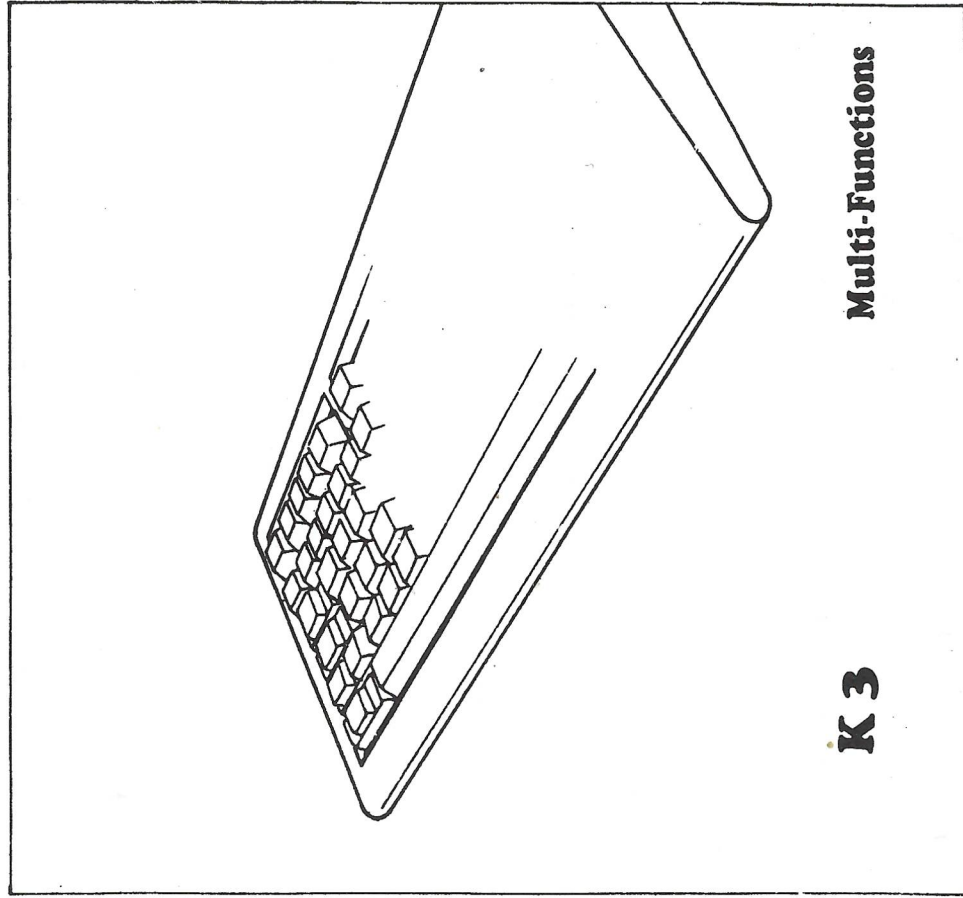


MULTI-COMPATIBLE KEYBOARD USER'S MANUAL



K 3

Multi-Functions

3

-2

-1

-1

-1

-1

-1

1

3

TABLE of CONTENTS

Chapter 1	OVERVIEW
Chapter 2	CONNECT TO APPLE-IIe/APP
Chapter 3	SYSTEM RESET
Chapter 4	F1~F10
Chapter 5	SPECIAL KEYS
Chapter 6	"Alt" KEY FOR ONE-KEY-B
Chapter 7	AUTO REPEAT
Chapter 8	NUMERIC PAD
Chapter 9	USER-PROGRAM AND CURSOR
9.1	User-Program Keys
9.2	Memory-Back-Up Battery
9.3	Initial Program for Apple-IIe
9.4	User-Program Function Keys
9.5	Applications of User-Program
9.5.1	Program Cursor Control C

Chapter 1

OVERVIEW

The "Multi-Compatible" Keyboard has seven outstanding functions as follows.

1. Both Apple-IIe and Apple-II plug-compatible.
2. Key-beep
3. Key-in-lock.
4. User-Program function with memory-backup battery.
5. Cursor control code programmable.
6. One-Key-BASIC-Commands.
7. Height adjustable tilts (Fig. 1-2).

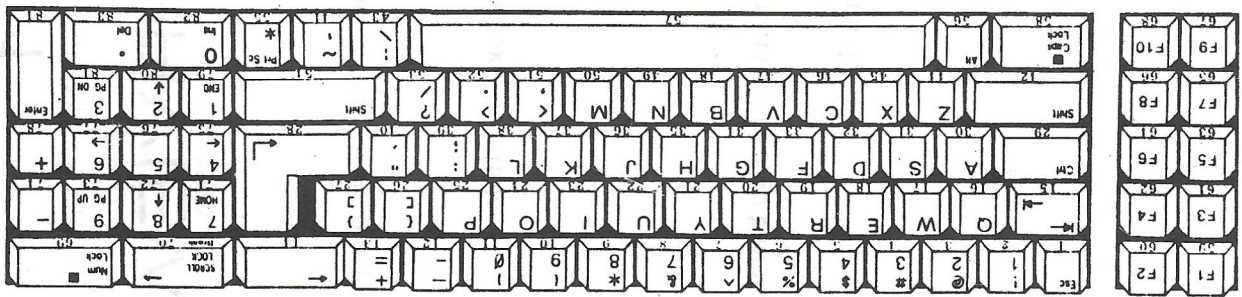


Fig. 1-1. Multi-Compatible Keyboard Layout.

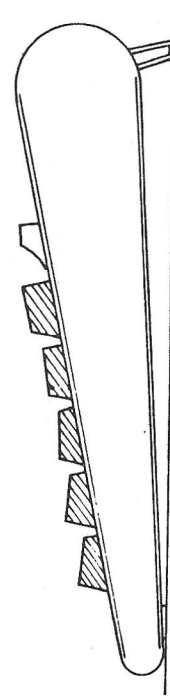
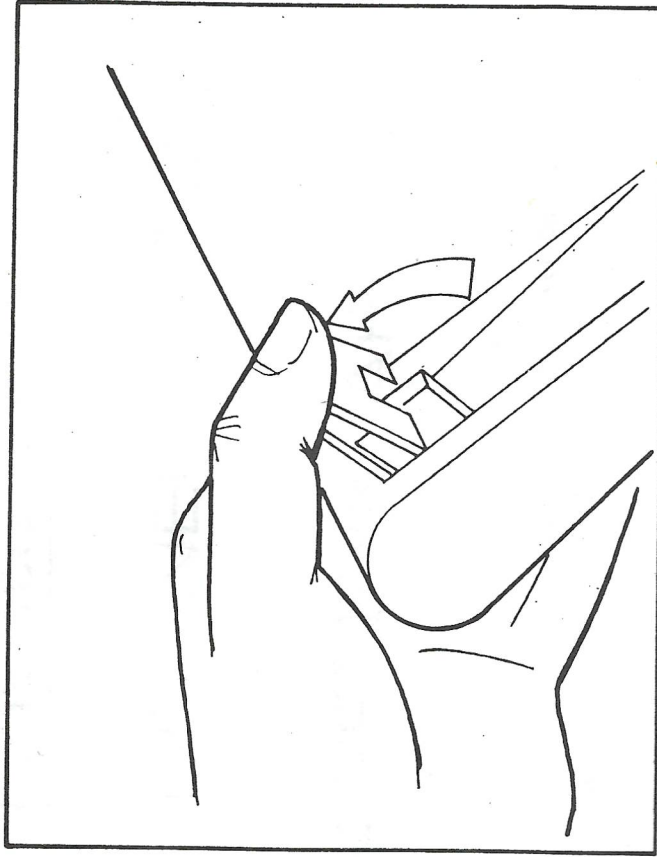


Fig. 1-2. Tilt Positions Adjustment.

Chapter 2

CONNECT TO

APPLE-IIe/APPLE-II

- 1) Insert plug of keyboard cable into socket on the "Serial to parallel interface card" (Fig. 2-1).
- 2) Turn off the power of Apple-IIe/Apple-II.
- 3) Insert the flat cable DIP jumper of "Serial to parallel interface card" into the "keyboard input I.C. socket" on Apple-IIe/Apple-II mainboard (Fig. 2-2).
- 4) Turn on the power and test keyboard.

Chapter 3

SYSTEM RESET

Press   simultaneously.

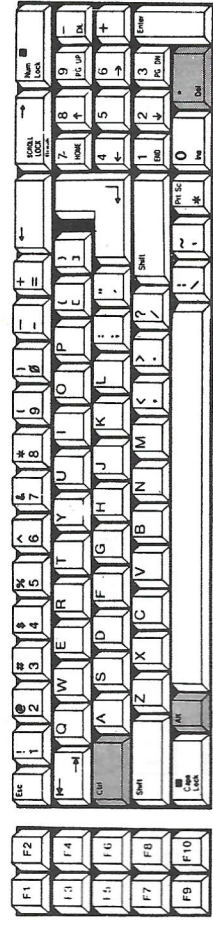


Fig. 3-1.

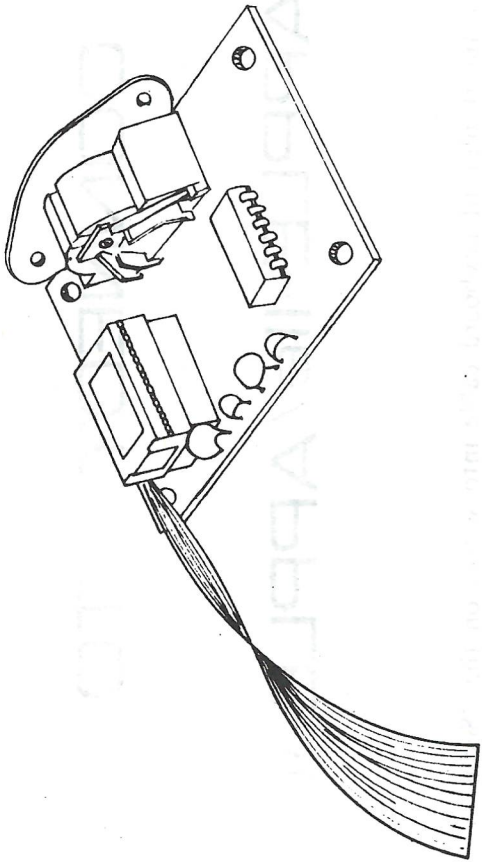


Fig. 2-1. Serial to Parallel Interface Card for Apple-IIe/Apple-II

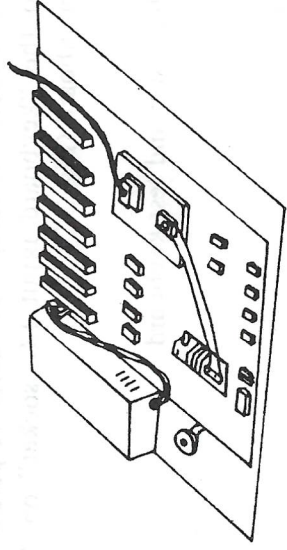


Fig. 2-2.

Chapter 4

F1~F10

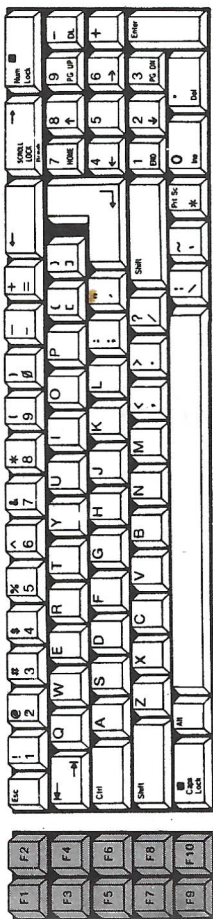


Fig. 4-1. Function Keys

F1	=	RESET 1
F2	=	RESET 2
F3	=	LIST
F4	=	RUN ↵
F5	=	CATALOG ↵
F6	=	CALL-151 ↵
F7	=	KEY-IN-LOCK
F8	=	KEY-BEEP
F9	=	(Joystick keyswitch No. 1)
F10	=	(Joystick keyswitch No. 2)

F1	F2	F9
F1	F2	F10

- = RESTART SYSTEM FOR Apple-IIe
- = START BUILD-IN SELF-TEST FOR Apple-IIe.

Chapter 5

SPECIAL KEYS

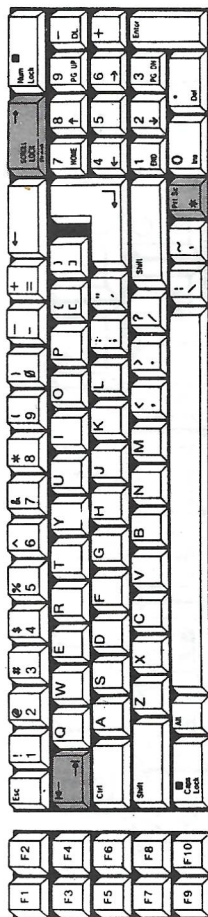
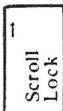
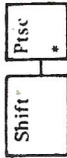
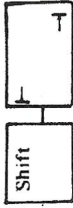


Fig. 5-1.

-  = Ctrl-U In "Apple-Soft" software, this key moves the cursor to the right; each character it crossed on the screen is entered as though you had typed it.
-  = Ctrl-C In "Apple-Soft" software, it sends out "Break" keycode.
-  = Ctrl-P In "Word-Star" software, it sends out "Print Screen" code.
-  = Ctrl-I In "Word-Star" software, it sends out "Tabulation" code.
-  = ASCII code 7FH

Chapter 6

“ALT” KEY FOR ONE-KEY-BASIC- COMMAND

Press **Alt** - **G** = GOTO Press **Alt** - **N** = NEXT

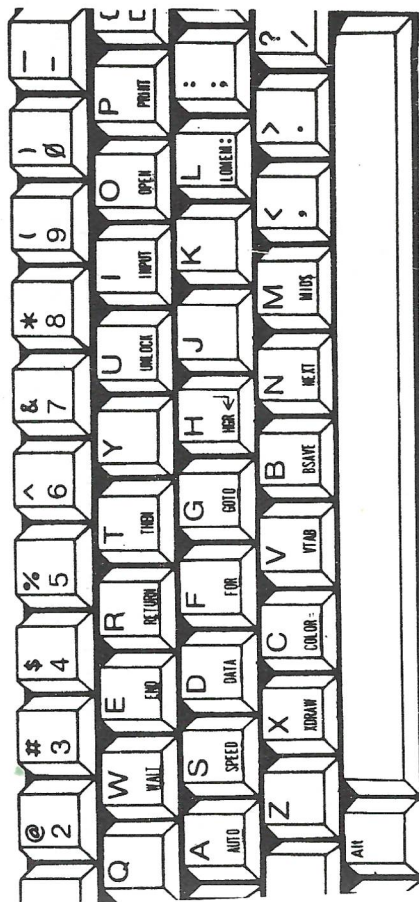


Fig. 6-1. One-Key-BASIC-Command Keys.

Chapter 7

AUTO REPEAT

Auto Repeat

Pressing a key over 1 second keyboard will repeatedly send out this keycode with rate of 11 keycodes per second.

Chapter 8

NUMERIC PAD

Numeric Pad

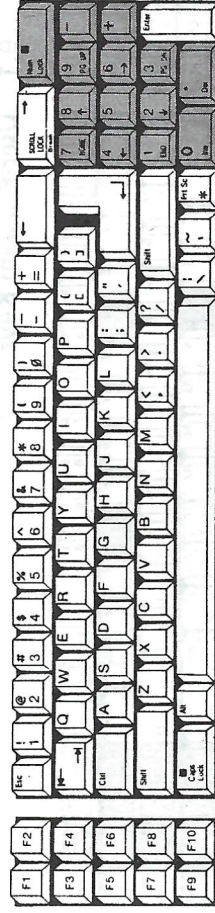
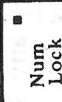
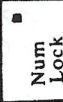


Fig. 8-1. The Numeric Pad.

Press  Num Lock

once, "Num Lock LED" lights; keyboard enters Numeric Mode.

Press  Num Lock

again, "Num Lock LED" turn off; keyboard return t Cursor Control Mode or User-Program Mode.

The chapter 9 will describe cursor control mode and user-program in detail.

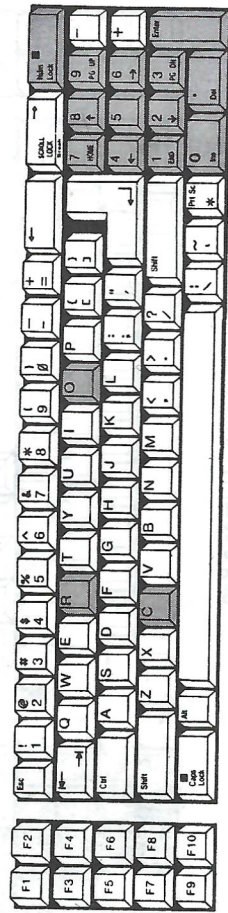
Chapter 9

USER-PROGRAM

AND

CURSOR CONTROL

9.1 User-Program Keys



There are eleven User-program keys at "Numeric Pad" can store totally 60 Bytes (characters) keycodes, commands, sentences and short programs which are key-in using User-program function keys.

The 60 Bytes (characters) memory can be shared by any 1 to 11 User-program keys. The keyboard will send out the data storing in User-program key by pressing it at "Num Lock Off" mode.

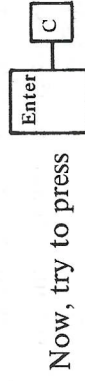
DF7=	7 Home	DF8=	8 ↑	DF9=	9 Pg Up
DF4=	4 ←	DF5=	5	DF6=	6 →
DF1=	1 End	DF2=	2 ↓	DF3=	3 Pg Dn
DF0=	0 INS	DF=	Del		

The "Numeric Pad" keytops have printed "Cursor Control" symbols of arrows and commands. It is very useful to store cursor control codes in different software such as Apple-IIe, Apple-II, Word-Star, Multiplan, dBASE... etc.

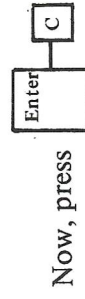
9.2 Memory-back-up Battery

The "Multi-compatible" keyboard has a battery to back-up the data in User-program keys for 5 years.

9.3 Initial Program for Apple-IIe



Before using this cursor control mode, you may inspect if the codes storing in user program keys are cursor control codes of Apple-IIe or not.



If Apple-IIe cursor control codes are available, the screen will display as follows.

Screen Display	Explanation
User Program	
1DF0 = \	
1DF1 = \	
1DF2 = AJ	2 ↓ = Ctrl-J

⌘DF3 = \

⌘DF4 = ⌘H

⌘DF5 = \

⌘DF6 = ⌘U

⌘DF7 = ⌘J@

⌘DF8 = ⌘K

⌘DF9 = \

⌘DF• = ■ = ⌘ = 7FH

You may not go on studying later sections, if you won't use any other user-program application such as programming commands, sentences, cursor control codes of Word-Star.

If nothing available the screen will display as follows:

⌘User-Program

⌘DF0= \

⌘DF1= \

⌘DF2= \

⌘DF3= \

⌘DF4= \

⌘DF5= \

⌘DF6= \

⌘DF7= \

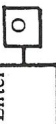
⌘DF8= \

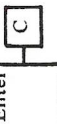
⌘DF9= \

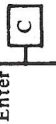
⌘DF•= \

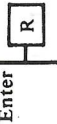
You may store Apple-IIe cursor control codes in User-program keys in advance for applications of Apple-IIe software packages. (Refer to Chapter 9.5)

9.4 User-program Function Keys

Enter  = "Open" User-program mode.

Enter  = "Close" User-program mode.

Enter  = "Display" all of data in User-Program keys

Enter  = "RESET" (Clear) all of data in User-program keys.

 = "Send out" data in  key.

 = "Send out" data in  key.

 = "Send out" data in  key.

•
•
•
•

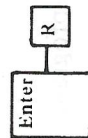
9.5 Applications of User-program

9.5.1 Program cursor control codes

EX.1 Key in Apple-IIe Cursor Control Codes

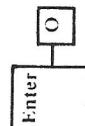
Under Apple-II or Apple-IIe software, you shall key-in Apple-IIe Cursor Control Codes.

Key to Press	Screen Display	Explanation
--------------	----------------	-------------



User Program
JDF0 = \
JDF1 = \
JDF2 = \
JDF3 = \
JDF4 = \
.
.
.
.
.
.

Reset (clear) all of data in User-program keys.



J User Program "Open" User-program



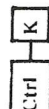
DF7 =



DF7 = \] (@ Esc@



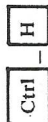
DF8 =



DF8 = \K Ctrl-K



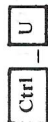
DF4 =



DF4 = \H Ctrl-H



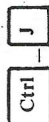
DF6 =



DF6 = \U Ctrl-U



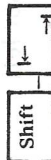
DF2 =



DF2 = \J Ctrl-J



DF• =

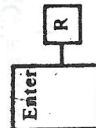


DF• = •• 7FH

EX.2. Key-in Word-Star Cursor Control Codes

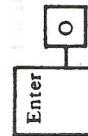
Under CP/M software, you shall key-in Word-Star control codes.

Key to Press	Screen to Display	Explanation
--------------	-------------------	-------------



See EX.1

Reset all of data



J User Program

7 Home	DF7= _	
Ctrl Q R	DF7= ↑QR_	"Ctrl-Q" "R"=Move Cursor to Home
8 ↑	DF8= _	
Ctrl E	DF8= ↑E_	"Ctrl-E"=line up =cursor up
9 Pg up	DF9= _	
Ctrl R	DF9= ↑R_	"Ctrl-R"=Screen up =Page up
4 ←	DF4= _	
Ctrl S	DF4= ↑S_	"Ctrl-S"=character left=cursor left
5	DF5= _	Nothing to key-in
6 →	DF6= _	
Ctrl D	DF6= ↑D_	"Ctrl-D"=character right=cursor right
1 End	DF1=	
Ctrl Q C	DF1= ↑QC	"Ctrl-Q" "C"=move cursor to End
2 ↓	DF2=	
Ctrl X	DF2= 1X	"Ctrl-X"=line down =cursor down
3 Pg Dn	DF3=	

Ctrl C	DF3= ↑C	"Ctrl-C"=screen down=Page Down
0 Ins	DF0=	
Ctrl V	DF0= ↑V	"Ctrl-V"=Insert on/ off
Del	DF.=	
Ctrl G	DF.= ↑G	"Ctrl-G"= character delete.
Enter C		
User Program		
DF0= ↑V		
DF1= ↑QC		
DF2= ↑X		
DF3= ↑C		
DF4= ↑S		
DF5=		
DF6= ↑D		
DF7= ↑QR		
DF8= ↑E		
DF9= ↑R		
DF.= ↑G		

The following examples are showing the cursor control code for Apple-Soft, Multiplan and d-Base for your reference.

EX.3. Apple-Soft (Key-in under "Apple-Soft" software)

User-Program Keys	Key-in Codes	Display
7 Home	ESC Shift @ 2	^ @
8 ↑	ESC D	^ D
4 ←	ESC B	^ B
6 →	ESC A	^ A
2 ↓	ESC C	^ C

EX.4. Multiplan (Key-in under "Apple-Soft" software)

User-Program Key	Key-in Codes	Display
7 Home	Ctrl Q	^ Q
8 ↑	Ctrl E	^ E
4 ←	Ctrl S	^ S
5 →	Ctrl D	^ D
2 ↓	Ctrl X	^ X
0 Ins	I	I
• Del	D	D

EX.5. d-Base (Key-in at CP/M Mode)

User-Program Keys	Key-in Codes	Display
8 ↑	Ctrl E	↑ E
4 ←	Ctrl S	↑ S
6 →	Ctrl D	↑ D
2 ↓	Ctrl X	↑ X
0 Ins	Ctrl V	↑ V
• Del	Ctrl G	↑ G

9.5.2 Program Commands/Words/Sentences

EX.6. Key-in command and correct mistake.

Key to Press	Screen Display	Explanation
Enter	] User Program	Enter User-program mode.
7 Home	] DF7=	
G O T P	DF7=GOTP	Key-in "GOTO" but mistake to "GOTP"

7 Home	Clear "GOTP" and key-in DF7 again
G O T O	
Enter C	
1 DF7=	
1 DF7=GOTO	
1 User Program \	Close User-program mode and display all of data
1 DF0= \	
1 DF1= \	
1 DF2= \	
1 DF3= \	
1 DF4= \	
1 DF5= \	
1 DF6= \	
1 DF7=GOTO	Correct data.
1 DF8= \	
1 DF9= \	
1 DF.= \	

EX.7. Key-in commands and words

Key to Press	Screen Display	Explanation
Enter R	See Ex.1	Reset (clear) all of data in User-program keys
Enter O	1 User Program	
0 Ins	DF0=	
N E W ↵	DF0= NEW ^ M	
6 ↑	DF6=	

R E A G E N	DF6= REAGEN
2 1	DF2=
D I R	DF2= DIR
Enter C	
	DF0= NEW ^ M \
	DF1= \
	DF2= DIR \
	DF3= \
	DF4= \
	DF5= \
	DF6= REAGEN \
	DF7= \
	DF8= \
	DF9= \
	DF.= \
Key to Press	Screen Display
0 Ins	1 NEW
	1
6 ↑	1 REAGEN
2 ↓	1 DIR

EX.8. Key-in sentence

Key to Press	Screen Display	Explanation
Enter R		Reset (clear) all of data
Enter O		Enter User-program mode.
O Ins		
I L O V E		
Space		
M U L T I		
C O M P A T I		
B L E K E Y		
B O A R D Z		
Enter C		

Chapter 10

KEYCODE TABLE

KEY 11 GEN	KEY NUMBER	ALONE	CAPLOCK	SHIFT	CONTROL	SHIFT CONTROL
A	30	61H	Same as SHIFT has been pressed	41H	01H	01H
B	48	62H	"	42H	02H	02H
C	46	63H	"	43H	03H	03H
D	32	64H	"	44H	04H	04H
E	18	65H	"	45H	05H	05H
F	33	66H	"	46H	06H	06H
G	34	67H	"	47H	07H	07H
H	35	68H	"	48H	08H	08H
I	23	69H	"	49H	09H	09H
J	36	6AH	"	4AH	0AH	0AH
K	37	6BH	"	4BH	0BH	0BH
L	38	6CH	"	4CH	0CH	0CH
M	50	6DH	"	4DH	0DH	0DH
N	49	6EH	"	4EH	0EH	0EH
O	24	6FH	"	4FH	0FH	0FH
P	25	70H	"	50H	10H	10H
Q	16	71H	"	51H	11H	11H
R	19	72H	"	52H	12H	12H
S	31	73H	"	53H	13H	13H
T	20	74H	"	54H	14H	14H
U	22	75H	"	55H	15H	15H
V	47	76H	"	56H	16H	16H
W	17	77H	"	57H	17H	17H
X	45	78H	"	58H	18H	18H
Y	21	79H	"	59H	19H	19H
Z	44	7AH	"	5AH	1AH	1AH
!@	2	31H	Not affected	21H	31H	21H
@#	3	32H	"	40H	32H	00H
#	4	33H	"	23H	33H	23H
\$%	5	34H	"	24H	34H	24H
%	6	35H	"	25H	35H	25H
^	7	36H	"	5EH	36H	1EH
&	8	37H	"	26H	37H	26H
*8	9	38H	"	2AH	38H	2AH
(9)	10	39H	"	28H	39H	28H
)0	11	30H	"	29H	30H	29H
! \	43	5CH	"	7CH	1CH	1CH

APPENDIX A

SPECIFICATIONS

Power Requirement +5 Vdc 280mA

Mechanical Specifications

Keyboard Height: Home row is 29mm from top of keytop to desktop. Typing angle adjustable from 6 degrees to 12 degrees.

Total Key Travel: 4.3mm $\pm$ 0.5mm

Activation Force: 60 grams $\pm$ 25 grams

Key Space Center: 19.0mm standard

Dimensions: Keyboard: 440 (W) x 185 (D) x 37 (H) mm

Weight: 1.2 Kg

PACKING DATA

One set keyboard in one inner box

Dimension: 490 (W) x 245 (D) x 85 (H) mm

Weight: 1.6 Kg

10 Boxes in one outer carton

Dimension: 515 (W) x 510 (D) x 445 (H) mm

Weight: 17.5 Kg

<	51	2CH	"	3CH	2CH	3CH
>	52	2EH	"	3EH	2EH	3EH
::	39	3BH	"	3AH	3BH	3AH
:/	53	2FH	"	3FH	2FH	3FH
"/	40	27H	"	22H	27H	22H
{	26	5BH	"	7BH	1BH	1BH
}	27	5DH	"	7DH	1DH	1DH
-	12	2DH	"	5FH	2DH	1FH
+ =	13	3DH	"	2BH	3DH	2BH
←	14	08H	08H	08H	08H	08H
ESC	1	1BH	1BH	1BH	1BH	1BH
→	15	09H	09H	7FH	7FH	7FH
SPACE	57	20H	20H	20H	20H	20H
↓	28	0DH	0DH	0DH	0DH	0DH
Scroll Lock	70	15H	15H	03H	03H	03H

