Chapter 22 Model 450 Simulator Software

This is a very unique and helpful tool to assist in setting up the 450 indicator for a specific application. The GSE Model 450 Simulator runs on any IBM compatible computer with at least 640K of memory. While a monochrome monitor will work, a color monitor provides a much more desirable model to work with. A simulated picture of the indicator appears on the computer screen and the computer keyboard provides input to the 450, much the same as the 450's front keypad, except that full alpha input is possible. A computer keypad allows for single key functions where as the 450 is limited to 5 front panel keys which must perform all setup operations.

22.1 Simulator Software Installation

The simulator consists of the following files. All files should be copied under one directory on the computer's hard drive. Preferably the directory should be named "M450". This will allow all 450 simulator files to be filed cleanly under their own directory. Future 450 simulator software files can easily be updated or added to this directory. Application files should be filed under a separate directory. Preferably the directory should be named "APPS" denoting applications. This procedure should be followed for all GSE equipment application software.

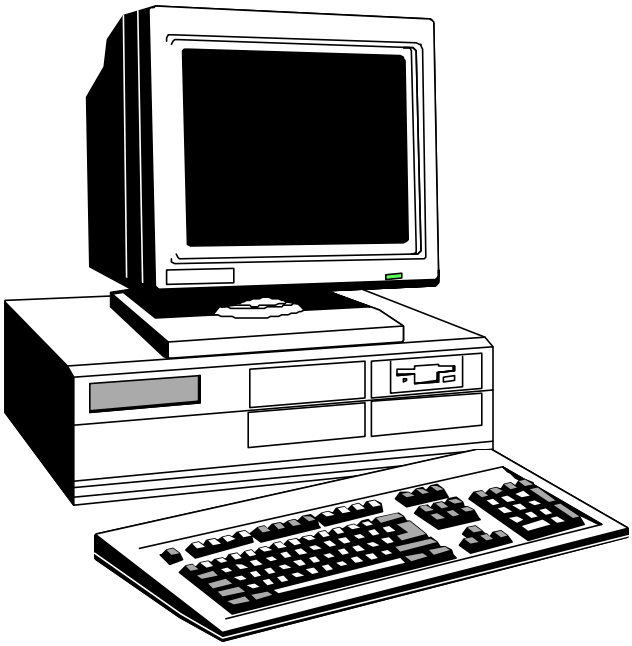

Figure 22-1 IBM PC or Compatible Computer

The 450 Simulator Software uses the DOS operating system. To execute or boot the Simulator Software simply change to the M450 directory and type M450 and press **<Enter>**.

C:\M450>M450 <Enter>

1) M450.EXE	The simulator program.
2) PRN_M450.EXE	Utility program for viewing files and help screens.
3) HELPXT.TXT	The help file laid out for the ten f-keys in a single row.
4) HELPAT.TXT	The help file laid out for ten f-keys, two columns of five.

In addition the following files are created when the simulator is executed if they are not found to already exist. These files are as follows:

1) M450.DAT	This file holds the simulators setup. It contains the exact same type of information as the EEPROMS in your M450. The file is always 2048 bytes in size, the largest amount available for the 450. If this file does not exist when the Simulator is powered up, then the message "Deflt Setup" will appear. Press any key and the simulator will step into the setup mode. The file will be created at that time.
2) M450.STP	This file keeps track of which files you have specified with the ALT- F1 through F3 keys and which help file is your preference based on your previous selection. If the simulator is exited abnormally, this file may get corrupted. If this happens, your file I/O operations may not work correctly. Simply delete the file and a new one will be automatically created.
coarse zero	Simulated A/D gain and errors are also recorded here.

AT Layout Help Screen

Function Keys

HELP	F1	F2	SETPOINT WINDOW
ZERO	F3	F4	UNITS
SELECT	F5	F6	
PRINT	F7	F8	TARE
ENTER	F9	F10	CLR

PRINT (Next Character)

(Backspace) ← ↓ → UNITS (Accept)

(Previous Character)

[Used for entering character strings]

Alt - Function Keys

-Set Input File	F1	F2	Set Comm File
	F3	F4	
	F5	F6	
-Invoke Editor and Edit Input File			DOS Shell
	F7	F8	Show Comm Output Window
-Access Setup Mode, Allow Changes (or <ALT-S>)	F9	F10	

Ctrl - Function Keys

View Input	F1	F2	View Comm File
	F3		F4
	F5	F6	
-Turn off Comm Window	F7	F8	
	F9	F10	-Set mV/V Input Value

Load Cell Input Simulation Keys

Increment Input by:	1 Grad	.0001 mV/V	1 mV/V		.01 mV/V	
	Ins	Home	PgUp		+	[Grey + key only]
Decrement Input by:	1 Grad	.0001 mV/V	1 mV/V		.01 mV/V	
	Del	End	PgDn		-	[Grey - key only]

[ALT-D] Display 1/10th resolution for 5 seconds.

Ctrl - Home — Sets Input to 0 mV/V

[ALT-R] Remote-key start.

[ALT-M] to keyin the desired mV/V input level.

[ALT-G] to keyin the desired gross weight.

[ALT-N] to keyin the desired

XT Layout Help Screen

Function Keys

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
HELP	SET POINT WINDOW	ZERO	UNITS	SELECT		PRINT	TARE	ENTER	CLR

PRINT
(Next Character)

(Backspace) UNITS (Accept)

(Previous Character)

[Used for entering character strings]

Alt - Function Keys

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
SET INPUT FILE	SET COMM FILE			INVOKE EDITOR AND EDIT "INPUT FILE"	DOS SHELL		SHOW COMM OUTPUT WINDOW	ACCESS SETUP MODE ALLOW CHANGES (or <ALT-S>)	

Ctrl - Function Keys

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
VIEW INPUT FILE	VIEW COMM FILE					TURN OFF COMM WINDOW			SET mV/V INPUT VALUE

Load Cell Input Simulation Keys

	1 Grad	.0001 mV/V	1 mV/V	.01 mV/V	
Increment Input by:	Ins	Home	PgUp	+	[Grey + key only]
	Del	End	PgDn	-	[Grey - key only]
Decrement Input by:	1 Grad	.0001 mV/V	1 mV/V	.01 mV/V	

Ctrl - Home
Sets Input to 0 mV/V

[ALT-R] Remote-key start.
[ALT-M] to keyin the desired mV/V input level.
[ALT-G] to keyin the desired gross weight.

This file keeps track of your most recent selections for the I/O REDIRECTION window. This allows you to create directories for each application into which you implement the 450. For instance, you might want to create a directory structure similar to that shown below.

directory	**contains**
c:\m450	The files supplied for the M450 Simulator.
c:\m450\pg	Directories for each 450 implementation at company named "PG".
c:\m450\pg\line1	Files for LINE 1 application at PG.
c:\m450\pg\line2	etc...
c:\m450\pg\line3	
c:\m450\ford	
c:\m450\ford\canton	
c:\m450\ford\wixom	
c:\m450\tests	
c:\m450\kodak	
c:\m450\acme	
c:\m450\acesprng	
c:\m450\kelloggs	

Keeping your setup files organized in such a manner will help you keep track of the files you have created for a given application. If you start the 450 Simulator from the appropriate directory then the 450's setup files will be stored in that directory. The next time you need to run the 450 configured for that application, you will not need to reload the setup file. The simulator will startup configured as it last was used in that directory.

22.2 Help Screens

Press the **F1** key to display the help screen. The definition of the function keys will be displayed. Page or scroll up and down to see additional information including the definitions of the keys used to change simulated scale input signal. If the layout of the function keys does not match your keyboard, press **[F1]** again with the incorrect help screen displayed. The alternate help screen layout will then appear. The Help

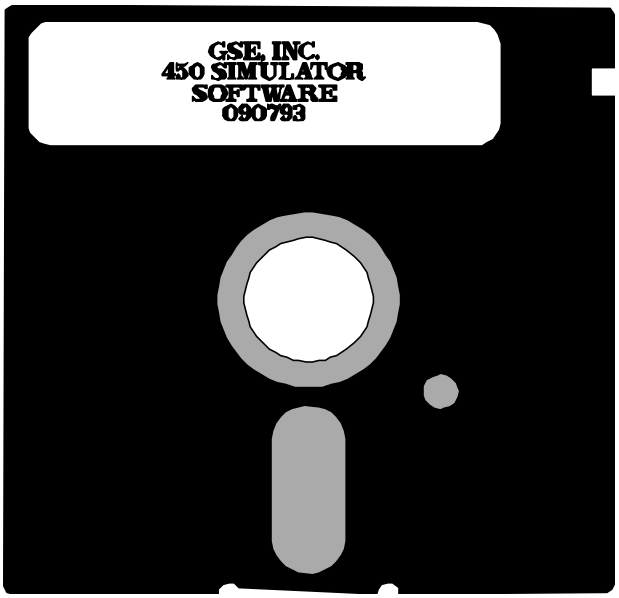

Figure 22-2 GSE 450 Simulator Computer Disk

Screen keys are shown on the previous pages.

22.3 Load Cell Simulation

Since the simulator does not provide for a connection to an actual live platform, we have made it possible for you to control the effective input signal to the simulator. Since most load cells and platforms are rated in terms of their milli-volt per volt (mV/V) output, most of the input simulation keys change the signal in terms of a mV/V amount. In addition, there are two keys which change the simulated input signal by the smallest discernible amount, one graduation (1 grad) of the indicator's A/D converter. The keys used for the simulation are shown above in the copy of the help file.

Also the ability to keyin a specific mV/V value or gross or net weight is possible using the **[ALT]-[M]**, **[ALT]-[G]** and **[ALT]-[N]** key combinations respectively. Simply press one of the key combinations and a window will appear instructing you to keyin the appropriate value. Then simply keyin the desired value and press **[ENTER]**.

Whenever the simulated input signal is changed with one

of these keys, an additional line of information appears below the numeric digits. This indicates the current status of the simulated input, supplying the number of A/D grads being simulated and the current level of the mV/V signal being simulated. This can supply valuable information when attempting to simulate a calibration situation. Also it can be used to determine the number of A/D graduations per displayed increment for a given calibration.

22.4 File Re-Direction

Capturing Simulator Output: The 450 simulator is capable of making direct use of the comm ports on the PC computer. Comm 1 is associated with the comm port of a standard 450. All "transmissions" performed by the simulator will always be scrolled across a window on the screen and the data may be captured to a disk file. This file may be viewed from within the simulator or the file may be used with a communication program to transmit the data after the simulator program is terminated. The Comm 1 port of the PC is configurable as the bi-directional port to the 450 simulator.

Setpoint Setup	Current State	
	In-Active	Active
Output 1	Black	Red
Output 2	Black	Red

Table 22-1 Setpoint Status Color Chart

data sent out the comm port is captured into a file.

To specify the file to which comm port data is captured to, press **[ALT]-[F2]**. A screen will be displayed which shows the status of all the file re-direction and it allows you to specify a new file name. Simply enter the file name and then set the file re-direction **ON**. Any subsequent transmission out that port will be captured into the specified file.

Similarly, to capture data sent out the comm port press **[ALT]-[F3]**.

This feature is employed to transfer setups from the simulator to your target 450 indicator. Once the simulator is setup as desired, simply specify a file for either the comm port re-direction. Then go to the setup download parameter, P64000, by keying in 64000 **[SELECT]**. Press **[ENTER]**. The setup will then commence being downloaded to the specified file. After a few seconds of inactivity or upon exiting the simulator, the file buffers are flushed and the entire file is saved to disk.

Loading in a Setup File: Similar to the 450 itself, the 450 simulator's setup can load its setup from a disk file. Simply press **[ALT]-[F1]**, specify the file name to be loaded, turn the file on, and watch as the setup gets loaded into the simulator. A small window will appear in the lower right corner of screen specifying that an input file is being processed. When the entire file has been processed, the window disappears.

As with the 450 itself, the simulator need not be in any particular mode when the setup file is begun to be processed. As long as the 450 or simulator is not in an intermediate mode (such as at the prompt to key in the access code or in the middle of an entry, etc...) then the file may be loaded, assuming the file uses the standard format established by GSE, ie it starts with the access code "23640%i%e" and proceeds with the parameter names and selections.

22.5 Setpoint Window

A window which displays the status of the **two** setpoints appears in the upper right corner of the screen whenever one of the setpoints first change state. The window may be toggled on and off with the **[F2]** key. The setpoints are represented by the terms OUT1 and OUT2. The state of each setpoint is indicated by its color. Refer to table 22-1. The setpoints are associated with a selected Standard Program in the 450. Refer to the chapters entitled Standard Program Operations and Setpoints/Logic Outputs.

Standard Setpoint Programs: Refer to the setpoint

status window (**[F2]**) to check which one of the standard setpoint programs is in operation. The top of the window will indicate which program is selected ie. (Batch). The standard programs are selected at P5100. Refer to the chapter titled Standard Program Operations for more information on this feature.

Setpoint Status: Refer to the setpoint status window (**[F2]**) to check on the status of any of the two setpoints at any point in time. The current state of the setpoint may be checked at a glance by comparing the color of the setpoint to the color code chart at the bottom of the window.

22.6 Terminating The Program

The simulator program is normally terminated by pressing the **[ESC]** key. This causes a message to appear asking if you are sure you want to exit the simulator program. Press **[Y]** or **[y]** to exit the program or any other key to continue running the simulator. **[ALT-X]** will also proceed to exit the program. Then proceed to press **[Y]** or **[y]** to exit the program or any other key to continue running the simulator.

After the program terminates, several lines of information are displayed on the screen which indicate GSE's address and the version of the simulator that was running.

If for some reason the simulator appears to have locked up your computer, pressing **[Ctrl] [C]** or <^C> may still be functional aborting the simulator program.

Just as with an actual 450, if you make changes in the setup mode and you **do not** save your changes then the new setup **will not** be saved.

22.7 Additional Benefits

Other features which make the simulator a valuable tool are listed below:

- Alpha input possible without scrolling through the alphabet or hooking up and external device.
- It forces you to create a computer disk file with the setup provided to a customer. This can be useful during repeat sales, attempting to simulate problems, or setting up a loaner or replacement unit during servicing.
- Portions of previously created indicator setups may often be re-used in other applications, reducing future setup efforts.
- You don't need to have an indicator available to begin setting up an application or experiment with a new idea.
- The state of the **two setpoints** is shown in a window allowing for easy verification of the status of any setpoint without needing any of the actual setpoint hardware.

22.8 Model 455 Simulator

Pressing the combination [ALT-K] will toggle to the 455 simulator version. This key combination will toggle between the 450 and 455 simulator versions. Access the on-line help text for more information.

22.9 Other Interesting Notes

Work is currently in process to allow an editor to be invoked from within the simulator and possibly to allow a DOS shell to be opened temporarily. Also, we may allow a directory listing to be displayed to help choose a file name to open.

22.10 Updated information for Specific Version of the Simulator Software

To access information about your version of the GSE Simulator Software not described in this chapter, press **[F1]** on your computer for information specific to the version you are running. Upgraded versions of *all* GSE Simulator software are available to users with original version copies *purchased through* GSE. Contact GSE for more information.