022?	0620	JP	MOD0
		0621		;
		0622		;
		0623		;DELETE
		0624		;
>2325		0625	DEL	
2325	B7	0626	OR	A ;FIX CARRY FLAG
2326	2AC14F?	0627	LD	HL,(END)
2329	ED5BB64F?	0628	LD	DE,(ADR61)
232D	ED52	0629	SBC	HL,DE ;GET NUMBER TO MOVE
232F	44	0630	LD	B,H
2330	4D	0631	LD	C,L ;COUNT TO BC
2	62	0632	LD	H,D
2332	6B	0633	LD	L,E
2333	23	0634	INC	HL ;(ADR61)+1 TO HL
2334	EDB0	0635	LDIR	;COPY FROM (HL) TO (DE),
		0636		; (BC) TIMES
2336	3E3C	0637	LD	A,'<' ;A MARKER
2338	CDCB23?	0638	CALL	RED

ADDR	CODE	STMT	SOURCE	STATEMENT
233B	D7	0639	DEFB	DISP
233C	21C14F	0640	LD	HL,END ;UPDATE END
233F	35	0641	DEC	(HL)
2340	C3B022	0642	JP	MODO ;GO HOME
		0643	;*****MODE 4 OPERATIONS*****	
		0644	;	
		0645	;MODE 4 IS AVAILABLE FOR REDEFINING THE KEYPAD FOR	
		0646	;OTHER USES. USER MUST ENTER THE ADDRESS OF HIS	
		0647	;KEYPAD HANDLING ROUTINE IN M4BA (ADDRESS 4FC8),	
		0648	;LOWER HALF FIRST. SETTING THE MODE TO 4	
		0649	;IN THE STARTUP ROUTINE WILL ROUTE CONTROL IN THIS	
		0650	;DIRECTION.	
		0651	;	
>2343		0652	MODE4	
2343	2ACA4F	0653	LD	HL,(M4BA) ;GET ENTRY ADDRESS
2346	E9	0654	JP	(HL) ;JUMP TO IT
		0655	;	
		0656	;	
		0657	;*****DISPLAY CONTROL ROUTINES*****	
		0658	;	
>2347		0659	CLEAR	
2347	ED4BB84F	0660	LD	BC,(SCRN) ;SIZE OF SCREEN
234B	110040	0661	LD	DE,4000H ;START OF SCREEN
234E	3E00	0662	LD	A,0H ;DATA TO FILL WITH
2350	FF	0663	DEFB	SYSTEM
2351	1A	0664	DEFB	1AH ;DO NT FILL--CLEAR SCREEN
2352	210000	0665	LD	HL,00H
2355	22C34F	0666	LD	(COORD),HL ;SET COORDINATES TO 0,0
2358	C9	0667	RET	
		0668	;	
		0669	;DISPLAY IS THE GENERAL DISPLAY ROUTINE FOR THE	
		0670	;SYSTEM. IT TAKES CARE OF THE SCREEN, TAPE, AND PRINTER	
		0671	;PORTS. PRINT DIFFERS FROM TAPE ONLY IN THAT	
		0672	;NONPRINTABLES ARE FILTERED OUT AND LINE FEEDS	
		0673	;ARE INSERTED.	
		0674	;	
>2359		0675	DISPLAY	
2359	E5	0676	PUSH	HL
235A	D5	0677	PUSH	DE
235B	C5	0678	PUSH	BC
235C	F5	0679	PUSH	AF
235D	21AE4F	0680	LD	HL,IOB ;TEST FOR TAPE OR PRINT OUT
2360	CB46	0681	BIT	0,(HL) ;TAPE OUT BIT
2362	C42724	0682	CALL	NZ,TWRT ;DO IT
		0683	;SIMPLE DISPLAY	
2365	F1	0684	POP	AF ;RESTORE CHARACTER
2366	F5	0685	PUSH	AF ;PUT IT BACK
2367	FE0D	0686	CP	ODH ;CHECK IF CARR. RETURN
2369	200A	0687	JR	NZ,D1 ;IF NOT, GO AHEAD
236B	CB4E	0688	BIT	1,(HL) ;PRINT ON?
236D	C42724	0689	CALL	NZ,TWRT ;YES, SEND CR TO PRINTER
2370	CD0524	0690	DO	CALL CRLF ;DO IT ON SCREEN
2373	182F	0691	JR	DRET
2375	FE20	0692	D1	CP 20H ;CHECK IF PRINTABLE
2377	3804	0693	JR	C,DOT ;JUMP IF MINUS
2379	FE5B	0694	CP	5BH ;UPPER LIMIT
237B	3802	0695	JR	C,OK ;JUMP IF NEG.
237D	3E2E	0696	DOT	LD A,'.' ;DO A DOT IF NOT PRINTABLE

ADDR	CODE	STMT	SOURCE	STATEMENT
237F	F5	0697	OK	PUSH AF ;SAVE IT
2	CB4E	0698		BIT 1,(HL) ;PRINT ON?
2382	C42724	0699		CALL NZ,TWRT ;YEP, DO IT
2385	ED5BC34F	0700		LD DE,(COORD) ;GET X,Y COORDINATES
2389	3AC54F	0701		LD A,(POPT) ;PICK UP OPTIONS, IF ANY
238C	4F	0702		LD C,A ;PUT IN C
238D	A7	0703		AND A
238E	2002	0704		JR NZ,OK1 ;IF NONZERO, USE IT
2390	0E04	0705		LD C,04H ;OTHERWISE STANDARD PRINT
2392	F1	0706	OK1	POP AF ;GET CHAR BACK
2393	EE80	0707		XOR 80H ;ALTERNATE FONT INDICATOR
2395	DD21BD26	0708		LD IX,SMLFNT ;SMALL CHAR. FONT DESCRIPTOR
2399	FF	0709		DEFB SYSTEM
239A	32	0710		DEFB 32H ;CHRDIS--OUTPUT CHARACTER ROUTINE
		0711		;RETURNS WITH UPDATED XY COORDS
		0712		;IN DE, D=Y, E=X
239B	3E9B	0713		LD A,9BH ;TEST FOR END OF LINE
239D	BB	0714		CP E
239E	DC1024	0715		CALL C,CLF ;IF SO,SET UP NEXT LINE
23A1	CDA923	0716		CALL CON ;PAINT CURSOR
23A4	F1	0717	DRET	POP AF ;AND GO HOME
23A5	C1	0718		POP BC
23A6	D1	0719		POP DE
23A7	E1	0720		POP HL
23A8	C9	0721		RET
		0722		;
2	010305	0723	CON	LD BC,0503H ;PAINT 3X5 CURSOR
23AC	3E55	0724		LD A,55H ;BINARY 01010101 COLOR MASK
		0725		;(COLOR #1)
23AE	ED53C34F	0726		LD (COORD),DE ;STORE COORDS BACK
23B2	FF	0727		DEFB SYSTEM
23B3	1C	0728		DEFB 1CH ;RECTAN--PAINT RECTANGLE
23B4	C9	0729		RET
		0730		;
		0731		;NOTE: STRING CLOBBERS ALMOST EVERYTHING, USE WITH CARE
		0732		;
>23B5		0733	STRDIS	
23B5	E3	0734		EX (SP),HL ;GET ADDRESS FROM CALLING ROUTINE
23B6	5E	0735		LD E,(HL)
23B7	23	0736		INC HL
23B8	56	0737		LD D,(HL)
23B9	23	0738		INC HL
23BA	E3	0739		EX (SP),HL ;FIX THE STACK
23BB	1A	0740	STR1	LD A,(DE) ;PICK UP CHARACTER
23BC	FE00	0741		CP 00H ;IF NULL, END
23BE	C8	0742		RET Z
23BF	D7	0743		DEFB DISP ;DISPLAY CHARACTER
23C0	13	0744		INC DE ;INCREMENT ADDRESS
23C1	18F8	0745		JR STR1 ;DO ANOTHER
		0746		;
		0747		;COLOR CHANGES
		0748		;
23C3	F5	0749	GREEN	PUSH AF
23C4	3E0C	0750		LD A,0CH ;GREEN ON BLACK OPTION
23C6	32C54F	0751	G1	LD (POPT),A
23C9	F1	0752		POP AF
23CA	C9	0753		RET
		0754		;

ADDR	CODE	STMT	SOURCE	STATEMENT
23CB	F5	0755	RED	PUSH AF
23CC	3E08	0756		LD A,08H ;RED ON BLACK
23CE	18F6	0757		JR G1
		0758		;
23D0	F5	0759	NORM	PUSH AF
23D1	AF	0760		XOR A ;BACK TO NORMAL
23D2	18F2	0761		JR G1
		0762		;
		0763		; NUMERICAL DISPLAY ROUTINE
		0764		;
23D4	FE0A	0765	NUMDIS	CP 0AH ;CHECK IF WITHIN NUMERICAL LIMITS
23D6	3802	0766		JR C,NUM1 ;JUMP IF NEG.
		0767		;ELSE NUMBER IS >= 'A' (HEX)
23D8	C607	0768		ADD A,07H ;SET UP FOR ASCII
23DA	C630	0769	NUM1	ADD A,30H ;MAKE IT ASCII
23DC	D7	0770		DEFB DISF
23DD	C9	0771		RET
		0772		;
		0773		; CHECK AND SCROLL IF NEEDED
		0774		;
23DE	3ABA4F?	0775	SCROLL	LD A,(SCRLN)
23E1	D606	0776		SUB 6 ;SCRLN-6 IS LOWER LIMIT OF SCREEN
23E3	BA	0777		CP D ;D IS Y COORDINATE
23E4	F0	0778		RET F ;GO HOME IF NOT THERE YET
23E5	F5	0779		PUSH AF ;SAVE THIS VALUE
23E6	AF	0780		XOR A ;CLEAR A AND CARRY FLAG
23E7	2AB84F?	0781		LD HL,(SCRN) ;GET SCREEN SIZE
23EA	01F000	0782		LD BC,0FOH ;MINUS 1 LINE'S WORTH
23ED	ED42	0783		SBC HL,BC
23EF	280A	0784		JR Z,SCR1 ;IF ZERO, JUST BLANK TOP LINE
23F1	E5	0785		PUSH HL
23F2	C1	0786		POP BC ;HOW MANY TO MOVE
23F3	21F040	0787		LD HL,40FOH ;SOURCE
23F6	110040	0788		LD DE,4000H ;DESTINATION
23F9	EDB0	0789		LDIR ;MOVE (HL) TO (DE) BC TIMES
23FB	01A006	0790	SCR1	LD BC,06A0H ;BLACK OUT LAST LINE
23FE	5F	0791		LD E,A
23FF	F1	0792		POP AF ;RESET COORDS
2400	57	0793		LD D,A
2401	AF	0794		XOR A ;DATA FOR RECTANGLE
2402	FF	0795		DEFB SYSTEM
2403	1C	0796		DEFB 1CH ;RECTAN
2404	C9	0797		RET ;GO HOME
		0798		;
2405	ED5BC34F?	0799	CRLF	LD DE,(COORD) ;GET CURSOR COORDS
2409	010305	0800		LD BC,0503H ;PAINT 3X5 BLANK
240C	3E00	0801		LD A,00H ;COLOR 0
240E	FF	0802		DEFB SYSTEM
240F	1C	0803		DEFB 1CH ;RECTAN
		0804		;UPDATE COORDINATES
2410	1E00	0805	CLF	LD E,0 ;'CARRIAGE RETURN'
2412	3E06	0806		LD A,6H ;'LINE FEED'
2414	82	0807		ADD A,D
2415	57	0808		LD D,A
2416	CDDE23?	0809		CALL SCROLL
2419	CDA923?	0810		CALL CON ;PAINT CURSOR
241C	21AE4F?	0811		LD HL,10B
241F	CB46	0812		BIT 0,(HL) ;TAPE WRITE IN PROGRESS?

ADDR	CODE	STMT	SOURCE	STATEMENT
*2421	C8	0813	RET	Z ;NOPE, GO HOME
*2	FF	0814	DEFB	SYSSUK
*2423	51	0815	DEFB	51H ;PAWS
*2424	08	0816	DEFB	8 ;4 CHARACTERS' WORTH
*2425	C9	0817	RET	;AND GO HOME
*2426	C9	0818	RET	
		0819	;	
		0820	;	THIS ROUTINE OUTPUTS ANY 8 BIT VALUE IN THE A REGISTER
		0821	;	TO THE TAPE OUTPUT PORT.
		0822	;	NOTE: THE TAPE PORT IS THE SAME AS THE PRINTER PORT
		0823	;	SO IT IS SUGGESTED THAT FOR PRINTING THE PRINT COMMAND
		0824	;	BE USED SO THAT THE PRINTER DOESN'T GO BANANAS.
		0825	;	
*>2427		0826	TWRT	;WRITE TO TAPE
*2427	4F	0827	LD	C,A ;CHAR. TO C
*2428	CB01	0828	RLC	C ;SHIFT LEFT ONCE
*242A	DB12	0829	TW1 IN	A,(12H) ;TAPE PORT FEEDBACK
*242C	E602	0830	AND	2 ;WAIT FOR CLOCK HIGH
*242E	28FA	0831	JR	Z,TW1
*2430	060A	0832	LD	B,0AH ;BIT COUNTER
*2432	3EC0	0833	TW2 LD	A,0C0H ;TIME COUNTER (192 DECIMAL)
*2434	3D	0834	TW3 DEC	A
*2435	20FD	0835	JR	NZ,TW3 ;1.72 MSEC., HALF OF 300 HZ
		0836		;CLOCK NOW LOW
*2437	05	0837	DEC	B ;START COUNTING BITS
*2438	C8	0838	RET	Z ;GO HOME IF ALL DONE
*2	DB12	0839	IN	A,(12H) ;IS FEEDBACK STILL SAME STATE?
*243B	5F	0840	LD	E,A ;IF SO, THEN CLOCK IS LOW
*243C	DB12	0841	TW4 IN	A,(12H)
*243E	AB	0842	XOR	E ;IF SAME, RESULT IS 0
*243F	E602	0843	AND	2 ;ELSE RESULT IS 2
*2441	28F9	0844	JR	Z,TW4 ;TRY AGAIN
		0845	;	CLOCK HIGH
*2443	7B	0846	LD	A,E ;OLD BIT TO A
*2444	A9	0847	XOR	C ;SEE IF NEED TO CHANGE STATE
*2445	E602	0848	AND	2 ;OF OUTPUT
*2447	2802	0849	JR	Z,TW5 ;NO, SKIP AHEAD
*2449	DB12	0850	IN	A,(12H) ;TOGGLE OUTPUT
*244B	CBC9	0851	TW5 SET	1,C ;PUT IN STOP BITS
*244D	CB09	0852	RRC	C ;SET FOR NEXT BIT
*244F	18E1	0853	JR	TW2 ;DO IT AGAIN
		0854	;	
		0855	;	
		0856	;	
		0857	;	
		0858	;	
*2451	3E20	0859	SPACE LD	A,20H ;ASCII SPACE
*2453	D7	0860	DEFB	DISP
*2454	C9	0861	RET	
		0862	;	
		0863	;	
*2	CDCB23'	0864	ERR CALL	RED
*2453	DF	0865	DEFB	STRING
*2459	B226'	0866	DEFW	ERM
*245B	C3B022'	0867	JP	MOD0
		0868	;	
		0869	;	THIS ROUTINE DISPLAYS THE CONTENTS OF THE A REGISTER.
		0870	;	THUS ANY BYTE OF DATA CAN BE DISPLAYED BY PUTTING IT



ADDR	CODE	STMT	SOURCE	STATEMENT
		0871		;IN A AND CALLING RGDIS.
245E	F5	0872	RGDIS	PUSH AF ;DISPLAY REGISTER CONTENTS
245F	E6F0	0873		AND OF0H ;MASK OUT LOWER HALF
2461	07	0874		RLCA
2462	07	0875		RLCA
2463	07	0876		RLCA
2464	07	0877		RLCA
2465	CDD423'	0878	CALL	NUMDIS
2468	F1	0879	POP	AF
2469	E60F	0880	AND	OFH ;MASK OFF UPPER HALF
246B	CDD423'	0881	CALL	NUMDIS
246E	C9	0882	RET	
		0883		;
246F	7C	0884	HLIST	LD A,H ;SHOW HL ROUTINE
2470	CD5E24'	0885	CALL	RGDIS
2473	7D	0886	LD	A,L
2474	CD5E24'	0887	CALL	RGDIS
2477	C9	0888	RET	
		0889		;
		0890		;
>2478		0891	READY	
2478	ED5BB84F'	0892	LD	DE,(SCRN) ;HOW MANY SCREEN BYTES
247C	21504F	0893	LD	HL,UPRAM ;1ST SYSTEM SCRATCH BYTE
247F	CBB4	0894	RES	6,H ;MAKE INTO A RELATIVE NUMBER
2481	B7	0895	OR	A ;CLEAR CARRY FLAG
2482	ED52	0896	SBC	HL,DE ;(TOTAL RAM-SCREEN RAM)
2484	CD6F24'	0897	CALL	HLIST ;DISPLAY IT
2487	DF	0898	DEFB	STRING
2488	6326'	0899	DEFW	RMSG ;STRING TO GO ALONG WITH IT
248A	2AB84F'	0900	LD	HL,(SCRN)
248D	CBF4	0901	SET	6,H ;FUDGE IT INTO AN ADDRESS
248F	CD6F24'	0902	CALL	HLIST ;DUMP IT OUT
2492	CD0524'	0903	CALL	CRLF
2495	C9	0904	RET	
		0905		;
		0906		;
		0907		*****KEYBOARD INTERFACE*****
		0908		;
		0909		;SCANS THE KEYPAD UNTIL A KEY IS PRESSED. RETURNS WITH
		0910		;THE NUMBER OF THE KEY IN B. NUMBERS ARE ROW-WISE
		0911		;RIGHT TO LEFT, 1 THROUGH 24.
		0912		;
2496	219624'	0913	KEYGET	LD HL,KEYGET ;SAVE THIS ADDRESS
2499	E5	0914		PUSH HL
249A	FF	0915	DEFB	SYSSUK ;
249B	51	0916	DEFB	51H ;PAWS--KEY DEBOUNCER, HOLD FOR
249C	02	0917	DEFB	02H ;2/60 OF A SECOND
		0918		;KEYPAD INPUT RETURNS WITH KEY NO. IN A
249D	11AF4F'	0919	LD	DE,KEYN ;OLD KEY NUMBER
24A0	011404	0920	LD	BC,414H ;B=COUNT, C=STARTING PORT
24A3	ED78	0921	KG1	IN A,(C) ;CHECK OUT PORT
24A5	E63F	0922	AND	3FH ;GET RID OF EXTRANEIOUS BITS
24A7	2006	0923	JR	NZ,KG2 ;JUMP IF GOT A GOOD ONE
24A9	0C	0924	INC	C ;NOPE, DO ANOTHER
24AA	10F7	0925	DJNZ	KG1
24AC	AF	0926	XOR	A ;NONE AT ALL
24AD	12	0927	LD	(DE),A ;KEEP TRACK OF LAST KEY
24AE	C9	0928	RET	;BACK TO KEYGET

ADDR	CODE	STMT	SOURCE	STATEMENT
		0929	;	
*24	05	0930	KG2	DEC B
*24B0	0E00	0931		LD C,0
*24B2	0F	0932	KG3	RRCA ;FIND THE RIGHT BIT
*24B3	3803	0933		JR C,KG4
*24B5	0C	0934		INC C
*24B6	18FA	0935		JR KG3
*24B8	79	0936	KG4	LD A,C ;BIT #
*24B9	07	0937		RLCA ;MULT BY 4
*24BA	07	0938		RLCA
*24BB	B0	0939		OR B
*24BC	3C	0940		INC A ;NOW HAVE KEY NO.
*24BD	47	0941		LD B,A
*24BE	1A	0942		LD A,(DE) ;OLD NUMBER
*24BF	A8	0943		XOR B ;COMPARE
*24C0	C8	0944		RET Z
*24C1	78	0945		LD A,B ;DIFFERENT, UPDATE
*24C2	12	0946		LD (DE),A
*24C3	E1	0947		POP HL ;FIX THE STACK
*24C4	C9	0948		RET ;AND GO BACK
		0949	;	
		0950	*****INTERRUPT ROUTINES*****	
		0951	;	
		0952	;	
		0953	;INITIALIZE INTERRUPTS	
		0954	;	
*24	DB12	0955	ININT	IN A,(12H) ;TAPE INPUT PORT
*24C7	E602	0956	AND	2 ;MAKE SURE IT'S SET TO 0
*24C9	20FA	0957	JR	NZ,ININT
*24CB	F3	0958	DI	;DISABLE INTERRUPTS
*24CC	ED5E	0959	IM	2 ;INTERRUPT MODE
*24CE	3E4F	0960	LD	A,4FH ;SET INTERRUPT PAGE
*24D0	ED47	0961	LD	I,A
*24D2	3EB2	0962	LD	A,0B2H ;SCREEN INTERRUPT VECTOR
*24D4	D30D	0963	OUT	(0DH),A
*24D6	3E08	0964	LD	A,08
*24D8	D30E	0965	OUT	(0EH),A ;SCREEN INTS ONLY
*24DA	3EC8	0966	LD	A,200
*24DC	D30F	0967	OUT	(0FH),A ;SCREEN INT. EVERY 200 LINES
*24DE	21EC24	0968	LD	HL,TAPINT ;LOAD INTERRUPT VECTORS
*24E1	22B04F	0969	LD	(LPINT),HL
*24E4	216C25	0970	LD	HL,SCRINT
*24E7	22B24F	0971	LD	(SCINT),HL
*24EA	FB	0972	EI	;ENABLE INTERRUPTS
*24EB	C9	0973	RET	
		0974	;	
		0975	*****LIGHT PEN INTERRUPT HANDLER*****	
		0976	;	
		0977	;THE TAPE INPUT HANDLER RECOGNIZES A COLON AS AN	
		0978	;ADDRESS DIRECTIVE, AND SPACE AND CR AS WRITE DIRECTIVES.	
		0979	;	
*24	C	0980	TAPINT	
*24E0	F5	0981	PUSH	AF
*24ED	D9	0982	EXX	
*24EE	CD4A25	0983	CALL	COLL ;GET A CHARACTER
*24F1	21AE4F	0984	LD	HL,IOB ;TEST TAPE DISPLAY BIT
*24F4	CB5E	0985	BIT	3,(HL)
*24F6	2045	0986	JR	NZ,TID ;IF SET, GO DISPLAY

ADDR	CODE	STMT	SOURCE	STATEMENT
'24FB	FE0D	0987	CP	ODH ;ELSE TEST FOR CR
'24FA	2007	0988	JR	NZ,TI2 ;SKIP IF NOT
'24FC	CD3321'	0989	CALL	WRITE ;DO A WRITE
'24FF	3E0D	0990	LD	A,ODH ;REPLACE CR
'2501	183A	0991	JR	TID ;DISPLAY IT
'2503	FE20	0992	TI2 CP	20H ;ELSE, ACT ON IT
'2505	3836	0993	JR	C,TID ;EXIT IF NOT DISPLAYABLE
'2507	200B	0994	JR	NZ,TI3 ;ZERO MEANS A SPACE
'2509	CB7E	0995	BIT	7,(HL)
		0996	;BIT 7 IN IOB IS ADDR FLAG MEANING IGNORE 1ST SPACE	
		0997	;FOLLOWING COLON	
'250B	E5	0998	PUSH	HL ;SAVE IOB
'250C	CC3321'	0999	CALL	Z,WRITE ;IF CLEAR
'250F	E1	1000	POP	HL
'2510	CBBE	1001	RES	7,(HL) ;CLEAR THE BIT
'2512	182A	1002	JR	TIX ;EXIT
		1003	;	
'2514	CBBE	1004	TI3 RES	7,(HL) ;CLEAR BIT IF NOT A SPACE
'2516	FE30	1005	CP	30H ;CHECK NUMBER LIMITS
'2518	3823	1006	JR	C,TID ;LESS THAN
'251A	FE3A	1007	CP	3AH
'251C	3008	1008	JR	NC,TI4 ;>=
'251E	E60F	1009	TI3A AND	0FH ;STRIP AWAY ASCII
'2520	4F	1010	LD	C,A
'2521	CDF220'	1011	CALL	NUMBER
'2524	1818	1012	JR	TIX
'2526	2009	1013	TI4 JR	NZ,TI5 ;JUMP IF NOT A COLON
'2528	E5	1014	PUSH	HL ;SAVE IOB
'2529	CD0E21'	1015	CALL	ADDR
'252C	E1	1016	POP	HL
'252D	CBFE	1017	SET	7,(HL) ;IGNORE NEXT SPACE
'252F	180D	1018	JR	TIX ;EXIT
'2531	FE41	1019	TI5 CP	41H ;'A'
'2533	3808	1020	JR	C,TID
'2535	FE47	1021	CP	47H ;'G'
'2537	3004	1022	JR	NC,TID
'2539	C609	1023	ADD	A,09H ;SET UP FOR NUMBER
'253B	18E1	1024	JR	TI3A ;GO TO IT
'253D	D7	1025	TI3D TID	DEFB DISP
'253E	3AAD4F'	1026	TI3 TIX	LD A,(MODE)
'2541	FE04	1027	CP	4 ;MODE 4 SET?
'2543	CA4323'	1028	JP	Z,MODE4 ;SKIP OUT
'2546	F1	1029	POP	AF
'2547	D9	1030	EXX	
'2548	FB	1031	EI	
'2549	C9	1032	RET	
		1033	;	
'254A	DB12	1034	COLL IN	A,(12H) ;COLLECT BITS FROM TAPE
'254C	1F	1035	RRA	;BIT TO CARRY
'254D	79	1036	LD	A,C ;BITS SO FAR
'254E	1F	1037	RRA	;NEW BIT SHIFTED IN
'254F	4F	1038	LD	C,A
'2550	78	1039	LD	A,B ;COUNT
'2551	A7	1040	AND	A
'2552	380A	1041	JR	C,CO1 ;NEG.
'2554	2012	1042	JR	NZ,CO2 ;NONZERO
'2556	CB79	1043	BIT	7,C ;ZERO, TEST HIGHEST BIT
'2558	200B	1044	JR	NZ,EXIT ;NOT READY YET

ADDR	CODE	STMT	SOURCE	STATEMENT
*255A	0608	1045	LD	B,08H ;GOT ONE
*255B	1807	1046	JR	EXIT
*255C	04	1047	CO1 INC	B ;NEG. COUNT LOOP
*255F	CB79	1048	BIT	7,C ;STILL COLLECTING BITS
*2561	2002	1049	JR	NZ,EXIT
*2563	06FC	1050	LD	B,0FCH ;A ZERO CAME THRU WITH
		1051		;COUNT WRONG
*2565	E1	1052	EXIT POP	HL ;DROP RETURN ADDRESS
*2566	18D6	1053	JR	TIX ;AND GET OUT
		1054		;
*2568	10FB	1055	CO2 DJNZ	EXIT ;POS COUNT, NOT DONE YET
*256A	79	1056	LD	A,C ;DONE
*256B	C9	1057	RET	
		1058		;
		1059		*****SCREEN INTERRUPT HANDLER*****
		1060		;
*256C	FB	1061	SCRINT EI	;ENABLE INTERRUPTS
*256D	C9	1062	RET	;AND GO BACK
		1063		;
		1064		;
		1065		;
		1066		*****UTILITY PROGRAMS*****
		1067		;
		1068		;
		1069		;BREAKPOINTS ARE SET BY WRITING 'CF' AT DESIRED LOCATIONS
		1070		;
*2571	CD9A21	1071	BRKPT CALL	CART ;BREAKPOINT ROUTINE
*2572	CD0524	1072	CALL	CRLF ;CART GETS ORIGINAL REG SET
*2574	DF	1073	DEFB	STRING
*2575	4126	1074	DEFW	BKM
*2577	E1	1075	POP	HL ;GET BRKPT ADDR
*2578	2B	1076	DEC	HL ;BACK OFF ONE
*2579	CD6F24	1077	CALL	HLIST ;SHOW IT
*257C	CD7322	1078	CALL	RLIST ;SHOW REGISTERS
*257F	C30020	1079	JP	START
		1080		;
		1081		;
		1082		;
		1083		;SET SCREEN SPECIFICATIONS
		1084		;
*2582	CD0524	1085	SCRSP CALL	CRLF ;OUTPUT A CARRIAGE RETURN
*2585	3E5A	1086	LD	A,90 ;DEFAULT VALUE
*2587	32B44F	1087	LD	(IN1),A ;TO INPUT REGISTER
*258A	DF	1088	DEFB	STRING
*258B	8126	1089	DEFW	BLM ;BLANK SPECS MESSAGE
*258D	AF	1090	XOR	A ;USE REG TYPE SEQUENCE
*258E	32BD4F	1091	LD	(RFG),A
*2591	3E03	1092	LD	A,3
*2593	32AD4F	1093	LD	(MODE),A ;SET MODE 3
*2596	C9	1094	RET	
		1095		;
		1096		;THE FOLLOWING SECTION WILL BE ENTERED EACH TIME A 'W' IS
		1097		;INPUT WHILE IN MODE 3
		1098		;
*2597	79	1099	MODE3 LD	A,C ;GET KEY VALUE
*2598	FE04	1100	CP	4H
*259A	CO	1101	RET	NZ ;ACCEPT WRITE ONLY
*259B	3ABD4F	1102	LD	(RFG) ;PICK UP FLAG

ADDR	CODE	STMT	SOURCE STATEMENT
*259E	FF	1103	DEFB SYSSUK
*259F	5B	1104	DEFB 5BH ; INDEXW-JUMP BASED ON FLAG
*25A0	EA20'	1105	DEFW M3JT ; JUMP TABLE
*25A2	D5	1106	PUSH DE ; RETURNED ADDRESS
*25A3	3AB44F'	1107	LD A, (IN1) ; GET INPUT VALUE
*25A6	C9	1108	RET ; JUMP TO ROUTINE
		1109 ;	
*25A7		1110 M30	; CALCULATE WHERE BLANKING
		1111	; SHOULD START
*25A7	FE5A	1112	CP 5AH ; IF 90 DECIMAL
*25A9	280B	1113	JR Z, M302 ; LEAVE ALONE
*25AB	E60F	1114	AND OFH ; MASK OUT UPPER DIGIT
*25AD	2001	1115	JR NZ, M300 ; IF ZERO, MAKE IT ONE
*25AF	3C	1116	INC A
*25B0	47	1117 M300	LD B, A ; NO. OF TEXT LINES INPUT
*25B1	AF	1118	XOR A
*25B2	C606	1119 M301	ADD A, 06H ; CHARACTER FRAME SIZE
*25B4	10FC	1120	DJNZ M301
*25B6	32B64F'	1121 M302	LD (ADRG1), A ; TEMP. LINE STORAGE
*25B9	3E2C	1122	LD A, 2CH ; 44 DECIMAL
*25BB	32B44F'	1123	LD (IN1), A ; HORIZONTAL COLOR BOUNDARY
*25BE	CD0524'	1124	CALL CRLF
*25C1	DF	1125	DEFB STRING
*25C2	8E26'	1126	DEFW CBM
*25C4	3E01	1127	LD A, 1 ; INCREMENT PROCESS POINTER
*25C6	32BD4F'	1128	LD (RFG), A
*25C9	C9	1129	RET ; GET THE NEXT SPEC.
		1130 ;	
*25CA	32BB4F'	1131 M31	LD (HRZCB), A ; NO LIMIT CHECKS
*25CD	3E00	1132	LD A, 00H ; DEFAULT BACK COLOR
*25CF	32B44F'	1133	LD (IN1), A
*25D2	CD0524'	1134	CALL CRLF
*25D5	DF	1135	DEFB STRING
*25D6	9F26'	1136	DEFW BCLM ; BACK COLOR MESSAGE
*25D8	3E02	1137	LD A, 2 ; SET UP FOR NEXT PROCESS
*25DA	32BD4F'	1138	LD (RFG), A
*25DD	C9	1139	RET ; GO BACK
		1140 ;	
*25DE	32C94F'	1141 M32	LD (BCOL), A ; SET BCOLOR
*25E1	3E07	1142	LD A, 07H ; FORE COLOR
*25E3	32B44F'	1143	LD (IN1), A
*25E6	CD0524'	1144	CALL CRLF
*25E9	DF	1145	DEFB STRING
*25EA	4C26'	1146	DEFW FCLM ; FORE COLOR MESSAGE
*25EC	3E03	1147	LD A, 3 ; SET UP FOR NEXT PROCESS
*25EE	32BD4F'	1148	LD (RFG), A
*25F1	C9	1149	RET
		1150 ; THIS IS THE ACTION OF THE LAST KEYPUSH OF THE	
		1151 ; SCREEN SPEC. ROUTINE	
*25F2	32C84F'	1152 M33	LD (FCOL), A ; SET FCOLOR
*25F5	3AB64F'	1153	LD A, (ADRG1) ; GET BLANK LINE #
*25F8	32BA4F'	1154	LD (SCRLN), A ; INTO ITS PROPER PLACE
*25FB	07	1155	RLCA ; SETOUT NEEDS IT
		1156	; SHIFTED LEFT ONE BIT
*25FC	57	1157	LD D, A
*25FD	3ABB4F'	1158	LD A, (HRZCB) ; COLOR BOUNDARY
*2600	47	1159	LD B, A
*2601	3E08	1160	LD A, 08H ; INTERRUPT MODE

ADDR	CODE	STMT	SOURCE	STATEMENT
*2603	FF	1161		DEFB SYSTEM
*2604	16	1162		DEFB 16H ;DO NT SETOUT
*2605	21C64F'	1163		LD HL,COLORS ;GET ADDRESS OF COLOR LIST
*2608	FF	1164		DEFB SYSTEM
*2609	18	1165		DEFB 18H ;COLSET
*260A	210000	1166		LD HL,00H ;CALCULATE SCREEN SIZE
		1167		;FROM NO. OF LINES DISPLAYED
*260D	3ABA4F'	1168		LD A,(SCRLN)
*2610	47	1169		LD B,A
*2611	112800	1170		LD DE,40 ;DECIMAL BYTES PER LINE
*>2614		1171	M331	
*2614	19	1172		ADD HL,DE
*2615	10FD	1173		DJNZ M331 ;FIGURE OUT
*2617	22B84F'	1174		LD (SCRN),HL ;NO. OF BYTES IN SCREEN
*261A	CD4723'	1175		CALL CLEAR ;CLEAR SCREEN
*261D	CD7824'	1176		CALL READY
*2620	AF	1177		XOR A ;CLEAN UP
*2621	32BD4F'	1178		LD (RFB),A
*2624	32AD4F'	1179		LD (MODE),A
*2627	C9	1180		RET ;GO HOME
		1181	*****MESSAGE TABLE*****	
*2628	413A	1182	AFM	DEFM 'A:'
*262A	00	1183		DEFB 00
*262B	2042433A	1184	BCM	DEFM 'BC:'
*262F	00	1185		DEFB 00
*2630	2044453A	1186	DEM	DEFM 'DE:'
*2631	00	1187		DEFB 00
*2635	20484C3A	1188	HLM	DEFM 'HL:'
*2639	00	1189		DEFB 00
*263A	20414444	1190	ADM	DEFM 'ADDR:'
	523A			
*2640	00	1191		DEFB 00
*2641	424B5054	1192	BKM	DEFM 'BKPT ADDR:'
	20414444			
	523A			
*264B	00	1193		DEFB 00
*264C	464F5245	1194	FCLM	DEFM 'BACKGROUND:'
	47524F55			
	4E443A20			
*2658	00	1195		DEFB 00
*2659	2A574152	1196	WAM	DEFM '*WARNING*'
	4E494E47			
	2A			
*2662	00	1197		DEFB 00
*2663	20425954	1198	RMSG	DEFM 'BYTES AVAILABLE STARTING AT '
	45532041			
	5641494C			
	41424C45			
	20535441			
	5254494E			
	47204154			
	20			
*2660	00	1199		DEFB 00
*2681	54455854	1200	BLM	DEFM 'TEXT LINES:'
	204C494E			
	45533A20			
*268D	00	1201		DEFB 00
*268E	434F4C4F	1202	CBM	DEFM 'COLOR BOUNDARY:'

ADDR	CODE	STMT	SOURCE	STATEMENT
	5220424F			
	554E4441			
	52593A20			
*269E	00	1203	DEFB	00
*269F	4241434B	1204	BCLM DEFM	'BACKGROUND COLOR:'
	47524F55			
	4E442043			
	4F4C4F52			
	3A20			
*26B1	00	1205	DEFB	00
*26B2	455252	1206	ERM DEFM	'ERR'
*26B5	00	1207	DEFB	00
*26B6	4F4B	1208	OKM DEFM	'OK'
*26B8	00	1209	DEFB	00
		1210		;
		1211		;
		1212	*****COLOR LIST*****	
*26B9	A3	1213	COLIST DEFB	0A3H ;GREEN
*26BA	52	1214	DEFB	52H ;RED
*26BB	07	1215	DEFB	07H ;WHITE
*26BC	00	1216	DEFB	00H ;BLACK
		1217		;
		1218		;
		1219	*****SMALL CHARACTER FONT DESCRIPTOR*****	
*26BD	A0	1220	SMLFNT DEFB	0A0H ;1ST CHARACTER
*26BE	04	1221	DEFB	4 ;X FRAME SIZE
*26BF	06	1222	DEFB	6 ;Y FRAME SIZE
*26C0	01	1223	DEFB	1 ;NO. OF BYTES X PATTERN
*26C1	05	1224	DEFB	5 ;NO. OF BYTES Y PATTERN
*26C2	C426'	1225	DEFW	SMLCHR ;ADDRESS OF CHARACTER TABLE
		1226		;
		1227		;
		1228	*****CHARACTER TABLE*****	
*26C4	00000000	1229	SMLCHR DEFB	00,00,00,00,00 ;SPACE
	00			
*26C9	20202000	1230	DEFB	20H,20H,20H,00,20H ;!
	20			
*26CE	A0A00000	1231	DEFB	0A0H,0A0H,00,00,00 ;"
	00			
*26D3	A0E0A0E0	1232	DEFB	0A0H,0E0H,0A0H,0E0H,0A0H ;#
	A0			
*26D8	00000000	1233	DEFB	0,0,0,0,0 ;UNDEFINED
	00			
*26DD	A0204080	1234	DEFB	0A0H,20H,40H,80H,0A0H ;%
	A0			
*26E2	00000000	1235	DEFB	0,0,0,0,0 ;UNDEFINED
	00			
*26E7	40800000	1236	DEFB	40H,80H,0,0,0 ;'
	00			
*26EC	40808080	1237	DEFB	40H,80H,80H,80H,40H ;(
	40			
*26F1	40202020	1238	DEFB	40H,20H,20H,20H,40H ;)
	40			
*26F6	00A040A0	1239	DEFB	00H,0A0H,40H,0A0H,00H ;*
	00			
*26FB	0040E040	1240	DEFB	00H,40H,0E0H,40H,00H ;+
	00			
*2700	00000040	1241	DEFB	00H,00H,00H,40H,80H ;,

ADDR	CODE	STMT	SOURCE STATEMENT
	80		
*2	0000E000	1242	DEFB 00H,00H,0E0H,00H,00H ; -
	00		
*270A	00000000	1243	DEFB 00H,00H,00H,00H,40H ; .
	40		
*270F	20204080	1244	DEFB 20H,20H,40H,80H,80H ; /
	80		
*2714	40A0A0A0	1245	DEFB 40H,0A0H,0A0H,0A0H,40H ; 0
	40		
*2719	40404040	1246	DEFB 40H,40H,40H,40H,40H ; 1
	40		
*271E	E020E080	1247	DEFB 0E0H,20H,0E0H,80H,0E0H ; 2
	E0		
*2723	E0206020	1248	DEFB 0E0H,20H,60H,20H,0E0H ; 3
	E0		
*2728	A0A0E020	1249	DEFB 0A0H,0A0H,0E0H,20H,20H ; 4
	20		
*272D	E080E020	1250	DEFB 0E0H,80H,0E0H,20H,0E0H ; 5
	E0		
*2732	E080E0A0	1251	DEFB 0E0H,80H,0E0H,0A0H,0E0H ; 6
	E0		
*2737	E0202020	1252	DEFB 0E0H,20H,20H,20H,20H ; 7
	20		
*273C	E0A0E0A0	1253	DEFB 0E0H,0A0H,0E0H,0A0H,0E0H ; 8
	E0		
*2741	E0A0E020	1254	DEFB 0E0H,0A0H,0E0H,20H,20H ; 9
	20		
*2746	00400040	1255	DEFB 00H,40H,00H,40H,00H ; :
	00		
*274B	00400040	1256	DEFB 00H,40H,00H,40H,80H ; ;
	80		
*2750	20408040	1257	DEFB 20H,40H,80H,40H,20H ; <
	20		
*2755	00E000E0	1258	DEFB 00H,0E0H,00H,0E0H,00H ; =
	00		
*275A	80402040	1259	DEFB 80H,40H,20H,40H,80H ; >
	80		
*275F	E0206040	1260	DEFB 0E0H,20H,60H,40H,40H ; ?
	40		
*2764	E0A020E0	1261	DEFB 0E0H,0A0H,20H,0E0H,0E0H ; @
	E0		
*2769	40A0E0A0	1262	DEFB 40H,0A0H,0E0H,0A0H,0A0H ; A
	A0		
*276E	C0A0C0A0	1263	DEFB 0C0H,0A0H,0C0H,0A0H,0C0H ; B
	C0		
*2773	E0808080	1264	DEFB 0E0H,80H,80H,80H,0E0H ; C
	E0		
*2778	C0A0A0A0	1265	DEFB 0C0H,0A0H,0A0H,0A0H,0C0H ; D
	C0		
*277D	E080C080	1266	DEFB 0E0H,80H,0C0H,80H,0E0H ; E
	E0		
*2	E080C080	1267	DEFB 0E0H,80H,0C0H,80H,80H ; F
	80		
*2787	E080A0A0	1268	DEFB 0E0H,80H,0A0H,0A0H,0E0H ; G
	E0		
*278C	A0A0E0A0	1269	DEFB 0A0H,0A0H,0E0H,0A0H,0A0H ; H
	A0		
*2791	40404040	1270	DEFB 40H,40H,40H,40H,40H ; I



ADDR	CODE	STMT	SOURCE STATEMENT
	40		
*2796	202020A0 E0	1271	DEFB 20H, 20H, 20H, 0A0H, 0E0H ; J
*279B	A0A0C0A0 A0	1272	DEFB 0A0H, 0A0H, 0C0H, 0A0H, 0A0H ; K
*27A0	80808080 E0	1273	DEFB 80H, 80H, 80H, 80H, 0E0H ; L
*27A5	A0E0A0A0 A0	1274	DEFB 0A0H, 0E0H, 0A0H, 0A0H, 0A0H ; M
*27AA	80E0E0A0 A0	1275	DEFB 80H, 0E0H, 0E0H, 0A0H, 0A0H ; N
*27AF	E0A0A0A0 E0	1276	DEFB 0E0H, 0A0H, 0A0H, 0A0H, 0E0H ; O
*27B4	E0A0E080 80	1277	DEFB 0E0H, 0A0H, 0E0H, 80H, 80H ; P
*27B9	E0A0A0E0 20	1278	DEFB 0E0H, 0A0H, 0A0H, 0E0H, 20H ; Q
*27BE	E0A0C0A0 A0	1279	DEFB 0E0H, 0A0H, 0C0H, 0A0H, 0A0H ; R
*27C3	6080E020 C0	1280	DEFB 60H, 80H, 0E0H, 20H, 0C0H ; S
*27C8	E0404040 40	1281	DEFB 0E0H, 40H, 40H, 40H, 40H ; T
*27CD	A0A0A0A0 E0	1282	DEFB 0A0H, 0A0H, 0A0H, 0A0H, 0E0H ; U
*27D2	A0A0A0A0 40	1283	DEFB 0A0H, 0A0H, 0A0H, 0A0H, 40H ; V
*27D7	A0A0A0E0 A0	1284	DEFB 0A0H, 0A0H, 0A0H, 0E0H, 0A0H ; W
*27DC	A0A040A0 A0	1285	DEFB 0A0H, 0A0H, 40H, 0A0H, 0A0H ; X
*27E1	A0A04040 40	1286	DEFB 0A0H, 0A0H, 40H, 40H, 40H ; Y
*27E6	E0204080 E0	1287	DEFB 0E0H, 20H, 40H, 80H, 0E0H ; Z
		1288 ;	
*27EB	28432920 31393831 20412E20 47554556 415241	1289	DEFM '(C) 1981 A. GUEVARA'
*27FE	00	1290 1291 ; 1292	DEFB 00  END





ADDR	CODE	STMT	SOURCE	STATEMENT									
DI	26B6	1208	0108										
OL1	21E0	0402	0407										
OUTLN	21CF	0395	0384	0380	0373								
POPT	4FC5	0041	0751	0701	0548	0103							
PR1	2306	0604	0600										
PR2	230D	0607	0603										
PRINT	22F8	0597	0202										
PW2	4FC0	0037	0096	0062									
PWRUP	4FBE	0036	0094	0056									
READ	2124	0265	0402	0177									
READY	2478	0891	1176	0089									
RED	23CB	0755	0864	0638	0604	0588	0359	0298					
REG	2206	0432	0181										
RGB	4FBD	0035	1178	1148	1138	1128	1102	1091	0508	0496			
			0489	0485	0482	0452	0437	0105					
RGDIS	245E	0872	0887	0885	0516	0269							
RGTBL	2213	0443	0455										
RLIST	2273	0507	1078	0483	0191								
RMSG	2663	1198	0899										
RMTBL	226B	0500	0492										
RP1	2264	0495	0487										
RPLUS	2251	0485	0540	0517	0474	0467	0460	0189					
RWRT	221B	0452	0192										
SCINT	4FB2	0026	0971										
SCR1	23FB	0790	0784										
SCNT	256C	1061	0970										
SCRNLN	4FBA	0032	1168	1154	0775	0087							
SCRN	4FB8	0031	1174	0900	0892	0781	0660	0085					
SCROLL	23DE	0775	0809										
SCRSP	2582	1085	0097										
SEP	200D	0053											
SKYD	0013	0012											
SMLCHR	26C4	1229	1225										
SMLFNT	26BD	1220	0708										
SPACE	2451	0859	0401	0280	0270								
STAR0	219D	0357	0182										
STAR2	2313	0612	0205										
START	2000	0048	1079										
STR1	23BB	0740	0745	0493									
STRDIS	23B5	0733	0053										
STRING	00DF	0014	1145	1135	1125	1088	1073	0898	0865	0526			
			0510	0434	0299	0107							
STSPC	2026	0065	0060										
SWDIS	22A4	0535	0524	0522	0520								
SYSSUK	00FF	0015	1103	0915	0814	0555	0490	0453	0241	0234			
			0130	0116	0090	0065							
SYSTEM	00FF	0016	1164	1161	0802	0795	0727	0709	0663				
TADIS	22D2	0573	0204										
TAPIN	22C2	0562	0574	0200									
TAPINT	24EC	0980	0968										
TJ	22DD	0582	0203										
TI1	24F1	0984											
TI2	2503	0992	0988										
TI3	2514	1004	0994										
TI3A	251E	1009	1024										
TI4	2526	1013	1008										
TI5	2531	1019	1013										
TID	253D	1025	1020	1006	0993	0991	0986						

ADDR	CODE	STMT	SOURCE	STATEMENT			
TIX	253E	1026	1053	1018	1012	1002	
T01	22ED	0590	0585				
T02	22F2	0592	0589				
TTT	2098	0139	0118				
TW1	242A	0829	0831				
TW2	2432	0833	0853				
TW3	2434	0834	0835				
TW4	243C	0841	0844				
TW5	244B	0851	0849				
TWRT	2427	0826	0699	0689	0682		
UPRAM	4F50	0017	0893	0293			
UPSTK	4FAC	0021	0055				
WAM	2659	1196	0300				
WRITE	2133	0275	0999	0989	0328	0180	

ERRORS=0000

APPENDIX B:

Z-80 Instruction Set

```

ADDR CODE STMT SOURCE STATEMENT
0002 ; PSEUDO OPS
0003 ;
>0000 0004 ORG 0 ; ORIGIN (STARTING ADDRESS)
0005 ;
*0000 AA 0006 DEFB 0AAH ; DEFINE BYTE
*0001 BBAA 0007 DEFW 0AABBH ; DEFINE WORD
*0003 41424344 0008 DEFM 'ABCD' ; DEFINE MESSAGE
>0007 0009 NN DEFS 2 ; DEFINE STORAGE (2 BYTES)
>0005 0010 IND EQU 5 ; DISPLACEMENT (IX,IY)
>0020 0011 N EQU 20H ; AN IMMEDIATE VALUE
>0030 0012 DIS EQU 30H ; DISPLACEMENT FOR RELATIVE JUMPS
0013 ;
0014 ;
0015 ;
0016 ; Z80 OPCODES
0017 ;
*0009 8E 0018 ADC A,(HL) ; ADD BYTE AT (HL) TO A W/CARRY
*000A DD8E05 0019 ADC A,(IX+IND)
*000D FD8E05 0020 ADC A,(IY+IND) ; IND=05 FOR ASS'Y PURPOSES
*0010 8F 0021 ADC A,A
*0011 88 0022 ADC A,B
*0012 89 0023 ADC A,C
*0013 8A 0024 ADC A,D
*0014 8B 0025 ADC A,E
*0015 8C 0026 ADC A,H
*0016 8D 0027 ADC A,L
*0017 CE20 0028 ADC A,N ; N=20H FOR ASSEMBLY
*0018 ED4A 0029 ADC HL,BC ; ADD HL TO BC W/CARRY
*001B ED5A 0030 ADC HL,DE
*001D ED6A 0031 ADC HL,HL
*001F ED7A 0032 ADC HL,SP
0033 ;
*0021 86 0034 ADD A,(HL)
*0022 DD8605 0035 ADD A,(IX+IND)
*0025 FD8605 0036 ADD A,(IY+IND)
*0028 87 0037 ADD A,A
*0029 80 0038 ADD A,B
*002A 81 0039 ADD A,C
*002B 82 0040 ADD A,D
*002C 83 0041 ADD A,E
*002D 84 0042 ADD A,H
*002E 85 0043 ADD A,L
*002F C620 0044 ADD A,N
*0031 09 0045 ADD HL,BC
*0032 19 0046 ADD HL,DE
*0033 29 0047 ADD HL,HL
*0034 39 0048 ADD HL,SP
*0035 DD09 0049 ADD IX,BC
*0037 DD19 0050 ADD IX,DE
*0039 DD29 0051 ADD IX,IX
*003B DD39 0052 ADD IX,SP
*003C FD09 0053 ADD IY,BC
*003D FD19 0054 ADD IY,DE
*0041 FD29 0055 ADD IY,IY
*0043 FD39 0056 ADD IY,SP
0057 ;
*0045 A6 0058 AND (HL) ; LOGICAL 'AND' A AND
0059 ; BYTE ADDR BY HL

```

ADDR	CODE	STMT	SOURCE STATEMENT
*0046	DDA605	0060	AND (IX+IND)
*0049	FDA605	0061	AND (IY+IND)
*004C	A7	0062	AND A
*004D	A0	0063	AND B
*004E	A1	0064	AND C
*004F	A2	0065	AND D
*0050	A3	0066	AND E
*0051	A4	0067	AND H
*0052	A5	0068	AND L
*0053	E620	0069	AND N
		0070 ;	
*0055	CB46	0071	BIT 0, (HL) ; TEST BIT 0 IN BYTE ADDR BY HL
*0057	DDCB0546	0072	BIT 0, (IX+IND)
*005B	FDCB0546	0073	BIT 0, (IY+IND)
*005F	CB47	0074	BIT 0, A
*0061	CB40	0075	BIT 0, B
*0063	CB41	0076	BIT 0, C
*0065	CB42	0077	BIT 0, D
*0067	CB43	0078	BIT 0, E
*0069	CB44	0079	BIT 0, H
*006B	CB45	0080	BIT 0, L
		0081 ;	
*006D	CB4E	0082	BIT 1, (HL)
*006F	DDCB054E	0083	BIT 1, (IX+IND)
*0073	FDCB054E	0084	BIT 1, (IY+IND)
*0077	CB4F	0085	BIT 1, A
*0079	CB48	0086	BIT 1, B
*007B	CB49	0087	BIT 1, C
*007D	CB4A	0088	BIT 1, D
*007F	CB4B	0089	BIT 1, E
*0081	CB4C	0090	BIT 1, H
*0083	CB4D	0091	BIT 1, L
		0092 ;	
*0085	CB56	0093	BIT 2, (HL)
*0087	DDCB0556	0094	BIT 2, (IX+IND)
*008B	FDCB0556	0095	BIT 2, (IY+IND)
*008F	CB57	0096	BIT 2, A
*0091	CB50	0097	BIT 2, B
*0093	CB51	0098	BIT 2, C
*0095	CB52	0099	BIT 2, D
*0097	CB53	0100	BIT 2, E
*0099	CB54	0101	BIT 2, H
*009B	CB55	0102	BIT 2, L
		0103 ;	
*009D	CB5E	0104	BIT 3, (HL)
*009F	DDCB055E	0105	BIT 3, (IX+IND)
*00A3	FDCB055E	0106	BIT 3, (IY+IND)
*00A7	CB5F	0107	BIT 3, A
*00A9	CB58	0108	BIT 3, B
*00AB	CB59	0109	BIT 3, C
*00AD	CB5A	0110	BIT 3, D
*00AF	CB5B	0111	BIT 3, E
*00B1	CB5C	0112	BIT 3, H
*00B3	CB5D	0113	BIT 3, L
		0114 ;	
*00B5	CB66	0115	BIT 4, (HL)
*00B7	DDCB0566	0116	BIT 4, (IX+IND)
*00BB	FDCB0566	0117	BIT 4, (IY+IND)



ADDR	CODE	STMT	SOURCE STATEMENT
0005	CB67	0118	BIT 4,A
0006	CB60	0119	BIT 4,B
0003	CB61	0120	BIT 4,C
0005	CB62	0121	BIT 4,D
0007	CB63	0122	BIT 4,E
0009	CB64	0123	BIT 4,H
000B	CB65	0124	BIT 4,L
		0125 ;	
000D	CB6E	0126	BIT 5,(HL)
000F	DDCB056E	0127	BIT 5,(IX+IND)
00D3	FDCB056E	0128	BIT 5,(IY+IND)
00D7	CB6F	0129	BIT 5,A
00D9	CB68	0130	BIT 5,B
00DB	CB69	0131	BIT 5,C
00DD	CB6A	0132	BIT 5,D
00DF	CB6B	0133	BIT 5,E
00E1	CB6C	0134	BIT 5,H
00E3	CB6D	0135	BIT 5,L
		0136 ;	
00E5	CB76	0137	BIT 6,(HL)
00E7	DDCB0576	0138	BIT 6,(IX+IND)
00EB	FDCB0576	0139	BIT 6,(IY+IND)
00EF	CB77	0140	BIT 6,A
00F1	CB70	0141	BIT 6,B
00F3	CB71	0142	BIT 6,C
00F5	CB72	0143	BIT 6,D
00F7	CB73	0144	BIT 6,E
00F9	CB74	0145	BIT 6,H
00FB	CB75	0146	BIT 6,L
		0147 ;	
00FD	CB7E	0148	BIT 7,(HL)
00FF	DDCB057E	0149	BIT 7,(IX+IND)
0103	FDCB057E	0150	BIT 7,(IY+IND)
0107	CB7F	0151	BIT 7,A
0109	CB78	0152	BIT 7,B
010B	CB79	0153	BIT 7,C
010D	CB7A	0154	BIT 7,D
010F	CB7B	0155	BIT 7,E
0111	CB7C	0156	BIT 7,H
0113	CB7D	0157	BIT 7,L
		0158 ;	
0115	DC0700	0159	CALL C,NN ;CALL SUBROUTINE AT NN IF CARRY=1
0118	FC0700	0160	CALL M,NN ;CALL IF RESULT MINUS
011B	D40700	0161	CALL NC,NN ;CALL IF NO CARRY
011E	CD0700	0162	CALL NN ;UNCONDITIONAL CALL
0121	C40700	0163	CALL NZ,NN ;CALL IF RESULT NONZERO
0124	F40700	0164	CALL P,NN ;CALL IF RESULT POSITIVE
0127	EC0700	0165	CALL PE,NN ;IF PARITY EVEN
012A	E40700	0166	CALL PO,NN ;IF PARITY ODD
012D	CC0700	0167	CALL Z,NN ;IF RESULTS ZERO
		0168 ;	
0130	3F	0169	CCF ;COMPLEMENT CARRY FLAG
		0170 ;	
0131	BE	0171	CP (HL) ;COMPARE BYTE ADDR BY HL WITH A
		0172	; IF EQUAL, Z=1 (RESULTS ZERO)
		0173	; IF A GREATER, RESULTS POSITIVE
		0174	; IF A SMALLER, RESULTS NEGATIVE (CARRY=1)
0132	DDBE05	0175	CP (IX+IND)

ADDR	CODE	STMT	SOURCE STATEMENT
*0135	FD8E05	0176	CP (IY+IND)
*0138	BF	0177	CF A
*0139	B8	0178	CF B
*013A	B9	0179	CF C
*013B	BA	0180	CF D
*013C	BB	0181	CF E
*013D	BC	0182	CF H
*013E	BD	0183	CF L
*013F	FE20	0184	CF N
		0185 ;	
*0141	EDA9	0186	CPD ;COMPARE BYTE AT (HL) WITH A, DECR HL & BC
*0143	EDB9	0187	CPDR ;AS ABOVE, REPEAT UNTIL BC=0
*0145	EDA1	0188	CPI ;AS ABOVE, INCR HL, DECR BC, NO REPEAT
*0147	EDB1	0189	CPIR ;AS IN CPI, REPEAT UNTIL BC=0
		0190 ;	
*0149	2F	0191	CPL ;1'S COMPEMENT A
		0192 ;	
*014A	27	0193	DAA ;DECIMALLY ADJUST A (MAKE A BCD NUMBER)
		0194 ;	
*014B	35	0195	DEC (HL) ;DECREMENT BYTE AT (HL)
*014C	DD3505	0196	DEC (IX+IND)
*014F	FD3505	0197	DEC (IY+IND)
*0152	3D	0198	DEC A
*0153	05	0199	DEC B
*0154	0B	0200	DEC BC
*0155	0D	0201	DEC C
*0156	15	0202	DEC D
*0157	1B	0203	DEC DE
*0158	1D	0204	DEC E
*0159	25	0205	DEC H
*015A	2B	0206	DEC HL
*015B	DD2B	0207	DEC IX
*015D	FD2B	0208	DEC IY
*015F	2D	0209	DEC L
*0160	3B	0210	DEC SP
		0211 ;	
*0161	F3	0212	DI ;DISABLE INTERRUPTS
		0213 ;	
*0162	102E	0214	DJNZ DIS ;DECR. B, ADD 'DIS' TO PC IF B<>0
		0215 ;	
*0164	FB	0216	EI ;ENABLE INTERRUPTS
		0217 ;	
*0165	E3	0218	EX (SP),HL ;EXCHANGE BYTE POINTED TO
		0219	;BY STACK POINTER WITH HL
*0166	DDE3	0220	EX (SP),IX
*0168	FDE3	0221	EX (SP),IY
*016A	0B	0222	EX AF,AF' ;EXCHANGE A WITH ALTERNATE A REG
*016B	EB	0223	EX DE,HL
*016C	D9	0224	EXX ;EXCHANGE PRIMARY REG SET WITH ALTERNATE
		0225 ;	
*016D	76	0226	HALT ;WAIT FOR INTERRUPT OR RESET
		0227 ;	
*016E	ED46	0228	IM 0 ;SET INTERRUPT MODE TO 0
*0170	ED56	0229	IM 1
*0172	ED5E	0230	IM 2
		0231 ;	
*0174	ED78	0232	IN A,(C) ;INPUT TO A FROM PORT SPEC'D BY C
*0176	DB20	0233	IN A,(N) ;AS ABOVE FROM PORT N,

ADDR	CODE	STMT	SOURCE STATEMENT
		0234	; WHERE N CAN TAKE ANY VALUE
*0	ED40	0235	IN B, (C)
*017A	ED48	0236	IN C, (C)
*017C	ED50	0237	IN D, (C)
*017E	ED58	0238	IN E, (C)
*0180	ED70	0239	IN F, (C)
*0182	ED60	0240	IN H, (C)
*0184	ED68	0241	IN L, (C)
		0242 ;	
*0186	34	0243	INC (HL) ; INCREMENT BYTE AT (HL)
*0187	FD3405	0244	INC (IY+IND)
*018A	DD3405	0245	INC (IX+IND)
*018D	3C	0246	INC A
*018E	04	0247	INC B
*018F	03	0248	INC BC
*0190	0C	0249	INC C
*0191	14	0250	INC D
*0192	13	0251	INC DE
*0193	1C	0252	INC E
*0194	24	0253	INC H
*0195	23	0254	INC HL
*0196	DD23	0255	INC IX
*0198	FD23	0256	INC IY
*019A	2C	0257	INC L
*019B	33	0258	INC SP
		0259 ;	
*0	EDAA	0260	IND ; LOAD BYTE AT (HL) WITH INPUT
		0261	; FROM PORT (C), DECR. HL AND B
*019E	EDBA	0262	INDR ; AS ABOVE, REPEAT UNTIL B=0
*01A0	EDA2	0263	INI ; AS ABOVE, INCR. HL, DECR. B, NO REPEAT
*01A2	EDB2	0264	INIR ; AS INI, REPEAT UNTIL B=0
		0265 ;	
*01A4	E9	0266	JP (HL) ; JUMP TO ADDRESS IN HL
*01A5	DDE9	0267	JP (IX)
*01A7	FDE9	0268	JP (IY)
*01A9	DA0700'	0269	JP C, NN
*01AC	FA0700'	0270	JP M, NN
*01AF	D20700'	0271	JP NC, NN
*01B2	C30700'	0272	JP NN
*01B5	C20700'	0273	JP NZ, NN
*01B8	F20700'	0274	JP P, NN
*01BB	EA0700'	0275	JP PE, NN
*01BE	E20700'	0276	JP PO, NN
*01C1	CA0700'	0277	JP Z, NN
		0278 ;	
*01C4	382E	0279	JR C, DIS
*01C6	182E	0280	JR DIS ; ADD 'DIS' TO PC (JUMP RELATIVE)
*01C8	302E	0281	JR NC, DIS ; DIS=2EH FOR ASSEMBLY
*01CA	202E	0282	JR NZ, DIS
*01CC	282E	0283	JR Z, DIS
		0284 ;	
*0	02	0285	LD (BC), A ; LOAD BYTE AT (BC) WITH A
*01CF	12	0286	LD (DE), A
*01D0	77	0287	LD (HL), A
*01D1	70	0288	LD (HL), B
*01D2	71	0289	LD (HL), C
*01D3	72	0290	LD (HL), D
*01D4	73	0291	LD (HL), E

ADDR	CODE	STMT	SOURCE STATEMENT
*01D5	74	0292	LD (HL),H
*01D6	75	0293	LD (HL),L
*01D7	3620	0294	LD (HL),N
		0295 ;	
*01D9	DD7705	0296	LD (IX+IND),A ;LOAD BYTE AT (IX)
		0297	;PLUS 'IND' WITH A
*01DC	DD7005	0298	LD (IX+IND),B
*01DF	DD7105	0299	LD (IX+IND),C
*01E2	DD7205	0300	LD (IX+IND),D
*01E5	DD7305	0301	LD (IX+IND),E
*01E8	DD7405	0302	LD (IX+IND),H
*01EB	DD7505	0303	LD (IX+IND),L
*01EE	DD360520	0304	LD (IX+IND),N
		0305 ;	
*01F2	FD7705	0306	LD (IY+IND),A
*01F5	FD7005	0307	LD (IY+IND),B
*01F8	FD7105	0308	LD (IY+IND),C
*01FB	FD7205	0309	LD (IY+IND),D
*01FE	FD7305	0310	LD (IY+IND),E
*0201	FD7405	0311	LD (IY+IND),H
*0204	FD7505	0312	LD (IY+IND),L
*0207	FD360520	0313	LD (IY+IND),N
		0314 ;	
*020B	320700'	0315	LD (NN),A ;STORE A AT LOCATION NN
*020E	ED430700'	0316	LD (NN),BC
*0212	ED530700'	0317	LD (NN),DE
*0216	220700'	0318	LD (NN),HL
*0219	DD220700'	0319	LD (NN),IX
*021D	FD220700'	0320	LD (NN),IY
*0221	ED730700'	0321	LD (NN),SP
		0322 ;	
*0225	0A	0323	LD A,(BC) ;LOAD A FROM BYTE ADDR BY BC
*0226	1A	0324	LD A,(DE)
*0227	7E	0325	LD A,(HL)
*0228	DD7E05	0326	LD A,(IX+IND)
*022B	FD7E05	0327	LD A,(IY+IND)
*022E	3A0700'	0328	LD A,(NN)
*0231	7F	0329	LD A,A
*0232	78	0330	LD A,B
*0233	79	0331	LD A,C
*0234	7A	0332	LD A,D
*0235	7B	0333	LD A,E
*0236	7C	0334	LD A,H
*0237	ED57	0335	LD A,I
*0239	7D	0336	LD A,L
*023A	3E20	0337	LD A,N
*023C	ED5F	0338	LD A,R
		0339 ;	
*023E	46	0340	LD B,(HL)
*023F	DD4605	0341	LD B,(IX+IND)
*0242	FD4605	0342	LD B,(IY+IND)
*0245	47	0343	LD B,A
*0246	40	0344	LD B,B
*0247	41	0345	LD B,C
*0248	42	0346	LD B,D
*0249	43	0347	LD B,E
*024A	44	0348	LD B,H
*024B	45	0349	LD B,L

ADDR	CODE	STMT	SOURCE STATEMENT
*024C	0620	0350	LD B,N
		0351 ;	
*024E	ED4B0700	0352	LD BC,(NN)
*0252	010700	0353	LD BC,NN
		0354 ;	
*0255	4E	0355	LD C,(HL)
*0256	DD4E05	0356	LD C,(IX+IND)
*0259	FD4E05	0357	LD C,(IY+IND)
*025C	4F	0358	LD C,A
*025D	48	0359	LD C,B
*025E	49	0360	LD C,C
*025F	4A	0361	LD C,D
*0260	4B	0362	LD C,E
*0261	4C	0363	LD C,H
*0262	4D	0364	LD C,L
*0263	0E20	0365	LD C,N
		0366 ;	
*0265	56	0367	LD D,(HL)
*0266	DD5605	0368	LD D,(IX+IND)
*0269	FD5605	0369	LD D,(IY+IND)
*026C	57	0370	LD D,A
*026D	50	0371	LD D,B
*026E	51	0372	LD D,C
*026F	52	0373	LD D,D
*0270	53	0374	LD D,E
*0271	54	0375	LD D,H
*0272	55	0376	LD D,L
*0273	1620	0377	LD D,N
		0378 ;	
*0275	ED5B0700	0379	LD DE,(NN)
*0279	110700	0380	LD DE,NN
		0381 ;	
*027C	5E	0382	LD E,(HL)
*027D	DD5E05	0383	LD E,(IX+IND)
*0280	FD5E05	0384	LD E,(IY+IND)
*0283	5F	0385	LD E,A
*0284	58	0386	LD E,B
*0285	59	0387	LD E,C
*0286	5A	0388	LD E,D
*0287	5B	0389	LD E,E
*0288	5C	0390	LD E,H
*0289	5D	0391	LD E,L
*028A	1E20	0392	LD E,N
		0393 ;	
*028C	66	0394	LD H,(HL)
*028D	DD6605	0395	LD H,(IX+IND)
*0290	FD6605	0396	LD H,(IY+IND)
*0293	67	0397	LD H,A
*0294	60	0398	LD H,B
*0295	61	0399	LD H,C
*0296	62	0400	LD H,D
*0297	63	0401	LD H,E
*0298	64	0402	LD H,H
*0299	65	0403	LD H,L
*029A	2620	0404	LD H,N
		0405 ;	
*029C	2A0700	0406	LD HL,(NN)
*029F	210700	0407	LD HL,NN

ADDR	CODE	STMT	SOURCE	STATEMENT
		0408 ;		
*02A2	ED47	0409	LD	I,A
		0410 ;		
*02A4	DD2A0700*	0411	LD	IX,(NN)
*02A8	DD210700*	0412	LD	IX,NN
		0413 ;		
*02AC	FD2A0700*	0414	LD	IY,(NN)
*02B0	FD210700*	0415	LD	IY,NN
		0416 ;		
*02B4	6E	0417	LD	L,(HL)
*02B5	DD6E05	0418	LD	L,(IX+IND)
*02B8	FD6E05	0419	LD	L,(IY+IND)
*02BB	6F	0420	LD	L,A
*02BC	68	0421	LD	L,B
*02BD	69	0422	LD	L,C
*02BE	6A	0423	LD	L,D
*02BF	6B	0424	LD	L,E
*02C0	6C	0425	LD	L,H
*02C1	6D	0426	LD	L,L
*02C2	2E20	0427	LD	L,N
		0428 ;		
*02C4	ED4F	0429	LD	R,A
		0430 ;		
*02C6	ED7B0700*	0431	LD	SP,(NN)
*02CA	F9	0432	LD	SP,HL
*02CB	DDF9	0433	LD	SP,IX
*02CD	FDf9	0434	LD	SP,IY
*02CF	310700*	0435	LD	SP,NN
		0436 ;		
*02D2	EDAB	0437	LDD	;LOAD BYTE AT (DE) WITH BYTE AT (HL)
		0438		;DECR. DE, HL, BC
*02D4	EDB8	0439	LDDR	;AS ABOVE, REPEAT UNTIL BC=0.
*02D6	EDA0	0440	LDI	;AS LDD, BUT INCR. DE, HL, DECR. BC
*02D8	EDB0	0441	LDIR	;AS LDI, REPEAT UNTIL BC=0
		0442 ;		
*02DA	ED44	0443	NEG	;2'S COMPLEMENT A
		0444 ;		
*02DC	00	0445	NOF	;NO-OP (DO NOTHING)
		0446 ;		
*02DD	B6	0447	OR	(HL) ;LOGICAL 'OR' A AND BYTE AT (HL)
*02DE	DDB605	0448	OR	(IX+IND)
*02E1	FDB605	0449	OR	(IY+IND)
*02E4	B7	0450	OR	A
*02E5	B0	0451	OR	B
*02E6	B1	0452	OR	C
*02E7	B2	0453	OR	D
*02E8	B3	0454	OR	E
*02E9	B4	0455	OR	H
*02EA	B5	0456	OR	L
*02EB	F620	0457	OR	N
		0458 ;		
*02ED	EDBB	0459	OTDR	;LOAD OUTPUT PORT (C) WITH BYTE AT (HL)
		0460		;DECR. HL AND B, REPEAT UNTIL B=0
*02EF	EDB3	0461	OTIR	;AS ABOVE, BUT INCR. HL
		0462 ;		
*02F1	ED79	0463	OUT	(C),A ;OUTPUT A TO PORT SPEC'D BY C
*02F3	ED41	0464	OUT	(C),B
*02F5	ED49	0465	OUT	(C),C

ADDR	CODE	STMT	SOURCE STATEMENT
*02F7	ED51	0466	OUT (C),D
*02F8	ED59	0467	OUT (C),E
*02FB	ED61	0468	OUT (C),H
*02FD	ED69	0469	OUT (C),L
*02FF	D320	0470	OUT (N),A ;OUTPUT A TO PORT N
		0471 ;	
*0301	EDAB	0472	OUTD ;AS OTDR, BUT NO REPEAT
*0303	EDA3	0473	OUTI ;AS OTIR, BUT NO REPEAT
		0474 ;	
*0305	F1	0475	POP AF ;RETRIEVE A FROM STACK
*0306	C1	0476	POP BC
*0307	D1	0477	POP DE
*0308	E1	0478	POP HL
*0309	DDE1	0479	POP IX
*030B	FDE1	0480	POP IY
		0481 ;	
*030D	F5	0482	PUSH AF ;PUT A ON STACK
*030E	C5	0483	PUSH BC
*030F	D5	0484	PUSH DE
*0310	E5	0485	PUSH HL
*0311	DDE5	0486	PUSH IX
*0313	FDE5	0487	PUSH IY
		0488 ;	
*0315	CB86	0489	RES 0, (HL) ;RESET (MAKE 0) BIT 0
		0490	;OF BYTE AT (HL)
*0317	DDCB0586	0491	RES 0, (IX+IND)
*0318	FDCB0586	0492	RES 0, (IY+IND)
*031F	CB87	0493	RES 0, A
*0321	CB80	0494	RES 0, B
*0323	CB81	0495	RES 0, C
*0325	CB82	0496	RES 0, D
*0327	CB83	0497	RES 0, E
*0329	CB84	0498	RES 0, H
*032B	CB85	0499	RES 0, L
		0500 ;	
*032D	CB8E	0501	RES 1, (HL)
*032F	DDCB058E	0502	RES 1, (IX+IND)
*0333	FDCB058E	0503	RES 1, (IY+IND)
*0337	CB8F	0504	RES 1, A
*0339	CB88	0505	RES 1, B
*033B	CB89	0506	RES 1, C
*033D	CB8A	0507	RES 1, D
*033F	CB8B	0508	RES 1, E
*0341	CB8C	0509	RES 1, H
*0343	CB8D	0510	RES 1, L
		0511 ;	
*0345	CB96	0512	RES 2, (HL)
*0347	DDCB0596	0513	RES 2, (IX+IND)
*034B	FDCB0596	0514	RES 2, (IY+IND)
*034F	CB97	0515	RES 2, A
*0351	CB90	0516	RES 2, B
*0353	CB91	0517	RES 2, C
*0355	CB92	0518	RES 2, D
*0357	CB93	0519	RES 2, E
*0359	CB94	0520	RES 2, H
*035B	CB95	0521	RES 2, L
		0522 ;	
*035D	CB9E	0523	RES 3, (HL)

ADDR	CODE	STMT	SOURCE STATEMENT
*035F	DDCB059E	0524	RES 3, (IX+IND)
*0363	FDCB059E	0525	RES 3, (IY+IND)
*0367	CB9F	0526	RES 3, A
*0369	CB98	0527	RES 3, B
*036B	CB99	0528	RES 3, C
*036D	CB9A	0529	RES 3, D
*036F	CB9B	0530	RES 3, E
*0371	CB9C	0531	RES 3, H
*0373	CB9D	0532	RES 3, L
		0533 ;	
*0375	CBA6	0534	RES 4, (HL)
*0377	DDCB05A6	0535	RES 4, (IX+IND)
*037B	FDCB05A6	0536	RES 4, (IY+IND)
*037F	CBA7	0537	RES 4, A
*0381	CBA0	0538	RES 4, B
*0383	CBA1	0539	RES 4, C
*0385	CBA2	0540	RES 4, D
*0387	CBA3	0541	RES 4, E
*0389	CBA4	0542	RES 4, H
*038B	CBA5	0543	RES 4, L
		0544 ;	
*038D	CBAE	0545	RES 5, (HL)
*038F	DDCB05AE	0546	RES 5, (IX+IND)
*0393	FDCB05AE	0547	RES 5, (IY+IND)
*0397	CBAF	0548	RES 5, A
*0399	CBAB	0549	RES 5, B
*039B	CBA9	0550	RES 5, C
*039D	CBAA	0551	RES 5, D
*039F	CBAB	0552	RES 5, E
*03A1	CBAC	0553	RES 5, H
*03A3	CBAD	0554	RES 5, L
		0555 ;	
*03A5	CBB6	0556	RES 6, (HL)
*03A7	DDCB05B6	0557	RES 6, (IX+IND)
*03AB	FDCB05B6	0558	RES 6, (IY+IND)
*03AF	CBB7	0559	RES 6, A
*03B1	CBB0	0560	RES 6, B
*03B3	CBB1	0561	RES 6, C
*03B5	CBB2	0562	RES 6, D
*03B7	CBB3	0563	RES 6, E
*03B9	CBB4	0564	RES 6, H
*03BB	CBB5	0565	RES 6, L
		0566 ;	
*03BD	CBBE	0567	RES 7, (HL)
*03BF	DDCB05BE	0568	RES 7, (IX+IND)
*03C3	FDCB05BE	0569	RES 7, (IY+IND)
*03C7	CBBF	0570	RES 7, A
*03C9	CBB8	0571	RES 7, B
*03CB	CBB9	0572	RES 7, C
*03CD	CBBA	0573	RES 7, D
*03CF	CBBB	0574	RES 7, E
*03D1	CBBC	0575	RES 7, H
*03D3	CBBD	0576	RES 7, L
		0577 ;	
*03D5	C9	0578	RET ; RETURN FROM SUBROUTINE
*03D6	DB	0579	RET C
*03D7	FB	0580	RET M
*03D8	DO	0581	RET NC



ADDR	CODE	STMT	SOURCE	STATEMENT
*03D9	CO	0582	RET	NZ
*0	FO	0583	RET	P
*03DB	EB	0584	RET	PE
*03DC	EO	0585	RET	PO
*03DD	CB	0586	RET	Z
		0587 ;		
*03DE	ED4D	0588	RETI	;RETURN FROM INTERRUPT ROUTINE
*03EO	ED45	0589	RETN	;RETURN FROM NONMASKABLE INTERRUPT
		0590 ;		
*03E2	CB16	0591	RL	(HL) ;ROTATE LEFT THRU CY, BYTE AT (HL)
*03E4	DDCB0516	0592	RL	(IX+IND)
*03E8	FDCB0516	0593	RL	(IY+IND)
*03EC	CB17	0594	RL	A ;ROTATE A LEFT THRU CARRY
*03EE	CB10	0595	RL	B
*03F0	CB11	0596	RL	C
*03F2	CB12	0597	RL	D
*03F4	CB13	0598	RL	E
*03F6	CB14	0599	RL	H
*03F8	CB15	0600	RL	L
		0601 ;		
*03FA	17	0602	RLA	;SAME AS RL A
		0603 ;		
*03FB	CB06	0604	RLC	(HL)
*03FD	DDCB0506	0605	RLC	(IX+IND)
*0401	FDCB0506	0606	RLC	(IY+IND)
*0405	CB07	0607	RLC	A ;ROTATE A CIRCULAR WITHOUT CY
*0	CB00	0608	RLC	B
*0409	CB01	0609	RLC	C
*040B	CB02	0610	RLC	D
*040D	CB03	0611	RLC	E
*040F	CB04	0612	RLC	H
*0411	CB05	0613	RLC	L
		0614 ;		
*0413	07	0615	RLCA	;SAME AS RLC A
		0616 ;		
*0414	ED6F	0617	RLD	;ROTATE DIGIT (4 BITS) LEFT AND RIGHT
		0618		;BETWEEN A AND (HL)
		0619 ;		
*0416	CB1E	0620	RR	(HL) ;ROTATE RT (THRU CY) BYTE AT (HL)
*0418	DDCB051E	0621	RR	(IX+IND)
*041C	FDCB051E	0622	RR	(IY+IND)
*0420	CB1F	0623	RR	A
*0422	CB18	0624	RR	B
*0424	CB19	0625	RR	C
*0426	CB1A	0626	RR	D
*0428	CB1B	0627	RR	E
*042A	CB1C	0628	RR	H
*042C	CB1D	0629	RR	L
		0630 ;		
*042E	1F	0631	RRA	;SAME AS RR A
		0632 ;		
*0	CB0E	0633	RRC	(HL) ;ROTATE RT CIRCULAR BYTE AT (HL)
*0431	DDCB050E	0634	RRC	(IX+IND)
*0435	FDCB050E	0635	RRC	(IY+IND)
*0439	CB0F	0636	RRC	A
*043B	CB08	0637	RRC	B
*043D	CB09	0638	RRC	C
*043F	CB0A	0639	RRC	D

ADDR	CODE	STMT	SOURCE	STATEMENT
*0441	C80B	0640	RRC	E
*0443	C80C	0641	RRC	H
*0445	C80D	0642	RRC	L
		0643 ;		
*0447	0F	0644	RRCA	; SAME AS RRC A
		0645 ;		
*0448	ED67	0646	RRD	; ROTATE DIGIT RT AND LFT BETWEEN
		0647		; A AND LOCATION (HL)
		0648 ;		
*044A	C7	0649	RST	0 ; RESTART TO LOCATION 00
*044B	CF	0650	RST	08H
*044C	D7	0651	RST	10H
*044D	DF	0652	RST	18H
*044E	E7	0653	RST	20H
*044F	EF	0654	RST	28H
*0450	F7	0655	RST	30H
*0451	FF	0656	RST	38H
		0657 ;		
*0452	9E	0658	SBC	A, (HL) ; SUBTRACT WITH CY THE BYTE AT
		0659		; (HL) FROM A
*0453	DD9E05	0660	SBC	A, (IX+IND)
*0456	FD9E05	0661	SBC	A, (IY+IND)
*0459	9F	0662	SBC	A, A
*045A	98	0663	SBC	A, B
*045B	99	0664	SBC	A, C
*045C	9A	0665	SBC	A, D
*045D	9B	0666	SBC	A, E
*045E	9C	0667	SBC	A, H
*045F	9D	0668	SBC	A, L
*0460	DE20	0669	SBC	A, N
		0670 ;		
*0462	ED42	0671	SBC	HL, BC ; 16 BIT SUBTRACT W/CY, BC FROM HL
*0464	ED52	0672	SBC	HL, DE
*0466	ED62	0673	SBC	HL, HL
*0468	ED72	0674	SBC	HL, SP
		0675 ;		
*046A	37	0676	SCF	; SET CARRY FLAG (CY=1)
		0677 ;		
*046B	CBC6	0678	SET	0, (HL) ; SET (TO 1) BIT 0 IN BYTE AT (HL)
*046D	DDCB05C6	0679	SET	0, (IX+IND)
*0471	FDCB05C6	0680	SET	0, (IY+IND)
*0475	CBC7	0681	SET	0, A
*0477	CBC0	0682	SET	0, B
*0479	CBC1	0683	SET	0, C
*047B	CBC2	0684	SET	0, D
*047D	CBC3	0685	SET	0, E
*047F	CBC4	0686	SET	0, H
*0481	CBC5	0687	SET	0, L
		0688 ;		
*0483	CBCE	0689	SET	1, (HL)
*0485	DDCB05CE	0690	SET	1, (IX+IND)
*0489	FDCB05CE	0691	SET	1, (IY+IND)
*048D	CBCF	0692	SET	1, A
*048F	CBC8	0693	SET	1, B
*0491	CBC9	0694	SET	1, C
*0493	CBCA	0695	SET	1, D
*0495	CBCB	0696	SET	1, E
*0497	CBCC	0697	SET	1, H

ADDR	CODE	STMT	SOURCE STATEMENT
*0499	CBCD	0698	SET 1,L
		0699 ;	
*049B	CBD6	0700	SET 2,(HL)
*049D	DDCB05D6	0701	SET 2,(IX+IND)
*04A1	FDCB05D6	0702	SET 2,(IY+IND)
*04A5	CBD7	0703	SET 2,A
*04A7	CBD0	0704	SET 2,B
*04A9	CBD1	0705	SET 2,C
*04AB	CBD2	0706	SET 2,D
*04AD	CBD3	0707	SET 2,E
*04AF	CBD4	0708	SET 2,H
*04B1	CBD5	0709	SET 2,L
		0710 ;	
*04B3	CBDE	0711	SET 3,(HL)
*04B5	DDCB05DE	0712	SET 3,(IX+IND)
*04B9	FDCB05DE	0713	SET 3,(IY+IND)
*04BD	CBDF	0714	SET 3,A
*04BF	CBDB	0715	SET 3,B
*04C1	CBD9	0716	SET 3,C
*04C3	CBDA	0717	SET 3,D
*04C5	CBDB	0718	SET 3,E
*04C7	CBDC	0719	SET 3,H
*04C9	CBDD	0720	SET 3,L
		0721 ;	
*04CB	CBE6	0722	SET 4,(HL)
*04CD	DDCB05E6	0723	SET 4,(IX+IND)
*04D1	FDCB05E6	0724	SET 4,(IY+IND)
*04D3	CBE7	0725	SET 4,A
*04D7	CBE0	0726	SET 4,B
*04D9	CBE1	0727	SET 4,C
*04DB	CBE2	0728	SET 4,D
*04DD	CBE3	0729	SET 4,E
*04DF	CBE4	0730	SET 4,H
*04E1	CBE5	0731	SET 4,L
		0732 ;	
*04E3	CBEE	0733	SET 5,(HL)
*04E5	DDCB05EE	0734	SET 5,(IX+IND)
*04E9	FDCB05EE	0735	SET 5,(IY+IND)
*04ED	CBEF	0736	SET 5,A
*04EF	CBEB	0737	SET 5,B
*04F1	CBE9	0738	SET 5,C
*04F3	CBEA	0739	SET 5,D
*04F5	CBEB	0740	SET 5,E
*04F7	CBEC	0741	SET 5,H
*04F9	CBED	0742	SET 5,L
		0743 ;	
*04FB	CBF6	0744	SET 6,(HL)
*04FD	DDCB05F6	0745	SET 6,(IX+IND)
*0501	FDCB05F6	0746	SET 6,(IY+IND)
*0505	CBF7	0747	SET 6,A
*0507	CBF0	0748	SET 6,B
*0509	CBF1	0749	SET 6,C
*050B	CBF2	0750	SET 6,D
*050D	CBF3	0751	SET 6,E
*050F	CBF4	0752	SET 6,H
*0511	CBF5	0753	SET 6,L
		0754 ;	
*0513	CBFE	0755	SET 7,(HL)

ADDR	CODE	STMT	SOURCE	STATEMENT
0515	DDCB05FE	0756	SET	7, (IX+IND)
0519	FDCB05FE	0757	SET	7, (IY+IND)
051D	CBFF	0758	SET	7, A
051F	CBFB	0759	SET	7, B
0521	CBF9	0760	SET	7, C
0523	CBFA	0761	SET	7, D
0525	CBFB	0762	SET	7, E
0527	CBFC	0763	SET	7, H
0529	CBFD	0764	SET	7, L
		0765 ;		
052B	CB26	0766	SLA	(HL) ;SHIFT LEFT ARITHMETIC,
		0767		;BYTE AT (HL)
052D	DDCB0526	0768	SLA	(IX+IND)
0531	FDCB0526	0769	SLA	(IY+IND)
0535	CB27	0770	SLA	A
0537	CB20	0771	SLA	B
0539	CB21	0772	SLA	C
053B	CB22	0773	SLA	D
053D	CB23	0774	SLA	E
053F	CB24	0775	SLA	H
0541	CB25	0776	SLA	L
		0777 ;		
0543	CB2E	0778	SRA	(HL) ;SHIFT RT ARITH., BYTE AT (HL)
0545	DDCB052E	0779	SRA	(IX+IND)
0549	FDCB052E	0780	SRA	(IY+IND)
054D	CB2F	0781	SRA	A
054F	CB28	0782	SRA	B
0551	CB29	0783	SRA	C
0553	CB2A	0784	SRA	D
0555	CB2B	0785	SRA	E
0557	CB2C	0786	SRA	H
0559	CB2D	0787	SRA	L
		0788 ;		
055B	CB3E	0789	SRL	(HL) ;SHIFT RT LOGICAL, BYTE AT (HL)
055D	DDCB053E	0790	SRL	(IX+IND)
0561	FDCB053E	0791	SRL	(IY+IND)
0565	CB3F	0792	SRL	A
0567	CB38	0793	SRL	B
0569	CB39	0794	SRL	C
056B	CB3A	0795	SRL	D
056D	CB3B	0796	SRL	E
056F	CB3C	0797	SRL	H
0571	CB3D	0798	SRL	L
		0799 ;		
0573	96	0800	SUB	(HL) ;SUBTRACT (NO CARRY) BYTE AT
		0801		; (HL) FROM A
0574	DD9605	0802	SUB	(IX+IND)
0577	FD9605	0803	SUB	(IY+IND)
057A	97	0804	SUB	A
057B	90	0805	SUB	B
057C	91	0806	SUB	C
057D	92	0807	SUB	D
057E	93	0808	SUB	E
057F	94	0809	SUB	H
0580	95	0810	SUB	L
0581	D620	0811	SUB	N
		0812 ;		
0583	AE	0813	XOR	(HL) ;"EXCLUSIVE OR" BYTE AT

ADDR	CODE	STMT	SOURCE	STATEMENT
		0814		; (HL) WITH A
*05	DDAE05	0815	XOR	(IX+IND)
*05B7	FDAE05	0816	XOR	(IY+IND)
*058A	AF	0817	XOR	A
*058B	AB	0818	XOR	B
*058C	A9	0819	XOR	C
*058D	AA	0820	XOR	D
*058E	AB	0821	XOR	E
*058F	AC	0822	XOR	H
*0590	AD	0823	XOR	L
*0591	EE20	0824	XOR	N
		0825		; EXCLUSIVE OR A WITH VALUE 'N'
		0826	END	

ERRORS=0000