

## 3. RAMCHECK USER INTERFACE

This section introduces you to the various aspects of the RAMCHECK user interface. It outlines the use of the keyboard, explains the screen display and the audio signals, and it illustrates some of the menus you will encounter.

### 3.1 THE KEYBOARD

RAMCHECK's keyboard consists of six keys, which are pressed momentarily to perform a function. The firmware changes the function of these keys depending on the mode of operation.

**ESC:** is always used to EXIT or ABORT the current mode.

**F1:** is typically the ACTION switch. Additionally, F1 can be used by various menus for item selection, skipping a pause or a specific test, and for other activities.

**F2 ←:** is used for menu navigation or for menu item selection. When used for menu navigation it moves the cursor or scrolls a full string one to the left. This key can also be used to repeat a previous test phase during the Extensive Test.

**F3 ↑:** is used for menu navigation, variable setup, or for menu item selection. When used for menu navigation it moves your selection up. When used for variable setup it increments the variable. This switch is also used to accelerate (minimize) various delays in the program.

**F4 ↓:** is used for menu navigation, variable setup, or for menu item selection. When used for menu navigation it moves your selection down. When used for variable setup it decrements the variable. This switch is also used to slow down (maximize) various delays in the program.

**F5 →:** is used for menu navigation or for menu item selection. When used for menu navigation it moves the cursor or scrolls a full string one to the right.

In the following discussions, we will refer to the dual function keys as F2-F5 or by their arrow marks.

### 3.2 SCREEN DISPLAYS

RAMCHECK utilizes an advanced 128x32 graphic LCD display with back lighting for improved visibility.

**INSTRUCTION MENUS:** Instruction menus display the potential choices for your next step (recall that in addition to the displayed choices, you can always press ESC). If no selection is made, a default alternative is chosen during a test procedure after a preset period of time; for setup menus, the display will remain until the user has selected one of the choices shown.

**REAL-TIME TEST RESULTS:** Many test results, like DUT size, speed, mode and other information are determined by RAMCHECK at the start of the BASIC test and during most other tests. These results are immediately posted on the screen for your review. We also use animation characters to give you a relative indication of several tests' progress, and a test timer to show you the length of the test.

**TIME DELAY:** To provide an automatic flow of test mode sequences, all final test results are displayed for a short period, followed by a short time delay, before the next mode proceeds automatically. To bypass these time delays - press F3, to increase the time delay (to slow down the process) press F4. Some test results, like structure information after BASIC test, may be altogether skipped to the next test phase by pressing F1.

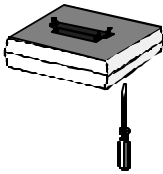
**LOCKING ERROR MESSAGE DISPLAYS:** When an error is detected in the DUT, the error message will stay on the display until you acknowledge it. This allows you to leave the machine working unattended and read the error message when you return. Errors are reported via several interactive menus that are explained below.

**NON-LOCKING WARNING MESSAGE DISPLAYS:** A "Warning Condition" (as opposed to "error") indicates a situation that you should be aware of, but it does not necessarily mean that the memory is bad. When a warning condition is detected, a message will appear on the display for a few seconds and the program will resume thereafter. You may terminate the warning message sooner by pressing F3. A common example for such messages is when an asymmetric refresh is detected in the DUT as in the following screen:

```
DEVICE TYPE WARNING:
ASYMMETRIC 4K REFRESH
12 ROWS 10 COLUMNS
```

In a rare case example, two upper address lines are shorted in a 1Mx64 module, but it is unaffected because one of the upper address lines that is shorted is not used internally by the module. If this happens, the module will still work as a 1Mx64 module provided that the upper address line is not wired in the computer socket. If the computer supports higher capacity modules, with this upper address line wired in the socket, and such a module is used, a short circuit on the motherboard will occur across its address lines. RAMCHECK will warn you when it detects this type of a module short circuit.

**Non-locking warning messages are displayed only during the start of BASIC test but they are recorded in the Test Log and they are often repeated in the structure summary information at the end of the test. Therefore, there is no need to constantly observe the display after the start of basic test.**



### 3.3 ADJUSTING THE LCD

The LCD intensity is preset by the factory and most users will not need to adjust it. Nevertheless, if adjustment is required, simply turn RAMCHECK over and locate the opening in the enclosure allowing access to the LCD intensity potentiometer. With a small screwdriver, simply turn the potentiometer until the LCD display is satisfactory.

The LCD utilizes an LED backlight for better viewing. There are two setting possibilities, Hi and Low. The factory setting is Low. Unless you typically work in the dark, we do not recommend that you change this setting. You can modify this setting by removing the top enclosure (you need to open the six screws at the bottom) and changing jumper JP6 as shown in Appendix H3: CHANGING JUMPER SETTINGS.

### 3.4 AUDIBLE SIGNALS

**Audible signals** are produced by RAMCHECK and are used throughout its operation. While various sound frequencies are used, **errors are always indicated by lower frequency tones.** After using RAMCHECK for a short time, you will learn to associate the signals with the corresponding messages displayed at the same time.

## 3.5 THE MENUS

You can use various menus throughout RAMCHECK's operation. After using RAMCHECK a few times and reviewing the DEMO mode, you should be familiar with the menus and their displays. Whenever possible, the program arranges the displayed menu keys to correspond to the actual keyboard layout. This section outlines some of the menus you are likely to encounter, showing some examples and providing you with information on how to maneuver through them.

### 3.5.1 SELECTION MENU

```
SETUP PARAMETERS
F1 SIZE      Est QUIT
F2 TIMING    F5 AUTO
F3 VOLTAGE   F4 MORE
```

The selection menu is the most common menu you will encounter. It is a simple list of all your available options. Enter your choice by pressing the corresponding key.

### 3.5.2 HORIZONTAL SCROLL MENU

```
SETUP SIZE:
AUTO
F1 ENTER      ABORT Est
← 4M          →
```

The horizontal scroll menu allows you to move through a horizontal window of options. Pressing either the ← or the → keys will show the available choices of this menu. When the display shows your selection, press F1 to enter your choice.

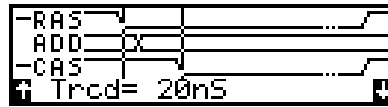
### 3.5.3 VARIABLE SETUP MENU

```
SETUP SPEED:
AUTO
F1 ENTER      ABORT Est
←↑ RAS ACCESS: 84ns ↓→
```

The variable setup menu allows you to enter the value of a selected number by pressing ↑ or ↓ to either increase or decrease its value. The value is changed by one unit or by a preset number of units. It also allows you to reposition the

cursor by pressing ← or → to continue to modify the value chosen. The menu is initiated with minimum and maximum values you cannot exceed. Variables may be displayed in either decimal or hexadecimal notations. Press F1 when the desired value is displayed.

### 3.5.4 GRAPHIC SETUP MENU



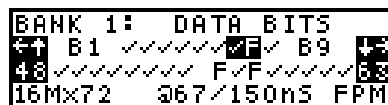
The graphic setup menu allows you to change the value of a timing measurement and view the results in a graphic format. As the value is changed, the waveform patterns moves accordingly. Use ↑ to increase the measurement, ↓ to decrease it.

### 3.5.5 VERTICAL SCROLL MENU



The vertical scroll menu allows you to make a choice by moving the highlighted selection with the ↑ and ↓ keys. After the right choice has been highlighted, press F1 to enter the selection.

### 3.5.6 ERROR DISPLAY MENU



The error display menu is present upon detection of a fault in the data bits of the DUT (Device Under Test). It provides explicit error information as well as numerous other details associated with the detected error.

The second line maps the error on the entire DUT at a byte resolution (each '✓' or 'F' represents a byte of 8 bits). The third line shows the two highlighted bytes of the second line at a bit resolution. In the example, byte 7 and 8 are highlighted, and as seen on the third line, all the bits of Byte 7 are OK, however, the

first and third bit of Byte 8 are faulty. Pressing ← and → allows you to highlight different bytes.

```

BANK 1: DATA BITS
←+ B1 FFFF ✓ B5 +→
0 F✓FF✓F F✓FF✓F 15
JEDEC:DQ6 PIN=24

```

The error display expands to the individual bit information screen by pressing ↓. At this screen you navigate among the bits of the third line with the ← and → keys, while the fourth line provides the detailed pin number and JEDEC notation of the highlighted bit. Pressing ↓ once again will reveal the address location where the error was detected. Pressing ↓ once more will display the read/write information on the fourth line. The hexadecimal number on the left marked by w: shows the data pattern which was written to the module, while the right (r:) pattern shows what was read to cause the reported error.

```

BANK 1: DATA BITS
←+ B1 FFFF ✓ B5 +→
0 ✓F✓F✓F ✓F ✓F ✓F ✓F 15
W:55555555 R:55550555

```

Pressing ↓ an additional time will show the function that was used to detect the current error. Such function names include shorts, array, march up/down, and others. You can scroll up to previous error information by pressing ↑.

You return to the STANDBY mode by pressing Esc. In some cases, pressing F1 allows you to continue the test in a search for more errors.

Error information is retained as an extended part of the Test Log. It will reappear on the display, with full menu navigation capabilities, at the end of the Test Log.

### 3.5.7 ERROR LIST MENU

```

FULL ERROR REPORT:
F1CONTINUE END Esc
←P118=A3 at 0 +→
ERROR 4 OF 10

```

The error list menu is used to provide explicit information in the form of a scrollable list. We typically use it to report control, data, and address lines, which are stuck at 0 or 1. The first errors that are encountered are viewed by pressing ← or → to scroll through the messages. In the example, the display is currently

on error 4 of 10 in which Address line 3 is stuck at 0. Address line 3 corresponds to pin 118 of the 168-pin module. Additional errors can be seen by pressing either F3 or F4, which will cause the display to show a "Full Error Report". Pressing F1 will typically continue the test, in search for more errors.

Some variants of this menu may include two message lines that are scrolled together.

### **3.5.8 MULTIPAGE LIST MENU**



```
SETUP LIST
SETUP SIZE: 016Mx36
SETUP SPEED: 055nS
VOLTAGE SETUP: 3.3V
```

The multipage list menu provides the means to report a long list or messages which cannot fit in one screen. We use this menu to list RAMCHECK's setup, as shown in the example, or to log test results. F1 toggles between the first and the last pages of the list. Use ↓ and ↑ to scroll the pages.