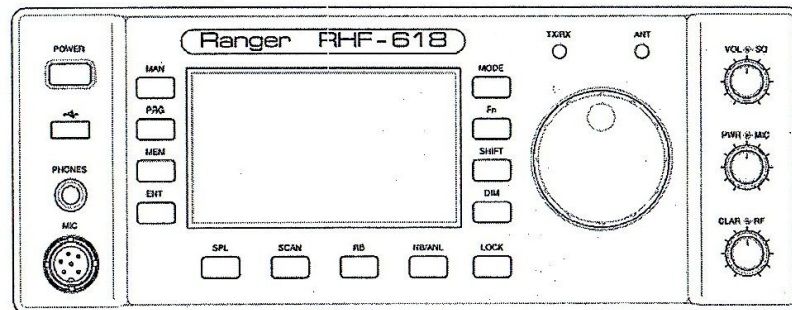


RANGER
Communications, Inc.

RHF-618

**AM/FM/SSB/CW Dual Band
Amateur Base Transceiver
With TFT Touch Screen and USB**



User's Manual

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Chapter 1 Specifications

GENERAL

Model	RHF-618
Frequency Range: 12 meter	24.8900 ~24.9900 MHz
: 10 meter	28.0000 ~29.6999 MHz
Tuning Steps	100 Hz, 1 KHz, 10 KHz, 100 KHz, 1 MHz
Emission	USB, LSB, CW, AM, FM
Frequency Control	Phase-Lock-Loop Synthesizer
Frequency Tolerance	0.005%
Frequency Stability	0.001%
Operating Temperature Range	-20°C to +50°C
Antenna Impedance	50 ohm
Microphone	Plug-In (6-Pin), 400 Ω Dynamic PTT
Meter Function	RF Output, RX Receive Signal Strength, SWR
Input Voltage	13.8 V DC
Dimensions	285 (W) x 335 (D) x 110 (H) mm
Weight	5.6 Kgs

TRANSMITTER

RF Power Output	25W : USB/LSB Peak Power 10W : CW/AM/FM
RF Transmit Modes	USB, LSB, CW, AM, FM
Antenna Connector	UHF Type, 50 Ω
Modulation	16F3, A3E, J3E, A1A
Spurious Emissions	-50 dB
Carrier Suppression	-50 dB

RECEIVER

Sensitivity	AM/CW : 0.5 μV for 10dB Sinad FM : 0.25 μV for 12dB Sinad USB/LSB : 0.15 μV for 10dB Sinad
Image Rejection Ratio	> 50 dB
Audio Power Output	2.5W

(SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE)

Chapter 2 Introduction

Congratulations on your purchase of an RHF-618 10 and 12 meter dual band amateur radio. Your RHF-618 is designed to provide trouble-free service and state-of-the-art communications, incorporating many useful features and functions in the 10 and 12 meter dual band radio. Please read this manual thoroughly to ensure proper performance.

IMPORTANT

*To operate this radio, you must possess an amateur radio operator's license issued by the FCC. Operation of this unit without proper licensing is **ILLEGAL** and can result in severe penalties.*

NOTE

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate this equipment.

Unpacking

The following items are included with our RHF-618. Carefully remove and examine all materials from the packing carton. If any items are missing or appear damaged, please contact your dealer immediately. Each unit should include:

- (1) RHF-618 Transceiver
- (2) Dynamic Microphone with remote frequency adjustment switches
- (3) Power Cord
- (4) Mounting Bracket & Hardware
- (5) Installation Hardware
- (6) Owner's Manual
- (7) Warranty Registration Card

It is recommended that you save the packing materials for future storage or shipping.

Chapter 3 Installation

The RHF-618 is easy to install. All necessary parts (less the antenna and coax cable) have been included to facilitate installation.

Transceiver Mounting

Choose a suitable location for the transceiver that will allow easy access to the front panel as well as proper air circulation to the back of the unit. If you are installing the unit in a vehicle, attach the mounting bracket first, and then attach the transceiver to the mounting bracket using the hardware provided. Before making any electrical connection, ensure that the transceiver is turned off and the vehicle's battery is disconnected.

Power Connection

The transceiver operates off of any 12 to 13.8 VDC source. Beware of voltage drops caused by operating from Cigarette Lighter Plugs or long DC wire runs. Sometimes it is best to connect direct to the battery for best RF output and TX audio quality

NOTE

The condition of a vehicle's electrical system can affect the operation of your RHF-618. A low battery, worn generator/ alternator, or poor voltage regulator will impair performance of the unit as well as the vehicle.

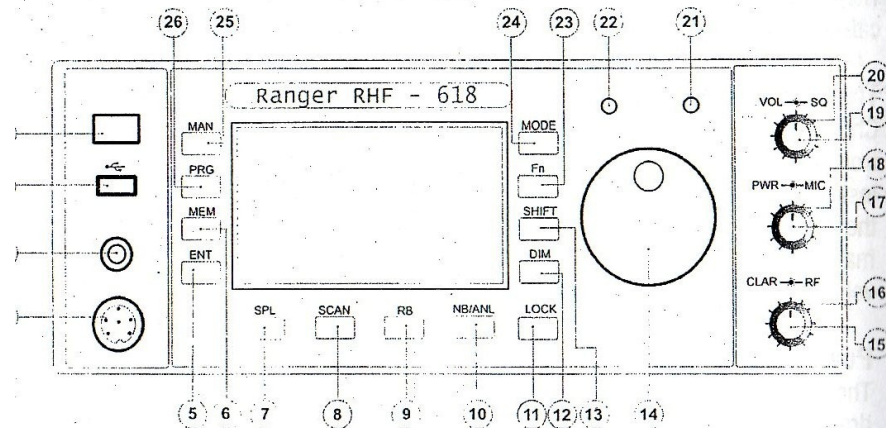
If an AC power supply is used with your radio, it must be regulated and rated for at least 2 Amps continuous for the RHF-618. Low voltage while under load will cause reduced receiver gain and low transmitter output with possible distortion and splatter.

CAUTION

Voltage above 15 VDC will damage the unit. Be sure to check the source voltage before connecting the power cord.

Chapter 4 Operation

Front Panel



1. **POWER ON SWITCH.**
2. **USB CONNECTOR.** To connect to a PC via USB-A type cable. (For details see Chapter Programming).
3. This jack accept a 32 Ohm external headphones.
4. Microphone connector with PTT and remote UP/DOWN switch.
5. **ENT BUTTON:** Used to accept changing and return unit to manual mode (see Programming)
6. **MEM BUTTON:** Used to program memory channels.
7. **SPL BUTTON:** Enables the offsetting of the transmitting frequency by up to 6 MHz for repeater operation.
8. **SCAN BUTTON:** Used to enable the scanning of frequencies. See the PROGRAMMING and SCANNING section of this manual for detailed information on using the scan control.

Operation (Continued)

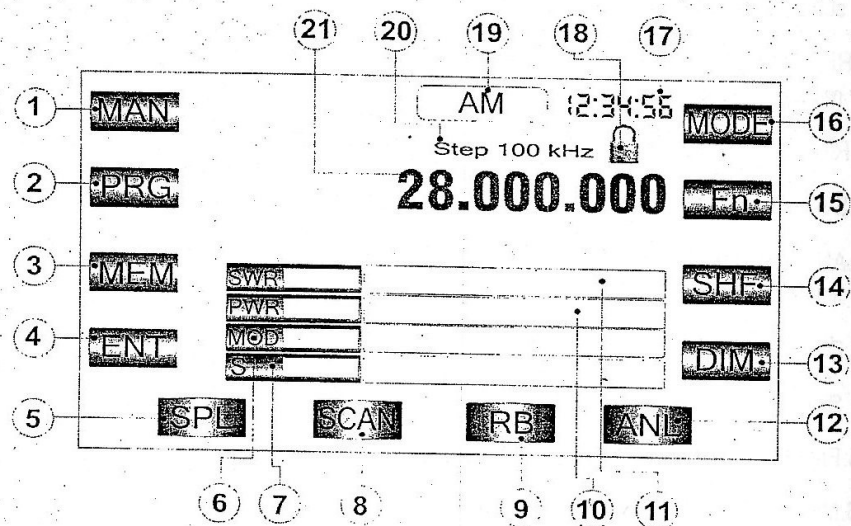
9. **RB BUTTON:** This switch activates the ROGER BEEP circuit, when its function is selected. When enabled, the radio automatically transmits an audio tone each time you release the PTT. This indicates the end of each transmission so that stations who may be having trouble receiving will know that you have finished transmitting. This feature is sometimes used in weak signal conditions or other special circumstances. We discourage use of this feature in normal operation, as it can be annoying to other operators.
10. **NB/ANL BUTTON:** The noise blanker (NB) is very effective in eliminating repetitive impulse noise such as ignition interference. In the ANL position, the AUTOMATIC NOISE LIMITER also limits noise at the receiver audio stages.
11. **LOCK BUTTON:** Disables the Frequency Selector Control, UP/DOWN buttons on the front control panel and remote UP/DOWN buttons on the microphone. Pressing this switch again will re-enable the frequency selectors.
12. **DIM BUTTON:** To changing screen and keyboard backlight brightness.
13. **SHIFT BUTTON:** Determines which step will change when changing frequencies. Allows frequency to be changed in 100 Hz, 1KHz, 10KHz, 12.5 kHz, 100KHz and 1 MHz increments.
14. **FREQUENCY SELECTOR:** It is also used to change some other parameters (see Programming).
15. **CLARIFIER CONTROL:** Allows variation of the receive frequency above and below the selected receive frequency as shown on the display. This control is intended primarily to tune in SSB signals when communicating with several stations that may not be exactly on frequency. It may also be used to optimize AM/FM signals as described in the operating procedure paragraph. The clarifier can adjust the receive frequency $\pm 2.5\text{KHz}$ but does not affect the transmit frequency or the frequency display.
16. **RF GAIN CONTROL:** This control is used to reduce the receiver's front end gain when receiving strong signals.

Operation (Continued)

17. **RF POWER CONTROL:** This control adjust the Transmitter's RF power output level.
18. **MIC GAIN CONTROL:** This feature adjust the microphone gain for the transmit and PA modes. Experiment with this control for the setting that will provide best audio quality. Avoid over-modulation, which causes interference to adjacent stations and "splatter".
19. **VOLUME CONTROL:** This knob controls the volume and power, rotate the knob clockwise. Turning the knob further will increase the volume of the receiver.
20. **SQUELCH CONTROL:** This control is used to control or eliminate receiver background noise in the absence of an incoming signal. For maximum receiver sensitivity, it is necessary that the control be adjusted only to the point where the receiver background noise is eliminated. Turn fully counterclockwise and then slowly clockwise until the receiver noise just disappears. Any signal to be received must now be slightly stronger than the average received noise. Further clockwise rotation will increase the threshold level that a signal must overcome in order to be heard. Only strong signals will be heard at a maximum clockwise squelch setting.
21. **SWR LED:** The indicator shows the dangerous rise in SWR level exceeded (SWR>3).
22. **TX/RX LED:** Red in TX mode. Green in RX Mode.
23. **Fn BUTTON:** For some programming functions (see Programming)
24. **MODE BUTTON:** This button allows you to select one of the following six operating modes: FM, AM, USB, LSB, CW and PA.
25. **MAN BUTTON:** Used to return the unit to manual mode.

Operation (Continued)

Software keys and control areas on the TFT screen



1. **MAN KEY.** Like MAN hardware button. This key looks semi-transparent in programming mode.
2. **PRG KEY.** Like PRG hardware button. This key looks semi-transparent in programming mode.
3. **MEM KEY.** Used to enter to memory channel mode. This key looks semi-transparent in frequency mode.
4. **ENT KEY.** Like ENT hardware button.
5. **SPL KEY.** Like SPL hardware button. This key looks semi-transparent when frequency offset is disabled.
6. **Modulation level bar.**
7. **S-meter bar.**

Operation (Continued)

8. SCAN KEY. Like SCAN hardware button. This key looks semi-transparent when scanning mode is not activated.
9. RB. Like RB hardware button. This key looks semi-transparent when roger beep mode is disabled.
10. RF POWER meter bar.
11. SWR meter bar.
12. ANL KEY. Like NB/ANL button. This key looks semi-transparent when any noise limiter is disabled.
13. DIM key. Like DIM hardware button.
14. SHF KEY. Like SHIFT hardware button.
15. Fn KEY. Like Fn hardware button.
16. MODE KEY. Like MODE hardware button.
17. CLOCK Area. Touch this area for display of calendar.
18. LOCK mode indicator.
19. Current RF mode indicator.
20. Current frequency step indicator.
21. Current RX/TX frequency.

Operation (Continued)

Frequency mode.

Use frequency selector and SHIFT button to set the desired receive frequency. Use MODE button for change current unit mode

Channel mode.

Press MEM button to set channel memory mode. Current channel number will appear on the screen. Use frequency selector to change current channel number. Attention. If no channel is not programmed, then enter to channel mode is impossible.

Scanning.

Press SCAN button for start scanning. Use the frequency selector to change the direction of the scanning. Press MAN or SCAN again to disable scanning.

Channel mode scanning

Unit scans all programmed channels in the channel mode

Frequency mode scanning.

You can set lower and upper edge frequencies for scanning. (See Chapter Programming). You can change step of scanning by pressing SHIFT button.

Split mode.

Press SPL button to enter TX frequency offset mode. Current frequency offset appears on the screen. Press SPL button again to disable frequency offset.

Roger Beep.

Press RB button to activate Roger Beep feature. Press RB again to disable Roger Beep.

Noise limiter and noise blanker.

Press NB/ANL button several times to select appropriate noise limiter mode.

Modes are selected in sequence OFF → ANL(noise limiter) → NB (noise blanker) → ANL+NB.

Operation (Continued)

Screen backlight.

Press DIM button several times to set appropriate backlight level.

Display profile switching.

Display has two profile of appearance. Every profile has own font color and background picture.

Press ENT button for changing current screen appearance.

You can choice background picture for current profile by pressing DIM button more 2 seconds.

Switch to CALENDAR mode.

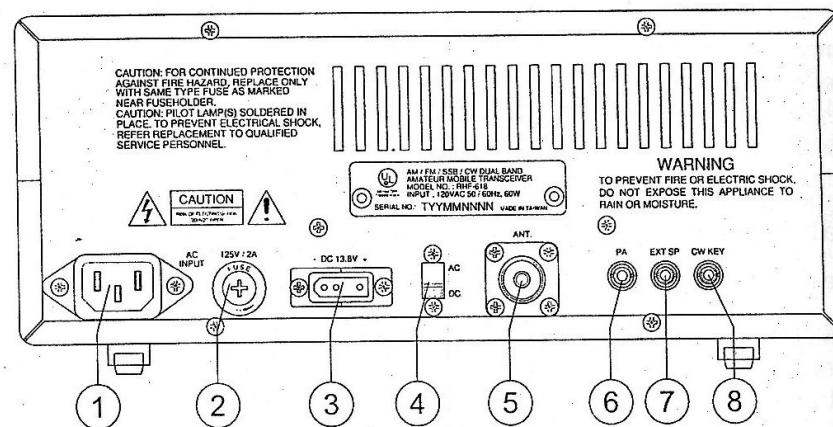
Touch to CLOCK area. You will see calendar. Touch to center of screen to return normal mode.

Lock buttons and frequency selector.

Press LOCK button. For return to normal state – press LOCK again.

Operation (Continued)

Rear Panel



1. **AC POWER CORD:** Connects to AC power outlet for AC main supply.
2. **FUSE:** Accommodates a fuse for AC input circuit protection. Use 125V/2A fuse for replacement.
3. **DC POWER:** This accepts a 13.8V DC power cable with built-in 4A fuse. The power cord provided with the radio has a black wire and a red wire. The black goes to negative and red goes to positive.
4. **AC/DC POWER SELECTOR :** This control is used to select a desired power supply of AC power or DC power.
5. **ANTENNA:** This jack accepts a 50 ohms coaxial cable with a PL-259 style plug.
6. **PA SP.:** This jack is for PA operation. Before operating, you must first connect a PA speaker (8 ohms, 4W) to this jack.
7. **EXT. SP:** This jack accepts 4 to 8 ohms, 4 watts external speaker. When the external speaker is connected to this jack, the built-in speaker will be disabled.
8. **CW KEY:** The CW key is used for Morse Code operation. To operate connect a CW key to this jack, and place the mode switch in the CW position.

Operation (Continued)

Microphone

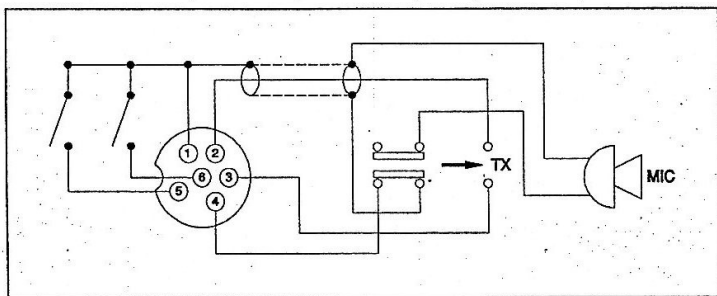
The receiver and transmitter are controlled by the push-to-talk switch on the microphone. Press the switch and the transmitter is activated, release switch to receive. When transmitting hold the microphone two inches from the mouth and speak clearly in a normal "voice". This transceiver comes complete with a low-impedance dynamic microphone.

For best results, the user should select a low-impedance dynamic type microphone or a transistorized microphone.

The microphone should provide the functions shown in schematic below.

6 WIRE MIC CABLE

<u>Pin Number</u>	<u>Mic Cable Lead</u>
1	Audio Shield
2	Audio Lead
3	Transmit Control
4	Receive Control
5	Up Control
6	Down Control



Transceiver Microphone Schematic Diagram

Operation (Continued)

Frequency Selection

Frequency selection in the RHF-618 can be accomplished using any one of the following three methods:

1. The first method of frequency selection uses the **SHF** (Shift) button and the **▲** (UP)/**▼** (DOWN) buttons located on the front panel. To accomplish this, press the **SHF** button until the display cursor on the frequency display is positioned under the frequency digit that is to be changed. Use the **▲** button to increase the number. Press the **▼** button to decrease the number. Perform the steps described above for each digit until the desired frequency is displayed in the **LCD** frequency display window.
2. The second method of frequency selection is performed using the **SHF** button and the **FREQUENCY** select knob located on the front panel. Use the **SHF** button in the manner described above to select the digit to be changed. Then rotate the **FREQUENCY** selector clockwise to increase the frequency and counterclockwise to decrease the frequency.
3. The third method of frequency selection is through the use of the **SHF** button and the remote **UP** and **DOWN** buttons located on the microphone. Frequency selection by this method is accomplished in the same manner as with the **▲** button and the **▼** button on the front panel keypad.

Sometimes when receiving more than one station on a fixed frequency such as on a "Net" or "round table" operation, it is convenient to be able to vary the receive frequency slightly without changing the transmit frequency. To do this, rotate the clarifier control while an off frequency station is transmitting. You can vary the receiver frequency by ± 1.5 KHz for clearest voice reception. The clarifier can be optionally modified to vary both Transmit and Receive frequencies together.

Mode Selection

To select an operating mode, rotate the **MODE** selector, and place it in the desired operating mode position.

Operation (Continued)

RF Power Control

This feature allows the adjustment of the RF output power continuously over the range of 1W through 25W.

Chapter 5 Programming

Memory functions.

Unit can store up to 99 frequencies in memory locations 1 – 99.

To program a frequency into memory, follow the procedure described below:

1. Set desired frequency by frequency selector.
2. Press PRG button
3. Press MEM button
4. Select empty memory location by frequency selector
5. Press ENT button.

Erase memory location.

1. Press PRG button
2. Press MEM button
3. Select desired location by frequency selector
4. Press MEM button for 2 seconds.
5. Press MAN to return to manual mode.

Erase all memory.

1. Press PRG button
2. Press MEM button
3. Press ENT button for 10 seconds.

Scan functions.

Lower and upper frequencies setting:

1. Press PRG button
2. Press SCAN button
3. Lower frequency SC0 and upper frequency SC1 appear on the screen
3. Change frequency SC0 by frequency selector (Use SHIFT if it is necessary.)
4. Press SCAN again for activate SC1.
5. Change frequency SC1 by frequency selector
6. Press ENT to return manual mode

Chapter 5 Programming (Continued)

Split functions.

To transmit frequency offset:

1. Press PRG button
2. Press SPL button
3. Tx offset appears on the screen.
4. Use frequency selector for offset setting (Use SHIFT button if necessary.)
5. Press ENT to return manual mode.

Roger Beep setting.

1. Press PRG button
2. Press RB button
3. Roger Beep number appears on the screen
4. Select RB number by frequency selector
5. Press ENT to return manual mode

CW electronic key tuning.

1. Select CW mode (Press MODE button several times)
2. Press Fn button
3. Menu items appear on the screen

Rate – speed of electronic key (1-30)

Ratio – relationship duration dot and dash (1: 2.5 to 1:4.5)

Mode - AUTO (for electronic CW key) or MANUAL (for standard CW key)

4. Use frequency selector to change menu item value.
5. Use Fn change menu item.
6. Use ENT to return to manual mode

Clock and calendar setting.

Clock setting.

1. Press Fn button for 2 seconds.
2. Clock starts flashing.
3. Use frequency selector for clock setting.
4. Press ENT for set counter of seconds to zero and exit to manual mode.

Chapter 5 Programming (Continued)

Year setting.

1. Press Fn button for 2 seconds
2. Press Fn again
3. Current year appears on the screen
4. Use frequency selector for year setting.
5. Press ENT to return manual mode

Month setting.

1. Press Fn button for 2 seconds
2. Press Fn again twice.
3. Current month appears on the screen
4. Use frequency selector for month setting.
5. Press ENT to return manual mode

Day of month setting.

1. Press Fn button for 2 seconds
2. Press Fn again trice.
3. Current day appears on the screen
4. Use frequency selector for day setting.
5. Press ENT to return manual mode

Chapter 6 Connecting to PC

To enter PC Connect mode:

1. Turn Off unit power supply
2. Press MAN button and hold it.
3. Turn on unit power supply
4. When you will see GREEN or BLUE screen – release MAN button.

Installing USB driver for OS Windows (XP and Windows 7).

1. Turn off unit power supply.
2. Connect unit and PC by USB cable (USB-A to USB-A type)
3. Enter PC connect mode
4. Windows will find new USB device and ask you about driver.
5. Specify the location of the folder with driver (usbser.sys and comport.ini)
6. After successful installation, the screen of unit turns blue.

Check list of equipment (Computer→ Property→ Equipment). Radio will look like an extra COM port with name Ranger. For example, Ranger (COM3).

Getting started with PC software.

Connect unit and PC and enter to PC Connect Mode.
When you see blue screen – unit is ready.

Run Ranger618.exe.

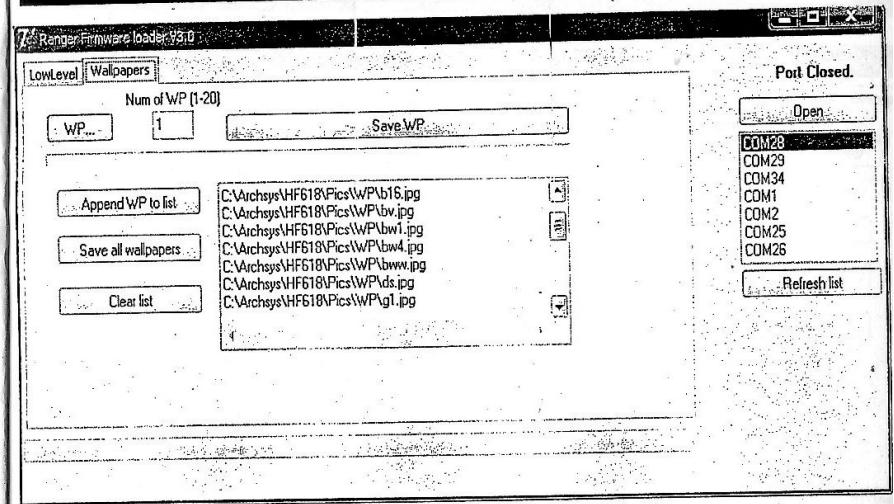
Select COM port number (COM3, for example) and press Open button. (You can press Refresh button for updating com port list)

Now PC and Radio ready to communication.

Download background pictures.

The device has 20 locations for storage of background pictures (wallpapers).
Image property:
size -- 480x272 pixels exactly
file format -- JPG only
file size -- should not exceed 32 768 bytes.

Chapter 6 Connecting to PC (Continued)



Open "wallpapers" page.

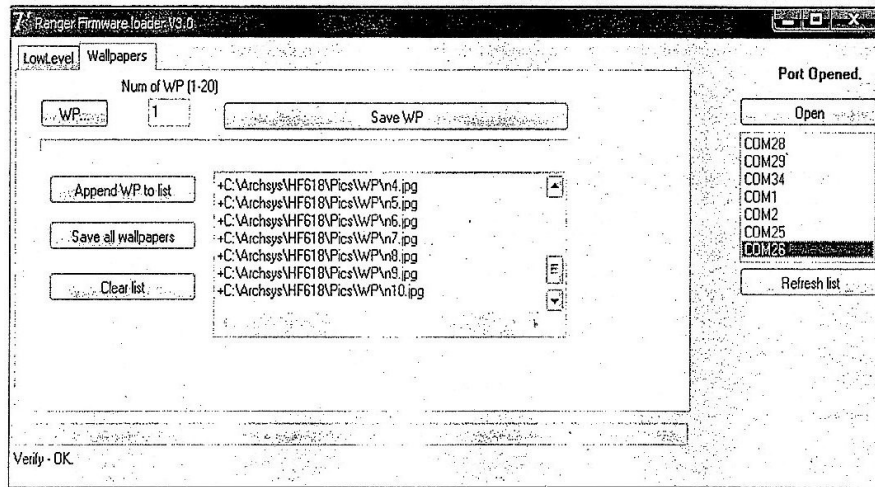
Use **Append to WP list** button to collecting of JPG files.

Press **Save all wallpapers** to download images to your device.

The process will take several minutes.

See list of images. The file names that begin with "+" sign – successful.

Chapter 6 Connecting to PC (Continued)



You can download single image in a position.

Press **WP...** button for select image.

Set position number (1-20)

Press **Save WP** button.

Turn off the radio, the changes to take effect.

Chapter 6 Connecting to PC (Continued)

Updating firmware.

Firmware consists of two files: White.BIN and Recourse.BIN.

White.bin is software image.

Recourse.bin is set of system fonts, system pictures and system sounds.

Open **LowLevel** page.

For updating software use **LoadFile To Flash** button

For updating recourse use **LoadFile To AT25DF** button

Updating status is displayed at the bottom of the window.

Try to update again if status is not OK.

Turn off the radio, the changes to take effect.

Chapter 7 Frequency Scanning

Frequency scanning can be achieved by either of two methods: the first method involves scanning of all frequencies between a pre-set upper and lower scan frequency. The second method permits the scanning of frequencies previously programmed in the memory locations 0 thru F.

All-Frequency scanning

To allow All-Frequency scanning, the user must first program the upper and lower scan limit frequencies as follows:

1. Press the **PRG** (Program) button.
2. Press the **SCAN** button. ("PRG SCAN+" should appear in the lower right-hand corner of the display window.)
3. Using the **SHF** button and the **UP** and **DOWN** arrows, select the upper scan limit frequency.
4. Press the **SCAN** button again. ("SCAN-" should appear in the display window.)
5. Using the **SHF** button and **UP** and **DOWN** arrows, select the lower scan limit frequency, then press **ENT**.

The upper and lower scan limits have now been programmed. To activate the scan feature, return the radio to manual operation and press the **SCAN** button. If the display shows "SCAN+", the radio will scan from the lower limit to the upper limit. If "SCAN-" is displayed, the unit will scan from the upper limit to the lower limit. To change from "SCAN+" to "SCAN-" or vice versa, press **SCAN**.

NOTE

Whichever upper and lower scan limits are programmed in, are also the upper and lower operating limits of the radio. The radio will not operate above or below the scan limits last programmed in. Full band coverage can be returned by reprogramming the original band edges.

Frequency Scanning (Continued)

Memory Scanning

The RHF-618 has 16 non-volatile memory locations which can be programmed with any frequency within the operating range of the radio. The scan function of the unit can scan the frequencies in the 16 memory locations.

The first step in utilizing the memory scan function is programming the desired frequencies into the memory locations 0 through F (Refer to Memory Function section on page 13).

1. After the desired memory locations have been programmed, return the unit to the manual mode of operation by pressing the **MAN** button.
2. Press **MEM** button.
3. Slowly turn the Squelch knob clockwise until the receiver noise disappears.
4. Press the **SCAN** button. The unit will scan from lower to higher memory locations. Pressing the **SCAN** button again will cause the unit to scan from higher to lower memory locations.
5. To stop scanning while on a memory location, press the **MAN** button. You can also turn the Squelch knob counterclockwise until you hear the receiver noise.
6. To disable memory scan function and go back to manual mode of operation, press the **MAN** button twice.

Chapter8 Offset Frequency Operation

The split frequency function offsets the transmitter frequency either above or below the receiver frequency by a user-programmable amount. This is necessary for operating on FM repeaters. In the following example, the programming of a 1 MHz offset will be described. Before attempting to program the offset frequency, ensure that the radio is operating in the manual mode by pressing the **MAN** button.

NOTE: FM repeaters may require that a sub-audible CTCSS tone be transmitted to gain access to the repeater. The RHF-618 can be equipped with an optional CTCSS encoder.

TO PROGRAM TX OFFSET:

1. Press the **PRG** (Program) button.
2. Press the **SPLIT** button. The LCD display will indicate **00000** with **PRG** and **SPLIT** showing in the lower left-hand corner of the display.
3. Using the **SHF** button and the **UP** and **DOWN** arrows as described earlier, program the display to read **10000**.
4. Press **ENT**. A 1 MHz offset has now been programmed into the radio.
5. Return the radio to manual operation by pressing the **MAN** button.
6. Using the **SHF** key and the **UP** and **DOWN** arrows as described previously, set the radio to the desired receive frequency.
7. Press **SPLIT**. Either "**SPLIT+**" or "**SPLIT-**" will be displayed in the lower right corner of the display. If "**SPLIT+**" is displayed, the transmitter will be offset 1 MHz above the receive frequency when keyed. If "**SPLIT-**" is displayed, the transmitter will be offset 1 MHz below the receive frequency.

NOTE

When the transmitter is keyed, the frequency display will change to show the frequency being transmitted.

Memo