Froggy Operating System

User's Manual

Version 3.0

Created by: Sophia David, Makayla Davis, Andrew Hay, Kerrigan Ranshaw

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Introduction:

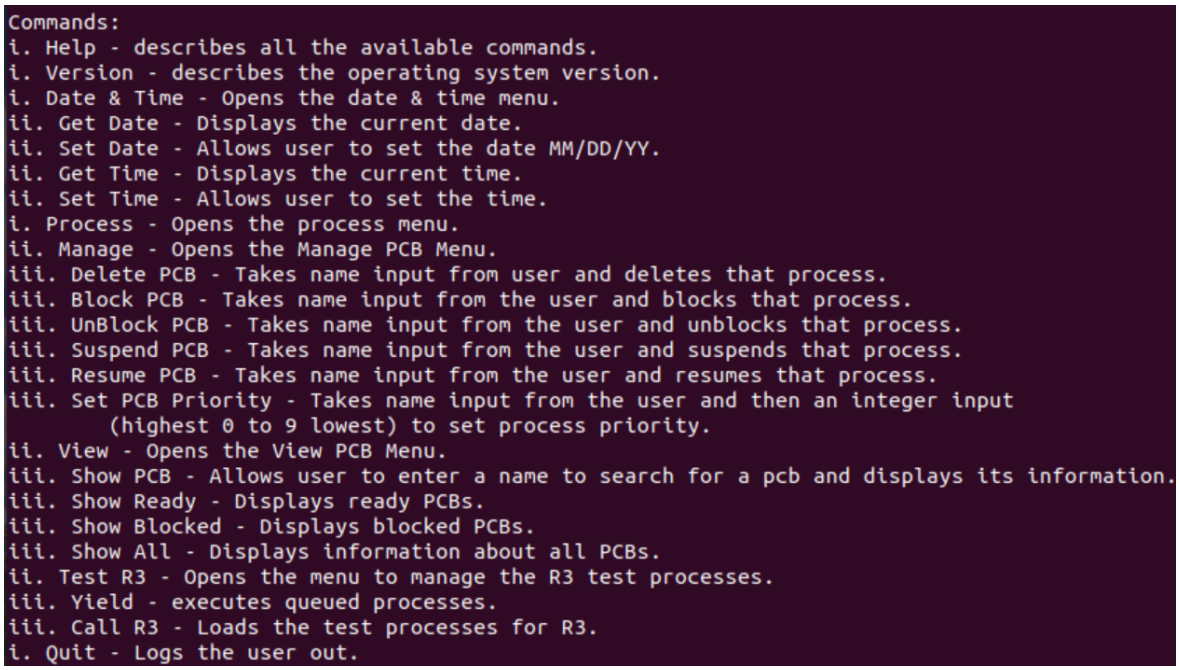
FroggyOS is an operating system that works by the user selecting options from a menu. The first implementation of this system allows for limited functionality. There are currently seven commands that the operating system can handle: Help, Version, Get Date, Set Date, Get Time, Set Time, Process Control Block Functions, Test R3 Functions, and Quit. Upon booting up the machine, the terminal will present the user with a menu of commands that they are able to run. *Figure 1* shows the menu upon firing up the system.

To call a command the user must simply type the number associated with the command and press the enter key. This will then call the command and perform the actions associated with it.

Commands:

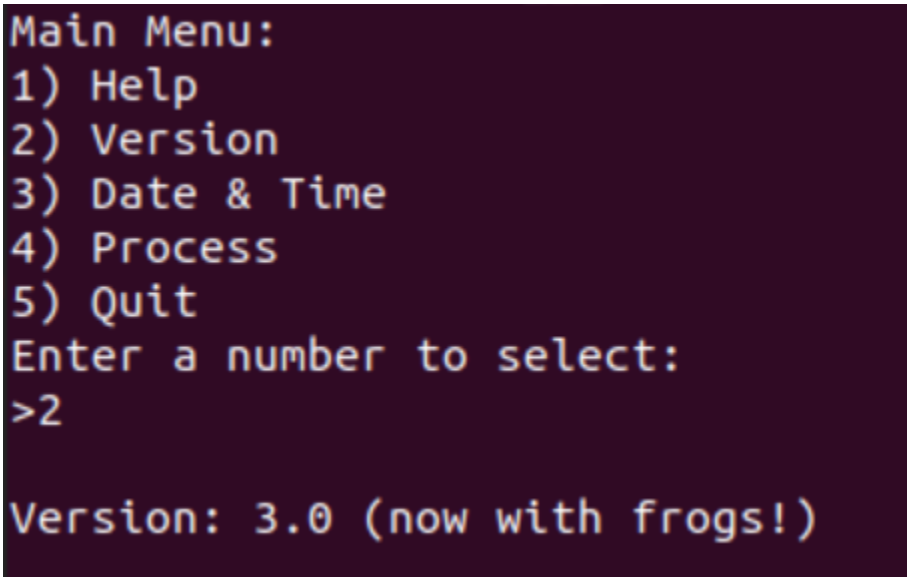
Help:

This command shows the user a list of all of the functions and a brief description of what they do. To call the Help command, the user must first start up the Operating System. Upon the booting of the machine, the user will be prompted with a list of commands. The help function can be called by the user by typing the number 1 in the terminal and pressing enter. *Figure 2* shows the output when the help command is called.



Version:

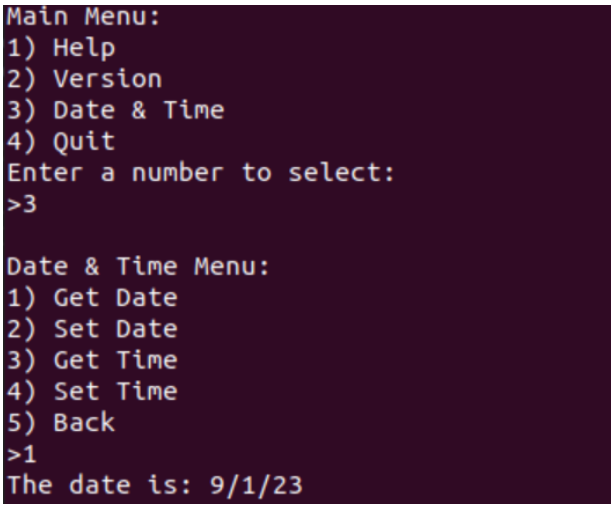
The version is the particular form of the OS that differs in certain respects from other and/or earlier forms of the OS. As this is the first implementation of the FroggyOS, there are no earlier/other versions. The current implementation is Version 3.0. The user can obtain this information by selecting the Version command in the user menu. To call this command the user must select the second option in the menu: type the number 2 and press the enter key. This will then output a line that says "Version 3.0". *Figure 3* shows the process of calling the Version command.



Upon later releases and updates, there will be more versions of FroggyOS.

Get Date:

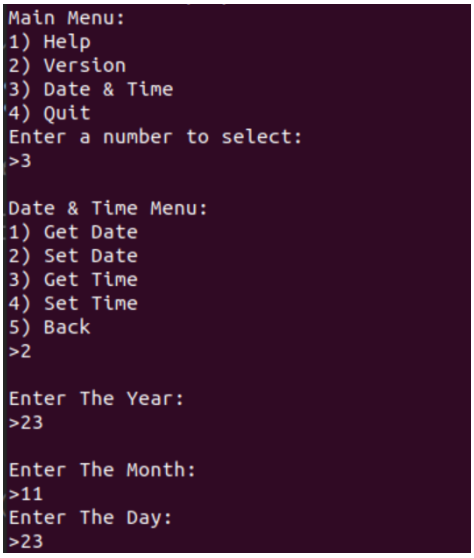
For the user to see the current date of the system, they can use the ‘get date’ command. This command will output the date in a 6-digit format (MM/DD/YY). First the user must select the date and time option from the menu by typing in the corresponding number and pressing enter. This will then present the user with a new date and time menu. Get date will be the first option on the list and can be selected by inputting the number associated with it. *Figure 4* shows an example of this process.



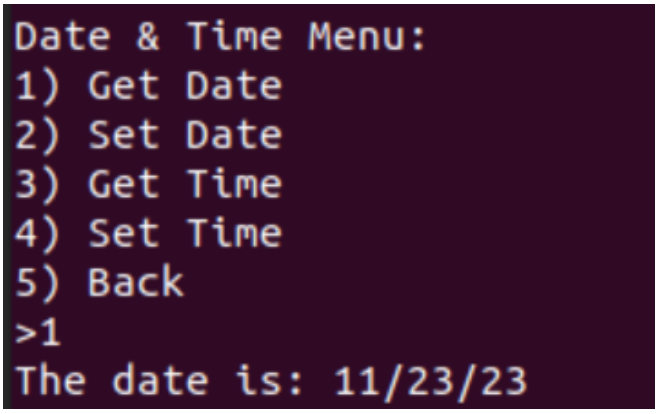
Once the get date command is selected, the date that is saved in the system will be output.

Set Date:

The set date command can be accessed through the date and time selection on the main menu. Once date and time is selected from the main menu, the user can then select the set date command, this is the second option in the date and time menu. The user will then be prompted to input the month, day, and year that they wish to set the date to. *Figure 5* can show this process in use.

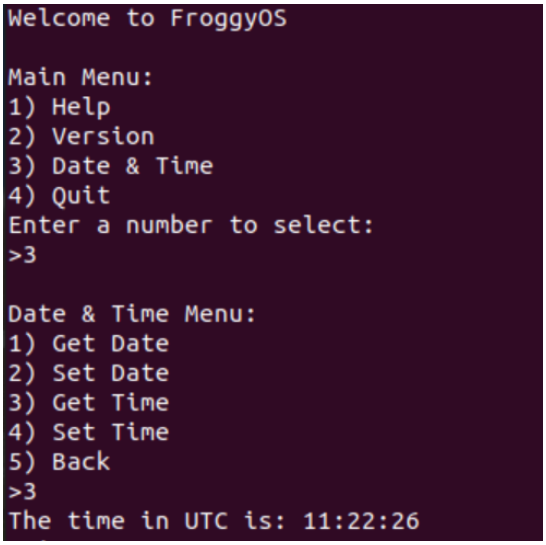


The get date command can then be used to see the updated date. *Figure 6* shows the date after the set date command is called.



Get Time:

The get time command works similarly to the get date command. The user must select the date and time option from the main menu inorder to navigate to the date and time menu. The get time command is the third option on the menu, and can be called by inputting the corresponding number. Once the number 3 is typed and enter is pressed, the machine will output the current time it is holding in its registers. The time being held is set to UTC or coordinated universal time. *Figure 7* shows the process of calling the get time command.



Set Time:

Just as get date and get time work similarly, set time works the same as set date. First the user must navigate from the main menu to the date and time menu, by selecting option 3. Once the date and time menu is showing, the user can then select option 4 on the list, or set time. Upon calling the command, the user will be prompted to input the seconds, the minutes, and the hours in which they wish to set the time to. This is done by typing the desired number(s) then pressing enter. *Figure 8* shows the process of setting the time.

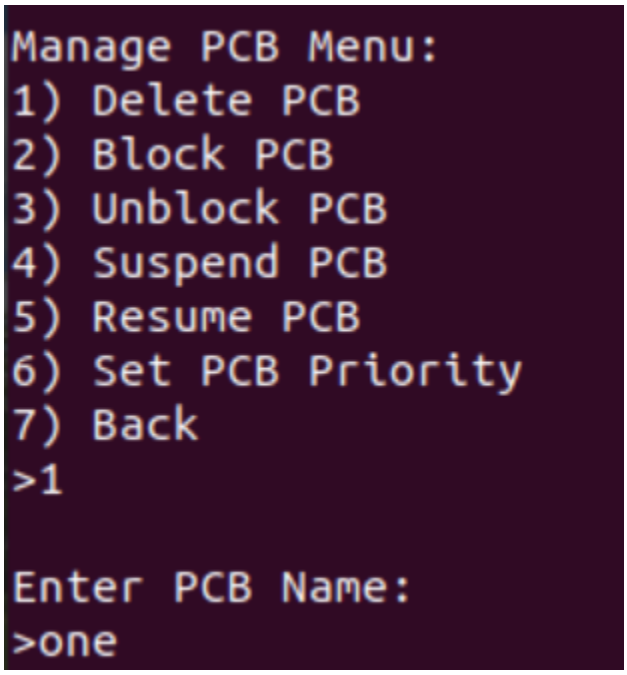
```
Main Menu:
1) Help
2) Version
3) Date & Time
4) Quit
Enter a number to select:
>3

Date & Time Menu:
1) Get Date
2) Set Date
3) Get Time
4) Set Time
5) Back
>4

Use 24 hr formating for the following entries:

Enter The Hours:
>12
Enter The Minutes:
>12
Enter The Seconds:
>12
```

To ensure that the time was updated correctly, the user can then run the get time command and see that the result is what they set it to. *Figure 9* shows this process, and the reason that the seconds have changed is because it takes a few seconds to call the get time command after the time has been set.

```
Main Menu:
1) Help
2) Version
3) Date & Time
4) Quit
Enter a number to select:
>3

Date & Time Menu:
1) Get Date
2) Set Date
3) Get Time
4) Set Time
5) Back
>3
The time in UTC is: 12:12:18
```

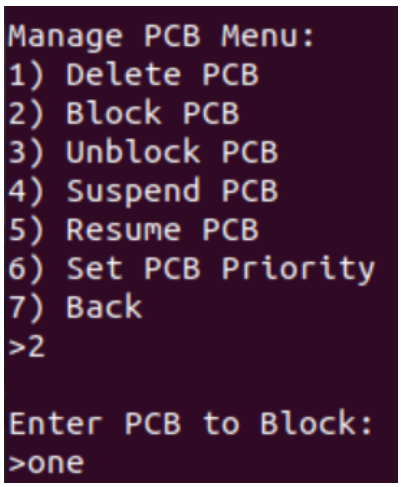
Delete PCB:

For the user to delete a process control block (PCB), the user must first select the option “Process”, number 4 from the menu. This will then reveal a separate menu, with options “manage”, “view”, and “back”. The delete command is in the manage menu, so the user must enter the number 1 to navigate into the manage menu. This menu will list the commands “delete”, “block”, “suspend”, “resume”, and “set priority”. To run the delete command, the user will type the number 1 and press enter. This will then prompt the user to enter the PCB name that they wish to delete. If the PCB name entered by the user is not an existing PCB, the system will throw an error message saying that it cannot delete a PCB that does not exist. It will then revert the user back to the PCB menu to try and enter the command correctly. *Figure 11* shows the process of a user calling the delete PCB command.



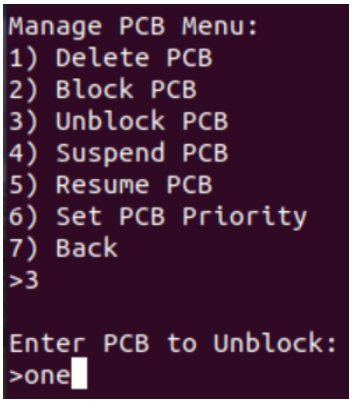
Block PCB:

The second option on the PCB manage menu is the Block PCB command. This command changes the state of a process to blocked. In order for the user to call this function, they must first navigate to the PCB manage menu, then the user can call the command by typing in the number 2, then pressing enter. The user will then be prompted to enter the name of the process in which they wish to block. *Figure 12* shows the process of this command being called.



Unblock PCB:

The third option on the PCB manage menu is the Unblock PCB command. This command changes the state of a process to unblocked or ready. In order for the user to call this function, they must first navigate to the PCB manage menu, then the user can call the command by typing in the number 3, then pressing enter. The user will then be prompted to enter the name of the process in which they wish to unblock. *Figure 12* shows the process of this command being called.



Suspend PCB:

The fourth option on the PCB manage menu is the Suspend PCB command. This command changes the state of a process to suspended. In order for the user to call this function, they must first navigate to the PCB manage menu, then the user can call the command by typing in the number 4, then pressing enter. The user will then be prompted to enter the name of the process in which they wish to suspend. *Figure 13* shows the process of this command being called.

```
Manage PCB Menu:
1) Delete PCB
2) Block PCB
3) Unblock PCB
4) Suspend PCB
5) Resume PCB
6) Set PCB Priority
7) Back
>4

Type PCB to Suspend:
>one
```

Resume PCB:

The fifth option on the PCB manage menu is the resume PCB command. This command resumes a process that had been suspended, or puts it in a non-suspended state. In order for the user to call this function, they must first navigate to the PCB manage menu, then the user can call the command by typing in the number 5, then pressing enter. The user will then be prompted to enter the name of the process in which they wish to resume. *Figure 14* shows the process of this command being called.

```
Manage PCB Menu:
1) Delete PCB
2) Block PCB
3) Unblock PCB
4) Suspend PCB
5) Resume PCB
6) Set PCB Priority
7) Back
>5

Type PCB to Resume:
>one
```

Set PCB Priority:

The sixth option in the PCB manage menu is the Set PCB Priority command. This command takes an existing PCB and changes it to a priority that the user wishes. The user can call the command by, first, navigating to the manage PCB menu. Once the command has been called the user will be prompted to insert the name of the PCB in which they wish to change the priority, and the new priority they wish to change it to. *Figure 15* shows the process of this command being called.

```
Manage PCB Menu:
1) Delete PCB
2) Block PCB
3) Unblock PCB
4) Suspend PCB
5) Resume PCB
6) Set PCB Priority
7) Back
>6

Choose PCB to Change Priority:
Type PCB Name:
>one

Type PCB Priority:
>2
```

Show PCB:

The Show PCB command allows the user to look at the details of a specific PCB given the name of the PCB. To call the command the user must navigate to the PCB view menu. The user can navigate to this menu by selecting “process” from the main menu, then “view” from the process menu. Show PCB is the first function in the PCB view menu. Once navigated to this menu the user can call Show PCB by entering the number 1, then pressing the enter key. The user will then be prompted to enter the name of the process in which they wish to view. *Figure 16* shows the process of this function being called.

```
View PCB Menu:
1) Show PCB
2) Show Ready
3) Show Blocked
4) Show All
5) Back
>1

 Enter PCB to Show:>one


Process Information:
Name: one
Class: 1
State: 0
Suspended Status: 3
Priority: 4
```

Show Ready:

The Show Ready command outputs a list of all PCBs that are in the ready state. To call the command the user must navigate to the PCB view menu. The user can navigate to this menu by selecting “process” from the main menu, then “view” from the process menu. Show Ready is the second function in the PCB view menu. Once navigated to this menu the user can call Show Ready by entering the number 2, then pressing the enter key. The terminal will then output all of the existing processes in the ready state, and if there are no processes in the ready state it will say so as well. *Figure 17* shows the process of this function being called.

```
View PCB Menu:
1) Show PCB
2) Show Ready
3) Show Blocked
4) Show All
5) Back
>2


Ready Queue:
Format: Name, Class, State, Status, Priority
r, 1, 0, 3, 1
rr, 1, 0, 3, 1


Suspended Ready Queue:
Format: Name, Class, State, Status, Priority
s, 1, 0, 4, 1
ss, 1, 0, 4, 1
```

Show Blocked:

The Show Blocked command outputs a list of all PCBs that are in the blocked state. To call the command the user must navigate to the PCB view menu. The user can navigate to this menu by selecting “process” from the main menu, then “view” from the process menu. Show Blocked is the third function in the PCB view menu. Once navigated to this menu the user can call Show Blocked by entering the number 3, then pressing the enter key. The terminal will then output all of the existing processes in the blocked state, and if there are no processes in the blocked state it will say so as well. *Figure 18* shows the process of this function being called.

```
View PCB Menu:
1) Show PCB
2) Show Ready
3) Show Blocked
4) Show All
5) Back
>3


Blocked Queue:
Format: Name, Class, State, Status, Priority
b, 1, 1, 3, 1
bb, 1, 1, 3, 1


Suspended Blocked Queue:

Suspended Blocked Queue is Empty
```

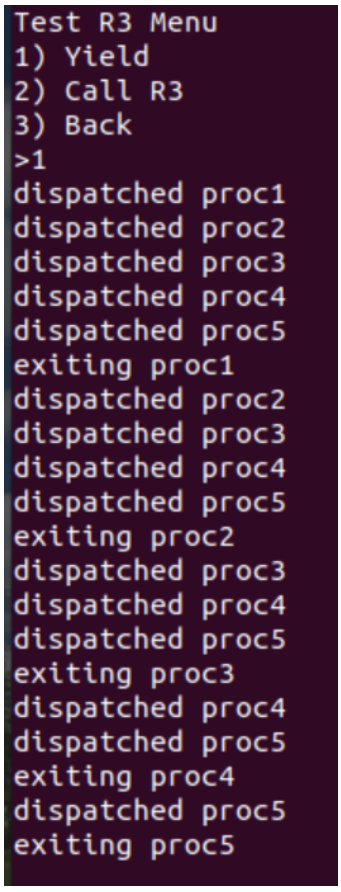
Show All:

The Show All command outputs a list of all of the existing PCBs, no matter the state. To call the command the user must navigate to the PCB view menu. The user can navigate to this menu by selecting “process” from the main menu, then “view” from the process menu. Show All is the fourth function in the PCB view menu. Once navigated to this menu the user can call Show All by entering the number 4, then pressing the enter key. The terminal will then output all of the existing processes, and if there are no processes it will say so as well. *Figure 19* shows the process of this function being called.

```
View PCB Menu:
1) Show PCB
2) Show Ready
3) Show Blocked
4) Show All
5) Back
>4


Ready Queue:
Format: Name, Class, State, Status, Priority
r, 1, 0, 3, 1
rr, 1, 0, 3, 1


Suspended Ready Queue:
Format: Name, Class, State, Status, Priority
s, 1, 0, 4, 1
ss, 1, 0, 4, 1


Blocked Queue:
Format: Name, Class, State, Status, Priority
b, 1, 1, 3, 1
bb, 1, 1, 3, 1


Suspended Blocked Queue:

Suspended Blocked Queue is Empty
```

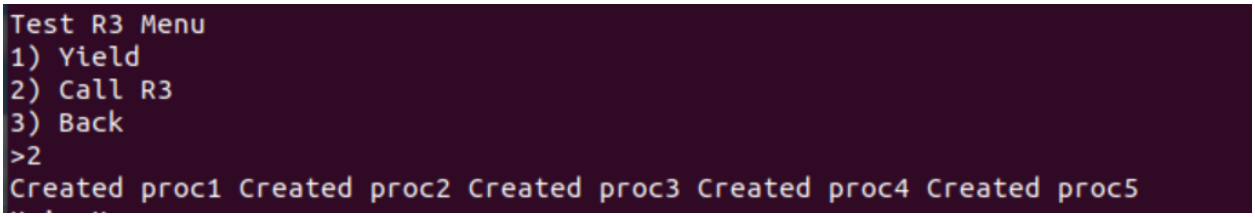
Yield:

The yield command can be found in the Test R3 menu. One can navigate to it by selecting option 5 on the menu. This can be done by typing “5”, then pressing the enter key. Once the Test R3 menu has loaded, the user will be given three options: Yield, Call R3, and Back. Yield can be called by typing the number 1 then pressing the enter key. This function will execute or yield the processes that are created when the user calls the “Call R3” command. If the user runs yield before R3 there will be error messages. *Figure 20* shows the yield command being called and its correct output.



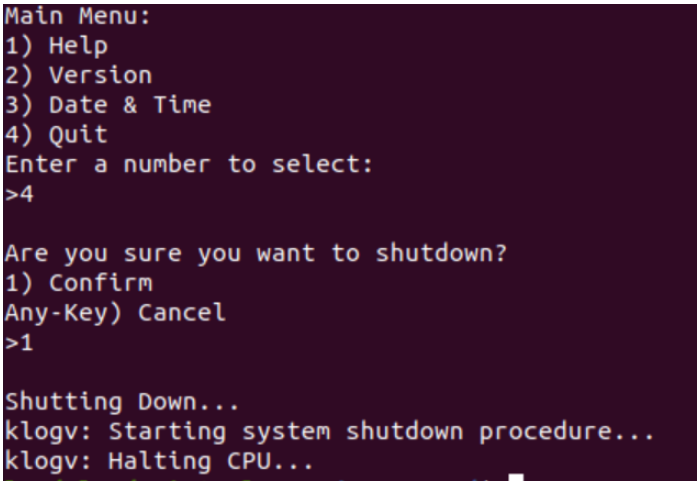
Call R3:

The second option in the Test R3 menu is the Call R3 command. This function loads the given test processes from processes.h. To call this command, the user must type the number 2 then press the enter key. Once this is done, the processes will be created and queued. To execute the processes, the user will have to call the yield command. *Figure 21* shows the process of calling Call R3.



Quit:

To close the system, the quit command will do so. To execute the command, first the user must select option 4 by typing the number in and pressing enter. Then the user will be prompted again to confirm that they would like to close the process. To confirm the shutdown, the user must type 1 then press enter, to cancel the shutdown the user can type any key then press enter or just simply press enter. *Figure 21* shows the process of shutting down the system.



Back (Sub-menus):

If the user navigates into a sub-menu, such as Date & Time, Process, Test R3, Process View, or Process Manage, they can call the last command in that menu called “back”. This allows the user to seamlessly go back to the previous menu. *Figure 21* shows the back command in use.