

FRANKLIN

ACE DISPLAY™

User Reference Manual



FRANKLIN
COMPUTER CORPORATION

Prepared by the Documentation Department,
Franklin Computer Corporation

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Getting The Big Picture With The Franklin ACE Display

The Franklin ACE Display Card for your Franklin ACE computer gives your black-and-white monitor an 80 column wide display. Because the card has its own built-in memory, you can switch back and forth between 40 column and 80 column displays without losing any information already on the screen.

The 80 character line length makes the ACE Display an invaluable word processing aid, because it lets you see lines as long as those on the average typewritten page. Many popular word processing programs depend on this feature and won't work without it.

The ACE Display will also let you draw lines on the display screen to create charts and tables. You can highlight any letter or symbol by displaying it as a dark character against a light background. You can even combine these capabilities to create eye-catching graphics.

When the ACE Display is installed in your computer along with the Franklin ACE 80 CPU Card or some other suitable **CP/M** card, the **CP/M** card automatically activates and controls the ACE Display. However, the ACE Display also has a set of built-in instructions that work well with **DOS**, the operating system standard on all models of the ACE. Many ACE Display instructions are identical to **DOS** commands, and the others are easy to learn.

If you're interested in programming, you'll find it useful to know that **BASIC**, **Pascal**, and all other languages that work on the ACE can use the ACE Display without modification.

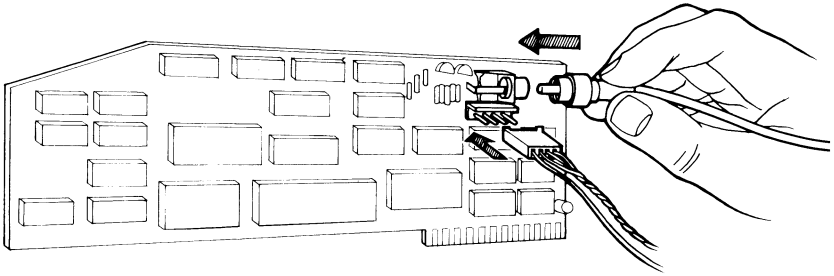
What It Looks Like And Where You Put It

The ACE Display is easy to install, but, as with all peripheral cards, it's important to read the directions carefully and completely before you start. A mistake in installation could damage the ACE Display, your computer, or both.

First, make absolutely sure the power to your computer is off. Unplugging the power cord from the computer is the most prudent way to do this.

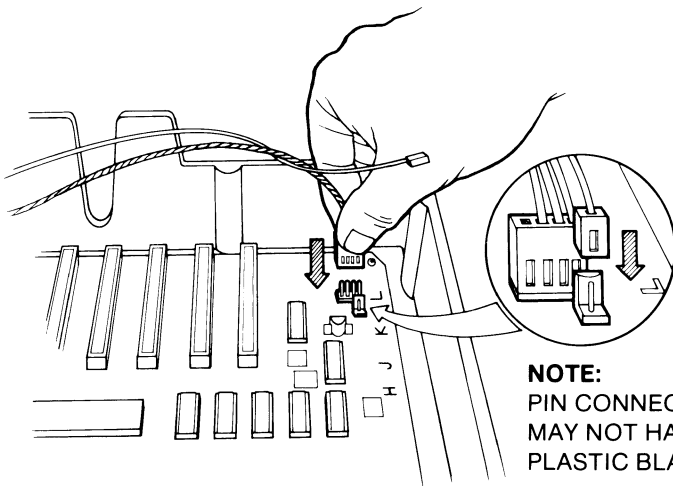
Pop the top off your computer and disconnect the video cable. Pick up the ACE Display. In one corner, you'll see a standard

female video connector, just like the one in the rear of your machine. Gently plug the video cable in here.



Included in your kit is a 12-inch-long cable with three plastic plugs attached to it. One of the plugs is connected to a set of three twisted wires and a lone yellow wire. It may already be plugged into the ACE Display. If it isn't, it's easy to attach.

Right next to the video connector on the ACE Display, there's a set of four tiny metal prongs and a square plastic blade. Take a look at the plug with the four wires. Align the plug so that the brown wire is to the right (the direction from which you inserted the video cable). Gently insert the plug. Be careful not to bend the prongs.



Now, look inside the computer. You'll see another set of four prongs at the right rear corner of the main circuit board, an inch away from the video connector. Pick up the plug with the three twisted wires. Align the plug so that the brown wire is to the right as shown in the illustration. You can seriously damage your machine if you install either plug backwards.

Most ACE 1000 and 1200 computers have a single prong labeled "TEXT/GR" on the circuit board, in front of the set of four prongs referred to earlier. Attach the plug with the single yellow wire to it. (If your computer is an ACE 100 or an APPLE II, the prong has a different function. Don't connect the yellow wire to it.)

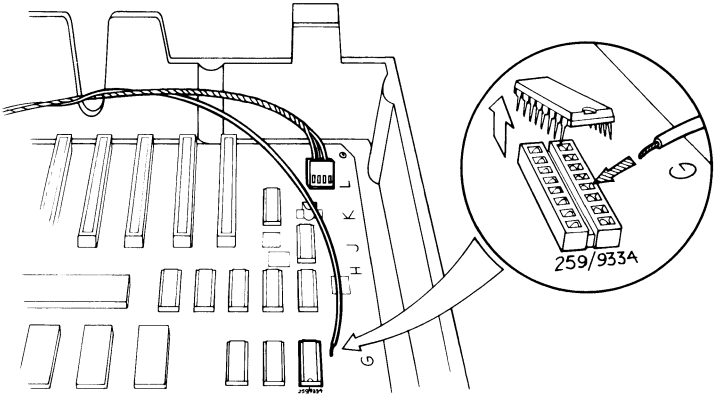
If your computer doesn't have the "TEXT/GR" prong, you'll have to connect the yellow wire directly to an integrated circuit. If you feel at all uncomfortable doing this, take the computer and the card to your Franklin dealer.

To connect the wire, make sure the power is off, and look for the integrated circuit labeled 9334 or 259/9334. In the ACE, it's the closest chip to the printed letter G along the right edge of the main circuit board. Look for the notch on one end of the integrated circuit. It should be pointed toward the keyboard.

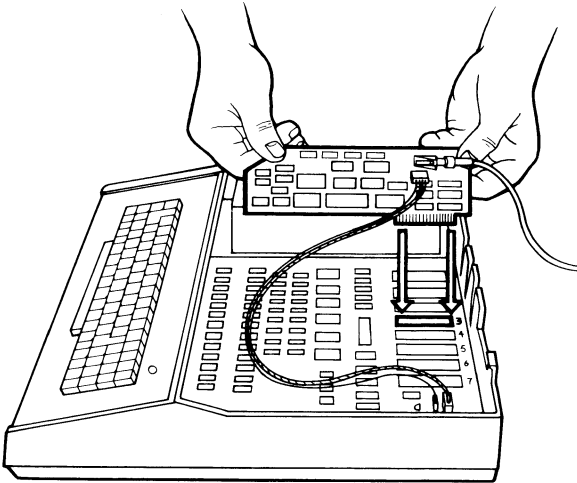
Insert the tip of a small, flat-bladed screwdriver between the integrated circuit and the socket at the notched end. Be careful not to loosen the socket itself from the circuit board. Gently pry the integrated circuit out of its socket, taking care not to bend the pins. Remove the integrated circuit.

Cut the plug off the yellow wire and strip the plastic covering off so that 1/8 inch of bare wire shows. Twist the strands of the wire together. Take another look at the socket for the integrated circuit that you just removed. You'll see two rows of eight holes, running front to back. Insert the bare wire into the fourth hole from the front on the right side.

Orient the notched end of the integrated circuit toward the keyboard end of the machine, place the ends of the pins in the socket, and push the integrated circuit straight down into the socket. Make sure the bare end of the wire doesn't touch any pin other than the fourth pin on the right. Again, be careful not to bend the pins.



Now that you've connected all the wires, you're ready to install the card itself. Check to see that the power is off and then place the tab with the gold-plated electrical contacts into slot 3.




Push it in gently, rocking it back and forth just a little to ensure that it seats properly. Don't stretch the 12-inch wire. Reconnect the power cord and make sure the monitor is connected to the video cable.

Although the ACE Display works in any slot from 1 to 7, most programs expect to find it in slot 3. (If the card doesn't work properly with a particular program, check the instructions that came with that program.)

Testing The ACE Display

When you flip the power switch, your computer does the same things it does without an 80 column card:

1. The red light at the top right corner of the keyboard comes on.
2. The display screen clears.
3. On the screen you see something like:

4. You hear a beep.
5. The red light on the front of disk drive 1 lights up and the disk drive makes a noise.

Hit the RESET switch to silence the disk drive. In the bottom left corner of the screen, you'll see a character | followed by a rectangle blinking on and off. The blinking rectangle, called a "cursor," marks the place where the next character will appear.

If something different happens, and you hear discomfiting noises, immediately turn the power off.

The problem is probably minor. Maybe the ACE Display isn't properly installed. Maybe the disk drive controller card was jarred loose. Go through the installation procedure again, make sure the connections aren't loose, and turn on the power. If you hear the noise again, shut off the power immediately and take the card and the computer back to the dealer who sold you the card.

If everything is all right and your ACE Display is in slot 3, type:

pr#3

and hit **RETURN**. (If you've installed the card in another slot, type pr# and the number of the slot. Then hit **RETURN**.)

The screen should flicker momentarily and then clear. You'll see a somewhat narrower and a blinking cursor in the bottom left corner of the screen. Hold down the **CTRL** key (it's in the bottom left corner of your keyboard) and type **L**. The vanishes and the cursor reappears in the upper left corner of the screen.

Now What?

The computer is now ready to show you what an 80 column display looks like.

Ordinarily, you'd give the computer a program before doing anything else. But, since each program has a unique way of telling the computer to display data, the testing procedure can become horrendously complicated. If any errors exist, you often can't tell if the computer or the program is causing them.

To simplify things, just type in a sentence or two. If you can't think of one, type this:

In 1732 I first publish'd my Almanack, under the name of Richard Saunders; it was continu'd by me about twenty-five years, commonly call'd Poor Richard's Almanack.

When the cursor reaches the 80th column, it automatically returns to the beginning of the next line. If you reach the 80th column when you're in the middle of a word, the ACE continues the word in the first column of the next line.

If you don't want to read broken words, you can back the cursor up to the beginning of the broken word by tapping the left arrow key (just above the **RETURN** key). Then type in spaces until the cursor returns to the beginning of the next line.

If you want to move the cursor ahead without erasing or correcting what you've typed, use the right arrow key (next to the left arrow key).

Occasionally, the computer may beep as you type. Don't be alarmed. Just keep typing. If it produces some unwanted characters on the screen, here's how to erase them.

Type **CTRL** **Y** to move the cursor back to the first column of the first line. Then, type **CTRL** **J** to move the cursor down, one line at a time, until you reach the line with the unwanted characters. Use the right arrow to position the cursor above the unwanted characters. Now, type **CTRL** **K**. Everything after the cursor is erased, and you can continue typing. Because of the way the system is designed, you can't use the left arrow to back

up past a . You won't have this problem when you use the ACE Display with a program.

You may be wondering whether you can use the numeric and cursor control pad (or editing pad) on the right of the keyboard. Unfortunately, you can't, just yet. The ACE Display can't make sense of the instructions from that editing keypad until you load and run a word processing program into the machine.

Most of the codes from the pad have no effect, but two of them have the same effect as the **BREAK** and **PAUSE** keys and could wreak havoc with your program if you hit them accidentally.

As soon as you feel you've mastered the left and right arrows, **CTRL Y**, **CTRL J** and **CTRL K**, you might want to try a few more functions.

Suppose you wanted to make a change in the line above the cursor. You can move the cursor up one line with two key-strokes. Press the **ESC** key at the upper left corner of the keyboard and then press **D**. The cursor moves up one line. Unlike the **CTRL** key, you don't have to hold the **ESC** key down as you type the letter. Now you can move the cursor right or left, as needed, and make corrections.

Suppose you wanted to move the cursor up five rows. You could type:

ESC D ESC D ESC D ESC D

or you could save yourself a bit of work by typing:

ESC | | | | | | ESC

This key, **ESC** **I**, is one of four “repeating escape” keys. When you type **ESC**, you can use the letters **I**, **J**, **K**, and **M** to move the cursor anywhere. **I**, **J**, **K**, and **M** form a diamond-shaped pattern on the keyboard. **I** moves the cursor up, **J** to the left, **K** to the right, and **M** down. To stop moving the cursor and start typing, hit the **ESC** key again.

Other **CTRL** and **ESC** keys are listed in the back of the manual.

Highlighting Your Text

The ACE Display has a feature called “inverse video” that allows you to highlight any group of characters on the screen. Inverse video displays letters, numbers, and other characters as dark objects against a light background.

You can demonstrate it by highlighting the title “Poor Richard’s Almanack.” Move your cursor up to the P in “Poor” and type **CTRL** **O**. (Use the letter O, not the zero.) Use the right arrow to move the cursor until it covers the period after “Almanack.”

See the difference?

You also can use **CTRL** **O** to type new letters in inverse video. Use **ESC** **M** to bring the cursor down below the last line of text and type Autobiography of Benjamin Franklin to see how this is done. To return to normal video, type **CTRL** **N**.

Another ACE Display feature lets you switch back and forth between 80 column and 40 column display without disconnecting the card or turning the power off. Type **CTRL** **Z**, release

the **CTRL** key, and type **1**. The screen flickers and you see what you saw before you switched over to the 80 column display.

If the cursor on the 40 column display isn't preceded by a **,**, hit **RETURN**. The ACE responds with:

MONITOR MODE

followed by the blinking cursor. If you see two or more blinking cursors, don't worry.

To return to 80 column display, simply type **pr#3** again and hit **RETURN**.

When Words (And Numbers) Just Aren't Enough

This instruction manual probably isn't the place to argue the truth of the old bromide, "A picture is worth a thousand words," particularly because the ACE Display can give you both. With its graphics capability, you can draw lines, boxes, graphs, and forms with the same keys you've been using to type text.

Before you actually see how the graphics mode works, you should know how to move the cursor around the screen and erase unwanted characters.

First, type **CTRL L** to clear the screen. Then, type **CTRL P** to enter graphics mode. Type the numerals 1 through 9 and

the following symbols:

: ; < = > ?

To return to regular display, type **CTRL Q**. Now, take a look at what the computer has produced. Relax. Your keyboard is not out of control.

What you see on the screen is a series of picture elements called special line characters. With them, your ACE Display can draw graphs and charts.

Believe it or not, there's even a logical relationship between the keys you type and the characters you produce in graphics mode. It's outlined in the tables on the following pages.

Think Of It As A Cryptogram, With The Key In Front Of You

Nearly all computers, the ACE included, use a modification of a standard pattern called the ASCII character set to turn characters into the kind of information computers can understand, and vice versa.

Although the special characters you just produced don't appear in the ASCII character set, the ACE Display allows you to use these characters and move the cursor around without continually typing **CTRL P** and **CTRL Q**.

Type **CTRL P** and try to get the ACE to print an exclamation point. If you simply type an exclamation point, the

ACE Display will print bar character 1, which is a solid block filling the top third of the space.

Look at Page 4-20. You'll see alternating columns labeled **DEC**, **HEX**, and **CHAR**. (**DEC** and **HEX** are sometimes useful in writing programs, but you really don't need to be concerned about them now.) Bar character 1 is on the second line, in the first column labeled **CHAR**. The exclamation point is on the same line, in the next **CHAR** column to the right.

Look in the next **CHAR** column to the right of the exclamation point. You'll see a capital A. Type in a capital A where you want the exclamation point to appear. There it is!

To print a capital A, just follow the same process. Look on the same line, one **CHAR** column to the right of the character you want to print. You'll see the lower case a. Type it.

When you're creating graphics with **CTRL** **P**, you display the character you want by looking it up in Table 1 and typing the character in the **CHAR** column to its right. However, to produce lower case letters (or any other characters in the last **CHAR** column), you must type **CTRL** **Q** first.

(A note to people interested in programming: If you need to know the **DEC** or **HEX** value for a particular character, you'll find them in the columns to its left.)

You can use both bar and line characters to produce business graphs or even combine graphics and inverse video to produce special effects.

Unfortunately, it's usually difficult to put ACE Display graphics on paper. For one thing, many word processing programs

simply make no provision for graphics characters, although, with luck, some data manipulation, and a little knowledge of programming, it's sometimes possible to insert them into a text.

Some printers have a more serious limitation: they can't print graphics characters at all. Ironically, this is always true of the more expensive printers of the daisy wheel or thimble variety. Some dot-matrix printers can reproduce ACE Display graphics characters if they're equipped with a feature called an alternate character set. You may have to program your computer or printer to produce these characters before you can print them.

On the bright side, if you know a little programming you can store graphics characters for screen displays by telling the computer to print `CTRL P`. You then enter the string of graphics characters you want to appear on the screen, and then `CTRL Q`.

Control Keys

This is a list of the things you can do when you press the `CTRL` key and type a letter at the same time. The parenthetical **DEC** and **HEX** listings are for people interested in programming.

- CTRL G** Rings the bell. (**DEC 07, HEX 07**)
- CTRL H** Moves the cursor to the left. Duplicates the function of the left arrow key. (**DEC 08, HEX 08**)
- CTRL J** Moves the cursor down in whatever column it happens to be in. (**DEC 10, HEX 0A**)
- CTRL K** Erases all characters from the cursor to the end of the screen. (**DEC 11, HEX 0B**)

- CTRL L** Erases the entire screen and positions the cursor in the first row, first column. (**DEC 12, HEX 0C**)
- CTRL M** Duplicates the **[RETURN]** key. (**DEC 13, HEX 0D**)
- CTRL N** Turns off inverse video. (**DEC 14, HEX 0E**)
- CTRL O** Turns on inverse video. (**DEC 15, HEX 0F**)
- CTRL P** Turns on the graphics display. (**DEC 16, HEX 10**)
- CTRL Q** Turns off the graphics display. (**DEC 17, HEX 11**)
- CTRL S** Duplicates the **[PAUSE]** key. (**DEC 19, HEX 13**)
- CTRL U** Moves the cursor to the right. Duplicates the right arrow key. (**DEC 21, HEX 15**)
- CTRL Y** Places the cursor in the first column of the top line (the "home" position) but does not erase characters. (**DEC 25, HEX 19**)
- CTRL]** Erases the display to the end of the line. If **[CTRL]** **[]** does not work, type **[CTRL]** **[SHIFT]** **[M]** all at the same time. (**DEC 29, HEX 1D**)
- CTRL Z** Makes overall changes to the display when you follow this character with a number from 0 to 7. Don't forget to release the **[CTRL]** key before typing the second character. (**DEC 26, HEX 1A**)

The Z functions are:

- CTRL Z 0** Screen reset. Turns graphics and inverse video off, returns to home position, and clears screen.
- CTRL Z 1** Returns to 40 column display.
- CTRL Z 2** Turns off inverse video.
- CTRL Z 3** Turns on inverse video.

- CTRL Z 4** Restores the normal appearance of the cursor (blinking rectangle).
- CTRL Z 5** Converts the cursor to an unblinking rectangle.
- CTRL Z 6** Converts the cursor to a blinking underline.
- CTRL Z 7** Converts the cursor to an unblinking underline.
- CTRL Z** Followed by **CTRL** and any letter, displays the graphics character on the same line of Table 1 as the letter. Be aware that the system sometimes interprets the second control character as a command, producing unexpected results. For more predictable results, use **CTRL P** or write the codes into a program, if you know how.

Escape Keys

To use these functions, tap the **ESC** key first. Don't hold the **ESC** key down when you type the second character. (The codes for the **ESC** key are **DEC 27**, **HEX 1B**.)

The first seven escape keys are nonrepeating:

- ESC @** Places the cursor on the home position and clears the screen.
- ESC A** Moves the cursor one space to the right.
- ESC B** Moves the cursor one space to the left.
- ESC C** Moves the cursor one line down.
- ESC D** Moves the cursor one line up.
- ESC E** Erases the display to the end of the line.
- ESC F** Erases the display to the end of the screen.

The next four keys move the cursor as long as they are held down. To stop the cursor movement and resume typing, press **ESC** or any key other than @ or A through F.

- ESC I** Moves the cursor up.
- ESC J** Moves the cursor to the left.
- ESC K** Moves the cursor to the right.
- ESC M** Moves the cursor down.

Other Codes

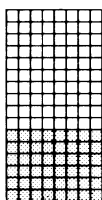
These codes also control the ACE Display, but the keyboard won't automatically produce them. They can be used only in programs.

- (**DEC 28, HEX 1C**) Moves the cursor one space to the right.
- (**DEC 30, HEX 1E**) Moves the cursor to a screen location specified by the two numbers entered immediately after it: a horizontal coordinate between decimal 32 (first column) and decimal 111 (last column), followed by a vertical coordinate between decimal 32 (top line) and decimal 55 (bottom line). You may be able to produce this code by typing **CTRL** **SHIFT** **N** all at the same time.
- (**DEC 31, HEX 1F**) Moves the cursor one line up.

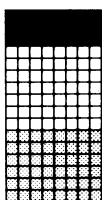
Detail Of Graphics Characters

To produce any character pictured on this page, enter graphics mode by typing `CTRL P`. Then type the character that appears to the lower left of the character you want to produce.

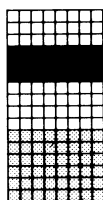
Note to Programmers: The shaded portion of each diagram appears in the memory of the 80-column card, but is not displayed on the screen.



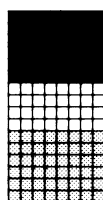
SPACE



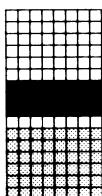
! BAR 1



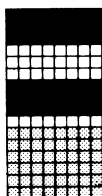
" BAR 2



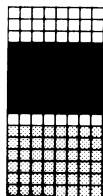
BAR 3



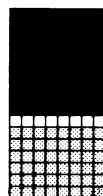
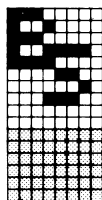
\$ BAR 4



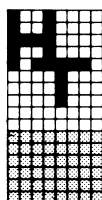
% BAR 5



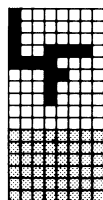
& BAR 6

' BAR 7
(single quote)

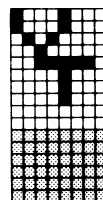
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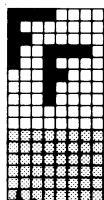
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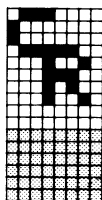
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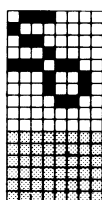
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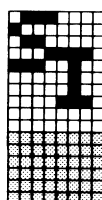
9 (comma)



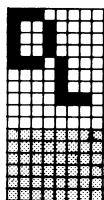
R (hyphen)



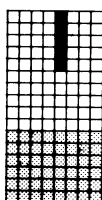
o (period)



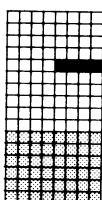
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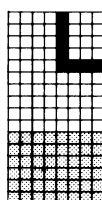
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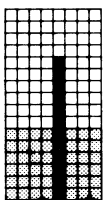
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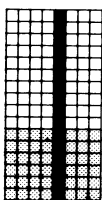
2 LINE 2



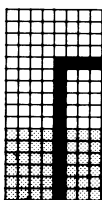
3 LINE 3



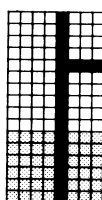
4 LINE 4



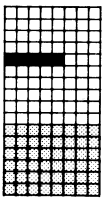
5 LINE 5



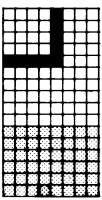
6 LINE 6



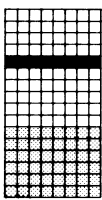
7 LINE 7



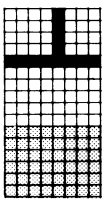
8 LINE 8



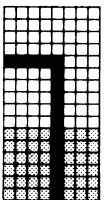
9 LINE 9



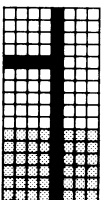
: LINE A



; LINE B



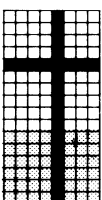
< LINE C



= LINE D



> LINE E



? LINE F

Characters Produced In Graphics Mode

This is a list of the characters produced by the ACE Display Card and their associated **DEC** and **HEX** codes. Instructions on using this chart and details of the graphics characters named in the leftmost **CHAR** column can be found elsewhere in this manual.

The **DEC** and **HEX** codes to the right of the desired character apply when you enter codes from the keyboard as described in this text. The same is true when you use **BASIC'S** **CHR\$** commands. However, when entering codes directly into memory, use the **DEC** or **HEX** codes to the left of each character.

DEC	HEX	CHAR NAME	DEC	HEX	CHAR	DEC	HEX	CHAR	DEC	HEX	CHAR
0	00	NULL	32	20	SPC	64	40	@	96	60	'
1	01	BAR 1	33	21	!	65	41	A	97	61	a
2	02	BAR 2	34	22	..	66	42	B	98	62	b
3	03	BAR 3	35	23	#	67	43	C	99	63	c
4	04	BAR 4	36	24	\$	68	44	D	100	64	d
5	05	BAR 5	37	25	%	69	45	E	101	65	e
6	06	BAR 6	38	26	&	70	46	F	102	66	f
7	07	BAR 7	39	27	'	71	47	G	103	67	g
8	08	BS	40	28	(	72	48	H	104	68	h
9	09	HT	41	29	)	73	49	I	105	69	i
10	0A	LF	42	2A	*	74	4A	J	106	6A	j
11	0B	VT	43	2B	+	75	4B	K	107	6B	k
12	0C	FF	44	2C	,	76	4C	L	108	6C	l
13	0D	CR	45	2D	-	77	4D	M	109	6D	m
14	0E	SO	46	2E	.	78	4E	N	110	6E	n
15	0F	SI	47	2F	/	79	4F	O	111	6F	o
16	10	DL	48	30	0	80	50	P	112	70	p
17	11	LINE 1	49	31	1	81	51	Q	113	71	q
18	12	LINE 2	50	32	2	82	52	R	114	72	r
19	13	LINE 3	51	33	3	83	53	S	115	73	s
20	14	LINE 4	52	34	4	84	54	T	116	74	t
21	15	LINE 5	53	35	5	85	55	U	117	75	u
22	16	LINE 6	54	36	6	86	56	V	118	76	v
23	17	LINE 7	55	37	7	87	57	W	119	77	w
24	18	LINE 8	56	38	8	88	58	X	120	78	x
25	19	LINE 9	57	39	9	89	59	Y	121	79	y
26	1A	LINE A	58	3A	:	90	5A	Z	122	7A	z
27	1B	LINE B	59	3B	;	91	5B	|	123	7B	{
28	1C	LINE C	60	3C	=	92	5C	\	124	7C	|
29	1D	LINE D	61	3D	<	93	5D]	125	7D	}
30	1E	LINE E	62	3E	>	94	5E	^	126	7E	-
31	1F	LINE F	63	3F	?	95	5F	_	127	7F	RUB OUT





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