DELTA
DRAWING®

DELTA DRAWING®
Introduction To Graphics Programming

USER'S GUIDE
for
Apple II+, IIe and IIc
IBM PC and PCjr
Computers

TABLE OF CONTENTS

INTRODUCTION

Welcome to the world of DELTA DRAWING®. Drawing with a computer is exciting, and DELTA DRAWING makes it easy, even if you have never used a computer before. While you are having fun drawing, you'll also learn some things about computer graphics and computer programming. DELTA DRAWING invites you to use your creativity. You can try any drawing idea. If you don't like the result, you can erase it and try again. Conducting your own drawing experiments is the best way to become familiar with DELTA DRAWING. And you can press any key without harming DELTA DRAWING or your computer.

USING THIS GUIDE

This guide will give you the basic framework for using DELTA DRAWING. All the tools included in DELTA DRAWING will be identified and explained. Sample exercises are also included to give you a clear understanding of those tools and to provide you with opportunities to practice with those tools. Once you have a grasp of them the only limit on the compositions you create is your imagination. You are now about to embark on your first computer graphics adventure!
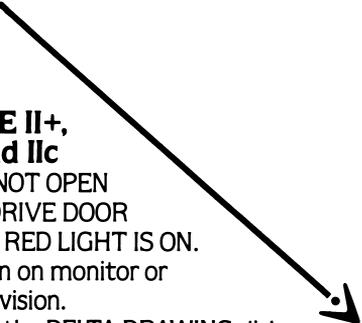
1. STARTING DELTA DRAWING

IBM PC and PCjr

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DO NOT OPEN DISK DRIVE DOOR WHEN THE RED LIGHT IS ON.

1. Put the DOS disk into the disk drive and close the door. (If you have two drives, use drive A, on the left.)
2. Turn on the computer and the monitor.
3. Follow the instructions.
4. When A⟩ appears on the screen, remove the DOS disk, insert the DELTA DRAWING disk and close the drive door.
5. TYPE: DD and press the return key. This will start DELTA DRAWING.

APPLE II+, IIe and IIc

DO NOT OPEN DISK DRIVE DOOR WHEN RED LIGHT IS ON.

1. Turn on monitor or television.
2. Put the DELTA DRAWING disk in the disk drive. Use drive 1 if you have two drives.
3. Close the disk drive door.
4. Turn on the computer.

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WHEN YOU SEE THE TITLE AND PUBLICATION DATA, DELTA DRAWING HAS BEEN STARTED. WHEN YOU SEE THE DELTA POINTER IN THE CENTER OF THE SCREEN, DELTA DRAWING IS READY TO GO.

APPLE IIe and IIc:
BE SURE THE CAPS LOCK KEY IS UP BEFORE YOU BEGIN DRAWING!

2. EXITING DELTA DRAWING

IBM and APPLE:
You can exit at any time by removing all disks and turning off the computer.

3. BASIC DRAWING

There are seven basic drawing commands. These commands tell the DELTA pointer what to do. The blinking dot designates the point from which the DELTA will begin to draw a line.

The seven basic commands are: DRAW, LEFT, RIGHT, ERASE, MOVE, TURN and ERASE THE ENTIRE DRAWING.

– To draw a line, press (D) for DRAW. A line will be drawn for as long as you press (D). (For APPLE II+ , use (REPT) with (D) to make it REPEAT.)

– To make the line go LEFT, press (L).

– To make the line go RIGHT, press (R).

– To ERASE a line, press (E) until the portion you want to erase is erased.

You can use these basic commands to draw a square. The following list contains the commands to do it. A number before a command key represents the number of times that key should be pressed. For instance, 8(D) means you should press (D) eight times. Try it.

PRESS: 8(D)
PRESS: 3(R)
PRESS: 8(D)
PRESS: 3(R)
PRESS: 8(D)
PRESS: 3(R)
PRESS: 8(D)

To erase the square, press (E) and watch as the square is erased. (APPLE II+, hold down (REPT) and (E) together.)

Here are a few more basic drawing commands.

– To MOVE the DELTA without drawing a line, press (M).

– To TURN 180 degrees, press (U) for U-TURN.

– To draw in slow motion, press (CTRL) and (V) at the same time. To resume normal speed, press them again. "V" stands for Velocity.

– To ERASE THE ENTIRE DRAWING, press (CTRL) and (E) at the same time. NOTE: (CTRL) is (CONTROL) on some computers.

– To ERASE ENTIRE TEXT SCREEN, press (CTRL) and (Q).

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4. FUNCTIONS

When you draw with the DELTA, you also create a drawing FUNCTION. FUNCTIONS are more easily understood when viewed on the TEXT SCREEN by pressing (T). A drawing FUNCTION is simply a list of the sequence of commands you use to create your drawing. (Functions are sometimes referred to as programs.) Linking FUNCTIONS together allows you to create very detailed and complex drawings quickly and easily. FUNCTIONS can be thought of as building blocks. So the sequence of commands you use to draw a square could be stored as a FUNCTION for later use in another drawing. The TEXT SCREEN is also called WORKSPACE.

– To SAVE a FUNCTION, press (S) at the end of the sequence of commands you used for the FUNCTION you want saved.

– When you press (S), the GRAPHICS SCREEN is cleared and the FUNCTION will appear on the TEXT SCREEN with a line drawn at the bottom.

– FUNCTIONS, for saving purposes, are labelled with an "F" which is then followed by a number. For example, the first FUNCTION you write in the process of creating a composition would be labelled F1. To use it you would press (F) then (1).

APPLE COMPUTER WORKSPACES can hold up to nine FUNCTIONS. (F1-F9).

– IBM COMPUTER WORKSPACES can hold up to eleven FUNCTIONS. (F1-F11).

– To ERASE a FUNCTION, press (CTRL) and (E) then press (DEL).
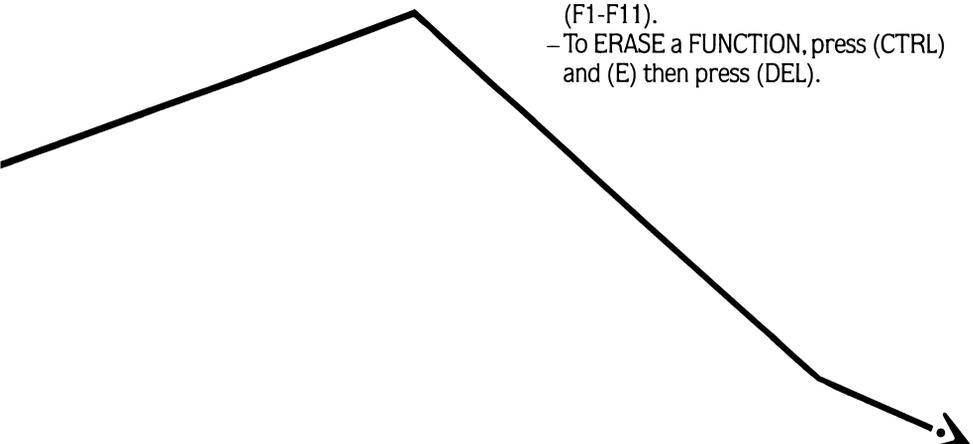
5. TEXT AND GRAPHICS SCREENS

All drawing occurs on the GRAPHICS SCREEN. The TEXT SCREEN shows the list of commands or FUNCTIONS you used to create a drawing. The TEXT SCREEN allows you to see the WORKSPACE.
– To see the GRAPHICS SCREEN, press (G).
– To see the TEXT SCREEN, press (T).

The commands that are entered are read left to right. Each FUNCTION label is shown above the commands that comprise that FUNCTION. A line under a FUNCTION indicates it is a CLOSED FUNCTION. A CLOSED FUNCTION is a FUNCTION that has been SAVED. It therefore can be used as a drawing command. FUNCTIONS without lines beneath them are OPEN because they haven't been SAVED yet and therefore can't be used as a command later.

Whenever you enter a command on the GRAPHICS SCREEN, it is automatically entered on the TEXT SCREEN and vice versa. The two screens provide two different ways of seeing and thinking about the same DELTA DRAWING commands. Not all commands are recorded on the TEXT SCREEN because they do not actually involve the process of drawing. These "unrecorded" commands include (T), (G), (E), (CTRL) – (V) and (H).

6. REPEATING COMMANDS

There are three ways to repeat a command.
1. Press the command key as many times as necessary.
2. Hold the command key down as necessary.*
3. Press a number key before the command key.**

 *APPLE II+: Press (REPT) with command key.
**IBM PC: Use the number keys above the keyboard, not those on the numeric pad.
– To stop repeating commands, press (ESC).
– To HIDE the DELTA, press (H). This also increases drawing speed. Press (H) again to make the DELTA reappear.
– To CLEAR and REDRAW the screen, press (SHIFT) and (G) at the same time.*
*APPLE II+: Use (.)(G).
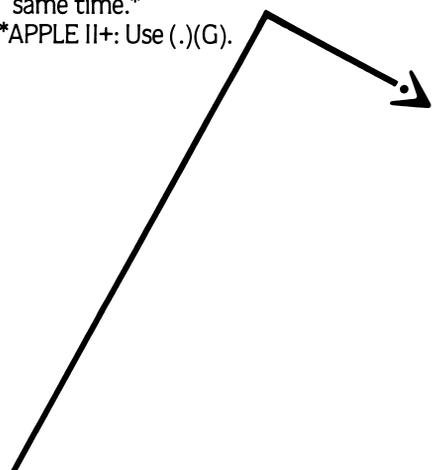
7. SMALLER STEPS AND TURNS

You can make the DELTA take smaller steps and turns to gain finer control in your drawing.

– Pressing the (SHIFT) key at the same time as one of the four drawing commands ((D), (M), (L) or (R)) produces HALF the normal line or move length and HALF the normal angle.

– Pressing (CTRL) produces one unit DRAWS (D) and MOVES (M) and one-degree turns. Press it at the same time as you are pressing the command key.

These two options allow you to do very detailed drawings. You can use number keys with these commands. For instance, pressing (5) then (CTRL) and (R) will produce a 5 degree right turn.

8. MORE WAYS TO EDIT

It is easy to experiment with your drawings. Try something. If you don't like the result, change it. You already know how to erase a command, (E), and erase a FUNCTION, (CTRL) and (E).

– To ERASE a SINGLE COMMAND, use cursor keys to locate it, then press (E). APPLE II+ use: (SHIFT) and (⟩).

– To ERASE an ENTIRE DRAWING, press (CTRL) and (Q).

– To ERASE ONLY ONE FUNCTION, you must erase all of the commands inside by pressing (CTRL) and (E), then press (DEL).

You can also edit the TEXT SCREEN

– To move the CURSOR LEFT, press (←).

– To move the CURSOR RIGHT, press (→).

– To move the CURSOR UP, press (↑).

– To move the CURSOR DOWN, press (↓).

FOR IBM COMPUTERS ONLY:

– To move UP ONE FUNCTION, press (PgUp).

– To move DOWN ONE FUNCTION, press (PgDn).

– To move to the start of the function it is in, press (Home).

– To move to the end of the function it is in, press (End).

*PCjr: Press (Fn) with these keys.

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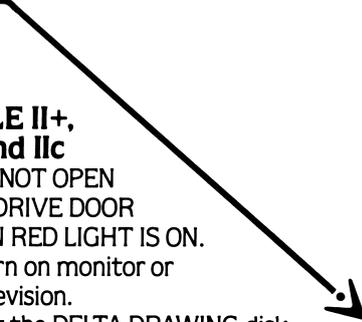
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3. Follow the instructions.
4. When A⟩ appears on the screen, remove the DOS disk, insert the DELTA DRAWING disk and close the drive door.
5. TYPE: DD and press the return key. This will start DELTA DRAWING.

APPLE II+, IIe and IIc

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You can exit at any time by removing all disks and turning off the computer.

- To PRINT A LIST OF FILES, you must first select the printer (see next section).
- Press ESC anytime to exit FILING SYSTEM.
- Maximum number of files: APPLE = 105; IBM single-sided disk = 64, double-sided = 112.

24. DISK ERROR

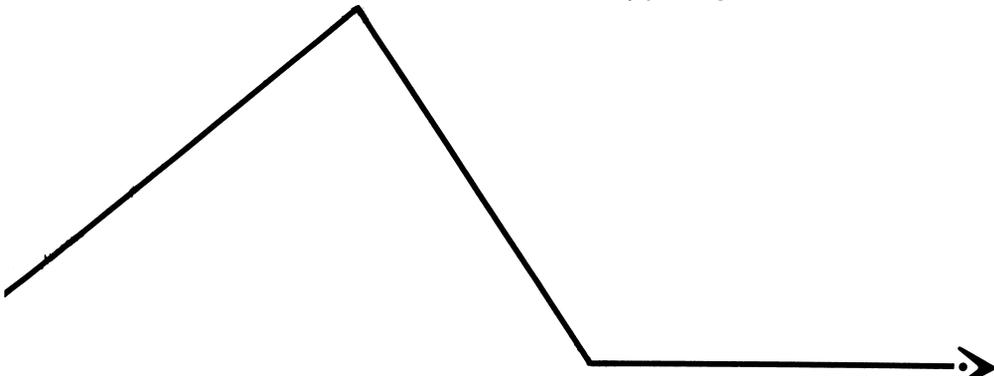You will see the DISK ERROR message if any of these conditions exist:
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3. The disk is write protected or there is a write-protect tab on the disk.
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BE SURE THE PRINTER IS ON AND THE PAPER IS POSITIONED.
- To PRINT text or graphics:
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  - Press (CTRL) and (P) simultaneously, then select the correct printer model. For IBM, the screen should tell you that the (P) key is now active.
  - Choose to print either text or graphic by pressing (T) or (G). For IBM, press (ESC) to go to graphic or text screen.
  - When you are ready to print, press (P) to print a small copy, or press (SHIFT) and (P) simultaneously to print a large copy. Press (ESC) to stop printing.

SPINNAKER SOFTWARE CORPORATION WARRANTY POLICY

If this product should fail to work for any reason whatsoever during the first 30 days following purchase, return it to the dealer from whom it was purchased for a free replacement. If it should fail to work after the first 30 days, mail it to Spinnaker Software at the address below. If it has been physically damaged, you will be charged five dollars for a replacement.

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Should you have any questions concerning this warranty, please contact the dealer from whom you purchased this program, or write or call Spinnaker:

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(Month)   (Year)

Product Type   □ disk   □ cartridge   □ cassette

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(Last)   (First)

Address _____ City _____

State _____ Zip _____ Phone (___)_____
(Area Code)

Intended Use: □ School   □ Home   □ _____
(Other)

Computer Used _____
(Brand/Model)

Date Computer Purchased _____
(Month)   (Year)

Magazines you read frequently _____

_____

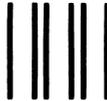Age(s) of the user(s) of this program: _____

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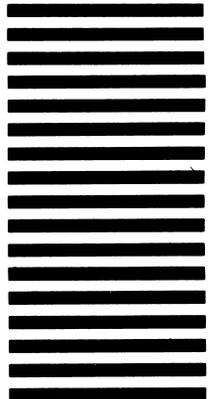
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20. VORTEX

To create the design for VORTEX, enter the following commands on your TEXT SCREEN:
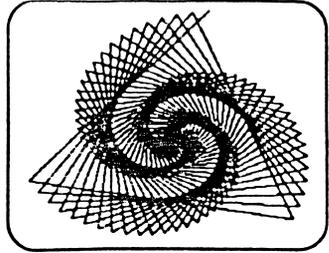
(F1)

#▲D..   4 R..   +..   2 ▲R.. 2 C

(F2) This is for good color on APPLE computers.

3 F 1.. 4 C..

(F3)
U..   M..   U..   R..   O..
61 F2..

To draw the picture press (H) for high-speed drawing.

To get good color on IBM computers, eliminate F2 and enter F3 in its place. The last command should be changed to F1 with a larger number of repeats.

21. MAZE

After making this maze you can try running it with the DELTA. Enter:

To make curve functions:
(F1)

#▲D..	#▲D..	13▲R..	+..

(F2)

▲B..	F1..	▲B..

To draw the maze:
(F3)

2 F1..	3 R..	30 D..	U..	30 M..
3 R..	? F1..	F2..	C..	

Press (H) for high-speed drawing.
(F4)

? C..	M..	32 /..	45 F1..	2 F2..
6 F3..	C..	24 *..	″S..	″T..
″A..	″R..	″T..	8 *..	3 R..
M..	3 R..			

(F5)

F4..
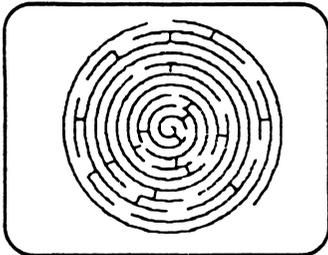
Press (H) to see the DELTA. Then DRAW a line from Start to the center of the maze. When you want to do the maze again, press (CTRL) and (E) together to erase this maze, then press (F) (4) to draw a new maze. Each maze will be different.

22. SAILBOAT

The gull function:
(F1)

%D..   R..

The sail functions:
(F2)

9 D..	4 R..	%R..	12 ▲R..%D..
10 D..	%D..	4 R..	3 ▲R.. 6 D..
3 R..			

(F3)

F2..   @F2.. 3 /..   3 I..   :F2..

The wave function:
(F4)

D..   2 R..   D..   2 L..

To draw the sailboat:
(F5)

U..	4 M..	3 R..	5 D..	%D..
4 L..	%L..	3 D..	2 L..	%L..
2 F4..	R..	2 ▲L..	8 D..	%D..
L..	2 ▲R..	2 F4..	R..	D..
U..	6 M..	4 R..	2 D..	▲D..
4 L..	8 D..	3 R..	D..	F3..

To draw the boat and gull and add color (choose colors for IBM):
(F6)

F5..	3 *..	6 O..	R..	10 M..
4 F1..	4 L.	3 F1..	D..	2 R..
11 M..	3 R..	2 M..	U..	3 C..
13 D..	3 R..	M..	▲F..	5 L..
4 M..	3 C..	▲F..	5 M..	▲F..
5 R..	7 M..	C..	▲F..	4L..
%M..	2▲M	%C..		

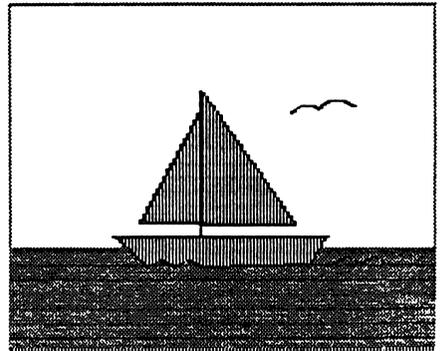A sailing function:
(F7)

SL..   SU..   SL..   SD..

Draw the picture and sail the boat!
(F7)

F6..   9 F7..

23. THE DISK FILING SYSTEM

You may put your DRAWING in a disk file so you can work on your drawings another day. Drawings may be put onto a FORMATTED BLANK DISK or on the DELTA DRAWING program disk. Consult your computer's Disk Operating System (DOS) manual on how to make a properly formatted file disk.

— To SAVE a drawing:
— Make sure the drawing to be saved is currently showing on the GRAPHICS SCREEN.
FOR IBM PC:
— Press (CTRL) and (S) to view the FILING SYSTEM menu.
— If you are using a FORMATTED BLANK DISK to store drawings, remove DELTA DRAWING program disk and place FORMATTED DISK in drive.
— Press (S) to view an alphabetical list of drawing files currently saved on that disk.
— Type a name for your new file, then press (RETURN).
— DO NOT type the same file name twice. If this happens the first file will be erased and the new file will take its place.
— To LOAD a drawing:
— Press (CTRL) and (S) to view the FILING SYSTEM menu.
— Press (L) to view files to be loaded.
— Select the file you would like by pressing the Space Bar, then press (RETURN).

— To DELETE a file:
— Press (CTRL) and (S) to view FILING SYSTEM menu.
— Press (D) to view files to be deleted.
— Select the file you would like to erase by pressing the Space Bar, then press (RETURN). Press (Y) to delete the file. To cancel, press any key other than (Y).
For APPLE:
— To SAVE a drawing:
— Press (CTRL) and (S) for FILE MENU. Make menu selections with Space Bar.
— Select "PUT WORKSPACE ON DISK," and press (RETURN).
— Type a name for your new file and press (RETURN).
— To LOAD a drawing:
— Press (CTRL) and (S).
— Select "GET WORKSPACE FROM FILE," then press (RETURN).
— Select your drawing, then press (RETURN).
— To DELETE a file:
— Press (CTRL) and (S).
— Select "DELETE A WORKSPACE FILE," then press (RETURN).
— Select the file to be deleted, then press (RETURN). Press (Y) to delete the file or any other key to cancel that choice.

- To PRINT A LIST OF FILES, you must first select the printer (see next section).
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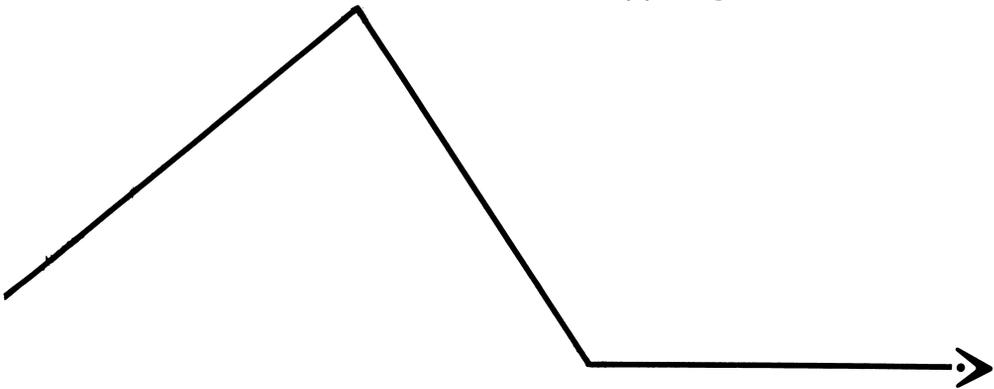You will see the DISK ERROR message if any of these conditions exist:
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(Month)   (Year)

Product Type   □ disk   □ cartridge   □ cassette

Name _____
(Last)   (First)
Address _____ City _____

State _____ Zip _____ Phone (_____) _____
(Area Code)
Intended Use: □ School   □ Home   □ _____
(Other)
Computer Used _____
(Brand/Model)
Date Computer Purchased _____
(Month)   (Year)
Magazines you read frequently _____
_____

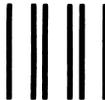Age(s) of the user(s) of this program: _____

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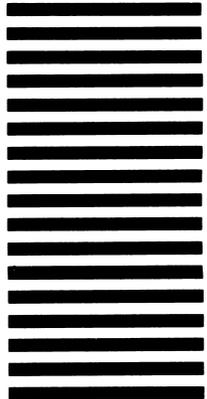
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DELTA DRAWING
COMMAND SUMMARY

DRAWING

DRAW	MOVE	LEFT TURN	RIGHT TURN	U TURN
D	M	L	R	U

HALF DRAW	HALF MOVE	HALF LEFT TURN	HALF RIGHT TURN	RANDOM
CTRL D	CTRL M	CTRL L	CTRL R	SHIFT ?

EDITING

SAVE	ERASE	ERASE PICTURE
S	E	CTRL E

PROGRAM

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

DISPLAY

GRAPHICS	TEXT	HIDE	CENTER
G	T	H	X

COLOR

SELECT COLOR	FILL SHAPE
C	CTRL F

REPEAT

REPEAT
REPT

SYSTEM

ESCAPE	DISK SYSTEM	RESET
ESC	CTRL S	RESET

PRINTING

PRINT	LARGE PICTURE PRINT
P	CTRL P

Computer-Access Corporation, creators of DELTA DRAWING® Computer Graphics, specializes in developing software which makes the power of the computer accessible to people of all ages.

DELTA DRAWING, Originated by Jock Gill, was authored by the principals of **Computer-Access Corporation**.

Programmer: Michael D. Aronson, Ph.D.
Program Management: Jock Gill
Programmer: Dennis W. Purcell

COMPUTER-ACCESS CORPORATION owes a debt of gratitude to the many people whose help and time have made DELTA DRAWING® Computer Graphics possible. They know who they are.
Thank you.
We must, however, give particular recognition to:

Louisa Birch
Richard Carter
Brian Fox
Michael Ward
Philip A. Wasson

Their help was invaluable.

Computer-Access welcomes comments from users.

Please write us in care of:
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