

2.1 INTRODUCTION

Your display system has a memory that can hold both words (TEXT) and pictures or symbols (GRAPHICS). Working with Graphics will be discussed later in this manual in Section 5. In this Section you will learn about how the memory in the display is made up, and how the keyboard is used to enter TEXT into memory.

When you initially plug your display into the power outlet, you will see a message on the screen. This message has been programmed into memory of the display through the keyboard. Any subsequent change to memory which you enter through the keyboard will be programmed directly into memory and will not be lost when you disconnect the display from power. If your display does not keep its program in memory, the battery likely needs to be replaced. This can only be done by a qualified serviceman.

Your display system will require very little power to run and generally it can be left on continually. There is an automatic ON/OFF timer which turns the display off at 1:30 AM and back on at 7:30 AM. These times can be changed (refer Section 3).

If you want to turn off the display manually without disconnecting from power, press the TAB key on the keyboard while the system is running.

2.2 TEXT PORTION OF MEMORY

The TEXT portion of your display memory is made up of MESSAGE PAGES and corresponding COMMAND PAGES. Each COMMAND PAGE has space for up to 10 Codes. These codes instruct the display computer what to do with the message on the corresponding MESSAGE PAGE.

The display computer examines each COMMAND PAGE and displays the message accordingly. For example:

A series of codes might instruct the computer to scroll a message onto the display and delay it for 4 seconds. When the computer is finished this task it will then go to the next page of text memory and carry out any codes on the corresponding COMMAND PAGE. This sequence will continue until all COMMAND PAGES have been examined in sequence and corresponding commands carried out. If a COMMAND PAGE is blank, the computer will skip over that page and continue until COMMANDS are found on a COMMAND PAGE.

If an asterisk is programmed on a COMMAND PAGE, all subsequent messages will be ignored by the computer, i.e. if an asterisk is placed on command page 5, messages 1 to 5 only will be displayed.

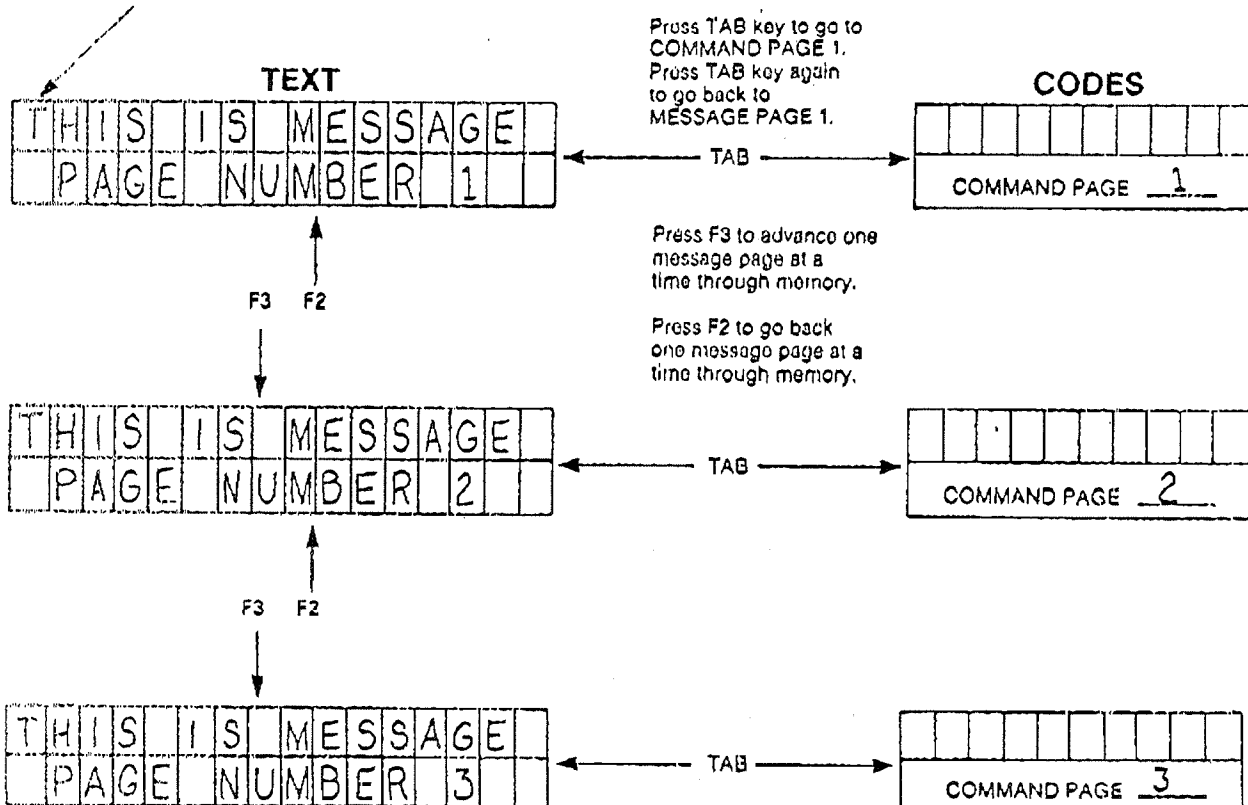
When you are editing text you will know you are on a COMMAND PAGE. If the bottom line says COMMAND PAGE XXX where XXX will be the page number you are editing.

Section 2.3 will discuss how you can move around in the memory of your display from one message to the next, both forward and reverse as well as from MESSAGE PAGE to a COMMAND PAGE and back.

2.3 EDITING THE TEXT PART OF MEMORY

Press the STOP/START key, shown as F1 on your keyboard. The display will stop and the "CURSOR" (a flashing block of lights) will appear in the upper left hand corner of the display.

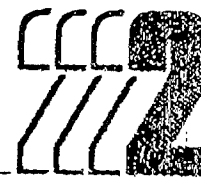
You are now in this position on MESSAGE PAGE 1.



NOTE: To move the cursor from the TOP LINE to the BOTTOM LINE or back again, press RETURN.

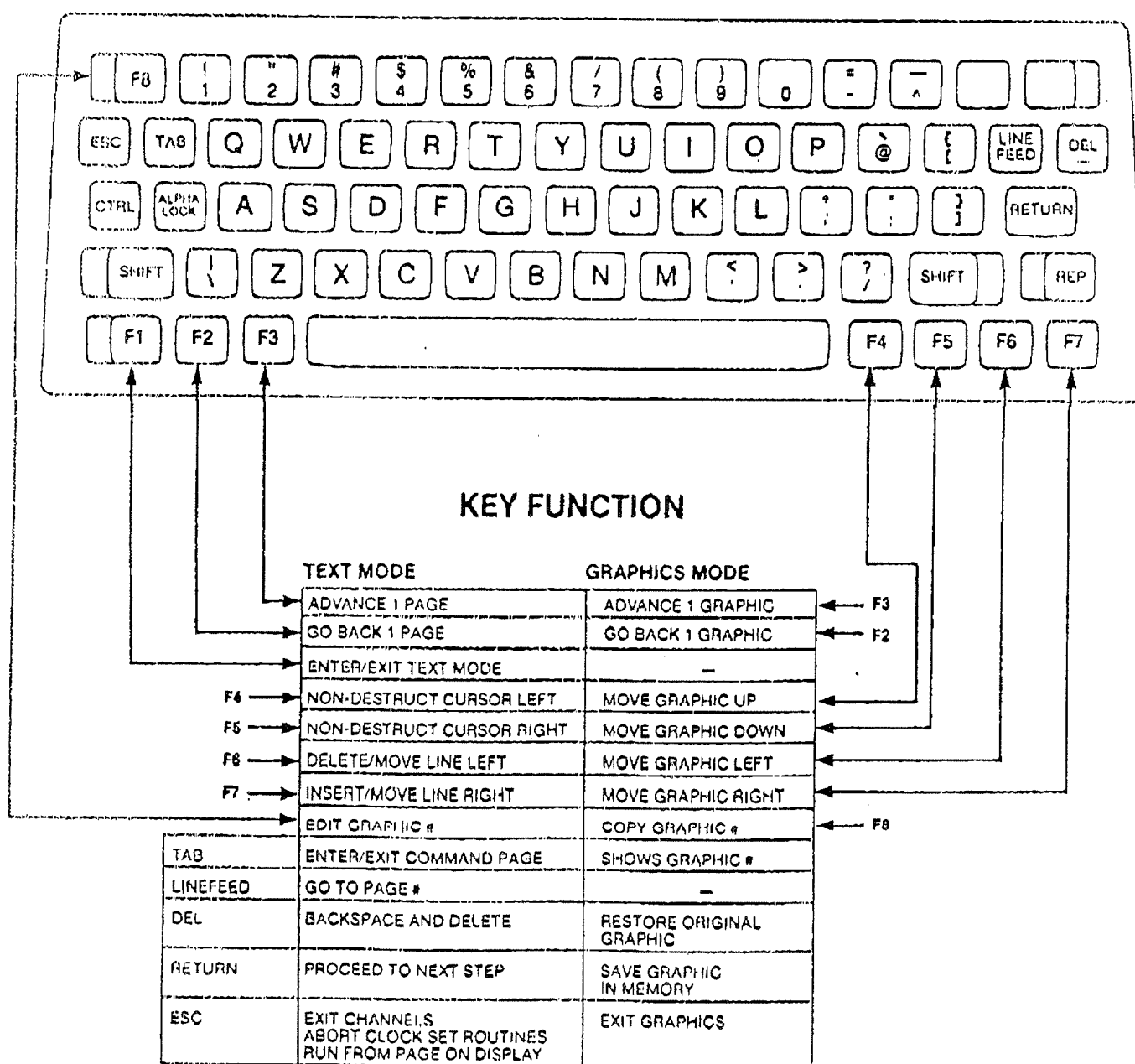
You can advance or go back rapidly through memory by holding the F3 or F2 keys down.

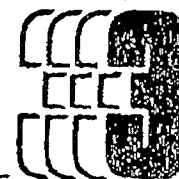
You can go directly to a message page in memory by pressing the LINEFEED key. Enter the page number you want to edit (3 digits) and press the RETURN key.



2.4 BASIC KEYBOARD FUNCTIONS

- The keyboard is plugged into a socket at the back of the display. Rotate the plug in the socket until the pins line up and then press the plug into the socket. The keyboard can be plugged in or removed while the display is running without causing harm.
- When you are editing the TEXT part of your program, refer to the left column of key functions below (TEXT MODE) where the purpose of each key is explained. When you are editing GRAPHICS part of your program, refer to the right column, (GRAPHICS MODE) for the key function.
- Advanced keyboard functions are explained in Section 3.





3.1 LET'S GET STARTED

1. Plug the KEYBOARD CONNECTOR into the socket at the back of the sign.
2. Press STOP/START key on the keyboard. You will now see a blinking cursor in the HOME position.
3. Press CTRL/DEL to erase the message on the display.
4. Type your own message. Or use our example:

Center you name here →

				MY				NAME					IS				

Note 1: Our example is for a series 32 display with 16 characters per line.

If your display is a different series, make appropriate adjustments to the sample program.

5. Now press the TAB key to enter the COMMAND PAGE. Press CTRL/DEL to erase the page if necessary.
6. Type the following code: 1D48★ (these codes are explained fully in Section 4 of these instructions)

7. The display should appear as follows:

1	D	4	8	*													
---	---	---	---	---	--	--	--	--	--	--	--	--	--	--	--	--	--

8. Now press STOP/START key again.

COMMAND PAGE 1																
----------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

You should see your message wipe on the display from the top (1), stay there for 4 seconds (D4), wipe off from the top (8), and repeat the sequence.

Now let's add some FLASH and make your name MOVE:

9. Press STOP/START key again. Your message will appear with the blinking cursor in the HOME position.
10. Press the TAB key and enter the following codes: 2F3D3L36★

NOTE 2: The asterisk tells the computer to ignore all messages after this one. The asterisk can be put anywhere in your program and taken out at a later time as required.

11. Press the STOP/START key again.

You will see your message wipe on from the left (2), flash for 3 seconds (F3), delay for three seconds (D3), your name will rotate to the left for three seconds (L3) and the display will go blank (7). The program will then repeat again as above.

12. Stop the display and press TAB key. COMMAND PAGE 1 will appear.
13. Press NON-DESTRUCT CURSOR RIGHT (F5) key until the cursor is over the ★.
14. Press the SPACEBAR key. The asterisk will be erased. (Refer NOTE 2)
15. Press PAGE ADVANCE (F3) key one time. You are on page 2.
16. Press CTRL/DEL to erase page, if necessary.

Otherwise, enter the following message:

				A	T	T	E	N	T	I	O	N					
T	H	I	S		M	E	S	S	A	G	E		W	I	L		

17. Press TAB key. COMMAND PAGE 2 will appear. Type S01★.
18. Press PAGE ADVANCE key. Page 3 will appear. Press CTRL/DEL to erase page, if necessary.
19. Complete your message as follows:

				T	R	A	V	E	L		A	C	R	O	S	S	
T	H	E		B	O	T	T	O	M		L	I	N	E	:		

NOTE 3: The semi-colon is an "end of message" code.

20. Press TAB key. COMMAND PAGE 3 will appear. Erase codes if necessary.

NOTE 4: Only the first page of a travelling message should have instruction codes. All other command pages must be blank.

21. Press STOP/START key and review your program.

Now let's add the TIME OF DAY (T) and DAY/DATE (Q) display.

22. Press STOP/START key.

23. Advance to page 2 and remove ★ from COMMAND PAGE 2. (Refer 16 & 17).

24. Advance to page 4. Erase page and type the following message: THE CORRECT TIME IS:

NOTE 5: The bottom line is left blank for the time to display.

25. Press TAB key. Command page 4 will appear. Type 4T58

26. Advance to page 5. Erase page and enter the following commands: Q5

27. Press STOP/START key. You will see your original messages on display followed by the time display and day/date display.



3.2 SETTING THE CLOCK/CALENDAR ON/OFF TIMES

You may notice that the Clock/Calendar information is not set for your time zone. Once you have set the Clock/Calendar, as explained in the following instructions, there is a battery which will keep the correct time and date when the display is disconnected from the AC power supply.

NOTE:

To ABORT any of these routines without changing memory, press ESCAPE key.

To BACKSPACE during any of these routines, press the DEL key.

SET THE DAY/DATE:

1. Enter Edit mode (STOP/START key)
 2. Press CTRL/Q
 3. Enter YEAR/MONTH/DAY (e. June 30, 1985 = 85/06/30)
 4. Press RETURN
 5. Enter DAY OF WEEK (e. Sunday = 1, Monday = 2 etc.)
 6. Press RETURN
- NOTE: The clock will stop while the calendar is being set.

SET ON/OFF TIMES:

1. Press CTRL/O
 2. Enter ON TIME in 24 Hr. format
 3. Press RETURN
 4. Enter OFF TIME in 24 Hr. format
 5. Press RETURN
- NOTE: Standard ON/OFF times are factory pre-set for
NOTE: 7:30AM and 1:30AM respectively.

SET TIME OF DAY:

1. Press CTRL/T
2. Enter the time of day in 24 hour format
e. 1:00PM = 13:00:00, 1:00AM = 01:00:00
3. Press RETURN

3.3 ADVANCED KEYBOARD EDIT FUNCTIONS

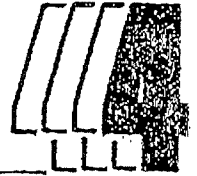
CTRL+DEL =ERASE PAGE ON DISPLAY (Message or Commands).

- F4 =Non-destruct cursor LEFT.
Use this key to move the cursor to the LEFT without erasing characters already on the display.
(TEXT OR COMMANDS).
- F5 =Non-destruct cursor RIGHT.
- F6 =DELETE and MOVE LINE LEFT.
This key is used to correct errors or to center text.
EXAMPLE: Display reads as follows:

A	T	T	E	N	T	I	O	N						
	A	L	L	E	M	P	L	O	Y	E	E	K	S	

You wish to correct the mistake on line 2 of the display.
Press STOP/START key and advance to the above message.
Press RETURN key. Cursor will move to the bottom line.
Press F5 key and hold it down until cursor is on top of the K. Then press F6. The K will be erased and the S will move one position to the left.

- F7 =INSERT SPACE and MOVE LINE RIGHT.
EXAMPLE: To center the top line of the above message, place the cursor in the top left position and press F7 until the word ATTENTION: is centered.
- CTRL+F =DELETE PAGE OF TEXT and MOVE PROGRAM FORWARD.
EXAMPLE: You have a program from page 1 to page 10 and you wish to remove page 6 from the program. Go to page 6 and press CTRL/F. Page 6 will disappear. Pages 7 on will now be moved forward one page, together with all COMMAND PAGES.
NOTE: If you want to keep the message programmed on Page 6 without having it display as part of your program, simply remove the COMMAND CODES for the message. This will allow you to display the same message at a later day by just re-entering the COMMAND CODES.
- CTRL+G =INSERT BLANK PAGE IN PROGRAM.
EXAMPLE: Suppose you wish to add a message in a program between pages 20 and 21. Advance to page 21. Press CTRL+G. Page 21 will now be a blank page. You can open up as many blank pages as you want.
- CTRL+E =ERASE ALL TEXT AND OR GRAPHICS AND OR CHANNELS.
Press Y or N in response to questions on the display screen.



4.1 WAYS TO DISPLAY YOUR MESSAGES

1. STATIONARY... You have the following options:

- a. Two lines of stationary message
- b. Full screen (ZOOM) stationary message (Models 6 & 12 only)
- c. Display the time with your message
- d. Display the day/date as part of your message sequence
- e. Display the temperature with your message (temp option)
- f. Add special function codes to create an exciting message

2. TRAVELLING... You have the following options:

- a. Top line stationary, bottom line moving right and left
- b. Top line stationary, bottom line travelling message
- c. Top line flashing, bottom line travelling message
- d. Full screen (ZOOM) scanning message (Models 6 & 12 only). In addition, you control the speed and repetitions of all travelling messages.

NOTE: Travelling messages can be as long as you want, but they must end with a semi-colon. The semi-colon tells the computer in the display that your message has ended.

*Three character fonts are available with full screen travelling messages:

- FONT 1. Upper/lower case characters
- FONT 2. Medium sized characters
- FONT 3. Large full screen characters

Your keyboard will normally type in upper case. If you want to display a message in upper/lower case you must type the message in upper/lower case. To do this, type your lower case letters by depressing the shift key (opposite of a normal typewriter).

3. GRAPHICS... You have the following options:

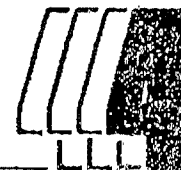
- a. Full screen graphics with text overlay.
 - b. Top line stationary, bottom line moving graphic.
 - c. Animated graphic sequence forward (with text overlay).
 - d. Animated graphic sequence forward and reverse (with text overlay)
- In addition, you control the speed and repetitions of all animation sequences.

4. DISPLAY INCREMENTING DAY COUNT:

The display computer will keep track of the current day count for you and display the current day count as part of your message.

For example: The number of days since the last lost-time accident, etc.

NOTE: YOU SHOULD WRITE OUT YOUR MESSAGE ON A COPY OF THE WORKSHEET FORMS PROVIDED WITH THESE INSTRUCTION. THIS WILL HELP YOU TO ORGANIZE YOUR MESSAGES AND THE INSTRUCTION CODES YOU NEED TO MAKE THEM APPEAR ON THE DISPLAY.



INSTRUCTION CODES

MODEL	CODE	FUNCTION
		4.2 ON CODES
All	0 =	Instant on
All	1 =	On from top
All	2 =	Double line laydown
All	3 =	Wink on
6, 12	4 =	Scroll down
2	4 =	Top and bottom to center
6, 12	5 =	Scroll up
		4.3 OFF CODES
	7 =	Instant off
	8 =	Off from top
	9 =	Wink off

4.4 STATIONARY MESSAGE

All D = Delay ____ seconds (1 to 9)
All d = delay ____ seconds/10 (10'ths)

CODE SEQUENCE: 0-5 D or d 1-9 7-9 Eg. 1D48
 On code Delay Seconds Off code (optional)

4.5 FLASHING MESSAGE

All F = ____ Flash ____ seconds

CODE SEQUENCE: 0-5 F 1-9 D 1-9 7-9 Eg. 2F3D39

On code Off code (optional)

Function code Seconds Seconds Function code

EXAMPLES

TEXT

		S	P	E	C	I	A	L					
T	H	I	S		W	E	E	K		O	N	L	Y

CODES

5 D 6 8
COMMAND PAGE 1

Explanation:
Scroll up, Delay 6 seconds,
Off from the top.

			S	P	E	C	I	A	L		
T	H	I	S	W	E	E	K	O	N	L	Y

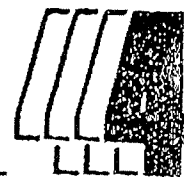
4 F 3 D 3 9
COMMAND PAGE 2

Explanation:
Scroll down, Flash 3 seconds,
Delay 3 seconds, Wink off.

			S	P	E	C	I	A	L					
	T	H	I	S		W	E	E	K		O	N	L	Y

4 F 3 D 3
COMMAND PAGE 3

Explanation:
Same as above only no Off code. The next message in your sequence will wipe on over this message.



MODEL

CODE

FUNCTION

DISPLAY DAY/DATE

All

Q = Display day date

CODE SEQUENCE: Q 1-9 NOTE: Leave text page blank.

Function code ↗ ↖ Delay

DISPLAY TIME

All

T = Message on top line, Time on bottom line (12 hour)

All

M = Message on top line, Time on bottom line (24 hour)

CODE SEQUENCE: 1-5 T or M 1-9 7-9 Eg. 3T58On code ↗ ↖ Off code (optional)
Function code ↗ ↖ Seconds

6, 12

Y = Zoom time (12 hour format)

3, 12

I = Zoom time (24 hour format)

CODE SEQUENCE: Y or I 1-3 1-9 7-9 Eg. Y259Function Code ↗ ↖ Off code (optional)
Character font: ↗ ↖ Seconds
3 = large font
2 = medium font
1 = upper/lower case fontNOTE: Leave message page blank when using
Zoom time feature

DISPLAY TEMPERATURE

NOTE: Optional temperature circuit is required in order
for temperature codes to function properly.

All

c Display temperature (centigrade -40 to +60)

with

f Display temperature (fahrenheit +1 to +140)

temp

option

CODE SEQUENCE: c or f 1-9

Function code ↗ ↖ Seconds



4.6 STATIONARY ZOOM

APPLICABLE TO MODELS 6 AND 12 ONLY

Series 32 = 8 full screen characters

Series 40 = 10 full screen characters

Z = Display 8 or 10 characters in full screen character font.

CODE SEQUENCE: Z 1-3 0-5 1-9 7-9 Eg. z35F2D37

Function Code On code Off code (optional)

Character font: Seconds

3 = large font Function code (D, F, etc.)

2 = medium font

1 = upper/lower case

z = Alternate Zoom between fonts 2 and 3

CODE SEQUENCE: z 1-z 1-z Eg. z99

Function Code Repetitions

Speed

EXAMPLES

TEXT

S	p	e	c	i	a	l											

CODES

Z	1	5	F	3	D	3			
COMMAND PAGE 1									

Explanation:

The word Special: will appear in upper/lower case letters in Zoom format, Flash 3 seconds and Delay 3 seconds.

NOTE: Type this message in upper/lower case.

		S	A	L	E												

Z	3		D	3					
COMMAND PAGE 2									

Explanation:

The word SALE will appear in large letters from the top and delay for 3 seconds.

T	O	D	A	Y													

z	6	8							
COMMAND PAGE 3									

Explanation:

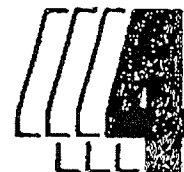
The word TODAY will appear in large letters, alternating between font 2 and 3 at a rapid pace a total of 8 times.

2	5	%	O	F	F												

Z	2	4	F	3	D	3			
COMMAND PAGE 4									

Explanation:

25% OFF will scroll down in font 2, flash for seconds and delay for 3 seconds.



4.7 SCANNING MESSAGES

IMPORTANT: * Commands are required on the first command page of a travelling message. All other command pages must be blank.

* Each travelling message must end with a semi-colon (;).

S = Top line stationary, bottom line scanning

s = Top line flashing, bottom line scanning

CODE SEQUENCE: S or s 0-2 1-9 Eg. S01
 Function Code Speed Repetitions

B = Zoom Scanning message (Models 6 & 12 only).

CODE SEQUENCE: B 1-3 0-2 1-9 Eg. B301
 Function Code Character font: Speed (0=fastest)
 3 = large font
 2 = medium font
 1 = upper/lower case

EXAMPLES

TEXT

CODES

	A	T	T	E	N	T	I	O	N	.				
T	H	I	S		P	L	A	N	T		C	L	O	S

S	0	1												
COMMAND PAGE <u>1</u>														

Explanation:

The top line will appear as a heading and the rest of the message beginning with the bottom line of page 1 will travel across the bottom line. IF the first command code is replaced with an s (lower case) the heading will flash while the message travels.

S		A	T	4	:	4	5		T	H	I	S		A
F	T	E	R	N	O	O	N	;						

COMMAND PAGE <u>2</u>														

A	T	T	E	N	T	I	O	N	.		T	H	I	S
P	L	A	N	T		W	I	L	L		C	L	O	S

B	3	0	2											
COMMAND PAGE <u>3</u>														

Explanation:

This message will travel in large characters (font 3) at a fast speed (0) two times.

E		A	T	4	:	4	5		T	H	I	S		A
F	T	E	R	N	O	O	N	;						

COMMAND PAGE <u>4</u>														

A	T	T	E	N	T	I	O	N	.		T	H	I	S
P	L	A	N	T		W	I	L	L		C	L	O	S

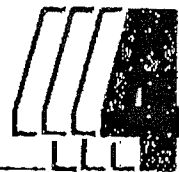
B	1	1	1											
COMMAND PAGE <u>5</u>														

Explanation:

This message will travel in Upper and Lower case (font 1) at a medium speed (1) one time.

E		A	T	4	:	4	5		T	H	I	S		A
F	T	E	R	N	O	O	N	;						

COMMAND PAGE <u>6</u>														



4.8 ROTATE BOTTOM LINE

R = Rotate bottom line Right

L = Rotate bottom line Left

CODE SEQUENCE: 0-5 R or L 1-9 7-9 Eg. 5L3R37

On code

Function code

Off code (optional)

Seconds

TEXT

T	O	D	A	Y	O	N	L	Y				
S	A	V	E	2	5	%						

CODES

5	F	3	L	3	R	3	7
COMMAND PAGE							1

Explanation:

Scroll up. Flash 3 seconds, rotate bottom line Left 3 seconds then Right 3 seconds, and instant off.

4.9 REVERSE DISPLAY

N = Reverses image on the display.
(Models 6 and 12 only).

CODE SEQUENCE 1: Z 2 N N Eg. Z23N1N2D3

On code (0 to 5)

TEXT

S	P	E	C	I	A	L	:					

CODES

Z	2	1	N	2	F	3	D	3	9
COMMAND PAGE									1

Explanation:

Message appears from the top in full screen format (font 2), reverse screen wipes on from the left (N2), flashes 3 seconds, delays 3 seconds and wipes off from the top.

4.10 USING THE DAY COUNTER FEATURE

1. The lower case character "x" is to appear in your message wherever you want the day count to appear.

Example:

I	T	H	A	S	B	E	E	N			x	
D	A	Y	S		S	I	N	C	E	C	U	R

A	S	T	L	O	S	T	T	I	M	E	A	C
C	I	D	E	N	T	:						

x	B	3	D	1					
COMMAND PAGE									

COMMAND PAGE									

- * Note that the first Command page for the message is lower case x.
- * Note that you must leave three character position for the day count.

To initialize the day counter:

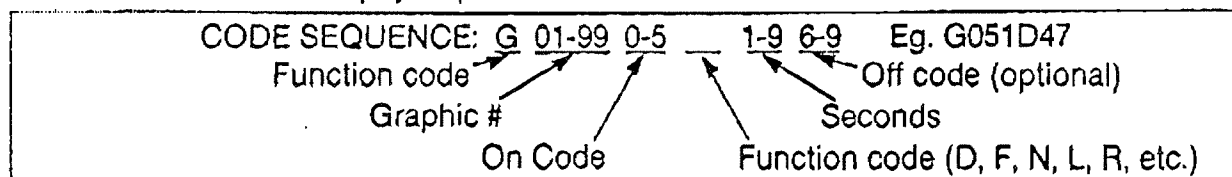
- a) Enter any text or Command Page;
- b) Type the initial count in the first three positions on the screen, ie. for an initial count of 5 days, type 005;
- c) Press CTRL/X (hold down the CTRL key and press X).



4.11 DISPLAY GRAPHICS

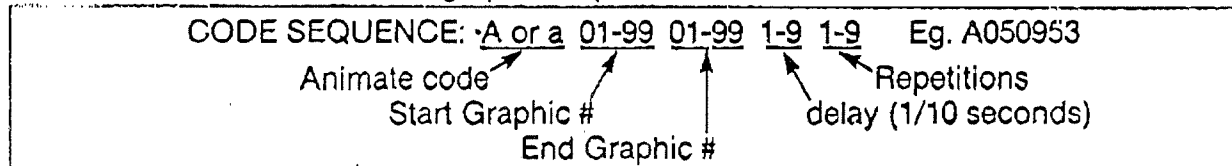
NOTE: Refer to Section 5 for instruction on creating Graphics and storing them in memory.

G = Display Graphic with or without text



A = Animate graphics sequence forward OR reverse

a = animate graphic sequence forward AND reverse



TEXT

CODES

G	0	1	5	F	3	N	1	D	3
COMMAND PAGE									1

Explanation:

Graphic # 01 (your LOGO, for example, will Scroll up (G015), then flash for 3 seconds (F3), wipe on reverse image from the top (N1) and Delay for 3 seconds (D3)

TEXT

CODES

G	0	1	1	R	5	7			
COMMAND PAGE									2

Explanation:

Graphic # 01 will wipe on with the text message shown (G011). A Graphic drawn on the bottom 8 rows of LED's will then rotate to the Right for 5 seconds (R5). Graphic 01 should have a car drawn on the bottom 8 rows.

TEXT

CODES

A	0	1	0	9	4	3			
COMMAND PAGE									3

Explanation:

Graphic #'s 01 to 99 will appear in sequence for 4 seconds each. The sequence will repeat 3 times. This graphic sequence might be an airplane taking off from the bottom left to the top of the display.

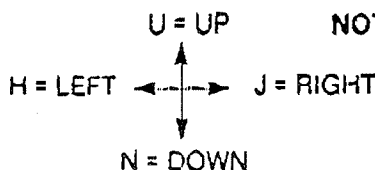
In the last example, each Graphic will be programmed slightly different from the previous one. The result will be an animated sequence with your message remaining stationary on the display. To achieve the desired effect, you can change the delay for each frame and the number of repetitions for the total sequence. If you want this sequence to appear in forward AND reverse direction, change the command code from A to a



The Mona Lisa began with but a single stroke on the canvas

5.1 HOW TO ENTER GRAPHICS:

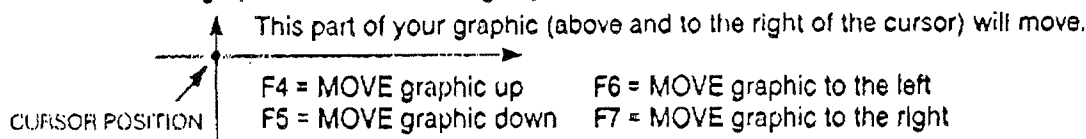
1. Press the F8 key. Enter desired Graphic # and press RETURN.
2. You will note a blinking cursor in the HOME position. The Cursor is a single LED. MOVE the Cursor as follows:



NOTE: You should start by sketching your graphic on a copy of the worksheet provided at the back of this manual.

To move the Cursor ... press the appropriate key.
Hold the key down to continue moving the Cursor.

3. To LIGHT UP DOTS on the display, hold down the SHIFT key while pressing the directional key.
4. To ERASE DOTS on the display, hold down the CTRL key while pressing the directional key.
5. To ERASE a graphic, press CTRL/DEL.
6. To RESTORE a graphic to its original condition, press DEL.
7. To SAVE a graphic, press RETURN.
8. To MOVE a graphic, use the following keys:



9. To EXIT graphic mode, press ESC. **NOTE:** You must save your graphic prior to pressing ESC.

5.2 GRAPHIC OVERLAY

You can overlay one graphic onto another, or you can copy a Graphic onto a blank page. You can then use the MOVE function to create a sequence of slightly different Graphics for animation.

1. Enter the Graphic page you want as your final graphic.
2. Press F8 key. Enter Graphic # you want to copy.
3. Press RETURN.

EXAMPLE: Suppose you want to merge Graphic #1 and Graphic #2.

- A. Go to Graphic page # 2.
- B. Press GR ED/COP key.
- C. Enter 1 and press RETURN.

NOTE: This is an OVERLAY function. If you want a COPY only, be sure to start with a blank graphic.

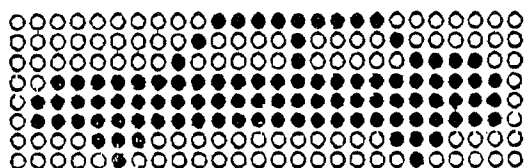
5.3 TEXT OVERLAY

This function is used to copy Text onto a Graphic page. The MOVE function will then re-locate the text. For example, to move a word of Text into the centre of the display area without having to draw the word dot as a Graphic: Press CTRL/T While on Graphic page. This will copy the text from the last text page on display prior to entering Graphic mode.

5.4 DISPLAYING GRAPHICS

Your Graphic will display on any page of text with the proper Command Codes. The Graphic will merge with any text you have programmed on the text page. Review the following example:

GRAPHIC # 01: Draw a car on the bottom 8 rows of LED's as follows:



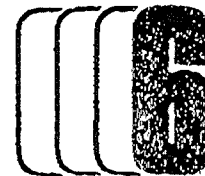
TEXT PAGE #001: Program the following message:

	O	R	I	V	E		I	N		T	O	D	A	Y	

Leave the bottom line blank.

COMMAND PAGE #001: Program the following codes: G013D2L67

Press STOP/START key. Your message will wink on with the car graphic on the bottom part of the display. After a 2 second delay, the car will begin to rotate to the left for 6 seconds.



6.1 PROGRAM SCHEDULING

This feature will allow you to schedule your messages in advance for each day of the week. The scheduling feature allows for up to 8 different advance schedules.

Each schedule can consist of up to two sequences of text pages. This means you can have a basic program on display at all times together with a changing message for daily specials, etc.

Each scheduled set of messages is called a CHANNEL.

A sample SCHEDULE WORKSHEET is provided at the back of this manual. Fill out your SCHEDULE WORKSHEET as in the following example:

CHANNEL #	FROM PAGE #	TO PAGE #	START TIME	DAYS ON SUNDAY = 1 etc.
1-1	001	015	07:30	1 2 3 4 5 6 7
1-2	016	025		1 2 3 4 5 6 7
2-1	001	015	07:30	1 2 3 4 5 6 7
2-2	026	040		1 2 3 4 5 6 7
3-1	001	015	07:30	1 2 3 4 5 6 7
3-2	041	057		1 2 3 4 5 6 7
4-1	060	080	13:30	1 2 3 4 5 6 7
4-2	060	080		1 2 3 4 5 6 7

EXPLANATION:

*Pages 1 to 15 are main program (1-1, 2-1, 3-1). This first sequence is on every day starting at 7:30AM.

*Each day a second sequence (perhaps a daily special) is added to the main program. On Monday, pages 16 to 25 (1-2) are displayed with the main program. On Wednesday, pages 41 to 57 (3-2) are displayed with the main program.

*At 1:30PM on Wednesday, a special program from pages 60 to 80 is displayed (4-1). Note that this sequence must be programmed in both sections of the Channel.

*This above example could continue with 8 full channels.

6.2 HOW TO ENTER YOUR SCHEDULE:

1. Press CTRL/C (While in EDIT MODE).

	DISPLAY WILL READ	ACTION	FOR THE ABOVE EXAMPLE
	CHANNEL 1 SELECT CHANNEL	Press RETURN key.	
2.	CHANNEL 1 FROM PAGE # _____	Enter Start Page, Channel 1-1 Press RETURN	Enter 001 Press RETURN
3.	CHANNEL 1 TO PAGE # _____	Enter last Page, Channel 1-1 Press RETURN	Enter 015 Press RETURN
4.	CHANNEL 1 FROM PAGE # _____	Enter Start Page, Channel 1-2 Press RETURN	Enter 016 Press RETURN
5.	CHANNEL 1 TO PAGE # _____	Enter last Page, Channel 1-2 Press RETURN	Enter 025 Press RETURN
6.	CHANNEL 1 TIME ON ____ : ____	Enter start time for Channel 1, (24 Hr. format) Press RETURN.	Enter 07:30 Press RETURN
7.	CHANNEL 1 DAYS ON _____	Enter days on for Channel 1. Press again to erase. Press RETURN.	Enter 2 Press RETURN
8.	CHANNEL 1 SELECT CHANNEL	To advance, press PAGE FWD. To abort, press ESC.	Advance to Channel 2 and continue

NOTE:

*To RUN a Channel, go to Text Page 1 of the Channel. Press ESC.

*When you press STOP/START key, the display will automatically Run from page 1 of the current Channel.

*A Channel will not operate if the TIME ON is 00:00, or if the DAYS ON are not programmed.

*A Channel will continue to run until a new Channel takes over or until the automatic display OFF time takes effect.



7.1 CASSETTE INTERFACE

INSTALLATION:

- *Special factory made cable required.
- *Use computer grade cassette players and cassettes.
- *Your display system cassette option has been factory tested using the Radio Shack CCR-82 COMPUTER CASSETTE RECORDER and SCOTCH Brand #830 computing cassette.
- *Where possible, use an AC power source to your cassette player.

CONNECTION:

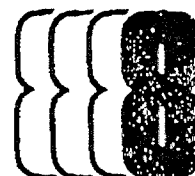
- *25 PIN connector at rear of display.
- *Cassette end of cable connects as follows:
 - RED plug to EARPHONE JACK.
 - BLACK plug to AUX JACK.

TO RECORD PROGRAM ONTO CASSETTE TAPE:

1. Set volume level to maximum.
2. Advance tape past leader if necessary.
3. Press CTRL/L on display keyboard.
4. Press RECORD button on recorder.
5. Enter start page. Press RETURN.
6. Enter last page. Press RETURN.
7. Enter start graphic. Press RETURN.
8. Enter last graphic. Press RETURN.
9. COMM COMPLETE will appear on the display after program is saved.
10. FOR SAFETY, ALWAYS MAKE A BACK-UP COPY OF YOUR PROGRAM ON ANOTHER TAPE.
11. DO NOT MOVE OR VIBRATE RECORDER DURING THE SAVE ROUTINE.
12. TREAT CASSETTE TAPES WITH THE SAME CARE AS A FLOPPY DISK.

TO LOAD PROGRAM FROM CASSETTE:

1. Rewind cassette to start of program.
2. Press PLAY BUTTON on cassette player. Display should be in RUN MODE.
3. Display will go blank during transmission.
 - Display should read COMM OK after transmission is completed. Stop cassette player at this point.
 - COMM ERROR indicates faulty transmission or tape. Try back-up tape.
 - If back-up tape also indicates COMM ERROR, consult your Dealer.



8.1 LOCAL AND REMOTE SYSTEMS

- * Any REMOTE or LOCAL system can act as a Master or Slave display.
- * For purposes of these instructions, the system with the keyboard attached will be designated as the Master.

8.2 TRANSMITTING TO A LOCAL OR REMOTE UNIT

1. Master is in EDIT MODE. Slave is in RUN MODE.	DISPLAY WILL READ
2. Press CTRL/S	
3. Enter Start page #. (3 digits). Press RETURN. _____	TX PG. 001 TO 120
4. Enter last page #. (3 digits). Press RETURN. _____	TX PG. 001 TO 120
5. Enter start graphic #. (2 digits). Press RETURN. _____	TX GR. 01 TO 10
6. Enter last graphic #. (2 digits). Press RETURN. _____	TX GR. 01 TO 10
7. REMOTE UNITS ONLY. Press F3 key until required Baud rate appears. Press RETURN.	BAUD RATE 300
8. Enter ID # of Slave you are transmitting to. When transmitting to all slaves in a LOCAL NETWORK, use Slave # 00. Press RETURN.	UNIT ID#

Both displays will go blank during transmission.

NOTES: * To transmit graphics only, enter 0 for starting page #.

* To transmit pages only, enter 0 for starting graphic #.

* To transmit CHANNELS, ON/OFF TIMES and the TIME/DAY/DATE, you must transmit at least one Graphic.

CAUTION: * Baud rate of Remote Master must be the same as the Remote Slave in order to communicate.

* To set the Baud rate of a Remote Slave, press CTRL/S, press RETURN until BAUD RATE appears. Press F3 until required BAUD RATE appears. Then Press ESC key.

When transmission is complete, the Slave display will enter RUN MODE and the Master will display one of the following messages.

COMM OK	Indicates transmission passed without error.
COMM ERROR	Indicates transmission errors ... probably due to noisy transmission lines. Try again.
COMM COMPLETE	Indicates transmission to all Slaves in a LOCAL network is complete.
COMM FAIL	Indicates faulty connection, computer or modem at either Slave or Master. Check that Baud rates in the REMOTE Master and Slave are the same and that cables properly connected.

EXAMPLES:

To transmit pages 25 to 40 and Graphics 3 to 5 your display should look like this:

TX PG.025 TO 040

TX GR. 03 TO 05

To transmit pages 25 only and no Graphics, your display should look like this:

TX PG.025 TO 025

TX GR. 00 TO 00

8.3 RECEIVING FROM A REMOTE OR LOCAL UNIT

1. Master is in EDIT MODE. Slave is in RUN MODE.

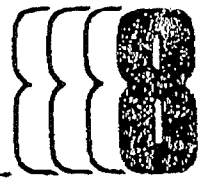
CAUTION: The Master must have at least as much memory as the Slave display. All memory will be transferred from the Slave back to the Master during this routine, including all TEXT, GRAPHICS, TIME, DAY/DATE and CHANNELS.

2. Press CTRL/R. For REMOTE units, set BAUD rate.
3. Enter Slave unit ID # (01 to 99). Do not use 00.
4. Press RETURN key. Both units will be blank until transmission is complete. The Master will display one of the messages above.
5. COMM OK, COMM FAIL or COMM ERROR.

8.4 VERIFYING TRANSMISSION TO LOCAL UNITS

NOTE: this routine is used only after transmission to multiple units (00) in a LOCAL network.

1. Master is in EDIT MODE. Slave is in RUN MODE.
2. Press CTRL/V. Enter Slave ID # and press RETURN.
3. The Master will display one of the messages shown above.
4. COMM OK, COMM FAIL or COMM ERROR.



8.5 WIRING INSTRUCTIONS — LOCAL NETWORK (RS 422)

WIRING 9 PIN D-SUB CONNECTORS

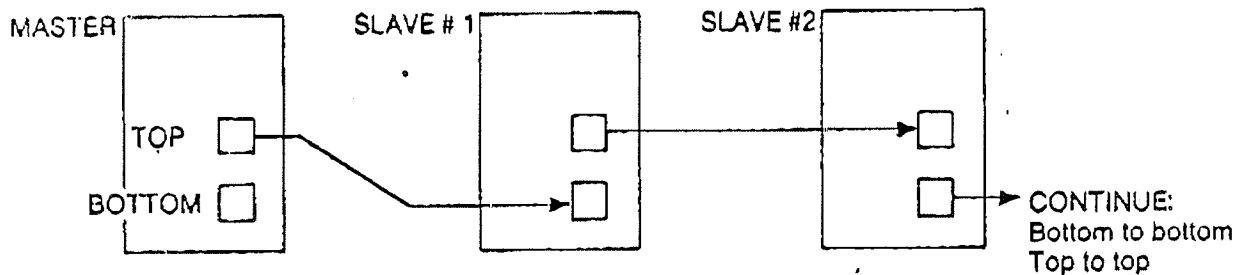
PIN 1 — PIN 1
PIN 3 — PIN 3
PIN 5 — PIN 5
PIN 6 — PIN 6
PIN 9 — PIN 9

NOTE: Pin 3 is ground (bare wire)
Shield should be attached to each connector
Metal covers should be used to shield RFI.

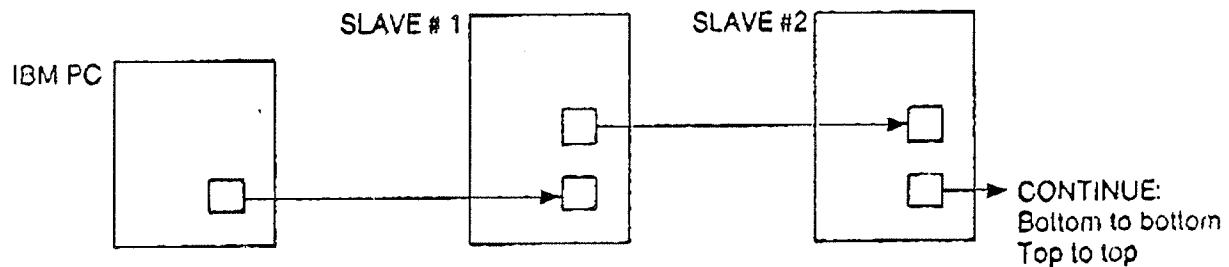
CAUTION

RS232 and RS422 circuits are sensitive to static electricity charges. Before connecting any cables between signs in a network, always ground yourself to the cabinet of the sign. As an added precaution, touch the exposed connector pins while you ground yourself to the cabinet in order to remove any static charge from the cable conductors.

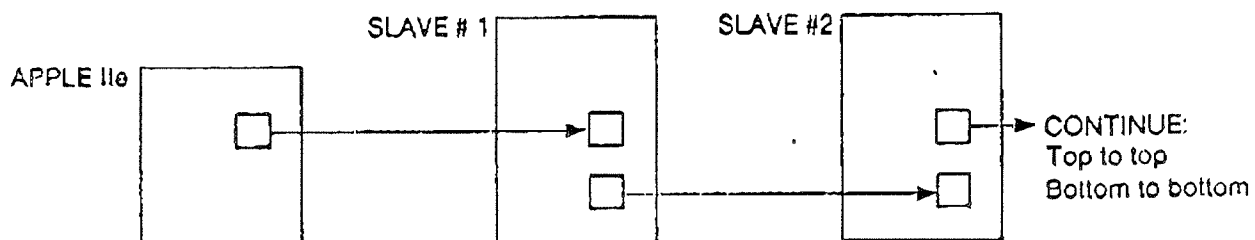
Wiring configuration - MASTER TO LOCAL SLAVES



Wiring configuration — IBM PC TO LOCAL SLAVES



Wiring configuration — APPLE TO LOCAL SLAVES



8.6 WIRING INSTRUCTIONS — REMOTE NETWORK (RS232)

WIRING 25 PIN DSUB CONNECTORS

PIN 2 — PIN 3
PIN 3 — PIN 2
PIN 7 — PIN 7

NOTE: Pin 7 is ground (bare wire)
Shield should be attached to each connector
Metal covers should be used to shield RFI.

NOTE: If any of the following signals are required, consult with the factory to ensure proper jumpers have been set on the display controller board

PIN 6 — DSR
PIN 5 — CTS
PIN 4 — RTS
PIN 20 — DTR

QUICK REFERENCE GUIDE-COMMAND CODES

DISPLAY	0	=	Instant On
ON CODES:	1	=	On from Top
	2	=	Double Line Laydown
	3	=	Wink On
	4	=	Scroll Down
	5	=	Scroll Up*
DISPLAY	7	=	Instant Off
OFF CODES:	8	=	Off from Top
	9	=	Wink Off
DISPLAY	D__	=	Delay for __ seconds
FUNCTION	d__	=	delay for __ seconds/10 (10'ths)
CODES:	F__	=	Flash for __ seconds
	G__	=	Display Graphic #__(followed by ON codes)
	N	=	Reverse image on display (followed by ON codes)
	x __	=	Incrementing day counter display
	Z__	=	Zoom message in font #__ (followed by ON codes) *
	z__	=	Alternate Zoom from fonts 2 to 3 at __ speed __ times*
	M__	=	Display time on bottom line for __seconds (24hour)
	T__	=	Display time on bottom line for __ seconds (12 hour)
	Y__	=	Display time in font #__ for __ seconds (12 hour) *
	I__	=	Display time in font #__ for __ seconds (24 hour) *
	Q.....	=	Display day/date for __ seconds
	A__	=	Animate forward or reverse from Graphic #__ to #__ at __ speed __ times
	a__	=	Animate forward and reverse from Graphic #__ to #__ at __ speed __ times
TRAVELLING	S__	=	Top line heading, bottom line moving at __ speed __ times
MESSAGE	s__	=	Top line flashing, bottom line moving at __ speed __ times
CODES:	B__	=	Zoom travelling message in font #__ at __ speed __ times*
	R__	=	Rotate bottom line right for __ seconds
	L__	=	Rotate bottom line left for __ seconds
CHARACTER	1	=	Upper/Lower case
FONTS:*	2	=	Medium font
	3	=	Large font
TRAVELLING	0	=	Fastest
MESSAGE	1	=	Medium
SPEEDS:	2	=	Slow

*NOT INCLUDED WITH MODEL 2 DISPLAY.