TRICORDER
II, III, VIA

OPERATION MANUAL

TRILITHIC

The Best Thing on Cable

TRILITHIC

TRILITHIC, Inc., one of the fastest growing privately held companies in the U.S. (Inc. 500, #10), is a leading supplier of test equipment to the CATV industry. Through the years, we have introduced a range of products to make CATV maintenance simpler, faster and more precise. Our contributions include the first PRACTICAL CATV sweep system (1976), the first CATV return adjustment system (1981), the SEARCHER PLUS for leakage measurement (1989) and the SUPER PLUS for overbuilt leakage and ingress measurement (1994).

Among our most popular products is the TRICORDER series of CATV analyzers (led by the new TRICORDER III, the most versatile member of the popular TRICORDER family).

TRILITHIC is especially well known for its leakage products. More than 15,000 SEARCHER PLUSES are in daily use as well as the SUPER PLUS and SUPER CT measurement devices (which take leakage measurement into the new era of overbuilds and digital services).

In addition to developing instrumentation for the CATV industry, TRILITHIC produces RF and microwave components and equipment for aerospace and wireless communications, as well as computer controlled assemblies for automated test systems, headend automation and communications signal routing.

TRILITHIC products are designed and manufactured at our facility in Indianapolis, Indiana. These products are distributed by sales agents in over 40 countries.

Should you have any questions or need our service, please contact us at the address or telephone numbers below:

TRILITHIC, Inc.
9202 East 33rd. Street
Indianapolis, IN 46236
(317) 895-3600
(800) 344-2412

Made in U. S. A.

TWO YEAR WARRANTY

Trilithic, Inc. warrants that each part of this product will be free from defects in materials and workmanship, under normal use, operating conditions and service for a period of two (2) years from date of delivery. Trilithic, Inc.'s obligation under this Warranty shall be limited, at Trilithic, Inc.'s sole option, to replacing the product, or to replacing or reporting any defective part, F.O.B. Indianapolis, Indiana; provided that the Buyer shall give Trilithic, Inc. written notice.

Batteries are not included or covered by this Warranty.

The remedy set forth herein shall be the only remedy available to the Buyer under this Warranty and in no event shall Trilithic, Inc. be liable for incidental or consequential damages for any alleged breach of this Warranty. This Warranty shall not apply to any part of the product which, without fault of Trilithic, Inc., has been subject to alteration, failure caused by a part not supplied by Trilithic, Inc., accident, fire or other casualty, negligence or misuse, or to any cause whatsoever other than as a result of a defect.

Except for the warranty and exclusions set forth above, and the warranties, if any, available to the Buyer from those who supply Trilithic, Inc., there are no warranties, expressed or implied (including without limitation, any implied warranties of merchantability of fitness), with respect to the condition of the product or its suitability for any use intended for it by the Buyer or by the purchaser from the Buyer.

TRILITHIC

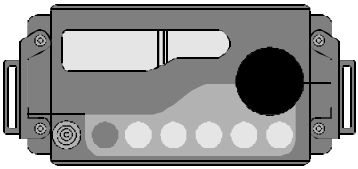
9202 E. 33rd Street
Indianapolis, IN 46236

317/895-3600

Table of Contents

I

INDEX



GENERAL INFORMATION

1

Introduction

Congratulations! You now own one of Trilithic's versatile meters, the **Tricorder**. These meters are computerized, state-of-the-art instruments which do it all so that you can do your job more effectively. This manual covers the operations for the standard Tricorder II and III models as well as the enhanced Tricorder II and III models which are equipped with the VIA features package.

More than a simple device for measuring signal levels, a Tricorder enables you to test leakage as well.

Each Tricorder weighs less than 3 pounds so that you can carry it in one hand. This size makes pole-climbing safer and operation in tight confines more comfortable for you. Tricorders are versatile as well and can be used in the field or installed in a mobile mount for vehicle surveys.

Standard Tricorder Features

All Tricorders are designed to perform a variety of functions which enable them to measure signal levels and monitor leakage.

SLM FUNCTION

A Tricorder tunes a range of 5 – 1000 MHz band in 50 kHz steps or in accordance to a Channel Plan.

Each unit comes with NCTA, IRC, HRC and "off-air" Channel Plans. You can also program your meter with two custom Channel Plans. For quick access, you can program the settings for up to ten commonly-used channels.

The Tricorder is equipped to measure carrier-to-noise and hum. Both measurements are semi-automated for speed and convenience.

As an aid to troubleshooting various types of power supply problems, the hum measuring function can differentiate between 60 Hz, 120 Hz and aggregate low frequency noise.

LEAKAGE MONITOR FUNCTION

A basic, uncalibrated leakage monitor is standard for all Tricorders. Operating in this mode, a Tricorder can detect leaks as small as 20 µV/m when you are patrolling on foot. During mobile patrols, sensitivity increases to 5 µV/m.

The strength of the leakage is indicated by a bar-graph LCD display as well as an audible tone which rises in pitch as you approach the leak. From the front panel, you can set the meter to monitor any frequency from 107 to 157.25 MHz; selectable in 12.5 kHz steps.

SUPER LEAK DETECTION

The SUPER PLUS Mode enables your Tricorder to utilize leakage test carriers which have been *tagged* by Trilithic's **CT-2 CHANNEL TAG**. This mode is especially useful in overbuilt CATV systems.

When several CATV systems operate in the same area, it is often difficult to determine which system is the source of the detected leak. Use the CT-2 CHANNEL TAG unit to *tag* your test carrier with a unique, low frequency modulation. This modulation is invisible to the subscriber but is detected easily by the Tricorder.

When the SUPER PLUS Mode is activated, your Unit responds ONLY to signals that have been tagged. This means the Meter will not respond to ignition noise, power line interference or leaks from overbuilt CATV systems.

AUTOMATIC LEVEL COMPENSATION

This feature enables your Tricorder to automatically compensate digital measurements on a channel-by-channel basis. Programmable compensations are provided which enable you to assign user-defined compensations to the level readout for any channel included in L1 or L2 Learned Channel Plans and to any of the channels or frequencies stored in the 10 user memories. Use **TriSetup** (Version 1.06 or higher) to program the desired compensations.

Tricorder Equipment

All Tricorders include the following standard equipment:

- LCD Display
- Spin Knob operation for Synthesized Tuning
- MEMory Access (10 channel setups)
- Replaceable NiCad Battery Pack
- Built-in Speaker
- Wall Plug Charger
- Charger Input
- Handstrap
- FUNCtion Selection
- CHannel/FREQuency Tuning
- Replaceable RF Input Connector
- Carrying Bag
- Rubber Duck Leakage Antenna

Optional equipment includes:

- Mobile Mount
- Cigarette Lighter Adapter
- Extra Battery Pack (NiCad)
- Alkaline Battery Holder
- Adjustable Frequency Dipole Antenna
- Fixed Frequency Dipole Antenna
- Magnetic Mount Antenna
- Near Field Probe
- RS-232C Communications Port
- **Tridata** and **Trimod** Software*
  * Used with Data Logging Option
- **TriSetup** Configuration Software
- VIA

Now that you know about Tricorders in general, you can learn about your particular Tricorder model (refer to *ABOUT TRICORDER II* on page 6; *ABOUT TRICORDER III* on page 6; and *ABOUT ENHANCED TRICORDER FEATURES* on page 7).

About Tricorder II

In addition to measuring signals for you, Tricorder II's sdB feature enables you to measure aural/visual or hi/lo pilot carrier ratios at the simple push of a button. Tricorder II can test uncalibrated leakage (standard) or calibrated if equipped with the CLI (Calibrated Leakage) option.

Tricorder II is designed to maintain an active distribution system by performing key tests. This meter is effective for testing from the tap to the customer outlet.

Using the SLM and Leakage Monitor Functions, Tricorder II can identify and measure the following:

- Signal Level
- sdB
- Signal Leakage
- Super Leak Detection
- Battery Voltage

If the Tricorder II is enhanced with the VIA features, it is even more powerful. These include:

- Data Logging
- FCC Evaluator
- Drop Evaluator

If you have purchased an enhanced Tricorder II model, see *ABOUT ENHANCED TRICORDER FEATURES* on page 7 for more information.

About Tricorder III

Tricorder III combines the strength of a full function signal level meter, a sensitive tunable leakage detector and a flexible measurement data recorder.

The unit measures signal levels, carrier-to-noise and hum. It can also detect leakage to levels below 5 µV/m.

Tricorder III is designed to maintain an active distribution system by performing key distribution tests.

Using the SLM and Leakage Monitor Functions, Tricorder III can identify and measure the following:

- Signal Level
- Carrier-to-Noise
- Hum
- sdB
- Signal Leakage
- Super Leak Detection
- Battery Voltage

If the Tricorder III is enhanced with the VIA features, it is even more powerful. These include:

- Data Logging
- FCC Evaluator
- Drop Evaluator

If you have purchased an enhanced Tricorder III model, see *ABOUT ENHANCED TRICORDER FEATURES* below for more information.

About Enhanced Tricorder Features

If you have purchased an enhanced Tricorder II or III, you have ensured that you are equipped with a powerful partner for maintaining your system.

These Tricorders include Data Logging, FCC Evaluator, and Drop Evaluator in addition to the standard functions.

DATA LOGGING FEATURE

The Data Logging feature contains two modes: MANUAL and AUTOMATIC.

Manual Mode

When Data Logging is set to the MANUAL Mode, the Tricorder can measure and store video carrier levels for up to 100 channels at up to 24 sites so that you can later download the information to a PC or a printer. These records can be invaluable for documenting installations or for tracking long-term amplitude problems.

Each data record is stamped with the data and time and you may also add a 7-digit work order number to facilitate record tracking. If you have connected the optional temperature probe, the record will also include ambient temperature.

Automatic Mode

When you set Data Logging to AUTOMATIC Mode, your Meter will measure and record the level of all carriers at regular time intervals; settable from 5 minutes to 6 hours between records.

A special *power down* feature conserves batteries between measurements so that complete 24-hour records can be taken on a single charge.

FCC EVALUATOR

The FCC Evaluator feature activates internal software which automatically analyzes signal level data and confirms compliance with FCC specifications.

The FCC Evaluator tests for all Part 76.605 amplitude-related requirements including:

- Absolute Amplitude (76.605.a3)
- Adjacent Visual Levels (76.605.a4i)
- Maximum/Minimum Visual Amplitude Difference (76.605.a4ii)
- Visual/Aural Carrier Ratio (76.605.a5)

Once it has analyzed the measurement data, the FCC Evaluator displays a simple PASS or FAIL message. Then it generates and stores a full test report which can be downloaded to a PC or a printer.

When troubleshooting, you can call up and display each channel which fell outside each of the FCC limits; with a message indicating which test failed.

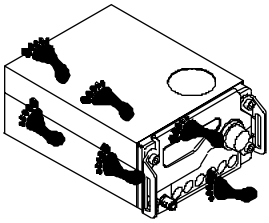
DROP EVALUATOR

Use the DROP EVALUATOR feature to scan the user memories automatically. This enables you to compare each memory to a minimum and maximum limit which is unique to each memory.

There are three sets of limits which may be selected via **F16**. These include one for:

- Tap Levels
- Block Levles
- Back of Set Top Converter Levels

This gives you a total of 30 entries in the limit table. These three sets of limits are stored in the EEPROM and are assigned a default value of – 30.0 dBmV minimum and + 60.0 dBmV maximum. Values which meet your system's requirements are set easily via **TriSetup** Software.



TRICORDER WALKTHROUGH

2

Introduction

Now that you have your Tricorder out of its box, take a few moments to look it over so that you become familiar with its controls.

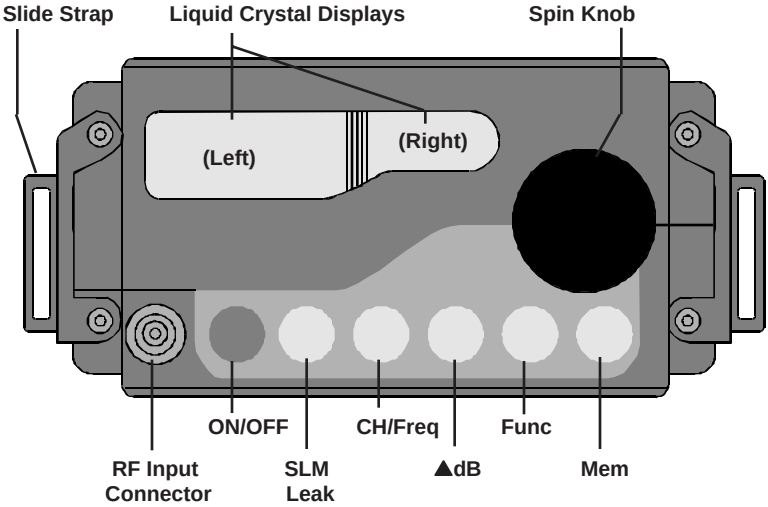
> **NOTE:** Display representations throughout this manual are samples only. Display numbers (i.e. channels and frequencies) in your actual Meter may be different.

Identify Components

The Tricorder has connectors and buttons on the front and rear panels.

TRICORDER II FRONT PANEL

The front panel contains the following:



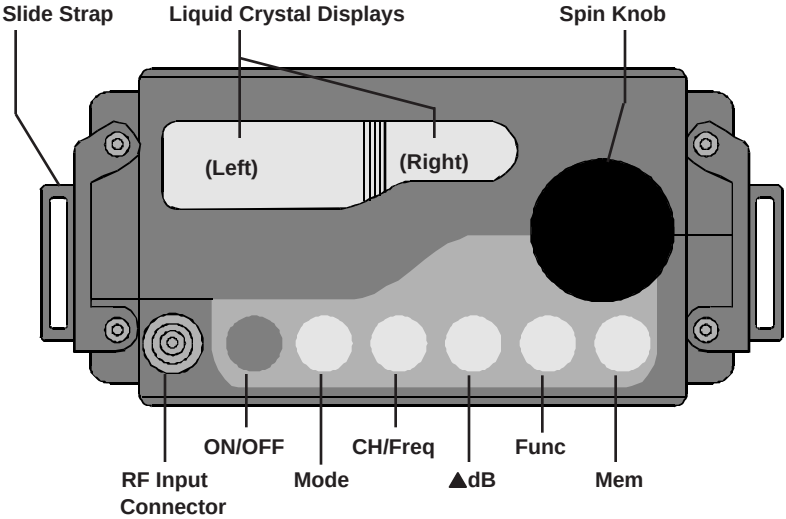
- 2 Liquid Crystal Displays (LCDs) – indicates Meter' status
- Spin Knob – sets frequencies, channels, control functions and modes
- Slide Strap – provides secure, comfortable grip on Unit
- RF Input Connector – signal input for SLM Mode
- ON/OFF button – powers up and down Tricorder; backlights LCDs
- SLM/LEAK button – selects operating mode of Tricorder
- CH/FREQ button – selects channel or frequency tuning
- ▲dB button – displays video/audio difference or system tilt
- FUNC button – enables the various functions of Tricorder
- MEM button – enables the memory feature of Tricorder

HOT TIP

There are a number of functions available to you which are used to set up the Tricorder, data logging, downloading, etc. These occur throughout the manual as they are needed. For a complete listing of all available functions, see* SUMMARY OF FUNCTIONS *page 108.

TRICORDER III FRONT PANEL

The front panel contains the following:



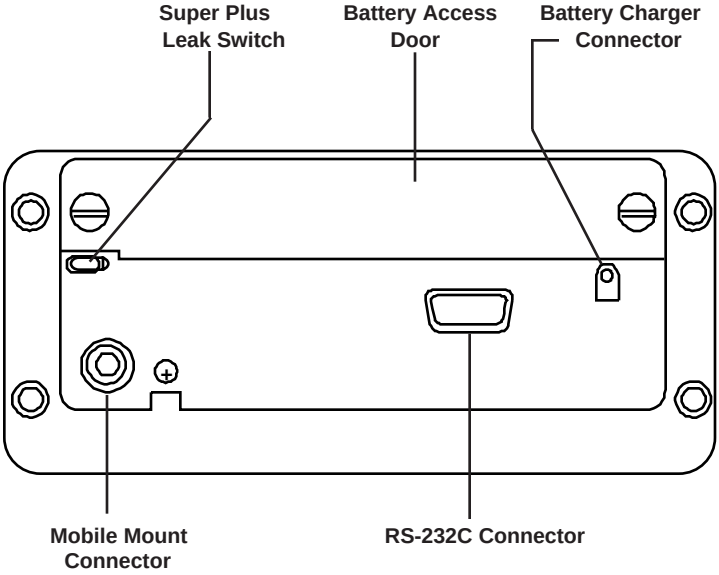
- 2 Liquid Crystal Displays (LCDs) – indicates Meter' status
- Spin Knob – sets frequencies, channels, control functions and modes
- Slide Strap – provides secure, comfortable grip on Unit
- RF Input Connector – signal input for SLM Mode
- ON/OFF button – powers up and down Tricorder; backlights LCDs
- MODE button – selects operating mode of Tricorder
- CH/FREQ button – selects channel or frequency tuning
- ▲dB button – displays video/audio difference or system tilt
- FUNC button – enables the various functions of Tricorder
- MEM button – enables the memory feature of Tricorder

HOT TIP

There are a number of functions available to you which are used to set up the Tricorder, data logging, downloading, etc. These occur throughout the manual as they are needed. For a complete listing of all available functions, see* SUMMARY OF FUNCTIONS *page 108.

TRICORDER REAR PANEL

The rear panel contains the following:



- Battery Pack – NiCad
- Mobile Mount connector – connects Tricorder to vehicle power source and antenna when Unit is installed in Mobile Mount
- RS-232C connector – links Tricorder to PC, Printer or second Meter
- Battery Charge connector – connects Tricorder to Wall Charger cube or cigarette adapter

Use of Controls

Two of the Tricorder's controls (**ON/OFF** button and Spin Knob) have more than one function.

1. PRESS/RELEASE the **ON/OFF** button – quickly press (less than 2 seconds) and then release the button. The Unit will turn ON.

2. HOLD IN – press and hold in **ON/OFF** (more than 2 seconds) until a *beep* is emitted. This will backlight the display. Once the display is backlighted, release the **ON/OFF** button.

3. Turn or rotate the Spin Knob to increment or decrement channels, frequencies, functions or other features that require cycling to the desired setting.

HOT TIP

Several of the controls have a "wrap-around" feature so that you can increment or decrement through the cycle and start over. (i.e. When cycling through channels, the Unit will not stop at the highest channel but will start over with the first. Increment – 85, 86, 87, t7, t8... Decrement – t8, t7, 87, 86, 85...)

4. PRESS/RELEASE the Spin Knob to select a desired function.

5. HOLD IN the Spin Knob to adjust your Meter's volume.

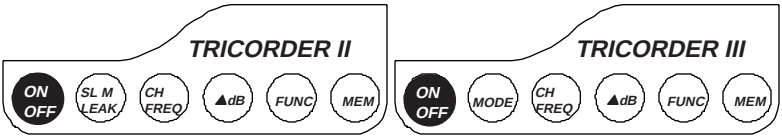
As you work through this manual, each function of a control will be indicated by PRESS/RELEASE (quickly press and release the button), HOLD IN (press and hold in the button) or ROTATE (turn the Spin Knob) to increment/decrement the desired setting.

Start Pushing Buttons

Okay, now that you know where all the buttons are, let's start pushing a few and give your new Tricorder a test drive.

TURN UNIT ON

The first thing to do, is turn on the Meter. PRESS/RELEASE the **ON/OFF** button.



There will be a *beep* from the speaker. There may be static and, possibly a wavering noise. This is normal, so don't be concerned.

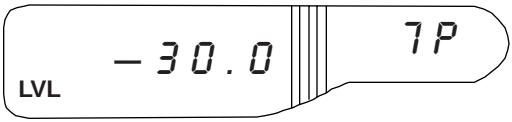
After a delay of a second or so, the decimal point, followed by additional digits, appear in the LCDs.

As originally shipped from the factory, the Unit should power-up in the SLM (Signal Level Measurement) Mode. This mode is indicated by LVL in the lower corner of the LEFT LCD.

HOT TIP

***If the Meter comes up in a different Mode, PRESS/RELEASE the* MODE *button to cycle the Unit back to SLM Mode. The factory default setting is for the Unit to power up in whichever mode it was in when turned OFF. This default can be changed via* F6 POWER-UP MODE SELECTION *page 66*.**

Since you do not have anything connected for measuring signals, the Meter will show – 30.0 (+30 for dBµV units) with the minus (–) sign *blinking*. This indicates that the Tricorder is receiving a signal too small to measure.



CAUTION: When you power up, your Unit should emit ONE *beep*. This means that your Tricorder is okay.

TWO *beeps* indicate that your Unit is ON and your data logging timer needs to be reset. See *DATA LOGGING* page 75.

If you hear THREE *beeps*, you have a Meter which is not calibrated correctly. This is not good. You need to return the Unit to Trilithic.

BACKLIGHT LCDS

HOLD IN the **ON/OFF** button to backlight the LCDs. The speaker emits two *beeps*; one when the button is pressed and the second after it is released.

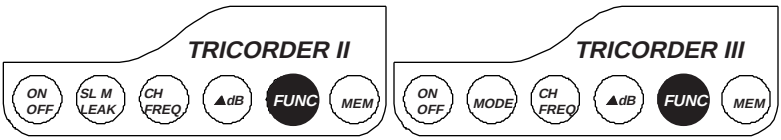
NOTE: You can turn OFF the backlighting by powering-down the Tricorder (PRESS/RELEASE **ON/OFF** to turn Unit OFF).

CAUTION: Extensive use of the backlighting feature uses up the battery charge faster.

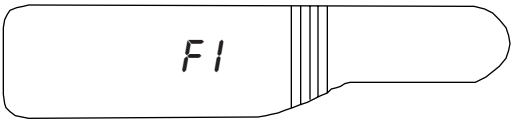
CHECK BATTERY LEVEL

Now that the Meter is ON (LCDs may or may not be backlighted depending on your preference), you should check the Unit's battery level.

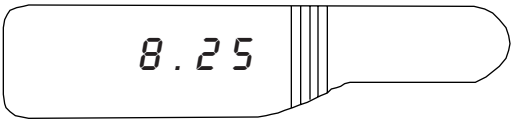
PRESS/RELEASE the **FUNC** (Function) button. There will be a *beep*.



F1 is displayed in the LEFT LCD.



PRESS/RELEASE the Spin Knob. The voltage appears in the LEFT LCD (i.e. 8.25). The typical voltage for a fully charged battery when it comes off the charger is 9.57. This voltage will vary somewhat with temperature and the age of the battery.

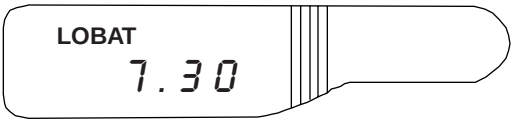


NOTES:

1. When the Tricorder operates from its battery pack, it automatically powers-down (turns OFF) if you do not use the front panel controls for at least five minutes.

   This feature is designed to conserve battery power. It can be temporarily disabled with Function F5 (see *F5 AUTO-POWER-DOWN* page 65).

2. The Unit also powers-down automatically if the charge in the battery pack drops below a usable level (approximately 6.70 VDC). As the voltage drop approaches that level (approximately 7.30VDC), the LOBAT indicator comes on in the LEFT LCD and starts to *blink*. As the voltage continues to drop, LOBAT *blinks* faster.



   When the voltage drops below the usable level, the Tricorder powers-down automatically.

You can return to SLM Mode now that you have checked the battery. PRESS/RELEASE the **FUNC** button. There will be a *beep* and the Meter reverts to SLM Mode.

NOTE: Do NOT check the battery when it is being charged.

HOT TIP

When you have selected a function, you cannot move from one function to another. Once a function is completed, you must return to the SLM (or LEAKAGE) Mode. Some functions will exit automatically to SLM Mode as part of their final procedure.

ADJUST SPEAKER VOLUME

You are ready to adjust the speaker volume of your Meter.

HOLD IN the Spin Knob. While holding, ROTATE the knob to adjust the volume. A *clockwise* rotation increases the volume. *Counter-clockwise* decreases the volume.

The volume control setting is stored in the Unit's non-volatile memory. This means that the Meter will return to the same setting each time it is powered up.

HOT TIP

You can also adjust the volume when you are in LEAKAGE Mode. There are separate volume settings for SLM and LEAKAGE Mode.

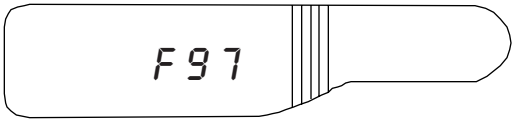
Verify Optional Features

It is a good idea to verify whether your Meter has any of the optional features installed.

VERIFY DATA LOGGING

To check for the data logging feature, PRESS/RELEASE **FUNC**.

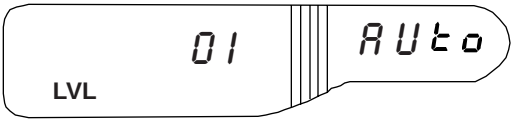
Rotate the Spin Knob *counter-clockwise* until **F97** appears in the LEFT LCD.



NOTE: Function numbers feature “wrap-around” so that it is not necessary to cycle through the entire range from F1 to F99. You can cycle either F1, F2, F3...or F1, F99, F98... ROTATE the Spin Knob *clockwise* to increment the functions. ROTATE *counter-clockwise* to decrement the functions.

When **F97** is displayed, PRESS/RELEASE the Spin Knob. This will select the function. PRESS/RELEASE the Spin Knob again.

If your Meter has the data logging feature installed, Record “O1” appears in the LEFT LCD and “AUto” is displayed in the RIGHT LCD.



HOT TIP

If the data logging feature is installed, you can also verify the time and date settings for your meter. Refer to* DATA LOGGING *page 75 for complete details on using the data logging feature.

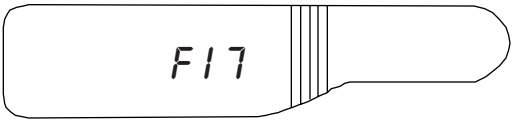
PRESS/RELEASE **FUNC** to return the meter to SLM Mode.

If your unit does not have data logging, when you try to select **F97** it will return to SLM Mode immediately.

VERIFY FCC EVALUATOR

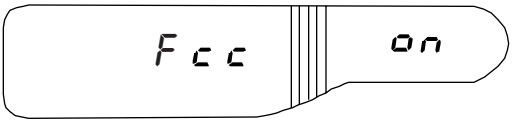
To check for the FCC evaluator mode, PRESS/RELEASE **FUNC**.

ROTATE the Spin Knob *counter-clockwise* until **F17** appears in the LEFT LCD.



When **F17** is displayed, PRESS/RELEASE the Spin Knob. This will select the function.

If you have the FCC evaluator option, you will be able to ROTATE the Spin Knob until the FCC display appears.

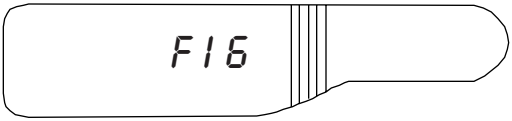


If your unit does not have the FCC evaluator mode, it will return to SLM Mode immediately when you select **F17**.

VERIFY DROP EVALUATOR

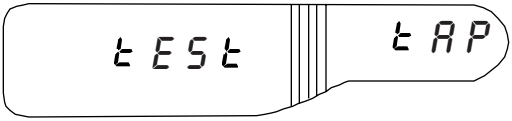
To check for the FCC evaluator mode, PRESS/RELEASE **FUNC**.

ROTATE the Spin Knob *counter-clockwise* until **F16** appears in the LEFT LCD.



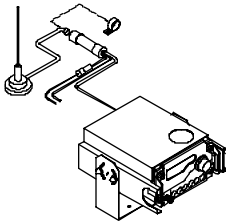
When **F16** is displayed, PRESS/RELEASE the Spin Knob. This will select the function.

If you have the drop evaluator option, the LEFT LCD displays “tESt” while the RIGHT LCD displays the selected set of limits which are currently selected.



The designations for the set of limits are “tAP”, “bloc”, and “SEt”. ROTATE the Spin Knob to cycle through the three set designations.

If your unit does not have the drop evaluator option, it will return to SLM Mode immediately when you select **F16**.



3

POWER SOURCE

Introduction

Now that you know some of the basics, let's take a moment to examine the Tricorder's power source. Your meter operates from three different sources of power:

- Battery
- 115V outlet (some overseas models use 230V)
- Vehicle Power

Battery

The battery pack is used with SLM or LEAKAGE Mode. Use **F1** to check battery level (see *CHECK BATTERY LEVEL* page 16 to review this procedure).

The battery pack provides approximately 3.5 hours of power during continuous operation. If the Meter is used intermittently, the battery life is extended.

> **NOTE:** Periodically, it is a good idea to turn the Unit ON and let it run until the battery becomes low. You will need to disable the auto-power-down feature (see *F5 AUTO-POWER-DOWN* page 65). The meter will turn itself OFF automatically. At that time, recharge the battery completely. This process can extend the life of your NiCad battery.

The battery in your Unit has been installed by TRILITHIC. If you need to replace it, rotate the rear-panel fasteners and remove the battery access door. The battery pack will slide right out.

CAUTION: Always turn the Unit OFF before removing the battery.

NOTE: Removing the battery will not result in lost Data Log information. However, removing the battery for more than a few hours could cause the Tricorder's clock to lose its setting.

Wall Charger

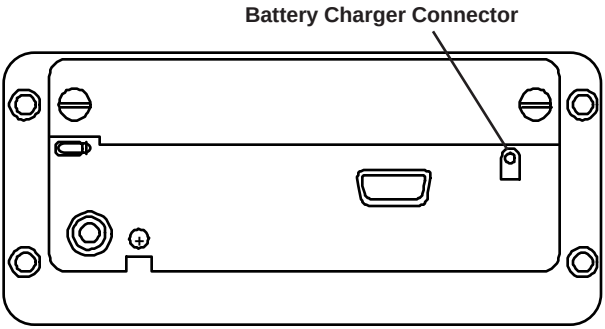
The wall charger cube is used to charge the NiCad battery pack. It can charge the battery while you are using the meter. You can also use the cube to charge the battery overnight when your unit is turned off.

There are two CHARGING Modes: *trickle* and *rapid* charging. Trickle charging is used for normal or overnight charging. Rapid charging is used when you need to charge the battery quickly.

TRICKLE CHARGE

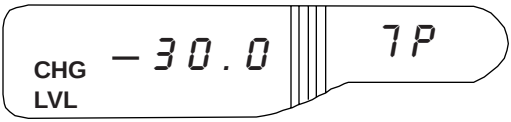
Use the following procedure to trickle charge your battery. Remember, use this method for normal or overnight charging.

Plug the wall charger's cable into the battery connector on the Meter's rear panel. You can access the connector even when your Unit is in its carry bag via a flap.



Plug the wall charger cube into a 115V outlet. (Some overseas models use 230V.)

CHG appears in the LEFT LCD (if the meter is turned ON while you are charging).



You can charge the meter with the power ON or OFF.

NOTE: It takes 14 hours to fully trickle charge the battery.

RAPID CHARGE

Use the following procedure to rapid charge your Tricorder.

CAUTION: Do NOT rapid charge your battery pack too often. Repeated rapid charging will REDUCE the battery's life.

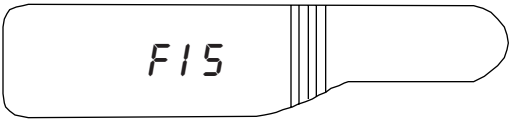
Whenever possible, trickle charge the battery pack overnight.

Plug the wall charger's cable into the battery connector on the meter's rear panel.

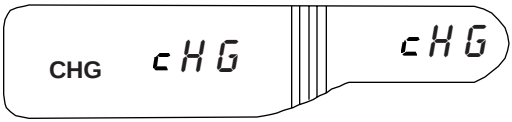
Plug the wall charger cube into a 115V outlet. (Some overseas models use 230V.)

PRESS/RELEASE **FUNC**.

ROTATE the Spin Knob until **F15** appears in the LEFT LCD. PRESS/RELEASE the Spin Knob to enter Function F15.



CHG appears in BOTH LCDs.



NOTE: When you are in the rapid charging function, F15, you will not be able to use any of the other modes (i.e. SLM, LEAKAGE Modes).

It takes 3.5 to 4 hours to rapid charge the battery pack.

In order to safeguard the battery against damage, the rapid charging will terminate automatically if the battery's temperature or voltage is inappropriate for rapid charging.

If the rapid charging is terminated, the meter returns to its previous mode (i.e. SLM).

HOT TIP
You can also trickle charge and rapid charge the meter when it is installed in the mobile mount.

Vehicle Mount

For vehicle surveys, the Tricorder is inserted into the mobile mount and connected to a Trilithic AVM-type or APM-type antenna.

Use the following procedure to install the mobile mount, antenna and the Tricorder (see the figure on page 26).

MOBILE MOUNT INSTALLATION

The mobile mount can be installed in any vehicle which has a +12V *negative* grounding electrical system.

1. Choose a spot in the vehicle where your Tricorder's front panel can be viewed easily.

   CAUTION: The front panel should NOT be in direct sunlight.

Suitable locations include:

- The underside of the dash
- The top of the transmission hump
- The engine cowling in a van

WARNING: NEVER install the mobile mount overhead or in any location where the Tricorder could cause injury if it is dislodged in an accident.

2. Fasten the power inserter to the vehicle with the clamp provided with the mobile mount. This inserter connects the Tricorder to the vehicle's 12V system and to the downlead of the whip antenna.

3. Connect the RED (+) and BLACK (–) power leads to a point in the vehicle's electrical system which stays energized even when the ignition key is OFF. This enables the vehicle's power source to charge the Tricorder overnight. Always use the fused lead supplied with the power inserter and a .5 amp slow-blow fuse.

   NOTE: The Tricorder will NOT drain the vehicle's battery even if it is left ON overnight.

4. Route the coax and power wires in a way that will not interfere with the safe use of the vehicle.

   CAUTION: The Tricorder is NOT protected against *reverse* polarity. Make sure that the power inserter is installed correctly BEFORE placing the Unit in the mobile mount.

ANTENNA INSTALLATION

1. Place the Trilithic AVM-type or APM-type antenna anywhere on the vehicle roof which is clear of obstructions. Make sure that this location is free of interference from the vehicle's electrical system.

2. Connect the antenna's downlead to the power inserter.

TRICORDER INSTALLATION

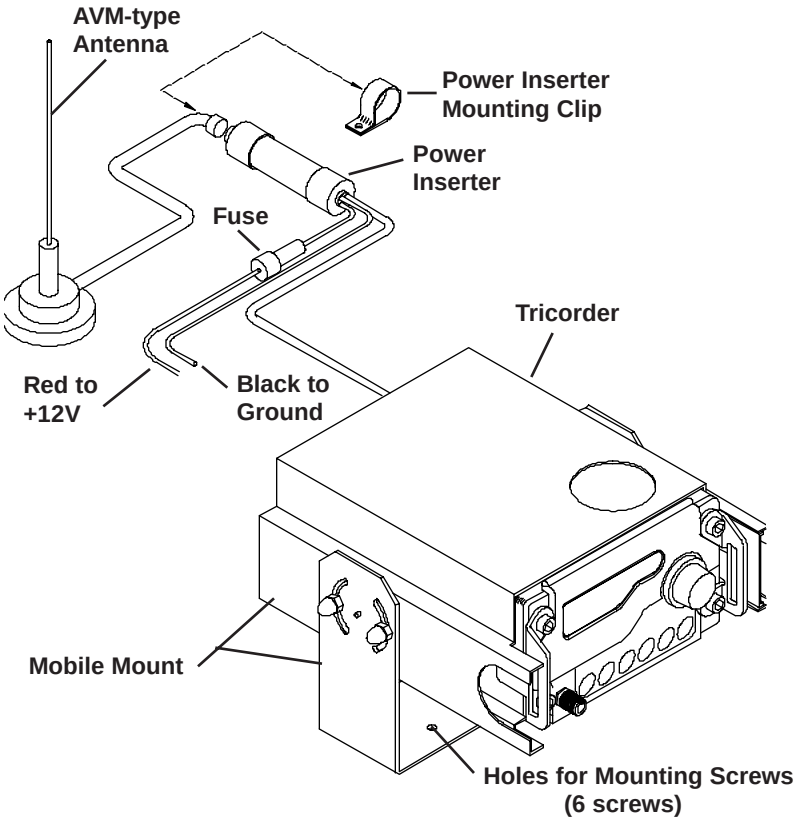
1. Install your Tricorder in the mobile mount. Snap it solidly into place.

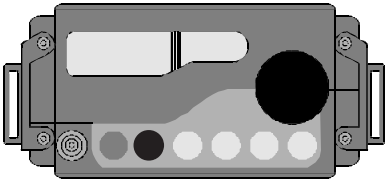
2. Set the **ON/OFF** button to ON. The Meter powers-up automatically in the LEAKAGE Mode.

VERIFY INSTALLATION

Start the vehicle's engine, heater blower and windshield wipers to make sure that the vehicle's electrical system does not interfere with the operation of the Tricorder.

NOTE: Interference can be reduced by moving the antenna to a different point on the vehicle's roof. In some cases, additional vehicle grounding, resistor spark plugs or other noise-reducing measures may be necessary.

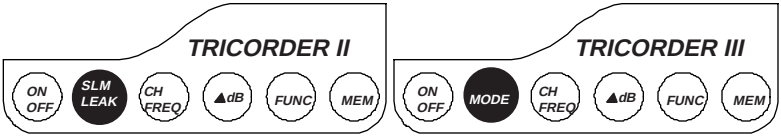




SLM OPERATION

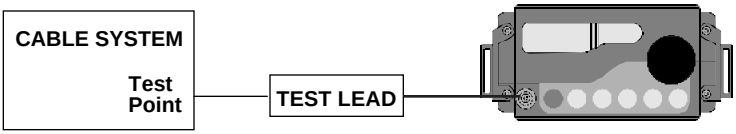
Introduction

Now that you are more familiar with your Tricorder, it's time for you to start giving it a real work out. Turn ON your meter. It should come up in SLM Mode. If not, PRESS/RELEASE the **SLM/LEAK** button on the Tricorder II or the **MODE** button on the Tricorder III to cycle your unit to SLM (**LVL** appears in the LEFT LCD).



Set Up

Connect a test lead with a type-F male connector to the RF input connector of the Tricorder's front panel. Connect the other end of the test lead to the tap (test point) of the cable system your are measuring.



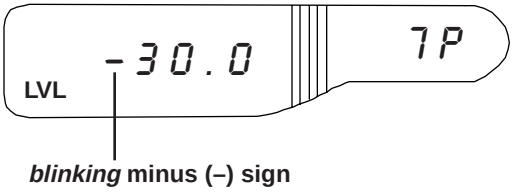
Amplitude Display

Check the amplitude display.

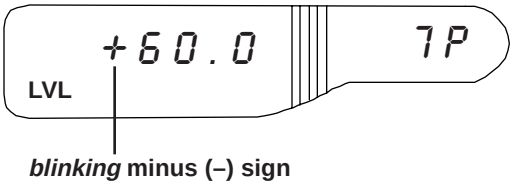
When the meter is in the SLM Mode, the level of RF in the LEFT LCD is displayed in dBmV.

NOTE: Some non-U.S. models are calibrated in dBµV.

If the signal is underange (too small for the unit to measure), the minimum level limit (– 30.0) is displayed in the LEFT LCD with a *blinking* minus (–) sign.



If the signal is overange (greater than the unit can measure), the maximum level limit (+60.0) is displayed in the LEFT LCD with a *blinking* minus (–) sign.



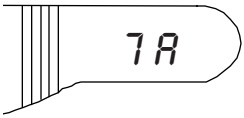
Channel/Frequency Mode Select

Your Tricorder can be tuned by channel number or by units of frequency.

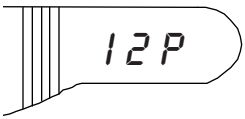
> **NOTE:** PRESS/RELEASE the **CH/FREQ** button to *toggle* the unit between channel number and frequency.

CHANNEL MODE

PRESS/RELEASE **CH/FREQ** so that the channel number is displayed in the RIGHT LCD with an “A” or “P”. The rightmost digit indicates whether an A(udio) or P(icture) (video) carrier is selected.



or



> **NOTE:** Channels plans are selectable. Don’t worry if the channel plan which is displayed is not yours. For more information, see *CHANNEL PLAN SELECTION* page 30.

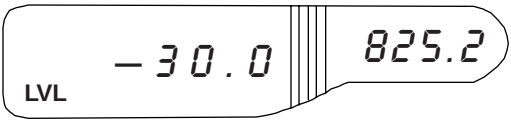
ROTATE the Spin Knob to change the channel number.

> **NOTE:** The channel numbers can be incremented or decremented with the “wrap-around” feature. When cycling through channels, the unit will not stop at the highest channel but will start over with the first: 85, 86, T7, T8... or T8, T7, 87, 86, 85...
>
> If the meter “wraps” before the maximum channel number is reached, Function **F24** may have been used to set the maximum scan frequency. (This effect is valid only when the unit is “learning” a channel. See *SET MAXIMUM SCAN FREQUENCY* page 57.)

FREQUENCY MODE

PRESS/RELEASE **CH/FREQ** to *toggle* from the Channel Mode to the Frequency Mode.

The frequency (shown in MHz) appears in the RIGHT LCD.



The decimal point is between the 1MHz and 100kHz digits.

> **NOTE:** If the frequency is set to 1GHz, the decimal point is NOT displayed.

The *blinking* digit in the frequency display indicates the selected tuning resolution. PRESS/RELEASE the Spin Knob to select a different digit.

ROTATE the Spin Knob to increment and decrement the frequency.

NOTE: Although the Tricorder has a minimum tuning step of 50kHz, the LCD display only has a 100kHz resolution.

Frequency settings which end in 50kHz (i.e. 55.250, 596.750) are indicated by a *blinking* decimal point in the frequency display.

If the decimal point is NOT *blinking*, the selected frequency does not end in 50kHz (i.e. 65.300, 560.700).

HOT TIP

As an alternative to using the Channel or Frequency Modes, you can sequence through a series of channels or frequencies which are stored in memory. See **MEMORY OPERATIONS** ***page 61.***

Channel Plan Selection

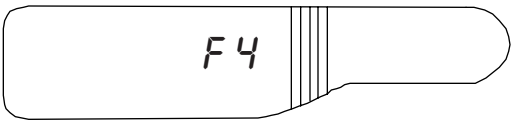
Your Tricorder contains several different channel plans which you can access via the **FUNC** button.

As shipped from the factory, you can access the channel plans for NCTA, HRC, IRC and UHF as well as several plans based on the PAL System.

HOT TIP

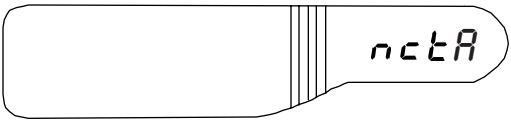
In addition to the standard plans, the meter can "learn" 2 user generated plans, L1 and L2. Once these customized plans have been developed, L1 and L2 will be added to the channel plan selection list as you cycle through F4. See **LEARNED CHANNEL PLANS,** ***page 55.***

PRESS/RELEASE **FUNC**. ROTATE the Spin Knob until F4 appears in the display. PRESS/RELEASE the Spin Knob to enter **F4**.



ROTATE the Spin Knob to cycle through the channel plans (L1 and L2 appear ONLY after they have been "learned" by the unit).

When the desired channel plan appears, PRESS/RELEASE **FUNC**.



The plan is selected and the unit returns to SLM Mode.

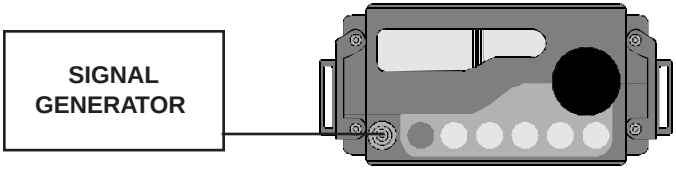
Operator Calibration

You can add or subtract an offset of up to 2dB using Function **F3**. This offset will be applied to every signal level measurement.

> **CAUTION:** You cannot enter **F3** just to inspect the calibration offset. Any time you enter this function, the meter's offset goes to zero automatically; thus returning the unit to the factory setting. If you wish to keep your current offset, do NOT enter this function.
>
> **NOTE:** You should check several frequencies and levels before you decide to use an offset. Note the HIGHEST and the LOWEST readings. Determine the average by comparing them. You should change your offset ONLY if the overall accuracy of the unit can be improved.

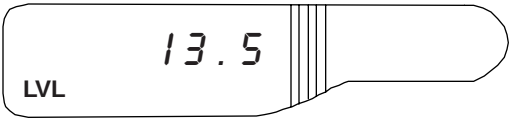
SETUP

Connect the calibrated signal source (i.e. signal generator or a test point with a known level) to the RF Input Connector on the Tricorder's front panel.



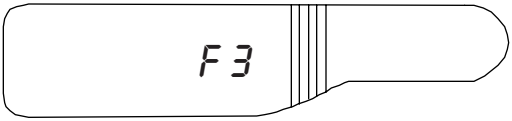
Set the signal generator to the desired frequency and level.

Set the Tricorder to the same frequency. The signal level will be displayed in the LEFT LCD.



SET CALIBRATION

PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F3.
PRESS/RELEASE the knob to enter **F3**.



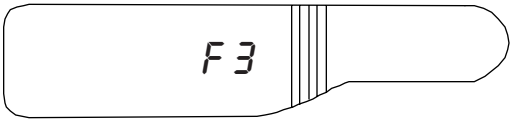
ROTATE the Spin Knob to increment or decrement the signal reading in ≈ 0.1dBmV steps.

When the reading has changed by the desired offset, PRESS/RELEASE **FUNC**. The calibration offset is stored in the meter's non-volatile memory.

SET CALIBRATION OFFSET TO ZERO

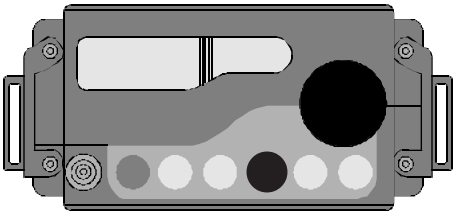
If you feel that your offset is incorrect or would like to return to no offset, you can set the single point calibration offset to zero.

PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F3.



PRESS/RELEASE **FUNC**. This stores a calibration offset of zero in the meter's non-volatile memory and returns the unit to SLM mode.

> **NOTE**: Do NOT turn the Spin Knob once Function F3 has been entered.



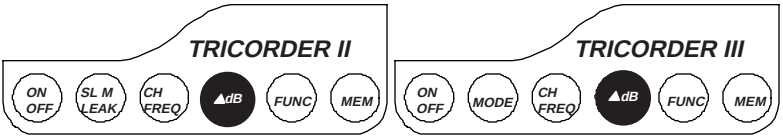
▲dB MODE

5

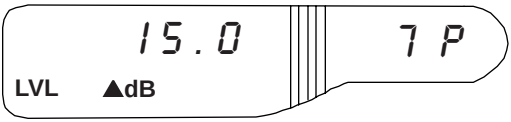
Introduction

The Tricorder's ▲dB feature lets you measure aural/visual or pilot carrier ratios at the simple push of a button.

To enter ▲dB in the normal channel tuning mode, tune to the desired channel. Then PRESS/RELEASE the ▲dB button.



The LEFT LCD displays the difference between the video-audio (V-A) carrier levels of the currently tuned channel. The RIGHT LCD displays the channel number.



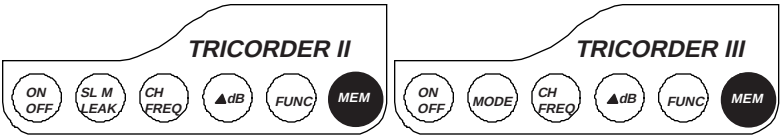
ROTATE the Spin Knob to select a new channel. Your meter will display the V-A difference.

> **NOTE:** Your unit will continue to update the ▲dB reading so that the V-A difference can be adjusted.

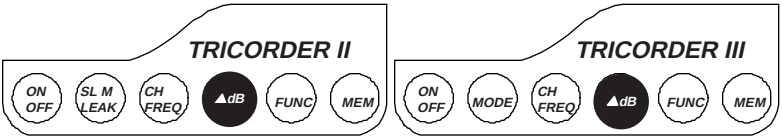
▲dB in Memory Mode

In Memory ▲dB, the Tricorder compares channels in the FIRST and LAST memories. Users normally put pilots in these locations.

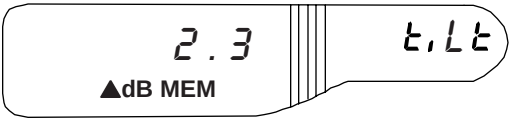
PRESS/RELEASE **MEM**.



Then PRESS/RELEASE the ▲dB button.



The low pilot/high pilot tilt, LAST memory minus (–) the FIRST memory, is displayed in the LEFT LCD with "▲dB MEM".



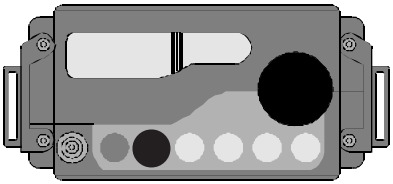
REMINDER: The FIRST and LAST user memories are always used for calculating tilt. For example, your unit is programmed with five memories. Program the low pilot in Mem #1. Program the high pilot in Mem #5.

NOTE: If at least two memories are not stored, you meter will emit three *beeps* when you press ▲dB.

WARNING: The memories must be programmed in the same Channel Plan.

HOT TIP

See* MEMORY OPERATIONS *page 61 for details on how to program your Tricorder's memories for* ▲dB *memory operation.



HUM MODE

6

Introduction

Your Tricorder III (this feature is not available on the Tricorder II) can measure hum in order to troubleshoot your cable system and to check for FCC compliance.

> **NOTE:** You will not be able to access your Tricorder's functions while you are in HUM Mode.

The meter is capable of measuring three kinds of hum:

60 Hz Bandpass
120 Hz Bandpass
600 Hz Lowpass

> **NOTE:** Optionally, the meter can be equipped to measure 50Hz bandpass, 100Hz bandpass and 500Hz lowpass.

The 60Hz and 120Hz bandpass settings are useful for troubleshooting since they enable you to look at the hum modulation on an active audio carrier. These two settings can be used for daily checks of the cable system or to diagnose customer complaints.

If you register 60Hz hum, it is most likely that passive failure is causing the problem in the cable system (i.e. a defective power inserter).

A hum of 120Hz may indicate failure of a power supply filter capacitor in an amplifier.

The third setting, 600Hz lowpass is used to measure low frequency disturbance on an unmodulated carrier in order to check for FCC compliance.

Measure Hum

To measure the cable system's hum, put the Tricorder in SLM Mode. Tune to the desired carrier.

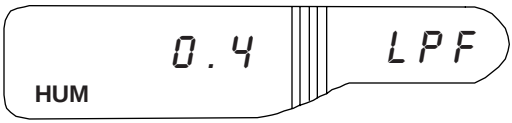
> **NOTE:** For best results, select carriers which are at least – 10dBmV.

For day to day monitoring or troubleshooting of your system, use the 60Hz or 120Hz filters on audio carriers to measure system hum. Tune to an audio carrier. Make sure that the carrier is greater than – 10dBmV. Select the 60Hz or 120Hz filter.

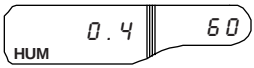
> **NOTE:** If you need to measure hum on a video carrier, remove the modulation BEFORE you measure the hum.

Use the 600Hz lowpass to measure hum and low frequency disturbances on unmodulated carriers. This is the method most often used for proof of performance testing.

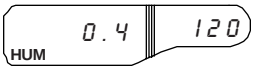
PRESS/RELEASE the **MODE** button to cycle the unit to "HUM". "HUM" appears in the LEFT LCD as well as the percentage of hum. "LPF" in the RIGHT LCD indicates that the unit is in the 600Hz lowpass measurement mode.



To select 60Hz or 120Hz bandpass, ROTATE the Spin Knob *clockwise* for one or two clicks. The RIGHT LCD displays "60" or "120".



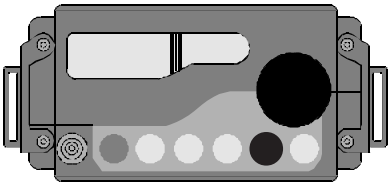
or



The percentage of the amplitude modulation (AM), which is shown in the LEFT LCD, is updated approximately every 1.3 seconds.

> **NOTE:** AM levels greater than 5.0% are clipped to 5.0% (with the "+" sign *blinking*).

> **NOTE:** It is normal for your meter to indicate hum when it is not tuned to a carrier.



CARRIER-TO-NOISE

7

Introduction

Your Tricorder III (this feature is not available on the Tricorder II) uses the Carrier-to-Noise (C/N) Mode to measure the difference between a carrier level and the system noise measured at a user-selected offset from the carrier frequency.

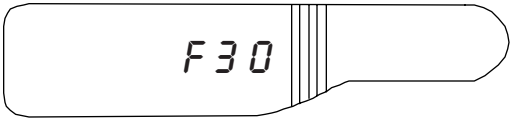
> **NOTE:** You will not be able to access your Tricorder's functions while you are in C/N Mode.

Set Noise Offset

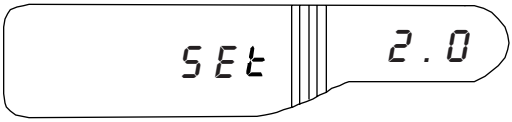
The recommended offset is 2MHz which measures the noise 2MHz above the video carrier. This is approximately the center of the video bandwidth.

> **NOTE:** Only change this offset if intermodulation exits at 2MHz.

To verify or set a new noise offset, PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to **F30**.



PRESS/RELEASE the knob to enter Function **F30**. "SEt" appears in the LEFT LCD. The noise offset is displayed in the RIGHT LCD.



ROTATE the Spin Knob to increment or decrement the noise offset.

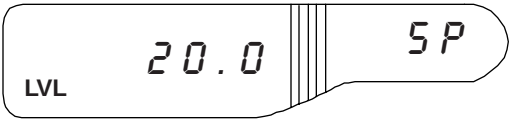
> **NOTE:** If your unit displays a – (minus) offset, simply ROTATE the knob to increment the setting through 0 (zero) and into the + (plus) setting range.

PRESS/RELEASE **FUNC** to store the offset. The unit returns to SLM Mode.

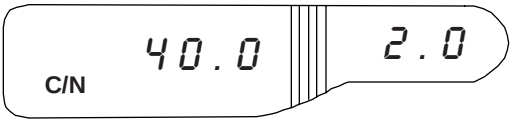
> **NOTE:** A carrier of at least +20dBmV is required to measure a 43dB C/N ratio. If your levels are below +20dBmV, see page 39.

Enter C/N Mode

ROTATE the Spin Knob to the desired carrier.



PRESS/RELEASE the **MODE** button to cycle the unit to C/N Mode. C/N appears in the LEFT LCD. The selected offset (i.e. 2.0) is displayed in the RIGHT LCD.



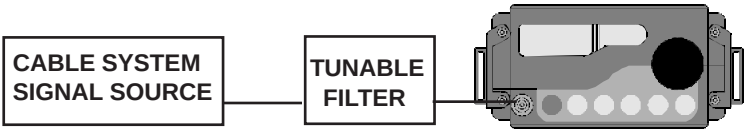
The meter measures the carrier level. The Tricorder then changes frequencies automatically by the noise offset.

The unit will measure the noise and compute the carrier-to-noise ratio. The display is updated approximately twice per second.

> **NOTE:** When the C/N ratio is displayed, remove the modulation from the channel which is under test.

When making the C/N measurement, it is important to make sure that your Tricorder is not overloading. One way is to listen to the audio for white noise and no sync buzz. If tones or other noise are heard, ROTATE the Spin Knob to move the noise measurement frequency up or down slightly to find a spot where only noise is heard. (The offset appears in the RIGHT LCD as you turn the knob.) The proper spot is indicated by a maximum C/N reading. If you cannot find such a spot, you may need to use a tunable filter between the cable system (signal source) and the Tricorder.

Connect one end of a tunable filter (such as Trilithic's VF-Series) to the RF Input Connector on your Tricorder. Connect the other end of the filter the cable system.



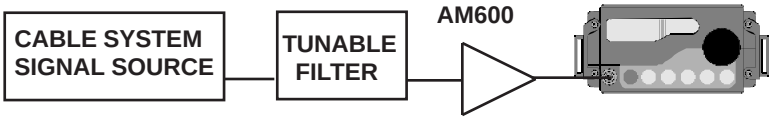
With the unit in the normal measurement mode, peak the filter on the video carrier.

> **NOTE:** You need to do this BEFORE you enter the C/N Mode.

Enter C/N Mode.

Once your meter displays the C/N ratio, remove the modulation and tune the tunable filter for the lowest C/N ratio (the peak noise).

> **NOTE:** Use a quality pre-amp (such as Trilithic's AM-600) when carrier levels fall below +20dBmV or C/N measurements greater than 43dB are desired. Connect the pre-amp between the Tricorder and the tunable filter.

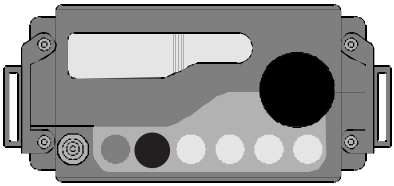


If the noise level is too low to be measured (< – 30.0dBmV), the LEFT LCD *blinks*. This means that the actual C/N is better than the displayed level but by an unknown amount.

If the noise level is too high to measure (noise frequency level > carrier frequency level), the LEFT LCD displays a *blinking* **+0.0**.

HOT TIP

The measurement for noise bandwidths of 4.00, 4.50, 5.00, 5.50, or 6.00MHz can be selected via Function F31. 4.00MHz is the U.S. (NTSC) standard. You can access F31 the same way as F30 (see **SET NOISE OFFSET** ***page 37).***



LEAKAGE MODE

8

Introduction

Your Tricorder is equipped with either an uncalibrated leakage feature or an optional calibrated leakage feature. The leakage detector is designed to locate and measure cable system leaks; providing audio and visual indication of the leakage.

> **NOTE:** A limited number of functions are available from LEAKAGE Mode. In it, you can set the leakage frequency and the squelch. For most functions, you need to enter the function from SLM Mode.

The Tricorder may be installed in the mobile mount where it can be used to survey the distribution system for sources of leaks. When used for vehicle surveillance, the meter is connected to a whip antenna.

The Tricorder can be used as a handheld device to locate the source of a specific leak or to verify the integrity of an installation. The meter's carry bag has an antenna connector and is supplied with a rubber duck antenna. You can also connect a near field probe or an AFS-2 dipole antenna.

> **NOTE:** If you are using the rubber duck antenna, make sure that you rotate it away from the front panel for maximum sensitivity.

Before proceeding, you need to determine if your meter is equipped with uncalibrated leakage or calibrated leakage.

When you select LEAKAGE Mode, a unit which is equipped with **calibrated** leakage will display numbers in the LEFT LCD.

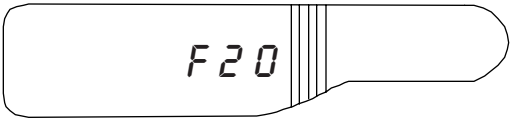
NOTE: When your Tricorder is in LEAKAGE Mode, its microprocessor is slowed down to minimize interference to the leakage receiver.

The Spin Knob and buttons will react much more slowly than they do in SLM Mode. Allow extra time for you meter to respond to controls when you are in LEAKAGE Mode.

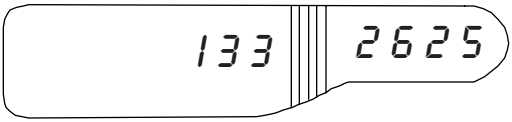
Uncalibrated Leakage

You need to set your leakage frequency first. PRESS/RELEASE **FUNC**.

ROTATE the Spin Knob to F20. PRESS/RELEASE the knob to enter **F20**.



There should be seven digits in the LEFT and RIGHT LCDs. The decimal point lies between the LCDs. For example, 133.2625MHz appears as:



ROTATE the Spin Knob to increment or decrement the monitoring frequency. The minimum is 107.0000MHz. The maximum is 157.2500MHz.

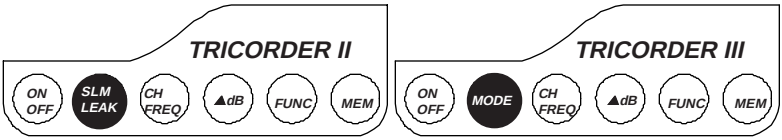
If you need to change the position of the cursor, PRESS/RELEASE the Spin Knob. The cursor will step from 12.5kHz (the 10kHz position) to 100kHz or 1MHz.

PRESS/RELEASE **FUNC** to store the monitoring frequency in the non-volatile memory and to return the meter to the operating mode.

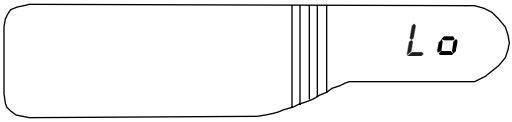
NOTE: If the unit is in the mobile mount, the operating mode is always LEAKAGE. If the unit is not in the mobile mount, it may be in SLM or LEAKAGE Mode.

Remember, the meter will NOT operate in LEAKAGE Mode if it is powered from the charge cube. If you are using the Tricorder as a handheld device and wish to enter LEAKAGE Mode, you need to run it from its battery pack.

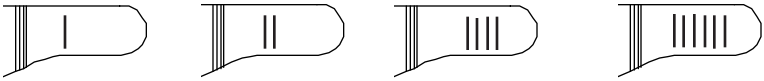
If the unit is in SLM Mode, you will need to cycle the Tricorder to LEAKAGE Mode. For the Tricorder II, PRESS/RELEASE the **SLM/LEAK** button. For the Tricorder III, PRESS/RELEASE the **MODE** button.



The “Lo” or “hi” displayed in the RIGHT LCD indicates the end of the measurement range in which the Tricorder is operating.



A relative indication of leakage intensity is displayed in the LEFT LCD as a series of six vertical bars. Each bar represents an increase in leakage of approximately 6dB. The following four examples show increasing leakage intensity.



NOTE: A *peak hold* feature is included in the bar graph leakage level indicator. It functions similarly to many stereo VU indicators. The rightmost vertical bar will HOLD for five seconds after the peak level decreases.

The leakage level is also indicated by an audible tone that increases in frequency as the level increases.

Your Tricorder also has an AM/FM DETECTOR Mode. This is handy for verifying the source of a leakage signal. Video signals have a characteristic sync buzz. Power line interference has a "raspy" sound.

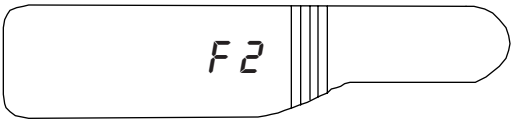
PRESS/RELEASE the Spin Knob to *toggle* your meter from TONE indication to AM/FM DETECTOR Mode.

> **NOTE:** The AM/FM DETECTOR Mode is also useful when you use the meter in conjunction with a dedicated leakage transmitter which has a modulated TONE or *beep*.

If the leakage is strong enough to activate the "hi" range, the audible signal pulsates in addition to varying with the signal level.

SET SQUELCH LEVEL

PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F2.



PRESS/RELEASE the knob to enter **F2**.

ROTATE the Spin Knob slowly to increment or decrement the leakage intensity at which the audible tone will sound.

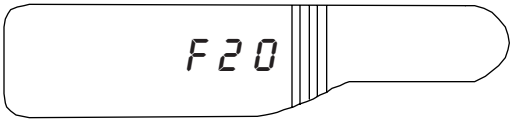
PRESS/RELEASE **FUNC** to store the setting in the unit's non-volatile memory. The meter returns to LEAKAGE Mode.

> **NOTE:** Just as your unit has separate volume settings for SLM Mode and LEAKAGE Mode, you can set independent squelch settings for the mobile mount and carry bag.

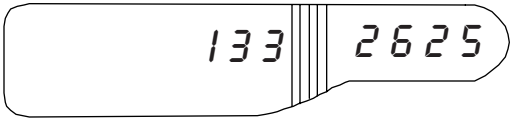
Calibrated Leakage

You need to set your leakage frequency first. PRESS/RELEASE **FUNC**.

ROTATE the Spin Knob to F20. PRESS/RELEASE the knob to enter **F20**.



There should be seven digits in the LEFT and RIGHT LCDs. The decimal point lies between the LCDs. For example, 133.2625MHz appears as:



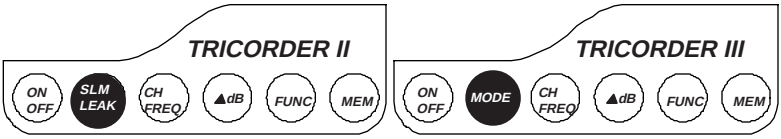
ROTATE the Spin Knob to increment or decrement the monitoring frequency. The minimum is 107.0000MHz. The maximum is 157.2500MHz.

If you need to change the position of the cursor, PRESS/RELEASE the Spin Knob. The cursor will step from 12.5kHz (the 10kHz position) to 100kHz or 1MHz.

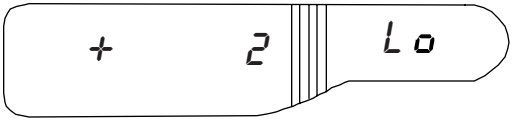
PRESS/RELEASE **FUNC** to store the monitoring frequency in the non-volatile memory and to return the meter to the operating mode.

> **NOTE:** If the unit is in the mobile mount, the operating mode is always LEAKAGE. If the unit is not in the mobile mount, it may be in SLM or LEAKAGE Mode.
>
> Remember, the meter will NOT operate in LEAKAGE Mode if it is powered from the charge cube. If you are using the Tricorder as a handheld device and wish to enter LEAKAGE Mode, you need to run it from its battery pack.

If the unit is in SLM Mode, you will need to cycle the Tricorder to LEAKAGE Mode. For the Tricorder II, PRESS/RELEASE the **SLM/LEAK** button. For the Tricorder III, PRESS/RELEASE the **MODE** button.



The “Lo” or “hi” displayed in the RIGHT LCD indicates the end of the measurement range in which the Tricorder is operating.



NOTE: The leakage readings are accurate when the meter is used with a dipole antenna such as Trilithic’s AFS-2. When used with other antennas, the µV/m reading should be used for relative indications only.

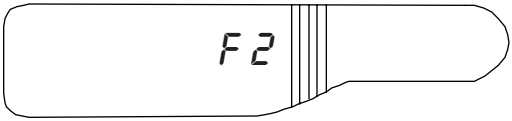
The leakage level is also indicated by an audible tone that increases in frequency as the level increases.

Your Tricorder also has an AM/FM DETECTOR Mode. This is handy for verifying the source of a leakage signal. Video signals have a characteristic sync buzz. Power line interference has a “raspy” sound.

PRESS/RELEASE the Spin Knob to *toggle* your meter from TONE indication to AM/FM DETECTOR Mode.

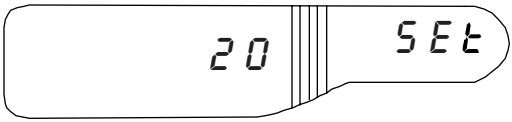
SET SQUELCH LEVEL

PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F2.



PRESS/RELEASE the knob to enter **F2**.

The squelch threshold is displayed in the LEFT LCD in µV/m. “SEt” is displayed in the RIGHT LCD.



NOTE: The squelch settings are accurate when the meter is used with a dipole antenna such as Trilithic’s AFS-2. When used with other antennas, the µV/m readings should be used for relative indications only.

NOTE: The AM/FM DETECTOR Mode is also useful when you use the meter in conjunction with a dedicated leakage transmitter which has a modulated TONE or *beep*.

If the leakage is strong enough to activate the “hi” range, the audible signal pulsates in addition to varying with the signal level.

ROTATE the Spin Knob slowly to increment or decrement the leakage intensity at which the audible tone will sound.

PRESS/RELEASE **FUNC** to store the setting in the unit’s non-volatile memory. The meter returns to LEAKAGE Mode.

NOTE: Just as your unit has separate volume settings for SLM Mode and LEAKAGE Mode, you can set independent squelch settings for the mobile mount and carry bag.

SUPER LEAK MODE

Introduction

Your Tricorder is equipped with the SUPER LEAK Mode which enables you to monitor leakage as well as localize on the source of a leak.

Applications

When your Tricorder is in the SUPER LEAK Mode, you can use it for the following applications:

- Leakage Monitoring
- Localizing on the Source of a Leak

LEAKAGE MONITORING

Your Tricorder is very useful for daily leakage monitoring activities. To monitor leakage, you should use the following:

- Tricorder
- AVM or APM-type mobile antennas
- Rubber Duck antenna when you are outside your vehicle

Mobile Patrol

If you are monitoring from your vehicle, make sure that your mobile antenna is installed on the roof, centered and clear of all obstacles. The coax from the antenna should be routed into the vehicle and connected to the power inserter in the mobile mount assembly.

When your meter is secured in the mobile mount, it automatically sources RF and charge current through the back panel BNC connector. You are now ready to start patrolling.

RELATIVE VS. ABSOLUTE READINGS

Ideally, it would be great if you could deduce the absolute value of a leak as referenced to a standard dipole at 3 meters. Unfortunately, while this ideal measurement acquisition is theoretically possible, there are a number of variables which can degrade the measurement accuracy.

Variable Effects

The following is a list of such variables.

Vehicle Antenna Pickup Pattern - The AVM-2 and AVM-3 vertical antennas tend to exhibit maximum gain at low angles with respect to the ground plane. This characteristic lends itself to good performance at medium to long range. However, the performance degrades at close range because the sensitivity of the antenna lessens as the leakage source approaches overhead and it comes closer to the leakage source.

Pattern Disruption - The placement of the antenna near other antennas, booms, ladders, etc. will affect overall pickup characteristics.

Polarization Angle - Gain characteristics versus the polarization angle may have different effects and is antenna dependent.

Field Decay - The fields very near to a leakage source are dominated by electric and electromagnetic fields which vary non-linearly with distance. These non-linear effects decay rapidly extending out to approximately three wavelengths from the source.

This non-linear near field effect can result in correlation problems between leakage measurements at three meters and those taken at the significantly greater distances which are typical when measuring from a vehicle.

Induced False Triggers - There are several factors which can mimic the amplitude change and produce false signals which may trigger your meter. For example, you may be driving at just the right speed for a standing wave to generate such a signal.

The SUPER LEAK Mode reduces substantially the false triggers from spurious RF signals by working with Trilithic's CT-2 CHANNEL TAG. The CT-2 *tags* a video carrier with a low frequency tag (10Hz) which is audible to your Tricorder. When the tone is sensed, the meter is triggered; alerting you to the presence of a potential leak.

> **NOTE:** This tag is important since it enables you to spot problems in YOUR system alone in overbuilt CATV system areas.

Other Variables - Other variables which can affect your readings include obstructions, multi-leak phasing, standing waves, etc.

Variable Problems Solution

The most logical solution to these problems is to perform a FULL evaluation of the mobile receiver's pick-up characteristics.

This procedure should be performed off a leak of known amplitude which has been qualified by a standard measurement test (Super Plus, dipole 3 meters from leak in horizontal plane). Refer to the illustrations on page 52.

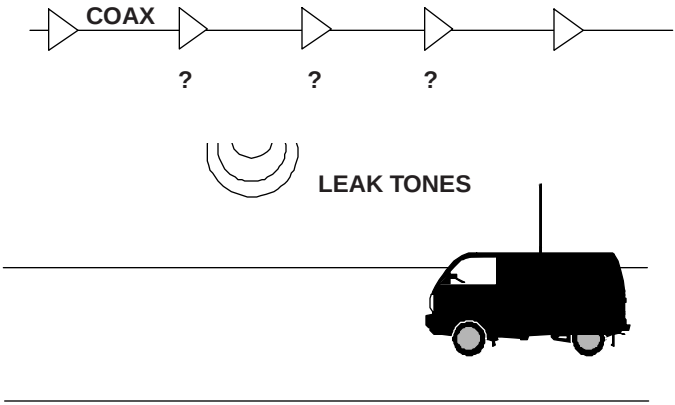
You also need to evaluate your vehicle in both the frontal and broadside modes at varying ranges until you are comfortable with the measurement characteristics. You can use this as a calibration source for all of your vehicles.

LOCALIZING THE SOURCE

Your Tricorder emits an audible tone which is ideal for finding the exact source of leakage. You will need the following:

- Tricorder
- Rubber Duck Antenna
- Near Field Probe

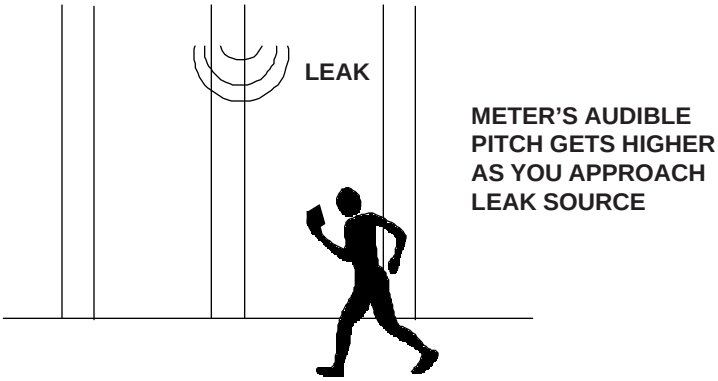
Let's say that you are patrolling in your vehicle and your Tricorder breaks squelch. Aha! A leak! Now that you have been alerted, you need to determine where the leak is located.



Once you have been alerted about a leak, take your Tricorder out of the mobile mount. Place the unit in its carry bag. The rubber duck antenna should be attached already. If not, connect the antenna.

> **NOTE:** Your meter is not as sensitive with the smaller antenna as it is with the vehicle antenna.

As your unit picks up signals, the audio VCO turns on. As you get closer to the source of the leak, the audible pitch increases. Use the audible tone to pinpoint the leak.



USING THE NEAR FIELD PROBE

Unfortunately, the rubber duck antenna is not selective enough to locate the EXACT source of the leak. However, you can use the rubber duck to narrow down the source of the leak to a tap, splitter, ground block or other part of the system.

Once you have pinpointed the suspect device, remove the rubber duck antenna and replace it with the near field probe. This probe is very directive at its tip. Due to this, you must be very close to the leak for the Tricorder to respond.

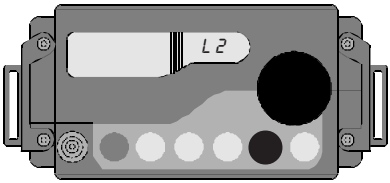
> **NOTE:** When you are patrolling on foot, it is easier to pin-point leaks by listening to the audible pitch signal than by reading the meter scale.

Use the near field probe to examine the tap, splitter or ground block in order to determine which connector is faulty.

INSTALLATION VERIFICATION

When you are installing all new equipment or modifying or replacing equipment in an existing system, it is a good idea to verify that the system contains no leakage. This way, when you leave the site, you can be sure that everything is installed, tight and perfect.

Use the rubber duck antenna to examine the taps, splitters, ground blocks and so on for leakage. If any leaks are detected, use the near field probe to determine which components and/or connections are faulty or not tight enough.



LEARNED CHANNEL PLANS

10

Introduction

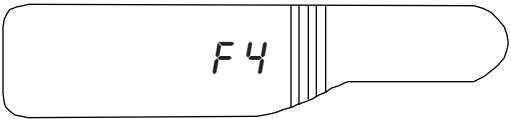
As mentioned earlier (see *CHANNEL PLAN SELECTION* page 30), your meter contains a number of standard channel plans. One of the handiest features of your Tricorder is its ability to “learn” the active channels in your system; giving you access to two customized plans as well as the standard ones. This enables the meter to skip channels, during its various operations, which are not used in your cable system.

Make sure the Tricorder is in SLM Mode. If not, PRESS/RELEASE the **SLM/LEAK** button (Tricorder II) or the **MODE** button (Tricorder III) to cycle your unit to SLM Mode.

> **CAUTION:** When you learn a channel plan, all of the automatic level compensations are set to zero. Use TRISETUP software to set the compensations on the channels in learned channel plans L1 and L2 (see page 105).

Select Basic Plan

PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F4.

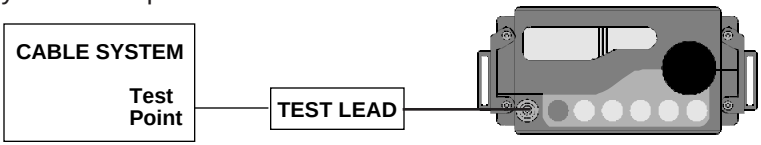


PRESS/RELEASE the knob to enter **F4**. ROTATE the knob to cycle through the basic channel plans (NCTA, HRC, IRC, UHF, etc.) for your cable system. PRESS/RELEASE **FUNC** to select one of the plans.

> **NOTE:** You can NOT use L1 or L2 as the basic plan for learning a plan. Use only a standard channel plan.

Set Up

Before “building” your channel plan, you need to perform several set up steps. Connect the RF Input of the Tricorder to the cable system’s test point.

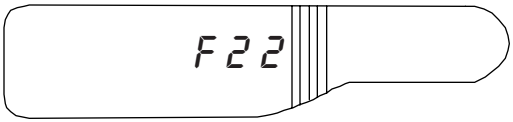


> **NOTE:** Select a point with approximately 0dBmV level at the weakest channel.

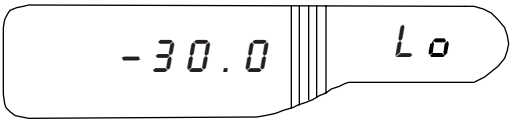
It is necessary to set the low and high video carrier limits which will contain the channels you desire to include in your channel plan.

SET LOW VIDEO CARRIER LIMIT

To set the low video carrier limit, PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F22.



PRESS/RELEASE the knob to enter **F22**. The LEFT LCD displays the current setting while the RIGHT LCD displays “Lo”.



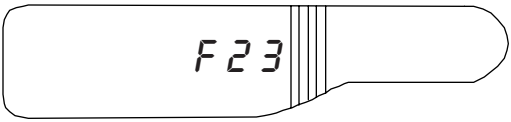
ROTATE the Spin Knob to increment or decrement the setting for the low video carrier limit.

> **NOTE:** Any video carrier level BELOW this limit will be excluded from the Learned Channel Plan. A good rule of thumb is to set the limit 5dB below the lowest expected video carrier level.

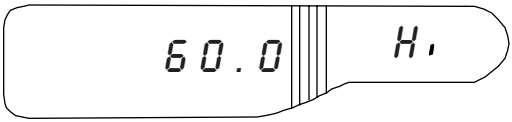
PRESS/RELEASE **FUNC** to store the setting in the non-volatile memory and return the unit to SLM Mode.

SET HIGH VIDEO CARRIER LIMIT

To set the high video carrier limit, PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F23.



PRESS/RELEASE the knob to enter **F23**. The LEFT LCD displays the current setting while the RIGHT LCD displays “Hi”.



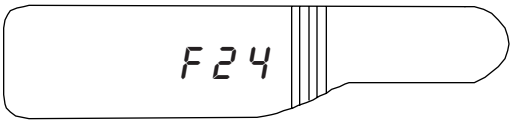
ROTATE the Spin Knob to increment or decrement the setting for the high video carrier limit.

> **NOTE:** Any video carrier level ABOVE this limit will be excluded from the Learned Channel Plan. A good rule of thumb is to set the limit at 60dBmV.

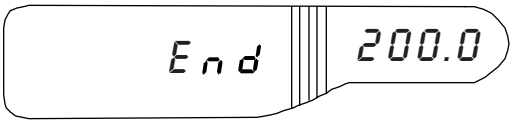
PRESS/RELEASE **FUNC** to store the setting in the non-volatile memory and return the unit to SLM Mode.

SET MAXIMUM SCAN FREQUENCY

Finally, you need to set the maximum scan frequency. PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F24.



PRESS/RELEASE the knob to enter **F24**. The LEFT LCD displays the message “End” while the RIGHT LCD displays the current setting.



ROTATE the Spin Knob to increment or decrement the setting for the maximum scan frequency. Set this to 1MHz above the HIGHEST carrier in your system.

PRESS/RELEASE **FUNC** to store the setting in the non-volatile memory and return the unit to SLM Mode.

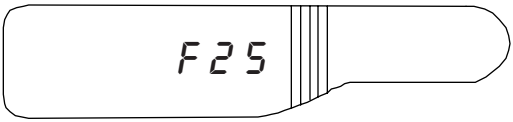
Channel Plan 1 (L1)

Your Tricorder is now ready to “learn” your first channel plan.

> **REMINDER:** Before your meter can “learn”, you must set the limits for your channels via one of the basic channel plans, **F22**, **F23** and **F24**.

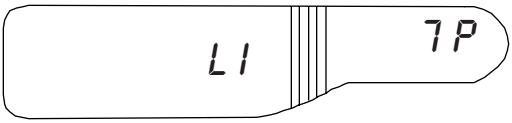
LEARN CHANNEL PLAN

PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to Function F25.



PRESS/RELEASE the knob to select **F25**.

The Tricorder starts “learning” Channel Plan 1 (L1) by scanning the cable system. As it scans, it marks as valid all the channels that fulfill the signal level and frequency limits which you set with **F22**, **F23** and **F24**. The LEFT LCD displays “L1” while the RIGHT LCD displays the channel being scanned.

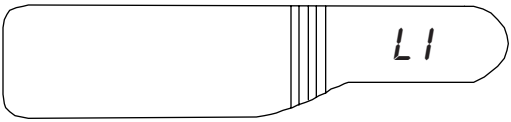


Once the channels have been scanned, the meter uses the data to assemble a modified channel plan. When the plan is assembled, the meter returns to the SLM Mode automatically.

SELECT L1

To use L1, you must first select it.

While in **F4**, ROTATE the Spin Knob to “L1” in the list of channel plans.



PRESS/RELEASE **FUNC**. L1 is selected and the unit returns to the SLM Mode.

> **IMPORTANT:** When you turn off your Tricorder, L1 will be the channel plan the next time you turn the meter ON.
>
> **NOTE:** If L1 is NOT included in your channel list, the unit did not identify any valid channels. You may need to check your basic plan setting **F4** and repeat **F22**, **F23** and **F24** to ensure that the desired channels fall within the setting limits.

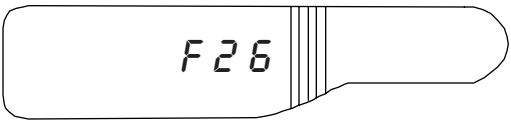
Channel Plan 2 (L2)

Usually, one learned channel plan is sufficient. However, sometimes you may need to use your Tricorder on a different system with a different channel plan. You can use the learned channel plan feature to generate a second channel plan.

LEARN CHANNEL PLAN

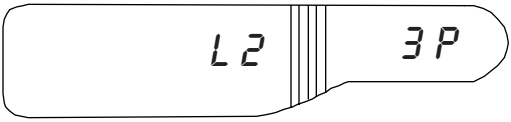
Use the same procedures to set the limits via channel plan, **F22**, **F23** and **F24**.

Once the limits have been set, PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F26.



PRESS/RELEASE the knob to select **F26**.

The Tricorder starts “learning” Channel Plan 2 (L2) by scanning the cable system. As it scans, it marks as valid all the channels that fulfill the signal level and frequency limits which you set with **F22**, **F23** and **F24**. The LEFT LCD displays “L2” while the RIGHT LCD displays the channel being scanned.

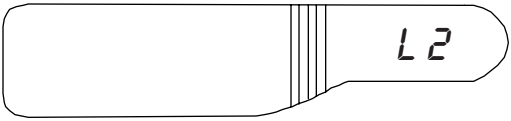


Once the channels have been scanned, the meter uses the data to assemble a modified channel plan. When the plan is assembled, the meter returns to the SLM Mode automatically.

SELECT L2

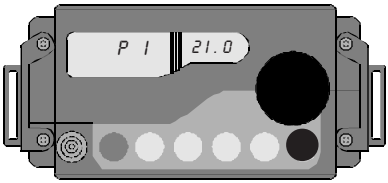
To use L2, you must first select it.

While in **F4**, ROTATE the Spin Knob to “L2” in the list of channel plans.



PRESS/RELEASE **FUNC**. L2 is selected and the unit returns to the SLM Mode.

> **NOTE:** If L2 is NOT included in your channel list, the unit did not identify any valid channels. You may need to check your basic plan setting **F4** and repeat **F22**, **F23** and **F24** to ensure that the desired channels fall within the setting limits.



11

MEMORY OPERATIONS

Introduction

As an alternative to using the CHANNEL or FREQUENCY Modes, your Tricorder enables you to sequence through a series of channels or frequencies which have been stored in memory.

Memory Storage

Any one of ten memories can be programmed with the currently selected channel or frequency.

> **NOTE:** When you are in MEMORY Mode, you can NOT *toggle* between audio and video carriers. It is necessary to store the carriers one at a time in SEPARATE memories.
>
> You can not store leakage frequencies.

Always store memories with the unit in the Channel Plan you will be using in NORMAL TUNING Mode. If you will be using a Learned Channel Plan, learn it FIRST. See *LEARNED CHANNEL PLANS* page 55 to review the procedure.

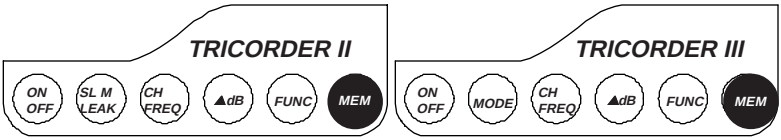
When the Tricorder exits MEMORY TUNING Mode, it returns to the channel/frequency you were using in NORMAL TUNING Mode.

If the channel you are storing is from L1 or L2 and has an automatic compensation value assigned to it, that compensation value will be programmed into the memory. If the channel is not from L1 or L2, the memory will set to a compensation value of zero.

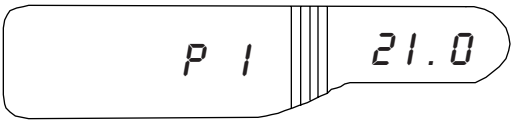
Tune your Tricorder to the frequency or channel which you wish to store in memory. (See *SLM OPERATION* page 27 to review the procedure.)

REMINDER: If you wish to use the ▲dB Mode to compare pilots, you MUST put the pilots in the FIRST and LAST memories.

PRESS/RELEASE **FUNC**. Then PRESS/RELEASE the **MEM** button.



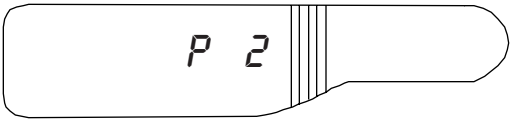
The unit enters the MEMORY PROGRAMMING Mode.



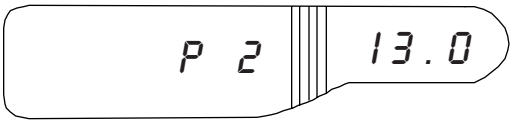
NOTE: The “1” in “P1” indicates the FIRST memory is currently selected.

ROTATE the Spin Knob until the desired memory (1 – 10) appears in the LEFT LCD.

NOTE: The unit will advance only to the number of the last programmed memory plus 1. For example, if P1 is the last memory programmed, the unit will cycle to P2 and no farther.



If a memory contains previously stored information, its parameters are displayed in the RIGHT LCD. Otherwise, it is blank.



Storing the new parameters overwrites the previous memory contents.

REMINDER: The Tricorder will NOT allow you to skip unused memories.

PRESS/RELEASE the Spin Knob to store the currently tuned channel or frequency into memory. The new channel number or frequency appears in the RIGHT LCD.

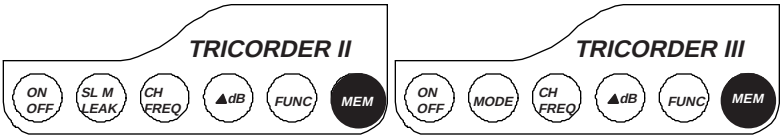
PRESS/RELEASE **FUNC** to exit this mode and return to the channel/frequency you were using before.

Repeat this procedure for any additional memories you wish to program in the unit.

Memory Retrieval

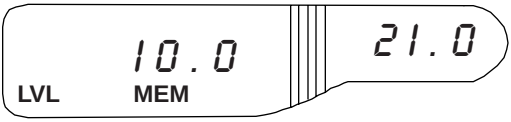
Make sure the unit is in SLM Mode before you start retrieving memories.

PRESS/RELEASE **MEM**.



Your unit will enter MEMORY Mode (MEM appears in the LEFT LCD).

> **NOTE:** The Tricorder will automatically set itself to the parameters which are stored in the first memory (P1).



> **NOTE:** If you push **MEM** and there are no stored memories, you meter will emit three *beeps*.

ROTATE the Spin Knob to cycle through the unit through the sequence of memories. As each memory is accessed, your Tricorder will set itself to the stored parameters.

If the recalled memory specifies CHANNEL Mode, the meter sets to that mode and tunes to the specific audio or picture carrier.

If the recalled memory specifies FREQUENCY Mode, the meter sets to that mode and tunes to the required frequency.

If the data recalled is invalid (i.e. memory data has been corrupted), the unit emits three short *beeps* and returns to SLM Mode. Check and reprogram the unit's memory.

> **NOTE:** Unprogrammed memories cannot be retrieved. For example, if only four memories contain information, the meter will sequence 1, 2, 3, 4, 1, 2... This prevents the unit from selecting an unprogrammed memory.

PRESS/RELEASE **MEM** to exit this mode and return to the last channel/frequency you were using in NORMAL TUNING Mode.

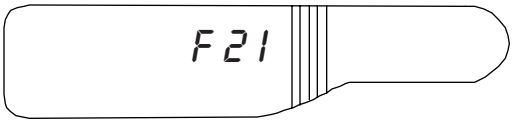
Erase Memories

There may be occasions when you wish to reprogram all the memories in the unit. One way is to store (overwrite) each memory individually. You can also ERASE all programmed memories at the same time by using Function F21.

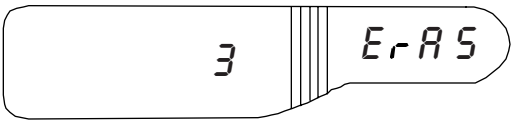
> **CAUTION:** Use this function ONLY when you want to clear ALL memories and start over with the ten memories empty.

PRESS/RELEASE **FUNC**.

ROTATE the Spin Knob to F21.



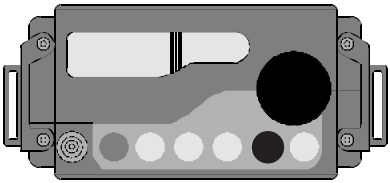
PRESS/RELEASE the knob to select **F21**.



PRESS/RELEASE **MEM** to decrement the number in the LEFT LCD. PRESS/RELEASE **MEM** a total of three times to erase all of the memories in the unit's non-volatile memory.

x 3

Your unit will return to SLM Mode automatically.



12

UTILITY FUNCTIONS

Introduction

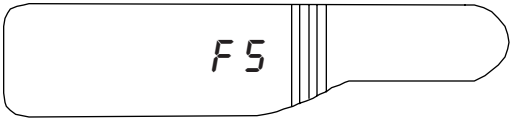
Your Tricorder is equipped with several functions which can be used for assorted utility procedures including time/date setting, changing default settings, and changing the unit's calibration. See *SUMMARY OF FUNCTIONS* on page 108 for a list of all the functions in your Tricorder.

Auto Power-Down (F5)

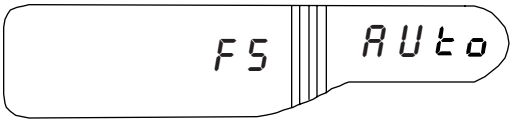
F5 is used to disable the Tricorder's timed automatic power-down feature temporarily.

PRESS/RELEASE **FUNC**.

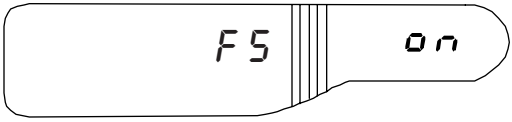
ROTATE the Spin Knob to F5.



PRESS/RELEASE the knob to select **F5**. ROTATE the knob to *toggle* between "AUto" and "on".



or



When “on” is displayed in the RIGHT LCD, PRESS/RELEASE **FUNC**. This disables the timed automatic power-down feature.

> **NOTE:** This procedure will NOT disable the auto power-down if it is caused by a low battery.

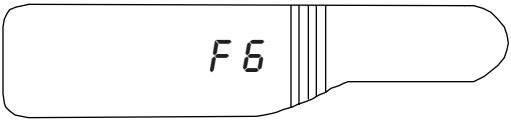
When you PRESS/RELEASE **FUNC**, your unit returns to the SLM Mode.

> **REMINDER:** F5 is a temporary function only. When you turn off your unit, the Tricorder returns to its default so that auto power-down is enabled each time the meter is powered-up.

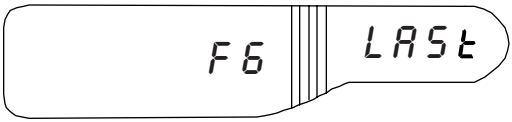
Power-Up Mode Selection (F6)

Function F6 is used to determine which mode the Tricorder will be in when it is powered-up.

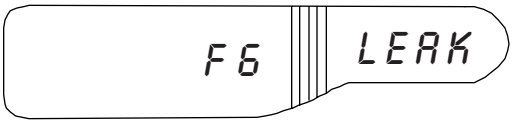
PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F6.



PRESS/RELEASE the knob to enter **F6**. ROTATE the knob to *toggle* between the two settings: “LASt” or “LEAK”.



or



If you select “LASt”, your Tricorder will power-up in SLM or LEAKAGE Mode; depending upon which it was in when it was last powered-down.

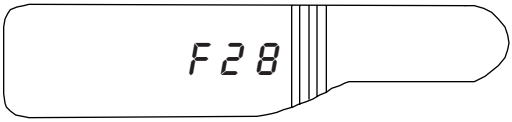
If you select “LEAK”, your Tricorder will always power-up in LEAKAGE Mode (if it is not powered from the charger).

PRESS/RELEASE **FUNC** to store the selected setting in the non-volatile memory. The unit returns to SLM Mode.

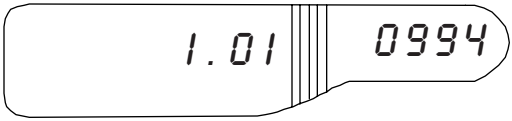
Check Firmware Number (F28)

You may need to check the number of your Tricorder’s firmware for *cloning* operations or if you call us for technical assistance.

First, PRESS/RELEASE **FUNC**. Then ROTATE the Spin Knob to F28.



PRESS/RELEASE the knob to select **F28**.

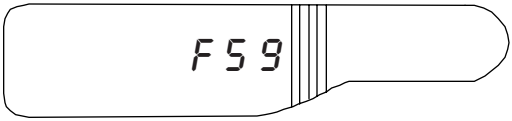


The firmware version number appears in the LEFT LCD. The date of the version appears in the RIGHT LCD.

Unlock Functions (F59)

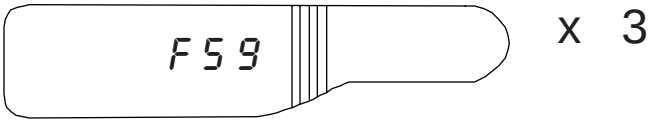
Function 59 is used to unlock Functions F40 - F48 (except for F44 which is not locked). This allows you to alter the settings of these functions by disabling the “lock out” feature that protects the functions from accidental changes.

PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F59.



PRESS/RELEASE the knob to select **F59**. Your unit will return to SLM Mode immediately.

Repeat this procedure TWO more times. When **F59** has been selected a total of THREE time, Functions F40 – F48 will be unlocked.



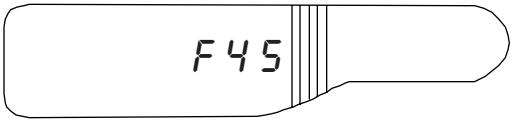
NOTE: When you power-down your Tricorder, the “lock out” of the Functions is restored.

Set Clock (F45)

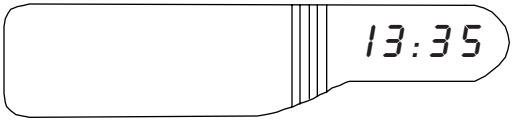
If you are using the DATA LOGGING option, you may need to change the time and date of your Tricorder. Use Function F45 to change the time of the unit.

REMINDER: Before you can access F45, you must unlock it with F59.

PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F45.



PRESS/RELEASE the knob to select **F45**.



ROTATE the Spin Knob to increment or decrement the “hour” setting.

PRESS/RELEASE the knob *toggle* to the “minute” setting. ROTATE the knob to increment or decrement the “minute” setting.

PRESS/RELEASE **FUNC** to store the time in the non-volatile memory and to return to SLM Mode.

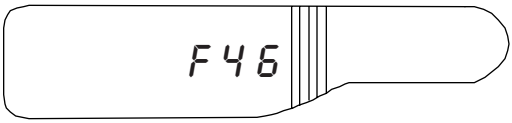
> **NOTE:** The clock uses 24-hour time rather than 12-hour. For example, 2:15 in the afternoon would appear as 14:15.

Set Month/Day (F46)

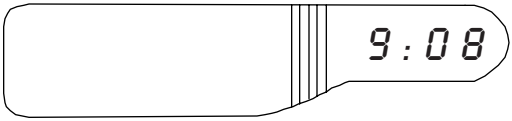
Use Function F46 to set the month and day (when you are using DATA LOGGING).

> **REMINDER:** Before you can access F46, you must unlock it with F59.

PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F46.



PRESS/RELEASE the knob to select **F46**.



ROTATE the Spin Knob to increment or decrement the “month” setting.

PRESS/RELEASE the knob to *toggle* to the “day” setting. ROTATE the knob to increment or decrement the “day” setting.

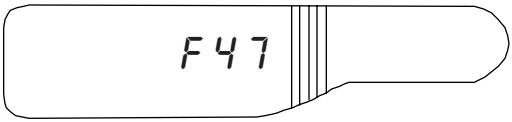
PRESS/RELEASE **FUNC** to store the date in the non-volatile memory and to return to SLM Mode.

Set Year (F47)

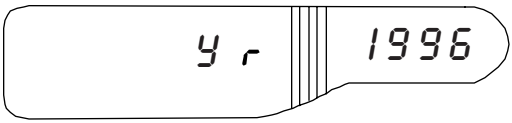
Use Function F47 to change the year of the unit (if you are using DATA LOGGING).

REMINDER: Before you can access F47, you must unlock it with **F59**.

PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F47.



PRESS/RELEASE the knob to select **F47**.

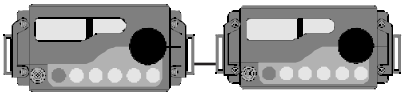


ROTATE the Spin Knob to increment or decrement the numerical year setting in the RIGHT LCD.

PRESS/RELEASE **FUNC** to store the time in the non-volatile memory and to return to the SLM Mode.

NOTE: The year cannot be set for LESS than 1992.

The year does not roll over automatically. You must reset it every January 1st.



CLONE TRICORDER

Introduction

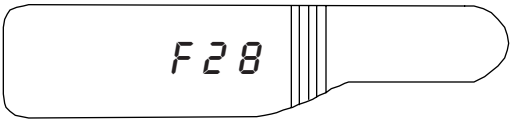
You can *clone* or copy memories, channel plan selection, learned channel plans, minimum and maximum settings, etc. from one Tricorder to another. This feature can reduce the set up time when you are using several meters for the same cable system.

> **REMINDER:** Functions F43 and F48 are locked functions. Before you can access them you need to unlock them (see *UNLOCK FUNCTIONS F59* page 67).

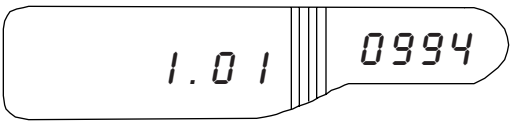
You need to set the baud rate and remote addresses of the *MASTER* (Tricorder containing all programming data) and the *CLONE* (Tricorder which will receive programming data) to the same configuration.

> **CAUTION:** Do NOT try to clone units which are disimilar. Only the same type of meter can be cloned. The units must be the same model, have the same options (i.e. data logging, calibrated leakage, 600MHz or 1000MHz) and the same firmware. If in doubt, call the factory. A better way is to use **TriSetup** which enables you to clone any unit's settings.

To check the firmware number, PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F28.



PRESS/RELEASE the knob to select **F28**. The firmware version number appears in the LEFT LCD. The date of the version appears in the RIGHT LCD.

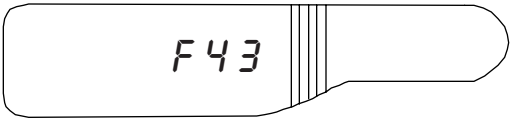


Set Baud Rate

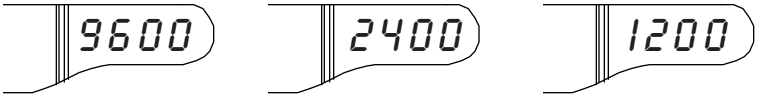
Set the baud rate of both *Master* and *Clone* to 9600.

> **REMINDER:** You need to unlock this function (see *UNLOCK FUNCTIONS F59* page 67).

On the *Master* unit, PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F43.



PRESS/RELEASE the knob to enter **F43**. The meter has three baud rates available: 9600 (factory default), 2400 or 1200. ROTATE the knob to *toggle* between the settings.



ROTATE the Spin Knob until “9600” is displayed in the RIGHT LCD.

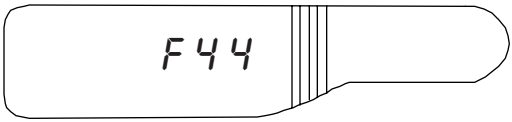
PRESS/RELEASE **FUNC** to set the baud rate in the non-volatile memory and return to SLM Mode.

Repeat the procedure with the *Clone* unit.

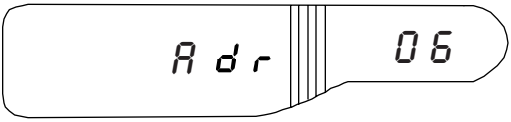
Set Remote Address

Set the remote address for both *Master* and *Clone* to the same address.

On the *Master* unit, PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F44.



PRESS/RELEASE the knob to enter **F44**. The meter displays "Adr" and the current address (0 – 255).



ROTATE the Spin Knob if a different address setting is desired.

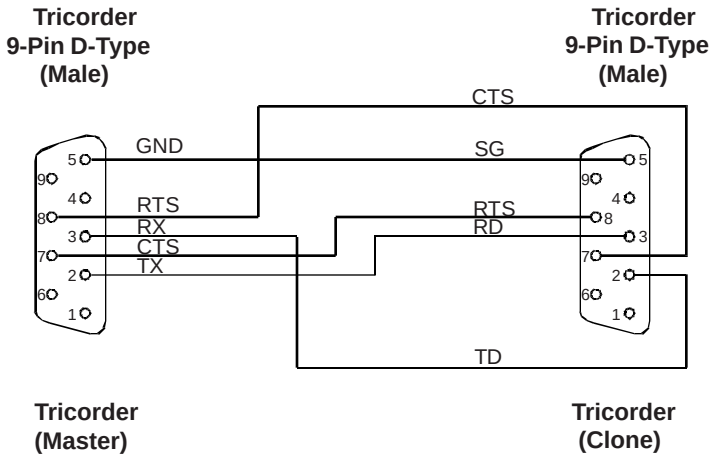
PRESS/RELEASE **FUNC** to set the remote address in the non-volatile memory and return to SLM Mode.

Repeat the procedure with the *Clone* unit.

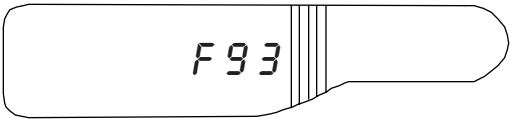
Cloning Operation

Now you are ready to begin the cloning operation.

Connect the *Master* and *Clone* units to each other with Trilithic's special CLONE CABLE (P/N 2070716000).

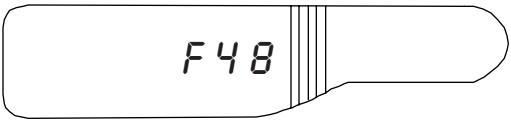


On the *Clone* unit, PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F93.



PRESS/RELEASE the knob to enter **F93**. The units are now ready for cloning.

On the *Master* unit, PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F48.



PRESS/RELEASE the knob to enter **F48**. The cloning process begins.

When the procedure finishes, both the *Master* and *Clone* units *beep* and then return to SLM Mode automatically.

Check the *Clone* unit to make sure that its settings and parameters are the same as the *Master* unit. You should now have two Tricorders with identical programming data.

Tricorder III Firmware Version: 1.01

Date: 9/07/96 LO-PILOT: 17.2
Time: 1:00 HI-PILOT: 17.7
Record: 1 TILT: .5

Channel	Frequency	Picture	Audio	Level	Plan
2		17.2	.0		NCTA
	103.55 MHz			-4.6	NCTA
16		.0	17.7		NCTA
9		20.7	.0		NCTA

14

DATA LOGGING

Introduction

In addition to the standard features, your Tricorder may also come with the enhanced features. The first of these is Data Logging. When equipped with this option, your Tricorder can measure and store up to 24 complete records of the levels of up to 100 channels. To verify whether you have this options see *VERIFY DATA LOGGING* on page 18.

If you use the manual data logging feature, the meter notifies you of any visual carriers that do not meet your user-select level limits.

Hot Tip

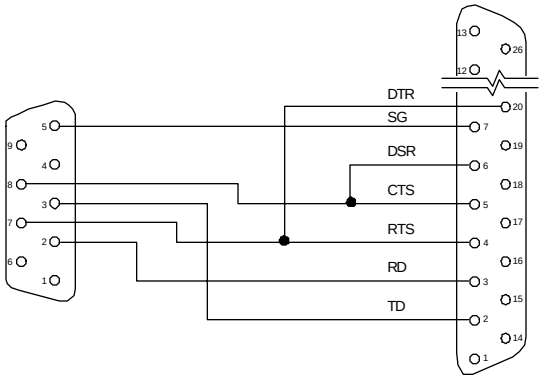
Each data record is stamped with the date and time the record was logged. You can also add a seven-digit tracking number to the data record so that when the record is uploaded to a printer or PC, it will be easy to match it to its respective work order. See* CUSTOMER ID NUMBER *page 82 for more information.

When you use AUTOMATIC Mode, your meter measures and records the level of all carriers at your user-set interval of one minute to six hours.

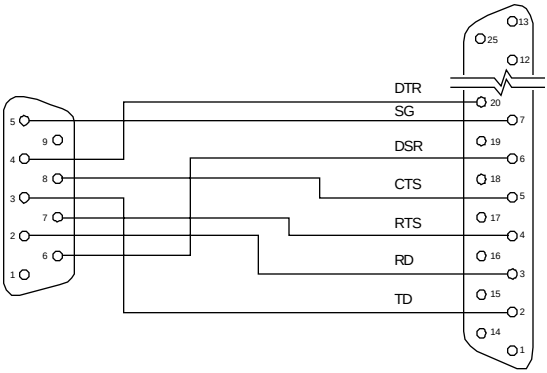
With data logging, your Tricorder can also perform the FCC mandated 24-hour level variation test unattended; using its battery pack.

Tricorder to Printer/PC Connection

In order to print out the data logging information or send it to your PC, you will need to connect your Tricorder to the printer or PC. Use Trilithic's RS-232 cable (P/N 2070698000) to make this connection.



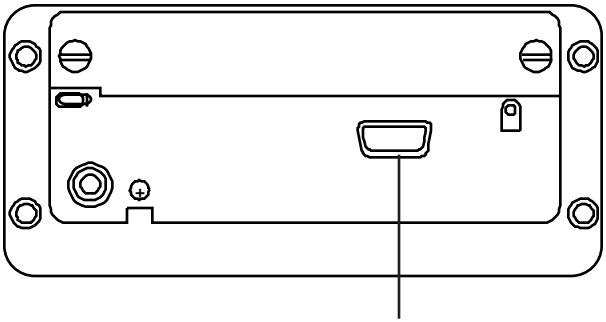
Printer/Computer Cable



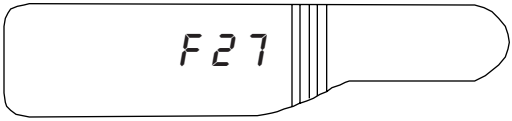
9-Pin Adaptor

External Temperature Display

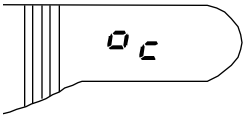
If you desire a temperature printout with your data log record, you will need to plug a temperature probe (P/N 207071000) into the RS-232C connector of your Tricorder.



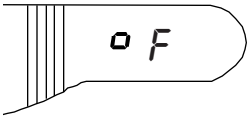
First, you can set the Tricorder to use either centigrade or Fahrenheit for temperatures. PRESS/RELEASE **FUNC**. Then ROTATE the Spin Knob to Function F27.



PRESS/RELEASE the knob to select **F27**. ROTATE the knob to *toggle* between °C or °F.

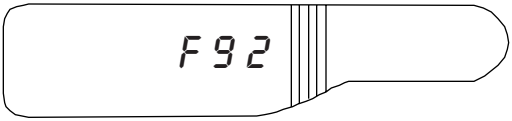


or

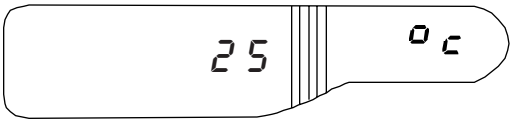


PRESS/RELEASE **FUNC** to select °C or °F and to return to SLM Mode.

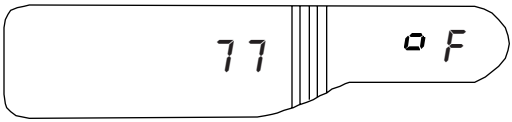
To display the external temperature, PRESS/RELEASE **FUNC** and ROTATE the Spin Knob to F92.



PRESS/RELEASE the knob to select **F92**. Your meter will display the external temperature in centigrade or Fahrenheit; depending on which you selected with **F27**.



or

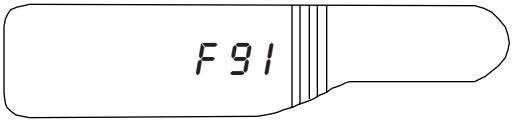


When you print out your data log record, the temperature will be included in the heading.

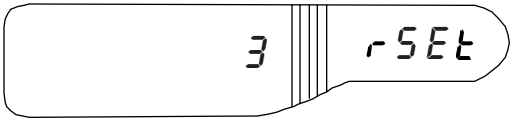
Reset Data Log Record Counter (F91)

You can reset your meter's record counter to one. This allows you to overwrite old data with new information.

PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F91.



PRESS/RELEASE the knob to select **F91**.



PRESS/RELEASE **MEM** to decrement the number in the LEFT LCD.

To erase all of the record's in the unit's non-volatile memory, PRESS/RELEASE **MEM** a total of THREE times.

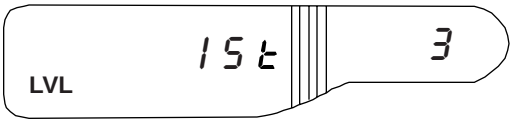
x 3

Your unit will return to SLM Mode automatically.

Create Data Log Record

There are four DATA LOGGING Modes: **F96**, **F97**, **F98** and **F99**. In any of these four modes, you can select the starting record for each data logging session. The record you select may be the number of an existing stored record or the number of the next available (unused) record.

When entering any of the four modes, your Tricorder displays "1st" in the LEFT LCD and the next available record in the RIGHT LCD.



If you wish to select a lower record number, ROTATE the Spin Knob *counter-clockwise*. When the desired number is displayed, PRESS/RELEASE the knob. Your unit will advance to the next step in the data logging sequence.

> **CAUTION:** If you select a lower record number, your meter will overwrite the old record with the new information. Selecting a lower record number will also destroy the data in higher record numbers (i.e. If you set the record at 2, the old data stored in records 2 – 24 will be lost.) Make sure that you no longer need older data before selecting a lower record.

This feature is especially useful during automatic data logging at multiple locations. For example, if your meter is left at a particular site for more than the desired number of records, the starting record for the next site can be reset to the appropriate number.

You can create data log records manually or automatically.

This includes:

- RS232C Port
- Real-time Clock/Calender
- Extra memory for storing up to 24 sets of measurement data

Using the RS232C Port, you can output your Tricorder's stored data directly to a serial printer. You can also upload the data to a PC host computer. Trilithic's **Tridata** software will enable you to view the data graphically or put it in a format which is compatible with popular spreadsheet routines such as Lotus or Symphony.

When using data logging, you can scan by channel number.

> **NOTE:** You can scan by frequency ONLY if stored in the 10 user memories.

When you scan by channel number (using **F97** or **F99**), both the video and audio carrier levels are recorded.

Before you proceed, you might want to verify the time and date of your Tricorder (if you have not already done so). See pages 68 through 70 to review the procedure for verifying time and date.

MANUAL DATA LOGGING

There are two manual data logging functions:

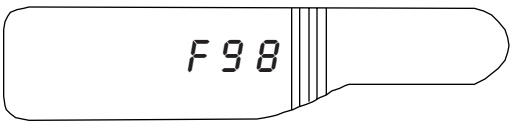
- **F98** – Used to scan the ten user memory positions.
- **F99** – Used to scan the channels in the currently selected channel plan. It scans for channels greater than 50MHz to the maximum frequency as defined by Function **F24** (see page 57).

Connect the signals which are to be measured to your meter's RF Input connector.

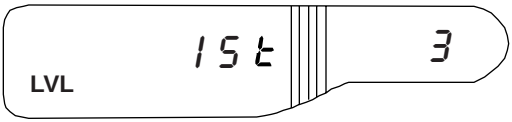
F98 Scan

Select **F98** to scan the ten user memory positions.

PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F98.

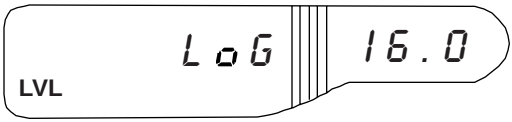


PRESS/RELEASE the knob to enter **F98**.

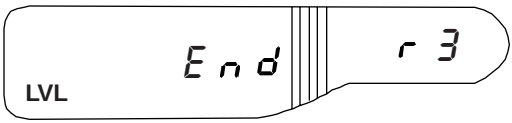


The LEFT LCD displays “1st” and the RIGHT LCD displays the record number which ranges from 1 to 24. If you wish to use a lower record number, ROTATE the Spin Knob *counter-clockwise*.

PRESS/RELEASE the Spin Knob to start scanning. The LEFT LCD displays “LoG” while the RIGHT LCD displays the frequency of the channel being scanned or the channel number, depending on what was stored in user memory.



When the scan is completed, the unit *beeps*, displays “End” and the record number (1 - 24).



Once the scan is complete, PRESS/RELEASE **MEM**. The data is stored and the unit advances the record counter to the next record. If you prefer, you can PRESS/RELEASE **FUNC** to abort the scan without saving.

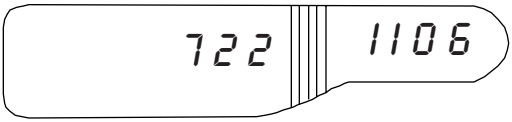
If you have chosen to save the data, you may wish to enter a Customer ID Number as a convenient method for linking measurement data to the work order (see *CUSTOMER ID NUMBER* on page 82).

If you do not want to enter a Customer ID Number, PRESS/RELEASE **FUNC** to return to SLM Mode.

Customer ID Number

You may wish to record the record number on the work order as a convenient method for linking measurement data to the paper record by assigning it a 7-digit identification number.

After you press **MEM** to save the data log record, the last-selected 7-digit ID number appears in the display.



PRESS/RELEASE the Spin Knob to move the *blinking* number from one position to the next.

ROTATE the knob to increment or decrement each of the numbers.

Once you have selected your desired number, PRESS/RELEASE **MEM**. This stores the number and returns the unit to SLM Mode.

If you change your mind and decide you do not want a number, PRESS/RELEASE **FUNC**.

If an ID number has been selected, it will appear in the header of the first page of the data log record (see SAMPLE DATA RECORD PRINTOUTS on pages 94 and 95).

> **NOTE:** Your Tricorder does NOT maintain the list of ID numbers which were used previously.

F99 Scan

Use **F99** to scan all channels greater than 50MHz to the maximum frequency as defined by **F24**.

> **NOTE:** The **F99** option works differently when the FCC EVALUATION Mode is enabled. See *FCC EVALUATOR* on page 97.

Before using **F99**, you must set the low video carrier limit, the high video carrier limit and the maximum scan frequency for your unit via **F22**, **F23**, and **F24**. Don't forget to choose a channel plan.

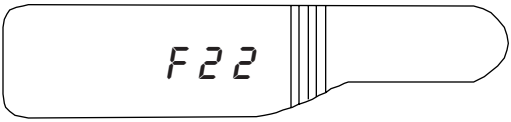
During manual scanning, your meter will check the video carriers in order to determine whether or not they are within the minimum/ maximum limits set by **F24** and **F23**. This is particularly useful when you are checking customer drops for proper levels and for checking that traps are installed on the proper channels.

When an "out-of-limits" condition is found, the Tricorder stops scanning and displays the level and the channel number.

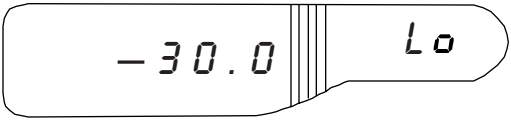
The Tricorder also checks for video/audio differences of greater than 18dB or less than 10dB. This feature is useful for spotting bad traps.

F22 SET LOW VIDEO CARRIER LIMIT

To set the low video carrier limit, PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to cycle to F22.



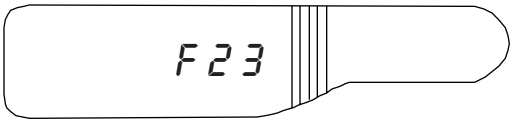
PRESS/RELEASE the knob to enter **F22**. The LEFT LCD displays the current setting while the RIGHT LCD displays "Lo".



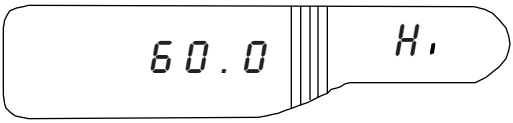
ROTATE the Spin Knob to increment or decrement the setting for the low video carrier limit.

PRESS/RELEASE **FUNC** to store the setting in the non-volatile memory and return the unit to SLM Mode.

F23 SET HIGH VIDEO CARRIER LIMIT
To set the high video carrier limit, PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F23.



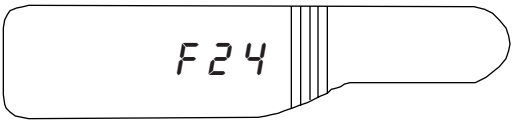
PRESS/RELEASE the knob to enter **F23**. The LEFT LCD displays the current setting while the RIGHT LCD displays “Hi”.



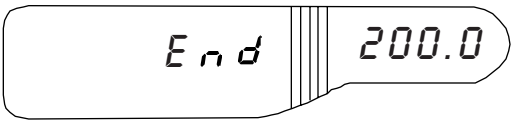
ROTATE the Spin Knob to increment or decrement the setting for the high video carrier limit.

PRESS/RELEASE **FUNC** to store the setting in the non-volatile memory and return the unit to SLM Mode.

F24 SET MAXIMUM SCAN FREQUENCY
To set the maximum scan frequency, PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F24.



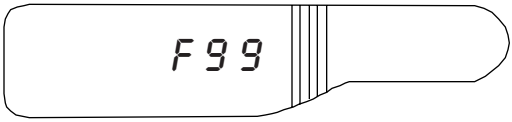
PRESS/RELEASE the knob to enter **F24**. The LEFT LCD displays the message “End” while the RIGHT LCD displays the current setting.



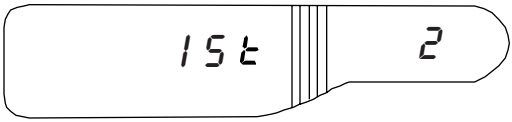
ROTATE the Spin Knob to increment or decrement the setting for the maximum scan frequency. Set this to 1MHz above the HIGHEST carrier in your system.

PRESS/RELEASE **FUNC** to store the setting in the non-volatile memory and return the unit to SLM Mode.

Now that your limits are set, select **F99**. PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F99.

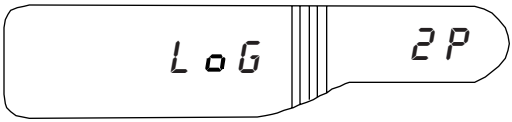


PRESS/RELEASE the knob to enter Function **F99**.

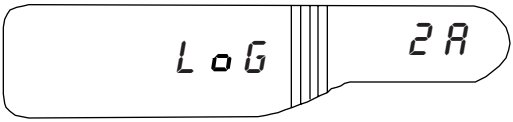


The LEFT LCD displays “1st” and the RIGHT LCD displays the record number which ranges from 1 to 24. If you wish to use a lower record number, ROTATE the knob *counter-clockwise*.

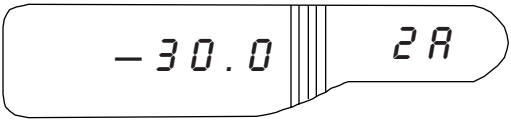
PRESS/RELEASE the Spin Knob to start scanning. Both video and audio signal levels will be stored. The LEFT LCD displays “LoG” while the RIGHT LCD displays the number of the channel being scanned.



and



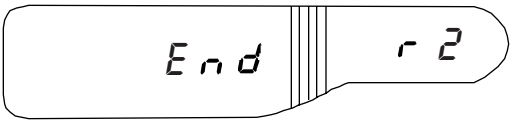
NOTE: If an “out-of-limits” level is encountered, the meter will *beep* and stop scanning. The level and channel number will be displayed.



PRESS/RELEASE the Spin Knob to continue scanning.

PRESS/RELEASE **FUNC** to abort the scan. The unit returns to SLM Mode without saving the data.

When the scan is completed, the unit *beeps* and displays “End” and the record number (1 - 24).



Once the scan is complete, PRESS/RELEASE **MEM**. The data is stored and the unit advances the record counter to the next record. If you prefer, you can PRESS/RELEASE **FUNC** to abort the scan without saving.

If you have chosen to save the data, you may wish to enter a Customer ID Number as a convenient method of linking measurement data to the work order (see *CUSTOMER ID NUMBER* page 82).

If you do not want to enter a Customer ID Number, PRESS/RELEASE **FUNC** to return to SLM Mode.

AUTO DATA LOGGING

Use the Auto Data Logging function to scan and record carrier levels up to 24 times spaced at regular intervals. The intervals are settable from 1 to 360 minutes in 1 minute steps.

There are two auto data logging functions:

- **F96** – Used to scan the ten user memory positions.

- **F97** – Used to scan the channels in the currently selected channel plan. It scans for channels greater than 50MHz to the maximum frequency as defined by Function **F24** (see page 57).

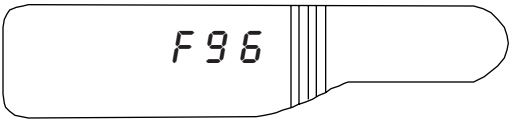
NOTE: Before using **F97**, you must set the maximum scan frequency for your Tricorder via **F24**. The low and high video carrier limits (**F22** and **F23**) are NOT used in auto data logging so you do not need to set these limits.

Connect the signals which are to be measured to your meter's RF Input connector.

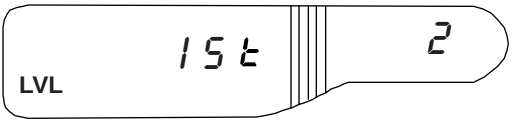
F96 Scan

Select **F96** to scan the ten user memory positions.

PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F96.



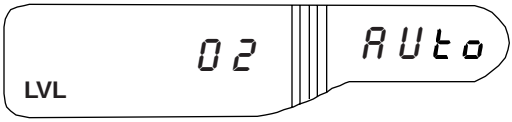
PRESS/RELEASE the knob to enter **F96**.



The LEFT LCD displays "1st" and the RIGHT LCD displays the record number which ranges from 1 to 24. If you wish to use a lower record number, ROTATE the Spin Knob *counter-clockwise*.

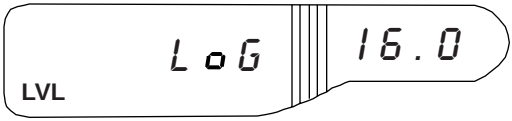
PRESS/RELEASE the knob again.

The LEFT LCD displays the current “minutes-between-scans” setting while “AUto” is displayed in the RIGHT LCD.



ROTATE the Spin Knob to increment or decrement to the desired time interval. PRESS/RELEASE the Spin Knob.

The LEFT LCD displays “LoG” while the RIGHT LCD displays the channel number or frequency currently being scanned.



At the completion of each scan, the data is automatically stored in non-volatile memory. The Tricorder powers-down until time to take the next record.

NOTE: After your meter powers-down, you can power up the Unit to see which record it is on. At this point, you have several options.

1. You can continue the automatic data log scanning by pressing **ON/OFF**. The unit will power-down until its real-time clock signals it to continue.

2. You can PRESS/RELEASE **FUNC**. This will end the automatic data log scanning and return the unit to SLM Mode.

   If your meter has not scanned all the records, the next time you enter **F96**, it will start with the record where it left off. For example, if you abort after four records, the meter will start at Record 5.

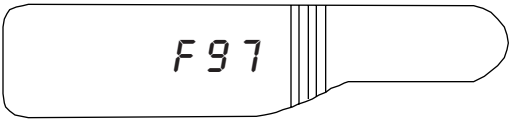
   If your Tricorder has finished scanning all of the records, the next time you enter **F96**, it will start with Record 24.

After the 24th record is taken, the unit powers-down completely. You must manually power-up the unit at this time.

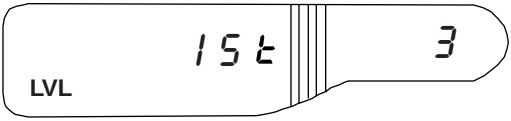
F97 Scan

Select **F97** to automatically scan up to 116 channels greater than 50MHz to the maximum frequency as defined by **F24** at regular time intervals.

PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F97.



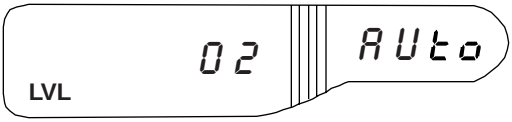
PRESS/RELEASE the knob to enter **F97**.



The LEFT LCD displays “1st” and the RIGHT LCD displays the record number which ranges from 1 to 24. If you wish to use a lower record number, ROTATE the Spin Knob *counter-clockwise*.

PRESS/RELEASE the knob again.

The LEFT LCD displays the current “minutes-between-scans” setting while “AUto” is displayed in the RIGHT LCD.

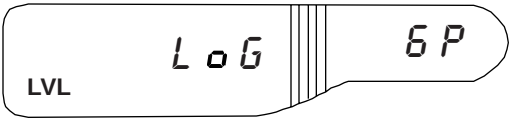


ROTATE the Spin Knob to increment or decrement to the desired time interval.

> **NOTE:** The amount of time needed to measure and record the system levels depends on both the number of carriers and the level variation between them.
>
> Your Tricorder can scan approximately 20 channels per minute.

PRESS/RELEASE the Spin Knob.

The LEFT LCD displays “LoG” while the RIGHT LCD displays the channel number currently being scanned.



At the completion of each scan, the data is automatically stored in non-volatile memory. The Tricorder powers-down until time to take the next record.

NOTE: After your meter powers-down, you can power up the unit to see which record it is on. At this point, you have several options.

1. You can continue the automatic data log scanning by pressing **ON/OFF**. The unit will power-down until its real-time clock signals it to continue.

2. You can PRESS/RELEASE **FUNC**. This will end the automatic data log scanning and return the unit to SLM Mode.

   If your meter has not scanned all the records, the next time you enter **F97**, it will start with the record where it left off. For example, if you abort after four records, the meter will start at Record 5.

DATA LOGGING UTILITIES

Now that you have stored your data records, either manually or automatically, you may transfer the information to a serial printer or a PC. Connect your Tricorder to a PC or a printer via its RS-232C port and Trilithic’s RS-232C cable. When using the meter with a PC, use Trilithic’s **Tridata** software.

Uploading Tricorder Records to a Computer

Your Tricorder can upload data records to a computer via its RS-232C port by using Trilithic’s **Tridata** software.

This powerful software enables you to:

- Upload any or all data log records and save them to disk.
- Print data log records.
- View data log records as data or graphically.
- Convert data log records to a format which a spreadsheet can read.
- Reset the Tricorder's record counter.

For more information, refer to your **Tridata** materials.

Connect Tricorder to Printer

Use Trilithic's RS-232C cable (P/N 2070698000) to connect your meter to the SERIAL input port of a printer.

> **NOTE:** Trilithic's RS-232C cable ends in a 25-pin, D-type connector. The connector on the printer may require the male to male adaptor which is included with the cable.
>
> **CAUTION:** RS-232C cables supplied with other equipment may be wired differently than our recommended cable. Trilithic recommends using ONLY our cable.
>
> **NOTE:** The meter will NOT drive a PARALLEL printer. If you wish to use a diconix printer, you must use a special procedure. See *TRICORDER FAMILY APPLICATION NOTES, NOS. 5 and 6*.

Set your Tricorder and the printer to the same baud rate (see *SET BAUD RATE* on page 72).

Set the printer's communications protocol to the following defaults:

- Parity : No Parity
- Number of Data Bits : 8
- Stop Bits : 1
- Hardware Handshaking : (not XON/XOFF)

If the printer can emulate several types of printers, set it for "IBM".

You can change the temperature units before printing by using **F27**. See *EXTERNAL TEMPERATURE DISPLAY* page 77.

Printing Data Records

There are two functions for transferring records to the printer:

- **F94** – Used to transfer a selected (1 - 24) formatted record to the printer.
- **F95** – Used to transfer ALL of the stored records (up to 24) to the printer.

Refer to the SAMPLE DATA RECORD PRINTOUTS on page 94 and 95 for examples of printouts.

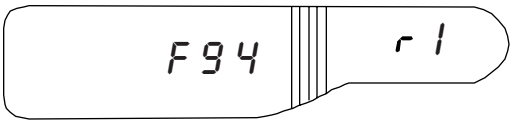
CAUTION: If you are including HI and LO pilots on your printout, you need to be aware of the following errors.

If **777.7** appears beside the HI and LO pilot lines, it means that the HI and LO pilots have NOT been programmed into memory.

If **888.8** appears, the HI and LO pilots are not in the SAME Channel Plan. See page 30.

F94 PRINT SELECTED RECORD

If you want to print a report for a specific record, PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F94. PRESS/RELEASE the knob to enter **F94**.

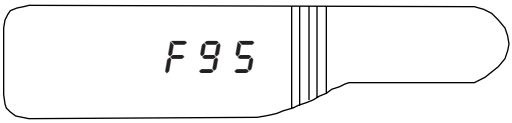


ROTATE the Spin Knob to advance the record number “r 1” in the RIGHT LCD.

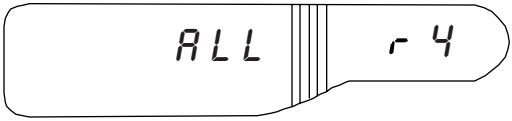
When you reach the desired record number, PRESS/RELEASE the knob to select the record. The data transfers to the printer.

F95 PRINT ALL

If you want to print a report for ALL records, PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F95.



PRESS/RELEASE the knob to enter **F95**. The RIGHT LCD displays the HIGHEST numbered valid record.



PRESS/RELEASE the knob. The data transfers to the printer.

Tricorder III Firmware Version: 1.01

Date: 9/07/94 LO-PILOT: 17.2
Time: 1:00 HI-PILOT: 17.7
Record: 1 TILT: .5

Channel	Frequency	Picture	Audio	Level	Plan
2		17.2	.0		NCTA
	103.55 MHz			-4.6	NCTA
16		.0	17.7		NCTA
9		20.7	.0		NCTA
	223.25 MHz			18.7	NCTA
6		16.8	.0		NCTA
	937.25 MHz			–30.0	NCTA
33		.0	–9.0		NCTA
32		19.7	.0		NCTA
39		17.3	.0		NCTA

F96 with mixed channel numbers and frequencies without temperature probe.

Tricorder III Firmware Version: 1.01 I.D. No.: 7221106

Date: 9/07/94 LO-PILOT: 17.1
Time: 1:02 HI-PILOT: 17.6
Record: 3 TILT: .5
Temp: 82°F

Channel	Frequency	Picture	Audio	Level	Plan
2		17.2	.0		NCTA
	103.55 MHz			-4.6	NCTA
16		.0	17.7		NCTA
9		20.7	.0		NCTA
	223.25 MHz			18.7	NCTA
6		16.8	.0		NCTA
	937.25 MHz			–30.0	NCTA
33		.0	–9.0		NCTA
32		19.7	.0		NCTA
39		17.3	.0		NCTA

F98 with mixed channel numbers and frequencies with temperature probe and 7-digit Customer ID Number.

Tricorder III Firmware Version: 1.01 I.D. No.: 7221106

Date: 9/07/94 LO-PILOT: 16.7
Time: 14:15 HI-PILOT: 17.2
Record: 4 TILT: .5
Temp: 82°F

Channel	Frequency	Picture	Audio	Delta
2		16.7	1.2	15.5
3		18.4	4.5	13.9
4		19.5	5.7	13.8
5		20.9	4.7	16.2
6		20.6	4.5	16.1
95		20.8	4.9	15.9
96		19.6	5.1	14.5
97		18.9	4.9	14.0
14		15.0	3.8	12.2

F99 manual data logging printout with °F temperature probe and 7-digit Customer ID Number.

Tricorder III Firmware Version: 1.01

Date: 9/07/94 LO-PILOT: 16.7
Time: 13:30 HI-PILOT: 17.2
Record: 5 TILT: .5
Temp: 25°C

Channel	Frequency	Picture	Audio	Delta
2		16.7	1.2	15.5
3		18.4	4.5	13.9
4		19.5	5.7	13.8
5		20.9	4.7	16.2
6		20.6	4.5	16.1
95		20.8	4.9	15.9
96		19.6	5.1	14.5
97		18.9	4.9	14.0
14		15.0	3.8	12.2

F97 automatic data logging printout with °C temperature probe.

Tricorder III Firmware Version: 1.01 I.D. No.: 0000000

Date: 9/07/96 LO-PILOT: 12.3
Time: 11:19 HI-PILOT: 8.8
Record: 2 TILT: -3.5
Plan: L1

	Level	Record #	Channel(s)
Visual Carrier with Highest Level	15.9	2	3
Visual Carrier with Lowest Level	.9	2	24
Hiighest Visual/Aural Ratio	25.0	2	6
Lowest Visual/Aural Ratio	.4	2	4

FCC EVALUATOR

Introduction

Before you proceed, make sure that your unit has the FCC Evaluator option installed. See page 19 for the verification procedure.

With the FCC Evaluator feature enabled, your Tricorder can:

- Perform all FCC level tests automatically.
- Evaluate test data and indicate status with a PASS or FAIL.
- Display any channel which falls outside of FCC limits.
- Store the full test record for downloading to a PC or a Printer.

Trilithic added this feature to the Tricorder to help you maintain the signal level tolerances as mandated by the FCC. These include:

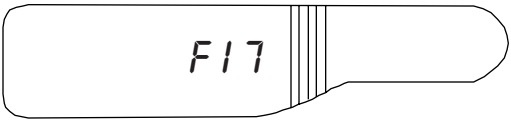
- Minimum signal level allowed is + 3dBmV.
- Sound carrier must be in the range of 10dB to 17db below the video carrier for a specific channel.
- Video carriers of adjacent channels must be within 3dB of each other.
- The worst case video to video difference is 10dB for systems of 300MHz with 1dB additional for each 100MHz thereafter.

NOTE: The Tricorder comes set up with the above factory defaults. If you need to change the default settings, use **TriSetup** to change to other performance standards.

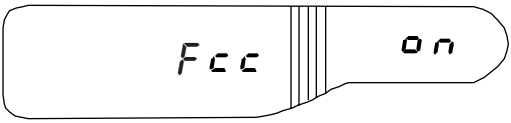
Procedure

Before you start the FCC EVALUATOR Mode, make sure that you are using a Learned Channel Plan so that you are evaluating ONLY the channels in your system. Otherwise, the Tricorder will note all of the unused channels as failures.

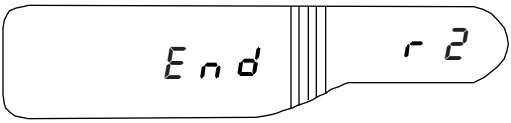
To enter the FCC EVALUATOR Mode, PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to **F17**. PRESS/RELEASE the knob.



ROTATE the Spin Knob until the display shows FCC ON. PRESS/RELEASE **FUNC**.



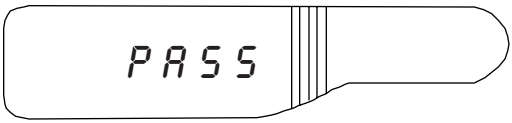
Use **F99** to scan through all the channels; checking for the FCC limits noted above. First, the Tricorder scans the Learned Channel Plan channels. The unit will continue until data has been collected from all channels. When the scan is completed, the unit *beeps* and displays “End” and the record number (1 – 24).



Once the scan is complete, PRESS/RELEASE **MEM**. The data is stored and the unit advances the record counter to the next record. If you prefer, you can PRESS/RELEASE **FUNC** to abort the scan without saving.

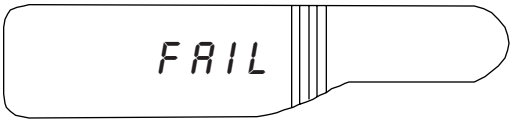
The unit now displays the Customer ID (see *CUSTOMER ID NUMBER* page 82). PRESS/RELEASE **MEM**. The data log is now stored in the unit’s memory.

The Tricorder now checks to see if the scanned channels are in accord with the FCC limits. If all channels meet the FCC standard, the display shows:



If the display is “PASS”, PRESS/RELEASE **FUNC** to return to normal SLM Mode. The data remains stored so that it can be examined later.

If one or more channels do NOT meet the FCC limits, the display shows:

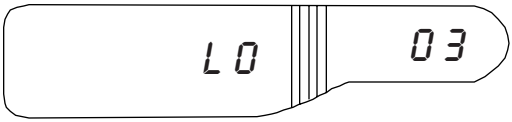


If the display is “FAIL”, you may decide to exit **F17** in order to troubleshoot your system. PRESS/RELEASE **FUNC** to return to normal SLM Mode.

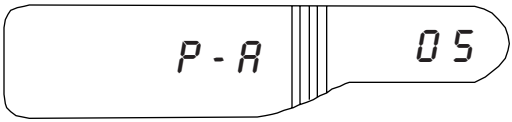
You may also choose to remain in **F17** in order to determine the nature of the failure. To continue, ROTATE the Spin Knob. The unit will go to the first error and display the channel and type of error in the display.

> **NOTE:** You can rotate the Spin Knob either forward or backward.

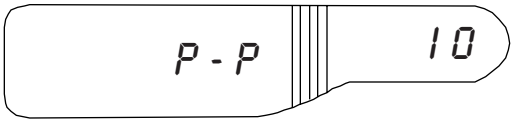
L O indicates that Channel 3 is below the FCC’s minimum level limit of + 3dBmV.



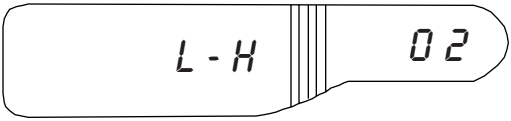
P - A indicates that Channel 5’s video/audio difference is outside the limits of 17dB maximum and 10dB minimum.



P - P indicates that Channel 10’s video carrier varies more than 3dB from the lower, adjacent channel.



L - H indicates that Channel 2 is greater than the maximum low to high difference allowed (10dB to 300MHz and 1dB extra for each additional 100MHz).



To continue, just keep rotating the Spin Knob.

> **NOTE:** The unit will display all of the channels containing one type of error before moving to the next type. For example, Channel 3 and Channel 6 are below the FCC's minimum level limit. Channel 4's video/audio difference is outside the FCC limit.
>
> The unit will display the Channel 3 and Channel 6 errors. Then it will display the Channel 4 error.

Once you have finished examining the errors, PRESS/RELEASE **FUNC** to return to normal SLM Mode.

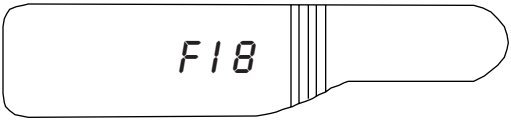
If you do not wish to keep the "FAILED" record, you can write over the record the next time you use **F99**.

> **NOTE:** All of the limits can be changed by editing variables in the Tricorder's memory using **TriSetup**.
>
> **REMINDER: F17** remains ON even after you return to SLM Mode. Thus, if you wish to keep your Tricorder set to the FCC EVALUATOR Mode, you do NOT need to do anything.
>
> If you need to turn the FCC EVALUATOR Mode OFF, simply enter **F17** and select the **FCC OFF** display.

Record Examination

You can use **F18** to go back later to review records (i.e. at the end of the day).

Make sure that **F17** is ON. Then, PRESS/RELEASE **FUNC**. ROTATE the Spin Knob to F18.



ROTATE the Spin Knob to the desired record. PRESS the Spin Knob to begin examination to that record.

If you used the FCC data logging method, the **F94** function will contain an additional page which lists the results of all four of the FCC tests. See the samples below and on page 102.

Tricorder III Firmware Version: 1.01 I.D. No.: 7221106

Date: 9/07/94
Time: 14:15
Record: 4
Temp: 82°F

LO-PILOT: 16.7
HI-PILOT: 17.2
TILT: .5

Channel	Frequency	Picture	Audio	Delta
2		12.5	1.9	10.6
3		15.9	–1.9	17.8
4		3.1	2.7	.4
5		4.8	2.2	2.6
6		14.4	–10.6	25.0
98		4.2	– .4	4.6
99		12.6	–11.0	23.6
14		11.1	– .7	11.8
15		11.4	–3.6	15.0
16		12.1	–3.7	15.8
17		6.0	–1.3	7.3
18		14.0	–10.0	24.0
19		5.6	–1.0	6.6
20		12.4	–6.9	19.3
21		11.1	–2.0	13.1
22		10.1	–3.4	13.5
7		11.0	–5.0	16.0
8		4.4	–4.3	8.7
9		11.3	–11.9	23.2
10		6.6	–3.5	10.1
11		10.7	–8.1	18.8
12		11.1	–2.9	14.0
13		8.0	–3.0	11.0
23		11.3	–6.2	17.5
24		.9	–3.0	3.9
25		10.7	–11.5	22.2
26		8.4	–2.2	10.6
27		9.6	–4.3	13.9
28		11.6	–1.9	13.5
29		7.8	–1.1	8.9
30		12.5	–6.2	18.7

SAMPLE DATA RECORD PRINTOUT WITH FCC RESULTS

Tricorder III Firmware Version: 3.00 I.D. No.: 0000000

Date: 9/08/95 LO-PILOT: 12.3
Time: 11:15 HI-PILOT: 8.8
Record: 2 TILT: –3.5
Plan: L1

	Level	Record #	Channel(s)
Visual Carrier With Highest Level	15.9	2	3
Visual Carrier With Lowest Level	.9	2	24
Highest Visual/Aural Ratio	25.0	2	6
Lowest Visual/Aural Ratio	.4	2	4
Greatest Adjacent Visual Carrier Delta	12.8	2	4
Greatest Max./Min. Visual Carrier Delta	15.0	2	3 24

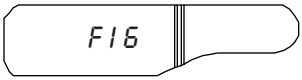
76.605 (a) (3) Channel Visual Carrier Level < 0.0dBmV
NO FAILURES

76.605 (a) (4) (i) Lower Adjacent Channel Visual Carrier Level > ± 3.0dB
3, 4, 6, 99, 17, 18, 19, 20, 8, 9, 10, 11, 13, 23, 24, 25, 29, 30

76.605 (a) (4) (ii) System Visual Carrier Level Variation > 10.0dB Below Max.
4, 5, 98, 19, 8, 24

76.605 (a) (5) Channel Aural Carrier Level < –17.0dB or > –10.0dB
3, 4, 5, 6, 98, 99, 17, 18, 19, 20, 8, 9, 11, 23, 24, 25, 29, 30

SAMPLE DATA RECORD PRINTOUT WITH FCC RESULTS (Continued)



DROP EVALUATOR

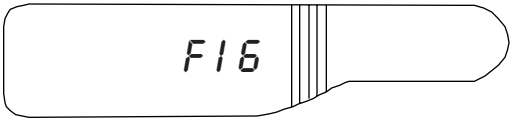
Introduction

You can use the Drop Evaluator option to scan the user memories. This enables you to compare each memory to a minimum and maximum limit which is unique to each memory.

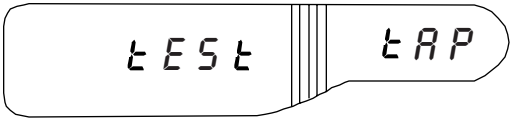
There are three sets of limits which may be selected via **F16** which gives a total of 30 entries in the limit table. These three sets of limits are stored in the EEPROM and are assigned a default value of –30.0dBmV minimum and +60.0dBmV maximum. Use your PC and **TriSetup** software to adjust these values.

Operation

To access the Drop Evaluator option to select the desired set of limits for a scan, PRESS/RELEASE the **FUNC** button. ROTATE the Spin Knob until **F16** appears in the display window.



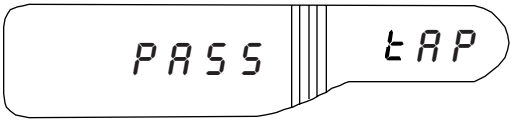
PRESS/RELEASE the Spin Knob to select **F16**. The LEFT LCD displays “tESt” while the RIGHT LCD displays the selected set of limits which are currently selected.



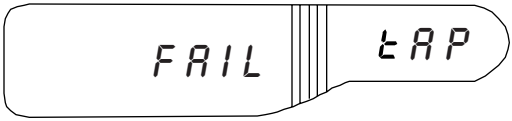
The designations for the set of limits are “tAP”, “bloc” and “SEt”. ROTATE the Spin Knob to cycle through the three set designations.

To use the Drop Evaluator, set the Tricorder to MEMORY Mode (see page 61). PRESS/RELEASE the Spin Knob to scan the user memories using the currently selected set of limits.

During the scan, the LEFT LCD displays “tESt” and the RIGHT LCD displays the currently selected limits. When the scan is finished, the LEFT LCD changes to show either “PASS” or “FAIL”. The RIGHT LCD still displays the limit set.



or



The display remains until the Spin Knob is pressed to start another scan. You can check each level individually by rotating the Spin Knob. Once you have checked the desired levels, exit MEMORY Mode. At this time, the display returns to normal Tricorder display for the selected operating mode.

17

AUTOMATIC LEVEL COMPENSATION

Introduction

This feature enables your Tricorder to automatically compensate for non-NTSC signals such as QAM, QPSK, and QPR on a channel-by-channel basis. Programmable compensations are provided which enable you to assign user-defined compensations to the level readout for any channel included in L1 or L2 Learned Channel Plans and to any of the channels stored in the 10 user memories.

You can set the compensations in 0.1 dB increments to a maximum of 10 dB. This feature is active in all tuning and operating modes.

Entering/Modifying Compensations

You will need to enter or modify the compensations via Trilithic's TRISETUP software.

> **NOTE:** When you generate a new learned channel plan (L1 or L2) using your Tricorder's internal functions, the compensations for all channels in that plan are set to zero. To set the compensations for the new plan, use TRISETUP.
>
> If you store a channel from the L1 or L2 channel plan in one of the 10 user memories, the compensations for that memory location is set equal to the L1/L2 compensation value for that channel. If you store a channel in one of the 10 user memories that is not in L1 or L2 channel plans or a frequency, the compensation value for that memory is set to zero.

Use TRISETUP to assign the desired compensation to any L1/L2 channel or user memory. The default compensation is always 0.0 dB.

TRISETUP contains the proper compensation values (such as QAM, QPSK and 9QPR). However, you can always replace any or all of the default values (up to 15) with ones of your own selection. Please call Trilithic (1-800-344-2412) or visit our website (www.trilithic.com) for current compensation values.

Using TRISETUP, you can program in the desired compensations when you first set up your learned channel plans or to any of the channels or frequencies stored in the 10 user memories. You can also use TRISETUP to read in your current L1/L2 and memory settings so that you can add compensations to the desired channels.

HOT TIP

The automatic level compensation feature is also useful for compensating almost any type of modulation or for matching your Tricorder's readings with your favorite piece of test equipment. All you need to do, is take a reading with the reference equipment, take a second reading with the Tricorder, figure the difference between the two and then, using TRISETUP, program that compensation into the Tricorder.

For more information on this procedure, refer to the *Trisetup Operation Manual*.

18

APPENDIX

Introduction

This Appendix contains the SUMMARY OF FUNCTIONS list and a brief TROUBLESHOOTING table.

SUMMARY OF FUNCTIONS

Func.	Description	
F1	Battery Check	Frequently Accessed Functions
F2	Set Leakage Squelch	
F3	Customer Calibration (Minor)	
F4	Channel Plan Selection	
F5	Disable Auto Power-Down	
F6	Power-Up in Leak/Power-Down Mode	
F15	Rapid Charge Battery	
F16	Drop Evaluator	
F17	FCC Evaluator	
F18	Examine Data Log Record	
F20	Set Leakage Frequency	Seldom Accessed Functions
F21	Erase Memories (1 – 10)	
F22	Set the Low Scan Limit	
F23	Set the High Scan Limit	
F24	Set the Maximum Scan Frequency	
F25	Learned Channel Plan L1	
F26	Learned Channel Plan L2	
F27	Select °C or °F Temperature Printout	
F28	Software Version #	
F30	Set Noise Offset	
F31	Set Noise Correction Bandwidth	
F43	Set RS-232 Baud Rate	Locked Out Functions
F44	Set RS-232 Remote Address	
F45	Set 24-hour Clock	
F46	Set Month/Day	
F47	Set Year	
F48	Clone a Slave	
F59	Unlock Functions	
F91	Reset Data Log Record Counter to 1	Data Logging Functions
F92	Display External Probe Temperature	
F93	Remote Mode	
F94	Print (RS-232) a Selected Data Log Record	
F95	Print (RS-232) All Data Log Records	
F96	Auto Data Log the 10-User Memories	
F97	Auto Data Log Current Channel Plan	
F98	Manual Data Log the 10-User Memories	
F99	Manual Data Log Current Channel Plan	

SIMPLIFIED TROUBLESHOOTING

The following chart lists several problems which may occur when you use your Tricorder.

PROBLEM/CAUSE	SOLUTION
Tricorder emits 3 beeps at power up. This means that your meter is not calibrated properly.	Return to Trilithic for recalibration.
Tricorder will NOT enter F94 or F95. It may be that there is no data stored in the Tricorder.	Review the procedure for logging data into the data memories.
Printer does NOT print or prints gibberish. Printer not on-line.	Press printer's **ON LINE** button.
Printer not set for hardware handshake.	Check printer settings.
Cable between meter and printer not wired correctly.	Use Trilithic's RS-232C cable or check the cable for correct pin-outs.
Printer data protocols not set up correctly.	Verify protocol settings. Also check that printer's emulation is for "IBM".
Printer and meter have different baud rates.	Set Tricorder and printer to same baud rate.
Can't connect RS-232C cable to PC. Incompatible connectors.	Use 25-pin to 9-pin connector.

SIMPLIFIED TROUBLESHOOTING
(Continued)

PROBLEM/CAUSE	SOLUTION
Meter and PC do NOT communicate. Cable between meter and PC not wired correctly.	Use Trilithic's RS-232C cable or check the cable for correct pin-outs.
PC and meter have different baud rates.	Set Tricorder and PC to same baud rate.
Some or all records scrambled during upload. Data transmission rate problem.	Try different baud rate.
Printer not set for hardware handshake.	Check printer settings.

TRILITHIC

The Best Thing on Cable

9202 E. 33rd St.
Indianapolis, IN 46236
(317) 895-3600

P/N 0010166000 3/98 Made in U.S.A.