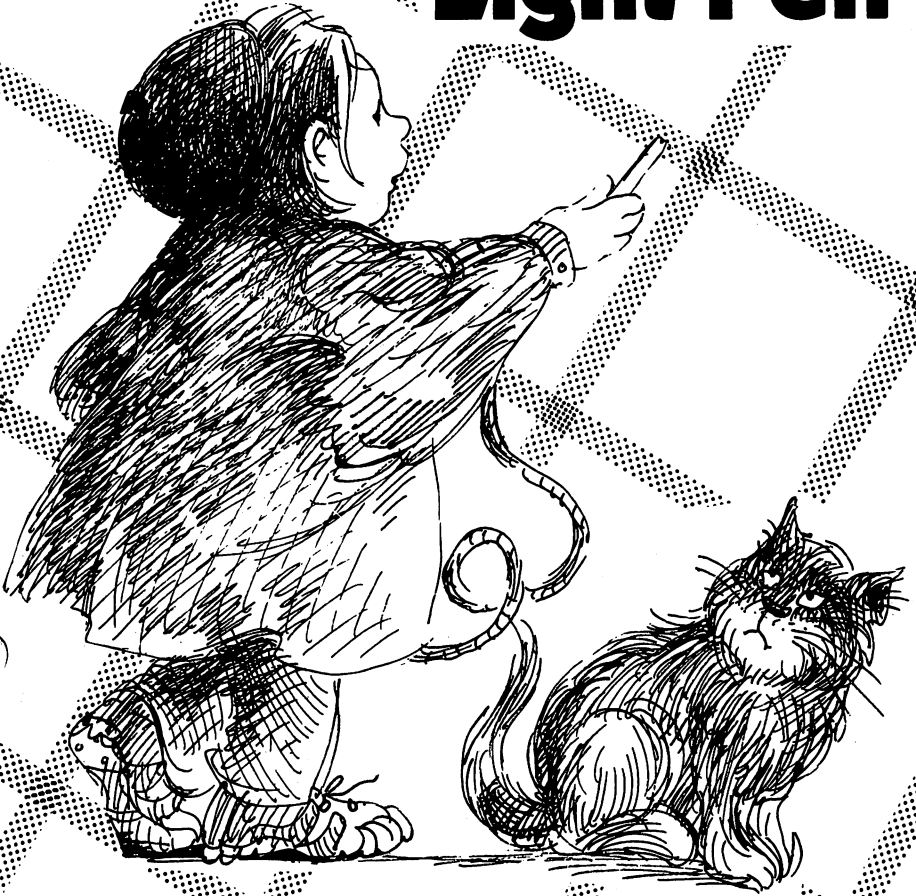# Edumate™
Light Pen

Commodore 64/VIC 20 compatible

futurehouse™

LIMITED WARRANTY

All Futurehouse programs are warranted to load and run. If defective, return original media for free replacement within 30 days of receipt of order.

Magnetic media may not be copyable on user's system using standard copying procedure. If media wear out, Futurehouse will provide a new copy if the original media is returned with a $5.00 replacement fee within one year from date of purchase.

TERMS AND CONDITIONS—
LIMITED WARRANTY

Futurehouse shall have no liability or responsibility to purchaser or any other person or entity with respect to any loss, liability or damage caused or alleged to be caused directly or indirectly by this product, including but not limited to any interruption of service, loss of business and anticipatory profits or consequential damages resulting from the use or operation of this product.

This product will be exchanged if defective in manufacture, labeling or packaging, but except for such replacement, the sale or subsequent use of this program material is without warranty or liability.

PLEASE NOTE:

It is important to adjust the brightness and contrast on your television/monitor for optimum light pen response. In some rare cases, a monitor will not be light pen compatible. However, the light pen will function properly with any standard television.

Commodore 64 users: It is necessary to load the main program menu into the computer **before** plugging in your light pen.

GENERAL INFORMATION

Congratulations! You have just purchased one of the most advanced graphics peripherals available on the home computer market! This high-resolution Edumate light pen will enable you to draw in many colors on your screen, make menu selections and enter program answers by simply touching the pen to the screen.

In addition to the FREE software that you have received with this pen, several other programs are currently available for the Edumate. We are offering an advanced draw routine which allows you to save and recall drawings to disk or cassette. You can also draw circles, rectangles and squares and fill them with color. Another feature allows you to vary the width of your "brush stroke."

Playground Software is a series of educational programs designed specially for preschool children. Each of these programs is guaranteed to delight your kids.

* Animal Crackers
* Alphabet Arcade
* Computer Crayons
* Bedtime Stories

The exciting world of computers will be no more than a touch away for your children with Playground Software and our Edumate light pen. Investing in Playground Software is an investment in your child's future. Call us at 800 334 SOFT for a complete catalog of our Edumate compatible products.

EDUMATE HINTS

Here are a few hints that will make working with your light pen easier.

1. Do not plug the light pen into your computer until after you have loaded the main program menu. Commodore 64 users should plug the light pen into control port 1.

2. To activate the light pen, hold down the space bar on the VIC 20 and the [F7] function key or the left [SHIFT] key on the Commodore 64.

3. Never try to load the machine language programs (ie "drwobj", VIC 20 and "drawobj", Commodore 64) from the disk utility menu. They will cause an error if loaded.

4. Be sure that the [SHIFT LOCK] key is not depressed while working with the Edumate.

5. VIC 20 users should not have memory expanders plugged into their computer.

EQUIPMENT REQUIREMENTS

The following equipment is needed to use the Edumate light pen and the accompanying software.

* A Commodore 64 or VIC 20 computer
* A disk drive or cassette recorder
* A television or monitor (color gives the best results)

LOADING FROM CASSETTE

1. Make sure you have your cassette recorder connected to your computer.

2. Turn on your TV or monitor.

3. Turn on your computer.

4. Place the program cassette in the cassette recorder and rewind the tape.

5. Press the [SHIFT] and [RUN/STOP] keys simultaneously on your computer.

6. Press [PLAY] on your cassette recorder to begin loading the program. UPON COMPLETION OF THIS STEP, COMMODORE 64 USERS MUST PRESS THE "COMMODORE" KEY AFTER "FOUND LIGHTMENU" IS DISPLAYED ON THE SCREEN.

7. The computer will now load and run the light pen menu.

8. The title screen should now appear on your screen.

9. Make your menu selection with either the light pen or the keyboard. To select from the menu with the light pen, point to the number with the light pen and hit the space bar (VIC 20) or the [F7] key (Commodore 64). Then follow the screen prompts.

Note: The disk utility program is provided on this cassette if you upgrade to a disk drive system. The disk utility, however, will not operate with a cassette recorder.

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LOADING FROM DISK

1. Make sure you have your disk drive connected to your computer.
2. Turn on your TV or monitor.
3. Turn on your computer and disk drive.
4. Place the program diskette in the disk drive.
5. Type LOAD "LIGHTMENU",8 and press [RETURN].
6. After the [READY] prompt appears, type RUN and press [RETURN].
7. The title screen should now appear on your screen.
8. Make your menu selection with either the light pen or the keyboard. To make menu selections with the light pen, point the light pen to the number and press the space bar (VIC 20) or the [F7] key (Commodore 64).

COMMODORE 64 PROGRAMS

Four free programs accompany your Edumate light pen. These programs will demonstrate the power of your new hi-res light pen. The Commodore 64 programs for the Edumate include:

1) Draw Routine

2) Disk Utility

3) 3D Tic Tac Toe

4) Pen Music

The programs are, for the most part, self-explanatory. The following are brief descriptions of each program.
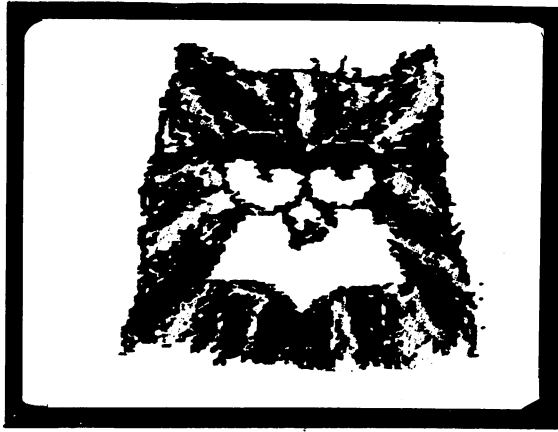
Draw Routine

This program enables you to use your computer as an electronic sketch pad. You can draw freely on your TV or monitor in a variety of colors.

Instructions:

1. TO ACTIVATE YOUR LIGHT PEN, HOLD DOWN THE [F7] FUNCTION KEY OR THE LEFT [SHIFT] KEY WHILE DRAWING OR MAKING SCREEN SELECTIONS. THESE KEYS ACT AS A SWITCH FOR THE LIGHT PEN!

2. To change your pen's "brush color", hit any of the color keys. You do not have to hold down the [CONTROL] key.

3. To erase a line, press the [F5] or the [A] key while holding the light pen to the screen.

4. To clear the screen, press the [CLR/HOME] key.

5. To end the program, press the [E] key.
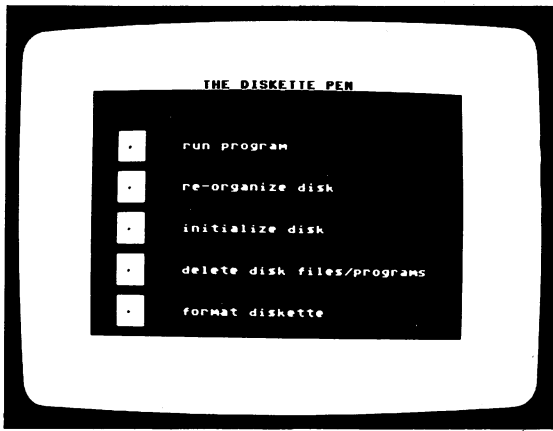
4

THE DISKETTE PEN

- run program
- re-organize disk
- initialize disk
- delete disk files/programs
- format diskette

Disk Utility

The disk utility program allows you to perform several disk-related activities.

You can "autorun" any program directly from the disk by selecting the "run program" option.

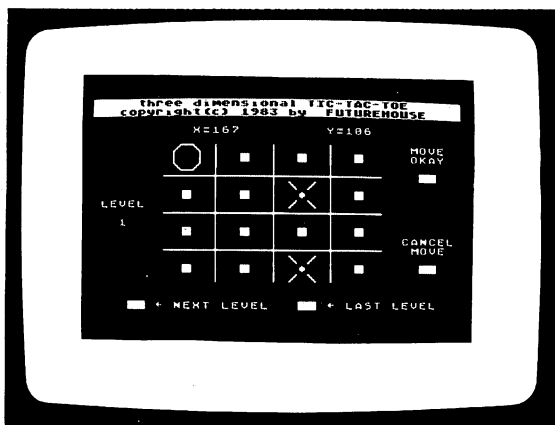The "re-organize disk" option allows you to validate your disk.*

Disk initialization is a simple process when you select the "initialize disk" option.*

"Delete disk files/programs" allows you to delete any file or program from a disk.

You can format a disk by choosing the "format diskette" option.

Select "end this program" from the menu or run "lightmenu" to exit the program.

*Refer to your 1541 disk drive User's Manual for further information on disk commands.

3D Tic Tac Toe

Challenge yourself by playing three dimensional Tic Tac Toe against your Commodore 64. The board is four levels deep. To play, touch the light pen to a spot on the board and hit the [F7] key or the left [SHIFT] key until the spot begins flashing. Then touch the "move okay" box to confirm your move. It is now the computer's turn. The computer occasionally requires some time to evaluate its move, so you will have to be patient.

To beat the computer you must get four consecutive crosses in one of the many possible configurations. You can win with four in a row diagonally across the four levels, straight through the levels, or straight across a single level. Many other possibilities exist!

When the game is over hit [F3] to run the program again and [F5] to exit the program.

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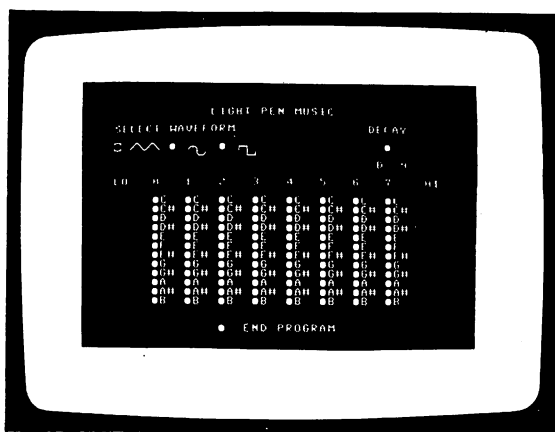
Pen Music

Compose tunes on your Commodore 64 by simply touching the notes with the Edumate while holding down the [F7] key.

The eight columns represent the eight octaves you are able to play. You can also change the duration of the notes by changing the decay option.

The select waveform option allows you to choose from three different waveforms. For example, the curved waveform will produce an arcade-style sound, while the square waveform produces a harpsichord-sounding tone.

Select "end this program" to exit the program.

REMEMBER: You must hold down the [F7] key or the left [SHIFT] key to activate the light pen.

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VIC 20 PROGRAMS

Four free programs accompany your Edumate light pen. These programs will demonstrate the power of your new hi-res light pen. The VIC 20 programs for the Edumate include:

1) Draw Routine
2) Disk Utility
3) Tic Tac Toe
4) Pen Music

The programs are, for the most part, self-explanatory. The following are brief descriptions of each program.

Draw Routine

This program enables you to use your computer as an electronic sketch pad. You can draw freely on your TV or monitor in a variety of colors.

Instructions:

1. TO ACTIVATE YOUR LIGHT PEN, HOLD DOWN THE SPACE BAR WHILE DRAWING OR MAKING SCREEN SELECTIONS. THE SPACE BAR ACTS AS A SWITCH FOR THE LIGHT PEN!

2. To change the color of your creation, hit any of the color keys. You *do not* have to hold down the [CONTROL] key.

3. To clear the screen, press the [CLR/HOME] key.

4. To end the program, press the [E] key.

Disk Utility

The disk utility program allows you to perform several disk-related activities.

You can "autorun" any program directly from the disk by selecting the "run program" option.

The "re-organize disk" option allows you to validate your disk.*

Disk initialization is a simple process when you select the "initialize disk" option.*

"Delete disk files/programs" allows you to delete any file or program from a disk.

You can format a disk by choosing the "format diskette" option.

Select "end this program" from the menu or run "lightmenu" to exit the program.

*Refer to your 1541 disk drive User's Manual for further information on disk commands.

Tic Tac Toe

Challenge yourself by playing Tic Tac Toe against your VIC 20.

You must get 3 crosses in a row in order to beat the computer. Don't give up; it's not as hard as you might think.

Select "no" to the prompt "another game?" to exit the program.

Pen Music

Compose tunes on your VIC 20 by simply touching the notes with the Edumate.

To change the tone of your music, touch the "select" option with the light pen and press the space bar.

Hit the [F1] function key to exit the program.

REMEMBER: You must hold down the space bar to activate the light pen with all of the programs.

TECHNICAL INFORMATION

A conventional television image is produced by a light beam (actually an electron beam which produces light when it hits the phosphorus screen) which scans the screen at a rapid rate. These horizontal scan lines, 525 in all, make up a frame which is refreshed 60 times every second. Due to the limitations of human vision, we see the rapidly moving beam as a continuous image.

Image = 525 lines/frame × 60 frames/sec

A light pen, on the other hand, is capable of detecting the high speed beam. When the beam passes the screen location where the light pen is pointed, the light pen produces a sharp electrical pulse which is transmitted to the computer. This pulse signals the computer to store two values representing the horizontal and vertical position of the light pen.

The reason the computer's resolution is not as sharp as a traditional television screen is because different computers have varied resolution on the vertical axis. Pixels on some computers might be 2 scan lines tall while others might be 3 tall. For example, the vertical resolution on the VIC 20 is 184 lines, while the Commodore 64 is 200 lines.

PROGRAMMING

The light pen's position can be retrieved by PEEKing the horizontal and vertical light pen registers. One way to demonstrate the light pen is to type and run the following program:

COMMODORE 64

```
1  POKE 53281,1:REM SELECT WHITE BACKGROUND
2  PRINT PEEK(53267),PEEK(53268):REM PRINT X,Y
3  GOTO 2:REM TAKE ANOTHER READING
```

VIC-20

```
1  POKE 36879,24:REM SELECT WHITE SCREEN
2  PRINT PEEK(36870),PEEK(36871):REM PRINT X, Y
3  GOTO 2:REM TAKE ANOTHER READING
```

If you wish to activate the light pen under user control, you can use the keyboard as a switch. When your program requires a pen reading, you can prompt the user with the message:

"press any key to activate pen"

Within your program, wait for the user to press a key before taking a reading by using the following subroutine:

```
1000 PRINT "PRESS ANY KEY TO ACTIVATE PEN"
1005 WAIT 198,1:GET A$
1010  X=PEEK(53267):Y=PEEK(53268):REM  36870,36871  FOR
     VIC
1015 RETURN
```

Light Pen Registers

	Commodore 64	VIC 20
horizontal	53267	36870
vertical	53268	36871