
CUMANA

USERS HANDBOOK



ENHANCEMENT

Following procedure will make the program "PAD" more convenient to the user :

1. Rewind the program cassette to the beginning of side A
2. Load the program by typing LOAD "PAD" and press (return) on the keyboard
3. After the program is loaded into the computer, type in:
285 X=X*1.035 : Y=Y*1.035 and press (return)
4. Place a new cassette into the recorder
5. Type SAVE "PAD" and press (return)

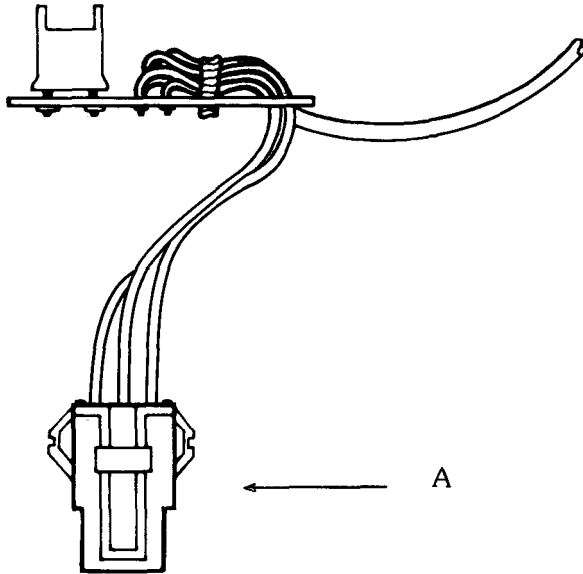
NOTE : Do not save the modified program on the original program cassette. The original program cassette must be kept in safety place as master tape.

Chapter 1

Connecting your Cumana Touchpad to your BBC Computer:

- A) Switch off the power of the BBC computer.
 - B) Connect the cable with the 8 pin din plug to the back of the touchpad.
 - C) Plug the end with 5 pin din plug into the RS-423 socket at the back of the BBC computer. The polarising keyway on the plug should be facing towards the R.G.B. socket.
 - D) Plug the housing on the Power PCB (as shown in Diagram A) to the auxiliary power output of the BBC computer which is located underneath the computer. If you are already using the auxiliary power output to run a Floppy Disk Drive or other peripheral then first remove this and re-connect it into the extension of the power PCB for the Touchpad as shown in Diagram 1 marked with arrow A
 - E) Switch on the power of the BBC computer.
 - F) The POWER LED of the touchpad should be on. Pressing the drawing area of the touchpad should turn on the pen down LED. If the above indication is correct, the touchpad has been connected to the BBC computer successfully and you may load and run the programs for the touchpad from the program cassette.
 - G) The touchpad program is called "PAD", at the start of the program a diamond cursor should appear on the screen when pen is up. If the cursor is missing it means that the 5 pin din plug is not in the correct direction. Replug the plug correctly and press the "break" key of the computer and then type: OLD <press return>
RUN <press return>
- NOTE: Switch power off while moving the position of the 5 pin din plug.

Diagram 1



Notes on the Content of the Cassette:

- 1) "HELP": CH. "HELP" to display the full explanations of operations for the touchpad program. A copy of the explanations is included in this note.
- 2) "PAD". CH. "PAD" to begin the touchpad program. In menu selection, the command to be selected is in the reverse video with yellow background. The elastic band feature in the drawing of LINE, LINES, FRAME, BOX and CIRCLE will disappear when performing menu selection.
- 3) "PRINT": CH. "PRINT" will enable you to print the picture you have previously drawn and saved. The program is menu driven. This program works the EPSON RX-80 and other printers that recognise the same command format as an RX-80.
- 4) "PICTURE": it is the sample picture.

Notes on the Touchpad Drawing Program Terminology

'PAD': the drawing area on the touchpad.

'PEN DOWN BUTTON': the upper button on the touchpad.

PEN DOWN LED ON THE TOUCH PAD:-

The LED ON indicates pen down on the pad is detected. If it is OFF, the pressure on the pad is not enough and you have to press harder until the LED comes on.

PEN UP AND PEN DOWN MODE:-

With the stylus on the pad, pressing pen down button will toggle the program between pen up and pen down mode. Cursor '+' indicates pen down mode and cursor '0' indicates pen up mode. One exception is for brush operation where pen down is indicated by '0' and pen up is indicated by '+'.

Command Menu:-

The menu is shown on the left hand side of the screen with the current command selection in reverse video. Move the stylus up and down the left margin of the pad to select other commands. The command you are about to select is also in reverse video. Pressing the pen down button will then select a command.

Colour Menu:-

The menu is shown on the right hand side of the screen with the box on the bottom showing the current colour. Moving the stylus up and down the right hand margin will select other colours. The colour you are about to select is shown on the upper part of the bottom box. Pressing the pen down button will select the new colour and the whole bottom box will change to that colour.

Details of Operations:-

1. DRAW: this mode will draw on the screen a freehand pattern drawn on the pad. Note that it will only draw in pen down mode

and as soon as the stylus is removed from the pad (pen down LED goes OFF), it will return automatically to pen up mode.

2. POINT: every time the pen down mode is pressed a point will be drawn on the screen at the location selected by the stylus.

3. LINE: this mode will draw a straight line. Select a point you want for the start of the line then press the pen down button, then move the stylus to the point you want the line to finish and again press the pen down button. Note that an 'elastic' line will be present between the start point and the location of your stylus, until you press the pen down button the second time to draw the line. This is to enable you to position the correct line.

4. LINES: similar to line except that the end of the line is the start point of the next and the program does not return to pen up mode.

5. RAYS: this function will draw radial lines from a preselected centre. First select the centre you want, then press the pen down button. The radial lines (rays) will be continuously drawn from the centre to the location where the stylus is moved around from the centre. The density of the rays is a function of speed of the stylus movement and also the distance between the stylus and the centre. It returns to the pen up mode as soon as the pen up condition is detected (pen down LED goes OFF) and you may then draw another ray.

6. FRAME: this function will draw a rectangular frame. The first operation of the pen down button will set a corner of the rectangle and the second pen down pressing will set the opposite corner. This also has an 'elastic' rectangle feature (similar to the elastic line) for accurate positioning.

7. BOX: similar to frame except that a solid rectangle is drawn.

8. CIRCLE: this function will draw a circle. First select the desired centre and press pen down button. Then move the stylus to the desired radius. (An 'elastic' line will be drawn from the centre to the stylus to show the radius). The second press of the pen

button will cause a full circle to be drawn.

9. DISC: similar to circle except a solid circle is drawn.

10. BRUSH: with background colour selected, BRUSH can be used to erase part of the drawing on the screen. With non-background colour selected, it enables you to draw in thick line or to fill in spaces. Please note that in this mode, the cursor identification are reversed. '0' means pen down. '+' means pen up.

11. SAVE: save the picture on the screen to tape/disk. Key in the file name from the keyboard. If you enter this command by mistake, press (return) to cancel.

12. LOAD: load a picture to the screen from tape/disk. Key in the file name from the Keyboard. If you enter this command by mistake press (return) to cancel.

13. NEW: clears the whole screen to the current selected colour. Entering 'NEW' twice will clear the screen to the background colour.

Chapter 2

Application Notes

(A) Operating Modes

1. Stream Mode

The pad sends coordinates at a maximum speed about 80 coordinates per second (at 9600 baud) as long as the pen touches the pad. If the pen is raised at the time this instruction is sent, only one coordinate will be output with the status indicating pen-up and the coordinates equal to zero. The pad will remain idle until the pen touches the pad again.

2. Point Mode

The pad sends a pair of coordinates when it receives a set-point mode command from the computer. If the pen is up, only the status will be valid and the coordinates will be zero, as in the stream-mode command above. The pad remains inactive, until it receives another command from the computer.

3. Idle

The pad will not send any data until either stream mode or point mode is set or when asked to transmit status. The idle mode is automatically set at power up.

4. Absolute/Relative

The format of the coordinate can be set to either absolute coordinates or relative-to-last coordinates by the computer. Absolute coordinate is the default format set at power-on.

5. Status

The pad will send out its status when it receives a "transmit status" command from the computer. It will continue to send out coordinates if in stream mode.

6. Turn on/off LED

Upon receiving the correct command from the computer, the pad will turn on or turn off a LED as specified.

7. Read button actuation or release count information.

The current button status, a count of button presses or releases of a button since the last call, and the coordinates of the point last touched will be transmitted, when the appropriate command is received.

(B) Command Format

The following commands are sent by the computer to the pad via the RS232 connection:

1. ESC 0 Set the operating mode of the pad to IDLE.
No coordinates will be transmitted by the pad.
 2. ESC 1 Set the operating mode of the pad to stream mode.
A continuous stream of coordinates will then be sent out by the pad.
 3. ESC 3 Set the operating mode of the pad to POINT-MODE and also transmit a pair of coordinates. Another pair of coordinates will only be sent when another ESC 3 is received or if STREAM-MODE is set.
 4. ESC 4 Ask the pad to send out its STATUS.
 5. ESC 5 Set the coordinate format to ABSOLUTE.
 6. ESC 6 Set the coordinate format to RELATIVE.
 7. ESC A Turn on LED L1. = LED1 ON.*
 8. ESC C Turn off LED L1 = LED1 OFF.*
- * This is the LED currently used for Power On Condition.
9. ESC G The pad transmits the Press-count of button 1.
 10. ESC H The pad transmits the release-count of button 1.
 11. ESC I The pad transmits the press-count of button 2.
 12. ESC J The pad transmits the release-count of button 2.

(C) Output Format

1. COORDINATE OUTPUT C,S,XXX,YYY<CR>

STATUS OUTPUT C.S<CR>

3. BUTTON INFORMATION OUTPUT B,N,M,XXX,YYY,<CR>

Where

C = Header character for coordinates and status output.

B = Header character for button information output.

XXX = X coordinate (from 000 to 999).

YYY = Y coordinate (from 000 to 999).

<CR>= Carriage return (terminator character).

S= Status Number = S1 '+' S2 '+' S3 '+' S4 '+' S5

Where

S1 = 0 when pen-up, 1 when pen down.

S2 = 0 when ABSOLUTE mode, 2 when RELATIVE mode.

S3 = 0 when STREAM or POINT mode, 4 when idle mode.

S4 = 0 if push-button B1 has not been pressed since last coordinate output or status output, 8 if push-button B1 has been pressed.

S5 = 0 if push-button B2 has not been pressed since last coordinate output or status output, 16 if push-button B2 has been pressed (NOTE: a button is considered as being pressed if a change from up position to down position is detected).

Where

N= Button status = N1 + N2

N1 = 0 if button 1 is up, 1 if button 1 is down.

N2 = 0 if button 2 is up, 2 if button 2 is down.

M = count of number of time the respective button has been pressed or released. The range of count is from 0 to 32767, and overflow is not checked. The count is reset to zero after the call. A button-

press in this case is the transition from up-to-down, and a button-release is the transition from down-to-up.

Note:

When in relative mode. the X<Y coordinates are assigned as follows: 000 to 499 correspond to -500 to -001 500 to 999 correspond to 000 to + 499.

If the relative movement is so great that it cannot be represented by one relative coordinate, two relative coordinate, will be sent out in succession such that their sum is the actual relative movement. If the user lifts up the pen and touches the pad again, the first relative coordinate output during pen down will be(500, 500). The coordinates in the button information output are the coordinates of the point last touched.

The coordinates in button information output is the coordinates of the point last touched.

(D) STATUS LED

The LED L3 is used to show the current status of the pad.

L3 On Condition
pen down

Off Condition
pen up

PIN OUT DETAILS

(For 8 Pin Din Connector on Touchpad)

Pin Number	Signal
1	CTS
2	+5V
3	RTS
4	+12V
5	-12V
6	TXD
7	RXD
8	GND

