

HBACKUP.COMD

The HBACKUP command allows the user to back up the PCOS partition of the hard disk (or the entire disk if it is all partitioned for PCOS) onto one or more diskettes. Moreover, it is the only way in which a file larger than the capacity of a diskette can be backed up.

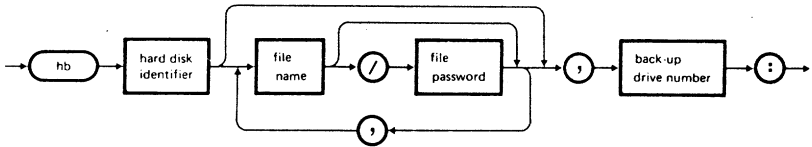


Fig. 14-23 HBACKUP

Where

SYNTAX ELEMENT	MEANING
hard disk identifier	The volume name or drive number to be backed up
file name	EITHER the name of a file to be backed up OR a file name containing wild cards to specify a group of files to be backed up
back-up drive number	The number of the diskette drive in which the backup will be made

Characteristics

If the specified diskette drive contains a blank, formatted diskette, then the backup commences immediately after the user enters the command line correctly.

If you specify less than two parameters in the command line, then the message

parameter missing

is displayed and the command terminates.

If the specified target volume identifier is not configured, then the message

destination volume missing

is displayed, and the command terminates.

If the user has entered the command line correctly but the specified drive does not contain a blank, formatted diskette, then the message

Bad disk in drive 0:

Insert a blank formatted disk and press RETURN

is displayed. Backing up will commence only after the user has inserted a blank, formatted diskette and strikes /CR/.

Once the backup has started, the HBACKUP command creates a file called "Backup.000" on the backup diskette. This is a composite file that will contain

- A table of all the names of the files on the hard disk to be backed up.
- As much of the data to be backed up as will fit onto the remainder of the diskette. This will comprise any number of the specified files, and/or a partial file. The data is held in a compressed form to save space and hence reduce the number of copies.

If all the specified files fit onto one diskette, then the backup operation terminates and control is returned to PCOS. If additional diskettes are required, however, the following prompt is displayed:

disk full - insert new disk and press RETURN

After the user inserts another blank, formatted diskette and strikes /CR/, the operation continues. The composite file on this diskette is automatically named "Backup.001." The user must then repeat this process until the backup is complete. Each subsequent diskette will contain one composite file automatically named in sequence "Backup.002," "Backup.003," etc., where each such file contains as many hard disk files and/or partial files as will fit on the diskette. Note that only the first diskette contains the table of file names.

Password-protected files may be backed up, but the password must be given. Write-protected files may be backed up, but will not be restored if a file of the same name exists on the hard disk and is still write-protected at restoration time. Copy-protected files will not be backed up by the HBACKUP command.

If the user specifies a file that does not exist on the hard disk, the message

file not found

is displayed, followed by the file name, and the backup continues.

Since the backup is saved in a format different from that of the original files on hard disk, a special command -- the HRESTORE command -- must be used to restore the backup to hard disk; that is, it is not possible to restore the backup using the FCOPY command. The backup can be copied (using the VCOPY command) **in the same format** to another set of diskettes, but cannot actually be used until it has been restored.

Examples

If you enter...	THEN...
hb 10:,0: /CR/	The entire contents of the PCOS partition of the hard disk are backed up onto a series of diskettes in drive 0
hb 10:*.cmd,0: /CR/	All files with the file name extension ".cmd" on the PCOS partition of the hard disk will be backed up onto a series of diskettes in drive 0

Remarks

The FCOPY command can be used to back up hard disk files, provided no file to be copied is greater than the capacity of the target diskette.

If the hard disk is partitioned, only the PCOS partition can be backed up using the HBACKUP command. Other partitions must be backed up under their respective operating systems.

HDISK.COMD

Partitions the hard disk.

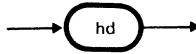


Fig. 14-24 HDISK

Characteristics

The HDISK command creates the PCOS partition on the hard disk. For operational details, refer to Chapter 12.

HRESTORE.COMD

Restores to hard disk all or part of a backup that was made using the HBACKUP command.

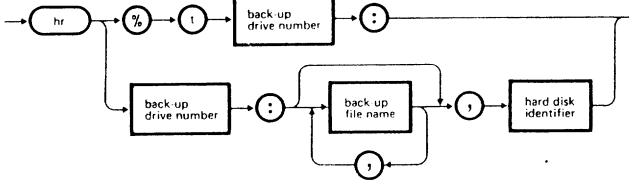


Fig. 14-25 HRESTORE

Where

SYNTAX ELEMENT	MEANING
t	A list of all files saved by the corresponding backup is displayed. No restore is performed. Only the first diskette of the corresponding backup operation is required for this operation
back-up drive number	The drive number of the diskette drive from which the backup copy is to be restored
back-up file name	EITHER the name of a backed up file to be restored OR a group of files specified using wild card characters. If this parameter is omitted, then all files from the corresponding backup are restored
hard disk identifier	The drive number of the hard disk to which the backup is to be restored

Characteristics

If the target volume is not specified and %t is not entered, the message
destination volume missing

is displayed and the command terminates.

If the source volume is not specified, then the message

backup volume missing

is displayed, and the command terminates.

If the drive specified by the source drive number contains the first disk of a backup session, then the restore operation begins as soon as the command line is entered. If not, then the message

please insert first back-up disk and press RETURN

will be displayed. In this case, the restore operation will begin after inserting the appropriate diskette and striking /CR/. The backup diskettes must be restored in the order in which they were saved; that is, the one containing backup file "Backup.000", followed by "Backup.001", and so on.

If the backup was made on more than one diskette, then the user is prompted to insert each diskette in turn.

If the no-interaction (%n) flag is used with this command, then files that already exist on the target volume will be overwritten without prompting.

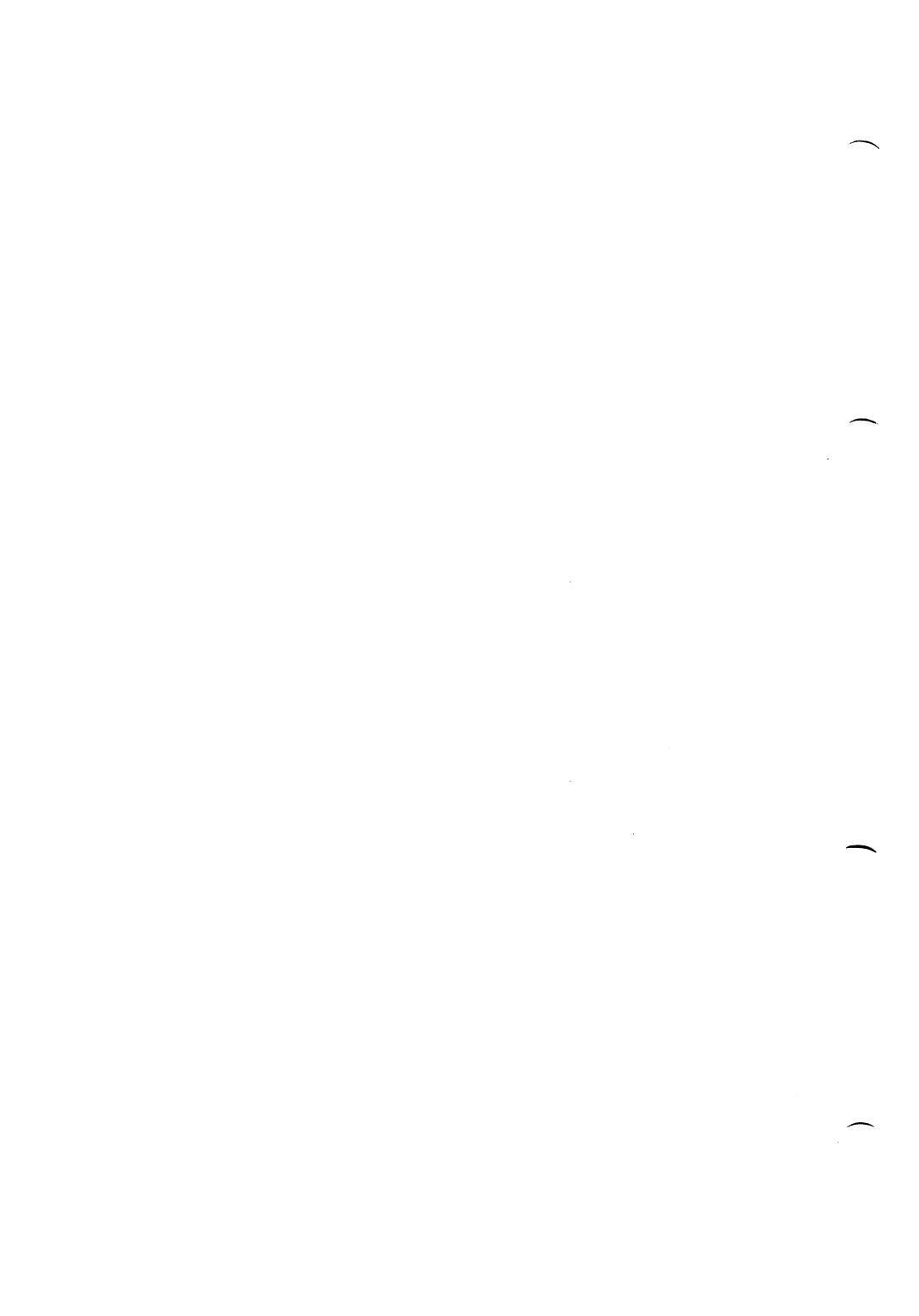
If a requested file is not on the backup, the message

file not found

followed by the file name is displayed, and the restore operation continues.

Examples

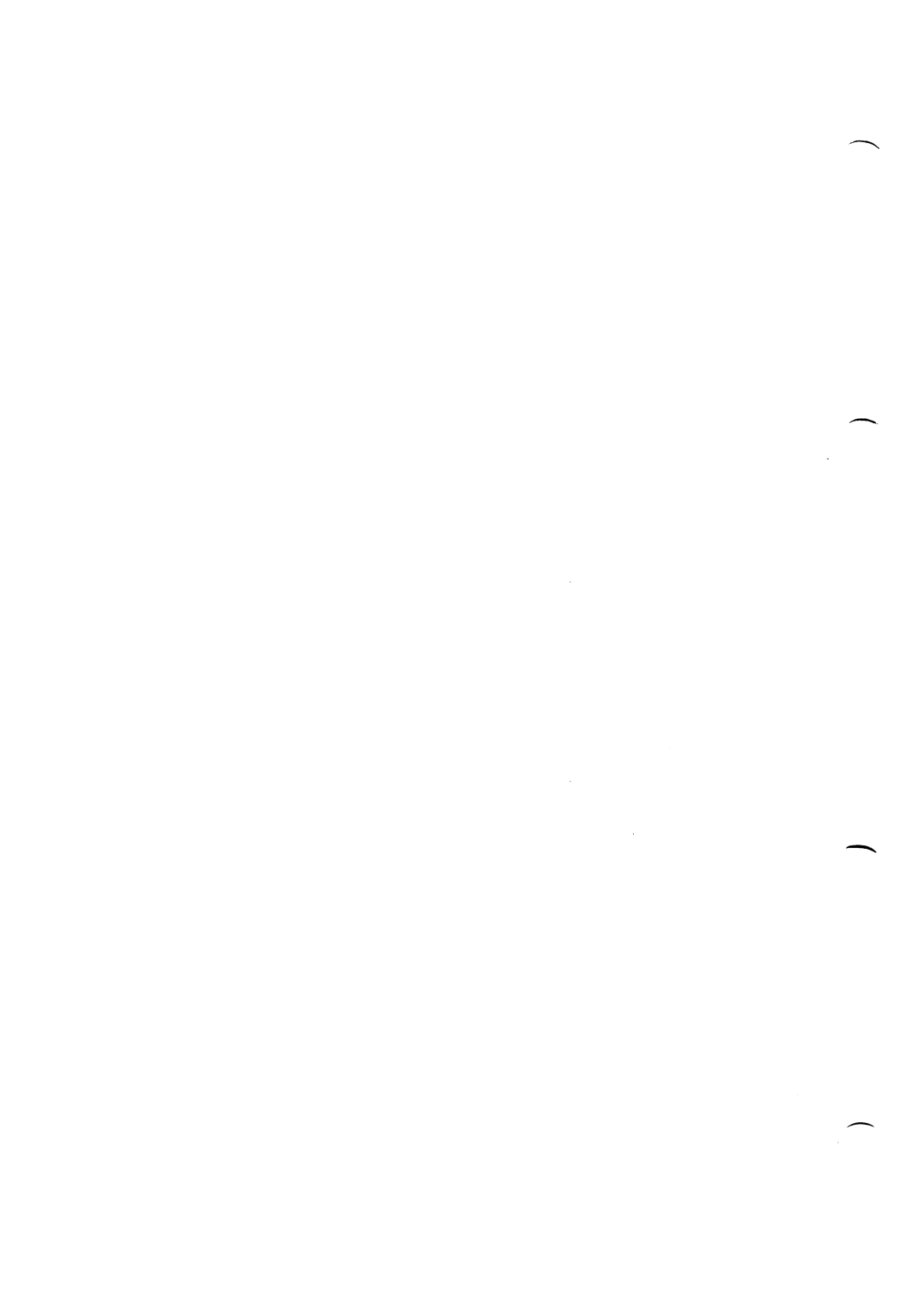
IF you enter...	THEN...
hr 0:,10: /CR/	The hard disk will be restored from one or more backup diskettes inserted in series in drive 0
hr 0:*.cmd,10: /CR/	All files with the file name extension ".cmd" on a series of one or more backup diskettes inserted in drive 0 are restored to the hard disk
hr %t 0: /CR/	The files contained in the backup are displayed



ASCII CODE

This table shows decimal (a), hexadecimal (b), and binary (c) representation of the ASCII code. (Boxed items are different on national keyboards.)

a	b	c	d	a	b	c	d	a	b	c	a	b	c
0	00	0000 0000	NUL	64	40	0100 0000	Ⓒ	128	80	1000 0000	192	C0	1100 0000
1	01	0000 0001	SOH	65	41	0100 0001	Ⓐ	129	81	1000 0001	193	C1	1100 0001
2	02	0000 0010	STX	66	42	0100 0010	Ⓑ	130	82	1000 0010	194	C2	1100 0010
3	03	0000 0011	ETX	67	43	0100 0011	Ⓒ	131	83	1000 0011	195	C3	1100 0011
4	04	0000 0100	EQT	68	44	0100 0100	Ⓓ	132	84	1000 0100	196	C4	1100 0100
5	05	0000 0101	ENQ	69	45	0100 0101	Ⓔ	133	85	1000 0101	197	C5	1100 0101
6	06	0000 0110	ACK	70	46	0100 0110	Ⓕ	134	86	1000 0110	198	C6	1100 0110
7	07	0000 0111	BEL	71	47	0100 0111	Ⓖ	135	87	1000 0111	199	C7	1100 0111
8	08	0000 1000	BS	72	48	0100 1000	Ⓖ	136	88	1000 1000	200	C8	1100 1000
9	09	0000 1001	HT	73	49	0100 1001	Ⓙ	137	89	1000 1001	201	C9	1100 1001
10	0A	0000 1010	LF	74	4A	0100 1010	Ⓚ	138	8A	1000 1010	202	CA	1100 1010
11	0B	0000 1011	VT	75	4B	0100 1011	Ⓛ	139	8B	1000 1011	203	CB	1100 1011
12	0C	0000 1100	FF	76	4C	0100 1100	Ⓛ	140	8C	1000 1100	204	CC	1100 1100
13	0D	0000 1101	CR	77	4D	0100 1101	Ⓜ	141	8D	1000 1101	205	CD	1100 1101
14	0E	0000 1110	SO	78	4E	0100 1110	Ⓝ	142	8E	1000 1110	206	CE	1100 1110
15	0F	0000 1111	SI	79	4F	0100 1111	Ⓞ	143	8F	1000 1111	207	CF	1100 1111
16	10	0001 0000	DLE	80	50	0101 0000	Ⓟ	144	90	1001 0000	208	D0	1101 0000
17	11	0001 0001	DC.	81	51	0101 0001	Ⓠ	145	91	1001 0001	209	D1	1101 0001
18	12	0001 0010	DC.	82	52	0101 0010	Ⓡ	146	92	1001 0010	210	D2	1101 0010
19	13	0001 0011	DC.	83	53	0101 0011	Ⓢ	147	93	1001 0011	211	D3	1101 0011
20	14	0001 0100	DC.	84	54	0101 0100	Ⓣ	148	94	1001 0100	212	D4	1101 0100
21	15	0001 0101	NAK	85	55	0101 0101	Ⓤ	149	95	1001 0101	213	D5	1101 0101
22	16	0001 0110	SYN	86	56	0101 0110	Ⓥ	150	96	1001 0110	214	D6	1101 0110
23	17	0001 0111	ETB	87	57	0101 0111	Ⓦ	151	97	1001 0111	215	D7	1101 0111
24	18	0001 1000	CAN	88	58	0101 1000	Ⓧ	152	98	1001 1000	216	D8	1101 1000
25	19	0001 1001	EM	89	59	0101 1001	Ⓨ	153	99	1001 1001	217	D9	1101 1001
26	1A	0001 1010	SUB	90	5A	0101 1010	Ⓩ	154	9A	1001 1010	218	DA	1101 1010
27	1B	0001 1011	ESC	91	5B	0101 1011	Ⓚ	155	9B	1001 1011	219	DB	1101 1011
28	1C	0001 1100	FS	92	5C	0101 1100	Ⓛ	156	9C	1001 1100	220	DC	1101 1100
29	1D	0001 1101	GS	93	5D	0101 1101	Ⓛ	157	9D	1001 1101	221	DD	1101 1101
30	1E	0001 1110	RS	94	5E	0101 1110	Ⓝ	158	9E	1001 1110	222	DE	1101 1110
31	1F	0001 1111	US	95	5F	0101 1111	Ⓞ	159	9F	1001 1111	223	DF	1101 1111
32	20	0010 0000	SPACE	96	60	0110 0000	Ⓟ	160	A0	1010 0000	224	E0	1110 0000
33	21	0010 0001	!	97	61	0110 0001	Ⓠ	161	A1	1010 0001	225	E1	1110 0001
34	22	0010 0010	"	98	62	0110 0010	Ⓡ	162	A2	1010 0010	226	E2	1110 0010
35	23	0010 0011	#	99	63	0110 0011	Ⓢ	163	A3	1010 0011	227	E3	1110 0011
36	24	0010 0100	\$	100	64	0110 0100	Ⓣ	164	A4	1010 0100	228	E4	1110 0100
37	25	0010 0101	%	101	65	0110 0101	Ⓤ	165	A5	1010 0101	229	E5	1110 0101
38	26	0010 0110	&	102	66	0110 0110	Ⓥ	166	A6	1010 0110	230	E6	1110 0110
39	27	0010 0111	'	103	67	0110 0111	Ⓦ	167	A7	1010 0111	231	E7	1110 0111
40	28	0010 1000	(	104	68	0110 1000	Ⓧ	168	A8	1010 1000	232	E8	1110 1000
41	29	0010 1001	)	105	69	0110 1001	Ⓨ	169	A9	1010 1001	233	E9	1110 1001
42	2A	0010 1010	*	106	6A	0110 1010	Ⓩ	170	AA	1010 1010	234	EA	1110 1010
43	2B	0010 1011	+	107	6B	0110 1011	Ⓚ	171	AB	1010 1011	235	EB	1110 1011
44	2C	0010 1100	,	108	6C	0110 1100	Ⓛ	172	AC	1010 1100	236	EC	1110 1100
45	2D	0010 1101	-	109	6D	0110 1101	Ⓜ	173	AD	1010 1101	237	ED	1110 1101
46	2E	0010 1110	.	110	6E	0110 1110	Ⓝ	174	AE	1010 1110	238	EE	1110 1110
47	2F	0010 1111	/	111	6F	0110 1111	Ⓞ	175	AF	1010 1111	239	EF	1110 1111
48	30	0011 0000	0	112	70	0111 0000	Ⓟ	176	B0	1011 0000	240	F0	1111 0000
49	31	0011 0001	1	113	71	0111 0001	Ⓠ	177	B1	1011 0001	241	F1	1111 0001
50	32	0011 0010	2	114	72	0111 0010	Ⓡ	178	B2	1011 0010	242	F2	1111 0010
51	33	0011 0011	3	115	73	0111 0011	Ⓢ	179	B3	1011 0011	243	F3	1111 0011
52	34	0011 0100	4	116	74	0111 0100	Ⓣ	180	B4	1011 0100	244	F4	1111 0100
53	35	0011 0101	5	117	75	0111 0101	Ⓤ	181	B5	1011 0101	245	F5	1111 0101
54	36	0011 0110	6	118	76	0111 0110	Ⓥ	182	B6	1011 0110	246	F6	1111 0110
55	37	0011 0111	7	119	77	0111 0111	Ⓦ	183	B7	1011 0111	247	F7	1111 0111
56	38	0011 1000	8	120	78	0111 1000	Ⓧ	184	B8	1011 1000	248	F8	1111 1000
57	39	0011 1001	9	121	79	0111 1001	Ⓨ	185	B9	1011 1001	249	F9	1111 1001
58	3A	0011 1010	:	122	7A	0111 1010	Ⓩ	186	BA	1011 1010	250	FA	1111 1010
59	3B	0011 1011	;	123	7B	0111 1011	Ⓚ	187	BB	1011 1011	251	FB	1111 1011
60	3C	0011 1100	<	124	7C	0111 1100	Ⓛ	188	BC	1011 1100	252	FC	1111 1100
61	3D	0011 1101	=	125	7D	0111 1101	Ⓛ	189	BD	1011 1101	253	FD	1111 1101
62	3E	0011 1110	>	126	7E	0111 1110	Ⓝ	190	BE	1011 1110	254	FE	1111 1110
63	3F	0011 1111	?	127	7F	0111 1111	Ⓞ	191	BF	1011 1111	255	FF	1111 1111



B. NATIONAL KEYBOARDS

ABOUT THIS APPENDIX

This appendix describes all the national keyboards available with the M20.

CONTENTS

<u>ASCII CHARACTER EQUIVALENCES</u>	B-1	SWEDEN/FINLAND KEYBOARD	B-33
<u>NATIONAL KEYBOARD LAYOUTS AND CODES</u>	B-1	SWITZERLAND FRENCH KEYBOARD	B-36
DENMARK KEYBOARD	B-3	SWITZERLAND GERMAN KEYBOARD	B-39
FRANCE KEYBOARD	B-6	USA ASCII KEYBOARD	B-42
GERMANY (ORIGINAL) KEYBOARD	B-9	USA ASCII + BASIC KEYBOARD	B-45
GERMANY (WEST) KEYBOARD	B-12	YUGOSLAVIA KEYBOARD	B-48
GREAT BRITAIN KEYBOARD	B-15		
GREECE KEYBOARD	B-18		
ITALY KEYBOARD	B-21		
NORWAY KEYBOARD	B-24		
PORTUGAL KEYBOARD	B-27		
SPAIN KEYBOARD	B-30		

ASCII CHARACTER EQUIVALENCES

The following table shows the national equivalents for those ASCII characters which are displayed in various national guises.

ASCII VALUE		NATIONAL EQUIVALENT														
DECIMAL	HEXADECIMAL	USA	ITALY	FRANCE	GREAT BRITAIN	GERMANY (ORIGINAL)	GERMANY (WEST)	SPAIN	PORTUGAL	DENMARK	SWEDEN FINLAND	NORWAY	SWITZERLAND FRENCH	SWITZERLAND GERMAN	GREECE	YUGOSLAVIA
35	23	#	£	£	£	#	#	£	#	£	#	£	£	£	£	#
36	24	\$	₯	₯	₯	₯	₯	₯	₯	₯	¤	₯	₯	₯	₯	¤
64	40	@	§	à	@	§	§	§	§	·	@	·	§	§	@	§
91	5B	[	o	o	[	Å	Å	i	Ã	Æ	Å	Æ	à	à	[	ø
92	5C	\	ç	ç	\	Ö	Ö	ñ	ç	Ø	Ö	Ø	ç	ç	\	ć
93	5D	|	é	§	]	ü	ü	ç	Ö	Å	Å	Å	é	é	|	ž
96	60	·	ù	·	·	·	·	·	·	·	·	·	·	·	·	·
123	7B	{	ä	é	{	ä	ä	o	ä	æ	ä	æ	ä	ä	{	đ
124	7C	|	ö	ü	|	ö	ö	ñ	ç	ø	ö	ø	ö	ö	|	ć
125	7D	}	è	è	}	ü	ü	ç	ö	ä	ä	ä	ü	ü	}	ž
126	7E	~	ï	·	·	ß	ß	·	o	·	·	·	é	é	·	ć

* Encircled characters are used for functions in BASIC.

Table B-1 ASCII Character Equivalences

NATIONAL KEYBOARDS LAYOUTS AND CODES

Each of the national keyboards is described by a figure that illustrates the keyboard layout, and a table that relates the key or key combination struck to the code generated. That is, the table shows the hexadecimal ASCII codes generated for each key whether struck on its own, or in conjunction with the /SHIFT/, /CTRL/, or /COMMAND/ key.

The keyboards are each toured in the same physical sequence, in ascending order of raw key codes.

Remark

The shift-lock and cursor-lock functions are enabled by the bottom right-hand key (// on the USA ASCII keyboard) struck in conjunction with the /COMMAND/ or /CTRL/ key respectively. Where:

shift-lock infers that all alpha keys on the alphanumeric keypad subsequently take on shifted values. That is, an alpha key struck on its own will generate an upper case character. Moreover, an alpha key struck in conjunction with the /SHIFT/ key will generate a lower case character. The shift-lock is disabled by re-entering /COMMAND/ //

cursor-lock infers that all keys on the numeric keypad subsequently take on shifted values. That is, if such a key is struck on its own it will generate the code normally associated with pressing the same key in conjunction with the /SHIFT/ key. Moreover, if such a key is pressed in conjunction with the shift key, it will generate the unshifted value. The cursor lock is disabled by re-entering /CTRL/ //.

Note that the cursor moving keys (↑, ↓, ←, →, and HOME) are not operational in the PCOS environment

DENMARK KEYBOARD

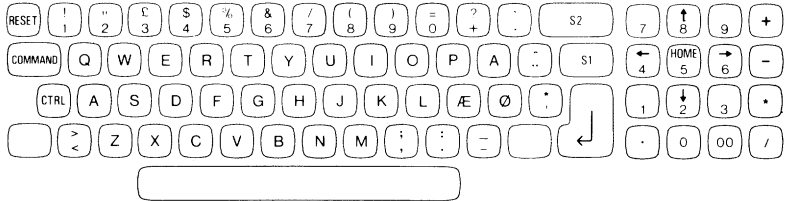


Fig. B-1 Denmark Keyboard

Alphanumeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
00	RESET	DD	DE	A0	Df
01	<	3C	3E	7F	F8
02	a	61	41	01	80
03	b	62	42	A1	81
04	c	63	43	A2	82
05	d	64	44	04	83
06	e	65	45	05	84
07	f	66	46	06	85
08	g	67	47	07	86
09	h	68	48	08	87
0A	i	69	49	09	88
0B	j	6A	4A	0A	89
0C	k	6B	4B	0B	8A
0D	l	6C	4C	0C	8B
0E	m	6D	4D	0D	8C
0F	n	6E	4E	0E	8D
10	o	6F	4F	0F	8E
11	p	70	50	10	8F
12	q	71	51	11	90
13	r	72	52	12	91
14	s	73	53	A3	92
15	t	74	54	14	93
16	u	75	55	15	94
17	v	76	56	16	95
18	w	77	57	17	96

19	x	78	58	18	97
1A	y	79	59	19	98
1B	z	7A	5A	1A	99
1C	0	30	3D	E0	EC
1D	1	31	21	E1	ED
1E	2	32	22	E2	EE
1F	3	33	23	E3	EF
20	4	34	24	E4	F0
21	5	35	25	E5	F1
22	6	36	26	E6	F2
23	7	37	2F	E7	F3
24	8	38	28	E8	F4
25	9	39	29	E9	F5
26	+	2B	3F	EA	F6
27	/	40	60	EB	F7
28	à	7D	5D	00	13
29	..	7E	5E	FB	1C
2A	æ	7B	5B	1E	FC
2B	ø	7C	5C	1F	FD
2C	,	27	2A	1D	9F
2D	.	2C	3B	FE	F9
2E	~	2E	3A	FF	FA
2F	-	2D	5F	A4	A5
C0	SPACE	20	20	20	20
C1	←	A7	A7	A7	A7
C2	S1	A8	A8	A8	A8
C3	S2	A9	A9	A9	A9

Numeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
C4	.	2E	2E	B0	2E
C5	0	30	30	B1	30
C6	00	A6	A6	B2	A6
C7	1	31	1C	B3	31
C8	2	32	9A	B4	32
C9	3	33	1D	B5	33
CA	4	34	9B	B6	34
CB	5	35	9C	1B	35
CC	6	36	9D	B8	36
CD	7	37	1E	B9	37
CE	8	38	9E	BA	38
CF	9	39	1F	BB	39
D0	+	2B	2B	BC	2B
D1	-	2D	2D	BD	2D
D2	*	2A	2A	BE	2A
D3	/	2F	2F	BF	2F

Notes:

Codes A0 through AF are special cases that are trapped by the keyboard driver. These codes are not placed in the buffer. The special cases are defined as follows:

- A0 - logical reset
- A1 - (reserved)
- A2 - break facility (clears buffer, then puts 03 in first location)
- A3 - halt display
- A4 - cursor lock
- A5 - shift lock
- A6 - two zeros
- A7 - End of line (CR in keyboard buffer, '0' in LTERM buffer)
- A8 - End of line (CR in keyboard buffer, '1' in LTERM buffer)
- A9 - End of line (CR in keyboard buffer, '2' in LTERM buffer)
- AA - End of line (CR in keyboard buffer, '0' in LTERM buffer - for DATEV keyboard)
- AB - End of line (CR in keyboard buffer, '1' in LTERM buffer - for DATEV keyboard)
- AC - End of line (CR in keyboard buffer, '2' in LTERM buffer - for DATEV keyboard)
- AD - (reserved)
- AE - (reserved)
- AF - no operation

FRANCE KEYBOARD

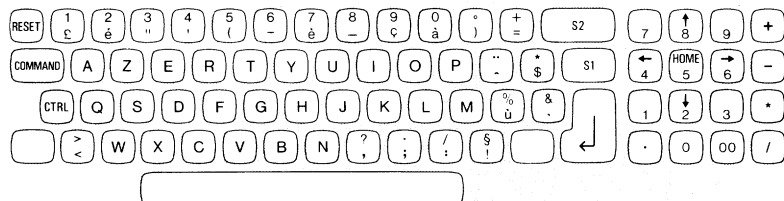


Fig. B-2 France Keyboard

Alphanumeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
00	RESET	DD	DE	A0	DF
01	<	3C	3E	7F	F8
02	q	71	51	11	90
03	b	62	42	A1	81
04	c	63	43	A2	82
05	d	64	44	04	83
06	e	65	45	05	84
07	f	66	46	06	85
08	g	67	47	07	86
09	h	68	48	08	87
0A	i	69	49	09	88
0B	j	6A	4A	0A	89
0C	k	6B	4B	0B	8A
0D	l	6C	4C	0C	8B
0E	,	2C	3F	1E	FC
0F	n	6E	4E	0E	8D
10	o	6F	4F	0F	8E
11	p	70	50	10	8F
12	a	61	41	01	80
13	r	72	52	12	91
14	s	73	53	A3	92
15	t	74	54	14	93
16	u	75	55	15	94
17	v	76	56	16	95
18	z	7A	5A	1A	99

NATIONAL KEYBOARDS

19	x	78	58	18	97
1A	y	79	59	19	98
1B	w	77	57	17	96
1C	à	40	30	E0	EC
1D	é	23	31	E1	ED
1E	è	7B	32	E2	EE
1F	''	22	33	E3	EF
20	'	27	34	E4	F0
21	(	28	35	E5	F1
22	-	2D	36	E6	F2
23	è	7D	37	E7	F3
24	|	5F	38	E8	F4
25	ç	5C	39	E9	F5
26	)	29	5B	EA	F6
27	=	3D	2B	EB	F7
28	,	5E	7E	00	13
29	\$	24	2A	FB	1C
2A	m	6D	4D	0D	8C
2B	ù	7C	25	1F	FD
2C	\	60	26	1D	9F
2D	;	3B	2E	FE	F9
2E	:	3A	2F	FF	FA
2F	!	21	5D	A4	A5
C0	SPACE	20	20	20	20
C1	↵	A7	A7	A7	A7
C2	S1	A8	A8	A8	A8
C3	S2	A9	A9	A9	A9

Numeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
C4	.	2E	2E	B0	2E
C5	0	30	30	B1	30
C6	00	A6	A6	B2	A6
C7	1	31	1C	B3	31
C8	2	32	9A	B4	32
C9	3	33	1D	B5	33
CA	4	34	9B	B6	34
CB	5	35	9C	1B	35
CC	6	36	9D	B8	36
CD	7	37	1E	B9	37
CE	8	38	9E	BA	38
CF	9	39	1F	BB	39
D0	+	2B	2B	BC	2B
D1	-	2D	2D	BD	2D
D2	*	2A	2A	BE	2A
D3	/	2F	2F	BF	2F

Notes:

Codes A0 through AF are special cases that are trapped by the keyboard driver. These codes are not placed in the buffer. The special cases are defined as follows:

- A0 - logical reset
- A1 - (reserved)
- A2 - break facility (clears buffer, then puts 03 in first location)
- A3 - halt display
- A4 - cursor lock
- A5 - shift lock
- A6 - two zeros
- A7 - End of line (CR in keyboard buffer, '0' in LTERM buffer)
- A8 - End of line (CR in keyboard buffer, '1' in LTERM buffer)
- A9 - End of line (CR in keyboard buffer, '2' in LTERM buffer)
- AA - End of line (CR in keyboard buffer, '0' in LTERM buffer - for DATEV keyboard)
- AB - End of line (CR in keyboard buffer, '1' in LTERM buffer - for DATEV keyboard)
- AC - End of line (CR in keyboard buffer, '2' in LTERM buffer - for DATEV keyboard)
- AD - (reserved)
- AE - (reserved)
- AF - no operation

GERMANY (ORIGINAL) KEYBOARD

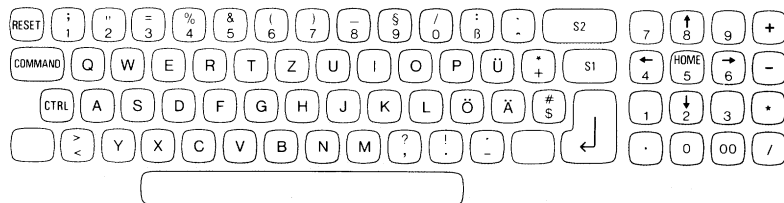


Fig. B-3 Germany (Original) Keyboard

Alphanumeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
00	RESET	DD	DE	A0	DF
01	<	3C	3E	7F	F8
02	a	61	41	01	80
03	b	62	42	A1	81
04	c	63	43	A2	82
05	d	64	44	04	83
06	e	65	45	05	84
07	f	66	46	06	85
08	g	67	47	07	86
09	h	68	48	08	87
0A	i	69	49	09	88
0B	j	6A	4A	0A	89
0C	k	6B	4B	0B	8A
0D	l	6C	4C	0C	8B
0E	m	6D	4D	0D	8C
0F	n	6E	4E	0E	8D
10	o	6F	4F	0F	8E
11	p	70	50	10	8F
12	q	71	51	11	90
13	r	72	52	12	91
14	s	73	53	A3	92
15	t	74	54	14	93
16	u	75	55	15	94
17	v	76	56	16	95
18	w	77	57	17	96

19	x	78	58	18	97
1A	z	7A	5A	1A	99
1B	y	79	59	19	98
1C	0	30	3D	E0	EC
1D	1	31	21	E1	ED
1E	2	32	22	E2	EE
1F	3	33	23	E3	EF
20	4	34	24	E4	F0
21	5	35	25	E5	F1
22	6	36	26	E6	F2
23	7	37	2F	E7	F3
24	8	38	28	E8	F4
25	9	39	29	E9	F5
26	ß	7E	3A	EA	F6
27	^	5E	60	EB	F7
28	ü	7D	5D	00	13
29	+	2B	2A	FB	1C
2A	ö	7C	5C	1E	FC
2B	ä	7B	5B	1F	FD
2C	\$	24	23	1D	9F
2D	,	2C	3F	FE	F9
2E	.	2E	21	FF	FA
2F	-	2D	27	A4	A5
C0	SPACE	20	20	20	20
C1	↵	A7	A7	A7	A7
C2	S1	A8	A8	A8	A8
C3	S2	A9	A9	A9	A9

Numeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
C4	.	2E	2E	B0	2E
C5	0	30	30	B1	30
C6	00	A6	A6	B2	A6
C7	1	31	1C	B3	31
C8	2	32	9A	B4	32
C9	3	33	1D	B5	33
CA	4	34	9B	B6	34
CB	5	35	9C	1B	35
CC	6	36	9D	B8	36
CD	7	37	1E	B9	37
CE	8	38	9E	BA	38
CF	9	39	1F	BB	39
D0	+	2B	2B	BC	2B
D1	-	2D	2D	BD	2D
D2	*	2A	2A	BE	2A
D3	/	2F	2F	BF	2F

Notes:

Codes A0 through AF are special cases that are trapped by the keyboard driver. These codes are not placed in the buffer. The special cases are defined as follows:

- A0 - logical reset
- A1 - (reserved)
- A2 - break facility (clears buffer, then puts 03 in first location)
- A3 - halt display
- A4 - cursor lock
- A5 - shift lock
- A6 - two zeros
- A7 - End of line (CR in keyboard buffer, '0' in LTERM buffer)
- A8 - End of line (CR in keyboard buffer, '1' in LTERM buffer)
- A9 - End of line (CR in keyboard buffer, '2' in LTERM buffer)
- AA - End of line (CR in keyboard buffer, '0' in LTERM buffer - for DATEV keyboard)
- AB - End of line (CR in keyboard buffer, '1' in LTERM buffer - for DATEV keyboard)
- AC - End of line (CR in keyboard buffer, '2' in LTERM buffer - for DATEV keyboard)
- AD - (reserved)
- AE - (reserved)
- AF - no operation

GERMANY (WEST) KEYBOARD

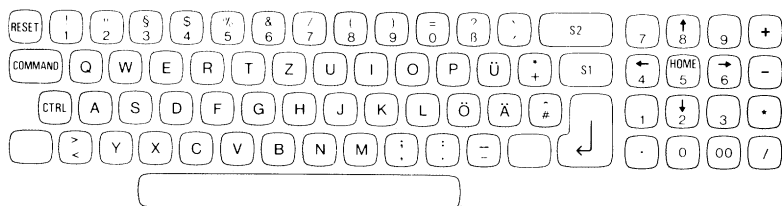


Fig. B -4 Germany (West) Keyboard

Alphanumeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
00	RESET	DD	DE	A0	DF
01	<	3C	3E	7F	F8
02	a	61	41	01	80
03	b	62	42	A1	81
04	c	63	43	A2	82
05	d	64	44	04	83
06	e	65	45	05	84
07	f	66	46	06	85
08	g	67	47	07	86
09	h	68	48	08	87
0A	i	69	49	09	88
0B	j	6A	4A	0A	89
0C	k	6B	4B	0B	8A
0D	l	6C	4C	0C	8B
0E	m	6D	4D	0D	8C
0F	n	6E	4E	0E	8D
10	o	6F	4F	0F	8E
11	p	70	50	10	8F
12	q	71	51	11	90
13	r	72	52	12	91
14	s	73	53	A3	92
15	t	74	54	14	93
16	u	75	55	15	94
17	v	76	56	16	95
18	w	77	57	17	96

NATIONAL KEYBOARDS

19	x	78	58	18	97
1A	z	7A	5A	1A	99
1B	y	79	59	19	98
1C	0	30	3D	E0	EC
1D	1	31	21	E1	ED
1E	2	32	22	E2	EE
1F	3	33	23	E3	EF
20	4	34	24	E4	F0
21	5	35	25	E5	F1
22	6	36	26	E6	F2
23	7	37	2F	E7	F3
24	8	38	28	E8	F4
25	9	39	29	E9	F5
26	ß	7E	3F	EA	F6
27	,	27	60	EB	F7
28	ü	7D	5D	00	13
29	+	2B	2A	FB	1C
2A	ö	7C	5C	1E	FC
2B	ä	7B	5B	1F	FD
2C	£	23	5E	1D	9F
2D	,	2C	3B	1E	F9
2E	.	2E	3A	FF	FA
2F	-	2D	5F	A4	A5
C0	SPACE	20	20	20	20
C1	←	A7	A7	A7	A7
C2	S1	A8	A8	A8	A8
C3	S2	A9	A9	A9	A9

Numeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
C4	.	2E	2E	B0	2E
C5	0	30	30	B1	30
C6	00	A6	A6	B2	A6
C7	1	31	1C	B3	31
C8	2	32	9A	B4	32
C9	3	33	1D	B5	33
CA	4	34	9B	B6	34
CB	5	35	9C	1B	35
CC	6	36	9D	B8	36
CD	7	37	1E	B9	37
CE	8	38	9E	BA	38
CF	9	39	1F	BB	39
D0	+	2B	2B	BC	2B
D1	-	2D	2D	BD	2D
D2	*	2A	2A	BE	2A
D3	/	2F	2F	BF	2F

Notes:

Codes A0 through AF are special cases that are trapped by the keyboard driver. These codes are not placed in the buffer. The special cases are defined as follows:

A0 - logical reset
A1 - (reserved)
A2 - break facility (clears buffer, then puts 03 in first location)
A3 - halt display
A4 - cursor lock
A5 - shift lock
A6 - two zeros
A7 - End of line (CR in keyboard buffer, '0' in LTERM buffer)
A8 - End of line (CR in keyboard buffer, '1' in LTERM buffer)
A9 - End of line (CR in keyboard buffer, '2' in LTERM buffer)
AA - End of line (CR in keyboard buffer, '0' in LTERM buffer - for DATEV keyboard)
AB - End of line (CR in keyboard buffer, '1' in LTERM buffer - for DATEV keyboard)
AC - End of line (CR in keyboard buffer, '2' in LTERM buffer - for DATEV keyboard)
AD - (reserved)
AE - (reserved)
AF - no operation

19	x	78	58	18	97
1A	y	79	59	19	98
1B	z	7A	5A	1A	99
1C	0	30	3D	E0	EC
1D	1	31	21	E1	ED
1E	2	32	22	E2	EE
1F	3	33	23	E3	EF
20	4	34	24	E4	F0
21	5	35	25	E5	F1
22	6	36	26	E6	F2
23	7	37	2F	E7	F3
24	8	38	28	E8	F4
25	9	39	29	E9	F5
26	~	2D	3D	EA	F6
27		58	7E	EB	F7
28	@	40	60	00	13
29	[	5B	7B	FB	1C
2A	;	3B	2B	1E	1C
2B	:	3A	2A	1F	FD
2C	]	5D	7D	1D	9F
2D	,	2C	3C	FE	F9
2E	.	2E	3E	FF	FA
2F	/	2F	3F	A4	A5
C0	SPACE	20	20	20	20
C1	↵	A7	A7	A7	A7
C2	S1	A8	A8	A8	A8
C3	S2	A9	A9	A9	A9

Numeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
C4	.	2E	2E	B0	2E
C5	0	30	30	B1	30
C6	00	A6	A6	B2	A6
C7	1	31	1C	B3	31
C8	2	32	9A	B4	32
C9	3	33	1D	B5	33
CA	4	34	9B	B6	34
CB	5	35	9C	1B	35
CC	6	36	9D	B8	36
CD	7	37	1E	B9	37
CE	8	38	9E	BA	38
CF	9	39	1F	BB	39
D0	+	2B	2B	BC	2B
D1	-	2D	2D	BD	2D
D2	*	2A	2A	BE	2A
D3	/	2F	2F	BF	2F

Notes:

Codes A0 through AF are special cases that are trapped by the keyboard driver. These codes are not placed in the buffer. The special cases are defined as follows:

- A0 - logical reset
- A1 - (reserved)
- A2 - break facility (clears buffer, then puts 03 in first location)
- A3 - halt display
- A4 - cursor lock
- A5 - shift lock
- A6 - two zeros
- A7 - End of line (CR in keyboard buffer, '0' in LTERM buffer)
- A8 - End of line (CR in keyboard buffer, '1' in LTERM buffer)
- A9 - End of line (CR in keyboard buffer, '2' in LTERM buffer)
- AA - End of line (CR in keyboard buffer, '0' in LTERM buffer - for DATEV keyboard)
- AB - End of line (CR in keyboard buffer, '1' in LTERM buffer - for DATEV keyboard)
- AC - End of line (CR in keyboard buffer, '2' in LTERM buffer - for DATEV keyboard)
- AD - (reserved)
- AE - (reserved)
- AF - no operation

GREECE KEYBOARD

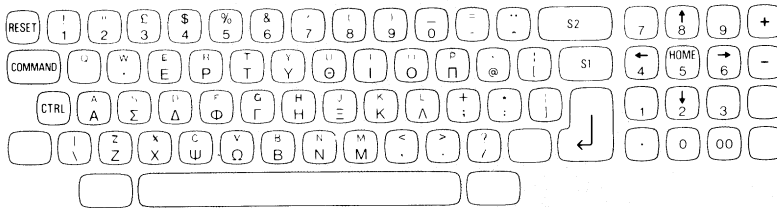


Fig. B-6 Greece Keyboard

Alphanumeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
00	RESET	DD	DE	A0	DF
01	\	5C	7C	7F	F8
02	A	C0	41	01	80
03	B	C1	42	A1	81
04	Ψ	C2	43	A2	82
05	Δ	C3	44	04	83
06	E	C4	45	05	84
07	Φ	C5	46	06	85
08	Γ	C6	47	07	86
09	H	C7	48	08	87
0A	I	C8	49	09	88
0B	≡	C9	4A	0A	89
0C	K	CA	4B	0B	8A
0D	Λ	CB	4C	0C	8B
0E	M	CC	4D	0D	8C
0F	N	CD	4E	0E	8D
10	O	CE	4F	0F	8E
11	Π	CF	50	10	8F
12		AF	51	11	90
13	P	D0	52	12	91
14	T	D1	53	A3	92
15		D2	54	14	93
16	⊖	D3	55	15	94
17	⊕	D4	56	16	95
18	.	D5	57	17	96

NATIONAL KEYBOARDS

19	X	D6	58	18	97
1A	Y	D7	59	19	98
1B	Z	D8	5A	1A	99
1C	0	30	5F	E0	EC
1D	1	31	21	E1	ED
1E	2	32	22	E2	EE
1F	3	33	23	E3	EF
20	4	34	24	E4	F0
21	5	35	25	E5	F1
22	6	36	26	E6	F2
23	7	37	27	E7	F3
24	8	38	28	E8	F4
25	9	39	29	E9	F5
26	~	2D	3D	EA	F6
27	^	5E	D9	EB	F7
28	@	40	60	00	13
29	[	5B	7B	FB	1C
2A	;	3B	2B	1E	FC
2B	:	3A	2A	1F	FD
2C	]	5D	7D	1D	9F
2D	,	2C	3C	FE	F9
2E	.	2E	3E	FF	FA
2F	/	2F	3F	A4	A5
C0	SPACE	20	20	20	20
C1	←	A7	A7	A7	A7
C2	S1	A8	A8	A8	A8
C3	S2	A9	A9	A9	A9

Numeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
C4	.	2E	2E	B0	2E
C5	0	30	30	B1	30
C6	00	A6	A6	B2	A6
C7	1	31	1C	B3	31
C8	2	32	9A	B4	32
C9	3	33	1D	B5	33
CA	4	34	9B	B6	34
CB	5	35	9C	1B	35
CC	6	36	9D	B8	36
CD	7	37	1E	B9	37
CE	8	38	9E	BA	38
CF	9	39	1F	BB	39
D0	+	2B	2B	BC	2B
D1	-	2D	2D	BD	2D
D2	*	2A	2A	BE	2A
D3	/	2F	2F	BF	2F

Notes:

Codes A0 through AF are special cases that are trapped by the keyboard driver. These codes are not placed in the buffer. The special cases are defined as follows:

- A0 - logical reset
- A1 - (reserved)
- A2 - break facility (clears buffer, then puts 03 in first location)
- A3 - halt display
- A4 - cursor lock
- A5 - shift lock
- A6 - two zeros
- A7 - End of line (CR in keyboard buffer, '0' in LTERM buffer)
- A8 - End of line (CR in keyboard buffer, '1' in LTERM buffer)
- A9 - End of line (CR in keyboard buffer, '2' in LTERM buffer)
- AA - End of line (CR in keyboard buffer, '0' in LTERM buffer - for DATEV keyboard)
- AB - End of line (CR in keyboard buffer, '1' in LTERM buffer - for DATEV keyboard)
- AC - End of line (CR in keyboard buffer, '2' in LTERM buffer - for DATEV keyboard)
- AD - (reserved)
- AE - (reserved)
- AF - no operation

ITALY KEYBOARD

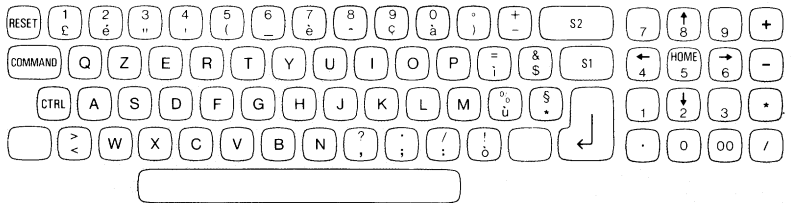


Fig. B-7 Italy Keyboard

Alphanumeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
00	RESET	DD	DE	A0	DF
01	<	3C	3E	7F	F8
02	a	61	41	01	80
03	b	62	42	A1	81
04	c	63	43	A2	82
05	d	64	44	04	83
06	e	65	45	05	84
07	f	66	46	06	85
08	g	67	47	07	86
09	h	68	48	08	87
0A	i	69	49	09	88
0B	j	6A	4A	0A	89
0C	k	6B	4B	0B	8A
0D	l	6C	4C	0C	8B
0E	,	2C	3F	1E	FC
0F	n	6E	4E	0E	8D
10	o	6F	4F	0F	8E
11	p	70	50	10	8F
12	q	71	51	11	90
13	r	72	52	12	91
14	s	73	53	A3	92
15	t	74	54	14	93
16	u	75	55	15	94
17	v	76	56	16	95
18	z	7A	5A	1A	99

19	x	78	58	18	97
1A	y	79	59	19	98
1B	w	77	57	17	96
1C	a	7B	30	E0	EC
1D	f	23	31	E1	ED
1E	e	5D	32	E2	EE
1F	"	22	33	E3	EF
20	'	27	34	E4	F0
21	(	28	35	E5	F1
22		5F	36	E6	F2
23	~	7D	37	E7	F3
24	>	5E	38	E8	F4
25	ç	5C	39	E9	F5
26	)	29	5B	EA	F6
27	-	2D	2B	EB	F7
28	i	7E	3D	00	13
29	\$	24	26	FB	1C
2A	m	6D	4D	0D	8C
2B	ü	60	25	1F	FD
2C	*	2A	40	1D	9F
2D	;	3B	2E	FE	F9
2E	:	3A	2F	FF	FA
2F	ö	7C	21	A4	A5
C0	SPACE	20	20	20	20
C1	↵	A7	A7	A7	A7
C2	S1	A8	A8	A8	A8
C3	S2	A9	A9	A9	A9

Numeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
C4	.	2E	2E	B0	2E
C5	0	30	30	B1	30
C6	00	A6	A6	B2	A6
C7	1	31	1C	B3	31
C8	2	32	9A	B4	32
C9	3	33	1D	B5	33
CA	4	34	9B	B6	34
CB	5	35	9C	1B	35
CC	6	36	9D	B8	36
CD	7	37	1E	B9	37
CE	8	38	9E	BA	38
CF	9	39	1F	BB	39
DO	+	2B	2B	BC	2B
D1	-	2D	2D	BD	2D
D2	*	2A	2A	BE	2A
D3	/	2F	2F	BF	2F

Notes:

Codes A0 through AF are special cases that are trapped by the keyboard driver. These codes are not placed in the buffer. The special cases are defined as follows:

- A0 - logical reset
- A1 - (reserved)
- A2 - break facility (clears buffer, then puts 03 in first location)
- A3 - halt display
- A4 - cursor lock
- A5 - shift lock
- A6 - two zeros
- A7 - End of line (CR in keyboard buffer, '0' in LTERM buffer)
- A8 - End of line (CR in keyboard buffer, '1' in LTERM buffer)
- A9 - End of line (CR in keyboard buffer, '2' in LTERM buffer)
- AA - End of line (CR in keyboard buffer, '0' in LTERM buffer - for DATEV keyboard)
- AB - End of line (CR in keyboard buffer, '1' in LTERM buffer - for DATEV keyboard)
- AC - End of line (CR in keyboard buffer, '2' in LTERM buffer - for DATEV keyboard)
- AD - (reserved)
- AE - (reserved)
- AF - no operation

NORWAY KEYBOARD

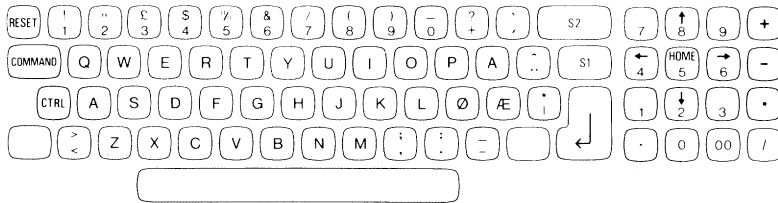


Fig. B-8 Norway Keyboard

Alphanumeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
00	RESET	DD	DE	A0	DF
01	<	3C	3E	7F	F8
02	a	61	41	01	80
03	b	62	42	A1	81
04	c	63	43	A2	82
05	d	64	44	04	83
06	e	65	45	05	84
07	f	66	46	06	85
08	g	67	47	07	86
09	h	68	48	08	87
0A	i	69	49	09	88
0B	j	6A	4A	0A	89
0C	k	6B	4B	0B	8A
0D	l	6C	4C	0C	8B
0E	m	6D	4D	0D	8C
0F	n	6E	4E	0E	8D
10	o	6F	4F	0F	8E
11	p	70	50	10	8F
12	q	71	51	11	90
13	r	72	52	12	91
14	s	73	53	A3	92
15	t	74	54	14	93
16	u	75	55	15	94
17	v	76	56	16	95
18	w	77	57	17	96

NATIONAL KEYBOARDS

19	x	78	58	18	97
1A	y	79	59	19	98
1B	z	7A	5A	1A	99
1C	0	30	3D	E0	EC
1D	1	31	21	E1	ED
1E	2	32	22	E2	EE
1F	3	33	23	E3	EF
20	4	34	24	E4	F0
21	5	35	25	E5	F1
22	6	36	26	E6	F2
23	7	37	2F	E7	F3
24	8	38	28	E8	F4
25	9	39	29	E9	F5
26	+	2B	3F	EA	F6
27	,	40	60	EB	F7
28	&	7D	5D	00	13
29	..	7E	5E	FB	1C
2A	ø	7C	5C	1F	1D
2B	æ	7B	5B	1E	1F
2C	'	27	2A	1D	9F
2D	,	2C	3B	FE	F9
2E	.	2E	3A	FF	FA
2F	-	2D	5F	A4	A5
C0	SPACE	20	20	20	20
C1		A7	A7	A7	A7
C2	S1	A8	A8	A8	A8
C3	S2	A9	A9	A9	A9

Numeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
C4	.	2E	2E	B0	2E
C5	0	30	30	B1	30
C6	00	A6	A6	B2	A6
C7	1	31	1C	B3	31
C8	2	32	9A	B4	32
C9	3	33	1D	B5	33
CA	4	34	9B	B6	34
CB	5	35	9C	1B	35
CC	6	36	9D	B8	36
CD	7	37	1E	B9	37
CE	8	38	9E	BA	38
CF	9	39	1F	BB	39
D0	+	2B	2B	BC	2B
D1	-	2D	2D	BD	2D
D2	*	2A	2A	BE	2A
D3	/	2F	2F	BF	2F

Notes:

Codes A0 through AF are special cases that are trapped by the keyboard driver. These codes are not placed in the buffer. The special cases are defined as follows:

- A0 - logical reset
- A1 - (reserved)
- A2 - break facility (clears buffer, then puts 03 in first location)
- A3 - halt display
- A4 - cursor lock
- A5 - shift lock
- A6 - two zeros
- A7 - End of line (CR in keyboard buffer, '0' in LTERM buffer)
- A8 - End of line (CR in keyboard buffer, '1' in LTERM buffer)
- A9 - End of line (CR in keyboard buffer, '2' in LTERM buffer)
- AA - End of line (CR in keyboard buffer, '0' in LTERM buffer - for DATEV keyboard)
- AB - End of line (CR in keyboard buffer, '1' in LTERM buffer - for DATEV keyboard)
- AC - End of line (CR in keyboard buffer, '2' in LTERM buffer - for DATEV keyboard)
- AD - (reserved)
- AE - (reserved)
- AF - no operation

PORTUGAL KEYBOARD

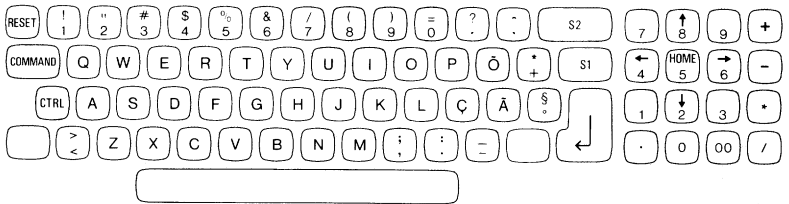


Fig. B-9 Portugal Keyboard

Alphanumeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
00	RESET	DD	DE	A0	DF
01	<	3C	3E	7F	F8
02	a	61	41	01	80
03	b	62	42	A1	81
04	c	63	43	A2	82
05	d	64	44	04	83
06	e	65	45	05	84
07	f	66	46	06	85
08	g	67	47	07	86
09	h	68	48	08	87
0A	i	69	49	09	88
0B	j	6A	4A	0A	89
0C	k	6B	4B	0B	8A
0D	l	6C	4C	0C	8B
0E	m	6D	4D	0D	8C
0F	n	6E	4E	0E	8D
10	o	6F	4F	0F	8E
11	p	70	50	10	8F
12	q	71	51	11	90
13	r	72	52	12	91
14	s	73	53	A3	92
15	t	74	54	14	93
16	u	75	55	15	94
17	v	76	56	16	95
18	w	77	57	17	96

19	x	78	58	18	97
1A	y	79	59	19	98
1B	z	7A	5A	1A	99
1C	0	30	3D	E0	EC
1D	1	31	21	E1	ED
1E	2	32	22	E2	EE
1F	3	33	23	E3	EF
20	4	34	24	E4	F0
21	5	35	25	E5	F1
22	6	36	26	E6	F2
23	7	37	2F	E7	F3
24	8	38	28	E8	F4
25	9	39	29	E9	F5
26	/	27	3F	EA	F6
27	\	60	5E	EB	F7
28	õ	7D	5D	00	13
29	+	2B	2A	FB	1C
2A	ç	7C	5C	1E	FC
2B	ã	7B	5B	1F	FD
2C	o	7E	40	1D	9F
2D	,	2C	3B	FE	F9
2E	.	2E	3A	FF	FA
2F	-	2D	5F	A4	A5
C0	SPACE	20	20	20	20
C1	↵	A7	A7	A7	A7
C2	S1	A8	A8	A8	A8
C3	S2	A9	A9	A9	A9

Numeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
C4	.	2E	2E	B0	2E
C5	0	30	30	B1	30
C6	00	A6	A6	B2	A6
C7	1	31	1C	B3	31
C8	2	32	9A	B4	32
C9	3	33	1D	B5	33
CA	4	34	9B	B6	34
CB	5	35	9C	1B	35
CC	6	36	9D	B8	36
CD	7	37	1E	B9	37
CE	8	38	9E	BA	38
CF	9	39	1F	BB	39
D0	+	2B	2B	BC	2B
D1	-	2D	2D	BD	2D
D2	*	2A	2A	BE	2A
D3	/	2F	2F	BF	2F

Notes:

Codes A0 through AF are special cases that are trapped by the keyboard driver. These codes are not placed in the buffer. The special cases are defined as follows:

- A0 - logical reset
- A1 - (reserved)
- A2 - break facility (clears buffer, then puts 03 in first location)
- A3 - halt display
- A4 - cursor lock
- A5 - shift lock
- A6 - two zeros
- A7 - End of line (CR in keyboard buffer, '0' in LTERM buffer)
- A8 - End of line (CR in keyboard buffer, '1' in LTERM buffer)
- A9 - End of line (CR in keyboard buffer, '2' in LTERM buffer)
- AA - End of line (CR in keyboard buffer, '0' in LTERM buffer - for DATEV keyboard)
- AB - End of line (CR in keyboard buffer, '1' in LTERM buffer - for DATEV keyboard)
- AC - End of line (CR in keyboard buffer, '2' in LTERM buffer - for DATEV keyboard)
- AD - (reserved)
- AE - (reserved)
- AF - no operation

SPAIN KEYBOARD

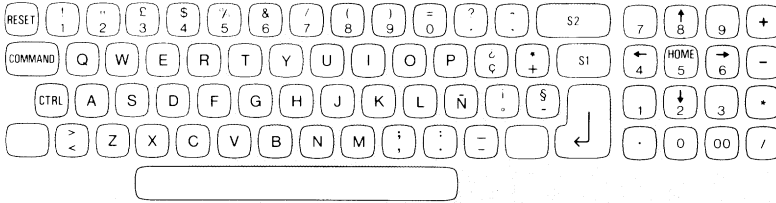


Fig. B-10 Spain Keyboard

Alphanumeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
00	RESET	DD	DE	A0	DF
01	<	3C	3E	7F	F8
02	a	61	41	01	80
03	b	62	42	A1	81
04	c	63	43	A2	82
05	d	64	44	04	83
06	e	65	45	05	84
07	f	66	46	06	85
08	g	67	47	07	86
09	h	68	48	08	87
0A	i	69	49	09	88
0B	j	6A	4A	0A	89
0C	k	6B	4B	0B	8A
0D	l	6C	4C	0C	8B
0E	m	6D	4D	0D	8C
0F	n	6E	4E	0E	8D
10	o	6F	4F	0F	8E
11	p	70	50	10	8F
12	q	71	51	11	90
13	r	72	52	12	91
14	s	73	53	A3	92
15	t	74	54	14	93
16	u	75	55	15	94
17	v	76	56	16	95
18	w	77	57	17	96

NATIONAL KEYBOARDS

19	x	78	58	18	97
1A	y	79	59	19	98
1B	z	7A	5A	1A	99
1C	0	30	3D	E0	EC
1D	1	31	21	E1	ED
1E	2	32	22	E2	EE
1F	3	33	23	E3	EF
20	4	34	24	E4	F0
21	5	35	25	E5	F1
22	6	36	26	E6	F2
23	7	37	2F	E7	F3
24	8	38	28	E8	F4
25	9	39	29	E9	F5
26	/	27	3F	EA	F6
27	\	60	5E	EB	F7
28	ç	7D	5D	00	13
29	+	2B	2A	FB	1C
2A	ñ	7C	5C	1E	FC
2B	ó	7B	5B	1F	FD
2C	~	7E	40	1D	9F
2D	,	2C	3B	FE	F9
2E	.	2E	3A	FF	FA
2F	-	2D	5F	A4	A5
C0	SPACE	20	20	20	20
C1		A7	A7	A7	A7
C2	S1	A8	A8	A8	A8
C3	S2	A9	A9	A9	A9

Numeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
C4	.	2E	2E	B0	2E
C5	0	30	30	B1	30
C6	00	A6	A6	B2	A6
C7	1	31	1C	B3	31
C8	2	32	9A	B4	32
C9	3	33	1D	B5	33
CA	4	34	9B	B6	34
CB	5	35	9C	1B	35
CC	6	36	9D	B8	36
CD	7	37	1E	B9	37
CE	8	38	9E	BA	38
CF	9	39	1F	BB	39
D0	+	2B	2B	BC	2B
D1	-	2D	2D	BD	2D
D2	*	2A	2A	BE	2A
D3	/	2F	2F	BF	2F

Notes:

Codes A0 through AF are special cases that are trapped by the keyboard driver. These codes are not placed in the buffer. The special cases are defined as follows:

- A0 - logical reset
- A1 - (reserved)
- A2 - break facility (clears buffer, then puts 03 in first location)
- A3 - halt display
- A4 - cursor lock
- A5 - shift lock
- A6 - two zeros
- A7 - End of line (CR in keyboard buffer, '0' in LTERM buffer)
- A8 - End of line (CR in keyboard buffer, '1' in LTERM buffer)
- A9 - End of line (CR in keyboard buffer, '2' in LTERM buffer)
- AA - End of line (CR in keyboard buffer, '0' in LTERM buffer - for DATEV keyboard)
- AB - End of line (CR in keyboard buffer, '1' in LTERM buffer - for DATEV keyboard)
- AC - End of line (CR in keyboard buffer, '2' in LTERM buffer - for DATEV keyboard)
- AD - (reserved)
- AE - (reserved)
- AF - no operation

SWEDEN/FINLAND KEYBOARD

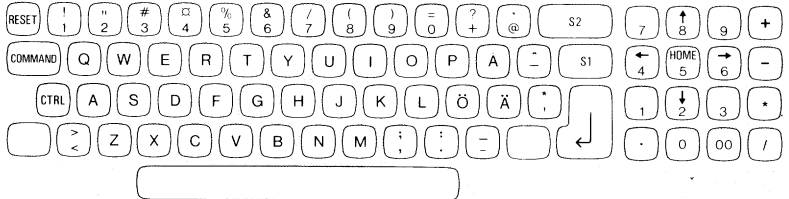


Fig. B-11 Sweden/Finland Keyboard

Alphanumeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
00	RESET	DD	DE	A0	DF
01	<	3C	3E	7F	F8
02	a	61	41	01	80
03	b	62	42	A1	81
04	c	63	43	A2	82
05	d	64	44	04	83
06	e	65	45	05	84
07	f	66	46	06	85
08	g	67	47	07	86
09	h	68	48	08	87
0A	i	69	49	09	88
0B	j	6A	4A	0A	89
0C	k	6B	4B	0B	8A
0D	l	6C	4C	0C	8B
0E	m	6D	4D	0D	8C
0F	n	6E	4E	0E	8D
10	o	6F	4F	0F	8E
11	p	70	50	10	8F
12	q	71	51	11	90
13	r	72	52	12	91
14	s	73	53	A3	92
15	t	74	54	14	93
16	u	75	55	15	94
17	v	76	56	16	95
18	w	77	57	17	96

19	x	78	58	18	97
1A	y	79	59	19	98
1B	z	7A	5A	1A	99
1C	0	30	3D	E0	EC
1D	1	31	21	E1	ED
1E	2	32	22	E2	EE
1F	3	33	23	E3	EF
20	4	34	24	E4	F0
21	5	35	25	E5	F1
22	6	36	26	E6	F2
23	7	37	2F	E7	F3
24	8	38	28	E8	F4
25	9	39	29	E9	F5
26	+	2B	3F	EA	F6
27	@	40	60	EB	F7
28	Ⓢ	7D	5D	00	13
29	-	7E	5E	FB	1C
2A	ö	7C	5C	1E	FC
2B	ä	7B	5B	1F	FD
2C	,	27	2A	1D	9F
2D	,	2C	3B	FE	F9
2E	.	2E	3A	FF	FA
2F	-	2D	5F	A4	A5
C0	SPACE	20	20	20	20
C1	↵	A7	A7	A7	A7
C2	S1	A8	A8	A8	A8
C3	S2	A9	A9	A9	A9

Numeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
C4	.	2E	2E	B0	2E
C5	0	30	30	B1	30
C6	00	A6	A6	B2	A6
C7	1	31	1C	B3	31
C8	2	32	9A	B4	32
C9	3	33	1D	B5	33
CA	4	34	9B	B6	34
CB	5	35	9C	1B	35
CC	6	36	9D	B8	36
CD	7	37	1E	B9	37
CE	8	38	9E	BA	38
CF	9	39	1F	BB	39
D0	+	2B	2B	BC	2B
D1	-	2D	2D	BD	2D
D2	*	2A	2A	BE	2A
D3	/	2F	2F	BF	2F

Notes:

Codes A0 through AF are special cases that are trapped by the keyboard driver. These codes are not placed in the buffer. The special cases are defined as follows:

- A0 - logical reset
- A1 - (reserved)
- A2 - break facility (clears buffer, then puts 03 in first location)
- A3 - halt display
- A4 - cursor lock
- A5 - shift lock
- A6 - two zeros
- A7 - End of line (CR in keyboard buffer, '0' in LTERM buffer)
- A8 - End of line (CR in keyboard buffer, '1' in LTERM buffer)
- A9 - End of line (CR in keyboard buffer, '2' in LTERM buffer)
- AA - End of line (CR in keyboard buffer, '0' in LTERM buffer - for DATEV keyboard)
- AB - End of line (CR in keyboard buffer, '1' in LTERM buffer - for DATEV keyboard)
- AC - End of line (CR in keyboard buffer, '2' in LTERM buffer - for DATEV keyboard)
- AD - (reserved)
- AE - (reserved)
- AF - no operation

SWITZERLAND FRENCH KEYBOARD

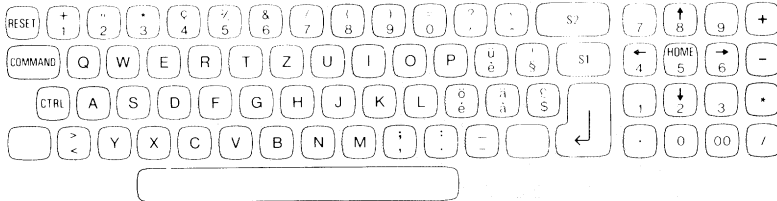


Fig. B-12 Switzerland French Keyboard

Alphanumeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
00	RESET	DD	DE	A0	DF
01	<	3C	3E	7F	F8
02	a	61	41	01	80
03	b	62	42	A1	81
04	c	63	43	A2	82
05	d	64	44	04	83
06	e	65	45	05	84
07	f	66	46	06	85
08	g	67	47	07	86
09	h	68	48	08	87
0A	i	69	49	09	88
0B	j	6A	4A	0A	89
0C	k	6B	4B	0B	8A
0D	l	6C	4C	0C	8B
0E	m	6D	4D	0D	8C
0F	n	6E	4E	0E	8D
10	o	6F	4F	0F	8E
11	p	70	50	10	8F
12	q	71	51	11	90
13	r	72	52	12	91
14	s	73	53	A3	92
15	t	74	54	14	93
16	u	75	55	15	94
17	v	76	56	16	95
18	w	77	57	17	96

NATIONAL KEYBOARDS LAYOUTS AND CODES

19	x	78	58	18	97
1A	z	7A	5A	1A	99
1B	y	79	59	19	98
1C	0	30	3D	E0	EC
1D	1	31	21	E1	ED
1E	2	32	22	E2	EE
1F	3	33	23	E3	EF
20	4	34	24	E4	F0
21	5	35	25	E5	F1
22	6	36	26	E6	F2
23	7	37	2F	E7	F3
24	8	38	28	E8	F4
25	9	39	29	E9	F5
26	/	27	3F	EA	F6
27	~	5E	60	EB	F7
28	é	5D	7D	00	13
29	§	40	21	FB	1C
2A	è	7E	7C	1E	FC
2B	à	5B	7B	1F	FD
2C	\$	24	23	1D	9F
2D	;	2C	3B	FE	F9
2E	.	2E	3A	FF	FA
2F	-	2D	5F	A4	A5
C0	SPACE	20	20	20	20
C1	↵	A7	A7	A7	A7
C2	S1	A8	A8	A8	A8
C3	S2	A9	A9	A9	A9

Numeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
C4	.	2E	2E	B0	2E
C5	0	30	30	B1	30
C6	00	A6	A6	B2	A6
C7	1	31	1C	B3	31
C8	2	32	9A	B4	32
C9	3	33	1D	B5	33
CA	4	34	9B	B6	34
CB	5	35	9C	1B	35
CC	6	36	9D	B8	36
CD	7	37	1E	B9	37
CE	8	38	9E	BA	38
CF	9	39	1F	BB	39
D0	+	2B	2B	BC	2B
D1	-	2D	2D	BD	2D
D2	*	2A	2A	BE	2A
D3	/	2F	2F	BF	2F

Notes:

Codes A0 through AF are special cases that are trapped by the keyboard driver. These codes are not placed in the buffer. The special cases are defined as follows:

- A0 - logical reset
- A1 - (reserved)
- A2 - break facility (clears buffer, then puts 03 in first location)
- A3 - halt display
- A4 - cursor lock
- A5 - shift lock
- A6 - two zeros
- A7 - End of line (CR in keyboard buffer, '0' in LTERM buffer)
- A8 - End of line (CR in keyboard buffer, '1' in LTERM buffer)
- A9 - End of line (CR in keyboard buffer, '2' in LTERM buffer)
- AA - End of line (CR in keyboard buffer, '0' in LTERM buffer - for DATEV keyboard)
- AB - End of line (CR in keyboard buffer, '1' in LTERM buffer - for DATEV keyboard)
- AC - End of line (CR in keyboard buffer, '2' in LTERM buffer - for DATEV keyboard)
- AD - (reserved)
- AE - (reserved)
- AF - no operation

SWITZERLAND GERMAN KEYBOARD

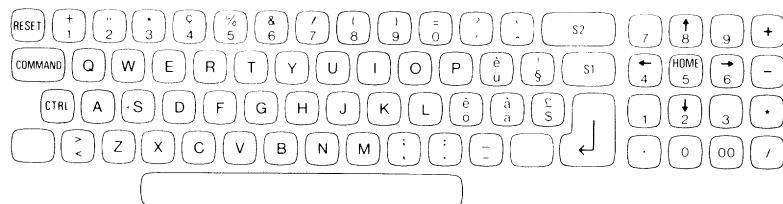


Fig. B-13 Switzerland German Keyboard

Alphanumeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
00	RESET	DD	DE	A0	DF
01	<	3C	3E	7F	F8
02	a	61	41	01	80
03	b	62	42	A1	81
04	c	63	43	A2	82
05	d	64	44	04	83
06	e	65	45	05	84
07	f	66	46	06	85
08	g	67	47	07	86
09	h	68	48	08	87
0A	i	69	49	09	88
0B	j	6A	4A	0A	89
0C	k	6B	4B	0B	8A
0D	l	6C	4C	0C	8B
0E	m	6D	4D	0D	8C
0F	n	6E	4E	0E	8D
10	o	6F	4F	0F	8E
11	p	70	50	10	8F
12	q	71	51	11	90
13	r	72	52	12	91
14	s	73	53	A3	92
15	t	74	54	14	93
16	u	75	55	15	94
17	v	76	56	16	95
18	w	77	57	17	96

19	x	78	58	18	97
1A	z	7A	5A	1A	99
1B	y	79	59	19	98
1C	0	30	3D	E0	EC
1D	1	31	21	E1	ED
1E	2	32	22	E2	EE
1F	3	33	23	E3	EF
20	4	34	24	E4	F0
21	5	35	25	E5	F1
22	6	36	26	E6	F2
23	7	37	2F	E7	F3
24	8	38	28	E8	F4
25	9	39	29	E9	F5
26	'	27	3F	EA	F6
27	^	5E	60	EB	F7
28	ü	7D	5D	00	13
29	§	40	21	FB	1C
2A	ö	7C	7E	1E	FC
2B	ä	7B	5B	1F	FD
2C	§	24	23	1D	9F
2D	,	2C	3B	FE	F9
2E	.	2E	3A	FF	FA
2F	-	2D	5F	A4	A5
C0	SPACE	20	20	20	20
C1	←	A7	A7	A7	A7
C2	S1	A8	A8	A8	A8
C3	S2	A9	A9	A9	A9

Numeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
C4	.	2E	2E	B0	2E
C5	0	30	30	B1	30
C6	00	A6	A6	B2	A6
C7	1	31	1C	B3	31
C8	2	32	9A	B4	32
C9	3	33	1D	B5	33
CA	4	34	9B	B6	34
CB	5	35	9C	1B	35
CC	6	36	9D	B8	36
CD	7	37	1E	B9	37
CE	8	38	9E	BA	38
CF	9	39	1F	BB	39
D0	+	2B	2B	BC	2B
D1	-	2D	2D	BD	2D
D2	*	2A	2A	BE	2A
D3	/	2F	2F	BF	2F

Notes:

Codes A0 through AF are special cases that are trapped by the keyboard driver. These codes are not placed in the buffer. The special cases are defined as follows:

- A0 - logical reset
- A1 - (reserved)
- A2 - break facility (clears buffer, then puts 03 in first location)
- A3 - halt display
- A4 - cursor lock
- A5 - shift lock
- A6 - two zeros
- A7 - End of line (CR in keyboard buffer, '0' in LTERM buffer)
- A8 - End of line (CR in keyboard buffer, '1' in LTERM buffer)
- A9 - End of line (CR in keyboard buffer, '2' in LTERM buffer)
- AA - End of line (CR in keyboard buffer, '0' in LTERM buffer - for DATEV keyboard)
- AB - End of line (CR in keyboard buffer, '1' in LTERM buffer - for DATEV keyboard)
- AC - End of line (CR in keyboard buffer, '2' in LTERM buffer - for DATEV keyboard)
- AD - (reserved)
- AE - (reserved)
- AF - no operation

USA ASCII KEYBOARD

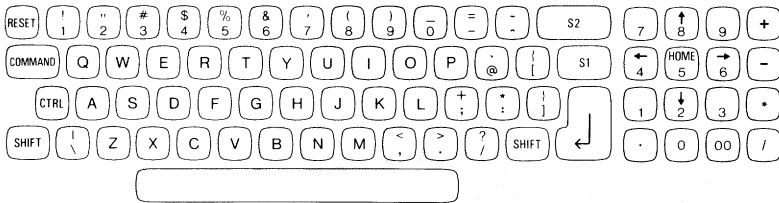


Fig. B-14 USA ASCII Keyboard

Alphanumeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
00	RESET	DD	DE	A0	DF
01	\	5C	7C	7F	F8
02	a	61	41	01	80
03	b	62	42	A1	81
04	c	63	43	A2	82
05	d	64	44	04	83
06	e	65	45	05	84
07	f	66	46	06	85
08	g	67	47	07	86
09	h	68	48	08	87
0A	i	69	49	09	88
0B	j	6A	4A	0A	89
0C	k	6B	4B	0B	8A
0D	l	6C	4C	0C	8B
0E	m	6D	4D	0D	8C
0F	n	6E	4E	0E	8D
10	o	6F	4F	0F	8E
11	p	70	50	10	8F
12	q	71	51	11	90
13	r	72	52	12	91
14	s	73	53	A3	92
15	t	74	54	14	93
16	u	75	55	15	94
17	v	76	56	16	95
18	w	77	57	17	96

NATIONAL KEYBOARDS

19	x	78	58	18	97
1A	y	79	59	19	98
1B	z	7A	5A	1A	99
1C	0	30	3D	E0	EC
1D	1	31	21	E1	ED
1E	2	32	22	E2	EE
1F	3	33	23	E3	EF
20	4	34	24	E4	F0
21	5	35	25	E5	F1
22	6	36	26	E6	F2
23	7	37	2F	E7	F3
24	8	38	28	E8	F4
25	9	39	29	E9	F5
26	-	2D	3D	EA	F6
27	^	5E	7E	EB	F7
28	@	40	60	00	13
29	[	5B	7B	FB	1C
2A	;	3B	2B	1E	FC
2B	:	3A	2A	1F	FD
2C	]	5D	7D	1D	9F
2D	,	2C	3C	FE	F9
2E	.	2E	3E	FF	FA
2F	/	2F	3F	A4	A5
C0	/ SPACE	20	20	20	20
C1	↵	A7	A7	A7	A7
C2	S1	A8	A8	A8	A8
C3	S2	A9	A9	A9	A9

Numeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
C4	.	2E	2E	B0	2E
C5	0	30	30	B1	30
C6	00	A6	A6	B2	A6
C7	1	31	1C	B3	31
C8	2	32	9A	B4	32
C9	3	33	1D	B5	33
CA	4	34	9B	B6	34
CB	5	35	9C	1B	35
CC	6	36	9D	B8	36
CD	7	37	1E	B9	37
CE	8	38	9E	BA	38
CF	9	39	1F	BB	39
D0	+	2B	2B	BC	2B
D1	-	2D	2D	BD	2D
D2	*	2A	2A	BE	2A
D3	/	2F	2F	BF	2F

Notes:

Codes A0 through AF are special cases that are trapped by the keyboard driver. These codes are not placed in the buffer. The special cases are defined as follows:

- A0 - logical reset
- A1 - (reserved)
- A2 - break facility (clears buffer, then puts 03 in first location)
- A3 - halt display
- A4 - cursor lock
- A5 - shift lock
- A6 - two zeros
- A7 - End of line (CR in keyboard buffer, '0' in LTERM buffer)
- A8 - End of line (CR in keyboard buffer, '1' in LTERM buffer)
- A9 - End of line (CR in keyboard buffer, '2' in LTERM buffer)
- AA - End of line (CR in keyboard buffer, '0' in LTERM buffer - for DATEV keyboard)
- AB - End of line (CR in keyboard buffer, '1' in LTERM buffer - for DATEV keyboard)
- AC - End of line (CR in keyboard buffer, '2' in LTERM buffer - for DATEV keyboard)
- AD - (reserved)
- AE - (reserved)
- AF - no operation

USA ASCII + BASIC KEYBOARD

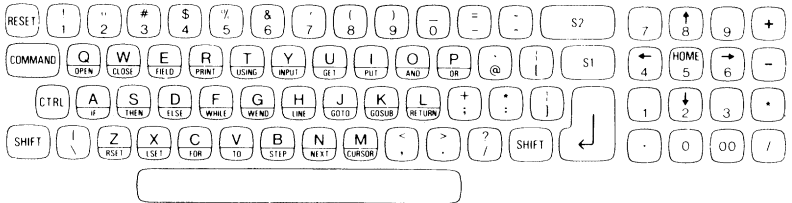


Fig. B-15 USA ASCII + BASIC Keyboard

Alphanumeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
00	RESET	DD	DE	A0	DF
01	\	5C	7C	7F	F8
02	a	61	41	01	80
03	b	62	42	A1	81
04	c	63	43	A2	82
05	d	64	44	04	83
06	e	65	45	05	84
07	f	66	46	06	85
08	g	67	47	07	86
09	h	68	48	08	87
0A	i	69	49	09	88
0B	j	6A	4A	0A	89
0C	k	6B	4B	0B	8A
0D	l	6C	4C	0C	8B
0E	m	6D	4D	0D	8C
0F	n	6E	4E	0E	8D
10	o	6F	4F	0F	8E
11	p	70	50	10	8F
12	q	71	51	11	90
13	r	72	52	12	91
14	s	73	53	A3	92
15	t	74	54	14	93
16	u	75	55	15	94
17	v	76	56	16	95
18	w	77	57	17	96

19	x	78	58	18	97
1A	y	79	59	19	98
1B	z	7A	5A	1A	99
1C	0	30	3D	E0	EC
1D	1	31	21	E1	ED
1E	2	32	22	E2	EE
1F	3	33	23	E3	EF
20	4	34	24	E4	F0
21	5	35	25	E5	F1
22	6	36	26	E6	F2
23	7	37	2F	E7	F3
24	8	38	28	E8	F4
25	9	39	29	E9	F5
26	-	2D	3D	EA	F6
27	~	5E	7E	EB	F7
28	@	40	60	00	13
29	[	5B	7B	FB	1C
2A	;	3B	2B	1E	FC
2B	:	3A	2A	1F	FD
2C	]	5D	7D	1D	9F
2D	,	2C	3C	FE	F9
2E	.	2E	3E	FF	FA
2F	/	2F	3F	A4	A5
C0	SPACE	20	20	20	20
C1	↵	A7	A7	A7	A7
C2	S1	A8	A8	A8	A8
C3	S2	A9	A9	A9	A9

Numeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
C4	.	2E	2E	B0	2E
C5	0	30	30	B1	30
C6	00	A6	A6	B2	A6
C7	1	31	1C	B3	31
C8	2	32	9A	B4	32
C9	3	33	1D	B5	33
CA	4	34	9B	B6	34
CB	5	35	9C	1B	35
CC	6	36	9D	B8	36
CD	7	37	1E	B9	37
CE	8	38	9E	BA	38
CF	9	39	1F	BB	39
D0	+	2B	2B	BC	2B
D1	-	2D	2D	BD	2D
D2	*	2A	2A	BE	2A
D3	/	2F	2F	BF	2F

Notes:

Codes A0 through AF are special cases that are trapped by the keyboard driver. These codes are not placed in the buffer. The special cases are defined as follows:

- A0 - logical reset
- A1 - (reserved)
- A2 - break facility (clears buffer, then puts 03 in first location)
- A3 - halt display
- A4 - cursor lock
- A5 - shift lock
- A6 - two zeros
- A7 - End of line (CR in keyboard buffer, '0' in LTERM buffer)
- A8 - End of line (CR in keyboard buffer, '1' in LTERM buffer)
- A9 - End of line (CR in keyboard buffer, '2' in LTERM buffer)
- AA - End of line (CR in keyboard buffer, '0' in LTERM buffer - for DATEV keyboard)
- AB - End of line (CR in keyboard buffer, '1' in LTERM buffer - for DATEV keyboard)
- AC - End of line (CR in keyboard buffer, '2' in LTERM buffer - for DATEV keyboard)
- AD - (reserved)
- AE - (reserved)
- AF - no operation

YUGOSLAVIA KEYBOARD

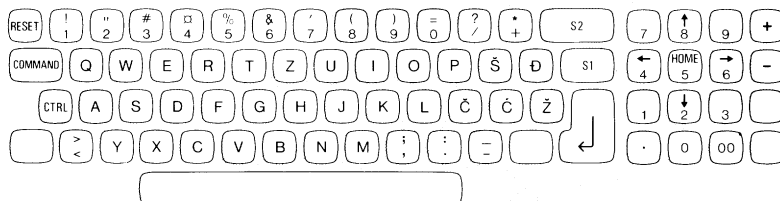


Fig. B-16 Yugoslavia Keyboard

Alphanumeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
00	RESET	DD	DE	A0	DF
01	<	3C	3E	7F	F8
02	a	61	41	01	80
03	b	62	42	A1	81
04	c	63	43	A2	82
05	d	64	44	04	83
06	e	65	45	05	84
07	f	66	46	06	85
08	g	67	47	07	86
09	h	68	48	08	87
0A	i	69	49	09	88
0B	j	6A	4A	0A	89
0C	k	6B	4B	0B	8A
0D	l	6C	4C	0C	8B
0E	m	6D	4D	0D	8C
0F	n	6E	4E	0E	8D
10	o	6F	4F	0F	8E
11	p	70	50	10	8F
12	q	71	51	11	90
13	r	72	52	12	91
14	s	73	53	A3	92
15	t	74	54	14	93
16	u	75	55	15	94
17	v	76	56	16	95
18	w	77	57	17	96

19	x	78	58	18	97
1A	y	79	59	19	98
1B	z	7A	5A	1A	99
1C	0	30	3D	E0	EC
1D	1	31	21	E1	ED
1E	2	32	22	E2	EE
1F	3	33	23	E3	EF
20	4	34	24	E4	F0
21	5	35	25	E5	F1
22	6	36	26	E6	F2
23	7	37	2F	E7	F3
24	8	38	28	E8	F4
25	9	39	29	E9	F5
26	/	2F	3F	EA	F6
27	+ ~	2B	2A	EB	F7
28	~ D	60	40	00	13
29	~ C	7B	5B	FB	1C
2A	~ C	7E	5E	1E	FC
2B	~ C	7C	5C	1F	FD
2C	~ Z	7D	5D	1D	9F
2D	,	2C	3B	FE	F9
2E	.	2E	3A	FF	FA
2F	-	2D	5F	A4	A5
C0	SPACE	20	20	20	20
C1	←	A7	A7	A7	A7
C2	S1	A8	A8	A8	A8
C3	S2	A9	A9	A9	A9

Numeric Section

RAW KEY CODE	KEYTOP	ALONE	with SHIFT	with CTRL	with COMMAND
C4	.	2E	2E	B0	2E
C5	0	30	30	B1	30
C6	00	A6	A6	B2	A6
C7	1	31	1C	B3	31
C8	2	32	9A	B4	32
C9	3	33	1D	B5	33
CA	4	34	9B	B6	34
CB	5	35	9C	1B	35
CC	6	36	9D	B8	36
CD	7	37	1E	B9	37
CE	8	38	9E	BA	38
CF	9	39	1F	BB	39
D0	+	2B	2B	BC	2B
D1	-	2D	2D	BD	2D
D2	*	2A	2A	BE	2A
D3	/	2F	2F	BF	2F

Notes:

Codes A0 through AF are special cases that are trapped by the keyboard driver. These codes are not placed in the buffer. The special cases are defined as follows:

- A0 - logical reset
- A1 - (reserved)
- A2 - break facility (clears buffer, then puts 03 in first location)
- A3 - halt display
- A4 - cursor lock
- A5 - shift lock
- A6 - two zeros
- A7 - End of line (CR in keyboard buffer, '0' in LTERM buffer)
- A8 - End of line (CR in keyboard buffer, '1' in LTERM buffer)
- A9 - End of line (CR in keyboard buffer, '2' in LTERM buffer)
- AA - End of line (CR in keyboard buffer, '0' in LTERM buffer - for DATEV keyboard)
- AB - End of line (CR in keyboard buffer, '1' in LTERM buffer - for DATEV keyboard)
- AC - End of line (CR in keyboard buffer, '2' in LTERM buffer - for DATEV keyboard)
- AD - (reserved)
- AE - (reserved)
- AF - no operation

C. HARD DISK AND DISKETTE CHARACTERISTICS

ABOUT THIS APPENDIX

This appendix provides a summary of the characteristics of the hard disk and the three types of diskette that can be used on the M20.

CONTENTS

<u>THE HARD DISK UNIT</u>	C-1
CHARACTERISTICS	C-1
<u>DISKETTES</u>	C-3
CHARACTERISTICS	C-4

THE HARD DISK UNIT

The hard disk is a Winchester disk unit incorporating three disk platters providing six recording surfaces. The read/write heads fly four microns above the disk surface allowing data to be stored at a very high density. To ensure reliability with this level of precision the disk is installed in a sealed casing and cannot be physically accessed by the user.

Although only 5 1/4in. in diameter the use of Winchester technology and high quality engineering allows the hard disk unit to store over 11 Mbytes of data (unformatted capacity) and transfer data at speeds up to 5 Mbits per second.

The hard disk unit is a high precision instrument and care must be taken whenever the M20 is moved to ensure that the unit is not damaged. The M20 should never be moved while the hard disk is being accessed.

CHARACTERISTICS

The main features of the hard disk unit are listed below.

Disk diameter 5 1/4in.

Unformatted capacity 11.25 Mbytes

Formatted capacity 8.85 Mbytes

Number of read/write heads 6 (one per surface)

Track density 254 tracks per inch (10 tracks per mm)

Tracks per surface 180

Number of cylinders 180

Access times:

- track to track 1.1 ms
- average 66 ms
- maximum 198 ms

Rotation speed 3,600 revs per minute (+ or - 1%)

Average latency time 8.33 ms

Transfer rate 5 Mbits per second

Formatted Capacity

256 bytes per block

32 blocks per track

8.192 Kbytes per track

1.475 Mbytes per surface

DISKETTES

Each 320 Kbyte and 640 Kbyte diskette drive has two read/write heads, and can read from, and write to, both surfaces of the diskette. 160 Kbyte diskette drives have one read/write head to read from and write to single-sided diskettes.

The diskettes that the drives use are standard 5 1/4in. magnetic disks, each one containing 35 tracks per surface.

Recording can be carried out on double-density diskettes, either single-sided or double-sided, thereby giving capacities of 160 Kbytes and 320 Kbytes, respectively; or on double-sided, quadruple-density diskettes thereby offering a capacity of 640 Kbytes.

A 640 Kbyte drive can perform both read and write operations on a 640 Kbyte diskette, but can only read from 320 or 160 Kbyte diskettes. A 320 Kbyte drive can perform both read and write operations on either 320 or 160 Kbyte diskettes, but can neither read from nor write to 640 Kbyte diskettes. Moreover, a 160 Kbyte can perform read and write operations only on 160 Kbyte diskettes.

CHARACTERISTICS

The main features of the diskettes are listed below.

	Diskette Type (Capacity)		
	640 Kbytes	320 Kbytes	160 Kbytes
diskette diameter	5 1/4 in.	5 1/4 in.	5 1/4 in.
average access time	303 ms	303 ms	303 ms
transfer rate	250 Kbits per second	250 Kbits per second	250 Kbits per second
tracks per surface	80	40 (35 used)	40 (35 used)
blocks per track	16	16	16
bytes per block	256 (except track 0 side 0 which is 128)	256 (except track 0 side 0 which is 128)	256 (except track 0 which is 128)

Note: Side 0 track 0 is not used by the system. It is written with standard Olivetti control data when the disk is formatted.

**D. DIAGNOSTIC/BOOTSTRAP
ERROR MESSAGES**

ABOUT THIS APPENDIX

This appendix provides an explanation of the error messages that might occur during the diagnostic/bootstrap process.

CONTENTS

<u>DIAGNOSTIC ERROR MESSAGES</u>	D-1
<u>BOOTSTRAP ERROR MESSAGES</u>	D-3

DIAGNOSTIC ERROR MESSAGES

Diagnostic error symbols and messages appear in the extream top left corner of the screen.

DISPLAYED SYMBOL	MESSAGE TYPE	DESCRIPTION
TRIANGLE	CPU diagnostic	A malfunction has been detected during the CPU diagnostic test. Correct operation of all registers, addressing modes, and instruction classes is verified
SQUARE	ROM diagnostic	A failure has been detected during the ROM diagnostic test. An error message is sent to the parallel printer port with the following format E(xn) where x= H or L - indicating high or low byte n= ROM number - a value in the range 0 to 4
DIAMOND	RAM diagnostic	A malfunction has been detected during the RAM diagnostic test. An error message is sent to the parallel printer port with the following format: EM(c) (bb) (ssss) (www) where c = RAM configuration number bb = bank failure number ssss = the expected data www = the actual data The RAM configuration number is a single digit octal number which specifies the hardware configuration of the particular M20 system

The bank number is a two-digit hexadecimal number that specifies the particular 16 Kbyte bank of memory (RAM or ROM) located either on a RAM expansion board or on the M20 mother board

FOUR BAR	Trap and Interrupt diagnostic	An illegal trap or interrupt has been detected.
E C0	IC error	Error detected in the 8255 parallel Centronics-like port IC
E C1	IC error	Error detected in the 6845 video controller IC
E C2	IC error	Error detected in the 1797 disk drive controller IC
E C3	IC error	Error detected in the 8253 real-time IC
E C4	IC error	Error detected in the 8251 (keyboard) USART IC
E C5	IC error	Error detected in the 8251 RS-232-C USART IC
E C6	IC error	Error detected in the 8259 interrupt controller IC

DIAGNOSTIC/BOOTSTRAP ERROR MESSAGES

E K0	Keyboard error	No response from the keyboard
E K1	Keyboard error	Self-test failure
E I0	Interrupt error	Non-vectored interrupt
E I1	Interrupt error	Vectored interrupt
E D0	Disk error	Error detected in diskette drive 0
E D1	Disk error	Error detected in diskette drive 1
E D10	Disk error	Error detected in hard disk drive 10

BOOTSTRAP ERROR MESSAGES

The messages listed in the following table can occur during the bootstrap procedure.

MESSAGE	MEANING
Insert system disk and type any key	Neither of the diskette drives is READY. Insert the system diskette and strike any key

Invalid File Error
(xx) on drive (n)

where (xx) is

- 00 - invalid extent count for the file descriptor block
- 01 - invalid file type
- 02 - invalid block count
- 03 - end of file error
- 04 - parameter out of range for the diskette drive

Disk Error: (xx)

A diskette or hard disk error has occurred where xx is a two-digit hexadecimal number indicating the diskette or hard disk driver return code. This value must be decoded into an 8-bit number, each bit of which represents an error condition which for a diskette drive is as follows:

- bit 7 - drive not ready
 - (most significant bit)
- bit 6 - write-protect error
- bit 5 - write fault error
- bit 4 - record not found error
- bit 3 - data transfer error
- bit 2 - seek error
- bit 1 - after restore, not track zero
- bit 0 - illegal parameters
 - (least significant bit)

or for the hard disk drive:

- bit 7 - bad block error
 - or
 - drive not ready error
 - (most significant bit)
- bit 6 - cyclic redundancy check error on data
- bit 5 - cyclic redundancy check error on block identifier
- bit 4 - record (block) not found error
- bit 3 - data transfer error
- bit 2 - abort error
- bit 1 - after restore, not track zero
- bit 0 - illegal parameters
 - (least significant bit)

Any number of these bits can be set signifying more than one error.

E. PCOS AND BASIC ERROR MESSAGES

INTRODUCTION

Errors returned from the BASIC Interpreter are not displayed with their error number (only the description is displayed). Errors returned from PCOS are always displayed with the error number; the descriptive label will only be displayed if the EPRINT command is present in memory (via execution, PLOAD or PSAVE), for example:

```
v1 %n novol /CR/
```

```
ERROR 69 --- volume name not found
```

The PCOS and BASIC error codes are listed in the table below. For each code the displayed message is given along with a descriptive comment. The table also indicates which codes apply to BASIC and which to PCOS.

PCOS AND BASIC ERRORS

ER- ROR CODE	MESSAGE	PCOS OR BASIC	COMMENT
1	NEXT without FOR	BASIC	A NEXT statement has been encountered without a matching FOR
2	syntax error	BASIC	A line has been encountered which includes an incorrect sequence of characters (misspelled keyword, incorrect punctuation etc.)
3	RETURN without GOSUB	BASIC	A RETURN has been encountered for which there is no previous unmatched GOSUB statement
4	out of data	BASIC	A READ statement has been executed when there are no DATA statements with unread data remaining in the program

5	illegal function call	BASIC	<p>A parameter that is out of range has been passed to a numeric or a string function.</p> <p>Such an error may occur when:</p> <ol style="list-style-type: none"> a. An array subscript is either negative or too big b. A log function is assigned a negative or a null argument c. The SQR function is assigned a negative value d. A negative number has an exponent which is not an integer e. An incorrect argument has been made in one of the following functions: MID\$, LEFT\$, RIGHT\$, TAB, SPC, STRING\$, SPACE\$, INSTR, or ON...GOTO
6	overflow	BASIC	<p>The result of a calculation is too large to be represented in BASIC's number format.</p> <p>Note: With underflow, the result is taken as zero, and execution continues without indication of an error</p>
7	out of memory	PCOS OR BASIC	<p>A program is too big; or has too many loops, GOSUBS, variables; or has expressions too complicated to evaluate, or a command or Assembler routine has been called that cannot be accommodated in the current memory available</p>
8	undefined line number	BASIC	<p>A line reference is to a non-existent line from a GOTO, GOSUB, IF..THEN..ELSE or DELETE</p>

9	out of range	BASIC	An array element has been referred to either with a subscript that is outside the dimensions of the array or with the wrong number of subscripts
10	duplicate definition	BASIC	Two DIM statements have been given for the same array, or a DIM statement has been applied to an array after the default dimension of 10 was previously established for that array
11	division by zero	BASIC	A division by zero has been encountered or the value zero has been raised to a negative power. In the former case the result is machine infinity (with the appropriate sign) and in the latter case the result is positive machine infinity
12	illegal direct	BASIC	A statement which is invalid in immediate mode has been entered as an immediate command
13	type mismatch	PCOS OR BASIC	A string value has been entered when a numeric value is required or vice versa
14	out of string space	BASIC	String variables have caused BASIC to exceed the amount of free user memory remaining. (BASIC will allocate space dynamically until it runs out of memory)
15	string too long	BASIC	An attempt has been made to create a string of more than 255 characters
16	string formula too complex	BASIC	A string expression is too long or too complex to be processed. It should be broken into smaller expressions

17	can't continue	BASIC	An attempt has been made to continue a program that is non-continuable: one that was halted due to an error, was modified during a break in execution, or does not exist in user memory
18	undefined function	BASIC	A function has been called that has not been previously defined
19	no RESUME	BASIC	An error-trapping routine has been entered that contains no RESUME statement
20	RESUME without error	BASIC	A RESUME statement has been encountered before an error-trapping routine is entered
21	unprintable error	BASIC	An error message is not printable. That is, it corresponds to an error with an undefined error code
22	missing operand	BASIC	An expression contains an operator but no following operand
23	buffer overflow	BASIC	An attempt has been made to enter a line with more than 255 characters
26	FOR without NEXT	BASIC	A FOR has been encountered without a matching NEXT
29	WHILE without WEND	BASIC	A WHILE has been encountered without a matching WEND
30	WEND without WHILE	BASIC	A WEND has been encountered without a matching WHILE
31	IEEE: invalid talker/ listener address	BASIC	An invalid talker/listener address has been used
32	IEEE: talker = listener address	BASIC	An attempt has been made to talk to a talker, or listen to a listener
33	IEEE: unprintable error	BASIC	An IEEE error message is not printable. That is, it corresponds to an error with an undefined error code

34	IEEE: board not present	BASIC	An attempt has been made to use IEEE on a machine which does not have the optional IEEE interface
35	window not open	PCOS OR BASIC	An attempt has been made to use a window which is not at present open
36	unable to create window	PCOS OR BASIC	The window to be created is too big or too small for its mode (graphics or text). (This error can be returned while executing an Assembly Language program)
37	invalid action verb	BASIC	An action verb has been incorrectly spelled or used
38	parameter out of range	BASIC	One or more parameters have exceeded the limits set for their range
39	too many dimensions	BASIC	An attempt has been made to use an array of more than one dimension, in graphics mode
50	field overflow	BASIC	A FIELD statement has attempted to allocate more bytes than were specified for the record length of a random file
51	internal error	BASIC	An internal malfunction has occurred. Report the conditions under which the error occurred to your support organisation
52	bad file number	BASIC	A statement or command refers to: - a file that does not have a file number within the range specified at initialisation - a file that is not open
53	file not found	PCOS OR BASIC	A LOAD, KILL or OPEN statement or a PCOS command refers to a file that does not exist on an enabled volume

54	bad file mode	PCOS OR BASIC	An attempt has been made to use random file operations (GET or PUT) with a sequential file; or to use the sequential operation LOAD with a random file; or to use an illegal file mode with OPEN, that is, not A, I, O, or R
55	file already open	PCOS OR BASIC	A sequential OPEN, O has been issued for a file that is already open, or a KILL has been applied to a file that is open
57	disk I/O error	PCOS OR BASIC	An input/output error has occurred during a disk I/O operation. It is a termination error from which PCOS/BASIC cannot recover - apply a RESET
58	file already exists	PCOS OR BASIC	The file name specified in a NAME statement, or the file name you are attempting to assign in a PCOS command is identical to a file name already in use on the volume
59	disk type mismatch	PCOS	A volume has been specified that is an invalid size for the operation
60	disk not initialized	PCOS	An attempt has been made to access a diskette or hard disk that has not been initialised
61	disk filled	PCOS OR BASIC	All disk storage space available is in use
62	end of file	PCOS OR BASIC	An INPUT statement has been executed: after all the data has been assigned, or for an empty (null) file. Note: the EOF function can be used to detect end of file
63	invalid record number	PCOS OR BASIC	The record number used with a GET or PUT statement exceeds range. That is, it is 0 or greater than 32767

64	invalid file name	PCOS OR BASIC	An invalid form of filename has been used with KILL, LOAD, OPEN, SAVE or a PCOS command. For example - too long - includes illegal characters such as space or hyphen
66	direct statement in file	BASIC	An immediate statement has been encountered when loading an ASCII format file. The LOAD operation is terminated
67	too many files	BASIC	An attempt has been made to create a new file (using SAVE or OPEN) when the present directory is already full
68	internal error	PCOS OR BASIC	An internal malfunction has occurred. Report the conditions under which the error occurred to your support organization
69	volume name not found	PCOS OR BASIC	The volume name referred to does not match any diskette or hard disk currently present
70	rename error	PCOS OR BASIC	An attempt has been made to rename a volume with an invalid name
71	invalid volume number	PCOS OR BASIC	The specified volume number is invalid
72	volume not enabled	PCOS OR BASIC	The specified volume has not been enabled
73	invalid password	PCOS OR BASIC	The specified password does not match that of the file
74	illegal disk change	PCOS OR BASIC	The diskette has been changed since the last file was last used
75	write protected file	PCOS OR BASIC	An attempt has been made to write to a write-protected file

76	error in parameter	PCOS OR BASIC	One or more of the quoted parameters contains an unacceptable value
77	invalid number of parameters	PCOS OR BASIC	More than the required number of parameters have been specified
78	file not open	PCOS OR BASIC	An attempt has been made to access a file that is not open
79	printer error	PCOS OR BASIC	A printer error has been returned indicating that some operator response is required, such as out of ribbon
80	copy protected file	PCOS	An attempt has been made to copy a file that is copy-protected
81	paper empty	PCOS OR BASIC	The printer has run out of paper
82	printer fault	PCOS OR BASIC	The printer has a hardware fault
92	command not found	PCOS	An invalid keyword has been entered
99	bad load file	PCOS	The program file specified is not compatible with the PCOS version being used
101	error in time or date	PCOS	An invalid time or date has been entered
108	call user error	PCOS	An error has been encountered in a call to an Assembly Language routine or a PCOS command
110	time out	PCOS	A time-out error has occurred
111	invalid device	PCOS	The specified device name does not exist

F. GET/PUT CONVERSION
— PCOS 1-3 TO PCOS 2-0/3-0

ABOUT THIS APPENDIX

This appendix provides details on how to convert BASIC files created under PCOS 1.3 to a format compatible with PCOS 2.0 or 3.0.

CONTENTS

<u>GET/PUT CONVERSION</u>	F-1
GETCONV.BAS	F-1

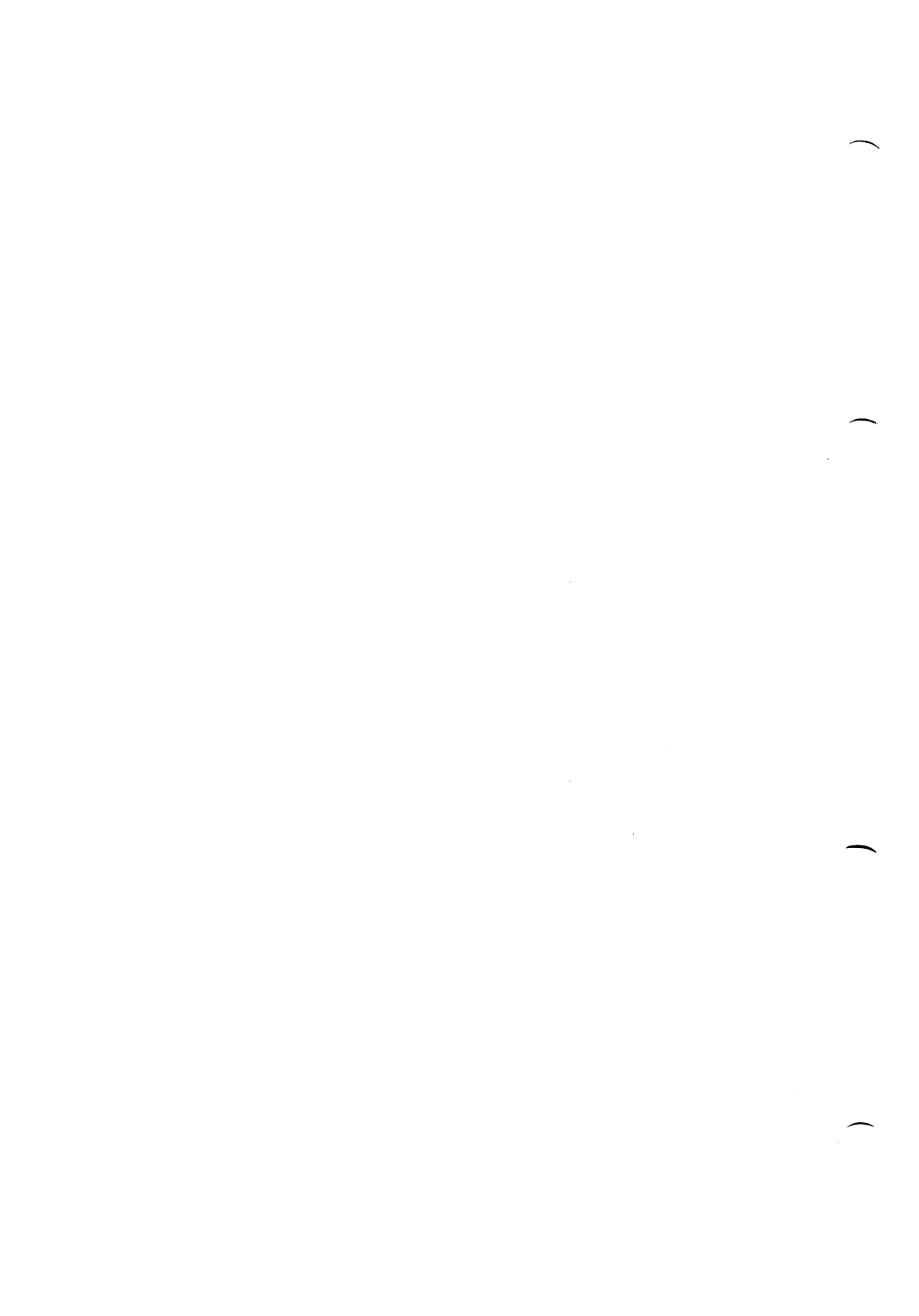
GET/PUT CONVERSION

GETCONV.BAS

Converts BASIC files containing video images created using GET/PUT statements under release 1-3 of PCOS, into a format compatible with releases 2-0 and 3-0 of PCOS.

The procedure is outlined below:

STEP	OPERATION
1	Boot PCOS 3.0
2	Execute the GETCONV.BAS utility by entering ge /CR/ OR by entering BASIC and entering run "getconv.bas"
3	Following the subsequent prompt, enter the identifier of the file to be converted
4	Following the subsequent prompt, enter the identifier of the output file
5	Following the subsequent prompt, enter "s /CR/" if the file to be converted is sequential, or "r /CR/" if it is a random file
6	Information about the conversion is then displayed. The process is complete when the "Conversion Complete" message is displayed



G. GLOSSARY OF TERMS

ABOUT THIS APPENDIX

This appendix defines the terms used in this manual that vary from general EDP terminology.

CONTENTS

GLOSSARY OF TERMS

G-1

GLOSSARY OF TERMS

The following table defines the non-standard terminology in this manual and also provides a page reference.

TERM	MEANING	REFERENCE
bootable file	a file of a specific format that the bootstrap loader can load into memory to initialise the system	5-6
device re-routing	a facility that enables input to be accepted from devices or files other than the keyboard, and output to be directed to devices and files other than the video	7-1/8
diskette	a single or double-sided 5 1/4in. floppy disk	C-3/4
drive number	<p>an integer referring to the diskette drive or hard disk drive in question. It may be</p> <p>10 - hard disk</p> <p>0 - first diskette drive</p> <p>1 - second diskette drive</p>	4-8
environment	<p>an operational environment in which the M20 responds to keyboard input in a specific way. Three distinct environments are mentioned in this manual</p> <p>PCOS</p> <p>BASIC</p> <p>Video File Editor</p>	5-1/4

global command	a PCOS command that allows the user to change global parameters	6-7/20
global parameter	a parameter that defines a feature of the system environment	6-7/20
hard disk	a 5 1/4in. Winchester disk unit	C-1/2
initialisation file	a file written in either Assembly Language or BASIC that is automatically loaded and executed on system initialisation. It may have one of the following names: <ul style="list-style-type: none"> - INIT.COMD - INIT.SAV - INIT.BAS 	5-7/8
logical reset	a reset of all global parameters (except those controlled by the real-time clock) and re-initialisation of the system (without performing diagnostic tests). It is caused by pressing /CTRL/ /RESET/, simultaneously	2-6
nil parameter	a parameter to a command where the parameter in question is not specified in the command line. The parameter therefore assumes either a default value, or the last specified value (in the case of global commands)	4-4
non-standard initialisation	a system initialisation where /L/, /D/, /F/, /B/, or /S/ is pressed during power-up diagnostics, or following a PRUN command	5-8/9

GLOSSARY OF TERMS

PCOS nucleus	that part of the operating system that is loaded into memory on initialising the system, and remains there until the working session is terminated	6-1/2
permanent memory area	that part of memory occupied by the PCOS nucleus, and those commands, assembler programs, programmed key definitions and user defined fonts made permanent by a PSAVE command	6-1/6
physical reset	a system re-initialisation caused by pressing the physical reset button. The subsequent initialisation includes diagnostic tests and a reset of all global parameters (including those controlled by the real-time clock	2-7
programmed key	a key that has either had its associated ASCII code changed by means of a CKEY command, or had a string assigned to it by means of the PKEY command	11-6/10
raw key code	the immediate code generated by a key (or key combination) corresponding to the physical position of the key on the keyboard, independent of system tables	11-5/6
semi-permanent memory area	that part of memory occupied by loaded commands and assembler programs, PKEYed strings and user-defined fonts that will be released on termination of the current working session	6-1/6

standard initialisation	initialisation following switch-on, physical reset, or logical reset; not having /L/, /D/, /F/, /B/ or /S/ pressed during power-up diagnostics	5-6/8
standard PCOS	the PCOS configuration supplied by Olivetti on the system diskette	6-1/2
text file	an ASCII file whose records are separated either by CR/LF, or by record separator (RS) characters	12-1
transient command	a command that is not loaded into memory at initialisation. This includes commands that are loaded and purged (those with CMD extension), and those that are loaded, but remain in memory after execution (those with SAV extension)	3-4
volume	the entire contents of a diskette or hard disk	4-6/8
wild card character	a special symbol used to represent any single character (?), or any string of characters (*)	4-10
working session	the time between booting PCOS and the next boot of PCOS or switch-off	5-12

H. COMMAND INDEX

ABOUT THIS APPENDIX

This appendix provides an alphabetic index of PCOS commands.

CONTENTS

COMMAND KEYWORD INDEX

H-1

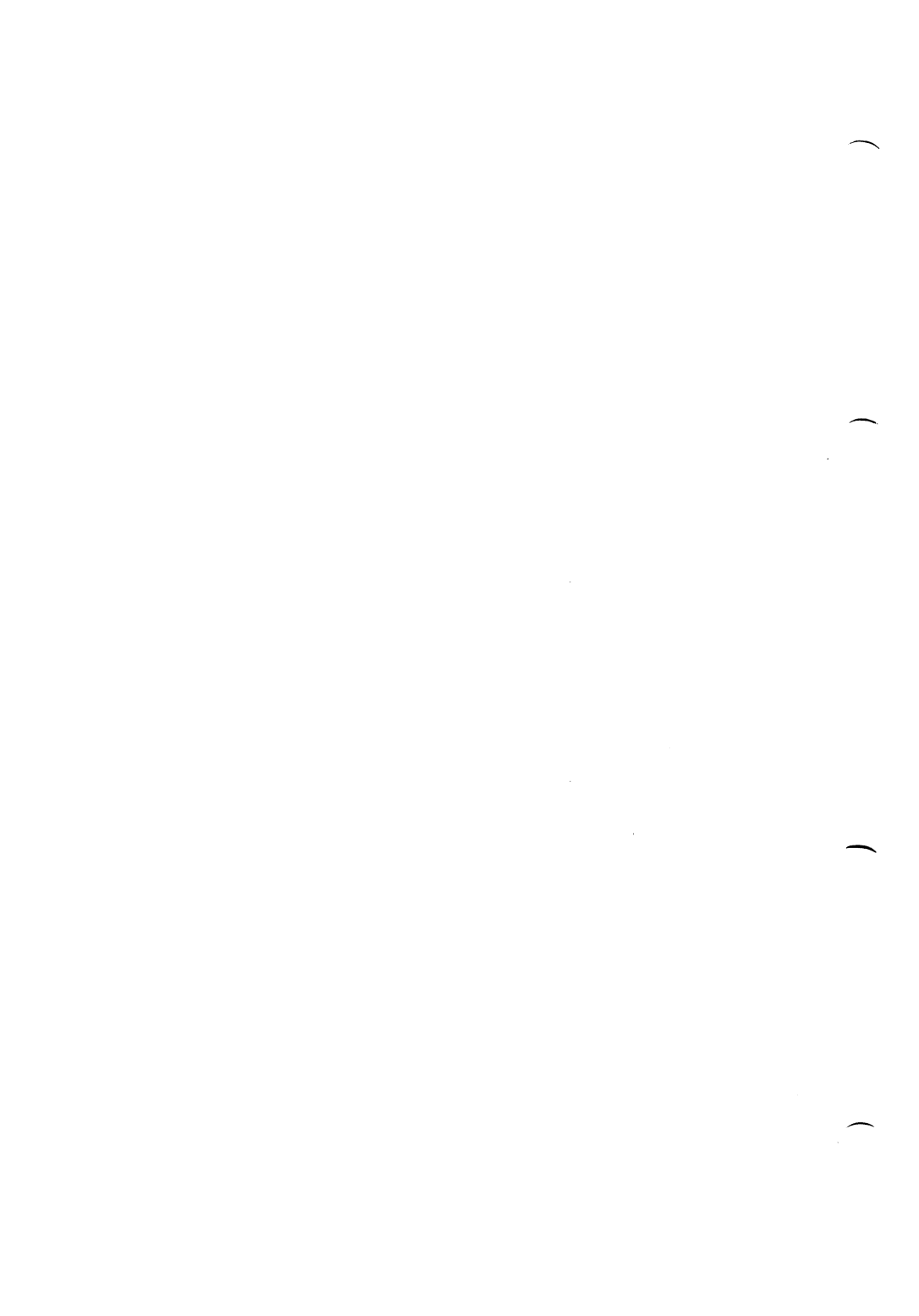
COMMAND KEYWORD INDEX

COMMAND KEYWORD	REFERENCE	
	PART I	PART II
BASIC.CMD	3-7, 7-7/8 8	13-1
BKEYBOARD.BAS		13-2
BVOLUME.SAV		13-3
CI.SAV	3-9	13-8
CKEY.CMD	11-6/7	13-9
COMMANDS.BAS		13-14
DCONFIG.CMD		13-15
EDIT.CMD	5-4, 11-10/13, 12-1/19	13-18
EPRINT.SAV	6-3/4	13-18
ERROR.BAS		13-20
FCOPY.CMD	9-9, 10-2/4, 10-6	13-20
FDEPASS.CMD	8-3, 10-8/9	13-26
FFREE.CMD	10-10/13	13-28
FKILL.CMD	10-14/15	13-30
FLIST.CMD	10-6/8	13-31
FMOVE.CMD	10-5/6	13-33
FNEW.CMD	8-2, 10-1	13-35
FPASS.CMD	8-2/3, 10-8/9	13-37
FRENAME.CMD	10-15/16	13-39
FUNPROT.CMD	8-4, 10-9/10	13-40
FWPROT.CMD	8-4, 10-9/10	13-42

HELP.BAS		13-44
IEEE.SAV	3-9	13-44
LABEL.CMD	11-1/3	13-45
LSCREEN.CMD	11-3/4	13-50
LTERM		13-52
PKEY.CMD	6-5, 6-6, 11-9	13-53
PLOAD	6-1/4	13-57
PRUN.CMD	5-9, 6-22	13-59
PSAVE.CMD	5-9, 6-21	13-61
PUNLOAD	6-1/2	13-63
RFONT.CMD	11-10	13-65
RKILL.CMD	10-15	13-67
RS232.SAV	3-9	13-69
SBASIC.CMD	6-14/15	13-69
SCOMM.CMD	3-9, 6-15	13-72
SDEVICE.CMD	6-11/13	13-73
SFORM.CMD	6-15/18	13-75
SLANG.CMD	6-19/20	13-78
SPRINT.CMD	11-3/4	13-80
SSYS.CMD	6-7/11	13-82
VALPHA.CMD	9-11	13-86
VCOPY.CMD	9-6/7	13-88
VDEPASS.CMD	8-2, 9-10	13-90
VFORMAT.CMD	9-1/3, 9-10	13-91
VLIST.CMD	9-4/5	13-94
VMOVE.SAV	9-8/9	13-96

COMMAND INDEX

VNEW.CMD	9-3/4, 9-10	13-98
VPASS.CMD	8-1, 9-10	13-100
VQUICK.CMD	9-5/6	13-102
VRENAME.CMD	9-11	13-104
VVERIFY.CMD		13-106
WFONT.CMD	11-14/15	13-109



NOTICE

Ing. C. Olivetti & C. S.p.A. reserves the right to make improvements in the product described in this manual at any time and without notice.

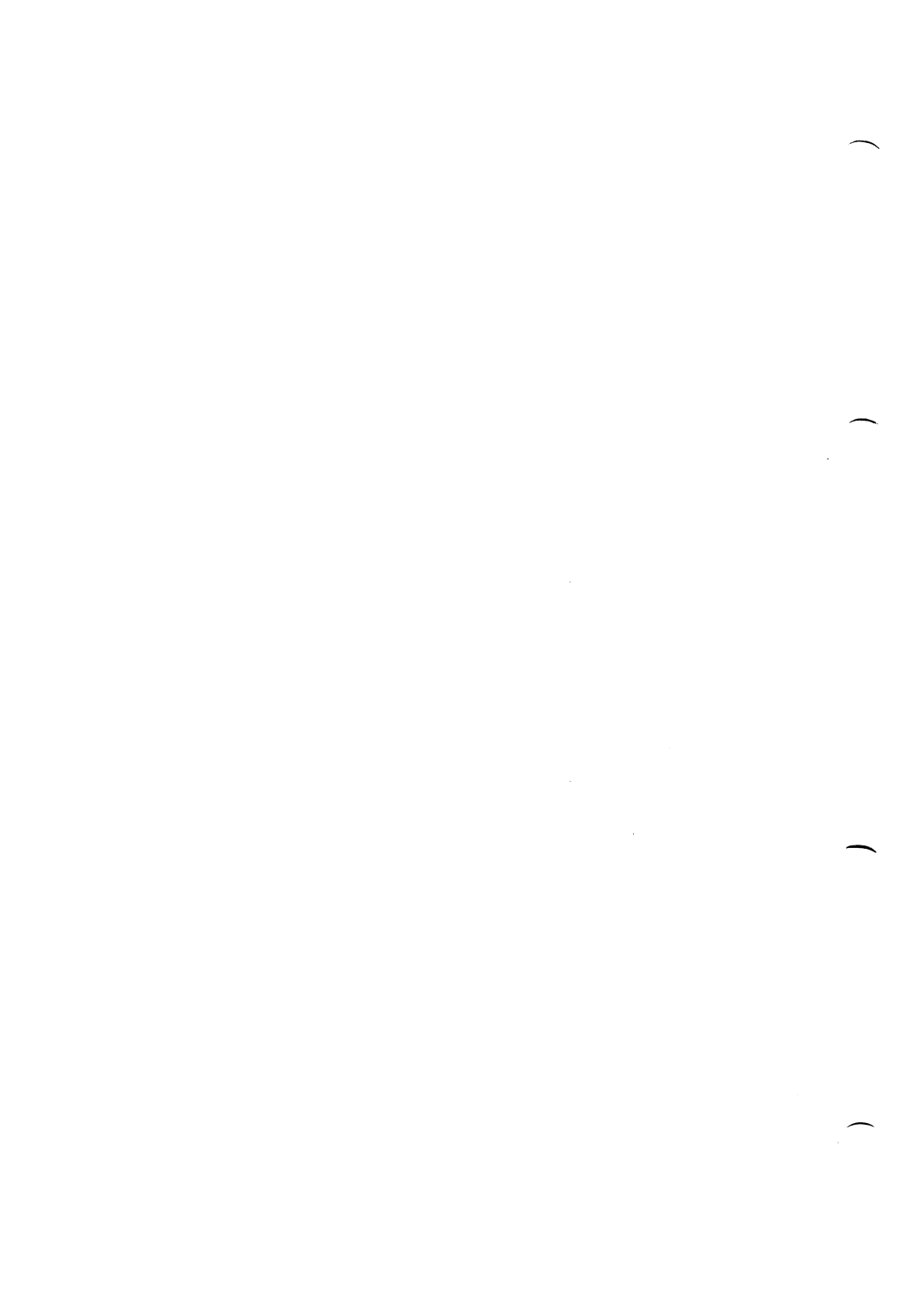
This material was prepared for the benefit of Olivetti customers. It is recommended that the package be test run before actual use.

Anything in the standard form of the Olivetti Sales Contract to the contrary notwithstanding, all software being licensed to Customer is licensed "as is". THERE ARE NO WARRANTIES EXPRESS OR IMPLIED INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTY OF FITNESS FOR PURPOSE AND OLIVETTI SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES IN CONNECTION WITH SUCH SOFTWARE.

The enclosed programs are protected by Copyright and may be used only by the Customer. Copying for use by third parties without the express written consent of Olivetti is prohibited.

GU Code 3985280 D (0)
Printed in Italy

olivetti



GU Code 3985280 D (0)
Printed in Italy

olivetti