

LB250

# Lil' Buttie *Ranger*<sup>®</sup>

**TELEPHONE TEST SET**  
with Amplified Speaker



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**BEST**  
in the  
**USA** ★

## Test-Um Inc.

The Intelligent Test Solutions Company

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## Contents

Chapter	Page
1. Specifications.....	4
2. Introduction .....	7
2.1 General Overview .....	7
2.2 Features and Benefits.....	8
2.3 The Ranger Illustrated.....	12
3. Installation and Battery Replacement .....	13
3.1 Connecting the Ranger to a Phone Line .....	13
3.2 Connecting the Headset to the Ranger.....	14
3.3 Replacing the Battery.....	15
4. Operation .....	17
4.1 Using the <b>TALK/BELL/MON</b> Switch .....	17
4.1.1 The <b>TALK</b> Setting ( <b>TALK</b> Mode) .....	17
4.1.2 The <b>BELL</b> Setting ( <b>BELL</b> Mode).....	19
4.1.3 The <b>MON</b> Setting ( <b>MONITOR</b> Mode) .....	20
4.2 Using the LCD Panel .....	21
4.3 Using the Mute Button .....	22
4.4 Using the Speaker Button.....	23
4.5 Using the Function Button.....	24
4.6 Using the Command Keys .....	25
4.6.1 Command-Key Functions in Normal <b>TALK</b> Mode .....	25
4.6.2 Command-Key Functions in Scrolling-Recall and Setup Modes.....	28
4.7 Scrolling-Recall Mode .....	29

Chapter	Page
4.8 Setup Mode.....	30
4.9 Special Features.....	34
4.9.1 Traffixguard™ Low Alert .....	34
4.9.2 Traffixguard™ High Alert.....	35
4.9.3 Automatic Power-Off.....	36
4.9.4 Battery-State Information .....	37
4.9.5 Overcurrent Protection.....	37
4.9.6 On-Hook Caller ID.....	38
4.9.7 Call Waiting Caller ID (CWCID).....	39
4.9.8 DigitView™ DTMF Decode and Display.....	39
4.9.9 Loudspeaker .....	40
5. Maintenance .....	41
6. Troubleshooting.....	42
6.1 Warranty.....	42
6.2 Calling Test-Um .....	43
6.3 Warranty Service.....	44
6.4 Non-Warranty Service.....	44
6.5 Shipping and Packaging .....	44
7. Accessories .....	46
7.1 Cordsets.....	46
7.2 Headsets .....	47
7.3 Modtest Adapters.....	48
7.4 Test Set Carrying Accessories .....	49

# 1. Specifications

**Interfaces** — Telephone system: Modular telco;  
Headset: 2.5 mm cell-phone type

**Ringer Equivalence** — In **BELL** mode: 0.0 (no ringer load)

**Pulse Dialing** — Pulse rate: 10 pps  $\pm$  10%;  
Make/break ratio: 40% to 60%  $\pm$  2%;  
Interdigit interval: 820 ms;  
Resistance during break: 120K Ohms

**Tone Dialing** — DTMF output (into 600 Ohms):  
Tone-frequency error:  $\pm$ 1.5%;  
Tone level: High group:  $-6 \pm 2$  dBm;  
Low group:  $-8 \pm 2$  dBm;  
High vs. Low Difference:  $2 \pm 1$  dBm

**Flash Duration** — 600  $\pm$  50 ms

**Pause Duration** — Tone: 3 seconds;  
Pulse: 3.4 seconds

**Memory** — Battery backed-up memory stores eight programmed phone numbers (24 numbers) and associated names (16 characters), plus last-number redial. Battery will typically maintain stored numbers in an unused test set for over 2 years

**Return Loss** — 14 dB at 600 Ohms

**Line-Current Range** — 15 to 120 mA

**Apparent Line Resistance** — 275 Ohms at 20 mA

**MONITOR-Mode Impedance** —  $>230$ K Ohm

**Measurement** — Voltage: 0 to 128 VDC  $\pm$  5%;  
Current: 10 to 140 mA  $\pm$ 5%;

**Note:** Do not attach test set to electric-power lines

**User Controls** — One left-side-mounted **TALK/BELL/MON** slide switch for operating mode;  
One right-side-mounted microphone mute push button (tap to lock or hold down);  
Six front-mounted push buttons for various options;  
One standard front-mounted 12-key phone keypad

**Indicator** — One front-mounted 2-line x 16-character reflective gray-mode super-twisted liquid crystal display (LCD) panel

**Connectors** — To telephone network: RJ-12 (6-wire RJ-11) female;  
To headset: 2.5 mm cell-phone headset jack

**Power** — From a 9-VDC alkaline battery, typical:  
**BELL** mode (timed out): 20  $\mu$ A;  
**TALK** mode: CWCID OFF: 4 mA;  
CWCID ON: 12 mA;

**MONITOR** mode: 27 mA

**Note:** The loudspeaker can draw as much as 200mA peaks itself, in addition to the currents listed above for **TALK** and **MONITOR** modes.

**Battery Life** — For a typical 9-VDC, 540 mA-hr alkaline battery:  
Operating: 20 hours min., 112 hours max.;  
Standby: 2.5 years;  
Typical: 25 to 40 hours  
**Note:** The loudspeaker draws a large amount of power and can discharge the battery quickly if used at high volume on a line with a lot of signal.

**Maximum Altitude** — 10,000 ft. (3048 m) operating

**Temperature Tolerance** — Operating: 32° to 122°F (0° to 50°C);  
Storage: -4° to +140°F (-20° to + 60°C)

**Humidity Tolerance** — 10% to 90% non-condensing

**Enclosure** — High-strength ABS plastic

**Size** — Excluding lanyard (top hook):  
7.25" H x 2.50" W x 1.68" D (18.5 x 6.4 x 4.3 cm)

**Weight** — With cable set: <10 oz. (284 g)

## 2. Introduction

### 2.1 General Overview

The Ranger is a self-contained, self-powered, portable telephone test set for use by installers, repair technicians, and other authorized personnel. It's ideal for temporary communication and for servicing and installing telephone and data lines. It comes with a headset you can attach for hands-free operation, as well as a deluxe cord set made from nylon cloth-covered test lead wire. It also comes with a cordura carrying case that holds the test set, head set and cord set.

Optimum results with the Ranger are obtained with Test-Um supplied cord sets. See *Section 7.1* for more available styles of cord sets.

## 2.2 Features and Benefits

- Compact size with normal earpiece-to-microphones spacing; it's small enough to wear on your belt or carry in your pocket.
- Comfortable-to-hold shape.
- Liquid crystal display shows a vast amount of information, including on-hook voltage and polarity in **MONITOR** mode, off-hook current and polarity in **TALK** mode, numbers currently being dialed and how they're being dialed, and battery status.
- Detects and displays Caller ID information and faults, both while it's on hook and off hook, Call Waiting Caller ID (CWCID).
- The Ranger incorporates DigitView™ features, which detect and display all 16 possible DTMF Digits, when in **MONITOR** mode.
- Amplified loud speaker can be used in both talk and monitor modes. It can be set to three volume levels (or off)
- When the Ranger is set to its amplified **MONITOR** mode, you can listen to the line without loading it. Volume levels are comparable to those of an off-

hook line. The test set has high impedance with small series capacitance, so there won't be any popping or clicking on the line when you attach the test set. The test set continues to display polarity indication while in this mode, and will light its "low battery" icon if power runs low. After 15 minutes of operating in this mode, the test set will automatically power down.

- It has a headphone jack and ear-mounted headset for hands-free operation. When you plug in the headset, it disconnects the earpiece and microphone in the handset. The headset is compact enough to fit in your shirt pocket, can be worn on the right or left ear, and can even be worn comfortably with a hard hat on.
- The Ranger continuously measures and displays the current and polarity when off hook.
- Has a conveniently located microphone-mute button. The mute button silences the microphone while the test set is off-hook with the loudspeaker off. Since the microphone must be muted while the loudspeaker is on, the mute button acts as a loudspeaker mute and allows the microphone to be used intercom-style with the Insta-Talk™ feature.
- Can do pulse and tone dialing.

- Performs last-number redial and can also store and recall as many as eight other preprogrammed numbers. Each of these phone numbers can be as many as 24 digits long; they are reliably stored in battery backed-up memory. The Ranger also provides an alphanumeric name field 16 characters long that is associated with each number memory slot.
- When the Ranger is set to pulse-dial, it can be switched to tone-dialing midway through the number.
- The test set also supports embedded pauses in phone numbers for compatibility with PBX systems.
- It's designed with maximum usability and safety in mind: It has a flash key to simulate hook flashing, an electronic ringer (turned OFF in **MONITOR** mode), a modular plug with strain relief for the cable-set or phone-cord attachment and over current protection.
- The Ranger incorporates Traffixguard™ features (which can be disabled in the setup menu.) These features include:
  - Low voltage lockout with override for in-use or unpowered data lines

- High voltage lockout for Pair Gain lines (high voltage digital lines)
- Low voltage warning going off hook when line voltage is low
- The Ranger has DSL-safe filters to allow it to be used on a POTS line that is simultaneously being used as a DSL line.

## 2.3 The Ranger Illustrated

Figure 2-1 below shows the Ranger and indicates what its various controls and other components are for.

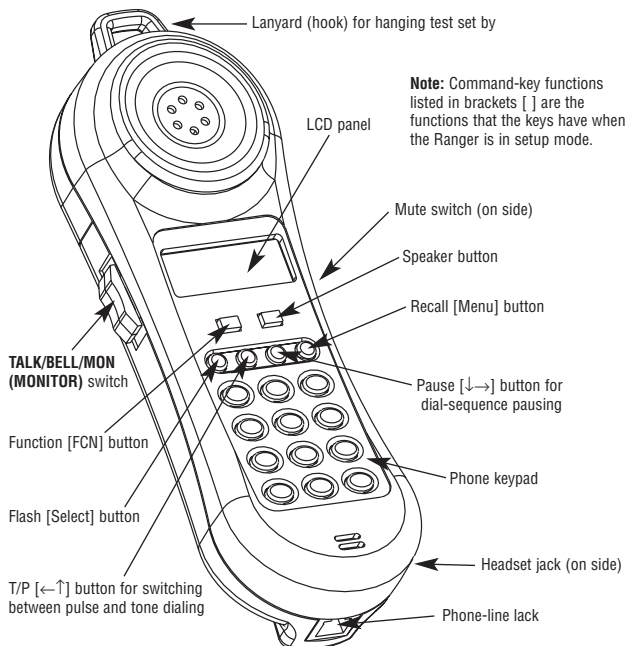


Figure 2-1. The physical components of the Ranger.

## 3. Installation and Battery Replacement

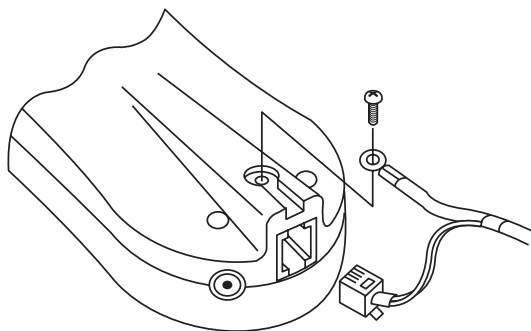
### 3.1 Connecting the Ranger to a Phone Line

The Ranger is designed with a standard RJ-12 (6 wire RJ-11) modular jack for quick connection to a phone line, either directly or through its included cable set. This jack is located at the base of the test set below its mouthpiece microphone. For a direct “temporary extension” connection, run a standard phone cable from this jack to a standard phone jack at your site.

To attach the included cable set to the Ranger, unscrew the strain-relief screw on the back of the test set, then place the strain-relief terminal in that spot and screw the screw back in, as shown in Figure 3-1 on the next page. You can then attach the cable’s RJ plug to the Ranger’s RJ-12 jack. Clip the other end of the cable to your desired line (in a wiring-closet “66 block”, for example) to establish a connection to that line.

To remove the cable set, detach it from the line and the jack on the Ranger. Unscrew the Ranger’s strain-relief screw, pop out the cable set’s strain-relief terminal, and screw the screw back in.

Figure 3-1. Connecting the cable set.



### 3.2 Connecting the Headset to the Ranger

You can use the included headset with the Ranger if you prefer hands-free or off-the-shoulder operation. Plug the 2.5 mm plug on the headset cord into the matching jack on the bottom of the Ranger, right next to the test set's modular phone jack. The headset can be used with either ear by rotating its microphone position by 90°.

Note that as soon as you plug in the headset, the main earpiece and microphone inside the Ranger handset are disabled.

### 3.3 Replacing the Battery

The Ranger comes with a battery installed, so you can use it right out of the box. But when the “low battery” icon comes on in the Ranger’s LCD panel, you’ll need to replace the current battery with another 9-volt alkaline battery. Take these steps *carefully*:

#### CAUTION!

When you swap in the new battery in step 3, you’ll need to do it in less than 30 seconds, or you could lose all of the phone numbers in the test set’s memory!

1. Remove the single screw at the top of the Ranger’s back panel with a #1 Philips-head screwdriver, then remove the test set’s battery door, as shown in Figure 3-2 on the next page.
2. Make sure that the Ranger is in **BELL** mode (see *Section 4.1.2*) and that the new battery is unpacked and ready to install.
3. Disconnect the existing battery, then *within 30 seconds* replace it with the new battery.
4. Route the battery cable carefully in the battery compartment, replace the battery door and screw the screw back in.



**CAUTION!**

Do *not* over-tighten this screw — damage to the test set might result. If you have problems closing the battery door, confirm that the battery is properly seated, the battery cable is properly routed and that the door is fully interlocked with the rest of the Ranger's case.

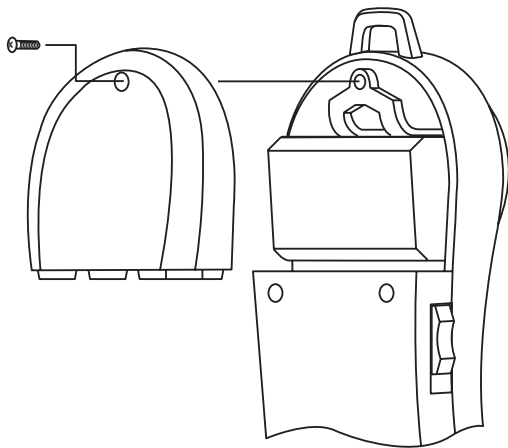


Figure 3-2. Replacing the battery.

## 4. Operation

### 4.1 Using the TALK/BELL/MON Switch

The **TALK/BELL/MON** switch is on the left side of the Ranger. The following subsections describe how the Ranger behaves in each of this switch's three settings.

#### 4.1.1 The TALK Setting (TALK Mode)

The **TALK** or off-hook position (**TALK** mode) takes the Ranger "off hook" on a standard "POTS" (plain old telephone system) voice phone line. While the Ranger is off-hook, it can dial numbers either directly from the keypad or from its memory dial slots (see *Sections 4 and 5*.)

**When the Traffixguard™ Low feature is selected as ON in the setup menu:**

The Ranger must measure 10 volts or more on the line it is connected to (a voltage level indicating a live but unused line) before it will go off hook. This stops the Ranger from interrupting data transmissions or voice calls already in progress. If the Ranger doesn't go off hook, it displays the line voltage it's measured for the line on its LCD panel, plus the string "In use??" and the

“Flash to connect” prompt on line 2. If you still want to go offhook despite this voltage reading, press the Ranger’s Flash key and the Ranger will go off hook and attempt to operate normally. (Because its voice circuits are line powered, they won’t work if there’s insufficient power on the line.) If there is not sufficient current for the test set to operate properly, it will go back on hook, to the “Flash to connect” prompt. If the Ranger is connected to a line with greater than 10 volts, it will automatically go off-hook.

#### When the Traffixguard™ Low feature is selected as OFF in the setup menu:

The Ranger does not test for low voltage before it goes off-hook.

#### When the Traffixguard™ High feature is selected as ON in the setup menu:

The Ranger checks for line voltage exceeding 65 volts. If it finds the line voltage exceeds this level, it doesn’t go off-hook but displays the messages: “x V,TOO HIGH!” and “DISCONNECT NOW!!” It continues to check the line voltage for about a minute, then goes to sleep if the high voltage has not been removed. The Ranger will go off-hook if the voltage goes below the 65 volt threshold.

#### When the Traffixguard™ High feature is selected as OFF in the setup menu:

The Ranger does not check for line voltage exceeding 65 volts. In either case, the test set automatically monitors the line current and goes on-hook if the current exceeds 125mA. The Ranger momentarily goes off-hook to sample the line current and display the new reading every few seconds.

In its normal off-hook display, the Ranger shows dialing information on the top line and status information on the bottom line. The status information consists of the dialing type (“Tone” or “Pulse”), the measured line current in milliamperes, and the line polarity (“NRM” [normal] or “REV” [reversed]).

#### 4.1.2 The BELL Setting (BELL Mode)

The **BELL** position (**BELL** mode) is the “off state” of the Ranger. The phone keypad is disabled and the Ranger is in its lowest power state. The test set monitors the phone line to which it is connected for ringing and Caller ID signals. If it detects an incoming ring, it sounds the electronic ringer. If the Ranger detects incoming Caller ID information, it will test the signal for correct format and checksum and display valid information and PASS

or FAIL depending on the correctness of the received data. If you leave the **TALK/BELL/MON** switch in this position when the Ranger is ringing, nothing will happen and the Ranger will power OFF again about 30 seconds after the end of ringing.

### 4.1.3 The MON Setting (MONITOR Mode)

The **MON** position (**MONITOR** mode) causes the Ranger to enable its amplifiers so that you can listen to a line without loading it. On-hook Caller ID is also received, checked and displayed in this mode. In the first minute of entry to **MONITOR** mode, if there is no Caller ID or DTMF information on the screen, the Ranger measures its battery voltage and estimates the remaining battery capacity. On line 2, it displays the time remaining to automatic power-off, the measured line voltage, and the polarity. The Ranger also monitors the line it is connected to for DTMF signals. If it detects any of the 16 valid DTMF signals, it will display up to 32 characters, and keep them on the LCD regardless of changes in the state of the monitored line.

## 4.2 Using the LCD Panel

The Ranger has a reflective type, super twisted liquid crystal display (LCD). The display has 2 lines of 16 alphanumeric characters each, plus a number of icon flags. The icons are used and defined as follows:

- **Steady ID** indicates displayed data is Caller ID information.
- **Flashing ID** indicates Call Waiting Caller ID (CWCID) detection is enabled. Enabling CWCID is an option in the setup menu (see Section 4.6).
- **PASS** appears with **ID** to indicate that Caller ID information was received with no errors detected.
- **FAIL** appears with **ID** to indicate that Caller ID information was received with errors. An error message will also be displayed.
- **SETUP** indicates that the Ranger is in SETUP mode.
- **1 through 8** indicate which stored phone number slot you've selected.
- A **battery icon** indicates that the Ranger's battery needs to be replaced.
- A **"no bell" icon** indicates that the Ranger is in **MONITOR** mode and that the bell (ringer) is off.

### 4.3 Using the Mute Button

When the test set is off hook in the **TALK** mode and the loudspeaker OFF, you can mute the output from the Ranger's microphone by pressing down the mute button on the right-hand side of the Ranger. (It doesn't matter whether you're using the handset's internal mike or the headset mike.) If you tap the button for less than 2 seconds, the TapLock™ feature is enabled. The test set will remain muted until you press the button again. If you hold this button down for more than 2 seconds, the mike will be muted only while the button is held down; as soon as you let go, it will resume operating normally.

When the test set is off hook in the **TALK** mode with the loudspeaker ON, the mute button is used to control the Insta-Talk™ feature. When the loudspeaker is ON, the microphone must be muted to prevent feedback, which disrupts the operation of the test set. The mute button is used to turn the loudspeaker OFF and the microphone ON so that the user can talk to the remote party over the phone line. The microphone is only ON while the mute button is being held down.

When the test set is in the **MONITOR** mode with the loudspeaker ON, the mute button is used to mute the loudspeaker. The loudspeaker is only OFF while the mute button is being held down.

### 4.4 Using the Speaker Button

When the test set is in the **TALK** mode or **MONITOR** mode, the speaker button is used to turn the loudspeaker ON and OFF. If you tap the button for less than 2 seconds, the loudspeaker will alternately turn OFF and ON. If you hold this button down for more than 2 seconds, the test set goes into the volume setting mode. It displays the prompt "SPKR VOL =" and one of three variable width icons to show the current volume setting. In this mode, tapping the speaker button causes the volume selected to cycle from low—mid—high and back. This mode (and the prompt) times out about 10 seconds after the last button tap, and the test set returns to normal operation.

**Note:** The loudspeaker draws a large amount of power and can discharge the battery quickly if used at high volume on a line with a lot of signal.

**Note:** When the test set is off hook (**TALK** mode) the unit depends on the current from the phone line to power the audio circuits. If the line is not providing enough current (>10 mA) the test set automatically mutes the loudspeaker to prevent uncontrolled audible noise from coming from the loudspeaker.

## 4.5 Using the Function Button

The Function (FCN) button acts to modify the operation of some of the keys on the keypad. The function button must be pressed or held down prior to pressing the key that the user wants to modify. Pressing a key that the function does not affect will cause the function button to be ignored. The affect of the function button on the command keys is described in *Section 4.6* below.

The affect of the function button on the standard keypad keys is shown on the keypad by the white printing on the test set above the affected key:

- **Star (\*)** – key becomes CL, a clear for the LCD when it is displaying caller ID or DTMF information, or while editing memory dial numbers or names.
- **3** – key is shifted to A for dialing or saving a DTMF tone that is not normally available on a 12-key telephone keypad.
- **6** – key is shifted to B in a similar fashion
- **9** – key is shifted to C
- **Pound (#)** – key is shifted to D

## 4.6 Using the Command Keys

There are sixteen pushbutton keys on the keypad of the Ranger. Twelve of these are a standard telephone keypad; the four keys in a single row at the top are the Ranger's command keys. The command keys each have multiple functions, depending on which operating mode the Ranger is in and the Function key.

### 4.6.1 Command-Key Functions In Normal TALK Mode

In regular **TALK** mode, the labels printed on the keys describe their functions. (The abbreviations in parentheses in the paragraphs below are the actual labels on the keys themselves.)

- The **Flash (Flsh)** key breaks the phone line connection for 0.6 seconds, simulating a phone "hookflash" signal. Hookflashes are often used to transfer calls or to activate special PABX or central-office features.
- When dialing is not in progress, the **T/P (Tone)** key toggles the test set between tone (DTMF) and pulse dialing. The current dialing mode is displayed on the bottom line of the LCD. While dialing is in progress, the **Tone** key can be used to switch from pulse to tone mode for sending tones after making

a connection in pulse mode. When you press the key to do this, a “T” will appear in the display along with the numbers you are dialing. If you are already in tone mode, pressing this key during dialing has no effect.

- When you dial a number, you can press the **Pause (Pau)** key between digits to add an extra 3.8 seconds to the usual interdigit delay between dialed digits. (You might want to do this, for example, to allow time for a PBX to answer and give you the option of dialing an extension.) When you do this, a “P” will appear in the display along with the numbers you are dialing.
- You can use the **Recall (Rcl)** key to recall a stored number or to enter either the setup mode or “scrolling stored-number recall” mode. (In these other modes, the command keys function differently, as described below.)

To do these different things, you need to press the **Recall** key followed by a second key. The normal **TALK**-mode display is replaced with a message prompt to help you select the second key to press:

If you press **Recall** and then press a number from **0** to **9** on the Ranger’s phone keypad, the Ranger dials a phone number in its memory. Pressing **0**

triggers “last-number redial” (the Ranger dials the phone number you most recently dialed manually).

- Pressing **1** through **8** causes the Ranger to dial the phone number (if any) that you’ve stored in the corresponding slot in its memory.
- Pressing **9** triggers the Ranger to dial Technical Support (it dials the phone number for Technical Support at the Test-Um factory.)
- If you press **Recall** and then press **Tone** or **Pause**, the Ranger enters scrolling-recall mode (see *Sections 4.6.2* and *4.7* for more information).
- If you press **FCN** and then **Recall** (or press **Recall Recall**), the Ranger decodes this as the **MENU** function and enters **SETUP** mode—even if you’re in **MONITOR** or **TALK** mode at the time (see *Sections 4.6.2* and *4.8* for more information).
- If you press **Flash** or **#** keys following **Recall**, the key press will be ignored and the mode change will be aborted. If you press **\***, the diagnostic mode is entered. Pressing the keypad keys **17** more times or moving the **TALK/BELL/MON** switch is required to exit this mode.

#### 4.6.2 Command-Key Functions In Scrolling-Recall and Setup Modes

In **SETUP** and **Scrolling-Recall** modes, the labels in the blue area above the command keys describe their functions. (The abbreviations in parentheses in the paragraphs below are the actual labels on the keys themselves.)

- Use the **Select (Flsh)** key to select the line that the “>” cursor symbol points at in setup mode to select the currently displayed number for dialing in scrolling-recall mode, or to finish the entry of a stored phone number or name and return to the number selection screen.
- Use the **FCN ←↑ (Tone)** key combination to scroll (move the cursor) up or left.
- Use the **FCN ↓→ (Pau)** key combination to scroll (move the cursor) right or down.
- Use the **Menu (Rcl)** key to go back one menu screen or to return to normal **TALK** mode from the first menu screen,

#### 4.7 Scrolling-Recall Mode

To get into scrolling-recall mode from normal operation, press **Recall** followed by either **Tone** or **Pause**. When you place the Ranger in this mode, it will display the number of the starting storage slot, and either the name entry associated with that slot (if one has been entered), the stored phone number, or the word “empty”. The starting slot depends on which button you pressed to get into scrolling-recall mode: It will be slot 1 on the left if you pressed **Pause** [↓→] or slot 8 on the right if you pressed **Tone** [←↑].

The Ranger’s command keys now take on their scrolling-recall-mode functions/identities (see *Section 4.6.2*): You can review all stored phone numbers by pressing the ←↑ or ↓→ scroll keys to move left or right in the list respectively. (Pressing ←↑ at slot 1 or ↓→ at slot 9 will cause the Ranger to “wrap” to the other end of the list.) Press **Select (Flsh)** to dial the currently displayed number, or press **Menu (Rcl)** to escape back to normal operation.

**Note:** slot 9 is permanently pre-programmed to store the number of Technical Support at the Test-Um factory (805-383-1500.)

## 4.8 Setup Mode

To get into setup mode from **TALK** mode (normal operation) or **MONITOR** mode, press **FCN RCL (Menu)** or **Recall** twice. The Ranger then presents a list of options that can be modified, and the Ranger's command keys now take on their setup-mode functions/identities (see *Section 4.6.2*). You can use the  $\leftarrow\uparrow$  or  $\downarrow\rightarrow$  scroll keys to move the ">" cursor symbol around to point to different items. Press the **Select** key to choose a particular function. Then **Select** again to save the selection currently pointed to by the ">" cursor.

- **Memory Dial Setup** – When you select this, the Ranger displays "Press 1-8". Pressing a number from **1** to **8** on the Ranger's phone keypad will cause the Ranger to display the number stored in the corresponding location in its memory. If the slot is blank, the Ranger displays the word "empty" instead.

At this point, you can press **Select** to advance to the name stored in this slot, or **Menu** to exit back to the slot selection menu, without making any changes; all currently stored numbers will be maintained unchanged. If instead you begin pressing keys corresponding to storable characters (the numeric keypad digits plus **Pause** and **Tone**),

any current number will be cleared and the number string you type in will become that slot's new stored phone number. (**Pause** corresponds to a 3.8-second pause embedded in the number, displayed as "P." **Tone** corresponds to an embedded switch from pulse to tone-dialing, displayed as "T".) While you are entering the number, you can use the arrow keys, selected by pressing **FCN** [ $\leftarrow\uparrow$ ] and **FCN** [ $\downarrow\rightarrow$ ] to move back to change a number entered in error. After moving left back into the number, you must move right to the end of the number to continue entering more digits.

When you're finished typing in the new number, press **Select** to save it and move to the name entry step, or **Menu** to exit back to the slot selection menu. In the name entry mode, the 12 number/letter keys can be used to enter alphanumeric strings into the name field of the dial memory. The keys with multiple functions are hit multiple times to select the character entered into the string. For example, to store a "B" into memory, press the "2ABC" key three times. The first time the key is pressed, a "2" will appear on the display, each successive press will display the next character printed on the key. To store the presently displayed character, the user can press any other key to advance the cursor and start entering characters from that key, or press the **FCN** [ $\downarrow\rightarrow$ ] key



combination to just advance the cursor (pressing **FCN** [↓→] again will enter a space into the name field.) In general, the cursor advances automatically when a new key is pressed, or after a single-function key is pressed. The cursor does not advance while pressing a multi-function key multiple times. While entering a name string, the **FCN** [←↑] key combination can be pressed to move back to the left to correct an entry error. While correcting entries, the cursor does not advance automatically. The cursor must be positioned by pressing the **FCN** [←↑] or **FCN** [↓→] keys to move it left or right. Once the last character on the right has been reached, the key functions return to normal entry function. The **FCN CL** key combination can be used to clear the entire string from the display and the memory location. To store the displayed string into the dial memory, press either **FCN/Flsh** (**Select**) to move to slot selection menu, or press the **FCN/Rcl** (**Menu**) to exit out of dial memory setup. After storing a string into the name memory, it cannot be edited. The stored string can be replaced by selecting its location in the name editing portion of Setup and entering a new string.

If you want to clear a stored number, or name, from memory, press the **FCN CL** (**Clear**) key combination to return it to “empty” status.

- **Call Waiting ID** – Use this screen to turn the Ranger’s Call Waiting Caller ID (CWCID) feature ON or OFF. (The factory default is OFF.) Use the ↓→ and ←↑ scroll keys to move the cursor between ON and OFF, then press **Select** to choose the setting you’ve moved the cursor to. (You will automatically be returned to the main setup menu.)

**Note:** When you go into **TALK** mode with CWCID ON, the Ranger flashes its “ID” icon to indicate that CWCID is active. With CWCID ON, the Ranger draws considerably more battery current than when CWCID is OFF. To conserve battery power, we recommend leaving CWCID turned OFF when it’s not being used.

- **Guard Low Volt** – This screen allows the low voltage lockout feature to be turned ON and OFF. (The factory default is ON.) Use the ↓→ and ←↑ scroll keys to move the cursor between ON and OFF, then press **Select** to choose the setting you’ve moved the cursor to. (You will automatically be returned to the main setup menu.)

**Note:** Traffixguard™ low prevents the test set from going off hook if the line voltage is less than 10 volts. The test set goes off hook automatically if the line voltage goes above the 10 volt threshold. When this feature is off, no low voltage check is made before the test set goes off hook.

- **Guard High Volt** – This screen allows the high voltage lockout feature to be turned ON and OFF. (The factory default is ON.) Use the ↓→ and ←↑ scroll keys to move the cursor between ON and OFF, then press **Select** to choose the setting you've moved the cursor to. (You will automatically be returned to the main setup menu.)

**Note:** Traffixguard™ high prevents the test set from going off hook if the line voltage is greater than 65 volts. The test set goes off hook automatically if the line voltage goes below the 65 volt threshold. When this feature is off, no high voltage check is made before the test set goes off hook.

## 4.9 Special Features

### 4.9.1 Traffixguard™ Low Alert

When the Guard Low is ON, each time you try to put the Ranger in **TALK** mode, it measures the voltage on the phone line. It will not connect (go off hook) if the measured voltage is less than 10 volts, which would normally indicate a dead line, a data line, or an in-use voice line. If this occurs, the measured voltage is displayed along with the messages “In use??” and “Flash to Connect”. This gives you the opportunity to verify the line status before proceeding.

If you still want to connect, press the **Flash** key to connect. The voltage is constantly updated, so while the Ranger is in this mode, you can use the cable-set leads to search for a line with normal on-hook voltage. If such a line is detected, the test set will automatically go off hook. When the Guard Low is OFF, this test is not done prior to going off hook.

**Note:** The test set continuously monitors the voltage on the line while it is off hook, and will go on hook automatically if it detects insufficient voltage. This test is done regardless of the setting of Guard Low.

When in either the high or low voltage states, the phone will time out after about 90 seconds of no change in status and turn off. The **TALK/BELL/MON** switch must be moved to Bell mode and then back to Talk or Monitor position to turn the phone on after timing out.

### 4.9.2 Traffixguard™ High Alert

When the Guard High is ON, each time you try to put the Ranger in **TALK** mode, it measures the voltage on the phone line. It will not connect (go off hook) if the measured voltage is greater than 65 volts, which would normally indicate a line with power for repeaters or a line with a power cross. If this occurs, the measured

voltage is displayed along with the messages “V TOO HIGH!” “DISCONNECT NOW!!” The test set will display this message and sound the alarm until the line voltage returns below 65 volts or the test set times out. When the voltage drops below 65 volts, the test set will go off hook if the voltage is in range or return to the low voltage message as is appropriate.

**Note:** The test set continuously monitors the current on the line while it is off hook, and will go on hook automatically if it detects excessive current. This test is done regardless of the setting of Guard High.

When in either the high or low voltage states, the test set will time out after about 90 seconds of no change in status and turn off. The **TALK/BELL/MON** switch must be moved to Bell mode and then back to Talk or Monitor position to turn the test set on after timing out.

#### 4.9.3 Automatic Power-Off

The Ranger has automatic power-off for all functions to conserve the battery. The **MONITOR** mode is the Ranger mode with the highest power consumption. It times out and powers off in 15 minutes. Because this is a relatively short period of time, the time remaining is displayed on

the screen in minutes. The **TALK** mode times out in approximately 60 minutes with CWCID (Call Waiting Caller ID) OFF and 30 minutes with CWCID ON. Once the Ranger times out and powers OFF, you'll have to move its **TALK/BELL/MON** switch to another position to wake up the test set.

#### 4.9.4 Battery-State Information

For a short time after you place the Ranger in **MONITOR** mode, it displays the approximate percentage of life remaining in its battery. If the Ranger is displaying Caller ID information when you switch to **MONITOR** mode, it will continue displaying that information for several seconds before displaying the battery-state information.

#### 4.9.5 Overcurrent Protection

If the Ranger is in **TALK** mode and senses a current on the attached phone line in excess of 120 mA, it displays the current measured and the message “CURRENT TOO HIGH”, then automatically disconnects from the line. Periodically, the Ranger reconnects for a short time, measures the current and displays the results, then disconnects again if the current is still too high.

#### 4.9.6 On-Hook Caller ID

While it's in **BELL** or **MONITOR** mode, the Ranger detects and displays on-hook Caller ID information. The Ranger doesn't block the first ring signal. If the Ranger or another phone on the line is taken off hook before the beginning of the second ring, the Caller ID information might not be properly received. Because the Ranger has a small screen, it only displays number and name information (when these are available). However, the Ranger is capable of receiving messages of any type and length (as long as they're formatted per Bellcore GR-30-CORE) and verifying their checksums. Besides name, number, "out of area," and "numbers blocked," the messages listed below are displayed by the test set as required:

- **"Single Msg Type"** – The Ranger correctly received a Caller ID in single-message format, but the message was an unsupported type.
- **"Multi Msg Type"** – The Ranger correctly received a Caller ID in multiple-message format, but one or more sections of the message were unsupported types.
- **"Chksum=xx, Rx=yy"** – The Ranger has detected a checksum error. The checksum xx was at the

end of the message, but the Ranger calculated the checksum *yy* from the received data.

- **"Lost Carrier"** – The Ranger detected the Caller ID carrier, but lost it before the end of the transmission.

#### 4.9.7 Call Waiting Caller ID (CWCID)

The Ranger in **TALK** mode handles off-hook Call Waiting Caller ID (CWCID) essentially the same way it does on-hook Caller ID, displaying the same information and errors. But instead of the first ring alerting the Caller ID circuitry, a special CPE Alerting Signal (CAS) tone is sent immediately after the usual Call Waiting alert tone. When CWCID is enabled, the Ranger detects this tone, mutes its audio circuits, sends an acknowledgment tone, and receives the data before re-enabling the audio circuits. Because the CAS-detection circuitry requires considerable battery power (about 3 times the normal **TALK**-mode battery power), the default setting for CWCID is "OFF." To enable CWCID, you'll need to access the setup mode (see *Section 4.6*).

#### 4.9.8 DigitView™ DTMF Decode and Display

In **MONITOR** mode, the Ranger decodes and displays any DTMF tones that are on the monitored phone line.

The test set decodes all 16 possible DTMF tones. The DTMF display remains on the screen for about two minutes unless the **TALK/BELL/MON** switch is changed or the **FCN CL** key combination is pressed to **CLEAR** the display.

#### 4.9.9 Loudspeaker

The Ranger has a loudspeaker that can be used in **MONITOR** and **TALK** modes to allow the test set to be used like a speaker phone so that the signal on the line can be heard without being close to the test set. The loudspeaker is controlled by the **Speaker** and **Mute** buttons as described in *Sections 4.3* and *4.4*. The Ranger provides a feature called Insta-Talk™ to allow intercom-like 2-way conversations in **TALK** mode. The loudspeaker times out in about 15 minutes and the test set goes back to normal earpiece/head set mode automatically. The loudspeaker is automatically set to **OFF** every time the test set goes from **TALK** to **BELL** modes or **MONITOR** to **BELL** modes unless the time between **TALK** and **MONITOR** modes is less than 3 seconds.

**Note:** The loudspeaker draws a large amount of power and can discharge the battery quickly if used at high volume on a line with a lot of signal.

## 5. Maintenance

You can clean the Ranger with a damp cloth. If the test set is very dirty, you may apply a small amount of liquid soap to the cloth to assist in cleaning. Do not use solvents, scouring powders, or other abrasive cleaners that might scratch the test set and/or cause malfunctions.

You should periodically check the Ranger's cable set for shorts, continuity, or obvious signs of wear, such as fraying or loose/damaged test clips.

## 6. Troubleshooting

### 6.1 Warranty

Test-Um Inc. guarantees to the end-user purchaser that its products, and each of the parts thereof, will be free of all defects in material and/or workmanship. This warranty extends for a period of 12 months for the portable telephone test set and months for the cordset from the date of manufacture or proof-of-purchase. The obligations of Test-Um Inc. under this warranty is limited to the repair or replacement (at our option) during the warranty period, of any part that proves to be defective in material or workmanship under normal use, installation and service, provided the product is returned to Test-Um Inc. freight prepaid. In the absence of such a receipt, the warranty period will cease 12 months from the date of manufacture. This warranty does not extend to products which have been subjected to neglect, accidental or improper use, or to units which have been altered, repaired, or inspected by other than Test-Um Inc. authorized personnel. In no event will Test-Um Inc. be liable for any incidental or consequential damages.

### 6.2 Calling Test-Um

If you determine that your Ranger is malfunctioning, *do not attempt to alter or repair the test set*. It contains no user serviceable parts. Contact Test-Um Technical Support at 805-383-1500. Note that this number is permanently stored in the Ranger's dial memory at slot 9, and can be dialed while hooked to a live phone line by pressing "**Rcl 9**".

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem; when the problem occurs;
- the components involved in the problem;
- any particular application that, when used, appears to create the problem or make it worse; and
- the results of any testing (of the Ranger itself) that you've already done.

### **6.3 Warranty Service**

All units returned for warranty repair will be repaired or replaced free of charge, at the discretion of Test-Um Inc., and will be shipped freight prepaid. In the event that a sales receipt or other dated proof-of-purchase documentation is not available, a period of not more than 12 months from date of manufacture shall apply.

### **6.4 Non-Warranty Service**

Damaged units returned for non-warranty repairs will be inspected and an estimated repair cost forwarded by phone or mail. Once an approval of these costs is received, the unit will be repaired. Charges for service and return freight will be invoiced on a C.O.D. basis with the unit.

### **6.5 Shipping and Packaging**

If you need to transport or ship your Ranger:

- Before returning any product to Test-Um Inc., you must first request a Return Goods Authorization Number by contacting our Customer Services Dept. at 805-383-1500. No shipments will be accepted without this number, which must be clearly marked on the shipping label.

- Ship the test set with a copy of the sales receipt, if available.
- Attach a description of the operational problem.
- Include a contact name, phone number, and e-mail address (if possible).
- Pack securely to prevent damage during shipping.
- Ship prepaid to: Test-Um Inc.  
808 Calle Plano  
Camarillo, CA 93012

## 7. Accessories

Accessories can be obtained by contacting your local distributor, or directly from Test-Um by contacting us at 805-383-1500. Also see our website at [www.test-um.com](http://www.test-um.com) for the latest information on the availability of these or other new accessories for your test set.

### 7.1 Cordsets

- **Cord Set**, Part Number LB20B  
Economy cord set made of standard test lead wire. Approximately 5 feet in length with modular plug and strain relief grommet on one end and self-piercing bent nose clips on the other end.
- **Bed of Nails Cord Set**, Part Number LB30B  
Same description as above, except for the addition of a bed of nails in place of the piercing spike in the clip.
- **Alligator Cord Set**, Part Number LB10B  
Same description as the replacement cordset, except for the substitution of alligator style clips.

- **Deluxe Cord Set**, Part Number LB25  
Deluxe cord set made of nylon cloth-covered test lead wire. Approximately 5 feet in length with modular plug and strain relief grommet on one end and self-piercing bent nose clips on the other end.
- **Replacement Deluxe Bed of Nails Cord Set**, Part Number LB35  
Same description as above, except for the addition of a bed of nails option in the clip. This cord set is included with the Ranger.

### 7.2 Headsets

- **Replacement Mini Headset**, Part Number LB40B  
Over the ear design works with hats and glasses; microphone boom adjustable for both left and right side; 2.5 mm cell phone style plug with 4-ft cord. This headset is included with the Ranger.
- **Deluxe Headset**, Part Number LB45B  
Full-sized headset with adjustable head band; noise-canceling microphone; use on left or right side; 2.5 mm cell phone style plug with 4-ft cord.



### 7.3 Modtest Adapters

- **4-Position Modtest Adapter**, Part Number LB64  
Pass-through cable adapter with 6-position RJ-12 jack on each end. Test points connected to each of the 4 active wires passing through the adapter for the attachment of test equipment.
- **6-Position Modtest Adapter**, Part Number LB66  
Pass-through cable adapter with 6-position RJ-12 jack on each end. Test points connected to each of the 6 active wires passing through the adapter for the attachment of test equipment.

### 7.4 Test Set Carrying Accessories

- **Deluxe Swivel Belt Clip**, Part Number LB60B  
Plastic belt clip which can be attached with a screw (included) to the test set for secure attachment to a tool belt.
- **AT&T Hook/Clip Assembly**, Blue, Part Number LB85B  
Hinged metal clip permanently attached to a replacement battery cover. Replaces the battery cover included with the test set and adds a secure belt clip.
- **Replacement Cordura Pouch For Lil' Buttie**, Part Number LB80  
Custom-made pouch built to store the test set and cord set in separate compartments. Has loop on the back for attachment to belt or tool box. This pouch is included with the Ranger.

