

# QUICKTOOLS<sup>®</sup> FOR THE IBM PC<sup>®</sup>

USER'S MANUAL



FLUKE AND PHILIPS  
THE T&M ALLIANCE

**FLUKE**



# **QUICKTOOLS<sup>®</sup>**

*FOR THE IBM PC<sup>®</sup>*

## **User's Manual**

P/N 852462

June 1988

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# Section 1

## Getting Started

### INTRODUCING QUICKTOOLS

QuickTools™ software makes remote operation of the Fluke 90  $\mu$ P Board Tester (the Tester) as easy as using the Tester's front panel. Here are the major features of QuickTools:

1. QuickTools is a communication tool for controlling the Fluke 90 remotely.
  - Records or prints either an entire interaction (commands and responses) between an IBM PC\* or a true compatible and the Fluke 90, or just the commands.
  - Assures correct remote command syntax through pop-up prompting.
2. QuickTools creates and executes sequences of Fluke 90 commands.
  - Performs user-definable actions on failure.
  - Executes short sequences with function keys.
  - Permits following the execution of command sequences either in full detail, or by observing only the labels of statements as they execute.
  - Includes a built-in program editor featuring pop-up command syntax prompting.

### ABOUT THIS MANUAL

QuickTools software is easy to use because it provides help to new users, but the built-in aids can be turned off later as familiarity increases. The manual has been designed similarly. It is structured as a series of exercises presented in an order most useful to a new user.

### You Already Know...

This manual is most effective if you are already familiar with the setup and general operation of the Fluke 90 and the IBM Personal Computer. In particular, you should know how to:

- Locate and connect the serial port
- Plug in and turn on the PC
- Load the operating system (DOS)
- Specify a path and filename (e.g., C:\QKTLS\qt.exe)
- Specify a pattern for matching (e.g., DIR A:\\*.TST)
- Change the active drive
- Start up an application program
- Use an editor program to add information to a file

You should also be able to use these DOS commands effectively:

MKDIR	(make directory, e.g., MKDIR C:\QKTLS)
DIR	(show directory listing)
COPY	(copy a file, e.g., COPY A:\*.* C:\QKTLS)
CD	(change working directory, e.g., CD C:\QKTLS)

You may need to refer to the appropriate sections of your computer's operation manual if you are unsure about how to use these commands.

### How This Manual is Organized

The QuickTools manual is arranged as a group of tasks, presented in the order that most new users need to perform them.

- |           |   |
|-----------|---|
| Section 1 | is an introduction to the QuickTools software and this manual, and shows how to connect the PC, Fluke 90 Tester, and your UUT in preparation for testing. |
| Section 2 | takes you through a practice QuickTools session in which you begin developing a test program for your own UUT.  |
| Section 3 | continues the development of the test routine while explaining how to use the QuickTools editor.  |
| Section 4 | explains how to run the test routine that is being developed.   |
| Section 5 | adds some enhancements to the test routine and shows how to include some sophisticated features.  |
| Section 6 | is a reference to all the QuickTools menus.   |



## SYSTEM REQUIREMENTS

QuickTools software is designed to run on the IBM PC, PC-XT, and PC-AT or compatibles. The software runs on systems under DOS version 2.1 or later. If you have an earlier version of DOS, you must update it before attempting to run QuickTools.

### Hardware Compatibility

If you intend to use a system other than an IBM personal computer for running QuickTools, the computer must meet certain criteria to be truly hardware compatible.

1. QuickTools communication drivers communicate directly with two components at the serial port:

Intel\* 8259A Programmable Interrupt Controller  
National Semiconductor\* 8250 or 16450 UART

All IBM systems and most compatibles use these parts, but if your compatible does not, QuickTools may not communicate properly.

2. QuickTools screen drivers directly address the following standard IBM (or compatible) display boards:

Standard monochrome display  
Enhanced Graphics Adapter (EGA)  
Color Graphics Adapter (CGA)  
Video Graphics Array (VGA)

If your system is compatible as described here, skip to the next section, titled "Setting Things Up."

3. However, QuickTools provides an alternative screen output that does not directly access the display board. Instead, the alternative output uses MS-DOS ANSI.SYS drivers. To make use of the alternative screen output requires you to install device drivers on the bootup disk. Include the following line in the file CONFIG.SYS:

DEVICE=ANSI.SYS

If ANSI.SYS was not specified in CONFIG.SYS at bootup, reboot so the PC will load the ANSI console driver.

\*Intel is a registered trademark of Intel Corporation.

\*National Semiconductor is a registered trademark of National Semiconductor Corporation.

### Setting Things Up

1. Make a backup copy of the QuickTools disk and put the original away for safekeeping. Use the copy for day-to-day operations.

#### CAUTION

**Memory Resident programs may cause a loss of serial data when running QuickTools. Your autoexec.bat file may be executing a program that stays active after returning automatically to DOS. It may be necessary to edit or remove the autoexec.bat file and reboot.**

2. Connect the IBM PC serial port (RS-232) to the Fluke 90.
3. Connect the Fluke 90 to a known good Unit Under Test (UUT). Do not connect a defective UUT until you are familiar with the way QuickTools works. Refer to the Fluke 90 Operator's Manual if you do not know how to make this connection.

The cable provided with your Fluke 90 fits most 25-pin IBM serial port connectors, but if you need an adapter, consult your local Fluke representative. You can perform most QuickTools operations even without the adapter, but the practice session in Section 2 assumes that the PC and the Tester are connected and that a working UUT is connected for testing.

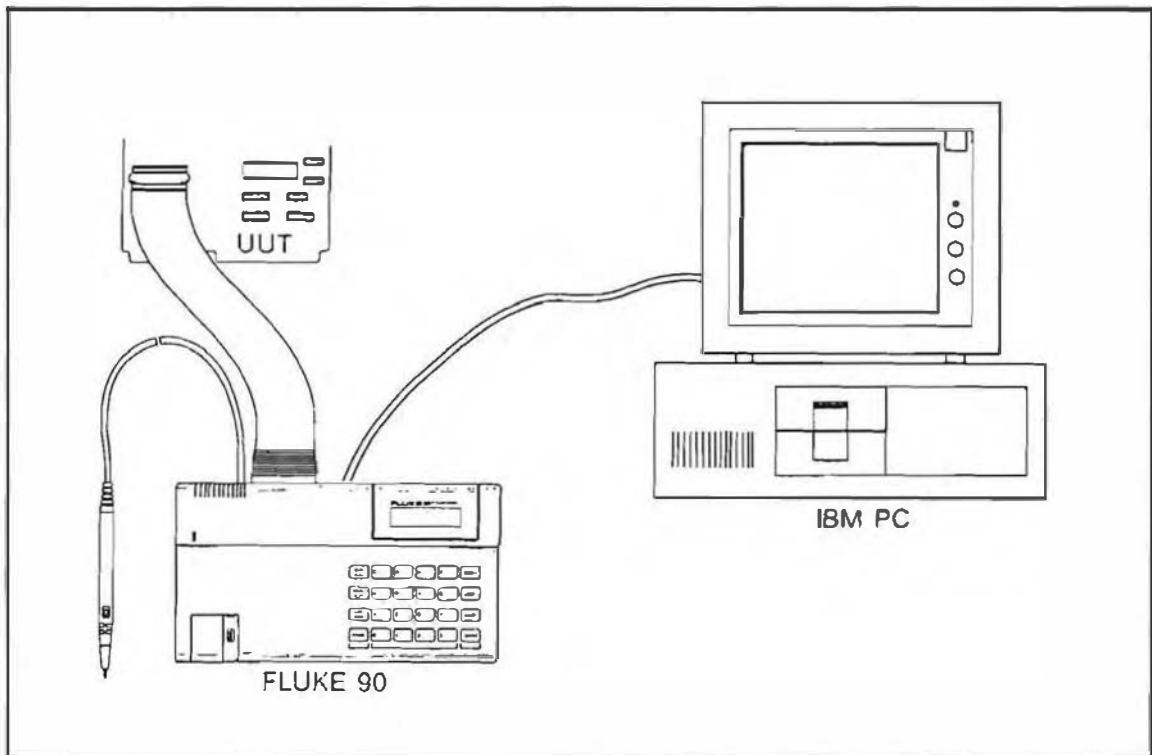


Figure 1. Connections Between IBM PC, Fluke 90  $\mu$ P Board Tester and UUT

## INSTALLING QUICKTOOLS ON A HARD DISK

If you have a hard disk, you can install QuickTools there to take advantage of its speed and convenience.

1. Change the default drive to the hard disk.
2. Make a directory using the DOS command MKDIR QKTL5.
3. Insert the QuickTools floppy disk and copy all files to the new hard disk directory. Assuming the floppy drive is drive A: and the hard drive is C:, the copy command would be:

```
COPY A:*. * C:\QKTL5
```

## GETTING AROUND IN QUICKTOOLS

QuickTools is easy to learn and to use. All operations are selected from menus.

To select a menu item from the Main Menu:

Simultaneously press <Alt> and the key that corresponds to the upper case letter in the selection. For example, to select Setup, press <Alt> s.

To select a menu item within Submenus:

Move the current selection using the arrow keys (↑ ↓), then press the Enter key. (The Enter key is shown in this manual as ↵.)

**OR**

Press the key that corresponds to the upper case letter in the selection. For example, to select Warning beeper from the Setup menu, press **w**.

Entry Fields:

Filenames and other editable selections are displayed in reverse video to indicate that they can be modified. Use the following keys when working with entry fields:

- <INSERT> toggles between Insert and Typeover modes.
- <DELETE> deletes the character at the cursor position.
- <BACKSPACE> deletes the character to the left of the cursor position.
- <CTRL> <END> deletes all of the field to the right of the cursor.
- ← and → move the cursor a character at a time within the field.
- <HOME> moves the cursor all the way to the left end of the field.
- <END> moves the cursor all the way to the right end of the field.



## Section 2

# A QuickTools Session

The session described here gets QuickTools operating right away and introduces you to most of its features.

### **STARTING QUICKTOOLS FOR THE FIRST TIME**

Boot DOS. Insert the QuickTools floppy disk, and change the default drive to the one where QuickTools is loaded. To start QuickTools, type:

```
QT ←
```

If you are using the ANSI drivers, start QuickTools by typing:

```
QT -A ←
```

When you start QuickTools, the Main Menu appears on the display. Each time you start QuickTools, the message “<Alt> H for Help” is flashing in the lower right corner. Try it. After reading the help screen, return to the main menu by pressing <Alt> x.

# A QUICKTOOLS SESSION

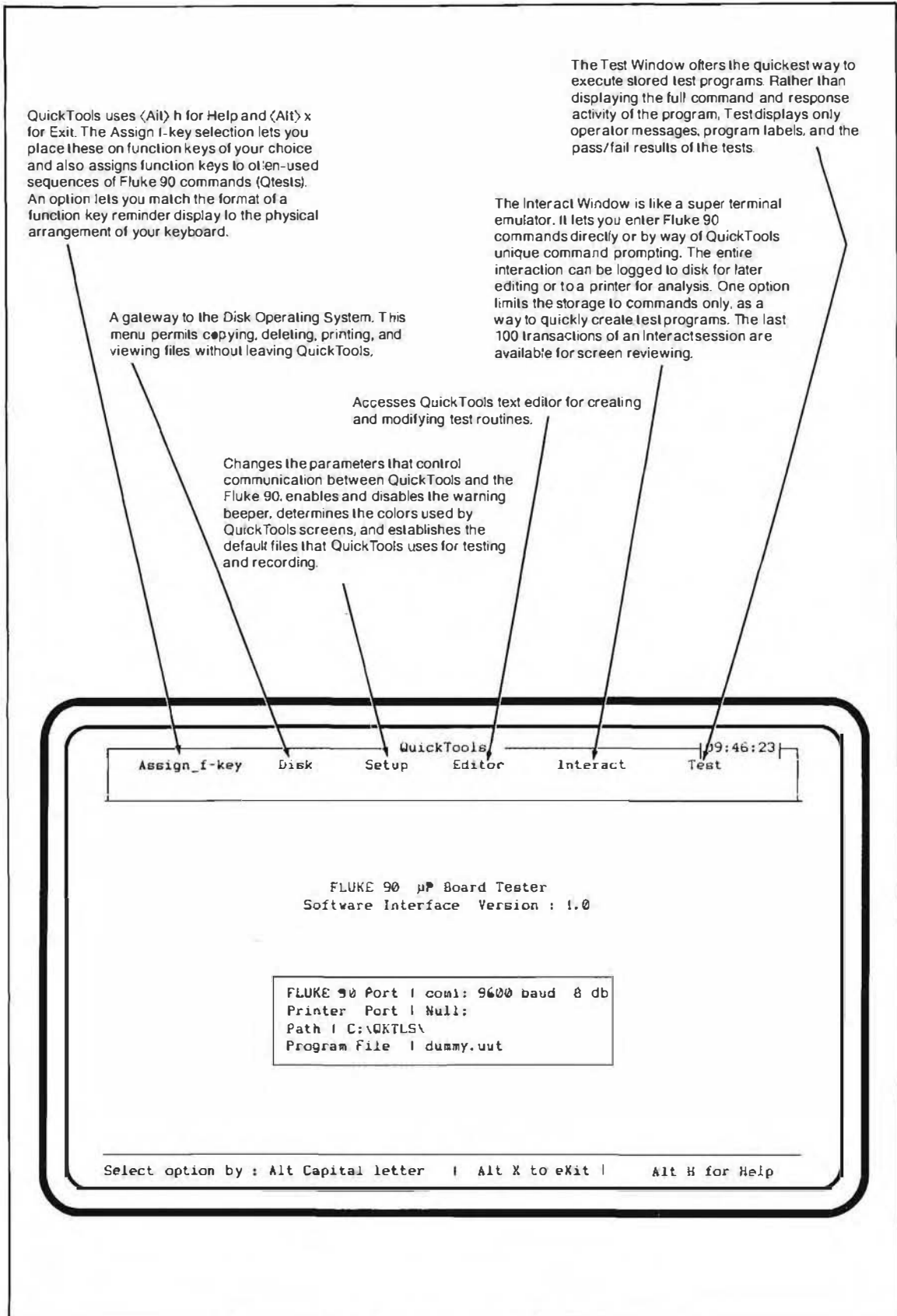


Figure 2. QuickTools Main Menu

### Your Screen Doesn't Look Like This?

If you do not see the display shown in Figure 2, make sure that you have done the following:

- Correctly loaded DOS Version 2.1 or later
- Used the correct command to start up QuickTools: QT

**OR**

- For the alternate display mode, started QuickTools using QT -A
- If necessary, placed the ANSI.SYS device driver on the same disk as DOS. This must be the ANSI.SYS that was supplied with your system disk.
- Booted the system with the CONFIG.SYS file specifying DEVICE = ANSI.SYS

Until QuickTools is running, any error messages come from the operating system. If DOS reports no errors, but you don't see the screen shown here, check out these possibilities:

- Odd characters seem to be filling the screen  
There is a problem with the ANSI.SYS driver. Be sure you have correctly configured the disk.
- The screen has little contrast or appears blurry.  
Some monochrome PC's may display color poorly. Go to the Setup Menu (Alt s), press the C key (color), then press the A key (all areas of the screen to monochrome). Press <Alt> x to go back to the Main Menu.

If all these things are correct, you may have a defective disk. In this case, make another QuickTools backup disk and try again.

To exit from QuickTools, press <Alt> x from the Main Menu.

## SET THE COMMUNICATION PARAMETERS

At the Main Menu, press <Alt> s.

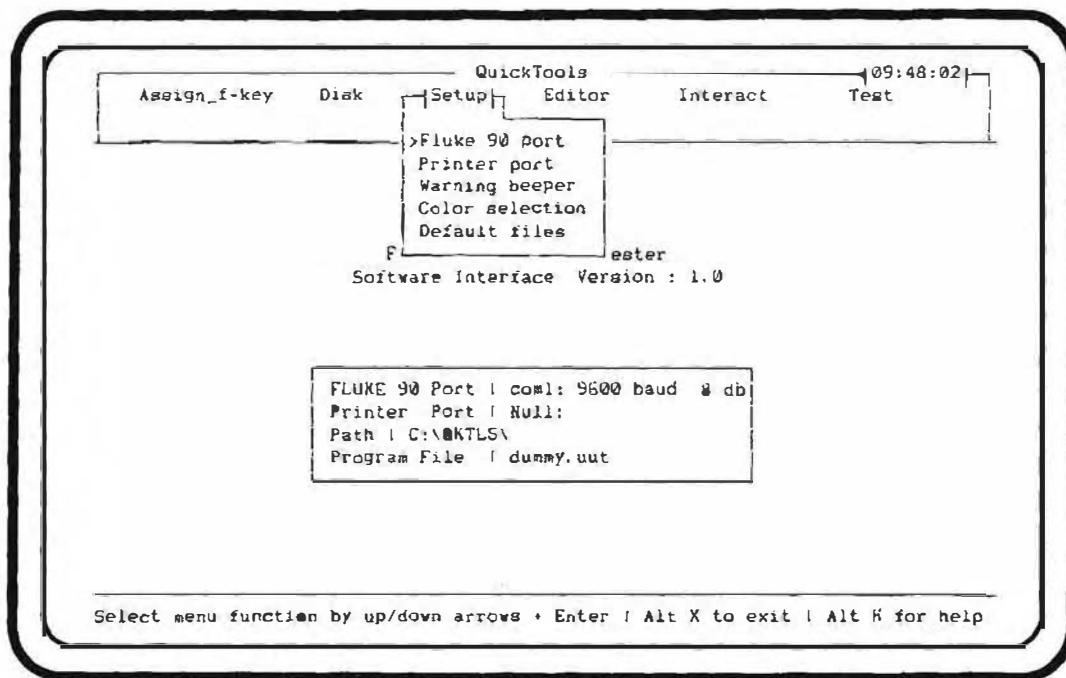


Figure 3. Setup Menu

Use the following steps to set up the Fluke 90 port.

1. If the Fluke 90 port selection is already highlighted, you can just press **↵**. If it is not highlighted, either use the arrow keys to move there, then press **↵**, or press the **f** key (Fluke 90 port).
2. Press either **1** or **2**, depending on whether the Fluke 90 is connected to COM1 or COM2.
3. Press **8** to select 8 data bits.
4. Press **9** to select 9600 baud and return to the Setup Menu.



## What You Have Accomplished

By making the Fluke 90 selection from the Setup Menu, you have defined the communication link between the Tester and the PC.

●n power up, the Fluke 90 sets itself to communicate using eight data bits and 1200 baud. Serial communication requires both devices to be set the same, so QuickTools automatically sets both the PC and the Fluke 90 to the selected parameters. For example, you may prefer to operate at a higher speed. Doing so only requires that you change the baud rate selection in the Setup Menu.

QuickTools first establishes communication with the Tester, resets its communication parameters, then resets the PC to match.

## START UP THE INTERACT WINDOW

The Interact Window provides one of the most powerful features of QuickTools: a way to send remote commands to the Tester and immediately see the results. An interact session is usually the first step in test routine development because it interactively tests the UUT. Later the commands are combined into a test routine.

To exit the Setup Menu, press:

<Alt> x           to return to the Main Menu, or,  
<Alt> i ←       to go immediately to the Interact Window

Before it starts an interactive session, QuickTools first displays the name of the default Program File, the one that QuickTools will load and prepare to run in the Interact session. Brand new copies of QuickTools uses an empty file called DUMMY.UUT as the name of the default Program File.

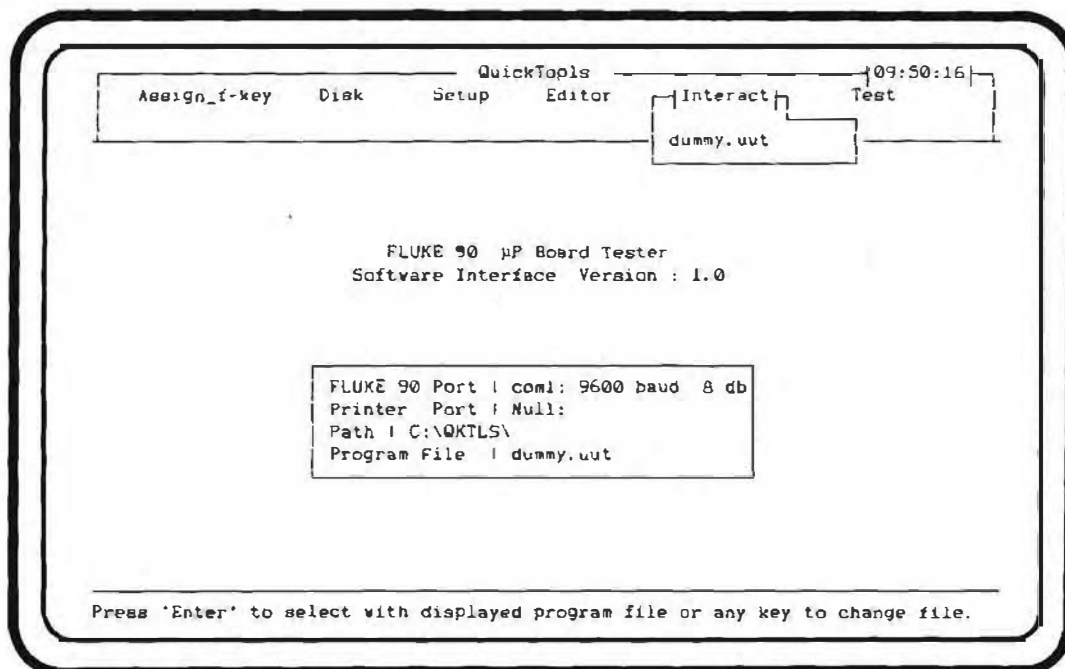


Figure 4. Interact Window Showing the Default Program Name

## A QUICKTOOLS SESSION

Pressing **←** activates the Interact window and establishes a communication link between the PC and the Fluke 90. The screen should look like the next illustration.

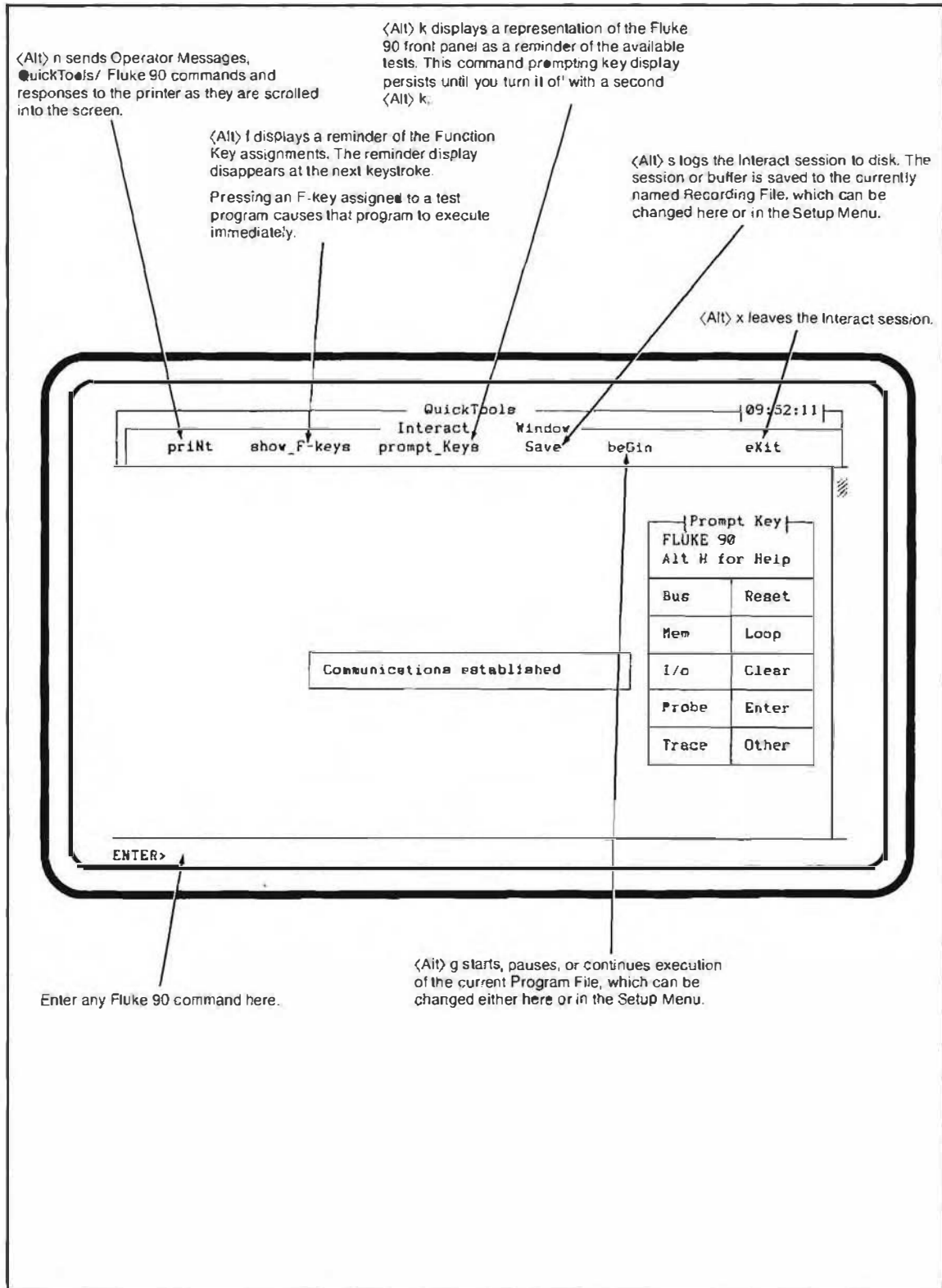


Figure 5. The Interact Window

## Run a Bus Test

Whenever the Tester is ready to accept a command, the remote command prompt ENTER> appears on the bottom line of the PC display.

Run Test Bus by typing:

<Alt>b to display bus tests, ← to select test bus.

Observe the display. QuickTools has generated the remote command syntax for a Test Bus (BT) and sent it to the Fluke 90. While QuickTools is waiting for the Tester's response, the command line displays

...working... ALT\_C to cancel.

## Run a Memory Test

Type <Alt> m. Notice that the QuickTools command prompting display changes to show the available memory tests.

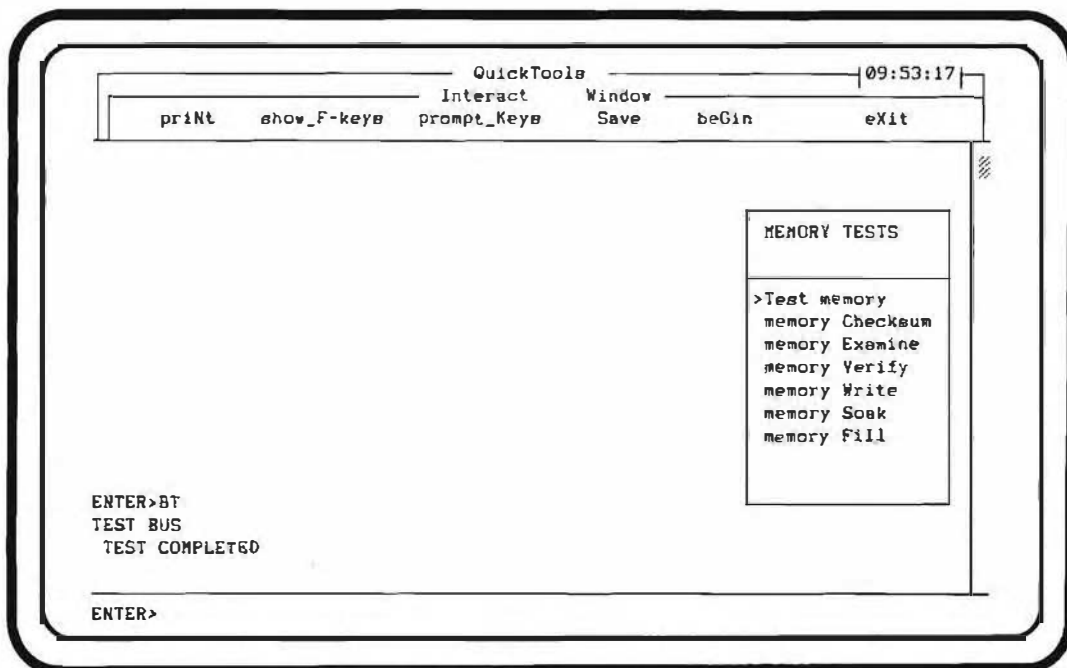


Figure 6. Memory Tests

Use the following steps to run a memory test.

1. If the Test memory selection is not highlighted, use the arrow keys to select it, then press `↵`.
2. QuickTools prompts for a beginning address. To begin the test at the displayed address, just press `↵`. To change the address, press `<HOME>` to go to the left, then delete the old address by pressing `<CTRL> <END>`. Type in the lowest RAM address of your UUT. When the address is correct, press `↵`.
3. QuickTools now prompts for an ending address and supplies 00FF, the default. This time to change the address, just type the new address. The editor always starts in typeover mode.
4. To send the command, press `↵`. Observe the display. The return of the `ENTER>` prompt indicates that the Tester is ready for the next command. To send the command again, press `↑` then `↵`. To change the command, press `↑`, then edit the line before pressing `↵`.
5. Run the same test a few times, trying out different address ranges. If the ending address is lower than the beginning address, the tester responds with `???`, indicating it is unable to complete the command.

Each command is redisplayed above the `ENTER` line. The buffer you are seeing can be printed out, saved on the disk, or edited.

### What You Have Accomplished

The Interact Window opens communication with the Fluke 90 and sends remote commands to it. In these few minutes, you have already used QuickTools' powerful command syntax generator. You never need to remember the name or syntax of Fluke 90 commands, because QuickTools takes care of that for you.

When you changed the beginning address, you used the QuickTools editor for the first time. The editor's capabilities are fully explained in Section 3.

By sending the BT and MT commands, you have checked the UUT bus and the RAM address range you entered.

### Run the Same Two Tests, Saving the Interaction

To prepare to save the interaction:

1. Select Save from the Interact menu.
2. Select disk On.
3. Select commands Only. You will be asked to name the Recording file.
4. For now, name the new file something easy to remember, like MYTEST.IST. If the file you name already exists, a message appears stating that the commands you enter will be appended to the existing file.

**CAUTION**

QuickTools reserves two filenames for its own use:

INIT__QT	VAL
TEMP__QT	DIR

The INIT\_\_QT file stores values that QuickTools uses from one session to the next, like the screen colors and default filenames. The TEMP\_\_QT directory is a temporary file created and deleted during QuickTools operation.

Now, repeat the Bus Test and Memory Test that you performed earlier in this section. The commands you send to the Tester are logged to the file named MYTEST.1ST.

Stop recording by selecting Save, then Disk off. (Leaving the Interact Window automatically closes the disk file for you.)

If you selected “Complete Data” in step 3 above, the responses would also be recorded. However, in this case, the file could not be Run until the responses were edited out.

**Run the Recorded Test Routine**

Once the test routine has been recorded to disk, it is always available for execution. Run the test routine you have just saved.

1. While you are still in the Interact Window, select beGin. QuickTools asks for a file name to begin running, showing the last named Program file. Change it to MYTEST.1ST.
2. Press **←-F** to run the test named in the pop-up window. Observe the display. As the tests run, the commands are displayed as they are sent, alternating with the Tester’s responses. A message window indicates QuickTools program activity. QuickTools displays two messages, first:

**Loading MYTEST.1ST**

and finally:

**Program complete**

3. Leave the Interact Window by pressing **<Alt> x**. QuickTools asks for confirmation because exiting clears the transaction records.

**Possible Problems**

If something didn’t work correctly when you ran the new test routine, it may actually indicate normal operation! The Tester attempts to interpret everything QuickTools sends as a remote command. Check for the following possible problems:

- If the tester doesn’t recognize a line as a valid Fluke 90 remote command, it returns ????. Look for typographical errors.
- If you selected “Complete Data” and saved both the remote commands and the Tester’s responses, there will be many instances of the Tester returning ????. To avoid this, be sure to save commands only or edit out the responses. The next section explains how to use the editor.

## A QUICKTOOLS SESSION

- Memory Resident programs may cause a loss of serial data when running QuickTools. Your autoexec.bat file may be executing a program that stays active after returning automatically to DOS. It may be necessary to edit or remove the autoexec.bat file and reboot.

### WHAT YOU HAVE ACCOMPLISHED

In this section, you have performed most of the tasks needed to create a new test routine for your own UUT. In this first QuickTools session you have done the following:

- Established communication between the PC and the Tester.
- Used QuickTools remote command syntax prompting as an aid to sending commands to the Tester.
- Saved the commands to a new file.
- Run the newly recorded test routine.

In the next section, you will edit the saved interaction to begin creating a fully developed test program.

## Section 3

# Editing Stored Commands

Any series of stored remote commands can be called a test routine, because without further enhancement they perform a series of tests on the UUT. Editing a test routine can make it even more useful. This section explains how to use QuickTools built-in editor to add capabilities to the test routine. Further enhancements are covered in the last section.

### *NOTE*

*Any text editing program can be used to create or edit test routines as long as the editor can save the results as an ASCII text file.*

**START THE EDITOR**

From the Main Menu, press <Alt> e then ← to start the editor program. Your display should appear as shown in the following figure.

Like the Interact window, the editor also uses key-prompting to generate the proper Fluke 90 remote command syntax.

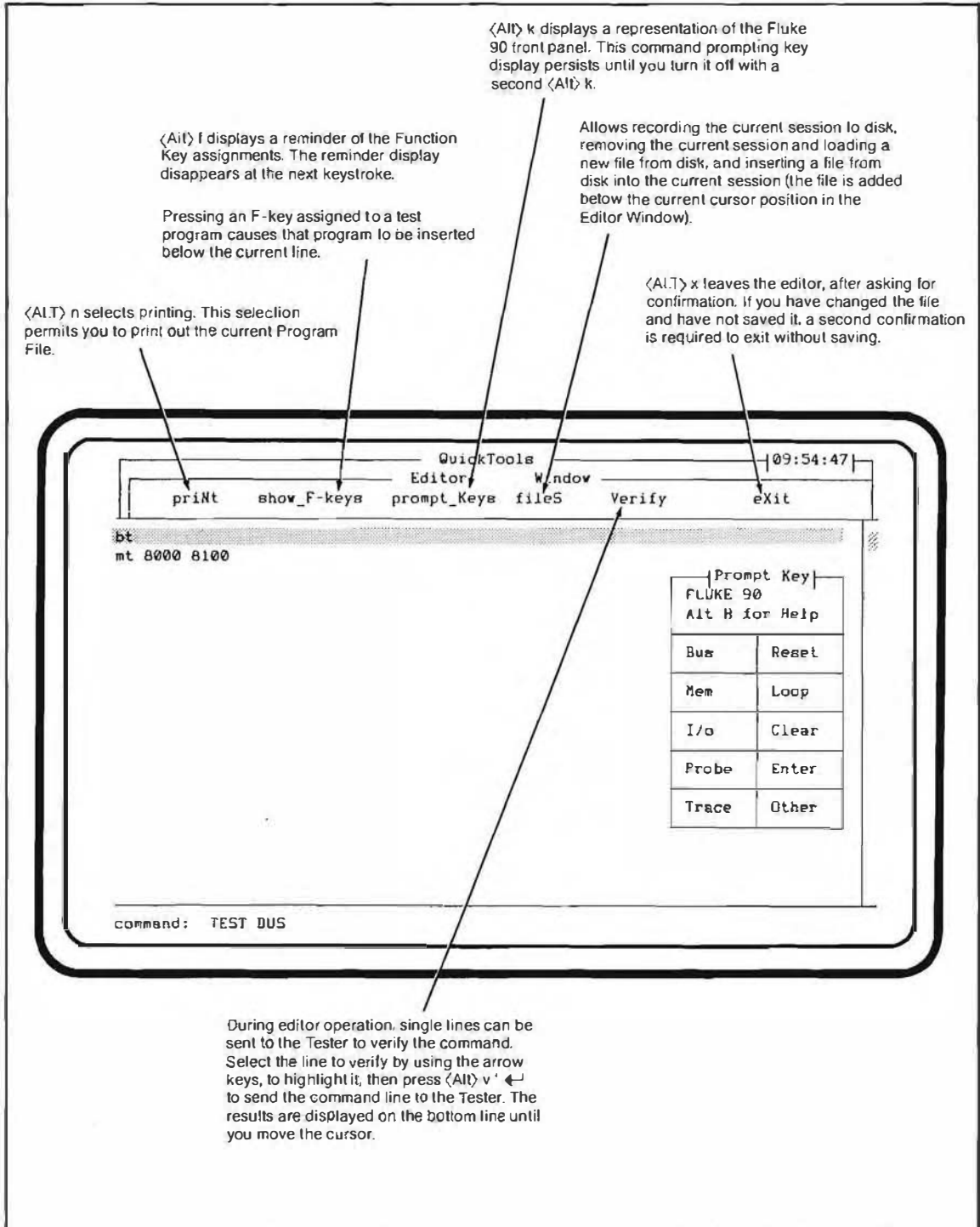


Figure 7. The Editor Window



**HOW THE EDITOR WORKS**

The QuickTools Editor is line-oriented. Each line is a single complete Fluke 90 or QuickTools command. Table 1 shows the functions of all the editing keys.

**Table 1. QuickTools Editor Key Functions**

KEY	ACTION
<INSERT>	toggles between insert and typeover modes
↵	the ENTER key breaks the line at the cursor. Everything to the right of the cursor forms a new line. If you press ENTER at the end of the line, a blank line is created, ready for entering a new command.
<u>CURSOR MOVEMENT KEYS</u>	
→	moves the cursor to the right one character position
←	moves the cursor to the left one character
↑	moves the cursor up one line
↓	moves the cursor down one line
<PAGE UP>	moves the cursor up in the buffer by one full page
<PAGE DOWN>	moves the cursor down in the the buffer by one full page
<End>	moves the cursor to the right end of the line
<Home>	moves the cursor to the left end of the line
<u>DELETION KEYS</u>	
<DEL>	deletes the character at the cursor position
<Ctrl> <End>	deletes from the cursor to the right end of the line
<Back Space>	deletes the character to the left of the cursor. If pressed when the cursor is at the left margin, Back Space combines the line with the line directly above it.

### Programmer Comments

To add a programmer comment to a test routine, precede the comment with two exclamation points:

**!!Programmer comments do not display while the program is running**

QuickTools treats programmer comments in a traditional way. Everything to the right of the comment marker (!! ) is ignored at runtime.

#### NOTE

*If you forget to include the "!!" in a comment line, QuickTools sends the line as a command. Generally the response from the Tester will be ????.*

### Operator Messages

A single exclamation point introduces an operator message. These messages can be displayed, recorded, or printed, but they are never output to the Fluke 90. Use operator messages to check on the progress of the test routine or to give directions to the operator.

**!RAMTEST IN PROGRESS 0000 - 00FF**

### Adding a Label to a Test Routine

Labels have two uses:

1. They display in the Test window, providing a convenient way for an operator to follow the execution of the test routine.
2. They identify a part of a test routine for branching. This usage is discussed in detail in Section 5.

A label can be up to 78 characters long and ends with a colon character (:). Fluke 90 remote commands follow the label. For example, part of the MYTEST.IST routine might be labeled as follows:

**MemCheck1: MT 0201 03FF**

#### NOTE

*QuickTools deletes leading and trailing spaces, so the following labels are equivalent:*

*mem check 1 :  
mem check 1 :  
MEM check 1 :*

Labels display on the PC in the Test window, but not the Interact window.

NOTE

*A label can be made invisible by ending it with two colon characters. Use invisible labels to suppress the display of less important labels that a test may branch to.*

Use the editor to add programmer's comments, operator messages, additional Fluke 90 commands, and labels to the test routine you are developing. A final version of MYTEST.IST might look like this:

A label (up to 78 characters) identifies lines the test routine will use for branching. Labels do not display during test execution in the Interact Window. Labels and operator messages are the only activity displayed in the Test Window. A label is made invisible by ending it with two colons instead of one.

Traditional programmer comments can be included in a QuickTools test routine. As shown here, comments begin with two exclamation points (!!).

QuickTools
09:56:19

Editor
Window

print
show\_F-keys
prompt\_Keys
fileS
Verify
eXit

```

!! First test the bus
BusTest: !Bus Test in progress
T2 BT - WAIT !! display on Fluke 90 LCD line 2
!! Now check memory 0000 - 0600
!Now checking memory locations
MemCheck1: MT 8000 80FF
MemCheck2: MT 8100 81FF
MemCheck3: MT 8200 82FF
MemCheck4: MT 8300 83FF
MemCheck5: MT 8400 84FF
                    
```

Prompt Key	
FLUKE 90	
Alt H for Help	
Bus	Reset
Mem	Loop
I/o	Clear
Probe	Enter
Trace	Other

command: XMIT LCD LINE 2

As you move to a new program line, QuickTools interprets the line and displays the expanded syntax for that command on the bottom line.

Messages for the operator are set off by a single exclamation point(!). These messages display on the PC screen during Interact and Test sessions.

The column on the far right hand side of the screen shows the relative location in the buffer of the line being edited. The buffer can hold 400 lines. To move within the buffer, use the up and down arrow keys, and (PAGE UP) and (PAGE DOWN).

Figure 8. Sample Program with Comments and Messages

### **Saving a Test Routine**

Before exiting the editor, save the test routine. Select “fileS” from the menu bar, then select “Save file”. You will be asked to name the file to save. If you use the name MYTEST.1ST, QuickTools overwrites the old file.

### **WHAT YOU HAVE ACCOMPLISHED**

The main purpose of this section has been to introduce QuickTools built-in editor, and show you how to use it to move around in and edit a QuickTools test routine. In Section 3 you have accomplished the following:

- Added comments, messages, and labels to the test routine.
- Saved the test routine to a disk file.

## Section 4

# Executing a Qtest

In Section 2 you created a test program and executed it in the Interact Window. Section 3 expanded the test program to include labels, operator messages and programmer comments. The purpose of this section is to explore QuickTools execution of these Qtest features.

### ASSIGNING A QTEST TO A FUNCTION KEY

When MYTEST.IST is fully developed and proven to locate faults reliably, you may want to speed things up by assigning it to a function key so the tests can be run by pressing just one key.

To assign a Qtest to a function key, perform the following steps.

1. Return to the Main Menu.
2. Select Assign, and press the Function Key you wish to use for the Qtest.
3. A Status Window appears that displays the current information for the Function Key you pressed. The selection "to Qtest" is highlighted. Press **←** .
4. An entry box appears, asking you for the name of the Qtest. Type MYTEST.IST **←** . When assigning tests to a Function Key, be sure to indicate the entire path. The full specification of a file can be up to 42 characters.
5. Next, another entry box requests a label for the file. The label can be a maximum of six characters. This label appears on the "Show F-Key" popup. Enter **MY1ST** **←** .
6. QuickTools next asks for a description of the file. The description can be a maximum of 22 characters and it appears in the Status Window area on the Main Menu when you select Assign, then F-Key. The description supplies the operator with additional information about the Qtest. After entering a description, press **←** .
7. To check that everything has been keyed in properly, repeat step 2. Press **<ESC>** to leave the entry unchanged.

### USING A QTEST THAT HAS BEEN ASSIGNED

Assigning a Qtest to a Function Key saves time and effort because all the tests are available with a single keystroke. The assigned Qtest can be used in the Interact, Test, and Edit Windows.

#### Interact and Test Windows

In the Interact and Test Windows, to run the tests that make up a Qtest, press only the Function Key that has the Qtest assigned to it. This can be an efficient way to prescreen boards. For example, a function key might be assigned to a Qtest that runs a Bus Test and some preliminary checksum tests. Another use of an assigned Qtest in the Interact Window might be to run a thorough set of memory tests on an area of memory already identified as faulty.

Pressing an assigned Function key is equivalent to pressing <Alt> g (beGin), S (Start), entering a filename, and ↵ .

#### Edit Window

In the Edit Window, pressing an assigned Function Key inserts the tests that make up the Qtest into the buffer. This is a way to include subtests into a group of longer tests (which in turn might be assigned to a Function Key).

In the Edit Window, pressing an assigned Function key is equivalent to pressing <Alt> s (fileS), I (Insert), entering a filename and ↵ .

Unless you later change an F-key assignment with the Assign function, the key will always run the tests in the file you've named. QuickTools retains Function key assignments between sessions. Remember that if you delete, rename, or move a file assigned to a function key, QuickTools will not be able to locate it.

### RUNNING THE ASSIGNED QTEST

Once a test has been assigned to a Function key, it is available by pressing just that Function key. To try it out the first time, follow these steps:

1. From the Main Menu, press <Alt> i and ↵ to go to the Interact window.
2. Press <Alt> f (showF-keys). Toggle the Function key display to ON by pressing ↵ . Confirm that you have assigned MYIST and verify the function key assignment.
3. Press the Function key indicated. Note that MYTEST. IST executes just as it has done in previous exercises (Section 2). All operator messages should appear, but you should see none of the programmer comments or labels.
4. Exit the Interact window.

5. Go to the Test screen (`<Alt>t` and `←`) and observe the display. The choices on the screen are described in Figure 9.

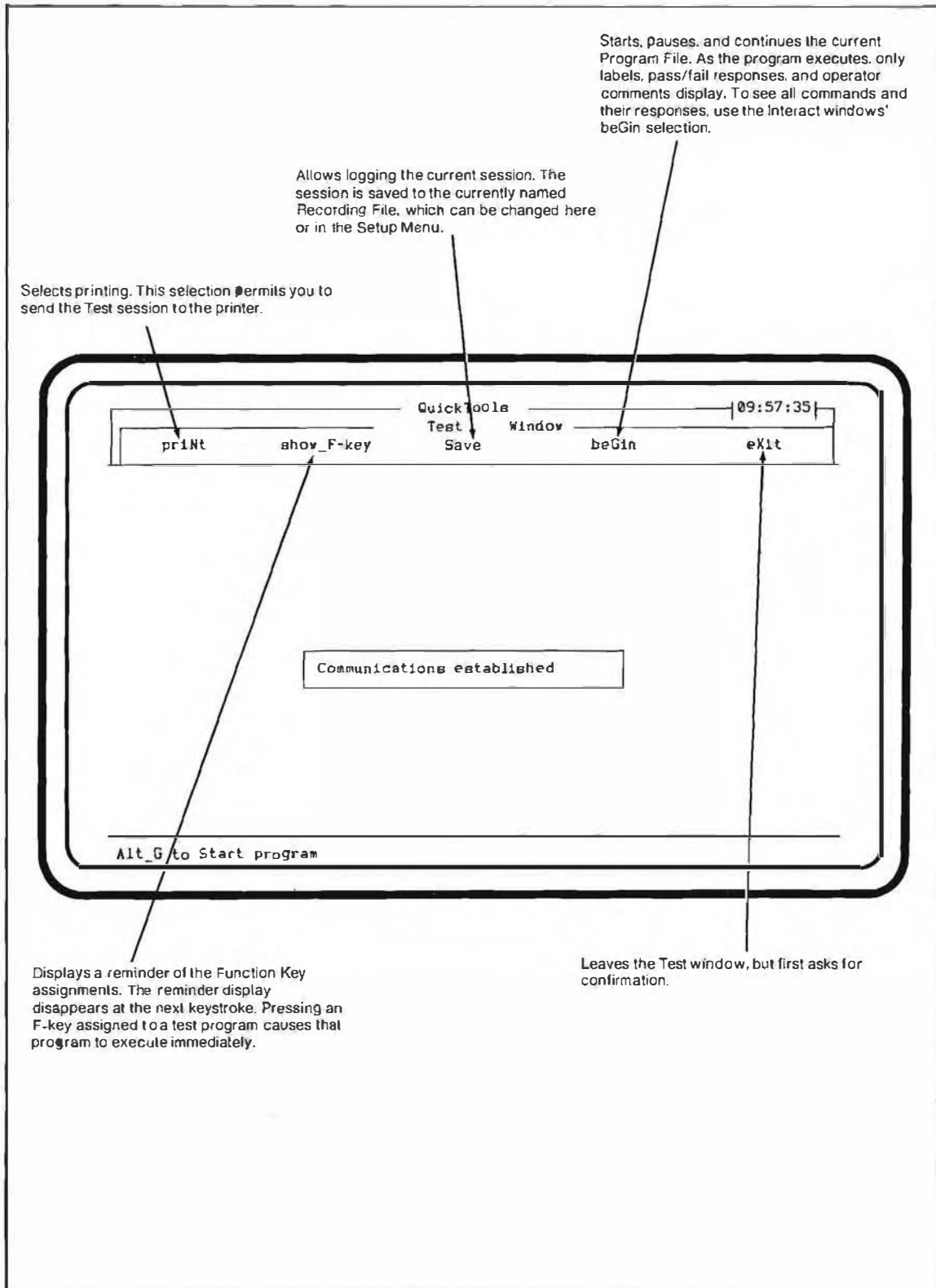


Figure 9. Running the Test Routine

## EXECUTING A QTEST

6. Again press the Function key assigned to MYTEST.1ST. Observe the display. As MYTEST.1ST is running, each label appears, followed by the word PASS or FAIL. If the UUT is operating properly, the screen will look as follows:

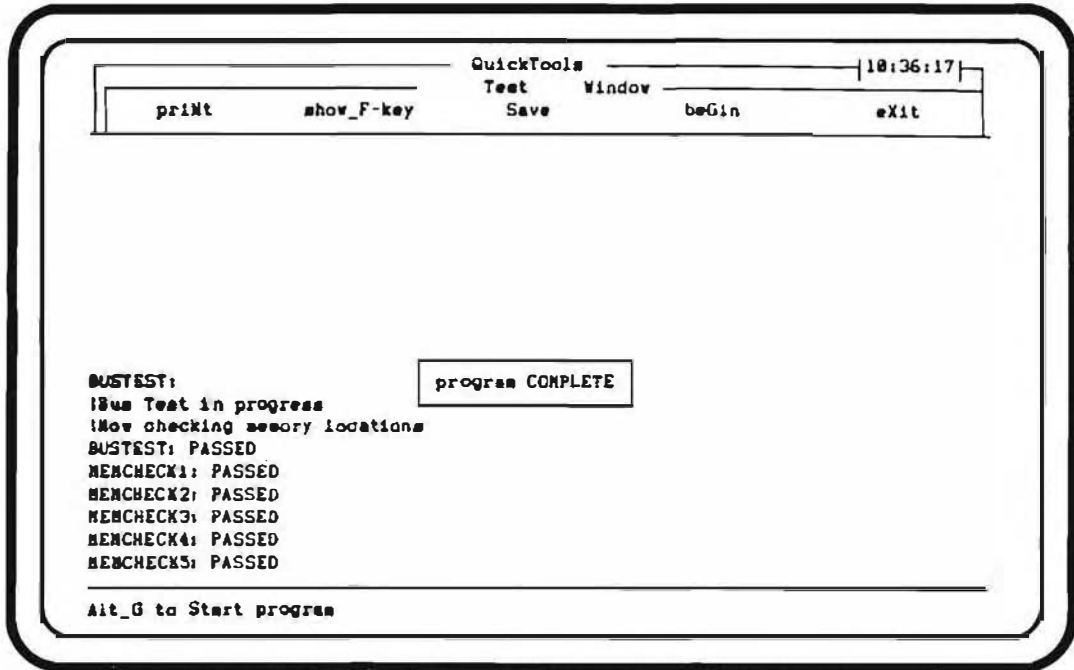


Figure 10. Labels and Pass/Fail Indications for MYTEST.1ST

7. To exit Test mode, press <Alt> x. As usual, QuickTools requests confirmation.



## Section 5

# Enhancing the Test Routine

This section adds some sophisticated features to the test routine you have been developing. It explains how to set up branching within the routine and how to call another test routine based on UUT failure conditions.

### THE ON FAIL COMMAND

When QuickTools is executing a test program, it sends each Fluke 90 command in sequence until a failure occurs. A failure is recognized as one of three conditions:

1. The Tester returns the string **FAIL**.

If QuickTools receives the word **FAIL** from the Tester, it means that the UUT has failed a test called for by a remote command.

2. The Tester returns the string **????**.

If the Tester sends **????**, it means that it was unable to recognize the command, indicating the command had a syntax error.

3. The Tester returns a string different from one specified in an **ON FAIL** statement. User-defined strings are explained later in this section.

When a failure is detected, QuickTools takes the action specified by the most recent **ON FAIL** command. **ON FAIL** can specify one of these actions:

<b>PAUSE</b>	(the default action)
<b>BRANCH ..</b>	to a label within the same test routine
<b>CALL ..</b>	another test routine and returns upon completion
<b>NO ACTION</b>	disables all failure action

The specified action remains in effect until changed by a different **ON FAIL** command or until a failure action is taken. When QuickTools takes action on a failure (**PAUSE**, **BRANCH** to a label, or **CALL** a different program), it automatically resets the failure activity to **PAUSE**, cancelling the currently defined action and any user-defined string.

### How to Use the ON FAIL Command

The following examples illustrate how to use the ON FAIL command in various ways:

Example 1:

#### ON FAIL PAUSE

The ON FAIL PAUSE command halts test program execution on a failure. This is the default condition, and is assumed at the beginning of a test program.

Example 2:

#### ON FAIL BRANCH {label}

The ON FAIL BRANCH command causes the test routine to begin execution at the indicated label if the test fails. For example, the following commands tell QuickTools to branch to the line labeled DAG: if any failures occur. If there are no failures, everything proceeds sequentially to the END statement.

```
ON FAIL BRANCH DAG
BT
.
.
more command lines
.
.
END    !! normal program execution stops here

DAG: !beGin MYTEST.2ND when ready
```

Example 3:

#### ON FAIL CALL {program}

The ON FAIL CALL command causes the test routine to pass control to another test routine. When the called routine is complete, control returns to the initial routine.

For example, the following commands first perform a memory test. If there is a failure, the test routine MYTEST.2ND will execute. When MYTEST.2ND completes, control returns to the first test routine, which then performs a CHECKSUM test.

If the memory test does *not* fail, the next command (CK 0000 0100) executes.

```
ON FAIL CALL MYTEST.2ND
MT 8000 8080
CK 0000 0100
```

### User-Defined Strings

In all of the preceding examples, a “failure” may be an actual UUT failure (FAIL) or a syntax error (????). Failures also occur if the response from the tester does not contain the user-defined string.

Use the following syntax to construct valid commands containing strings for matching:

```

ON FAIL {<string>} [ BRANCH ] {label}
                   [ CALL   ] {program}
                   [ PAUSE  ]
                   [ NO ACTION ]
    
```

Example:

The following list of commands tells the Tester to call the program ‘F90RT’ if the checksum returned from the Fluke 90 is not the same as the checksum listed in the ON FAIL command. If “E720” is contained anywhere in the returned string, the program continues.

```

ON FAIL <E720> CALL F90_RT
CK 0000 00FF
ON FAIL <4F36> CALL F90_RT
CK 0101 0200
ON FAIL PAUSE !! cancels user-defined string, specifies new action
:
more command lines
:
    
```

**NOTE**

*The maximum length of an ON FAIL <string> command is 78 characters.*

## SPEEDING UP TEST EXECUTION

The next few paragraphs describe a method for speeding up test routine execution.

In operation, the Fluke 90 Board Tester “cycle steals” from the UUT microprocessor. This means that normally the Fluke 90 does all of its testing while the UUT processor is running. By having the test routine halt the UUT processor, considerable time can be gained since the Tester does not have to wait for a free processor cycle before performing its activity in the UUT.

In the following example program listing, a speed increase of 4 to 1 is accomplished by using a breakpoint to halt the microprocessor during testing.

### CAUTION

**The method described here should only be used for UUTs with static RAM because the refresh cycle may be stopped during breakpoint operation. Stopping a UUT with dynamic RAM may cause the contents of the RAM to be lost.**

### Example Program:

```

!!!
!!! TEST.UUT
!!!
!!! Example of speed increases available for STATIC RAM boards
bt
db
Cycle sharing timing test:
!!! For this portion of the tests, the UUT is running.
!!! execution time for this memory test is about 21 seconds
!!! for checksum, about 12 seconds.
!!! Time the execution of the following two tests.
MT 8000 9000
ck 0000 1000
!!! record execution time
!!!
!!! now we'll halt the UUT and retest
!!! time for the memory test is now about 7 seconds,
!!! for the ROM checksum test, 3 seconds
UUT Halted timing test:
bp
^X
!!! Time the two tests again
mt 8000 9000
ck 0000 1000
!!! record execution time
db
end

```


**QUICKTRACE™**

The QuickTrace™ function follows and isolates suspected faulty address, data, or control lines on the UUT. The signal line can be followed to isolate the fault. When QuickTrace is used in a test program, The program halts and allows you to probe various points on the UUT. Each time you probe a trace on the UUT, the trace name is displayed on the QuickTools screen (followed by a carriage return). If two traces are shorted together, both trace names are displayed on the same line of the QuickTools screen. To exit from QuickTrace, either press <Alt> c on the IBM PC keyboard or press the button on the probe.



## Section 6 On the Menu

### THE MAIN MENU WINDOW

Assign f-key	QuickTools uses <Alt> h for Help and <Alt> x for Exit. The Assign f-key selection lets you place these on function keys of your choice and also assigns function keys to often-used sequences of Fluke 90 commands (Qtests). An option lets you match the format of a function key reminder display to the physical arrangement of your keyboard.
Horizontal Form	Matches the Function Key reminder display to the layout of the keyboard being used.
Vertical Form	
press <F1> - <F10>	Changes the assignment of a Function Key.
Disk	A gateway to the Disk Operating System. This menu permits copying, deleting, printing, and viewing files without leaving QuickTools.
select File(s)	Marks files for deletion, copying, printing or viewing. QuickTools prompts for a pattern and will accept wildcards. Files matching the pattern display in the menu area.  When you press  at a highlighted filename, QuickTools marks the file with an asterisk. <Alt> x ends file selection and returns you to the Disk menu to choose the operation for the selected files.
Delete	Deletes all marked files after confirmation.
Copy	Copies the marked file(s). QuickTools prompts for a destination filename. When the destination is a directory, all selected files are copied there without a name change. In any copy operation, a destination file with the same name as the source file is overwritten without warning.

Print	Sends the selected file(s) to the printer port.
View	Displays the selected file(s).
Setup	Changes the parameters that control communication between QuickTools and the Fluke 90, enables and disables the warning beeper, determines the colors used by Quick Tools screens, and establishes the default files that QuickTools uses for testing and recording.
Fluke 90 port	Sets the port (COM1 or COM2), baud rate, and number of databits to be used for communication between the PC and the Fluke 90.
Printer port	Selects the printer port QuickTools uses.
Warning Beeper	Enables and disables operation of the PC beeper.
Color Selection	Sets the background colors for the menu bar, main screen body and status/entry line. QuickTools automatically changes the foreground colors. For best results with monochrome monitors, choose "All" to select monochrome for all three areas.
Default files	Tells QuickTools software the names of the files to use for running (the default Program File), for recording (the default Recording File), and for the Upload and Download filenames.
Editor	Accesses QuickTools text editor for creating and modifying test routines.
Interact	The Interact Window is like a super terminal emulator. Fluke 90 commands can be entered directly or by way of QuickTools unique command prompting. The entire interaction can be logged to disk for later editing or to a printer for analysis. One option limits the storage to commands only, as a way to quickly create test programs. The last 100 transactions of an Interact session are available for screen reviewing.
Test	The Test Window offers the quickest way to execute stored test programs. Rather than displaying the full command and response activity of the program, Test displays only operator messages, program labels, and the pass/fail results of the tests.



## THE EDITOR WINDOW

priNt	Selects printing. This selection permits you to print out the current program file.
showF-keys	Displays a reminder of the Function Key assignments. The reminder display disappears at the next keystroke.  Pressing an F-key assigned to a test program causes that program to be inserted below the current line.
promptKey	Displays a representation of the Fluke 90 front panel. This reminder display persists until you turn it off by selecting it a second time.
Save	Allows recording the current session to disk, removing the current session and loading a new file from disk, and inserting a file from disk into the current session (the file is added below the current cursor position in the Editor Window).
Verify	During editor operation, single lines can be sent to the Tester to verify the command. Move the highlighted line using the arrow keys, then select Verify to send the command line to the Tester. Results are displayed on the bottom line.
eXit	Leaves the editor, after asking for confirmation. If the file has changed since the last save, prompts again to exit without saving.

## THE INTERACT WINDOW

priNt	Selects printing. This selection permits you to send the Interact session to the printer.
showF-keys	Displays a reminder of the Function Key assignments. The reminder display disappears at the next keystroke.
promptKey	Shows the ALT keys to use for invoking Fluke 90 command syntax. This reminder display persists until you turn it off by selecting prompt-Key a second time.
Save	Allows logging the current session. The session is saved to the currently named Recording file, which can be changed here or in the Setup Menu. In Interact, you can save the entire transaction or just the commands. You can log the interactions as they occur, or log the contents of the current 100-line buffer.
beGin	Starts, pauses, and continues the current Program File, which can be changed either here or in the Setup Menu. QuickTools displays all commands and operator messages and the the Fluke 90 responses. To limit the display to labels, operator messages, and pass/fail responses only, use the Test Window.
eXit	Leaves the session, but first asks for confirmation to ensure that any changed or new files have been logged. Leaving clears the transaction buffer.

**THE TEST WINDOW**

priNt	Selects printing. This selection permits you to send the Test session to the printer.
showF-keys	Displays a reminder of the Function Key assignments. The reminder display disappears at the next keystroke. Pressing an F-key assigned to a test program causes that program to execute immediately.
Save	Allows logging the current session. The session is saved to the currently named Recording file, which can be changed here or in the Setup Menu.
beGin	Starts, pauses, and continues the current Program File. As the program executes, only labels, pass/fail responses, and operator comments display. To see all commands and their responses, use the Interact window's beGin selection.
eXit	Leaves the Test window, but first asks for confirmation.



# Appendix A

## Glossary

### **interaction**

A communication between the PC and the Tester. Interactions have two parts: first, QuickTools sends a remote command from the IBM PC to the Tester. In the second part, the Tester responds. The response might be test results, a checksum calculated for an area of memory, an address or data line being probed using QuickTrace, and so on.

### **message area**

An area in the QuickTools display that gives information about different operations. For example, in the Test and Interact Windows, Qtest progress is shown in this area.

### **program file**

A disk file containing a series of Fluke 90 commands. QuickTools permits program files to be edited, assigned to function keys, run, or printed out.

### **Qtest**

A sequence of Fluke 90 commands. Also called a test routine or a program, a Qtest is a program file that is assigned to a function key. Qtests are assigned from the Main Menu and executed in the Interact and Test Windows. In the Editor, pressing a Function key which has a Qtest assigned inserts the Qtest into a program.

### **recording file**

The file QuickTools uses to save interactions.

### **select**

To make a choice from a menu. The selected item is highlighted and preceded by a prompt symbol >.

Select Menu options by pressing <Alt> and the capitalized letter. Submenus require only the capitalized letter. For example, in the Setup Menu, press W to select Warning beeper, then N to select oN.

### **status/entry line**

QuickTools uses the bottom line of each window to display information pertinent to that window's operation. For example, in the Editor Window, the bottom line of the display expands the syntax of the currently selected command line.