Phil's R75 Cookbook

VERSION 1.1 (changes are in purple)

Introduction:

This cookbook is a crash course in using the R75. It contains tricks to improve reception and other useful information. Using the buttons and knobs cannot hurt the receiver; all cautions below are simply to prevent getting blasted by excessive volume.

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Section I: Fundamentals

1. What is ECSS?

ECSS is an acronym for Exalted Carrier Selectable Sideband. ECSS is the tuning of AM stations as if they were SSB. ECSS reduces fading, minimizes distortion, and allows choosing the sideband (LSB or USB) with the least interference. The R75 has the stability (1 ppm) and fine tuning steps (1 Hz) necessary for excellent ECSS reception.

Note: To display 1 Hz resolution press 'TS' until the inverted triangle disappears and then depress 'TS' 2 seconds.

2. Setup Mode Essentials:

- Press 'SET' then press 'UP' or 'DN' until 'RF/SQL' is displayed.
- Turn the tuning dial to the right until 'r5' (aka RS) is displayed.
- Press 'SET' again to exit.

This allows manual gain control and is **VERY IMPORTANT** to proper use of the tricks below. The left half of the RF/SQL knob is the RF gain control and the right half is the squelch control.

- Press 'SET' then press 'UP' or 'DN' until 'REC/RM' is displayed.
- Turn the tuning dial to the left until 'OFF' is displayed.
- Press 'SET' again to exit.

This will turn off the recorder remote and **STOP RELAY CLICKING**, an annoyance.
Note: You may also wish to change 'BK LIGHT' (backlight level) and 'BP LVL' (beep level).

3. Filter Setup:

I use the following (9 MHz & 455 kHz) filter settings on my stock R75:

- AM normal = 15 kHz & 6 kHz
- AM narrow = 2.4 kHz & 2.4 kHz
- SSB normal = 2.4 kHz & 2.4 kHz
- SSB wide = 15 kHz & 6 kHz (for Robert's ECSS Fine Tuning Trick below)
- FM normal = 15 kHz & 15 kHz

Note: Enter the filter setup mode by depressing 'FIL' 2 seconds, then use 'UP' and 'DN', and select filter values using the tuning knob. The 'N' stands for 'narrow' and the 'W' stands for 'wide'. SSB wide CANNOT be set as per above unless 'EXP' is first set to 'oN'. Press 'FIL' again to exit.
Note: The stock filters are quite good and tricks may make additional ones unnecessary.

4. Setting the Clock:

Set the R75's clock to UTC or Coordinated Universal Time. UTC is available from the US Naval Observatory's Master Nuclear Clock website:
http://tycho.usno.navy.mil/cgi-bin/timer.pl

- Press 'CLOCK'.
- Depress 'SET' 2 seconds (time will flash).
- Enter a 4-digit military time (or) Use the tuning dial.
- Press 'ENT' to accept (or) Press 'CLR' to cancel.
- Press 'CLOCK' again to exit.

5. Noise Control:

For pulsating (ignition, lamp, neon) noise use the noise blanker (NB). For heterodynes (whistles) especially while tuning on SSB use the automatic notch filter (ANF). For atmospheric (static) noise use the noise reduction (NR), setting as follows:

- Depress 'NR' 2 seconds.
- Use the tuning knob to adjust.
- Press 'NR' when done.

Note: A NR value between 3 and 5 usually works best.
Note: Engaging the NB without pulsating noise being present will cause interference.

6. General Reception Tips:

Frequencies below 13 MHz work better at night while those above 13 MHz work better in the day. Ham radio operators use LSB below 10 MHz and USB above 10 MHz. Maritime, military, and aeronautical uses USB. Due to gray-line reception listening will be enhanced from a half hour before to a half hour after your local sunrise or sunset.

7. Inexpensive Indoor Antenna and Loops:

I use a 50-foot roll of white wire wrap attached to the RED random-wire push connector terminal in back. At 30-guage size it is nearly invisible against white walls (or the ceiling) and the cost at Radio Shack is only $4.99 (#278-502).

Loop antennas are excellent for indoor reception. Radio waves contain both electrical and magnetic components. The former contains most of the local noise. A loop antenna responds mostly to the latter. Loops are also directional (figure-8) in nature.

8. ‘Something is Wrong’ List for Beginners:

No sound? Check this list first:

- Set the RF gain to 12 o'clock.
- Turn up the volume.
- Turn the attenuator OFF.
- Set both PBTs to 12 o'clock.
- Turn the AGC ON (press momentarily).
- Depress 'ANT' 2 seconds (select the correct antenna).

Note: If the tuning dial is not working press the black button under the ‘DN’ button to release the ‘LOCK’ mode. The lock mode is intended to prevent accidental changes.
Note: Increase tuning dial tension by moving the lever below the dial. This lever should be pulled slightly outward (toward you) and then slid to the left.
Note: The R75 has a mute circuit so quiet could denote audio overload.

Section II: Tricks

CAUTION: Start with the volume low and try these tips without headphones first.

Indispensable Tricks

1. Audio Enhancement 'Tricks':

- Purchase computer speakers for program listening ($30).
- Purchase earbuds for dxing ($5).
- Possibly purchase the Koss EQ50 equalizer ($20).

Ok, this first trick is 'cheating' (hardware) but the stock R75 speaker is small and upgrading here will help sound quality tremendously.

Note: Attach amplified speakers to ‘REC’ and un-amplified speakers to ‘EXT SP’.

2. Bryant's AGC Shutoff Trick:

- Decrease RF gain. **IMPERATIVE**
- Turn the AGC OFF (depress 'AGC' 2 seconds).
- Increase RF gain until s-meter drops to 9-20 dB.
- Adjust volume.

This trick prevents AGC pumping by allowing the minimum gain for a signal. It also stops AGC and RF back-mixing. Using as little gain as possible is generally a good policy: turn off the preamps or engage the attenuator whenever possible. This is very important!

CAUTION: Never tune or scan with the AGC OFF! Press ‘AGC’ again to turn it back on.

3. Bruce's Fade Reducing Trick:

- Decrease RF gain until s-meter starts rising.

This trick will decrease fading. Use it with the AGC on.

AM Tricks

1. Phil's AM Detuning Trick:

- Using the AM mode engage dual 2.4 kHz filters.
- Detune the station exactly +/- 1.2 kHz (aka half the filter value).

This trick increases fidelity over just using the narrow filter on AM and may cut out adjacent sideband interference.

Example: For 9010 kHz AM engage the narrow filter and tune either 9011.2 kHz or 9008.8 kHz.

Note: Using the 6 kHz AM filter detune down by 0 to 2.5 kHz for LSB-only or up by 0 to 3.5 kHz for USB-only. Make sure the 'S' in 'S-AM' is not blinking (disengaged).

2. Robert's ECSS Fine Tuning Trick:

- Set mode to SSB for an AM signal (ECSS).
- Tune until signal sounds natural.
- Engage the 6 kHz filter.
- Tune until fluttering modulation stops.
- Engage the 2.4 kHz filter.

This **GREAT** trick helps make ECSS fine-tuning easy and fun!

Note: To set the wide SSB filter to 6 kHz see 'Filter Setup' above.

3. Pinpointing AM Stations Tricks:

- Engage dual 2.4 kHz filters on AM.
- (or) Switch to SSB and set tuning steps to 5 kHz.
- (or) Confirm the signal exists on both LSB and USB.

These tricks allow finding the station's carrier frequency since the R75's AM chip is capable of a wide locking range with the 6 kHz filter engaged. After finding the center switch back to the 6 kHz filter for better fidelity.

Note: To set tuning step depress 'TS' 2 seconds. I use 5 kHz on AM and 1 kHz on SSB.

4. S-AM Usage Trick:

- Press 'SET' then press 'UP' or 'DN' until 'SAM SW' is displayed.
- Using the tuning knob select 'En' (aka selectively use SAM).
- Press 'SET' again to exit.
- Set mode to SAM (press 'AM' if necessary).
- Increase the RF gain until the 'S' in 'S-AM' is not blinking (activated).

This trick will allow the S-AM mode to work "as well as can be expected".

SSB Tricks

1. SSB Filter Bandwidth Trick:

- Turn the two PBTs in opposite directions.

This trick will allow SSB bandwidths of ~300 Hz to 2400 Hz. For ham reception move the PBTs in opposite directions one white mark.

Note: The inner knob is the 455 kHz IF.
Note: Moving the PBTs together (same direction) causes bandpass shifting.

2. SSB Tone Control Tricks:

- Detune the station up to +/- 30 Hz.
- (or) Turn one of the PBT controls to the left or right.

These tricks allow good tone control on SSB. On USB introduce bass by either increasing the frequency or turning the inner PBT knob to the right.

3. Which Direction to Tune on the Other Sideband Trick:

- After switching to LSB, tune higher in frequency.
- After switching to USB, tune lower in frequency.

This trick helps pinpoint a signal after changing sidebands.

Example: If a heterodyne is heard on LSB 14243 kHz, change to USB and tune **lower** to find a signal at USB 14240 kHz.

4. Phil's 'I use ECSS exclusively. Can AM be disabled?' Trick:

Note: This trick requires at least one missing optional filter.

- Depress 'FIL' 2 seconds.

- Press 'UP' twice. ('9M' 'N' is displayed)
- Turn the dial until 'OFF' is displayed.

- Press 'UP' once. ('9M' 'W' is displayed)
- Turn the dial until 'OFF' is displayed.

- Press 'UP' once. ('EXP oFF' is displayed)
- Turn the dial until 'ON' is displayed.

(If a 9 MHz optional filter **is present** use the **RED VALUES** instead.)
- Press 'UP' until 'oP1' **('oP2')** is displayed.
- Turn the dial until '100' **('52A')** is displayed.
- Press 'UP' until '9M' **('455K')** is displayed.
- Turn the dial until '0.5' is displayed.

- You should hear NO SOUND!
- Press 'FIL' again to exit.

This trick prevents high volume in the event of accidentally switching from ECSS to AM. The CPU is told to use an optional filter that is missing; therefore, when AM is engaged an open circuit exists and no signal gets through.

Note: A less invasive albeit less effective method is to set AM to dual 2.4 kHz filters.
Note: This trick is also capable of muting FM.

Miscellaneous Tricks

1. Robert's Antenna Mute Trick:

- Depress 'ANT' 2 seconds (switch to a missing antenna).

This trick will mute the audio when only one antenna is present. This avoids having to adjust the volume control back to previous levels following an interruption.

2. Transmitter Versus Receiver Distortion Diagnostic Trick:

- Turn PreAmps and attenuator OFF.
- Tune till distortion is 9 dB on s-meter.
- Press 'ATT' to engage the attenuator.
- Note the s-meter reading.

This trick is diagnostic: if the s-meter reads ~6 dB suspect the distortion is at the transmitter; however, if it is **much less than** 6 dB then suspect the receiver.

3. Bruce's Super DXing Trick:

- Set mode to SSB.
- Decrease the volume. **IMPERATIVE**
- Turn AGC OFF (depress AGC 2 seconds).
- Turn the RF gain to maximum (12 o'clock).
- Select PreAmp '2'.
- Spin dial looking for DX (distance reception).

This trick allows high gain for dxing but use with **CAUTION** (can be very loud).
WARNING: Use with extreme care (use stock speaker, NOT headphones).

4. RF Volume Trick:

- Turn RF gain to zero. **IMPERATIVE**
- Increase volume fairly high.
- Use the RF gain as volume control

EFFECT: May help reception but use with **CAUTION** (can be very loud).
WARNING: Use with extreme care (use stock speaker, NOT headphones).

Section III: Scanning

1. Setup Mode Scanning Options: OPTIONAL

- Press 'SET' then press 'UP' or 'DN' until 'SCN RS' [Scan Resume] is displayed.
- Turn the dial to the right for 'ON' or to the left for 'OFF'.
- Press 'SET' again to exit.

'ON' means scanning resumes after stopping on a signal or when the signal disappears.
'OFF' means scanning stops and must be restarted manually.

- Press 'SET' then press 'UP' or 'DN' until 'SCN SPd' [Scan Speed] is displayed.
- Turn the dial to the right for 'HI' or to the left for 'LO'.
- Press 'SET' again to exit.

2. Review of the Five Scanning Modes:

Note: Pressing 'V/M' toggles between the VFO and MEMORY modes.
Note: Press 'SCAN' again to stop any of the scans below.

Programmed Scan - moves from P1 to P2 starting at the VFO frequency if possible.
- •Turn the SQL (squelch) to the right of 12 o'clock.
- •In VFO mode, press 'SCAN'.

Note: P1 and P2 are special memories located above '99' and below '1'.
Note: Setting P1 to 30 kHz and P2 to 60 MHz ensures starting at the VFO frequency!

Auto Memory Write Scan - as above but writes to memories 80 to 99.
- •Turn the SQL (squelch) to the right of 12 o'clock.
- •In VFO mode, press 'SCAN' then press 'M/W'.

Priority Watch - checks for activity on a memory channel every 5 seconds.
- •Select memory to watch using 'UP' or 'DN'.
- •Turn the SQL (squelch) to the right of 12 o'clock.
- •In VFO mode, depress 'SCAN' for two seconds.

Note: A memory must be programmed to use priority watch.

Memory Scan - moves from memory 1 to 99.
- •Turn the SQL (squelch) to the right of 12 o'clock.
- •In MEMORY mode, press 'SCAN'.

Select Memory Scan - as above but only checks 'selected' channels.
- •Turn the SQL (squelch) to the right of 12 o'clock.
- •In MEMORY mode, press 'SCAN' then press 'SEL'.

Note: Usage was left out of the ICOM manual.
Note: Pressing 'SEL' while in the MEMORY mode toggles select on/off for each individual memory (notice that a small 's' appears next to each number if selected).

3. Scanning Tips:

While using Programmed Scan or Auto Memory Write Scan make sure the AGC in ON!

While using Priority Watch, Memory Scan, or Select Memory Scan make sure that the PreAmp, Attenuator, AGC, and Antenna settings are the same or there will be reduced scanning speed, relay chatter, or Priority Watch will NOT be transparent. If this is not possible group similar settings sequentially.

Section IV: Memories

1. Keypad Frequency Entry:

- •Type numbers followed by 'ENT', placing the decimal after the MHz place.
- •It is not necessary to enter the MHz part on subsequent entries.
- •Press 'CLR' to clear all digits.

Example: '14 ENT' turns into 14.000.000 MHz.
Example: '.7 ENT' after the above turns into 14.700.000 MHz.

2. Memory Manipulation:

Selection of a Memory: Direct

- Enter via keypad the number of the memory (ex. 45).
- Press 'V/M'.

Selection of a Memory: Indirect

- Press 'V/M' to enter the MEMORY mode.
- Use 'UP' or 'DN' to go through memories.

Saving to Memory:

- Press 'UP' or 'DN' to select a memory.
- Depress 'M/W' (memory write) 2 seconds.

Clearing a Memory:

- Press 'V/M' to enter the MEMORY mode.
- Press 'UP' or 'DN' to select a memory.
- Depress 'CLR' 2 seconds.

Transfer a Memory to VFO:

- Press 'UP' or 'DN' to select a memory.
- Depress 'V/M' 2 seconds.

Note: Press 'V/M' to toggle between VFO and MEMORY modes.

ERASE ALL MEMORIES: WARNING

- Depress 'UP' and 'DN' while turning the power ON to ERASE ALL MEMORIES.

WARNING: THIS WILL ERASE ALL MEMORIES!
Note: Memories use non-volatile EEPROM and therefore survive power loss. The internal battery is for timekeeping.

3. Alphanumeric Labels:

- Press 'V/M' to enter the MEMORY mode.
- Depress 'SEL' 2 seconds to enter the 'ALPHANUMERIC' mode.
- Press 'UP' or 'DN' to select a memory.
- Press 'ENT' to start (cursor blinking starts).
- Press 0 or 2-9 as needed (ex. to get a 'P' press '7' twice).
- Press period to enter a space.
- Use the tuning dial to move left or right through the digits.
- Press 'ENT' when done.

Note: Depress 'SEL' 2 seconds to exit the 'ALPHANUMERIC' mode.
Note: Names can be eight characters long but the last two must be numeric.
Note: While in the ALPHANUMERIC mode pressing 'TS' will show the frequency!
Note: It is easier to enter alphanumeric labels via a computer and transfer.

Section V: Computer Related

1. Digital Transmissions:

A computer can be used to decode digital transmissions without the need for additional filters. Connect the output labeled 'REC' to the computer sound card's input. To start try the 20-meter amateur band at night or on weekends, specifically: 14.025 to 14.150 MHz for BPSK/CW/RTTY, or 14.230 & 14.233 MHz for SSTV. Use the following software:

•***DigiPan*** for BPSK or typed chat via radio. Includes an audio 'waterfall'.
http://www.digipan.net/

•***CWGet*** for CW or Morse code.
http://www.dxsoft.com/micwget.htm

•***MMTTY*** for RTTY or radio teletype (text) via radio.
http://www.qsl.net/mmhamsoft/mmtty/index.html

•***JVComm32*** for SSTV or slow scan television (still pictures) via radio.
http://www.jvcomm.de/indexe.html

2. Sound Related:

I recommend two very useful sound programs:

•***SR5*** is a digital filter and spectrum analyzer.
http://www.ar5.ndirect.co.uk/html/sr5.html

•***Scanner Recorder*** is a digital audio recorder with squelch control (VOX).
http://www.davee.com/scanrec/index.html

3. Computer Control:

ICOM's ***RS-R75 Control Software*** is $60; however, I recommend purchasing an RS232C (male/female DB9) cable from Radio Shack (#26-117B) and trying Mark Fine's shareware program first. His program is called ***Smart ICOM Control 32*** and usage after 60 days requires only a $60 registration fee.
http://www.fineware-swl.com/sic.html

AUTHOR'S NOTE:

I would like to thank those who shared their tricks with me. If you have a trick, correction, or suggestion write me at just_rtfm@yahoo.com so it can be included in future versions of the cookbook. The R75 community is our greatest asset! dr phil :)

'All too easy.'

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