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ASTi Hand-Held Terminal Operator Interface Guide for T4 ACE

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Product Name: Hand-Held Terminal

Description: Operator Interface Guide with T4 ACE

ASTi Hand-Held Terminal Operator Interface Guide with T4 ACE

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ASTi

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1.0. Introduction

The ASTi Hand Held Terminal (HHT) system provides a highly flexible user interface for controlling and monitoring ASTi simulated radios and intercoms.

A typical system consists of an ASTi Telestra 4 Target chassis equipped with a number of ACENet audio distribution devices such as ACE-RIUs or ACUs, and a number of HHTs. Each ACE-RIU can support two HHTs and each ACU can support up to six HHTs. One HHT is required per operator; the maximum basic system configuration supports 16 operators.

ASTi offers a pre-configured product called Synapse Workstation that bundles a Telestra 4 Target with pre-configured HHT-based software models, ACE-RIU audio distribution modules and HHTs. Contact ASTi and ask about Synapse Workstation to find out more about turnkey systems.

This manual focuses on HHT operation. Refer to the Telestra 4 documentation (available at <http://www.asti-usa.com/support/document/index.html>) for complete instructions about system hardware installation and ACE Studio software configuration tools. For model configuration, see ASTi Application Note 83: Creating a Model for HHTs using ACE Studio Helpers (available at <http://www.asti-usa.com/support/appnotes/index.html>).

2.0. Hardware Overview and Setup

Use Figure 1 on the following page as a reference to view the main physical components of the system, which consist of a Telestra 4 Target chassis equipped with a number of ACENet devices with power supplies, and a number of Hand Held Terminal units complete with cables. The numbers supplied for the various units will vary according to the user requirement. In order to complete the system, cables to interconnect the ACENet devices, and operator headsets will be required. These may be user-supplied or purchased from ASTi.

The ACENet devices are connected to the ACENet network through an ASTi Approved ACENet Ethernet switch.

Each ACENet device is powered by a small switching power supply. Note that the system will continue to function with one or more ACENet device powered down, as long as all data cables remain connected.

The HHT units connect to the serial port connections on the ACENet devices. For ACE-RIU #1, operator 1 headset connects to **channel A** and the HHT connects to **serial port A**. The operator 2 headset connects to **channel C** and the HHT connects to **serial port B**. Note: HHTs do not connect to channels B and D on the ACE-RIU.

For ACUs, the front panel audio connections map directly with the serial ports on the rear panel. For example, Operator 1 headset connects to channel A and the HHT connects to serial port A. Operator 2 headset connects to channel B and the HHT connects to serial port B, and so on for subsequent ACUs.

Analog audio signals are kept to a minimum within this architecture, since all information is converted from digital to analog by the ACENet devices. The only analog signals are those between the ACENet devices and the operator headsets.

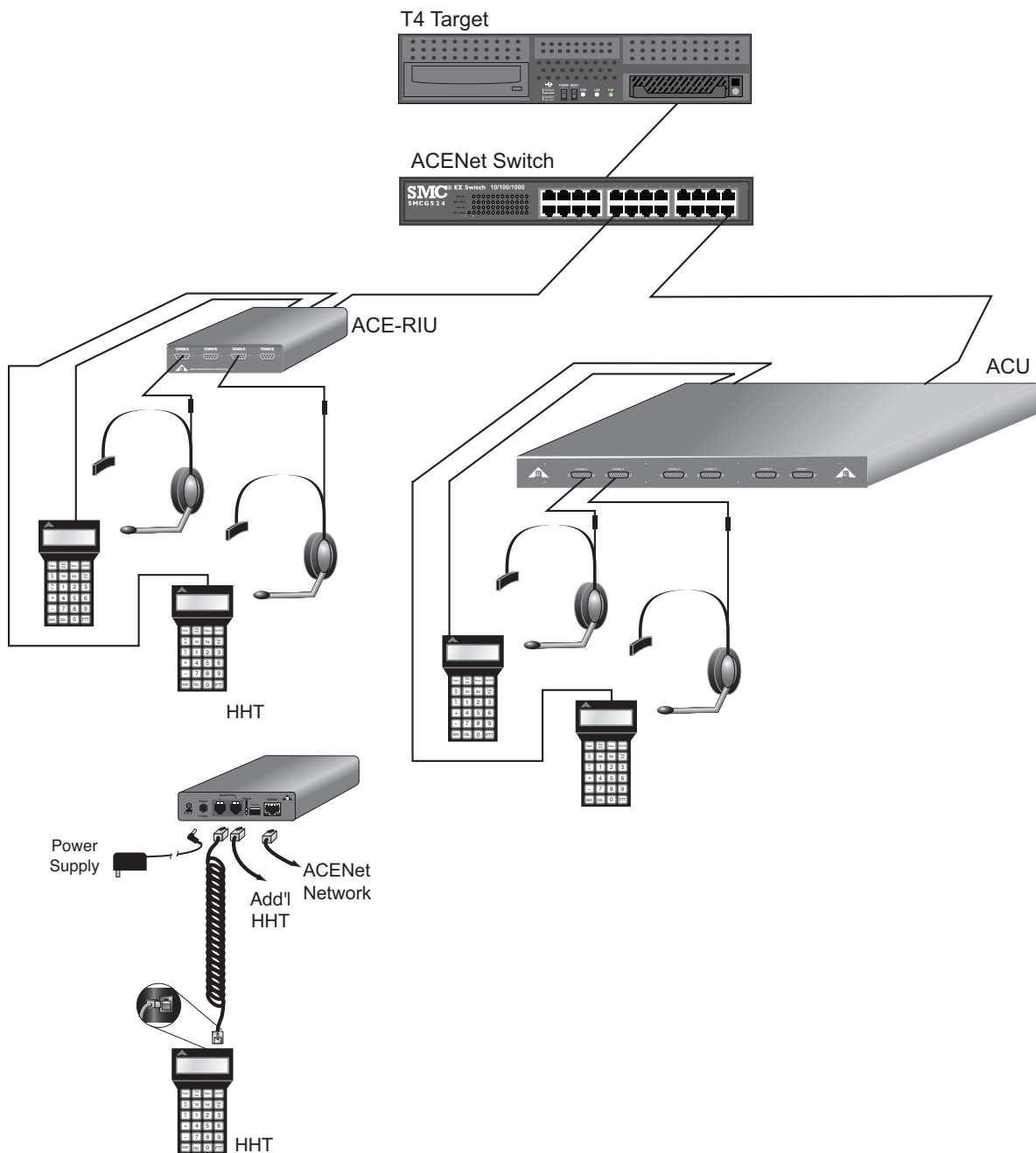


Figure 1: Typical Hardware Configuration

Example serial port and channel set up connections:

ACE-RIU1: Serial Port A = HHT#1, Chan. A = Operator 1 audio in/out
Serial Port B = HHT#2, Chan. C = Operator 2 audio in/out

ACE-RUI2: Serial Port A = HHT#3, Chan. A = Operator 3 audio in/out
Serial Port B = HHT#4, Chan. C = Operator 4 audio in/out

...

ACE-RUI8: Serial Port A = HHT#15, Chan. A = Operator 15 audio in/out
Serial Port B = HHT#16, Chan. C = Operator 16 audio in/out

ACU1: Serial Port A = HHT#1, Channel A = Operator 1 audio in/out
Serial Port B = HHT#2, Channel B = Operator 2 audio in/out

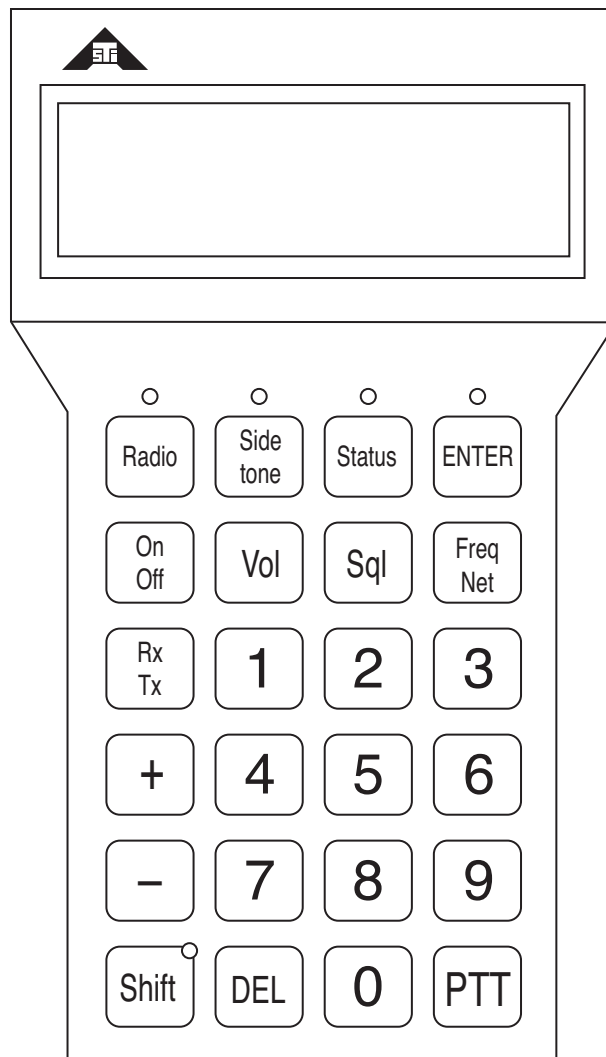


Figure 2: Hand Held Terminal

3.0. Operating Concepts

This guide applies to the following ASTi equipment: Telestra 4 Target systems with ACE Studio software, ACENet audio distribution devices (such as ACUs or ACE-RIUs) with Hand-Held Terminals.

The Virtual Radio Environment

The Hand-Held Terminal (HHT) provides operator interface to the virtual radio environment communications model. The HHT's functionality and the virtual radio environment simulation are resident local to the system.

The virtual radio environment and HHT functionality are capable of supporting up to 16 operators and 16 radios.

Each operator uses the HHTs to connect to all 16 radios, or a selected subset of radios. This allows modeling of real world situations where more than one operator has access to the same radio(s). HHTs are pre-configured using the ACE Studio software utility. The HHT pre-configuration defines the specific radios that an operator can select for receive and transmit access. Details for use of this tool can be found in the ACE Studio User Guide (DOC-01-TELAS-UG-4) for general guidance and the Synapse Workstation Operator Manual (DOC-01-SYN4W-OM-1) for specific guidance for an HHT pre configured system.

The concept of a radio in the virtual environment is analogous to a real radio transceiver. An operator may select frequency or net number, squelch, and secure mode operation for any radio to which he has access. If a radio is shared by separate operators, changes made to the simulated radio by one operator will be reflected on both his own, and the other operators' displays. When more than one operator transmits on the same radio simultaneously, each will hear the other's transmission, just as in the real world.

Each operator may individually set the volume of each radio to which he has access. Additionally, each operator can individually select receive, receive/transmit, or neither for each radio. In the virtual environment, radio transceivers are always ON unless the radio frequency is set to zero. Operator Rx and Rx/Tx selection simply routes the audio to and from the appropriate radio.

The ASTi radio environment simulates many of the real-world features of a radio such as power and range calculations, over-the-horizon effects on signal, etc. In the event that the user is experiencing difficulty with reception, he is advised to check the quality of reception in the simulated environment before concluding that there are DIS network or other equipment problems.

Operating System Basics

This section provides an overall concept of how the system works.

The Hand-Held Terminal operator interface is a generic, all-purpose interface to simulate the radio, yet its operation is identical to that of a high-fidelity, simulated radio panel.

The only “brains” that the HHT contains is an interface unit (in place of the radio’s front panel) which bundles the keypad input information, and updates the panel displays based on the information received from the state machine / HHT driver software running on the Target.

The ACE Target software processes the HHT key inputs. In addition to receiving and sending information to/from the HHT, the software also passes information into the radio modeling environment.

The radio modeling environment is part of the ACE software running on the Target. The radio models are all-purpose, reconfigurable communications simulations. Control parameters--such as volume, squelch, frequency, etc.--can be set from several different sources (different HHTs, model configuration or helpers). The radio environment is all-purpose in that it is immaterial to the radio model as to the source of this information. The same radio model can interface to a multitude of panel simulation types without requiring a different radio model for each type of radio being simulated.

At model start-up, a configuration file passes information to the panel and radio model. These include parameters such as the default frequency, squelch and volume to be used for each radio, as well as the HHTs default display output. Each radio and operator station can be programmed with a different set of parameters.

Terminal Operating Concepts

When powered on or reset, the panel displays the Status Page. This page presents information relating to the overall radio environment. The top line of the display contains an identifier for the panel which can be assigned at startup. If an identifier is not assigned, the display will default to “Operator: 1” for the first panel with each following panel numbered sequentially.

The second line of the display contains a line of digits representing the radio number of the symbols directly beneath it in the Rx and Tx status lines. The default radio numbers start from one (1) and go to nine (9) for the first nine radios then zero (0) through six (6) for radios ten through sixteen. The radio numbers can also be set as letters in the identifier field in ACE Studio. This line also indicates radio activity. When the operator is receiving a signal, the digit corresponding to the transmitting radio number changes to an asterisk (*).

Along the bottom two lines of the display are the Rx and Tx status lines. Each radio controlled by the panel is represented by a symbol showing its current state. A radio selected for receive and transmit is represented by an R in the Rx status line and a T in the Tx line. A radio not selected is represented by a period (.). When in secure mode, the transmit and receive representations change to an S.

a	Operator: 1
b	1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
c	Rx: . R . . . R . . . S . . S . . .
d	Tx: T S . . .

a) Identifier, b) Radio Designation,
c) Receive Status, d) Transmit Status

Figure 3: HHT Display

The panel has two modes: Master and Operator. To toggle between the two modes, press “Shift” followed by “Status” on the terminal.

In Operator Mode each operator can modify the following parameters:




- Specific Radio Bus State and Volume
- Overall Volume and Sidetone Level
- Secure or non-secure radio operation

In Master Mode each operator can modify the following parameters:

- Frequency and Squelch of Radio Transceivers (Note: This will effect all the shared users of that radio.)
- Specific Radio Bus State and Volume
- Overall Volume and Sidetone Level
- Secure or non-secure radio operation

Note: It is possible, via ACE Studio, to prevent specific operators from accessing master mode, and to initialize specific operators in either mode.

The panel logic is designed so the entry is ignored if an operator uses a key that is not a logical part of the entry sequence.

To modify a value the operator can either enter the data numerically, or press  or  to ramp the value up or down, followed by  to indicate that the desired value is attained.

4.0. Keypad Operation

This Main Status Page mode employs a “hot key” concept to access the most frequently required functions:

To select a particular radio to Transmit and Receive, press the two-digit number (e.g., 01, 02, 15, etc.) of the radio from the Status Page. To turn off a Transmit/Receive radio, press **Shift** followed by the two-digit radio number.

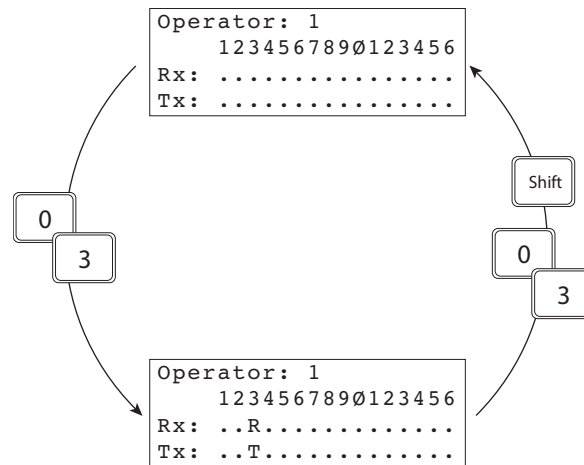


Figure 4: Hot Key Operation Rx/Tx

Note: Use of the hot key method for selection of transmit status selects only a single radio for transmission at any one time. Using the method described in the “Operator Mode Controls” section below, an operator may select multiple radios for simultaneous transmission.

To select additional radios to be monitored in the Receive-Only mode, press **Shift** followed by the two-digit radio number. To turn off a Receive-Only radio, press **Shift** followed by the two-digit radio number again.

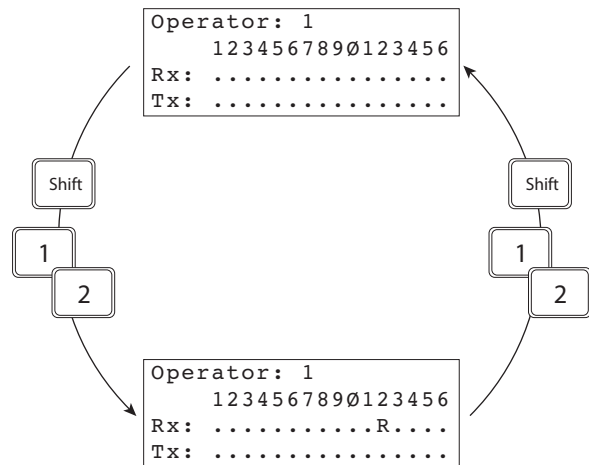


Figure 5: Hot Key Operation Rx-only

To toggle the “Secure/Non-Secure” mode of a particular radio, press **Shift** then **On/Off** then the two-digit radio number.

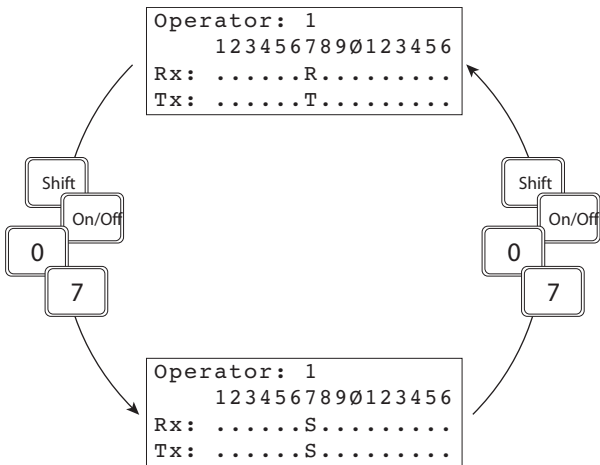
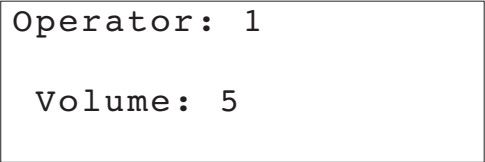


Figure 6: Hot Key Operation Secure On/Off

Operator Mode Controls

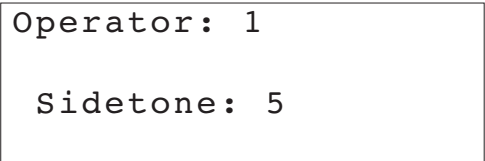
In Operator mode, the operator can set his overall volume level. From the main Status screen, press **Vol** then either press the numeric key 0-9 for the desired volume, or ramp up or down using **+** and **-** followed by **ENTER**.



```
Operator: 1  
  
Volume: 5
```

Figure 7: Operator Volume Page

The operator can also adjust his sidetone. From the main Status screen, press **Side tone** then either press the numeric key 0-9 for the desired sidetone, or ramp up or down using **+** and **+** followed by **ENTER**.



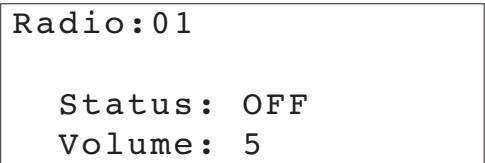
```
Operator: 1  
  
Sidetone: 5
```

Figure 8: Operator Sidetone Page

The operator can also select a particular radio for transmission and any series of radios for passive monitoring. This can be accomplished most simply by use of the “hot keys” as described earlier.


An alternative method is to use **Radio**, **Rx Tx** and **On Off** keys while in the Radio Status page.


Pressing **Radio** will bring up the Radio Status page. The radio displayed will default to the last radio selected by a hot key sequence or the first radio if a hot key sequence has not been used.





```
Radio: 01  
  
Status: OFF  
Volume: 5
```

Figure 9: Radio Status Page (Operator Mode)

Pressing  from this screen will toggle the mode of that radio (shown in the “Status” field) between OFF (silent) and RX.

Pressing  will toggle the mode of that radio between RX and RX_TX.

Also from the Radio Status Page, the radio may be toggled between Secure/Non-Secure modes by pressing  followed by .

Operator Mode Controls (Overview)

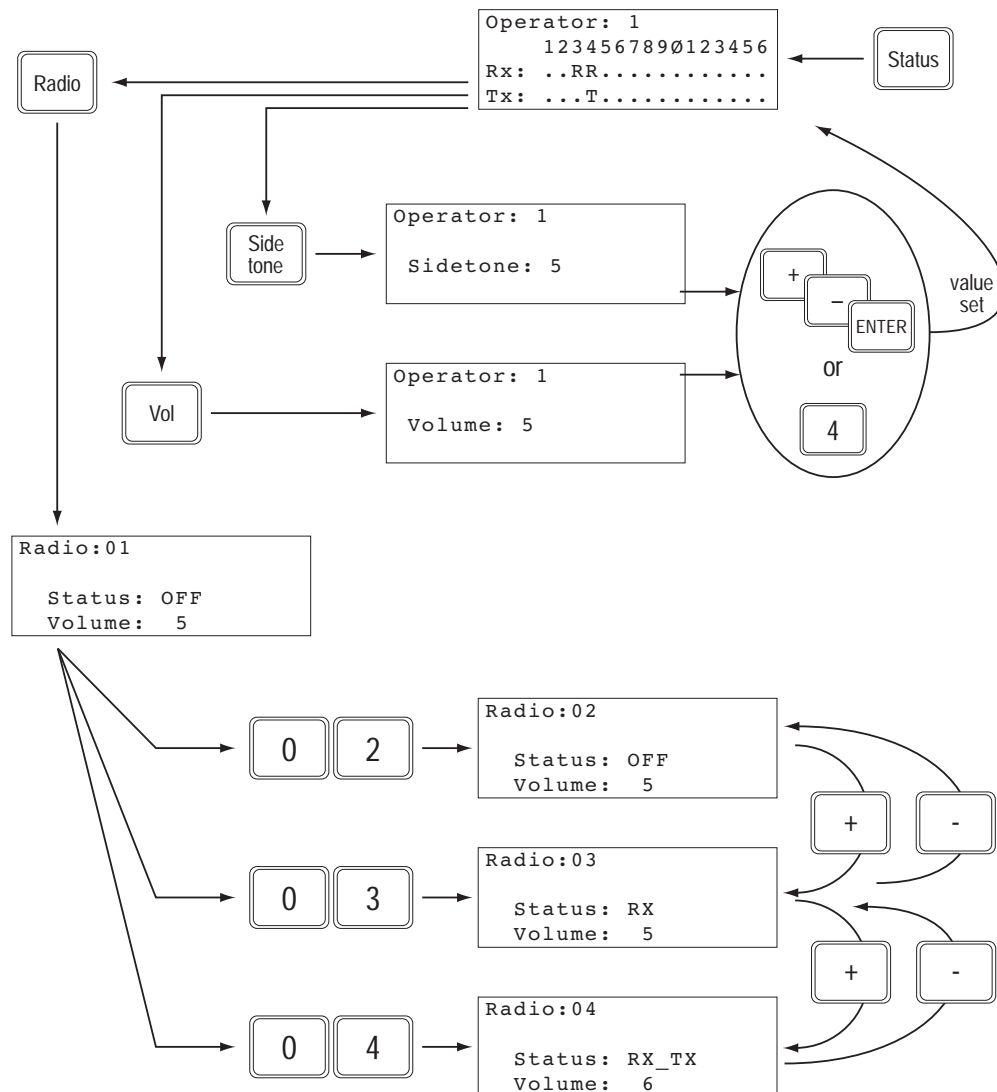
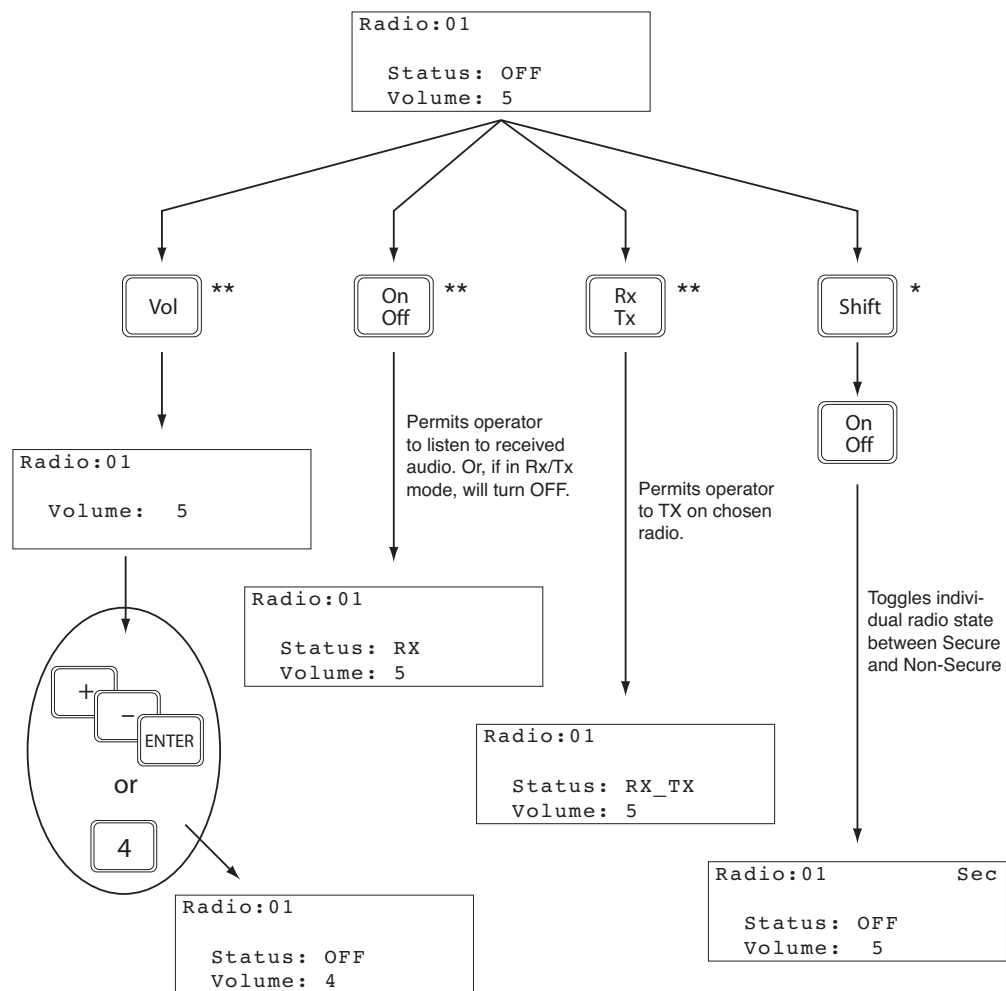


Figure 10: Operator Mode Operation (Main Status Page)



* This control affects operation of the simulated radio.


** This control affects how individual operator audio is routed (and its level) to/from a simulated radio.

Figure 11: Operator Mode Operation (Radio Status Page)

Master Mode Controls

To enter Master mode, press **Shift** then **Status** from the Main Status Page. The display shows “Master” at the top of the screen beside the panel identifier.

Master Mode
Indicator



```

Operator: 1 Master
          1234567890123456
Rx: .....
Tx: .....
  
```

Figure 12: Main Status Page Displaying Master Mode

When in Master mode, the operator may review or change the frequency and the squelch value of the various radios connected to their Hand Held Terminal unit. This is accomplished by pressing **Radio** followed by a numeric key sequence 01 through 16 to represent the radio head to be modified.

```

Radio:01
Freq: 101000000
Stat: Rx      Net:---
Volume:5     Sql:5
  
```

Figure 13: Radio Status Page (Master Mode)

To modify that radio’s frequency, press **Freq Net**. Enter the desired frequency in Hz using the 0-9 keys and press **ENTER**. To return to the Main Status page, press **Status**.

```

Radio:01
Freq: 101000000
Enter Freq or Net
Freq/Net:      0
  
```

Figure 14: Changing Frequency or Net (Master Mode)

Users may select a predefined Net instead of entering the frequency. Net numbers begin at one (1) and can be as high as 999, depending on the system configuration. A radio may be limited to selecting “nets only” via initialization file commands. In this case, the user will be prompted to enter a net number only. To enter a Net, enter the Net number (1-999) and press **ENTER**.

In Master mode, the operator may also adjust the Receive and Transmit status of the various radios, their “Secure/Non-Secure” modes, as well as the overall Volume and Sidetone. These procedures are the same as described in the “Operator Mode Controls.”

Master Mode Controls (Overview)

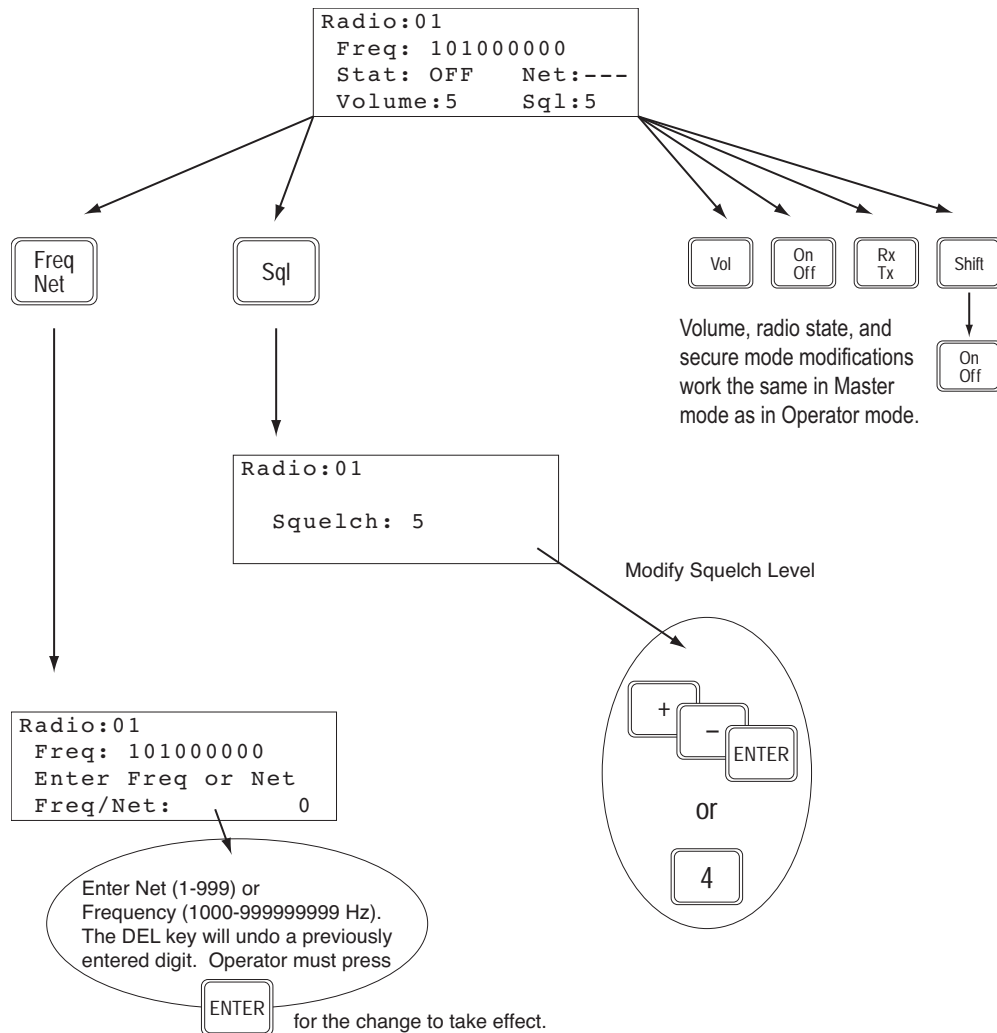


Figure 15: Master Mode Operation (Radio Status Page Level)