AOR ®
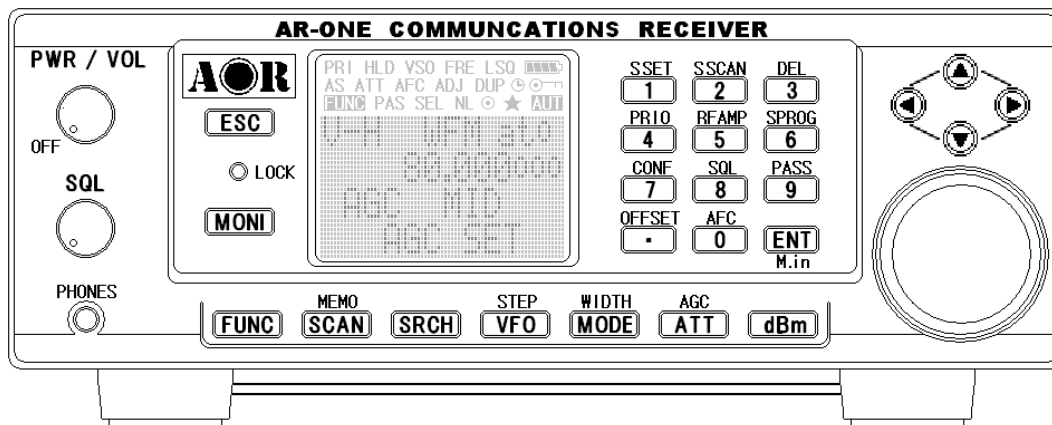
AR-ONE

Ultra Wide Band
Communications Receiver

Operating manual

AOR, LTD.

Table of contents

1 Introduction

1-1 Introduction

Thank you for purchasing the AR-ONE Ultra Wide Band Communications receiver. The AR-ONE is designed using the very latest technology to ensure the highest levels of performance and reliability. To get the best possible results from your AR-ONE, we strongly recommend you to read this manual and familiarize yourself with the receiver. Although carefully designed, this receiver (like all receivers) suffer from a degree of internal noise known as spurious emissions. They are a product of the receiver's circuitry, and therefore, do not represent a fault. Apparent faults may be due to accidental misoperation of the receiver. If you believe there is a problem, carefully read all of the manual before deciding to contact your dealer for advice.

It is acknowledged that sections of this manual are repetitive, this is to enable the manual to be used as a reference book (you don't have to read it all from cover to cover in one go).

Every effort has been made to make this manual correct and up to date. Due to continuous development of the receiver, and by error or omission anomalies may be found and this is acknowledged.

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Main features:

- Super wide coverage: 10 KHz ~ 3.3 GHz (continuous)
- 1,000 memory channels
- 10 VFOs
- Monitor AM, NFM, WFM, USB, LSB, CW, Data
- Ultra-stable reference frequency oscillator
- Two RS-232C ports plus control head port
- Control up to 99 AR-ONE Units with one PC
- Triple conversion superheterodyne front end
- Antenna input level readout
- Adjustable BFO
- High intercept
- IF signal output (10.7 MHz or 455KHz)
- Excellent sensitivity
- Detachable control head (optional kit required)

1-2 Taking care of your radio

There are no internal operator adjustments. In the unlikely event of servicing being
required, please contact your dealer for technical assistance.
Do not use or leave the receiver in direct sunlight (especially the LCD). It is best to avoid
locations where excessive heat, humidity, dust and vibration are expected. Always keep
the AR-ONE free from dust and moisture. Use a soft, dry cloth to gently wipe the set
clean, never use abrasive cleaners or organic solvents which may damage certain
parts. Treat the AR-ONE with care, avoid spillage or leakage of liquids into the receiver
and associated power supply. Special care should be taken to avoid liquid entering
around the controls, through the speaker grille or via the connection jacks.
The AR-ONE is designed for operation from a good quality regulated DC supply of 12 to
14 V, which should be capable of supplying 1.5 A. Never connect the AR-ONE
directly to the AC outlet.
The chassis of the receiver is at negative ground. Where provided (depending upon
world market location), the power supply is pre-wired and provides a nominal 12 V DC
output with suitable connectors being fitted as standard for the AC power input and
connection to the AR-ONE.

SAFETY NOTICE – Always disconnect the power supply from the AC outlet when not in use. If used mobile, it should be noted that the AR-ONE has NOT been manufactured or tested to meet any specific mobile safety requirements.
The AR-ONE has no internally user adjustable parts.

If using the AR-ONE in a base station situation, the best short wave reception is usually achieved by the fitting of a separate external earth rod, however, consider the implications carefully if your AC building supply uses a Protective Multiple Earth (PME) system. If in doubt consult an expert electrician. Never earth to a gas pipe!

The AR-ONE has a single N type antenna connector for all frequencies. This is intended for connection to a 50 Ω (unbalanced) coaxial fed antenna such as a discone, dipole, unipole, Yagi, etc. When sighting the antenna, avoid power cables. Ensure that you do not confuse the antenna and other IF output connectors as they are closely located.

1-3 Attention while operating

1. Certain key operations are acted upon when the key is RELEASED, not while it is pressed. Allow time for the AR-ONE to register such actions before pressing another key.

2. The key lock (**LOCK**) is intentionally made to be difficult to operate to prevent accidental operation. To release key lock, the **LOCK** key has to be held for more than one second, the key icon on the LCD confirms operation. The **LOCK** is disabled during keying sequences (such as when entering frequencies).

3. If a key sequence is not completed, the microprocessor will automatically abort most operations after about 90 seconds of keypad inactivity.

4. Currently displayed VFO data is saved at power down (to increase speed of operation and to reduce write cycles). For this reason, if the AR-ONE is powered down using the **PWR/VOL** control or external power is removed, the last displayed frequency will be lost and the frequency used prior to this will be displayed when next powered up.

Terminology – Search & Scan

If you have not used a wide band receiver before or are not familiar with the terminology used, it is very important to understand the difference between **SEARCH** and **SCAN** modes.

> **SEARCH**: The AR-ONE provides several operations where transmissions (active frequencies) may be automatically located by sweeping the receiver over a wide

frequency range, either from the currently displayed frequency traveling upwards (or downwards) in a specified tuning increment (step) or by sweeping over-and-over between two specified frequency limits. This process is known as **SEARCHING**, as the title implies, it can take a long time to find transmissions due to their 'often intermittent' and brief nature. For this reason it is best to slice large frequency ranges into smaller, more manageable pieces where they may be intensively studied.

When examining large frequency bands, it is common to find that 90% of frequencies are inactive and only a small number of the remaining constitute what you really want. Searching still remains the best way to initially locate active and interesting transmissions (in conjunction with a good frequency listing and band plan).

SCAN: Once active transmission have been identified (either by searching or by using a good frequency guide), it is more efficient to store the data into memories which can be rapidly and automatically monitored in succession, stopping when activity is encountered. This forms a much more efficient means of monitoring the most wanted frequencies as you have targeted 100% what you most want to hear, by contrast searching is very inefficient for day-to-day monitoring.

Note*: It is very important that the squelch is advanced to cancel background noise for the search & scan functions to operate. This is because the AR-ONE believes that it has found an active frequency when the squelch opens and "S" 'squelch open' icon is displayed to the left of the signal meter. Advance the squelch control clockwise until the background noise is just cancelled, this is known as the threshold position. If the squelch control is advanced too far, weaker signals may be missed.*

No noise and no "**S**" icon displayed (with squelch advanced clockwise passed threshold) = **squelch closed**.

Signal received or 'noise' emanating from speaker (squelch fully counterclockwise, below threshold) with "**S**" icon displayed = **squelch open**.

1-4 Accessories supplied

The following items are provided in the carton box:

1   AR-ONE receiver

1   DC power cable

1   Operating manual

1-5 Controls & functions

Controls are located on the front with most connectors on the rear of the AR-ONE, a brief identification is given here:

Front Panel
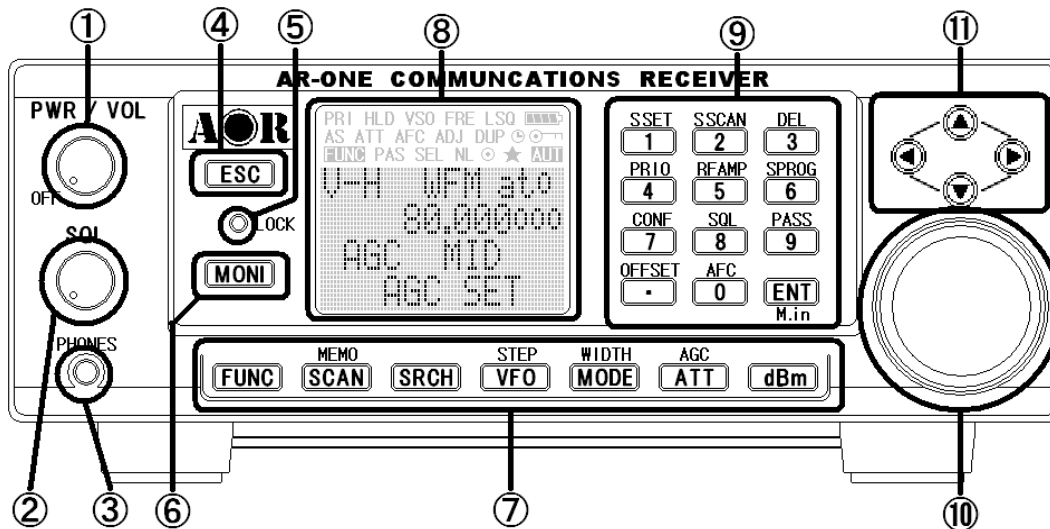
1. Volume control plus isolate power On/Off
2. Squelch control
3. Phones jack (3.5 mm mono or stereo may be used)
4. Escape key
5. Key Lock key
6. Monitor key
7. Function keys
8. LCD (Liquid Crystal Display)
9. Main keyboard (ten keys plus decimal and enter)
10. Main tuning dial (frequency change and menu manipulation)
11. Arrow keys (frequency change and menu manipulation)

Rear Panel
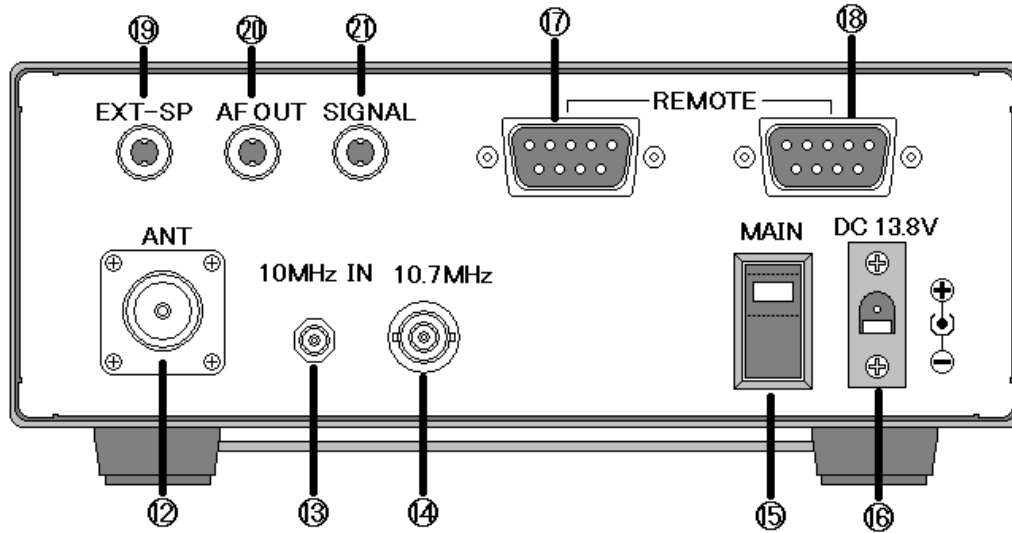
12. Antenna connector (N type)

13. Standard signal (10 MHz) input connector

14. IF output connector

15. Main power switch

16. DC power input connector (design may vary depending on AR-ONE generation)

17. Remote control connector (RS-232C)   -- 1

18. Remote control connector (RS-232C)   – 2

19. External audio output connector (when used, the internal speaker is disabled)

20. Audio output connector (speaker output without disabling the internal speaker)

21. Signal output connector (0 – 4.5 V DC maximum)

RS-232C connection requirements:

The REMOTE RS-232C connectors (17 & 18 above) are designed for connection directly to a RS-232C serial port of a PC. By daisy chaining the units, control of up to 99 AR-ONE receivers is possible from one PC. No interface is required, just a standard RS-232C straight cable. Connections for a PC are as follows:

AR-ONE	DB-9 RS-232C cable	DB-25 RS-232C cable
Pin # 2	Pin # 2	Pin # 3
Pin # 3	Pin # 3	Pin # 2
Pin # 5	Pin # 5 (Ground)	Pin # 7 (Ground)
Pin # 7	Pin # 7	Pin # 4
Pin # 8	Pin # 8	Pin # 5

1-5-1 Keypad

Keypad conventions

Most keys have secondary functions, these are printed on the panel. However, due to the restrictions of available space, not all functions can be shown.

Secondary functions of the AR-ONE are indicated with white characters above each key. To access the secondary function, push the **FUNC** key, and then push the respective key.

1-5-2 Summary of keys

ESC

Cancels entry from the keypad.

LOCK

This key is intentionally small to reduce the chances of accidental operation. Key lock is useful when you do not wish an important frequency to be lost or the AR-ONE to be incorrectly set to a different frequency.

MON

To force the squelch open so that you may manually intervene to ensure that no weak signals are missed.

FUNC

Selects the secondary functions of keypad.

SCAN

Initiates **SCAN**.

MEMO

Push the **[FUNC]** key, and then push this key to go into memory read mode.

SRCH (SEARCH)

Initiates **SEARCH**.

VFO

VFO mode selection. There are 10 **VFO**s (**VFO-A** through **VFO-J**).

STEP

Push the **[FUNC]** key, and then push this key to enable frequency step selection.

MODE

Receive mode selection.

WIDTH

Push the **[FUNC]** key, and then push this key to select the IF band width menu.

ATT

RF Attenuator. Move the cursor to select the desired parameter. The **AUTO** selection will work best for most of cases.

AGC

Automatic Gain Control. Move the cursor to select the desired **AGC** time constant. Usually, **FAST** is used to receive CW, **MEDIUM** for AM and FM, and **SLOW** for SSB. When **MANU** is selected, any desired parameter (between 0 – 255) can be selected for manual gain control.

dBm

Toggles the incoming signal strength unit between **dBm, dBuV,** or ordinary **S units**.

0 ~ 9 , .

Numeric keys.

S. SET

Push the **[FUNC]** key, and then push this key to select the desired memory channels to scan in the **SELECT SCAN** mode.

S.SCAN

Push the **[FUNC]** key, and then push this key to initiate **SELECT SCAN**.

DEL

Push the **[FUNC]** key, and then push this key to delete memory channels, a search bank or pass frequency.

PRIO

Push the **[FUNC]** key, and then push this key to initiate **PRIORITY CHANNEL RECEIVE**.

RF AMP

Push the **[FUNC]** key, and then push this key to activate/deactivate the **RF amplifier** (**ON**/**OFF**/**AUTO**).

S PROG

Push the **[FUNC]** key, and then push this key to set the search bank.

CONF

Push the **[FUNC]** key, and then push this key to access **CONFIGURATION** menu to alter beep level setting, backlight function, etc.

SQL

Push the **[FUNC]** key, and then push this key to select either the noise squelch mode or level squelch mode.

PASS

Push the **[FUNC]** key, and then push this key to set pass frequencies in search mode.

OFFSET

Push the **[FUNC]** key, and then push this key to activate/deactivate the frequency offset in duplex mode.

AFC

Push the **[FUNC]** key, and then push this key to activate/deactivate the **AFC** (Automatic Frequency Control) function.

ENT

To validate data entry.

M. in

In the manual receive mode or search mode, push the **[FUNC]** key, and then push this key to enter the frequency into memory.

1-6 Computer control

Connect the AR-ONE to the serial port of a computer using an RS-232C serial cable terminated in a 9-pin male connector. The RS-232C parameters may be defined using the **CONFIG** menu. Baud rates (transfer speed) can be set to 9600, 19200 (default) or 38400 bps. Since there are two independent RS-232C ports with the AR-ONE, it is possible to set an 'address' to facilitate connection of up to 99 AR-ONE receivers to a single PC.

The RS-232C parameters are as follows:

Baud Rate:	9600, 19200 (default) or 38400 bps
De-limiter:	CR, LF
Data bit:	8 bit
Stop bit:	2 bit
Parity:	None
X flow:	None

Please refer to chapter 7 for further details.

1-7 IF output and Spectrum Display Unit (SDU5600)

The rear panel has a 10.7 MHz IF output designed to drive the optional SDU5600 Spectrum Display Unit. The SDU5600 provides an excellent tool for locating elusive transmissions with a PEAK capability to 'freeze' the briefest of transmissions for later measurement of frequency and level after the event.

(Note: The IF output frequency is selectable in the **CONFIG** menu, 10.7 MHz or 455 kHz).

2 Getting started

2-1 Making the AR-ONE ready for operation

2-1-1 LCD (Liquid Crystal Display)

All relevant operational information is provided via the LCD. The LCD contrast is adjustable.

2-1-2 Connect the antenna

For reception on all bands, connect the antenna to the N connector on the rear panel of the AR-ONE. Refer to chapter 10 for an overview of the available AOR antennas depending on your target frequency range.

2-1-3 Connect power

Connect power to the DC power jack on the rear panel of the AR-ONE. For optimal performance use a regulated DC power supply (12 ~ 14 V with capacity 2A).
Do not connect to a 24 V system.
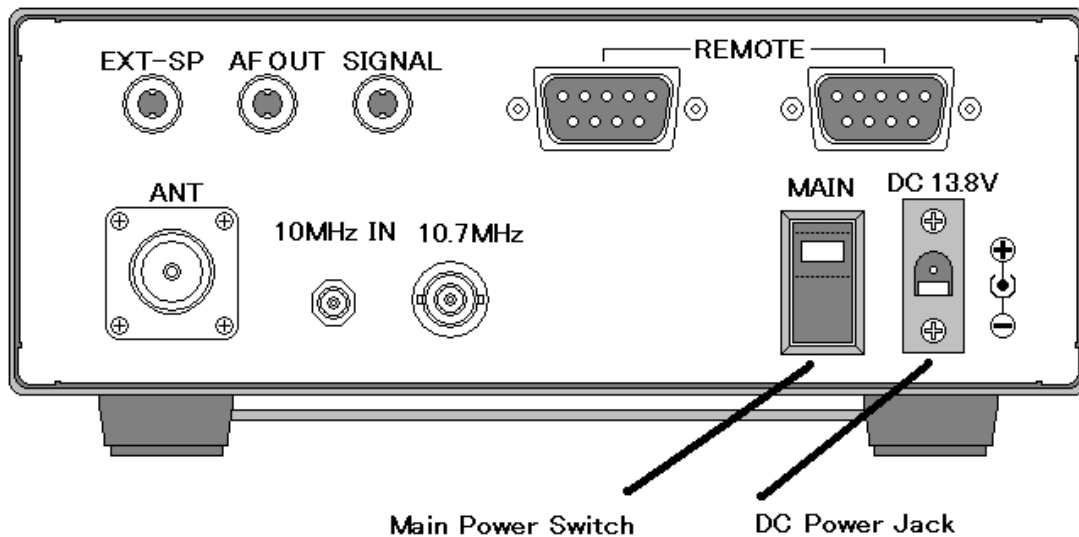
(DC power socket design may vary depending on AR-ONE generation)

2-2 Switching on for the first time

Set the squelch control to the 'mid point'. Turn the power switch on the rear panel of the AR-ONE. This is a main power switch. The green LED on the switch will illuminate. Then rotate the PWR/VOL control to the 'mid point', as you start to rotate the PWR/VOL control, a 'click' will be heard as the power isolation switch contact switches on. Please be careful NOT to switch on any receiver with an earphone connected, there may be an audible click when the unit is switched on or the volume may be accidentally set too high.

Power/VOL control

AR-ONE COMMUNCATIONS RECEIVER
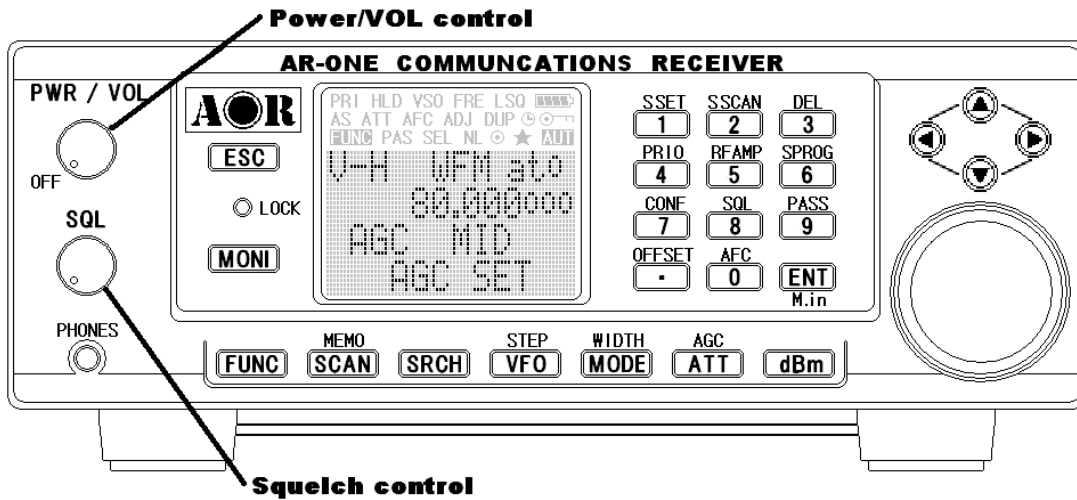
Squelch control

The AR-ONE will take approximately 4 - 5 seconds before information appears on the LCD. This is normal, while the AR-ONE microprocessor generates the 'boot up data' required to control the receiver.

2-3 Squelch Circuit

In normal use, **NOISE SQUELCH** is used. However, **LEVEL SQUELCH** can be selected for search and scan operations. The **LEVEL SQUELCH** parameter causes the AR-ONE to check the signal strength of *active* frequencies and to only stop when the signal strength is above a preset level (which is programmable).

To select **LEVEL SQUELCH**, perform the following steps:

AR-ONE COMMUNCATIONS RECEIVER

Push   Push
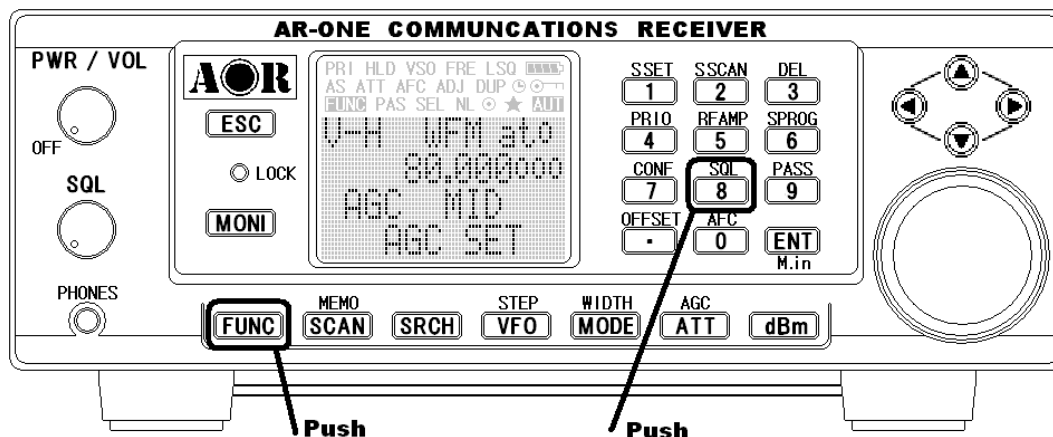
1. Push the **FUNC** key.
2. Push the "**8**" key.

14

3. On the bottom of the LCD, a bar will be displayed. Using the **SQL** control, adjust the desired signal level.

4. Push the **ENT** key to confirm entry.

5. Squelch will open only when the input signal strength is above this set level.

6. To select **NOISE SQUELCH**, repeat above steps.

2-4 VFO selection

The AR-ONE has ten (10) VFOs being identified as "V-A" through "V-J" on the top left of the LCD. The term VFO historically means *'Variable Frequency Oscillator'* and today refers to a tunable data store which contains frequency, step, step-adjust, attenuator etc. Pushing the **VFO** key each time will select the one VFO out of 10. The AR-ONE has an AUTOMODE setting, and therefore, in most cases a proper receive mode and frequency step are automatically selected.

2-4-1 Tuning frequency
2-4-1-1 Entering a frequency using the numeric keypad

While in **VFO** mode, enter the required frequency using MHz format followed by the **ENT** key.

Example of frequency entry of 80.8 MHz:

Push the [**8**] key. Push the [**0**] key. Push the [**.**] key. Push the [**8**] key. Push the [**ENT**] key.

Example of frequency entry of 954 kHz (0.954 MHz)

Push the [**.**] key. Push the [**9**] key. Push the [**5**] key. Push the [**4**] key. Push the [**ENT**] key.

Aborting frequency input

If for some reason you do not wish to complete the frequency data input, push the **ESC** key before completing the input sequence with the **ENT** key.
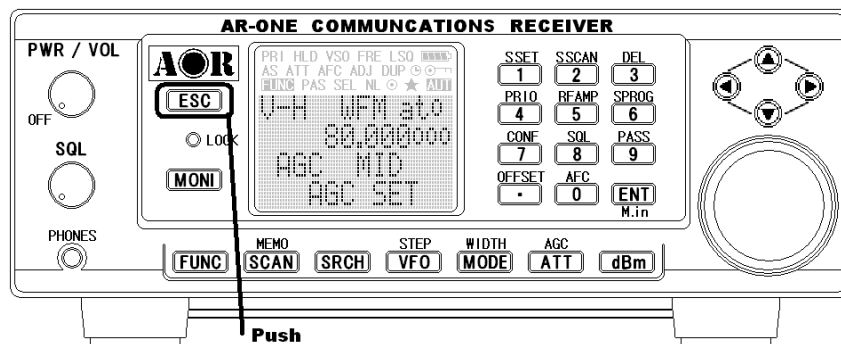
2-4-1-2 Changing frequency using the main tuning dial

While in **VFO** mode, the active VFO frequency may be 'tuned' using the rotary main tuning dial which is mounted on the right side of the front panel. You may rotate the dial 'clockwise' to increase frequency or turn 'counterclockwise' to decrease frequency.

2-4-1-3 Changing frequency using UP arrow key or DOWN arrow key

The **UP** arrow key and **DOWN** arrow key provide a convenient method of frequency change. The speed at which the receiver steps up or down depends upon the **STEP SIZE** which is default to **AUTO**. In **AUTO** the step size, receiver mode etc. is taken from the factory pre-programmed band plan but may be overridden at any time.

Push the **UP** arrow key to tune the receiver upward in whichever step size is selected, use the **DOWN** arrow key to tune the receiver downward in frequency.

2-5 Changing receive mode

Due to the necessities of signal bandwidth, channel occupancy and transmission efficiency, different receive modes are used by various services. Specifications being not consistent throughout the world, it is sometimes necessary to change receive mode in order to monitor various transmissions.

For your convenience, receive mode and tuning step size have been pre-programmed into the AR-ONE auto-mode band plan data at the factory to simplify operation of the receiver, especially while you familiarize yourself with all functions. Should you wish, the defaults may be manually overridden at anytime so that you may select an alternative receive mode and tuning step on any frequency.

AM

Amplitude Modulation – Used by broadcast services throughout the world on long wave, medium wave and shortwave. AM is also used by VHF airband, UHF military airband and some PMR (Private Mobile Radio) and utility services.

FM

There are two common types of FM (Frequency Modulation), these are:

NFM – Narrow Band Frequency Modulation – this provides high quality communication for relatively short distance operation. FM uses a greater frequency bandwidth than other modes such as SSB, so is less efficient.

NFM is the most common mode used above 30 MHz with the exception of the airbands. NFM is widely used on the VHF bands: VHF marine band, 2m amateur band, 70 cm amateur band, PMR (Private Mobile Radio) and utilities.

In the absence of signal, the background white noise may appear quite loud. For ease of listening, the squelch control should be rotated clockwise until he background noise just disappears, this should be carried out while no signal is present. The point where the background noise is cancelled is known as threshold point. Do not advance the squelch control more than necessary or the receiver will appear to be desensitized and weaker signals will be missed.

WFM – Wide Band Frequency Modulation – used by VHF and UHF broadcast stations as excellent audio quality is available due to the relatively wide frequency bandwidth employed. Used only for local services such as VHF band stereo (received as mono on the AR-ONE) and UHF TV sound channels.

LSB – Lower Side Band – is form of SSB (Single Side Band). LSB tends not to be used commercially but is extensively used by Radio Amateurs on frequencies below 10 MHz. This assists the separation of Commercial and Amateur users on traditionally shared bands and prevents them from speaking to each other.

SSB is a very efficient method of transmission as the unwanted second sideband and carrier have been removed. This allows the full transmitter power to be employed in carrying useful information within the wanted sideband. As a result, greater distances are possible on SSB and a smaller frequency bandwidth is required than most other modes.

USB – Upper Side Band – The same comments apply as for LSB. By convention, Radio Amateurs also use USB above 10 MHz.

CW - Continuous Wave – Often referred as Carrier Wave or Morse Code. Commonly used on the shortwave bands by radio amateurs toward the lower end of each band allocation. Some commercial use is still made by shipping etc although its use is being phased out due to the introduction of automated stations.
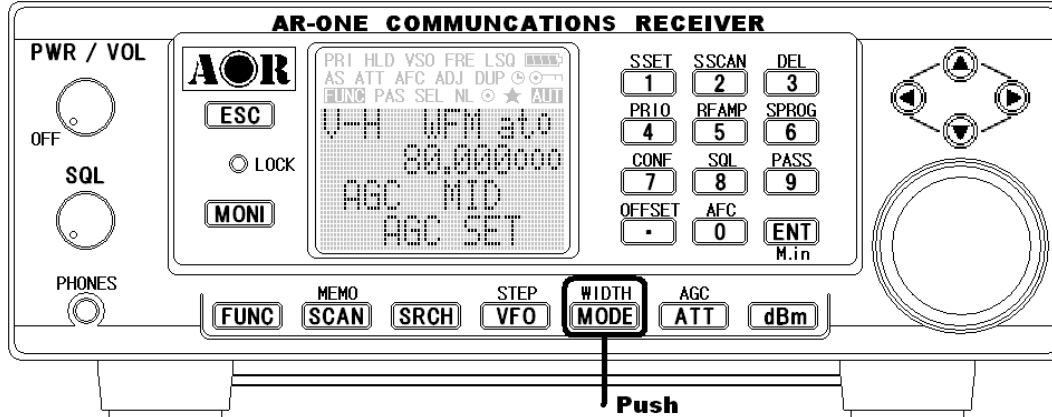
2-5-1 Auto-mode selection

When auto-mode is in operation, receive mode and tuning step size are automatically selected for you.

To activate auto-mode or reconfirm its selection while in **VFO** mode,

Push and hold the **MODE** key for more than 2 seconds.

The **AUT** icon appears on the top right portion of the LCD.

Push

Note: Auto-mode is cancelled as soon as the receive mode, tuning step or other related data is changed. Remember that auto-STEP and auto-MODE are linked, reselect **AUTO-MODE** if either have been adjusted and you require the auto band plan selection.

2-5-2 Receive mode selection

Any receive mode may be selected at any frequency within the receiver's frequency coverage. To access the receive mode menu, push MODE. The following modes are available: AUTO, WFM, NFM, USB, LSB, CW.   Use the main tuning dial or arrow key to make the selection. To accept the selection, push the **ENT** key.

2-6 Changing tuning STEP size

Each country's government decides upon the specification for channel occupancy, step (separation) and mode.

Not surprisingly the allocation of frequency bands are not the same all over the world and channel separation (step) varies from band to band. As an example, the channel separation (step) for the MW (medium wave) band in the U.S.A. is 10 kHz while in Europe and Japan it is 9 kHz.

For the above reasons it is necessary to sometimes alter the **STEP** size according to local band plan conventions. The pre-programming of step size may be manually over-ridden so you may choose alternative settings at will.

Should you wish to change the default tuning step size, push the **FUNC** key and then push the **VFO** key.

The third row of the LCD will display the current default size.
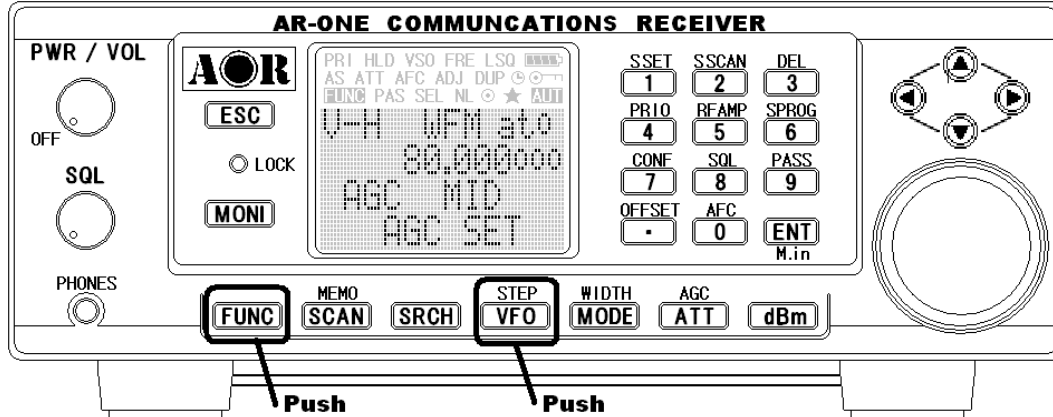
The bottom line of the LCD displays the icon "**STEP SET**" to indicate that the AR-ONE is Waiting for you to change the step size.

Use the main tuning dial or arrow key to select the desired step size. To accept the displayed tuning step size, push the **ENT** key.

The tuning step size can be programmed in 1 Hz increments (via the keypad) so unusual step sizes are possible.

The acceptable step size range is less than 1 MHz in 1 Hz steps.

2-7 IF Bandwidth

The IF bandwidth determines how SELECTIVE the receiver will be when monitoring signals off air. However, it is not simply a case of using the narrowest filter at all times, particular modes require differing amounts of bandwidth in order to operate, otherwise the receive system simply will not produce intelligible sound. Correct receive mode and IF bandwidth must always be selected for optimum reception. If the bandwidth selection is too narrow, distortion or signal break-up may occur. If the bandwidth selection is too wide, adjacent interference may be encountered. For this reason, a selection of IF filter bandwidths are fitted as standard.

Typical examples of receive mode and IF bandwidth are:

300 KHz   -- VHF FM broadcast (220 KHz may be also be used – mono only).

200 KHz   -- VHF FM broadcast (110 KHz may be also be used – mono only).

100 KHz or 30 KHz – Wireless mic, etc. (30 KHz for satellite FAX, too).

16 KHz – PMR, amateur band, etc. FM 6 KHz may also be used.

8.5 KHz or 6 KHz – VHF/UHF airband, shortwave, medium & long wave, PMR, etc.

3 KHz – Short wave amateur band, short wave utility such as oceanic airband etc.

0.5 KHz – Morse code used by radio amateurs and some marine traffic on shortwave.

An appropriate IF filter is automatically selected when auto mode is engaged. However any combination of IF filter and receive mode is possible in manual mode. When you have manually selected an IF filter bandwidth, auto mode will be disengaged, but the receive mode, step size, etc will be retained until they are changed manually.

2-7-1 Manually selecting IF bandwidth

Push the **FUNC** key, and then push the **MODE** key.

Select a new bandwidth from the list of 300, 200, 100, 30, 16, 8.5, 6, 3, and 0.5 KHz by rotating the main tuning dial or arrow key. To accept the new bandwidth selection, push the **ENT** key.
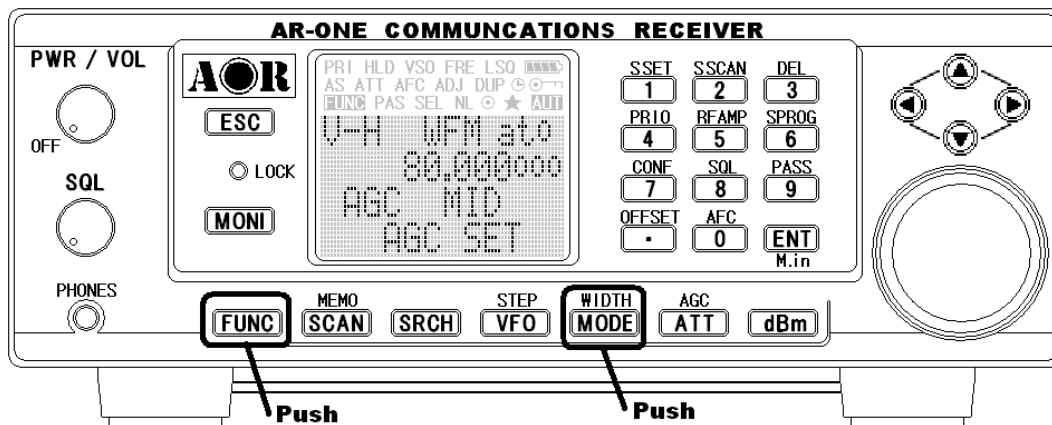
2-8 AGC (Automatic Gain Control)

To change the **AGC** parameter setting, push the **FUNC** key and then push the **ATT** key.
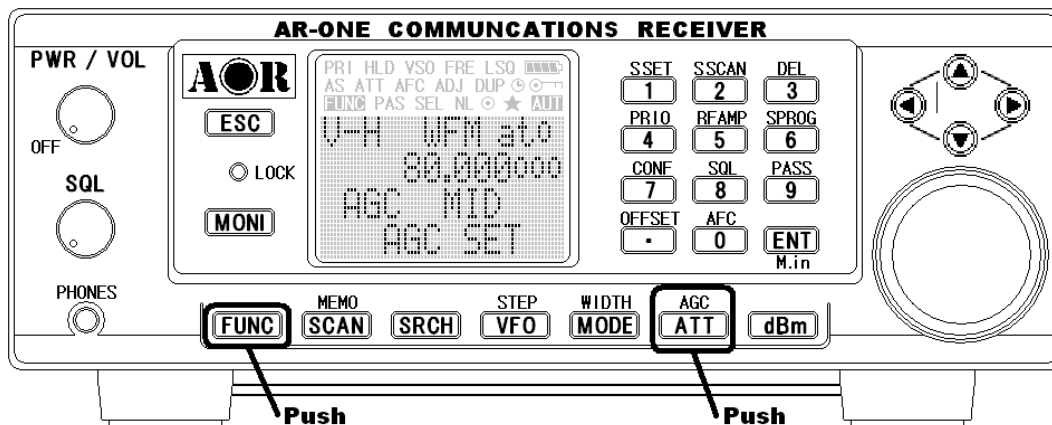
Select a new **AGC** parameter from the list of **MANU, FAST, MID, SLOW** by rotating the main tuning dial or arrow key. To accept the new **AGC** parameter, push the **ENT** key.
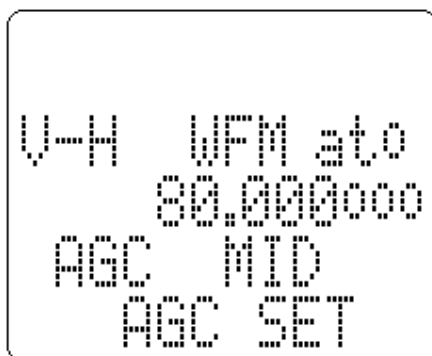
When **MANU** is selected, a desired parameter can be entered between **0 ~ 255** in the Configuration Menu.

2-9 ATTENUATOR

Activating the attenuator reduces signals to the RF input stages of the AR-ONE to prevent overloading, for example when the receiver is used in close proximity to strong transmissions.

The AR-ONE has four settings for **ATT** (attenuator), **0 dB**, **10dB**, **20 dB**, and **AUTO**.

To change the **ATT** parameter setting, push the **ATT** key.
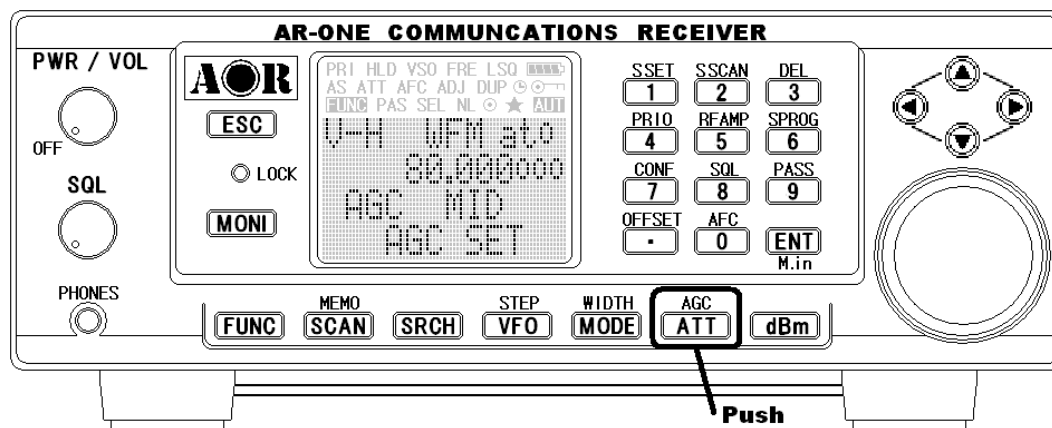
Select a new **ATT** parameter from the list by rotating the main tuning dial or arrow key. To accept the new **ATT** parameter, push the **ENT** key.

When **ATT** is set to **OFF**, the 't0' icon will display on the top right of the LCD.
When **ATT** is set to **10 dB**, the 't1' icon will display on top right of the LCD.
When **ATT** is set to **20 dB**, the 't2' icon will display on top right of the LCD.

ATT

V-H   WFM ato
      80.000000
ATT   10 dB
      ATT SET
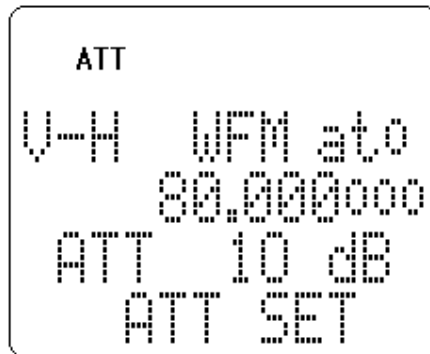
2-10 RF AMPLIFIER

The AR-ONE features a preamplifier. The LCD icon "a" is used to display the setting in use.

To change the RF Amplifier setting, push the **FUNC** key and then push the **5** key.

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Push   Push
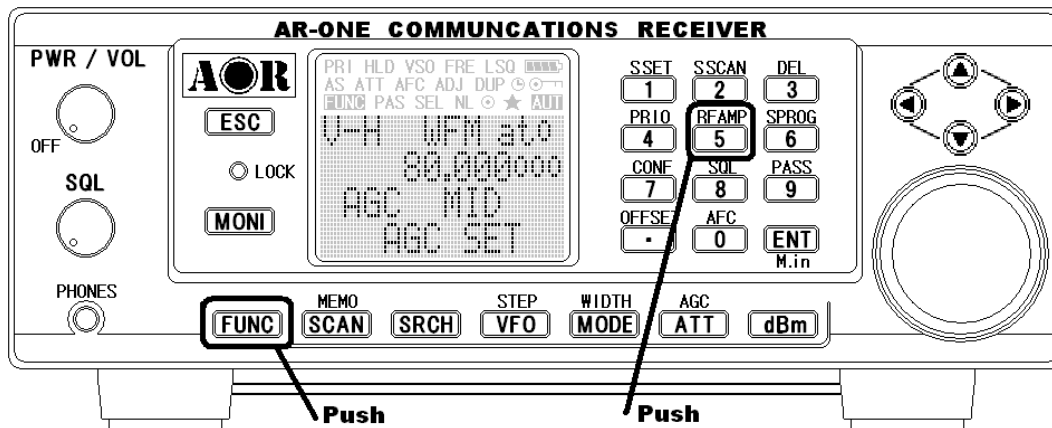
Select a new **AMP** parameter from the list of **ON, OFF, AUTO** by rotating the main tuning dial or arrow key. To accept the new **AMP** parameter, push the **ENT** key.

V-H   WFM ato
      80.000000
AMP   ON
      AMP SET
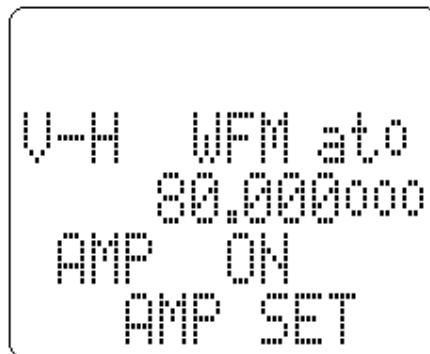
2-11 OFFSET

This function enables the receive frequency to be quickly SHIFTED by a predetermined value, this makes it easy to track duplex-transmissions or check repeater inputs/outputs. The locations for frequency offset storage are numbered 00 to 47 with 00 acting as OFF, this makes 47 locations available.

Frequency offset may be programmed into VFO, memory channel and search banks. It is most convenient to set-up in VFO mode then save the data to specific memory channels for quick recall at a later date. Frequency offset is primarily designed for memory channel use, it may appear rather long winded to toggle on/off in VFO mode. However even when programmed, frequency offset is in no way detrimental to normal operation.

The acceptable range of frequency offset is 0 MHz to 999.999 MHz, of course if the offset is set to 0 MHz, the frequency will not change! Before the FREQUENCY OFFSET function can be used, it first needs to be configured.

2-11-1 Using pre-programmed frequency offset data

To access the frequency offset set-up menu, push the **FUNC** key, and then push the **.** (decimal) key.
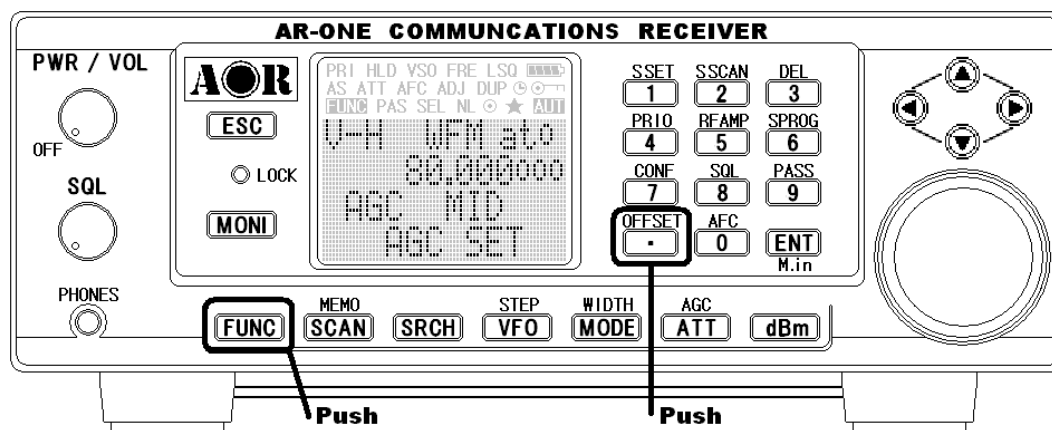
The third line will display **DUPLEX** followed by the current offset channel number. Use the main tuning dial or arrow keys to review the offset locations. The shift direction can be changed by pushing the **FUNC** key. To accept the offset setting, push the **ENT** key.

2-11-2 Entering new frequency offset data

Assume that you are in VFO mode.

To access the frequency offset set-up menu, perform the following steps:

1. Push the **FUNC** key, and then push the **.** (decimal) key. The third line will display

DUPLEX followed by the current offset channel number.

Use the main tuning dial or arrow keys to review the offset locations.

2. Push down arrow key. The cursor will move down to the bottom line of the LCD.
3. Enter the desired offset in MHz format. The shift direction can be changed by pushing the **FUNC** key.
4. To accept the offset setting, push the **ENT** key.

```
                    DUP
V-H    WFM at0
         80.000000
       DUPLEX 01
  -    5.0000
```
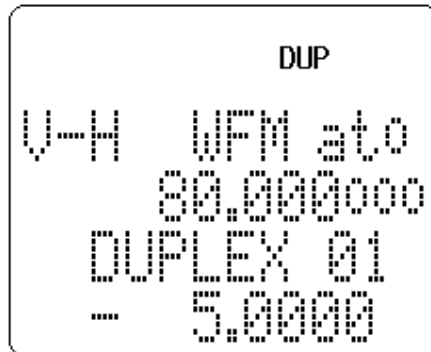
3 Memory channels & banks

It is convenient to store commonly used frequencies into a memory channel along with mode etc, this saves having to key the data in over and over again. Memory read is very straightforward and quick when compared to retyping all data.

3-1 Memory channel overview

Think of memory channels as pages in a notebook, each of which is numbered to identify it. Data may be written to each new page (memory channel) and each page may be overwritten with new data, they can be used over and over again. The AR-ONE has **1,000 memory channels** and one **priority channel**.

Each memory channel may hold:
● **One receive frequency**
● **Receive mode**
● **Tuning step**
● **Frequency offset**
● **Attenuator setting**
● **Text comment of up to 12 characters**

The alphanumeric comment may be used to ease identification at a later date and to provide text search function. The 1,000 memory channels are divided into 10 banks, each having

100 channels. The memory banks are identified by the first **BANK** number 0, 1, 2, 3, 4, 5, 6. 7, 8 and 9 and the individual channels are numbered from 00 to 99.

Examples are "000" for the first channel location in memory bank "0" and "099" for the last memory channel in memory bank "0".

"415" is the location: memory bank "4" channel "15".

The data contents of memory and search banks are held in a EEPROM so that no backup battery is required for memory retention.

The stored data may be quickly and easily recalled, changed or deleted using the memory recall and delete functions.

Note: *When the receiver is switched OFF, all VFO data will be automatically stored into EEPROM memory storage.*

3-2 Storing VFO frequencies & data into memory

The process to save a displayed VFO frequency to memory is as follows:

   a) In VFO mode, select the required frequency, mode, attenuator etc.

   b) Push the **FUNC** key, and then push the **ENT** key to go to the memory write screen.

Push   **Push**
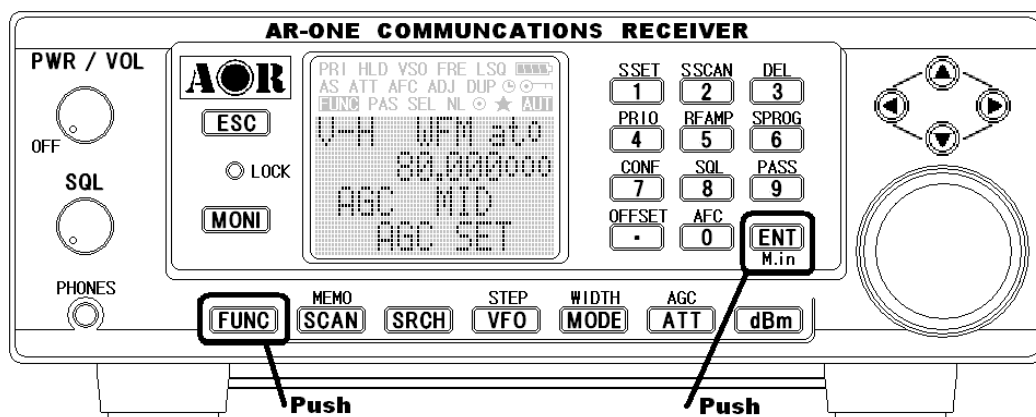
   c) Use the keypad, main tuning dial or arrow keys to select the desired memory location (BANK and CHANNEL).

   d) Add a text comment (optional) or delete an existing comment.

   e) Push the **ENT** key to exit the menu and save the data to the specified memory location.

Let's assume that you are going to store the frequency of 123.500 MHz into memory bank "**3**" location "**25**" (325) while in VFO mode with the text comment of "**AIRBAND**".

If a mistake is made during programming, push the **ESC** key to abort entry and return to VFO mode.

1) Start by selecting VFO mode then key in the frequency of 123.500 MHz, "mode and step

size" are set to the default auto mode.

Push the **VFO** key to set the AR-ONE into VFO mode.

Push the **1** key.

Push the **2** key.

Push the **3** key.

Push the **.** (decimal) key.

Push the **5** key.

Push the **ENT** key.

2) Then push the **FUNC** key, and then push the **ENT** key to enter "memory input" mode. Using the main tuning dial or arrow keys, enter **325** to store the frequency into the location (memory bank 3, channel number 25).

3) Push the down arrow key to add the text comment "**AIRBAND**".
Use the main tuning dial to select the text and the arrow keys to move position of text input. A maximum of 12 characters may be added to each memory channel, it is recommended that a minimum of three be used for efficient use of the text search function (a minimum of 2 characters are required for text search).

To erase a character press the **S SET** key, to erase an entire text comment, place the cursor on the first character and push the **FUNC** key. Push the **ENT** key to complete.
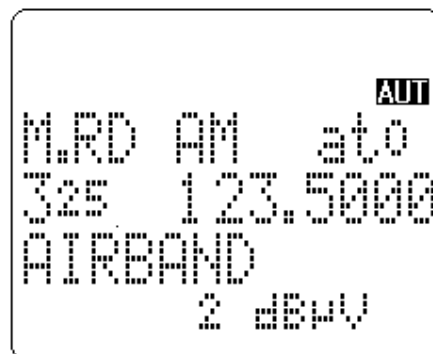
3-3 Memory read "M.RD"

Once frequency and mode data has been stored into a memory location, its retrieval is quick and simple. Let's assume that you are going to retrieve the frequency of 123.500 MHz which has been programmed into memory "325" during an earlier example in the preceding section.

Push the **FUNC** key and push the **SCAN** key to go into **memory read mode**, the "**M.RD**" icon appears on the top left of the LCD to confirm operation. The AR-ONE will monitor

whatever memory channel you enter.
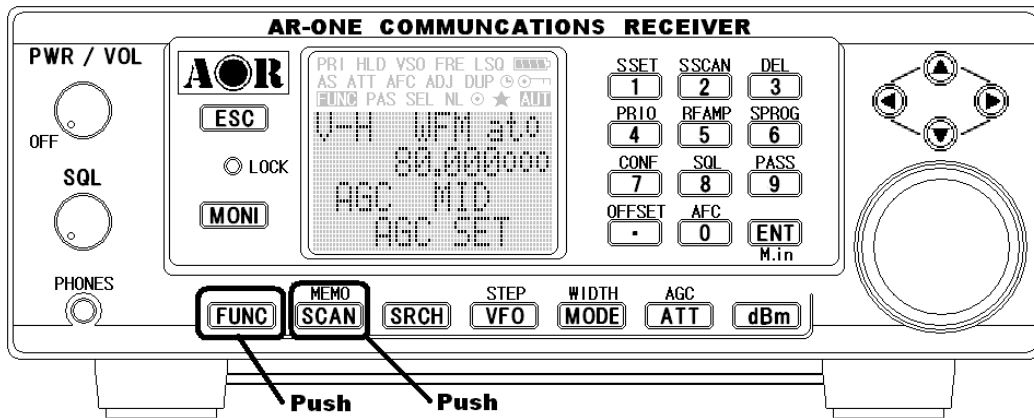
The AR-ONE will display memory channel, mode, text comment (if one was used). The memory channel last used (for memory write or recall) will initially be displayed. If the desired memory channel is not immediately displayed, it may be recalled by keying in the required three digit location.

To recall memory channel "**325**", push either the right arrow key or left arrow key to select "**3**" as the memory bank. Rotate the main tuning dial or push either the up arrow key or down arrow key to select "**25**".
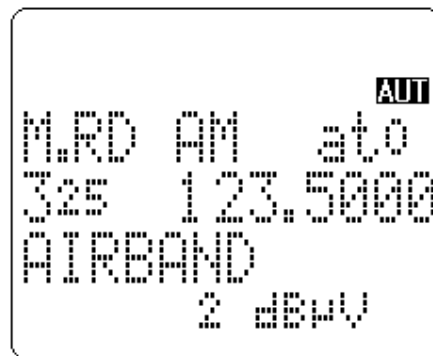
3-4 Deleting memory channels

It is possible to over-write a memory channel with new data or delete the channel entirely.

Push the **FUNC** key, and then push the **3** key to enter the "**MEM DELETE**" menu.
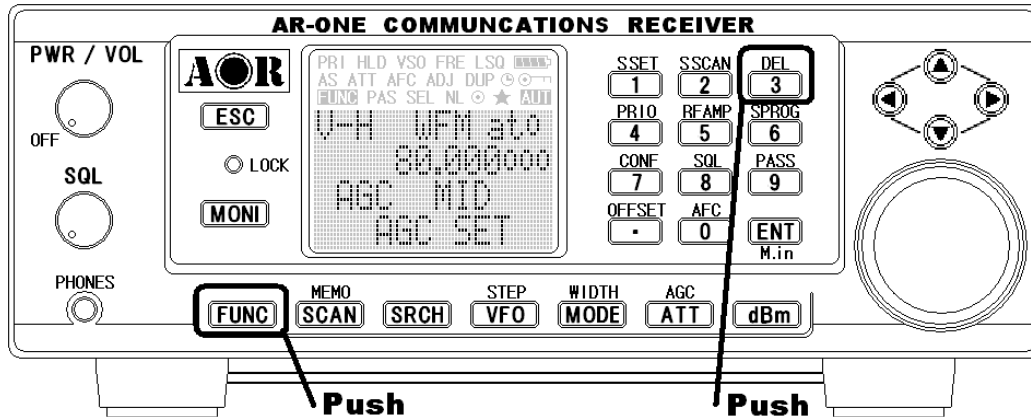
Push either the right arrow key or left arrow key to select the desired memory bank.

Rotate the main tuning dial or push either the up arrow key or down arrow key to select the desired memory channel to delete.

Push the **ENT** key to delete it or push **ESC** to abort.

4 SCAN – scanning memory channels

In the **SCAN** mode the contents stored in the memory channels are automatically recalled and scanned very quickly for activity.

*** It is important that you do not confuse **SCAN** and **SEARCH** modes. ***

SEARCH mode (covered later in this manual) automatically **TUNES THE RECEIVER THROUGH ALL FREQUENCIES** between two specified frequency limits looking for active frequencies.

4-1 SCAN – outline introduction

During SCAN, the AR-ONE automatically recalls memory channels which contains data in numeric order and monitors them looking for activity. When an 'active' memory channel is located (when a signal is found and the squelch is open), the AR-ONE will temporarily stop scanning.

4-2 Starting SCAN

Presuming that some memory channels are programmed with data, start the scan process with one push of the **SCAN** key.

The icon "**HYPER SCAN**" is displayed on the LCD to indicate that the SCAN process has been started, a bank number will be also be displayed representing the current bank.

Ensure that the squelch is set to threshold point so that background noise is cancelled and the squelch closes (otherwise scan will not operate).

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When SCAN has been selected, only the currently displayed memory bank WHICH CONTAINS DATA will be SCANNED, receive mode and frequency are unimportant. Any memory channels which contain no data (empty) will be ignored (skipped).

4-3 Selecting a scan bank

The memory bank identifier (such as "**3**") will be displayed on the middle right of the LCD. If more than one memory channel is programmed into the current memory bank, and when an 'active' channel has been located (busy, so the squelch opens), the scan process will temporarily pause on the active channel, the memory location (such as "**115**") will be displayed along with any accompanying text (displayed underneath the memory location). To select another memory bank for scanning, use the right arrow key or left arrow key. If no data is available, the next bank with valid data will be recalled (empty memory banks are skipped).

To exit from **SCAN** mode, push the **VFO** key.

4-4 Select scan

Select scan enables you to 'tag' memory channels to make a temporary list up to 50 channels in the same memory bank for scanning in a separate list called the SELECT SCAN LIST.

4-4-1 Adding select scan channels in memory read

In memory read mode, push the **FUNC** key, and then push the **1** key to toggle the select scan tag on/off, the icon "**SEL**" confirms selection.
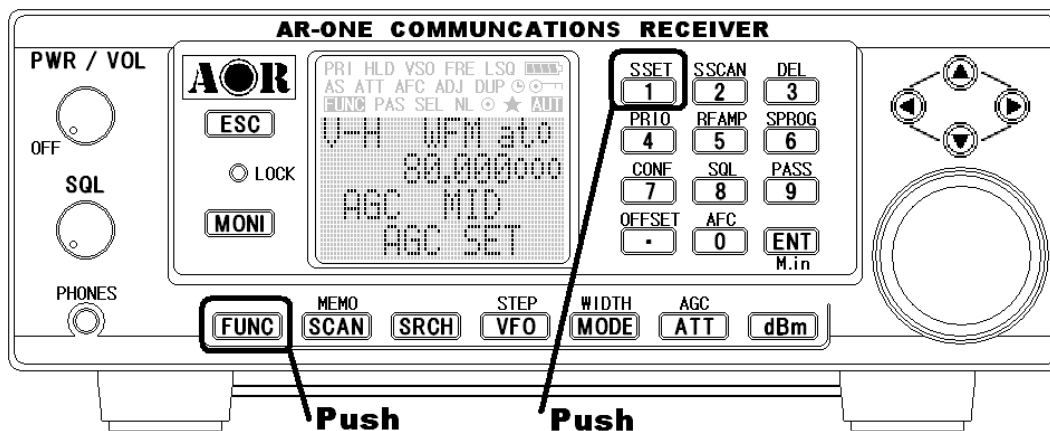
4-4-2 Starting / stopping select scan

To start select scan, you must first have at least two memory channels tagged for select scan.

Push the **FUNC** key, and then push the **2** key to start select scan. The direction of scan can be reversed using the main tuning dial knob.
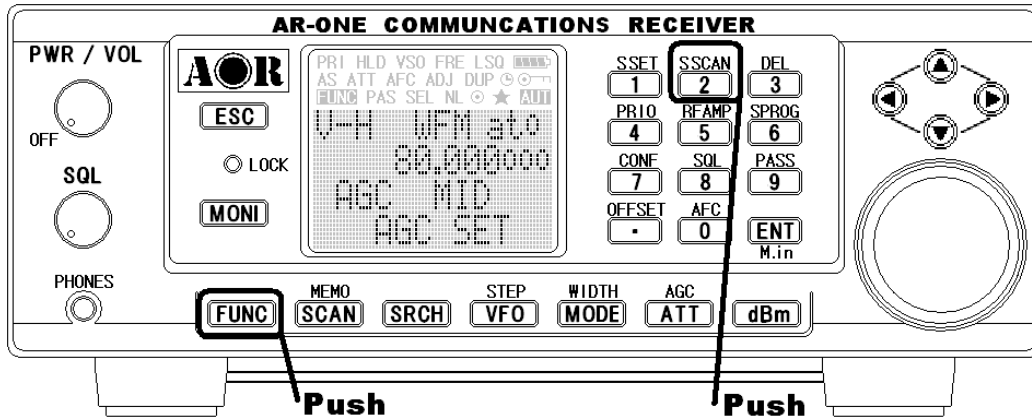
To stop select scan, push the **VFO** key.
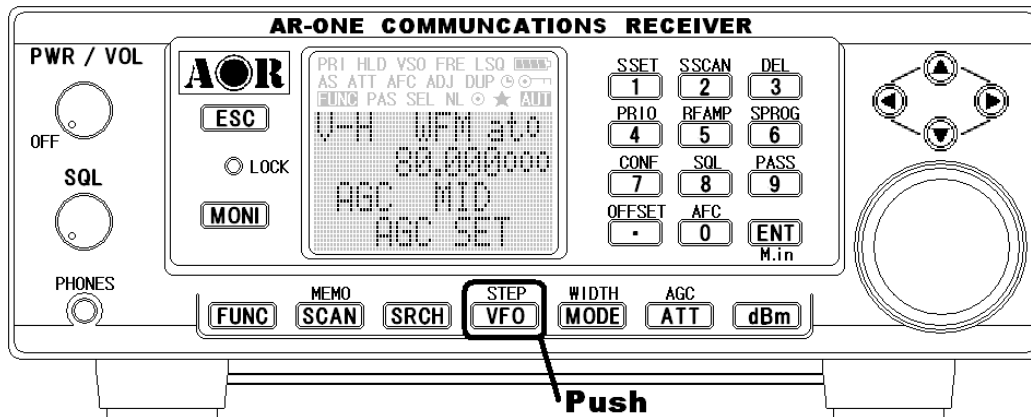
5 Search mode

In search mode, the AR-ONE is programmed to automatically tune between two specified frequency limits looking for activity. Please refer to **section 1-3** of this manual if you do not fully understand the function of SEARCH.

5-1 Search type

The AR-ONE is equipped with PROGRAM SEARCH.

PROGRAM SEARCH = search between user preprogrammed limits

5-1-1 Program search overview

There are 40 program search banks (referred to simply as search banks), which can be programmed with specific parameters:

- LO (lower) start frequency
- HI (upper) stop frequency
- Receive mode (or set to AUTO MODE)
- Step (if auto is not selected)
- Text comment

The program search banks are identified by numbers (01 ~ 40). To help with identification, each bank may be labeled with an alphanumeric text comment.

5-2 Staring program search

Presuming that data is already stored into a search bank …
Push the **SRCH** key to start the program search process.
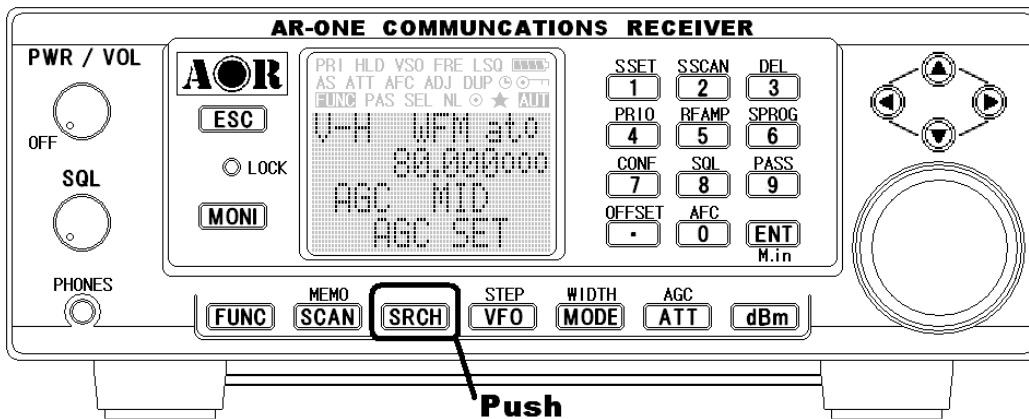
The LCD icon "**SRCH**" will be displayed and as long as the squelch is closed, the search process will start from the lower frequency limit and will progress toward the upper frequency limit. When the program limit is reached, the search loops around and starts the process again.

Note: If no search banks have been programmed, the search will not operate.

5-2-1 Reversing the direction of search

To reverse the direction of search, use the main tuning dial or the up/down arrow keys. This is useful to enable you to search back over an interesting point of the search process.

5-2-2 Forcing the search to resume

If the AR-ONE stops on an unwanted busy frequency, rotate the main tuning dial knob or use the up arrow key or down arrow key to force the search process to resume from the current frequency displayed.

5-2-3 Stopping the search

While the search process is in progress (not stopped), push the **VFO** key (displaying the data on screen before search was started).
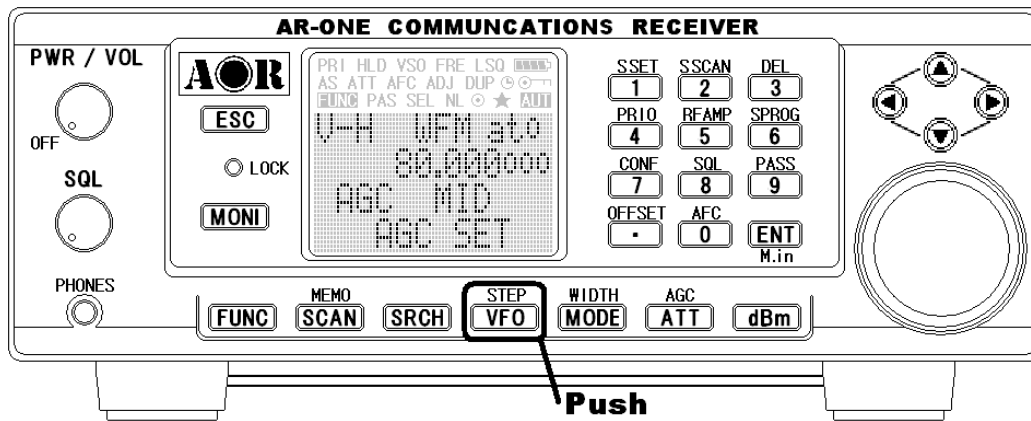
5-3 Selection of search bank

There are 40 search banks. While searching, use the right arrow key or left arrow key to step through search banks which contain data. If no data is programmed in the nominated search bank, the next bank containing valid data will be used.
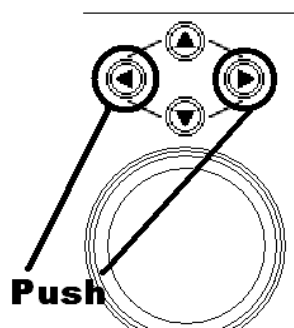
5-4 Programming a search bank

Each of the 40 search banks may be programmed with different frequency limits, receive modes, etc.

Push the **FUNC** key, and then push the **6** key to access the "**SRCH PROG**" menu.

AR-ONE COMMUNCATIONS RECEIVER

Push   **Push**
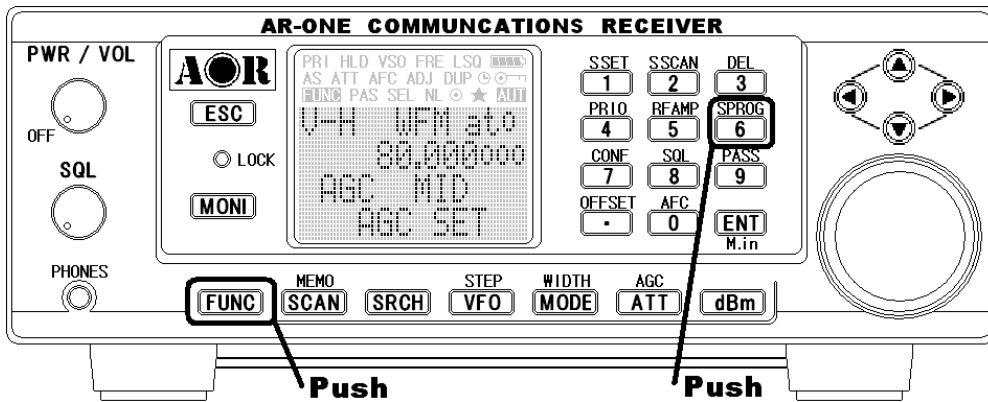
Use the main tuning dial, right arrow key, left arrow key or keypad to select the bank you wish to program or overwrite (The down arrow key is used to move through the menu).


```
SRCH PROG 02
LO    50.0000
HI    54.0000
  SELECT CH
```
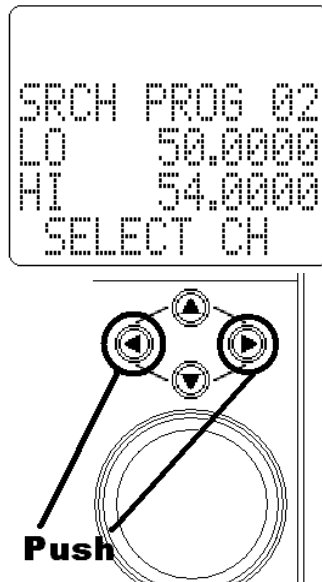
Push

Push the down arrow key.
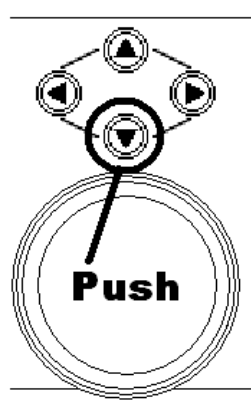
Push

LO: Input the **lower** start frequency in MHz format (don't push the **ENT** key).

```
SRCH PROG 02
LO      50.0000
HI      54.0000
  STAT FREQ
```

Push the down arrow key.
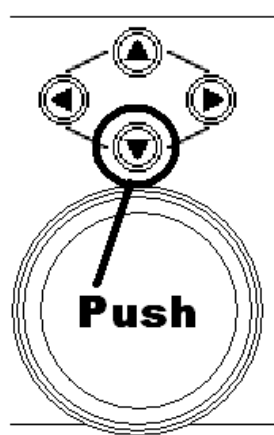
Push

HI: Input the **higher** end (stop) frequency in MHz format (don't push the **ENT** key).

```
SRCH PROG 02
LO      50.0000
HI      54.0000
  STOP FREQ
```

Push the down arrow key.

Push
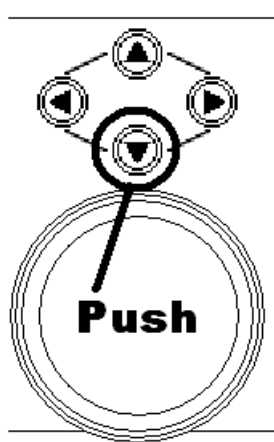
MODE SET: Use the right arrow key or left arrow key or main tuning dial to select receive mode, the **FUNC** key is used as a short cut to "**AUTO**".

```
┌─────────────────────┐
│ SRCH PROG 02        │
│ HI      54.0000     │
│ NFM ▓▓▓▓▓ FM        │
│      MODE SET       │
└─────────────────────┘
```
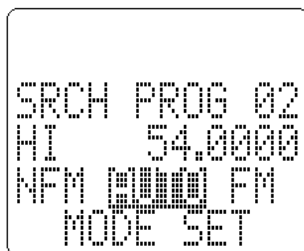
> **Note**: If the receive mode is set to "AUTO", the receive mode, channel step will be taken from the pre-programmed auto band plan data, for this reason the detailing will not be required and skipped. The next menu will be TEXT INPUT.

Push the down arrow key.
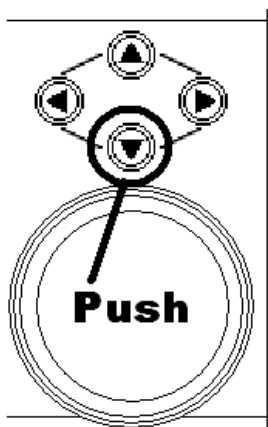
STEP: Assuming that a receive mode other than "**AUTO**" was selected, you will be presented with the "**STEP SET**" menu. Use the main tuning dial or the right arrow key or left arrow key to select the required tuning step from the following:

0.001 (1 Hz), 0.010 (10 Hz), 0.500 (500 Hz), 1.000 kHz, 2.000 kHz, 5.000 kHz, 5.25 kHz, 9.000 kHz, 10.000 kHz, 12.5 kHz, 25.000 kHz, 50.000 kHz, 100.000 kHz.

Alternatively, a step size may be entered in kHz format via the keypad in multiples of 1Hz in the range of 1Hz ~ 100.000 kHz (do not push enter).

Push the down arrow key to access the TEXT INPUT menu.

TXT (TEXT): The cursor will be positioned in the bottom of the LCD. If an unwanted text comment exists, push the **S SET** key to delete the character highlighted. To delete the entire comment, place the cursor on the first character and push the **FUNC** key. Add new text as required.

```
SRCH PROG 02
HI    54.0000
   MODE AUTO
BAMA-50MHz
```

To accept the data input, push the **ENT** key.
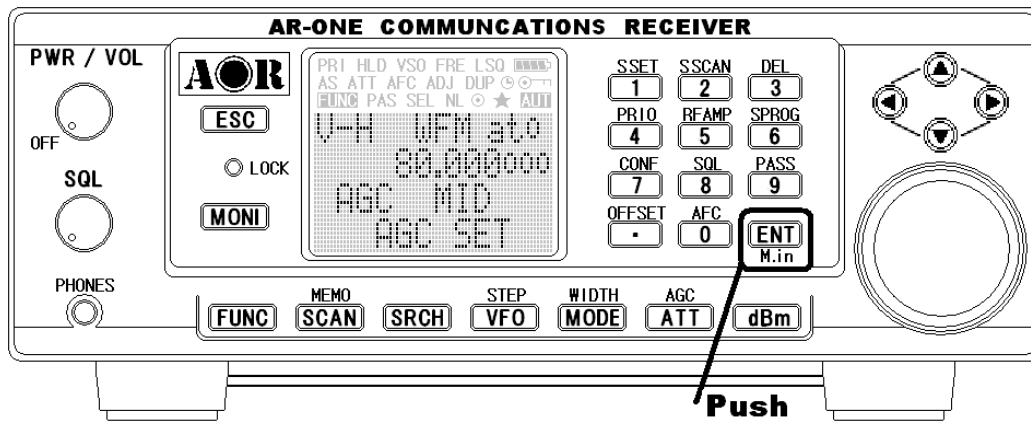
Push

5-5 Deleting search banks

A delete menu is provided so that you can delete program search data (of course you may simply overwrite the data, too) .

While in search mode, the **DELETE menu** is accessed as follows:

Push the **FUNC** key and then push the **3** key.

Push   **Push**
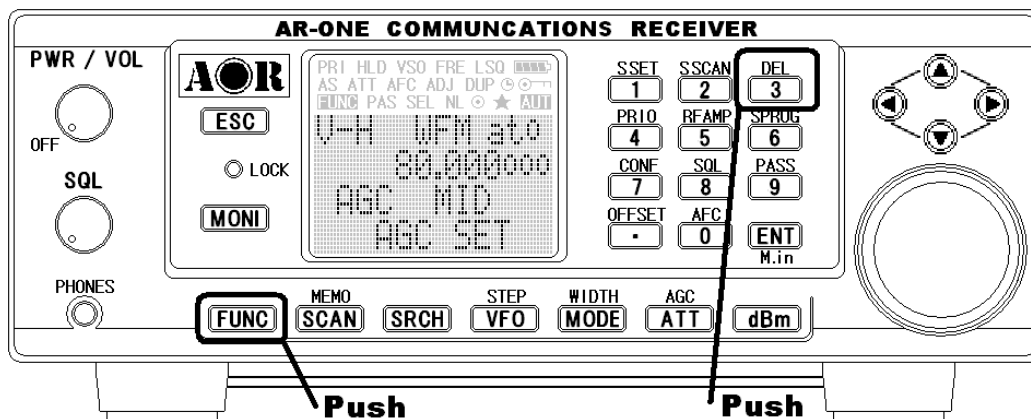
Push the down arrow key.
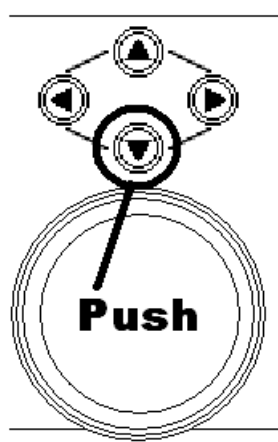
Using the main tuning dial, keypad, right arrow key or left arrow key, select the desired search bank.
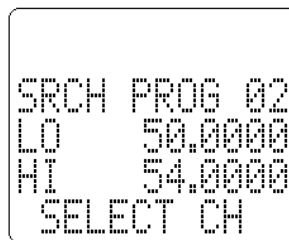
The "**HI**" and "**LO**" frequency limits will appear on the LCD along with any associated text comment to aid the identification of the required search bank.

To delete the program search bank, push the **ENT** key.
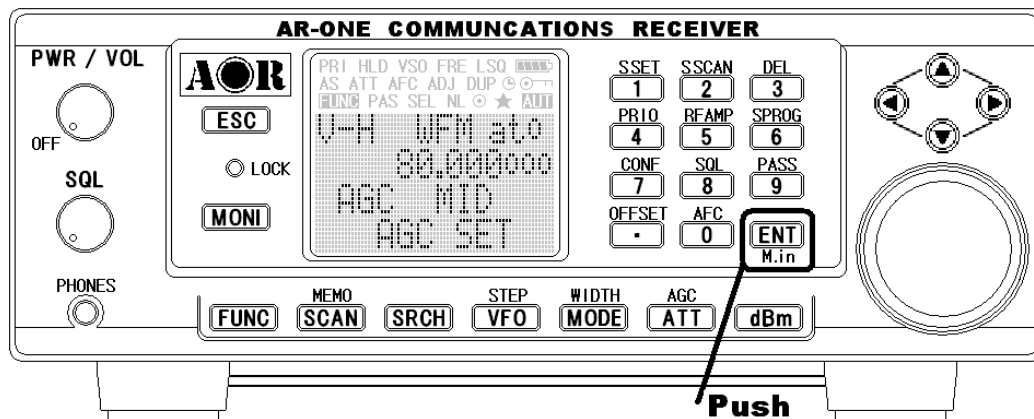
5-6 Locking out unwanted active frequencies (PASS)

It is possible to lock out (PASS) unwanted frequencies while in program search mode.

This is useful to eliminate unwanted permanent transmissions. It is important to understand

the PASS function before taking action or transmissions may be missed.

While stopped on an unwanted frequency, push **FUNC** and then push the **9** key.
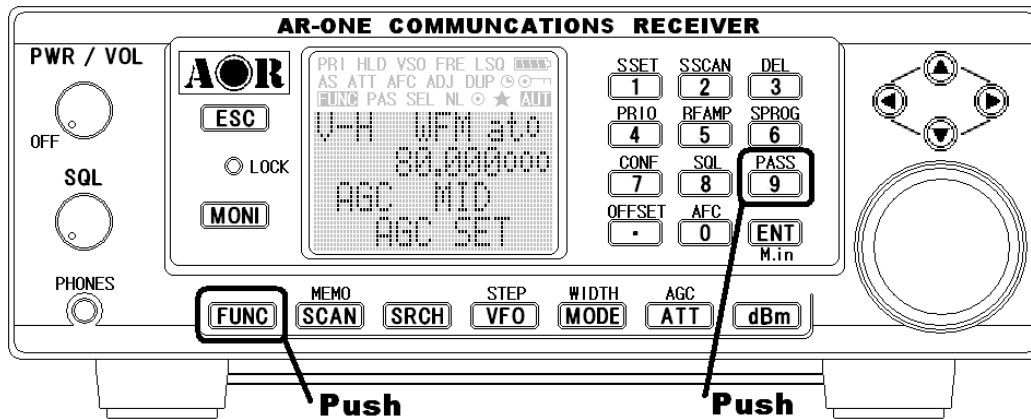
The search process will resume. It will appear that **all** frequencies are still searched, however, locked out frequencies will be 'passed over', the search will **not stop** on locked out frequencies.

5-6-1 Deleting pass channels

If you are currently in search mode, push the **FUNC** key and then push the **3** key.

This will access the **MEMORY CHANNEL DELETE MENU**.
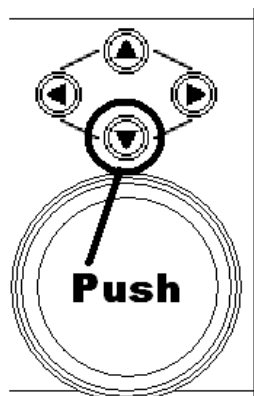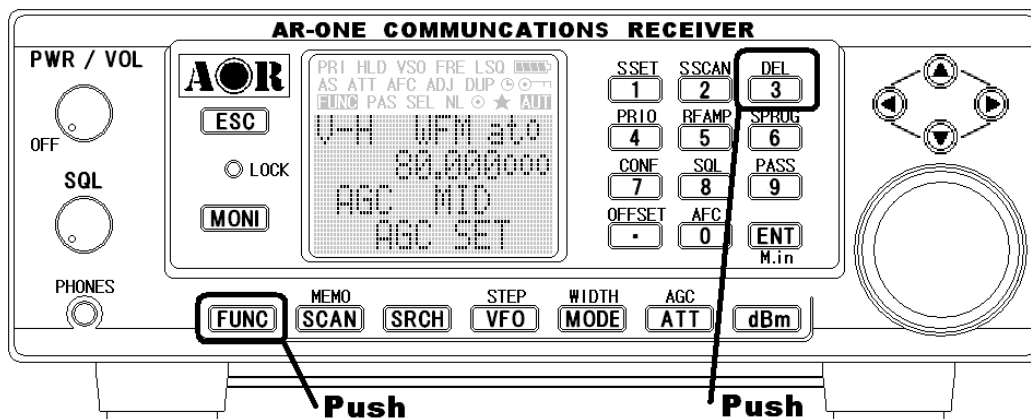
Push the down arrow key.

If pass channels have already been tagged for the current search bank, the icon "**PAS**" (PASS) will be displayed on the LCD.

Push the **FUNC** key to delete the pass frequency.
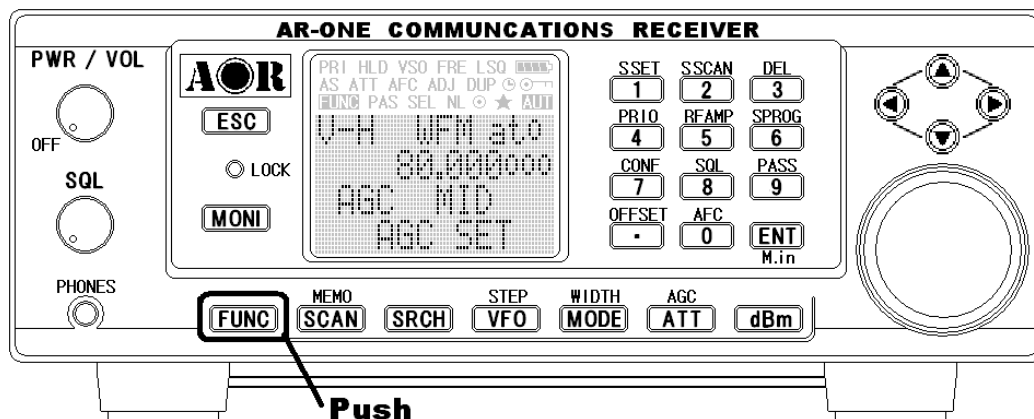
To exit from this menu, push the **ENT** key.
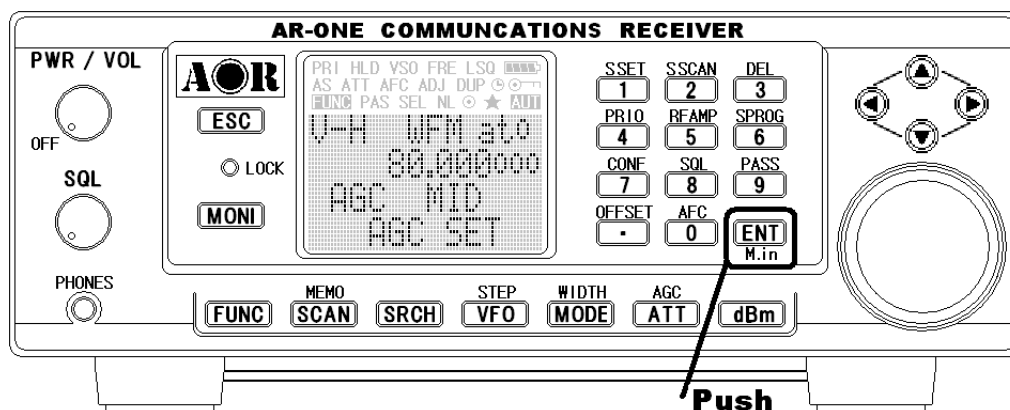
6 Configuration menu

The configuration menu is used to set fundamental operating parameters and other variables which do not appear in any other menu heading.

BEEP	Confirmation & error tone
LAMP	LCD & keypad illumination
DIMM	Backlit illumination dimmer
CONTRAST	LCD contrast adjustment
OPENING MESSAGE	Change the power-up message
AGC	AGC (Automatic Gain Control) adjustment
IF-GAIN	IF Gain control adjustment
RF-GAIN	RF Gain control adjustment

BPS	Communication data speed setting	
RMT-ID	RS-232C identification address setting	
DELAY	Scan/Search delay setting	
FREE	Scan/Search free setting	
SPEAKER	Speaker/headphones setting	
HPF/LPF	Audio Filter setting	
DE-Emphasis	De-emphasis setting	
PRIO-CH	Priority channel setting	

Item	Parameter	Default
BEEP	**OFF/ 01 – 09**	**6**
LAMP	**AUTO/ON/OFF**	**ON**
DIMM	**ON/OFF**	**OFF**
CONTRAST	**00 – 32**	**12**
OPENING MSG	**NORM/QUICK/USER**	**NORM**
MANUAL AGC	**0 – 255**	**255**
IF-GAIN	**0 – 255**	**255**
RF-GAIN	**0 – 255**	**255**
BPS	**9600, 19200 or 38400**	**19200**
RMT-ID	**00 – 99**	**0**
DELAY	**00 – 99**	**0**
FREE	**OFF/0.1 – 9.9**	**OFF**
SPEAKER (REAR)	**ON/OFF**	**ON**
(FRONT)	**ON/OFF**	**ON**
(PHONES)	**ON/OFF**	**ON**
HPF	**AUTO/50/200/300/400Hz**	**AUTO**
LPF	**AUTO/3K/4K/6K/12K**	**AUTO**
De-Emphasis	**Auto/THRU/25μS/75μS/750μS**	**AUTO**

6-1 Configure beep

The AR-ONE emits confirmation 'beeps' while the keypad is used. A 'HIGH' pitched beep indicates correct operation while a 'LOW' pitched beep indicates that an error or unexpected entry has taken place. The volume of the beep is independent of the main volume control and can be separately defined. It is recommended that the beep function be enabled,

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especially in the early days while gaining familiarity of the receiver.

To access the configuration menu, push the **FUNC** key and then push the **7** key.
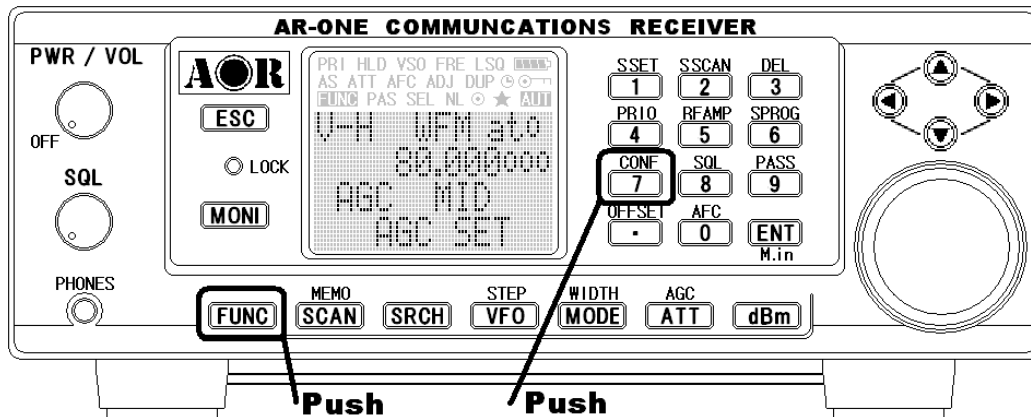
The first item in the configuration menu is "**BEEP**", the **default is beep on** with a volume level of **06**. Use the main tuning dial, the right arrow key or the left arrow key to change the beep level between the range of OFF and 01 to 09 (09 being the loudest).
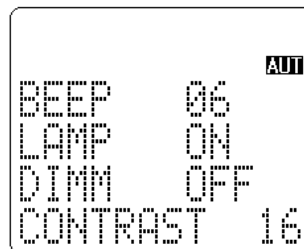
Push the **ENT** key to accept the data and return to a standard display.

Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (LAMP).

6-2 Configure lamp

The AR-ONE is equipped with high intensity green LEDs to illuminate the LCD and keypad when operating in areas of low level lighting.

The lamp may be configured in three ways:

AUTO: The lamp will automatically illuminate when the keypad or main tuning dial are used. The lamp will remain illuminated for a further five second after the last key push and then switch off. The lamp will also automatically illuminate while the squelch opens.

ON: This is **default** setting. The lamp will continuously illuminate the LCD and keypad.

OFF: The lamp remains permanently extinguished, this is useful when used in areas of high light levels.

To access the configuration menu, push the **FUNC** key and then push the **7** key.

Push the down arrow key to move the cursor to the "**LAMP**" selection point.

Use the main tuning dial, the right arrow key or the left arrow key to toggle the lamp between AUTO, ON and OFF.

Push the **ENT** key to accept the data and return to a standard display. Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (DIMM).

6-3 Configure dimmer

A DIMM (dimmer) function is available to dim the intensity of the LEDs. This function is useful when used in areas of high light levels.

The default setting of DIMM is "**OFF**".

To access the configuration menu, push the **FUNC** key and then push the **7** key.

Push the down arrow key to move the cursor to the "**DIMM**" selection point.

Use the main tuning dial, the right arrow key or the left arrow key to toggle the dimmer between ON and OFF.

Push the **ENT** key to accept the data and return to a standard display.

Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (CONTRAST).

6-4 Configure contrast

The AR-ONE is equipped with variable LCD contrast which is adjustable in 32 steps to provide best visibility under different viewing angles, extremes of ambient light & temperature (and between sets due to variation).

The default setting for contrast is 12. The display generally becomes too dark to read around 20 and too feint around 02. Best results are usually achieved within the range of 09 – 15.

To access the configuration menu, push the **FUNC** key and then push the **7** key.

Push the down arrow key to move the cursor to the "**CONTRAST**" selection point.

Use the main tuning dial, the right arrow key or the left arrow key to vary the contrast level to achieve best visibility.

Push the **ENT** key to accept the data and return to a standard display. Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (OPENING MESSAGE).

6-5 Configure Manual AGC

The manual AGC function is to adjust the receiver's AGC (Automatic Gain Control) when it

is set OFF.

The default setting for Manual AGC is 255, maximum gain control value. The value can be adjusted according to the receiving condition.

To access the configuration menu, push the **FUNC** key and then push the **7** key.
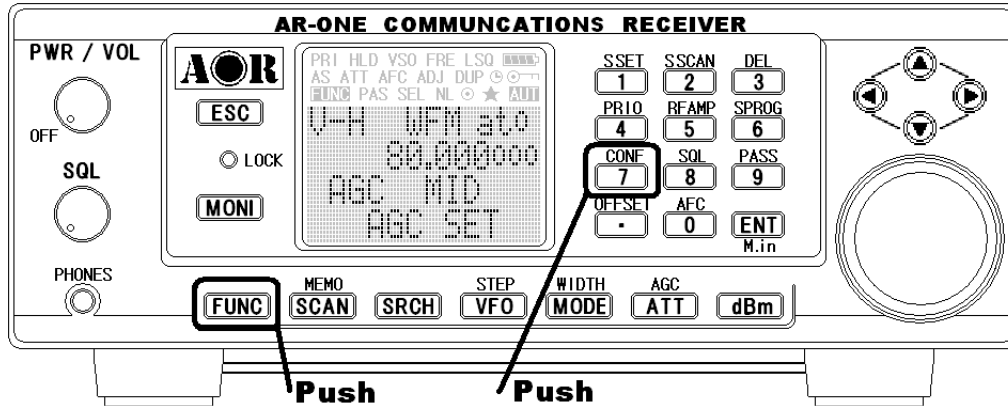
Push the down arrow key to move the cursor to the "**MANU AGC**" selection point.
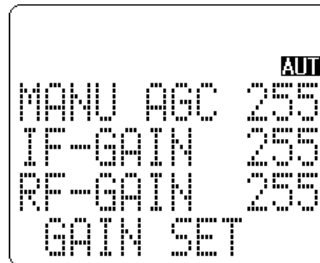
Use the main tuning dial, the right arrow key or the left arrow key to vary the manual AGC level for best reception.

Push the **ENT** key to accept the data and return to a standard display. Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (IF-GAIN).

6-6 Configure IF-GAIN (Intermediate Frequency gain)

The IF gain control reduces the amplification in the receiver's IF circuits and has the effect of reducing the sensitivity of the receiver. Normally, this is performed by the AGC system, and the control is left at maximum gain, but reducing the gain can be useful to limit noise when listening to CW or SSB signals. The IF gain control must be used if the AGC is turned off.

The default setting for IF-GAIN is 255 (maximum gain control value).

To access the configuration menu, push the **FUNC** key and then push the **7** key.

Push the down arrow key to move the cursor to the "**IF-GAIN**" selection point.

Use the main tuning dial, the right arrow key or the left arrow key to vary the IF-Gain

level for best reception.

Push the **ENT** key to accept the data and return to a standard display. Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (RF-GAIN).

6-7 Configure RF-GAIN (Radio Frequency gain)

The RF gain setting switches in the attenuator or preamplifier to suite the band conditions and antenna in use.

The default setting for RF-GAIN is 255 (maximum gain control value). The value can be adjusted according to the receiving conditions.

To access the configuration menu, push the **FUNC** key and then push the **7** key.

Push the down arrow key to move the cursor to the "**RF-GAIN**" selection point.

Use the main tuning dial, the right arrow key or the left arrow key to vary the RF-Gain level for best reception.

Push the **ENT** key to accept the data and return to a standard display. Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (BPS).

6-8 Configure Remote BPS (Baud rate)

The Remote BPS Set menu is used to configure the RS-232C computer control settings as it is important that they exactly match those of an associated computer connection or another AR-ONE (connected via a male 9-pin to male 9-pin straight cable).

To access the configuration menu, push the **FUNC** key and then push the **7** key.

Push the down arrow key to move the cursor to the "**BPS SET**" selection point.

Use the main tuning dial, the right arrow key or the left arrow key to select the desired RS-232C baud rate between 9600, 19200 or 38400 bps. The default setting is 19200 bps.

Push the **ENT** key to accept the data and return to a standard display. Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (RMT-ID).

6-9 Configure RMT-ID (Remote ID)

When multiple units are connected via remote connectors, each AR-ONE must be assigned a different ID (address). The value is adjustable between 00 ~ 99. The default value is 00.

> **Important notice**: It is extremely important to set the RMT-ID to **00** for normal operation of the RS-232C connection.

To access the configuration menu, push the **FUNC** key and then push the **7** key.
Push the down arrow key to move the cursor to the "**RMT-ID**" selection point.
Use the main tuning dial, the right arrow key or the left arrow key to change the AR-ONE's RS-232C identification address.
Push the **ENT** key to accept the data and return to a standard display. Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (DELAY).

6-10 Configure DELAY (Scan delay and Search delay)

This parameter affects the time the AR-ONE will remain on an active frequency in scan or search mode once the received signal has disappeared and the squelch has closed. This is particularly useful for customizing how long the receiver will wait for a reply before resuming scan or search. For example, passing communications back and forth between a control tower / aircraft may take a few seconds. The limits are OFF / HOLD and 0.1 to 0.9 seconds in 0.1 second increments. The default is 2.0 seconds.
To access the configuration menu, push the **FUNC** key and then push the **7** key.

Push the down arrow key to move the cursor to the "**DELAY**" selection point.

Use the main tuning dial, the right arrow key or the left arrow key to select the desired delay parameters.

> **2.0s**   The AR-ONE will wait the specified time after the squelch closes before resuming scan or search.
>
> **HOLD**   The AR-ONE will stop indefinitely when an active frequency is located, this is very useful when you don't want to miss that once-in-a-lifetime transmission!
>
> **OFF**   The AR-ONE will resume scan or search instantaneously when the squelch closes.

Push the **ENT** key to accept the data and return to a standard display. Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (FREE).

6-11 Configure FREE (Scan free and Search free)

The scan free and search free parameter determines how long the AR-ONE will remain on **active** frequency before resuming scan or search even though the frequency is still active. This is useful if you wish to gain a snap shot of activity without the AR-ONE being tied to a busy frequency for long periods of time (such as when monitoring active commercial repeaters etc). Scan free and search free time saves you having to manually intervene to force the scan or search process to resume and saves the need to lockout memory channels or search frequencies using the **PASS** function. The limits are OFF and 0.1 to 9.9 seconds. The default setting is OFF.

To access the configuration menu, push the **FUNC** key and then push the **7** key.

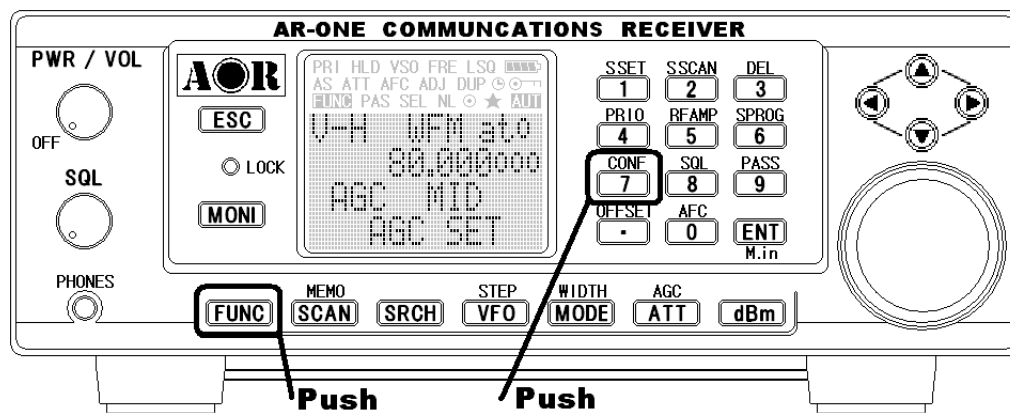Push the down arrow key to move the cursor to the "**FREE**" selection point.

Use the main tuning dial, the right arrow key or the left arrow key to select the desired free parameters.

Push the **ENT** key to accept the data and return to a standard display. Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (SPEAKER).

6-12 Configure SPEAKER

The AR-ONE is equipped with 2 separate speakers, one in the main receiver unit and one in the control head (Note: This function is available only when an optional separation kit is used) and a phones jack. Each speaker / head phones output can be configured under this menu.

6-12-1 Configure rear speaker

To access the configuration menu, push the **FUNC** key and then push the **7** key.

Push the down arrow key to move the cursor to the "**REAR SP**" selection point. This menu is to configure the rear speaker. Use the main tuning dial, the right arrow key or the left arrow key to select the desired rear speaker setting (ON or OFF).

Push the **ENT** key to accept the data and return to a standard display. Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (FRONT SP).

6-12-2 Configure front speaker

(Note: This function is available only when an optional separation kit is used)

To access the configuration menu, push the **FUNC** key and then push the **7** key.

Push the down arrow key to move the cursor to the "**FRONT SP**" selection point. This menu is to configure the front speaker. Use the main tuning dial, the right arrow key or the left arrow key to select the desired rear speaker setting (ON or OFF).

Push the **ENT** key to accept the data and return to a standard display. Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (PHONES).

6-12-3 Configure head phones output

To access the configuration menu, push the **FUNC** key and then push the **7** key.

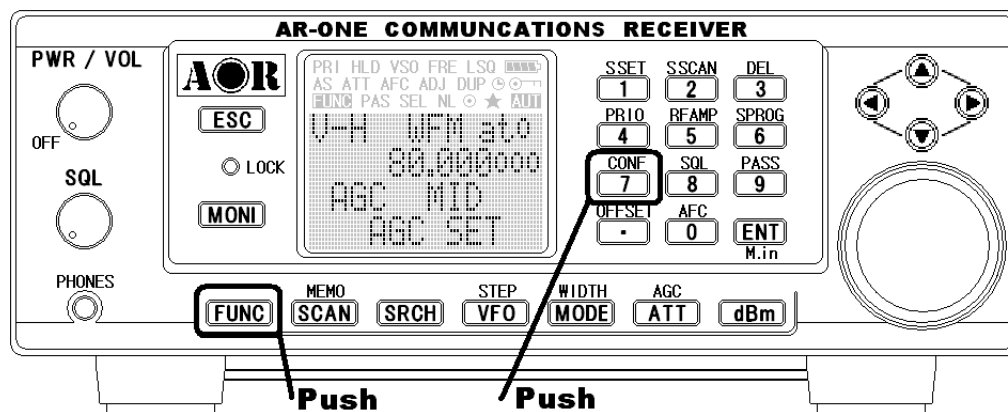Push the down arrow key to move the cursor to the "**PHONES**" selection point. This menu is to configure the headphones output. Use the main tuning dial, the right arrow key or the left arrow key to select the desired head phones output setting (ON or OFF).

Push the **ENT** key to accept the data and return to a standard display. Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (Audio Filter).

6-13 Configure audio filters (HPF / LPF)

An audio HPF (High Pass Filter) and a LPF (Low Pass Filter) are available.

6-13-1 Configure audio HPF (high pass filter)

The audio high pass filter is useful for limiting the audio bass response (allowing higher tones to pass) improving intelligibility in certain circumstances (such as low frequency whistles on AM, SSB & CW).

There are four available pass frequencies: 50Hz, 200Hz, 300Hz, and 400Hz.

The higher the frequency the more limited the audio bandwidth. For highest fidelity for listening, select 50Hz. The filter selection can be set to auto mode to select the proper filter setting automatically.

The default is **AUTO**.

To access the configuration menu, push the **FUNC** key and then push the **7** key.
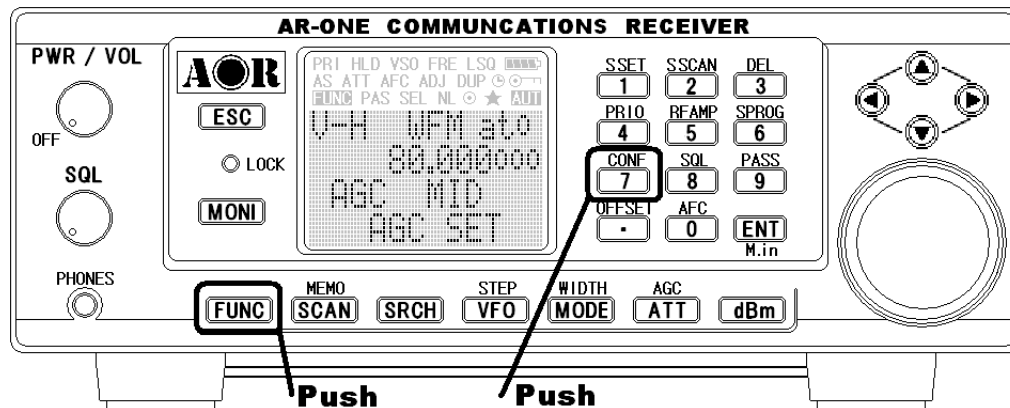
Push the down arrow key to move the cursor to "**HPF**" selection point.
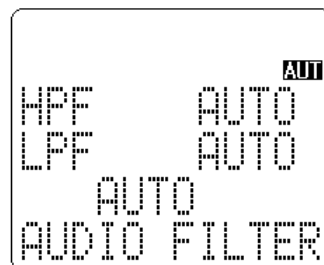
This menu is to configure the high pass filter.

Use the main tuning dial, the right arrow key or the left arrow key to select the desired high pass filter setting (AUTO / 50Hz / 200Hz / 300 Hz or 400Hz).

Push the **ENT** key to accept the data and return to a standard display. Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (LPF).

6-13-2 Configure audio LPF (low pass filter)

The audio low pass filter is useful to cut off high tones (allowing low tones to pass) to improve intelligibility of weak signals in close proximity to adjacent interference and to remove **hiss** making listening for extended periods easier on the ears.

There are four available pass frequencies: 3KHz, 4KHz, 6KHz and 12KHz.

The lower the frequency the more limited the audio bandwidth. For highest fidelity for listening, select 12.0KHz. The filter selection can be set to auto mode to select the proper filter setting automatically. The default is **AUTO**.

To access the configuration menu, push the **FUNC** key and then push the **7** key.

Push the down arrow key to move the cursor to the "**LPF**" selection point.

This menu is to configure the low pass filter.

Use the main tuning dial, the right arrow key or the left arrow key to select the desired high pass filter setting (AUTO / 3KHz / 4KHz / 6KHz or 12KHz).
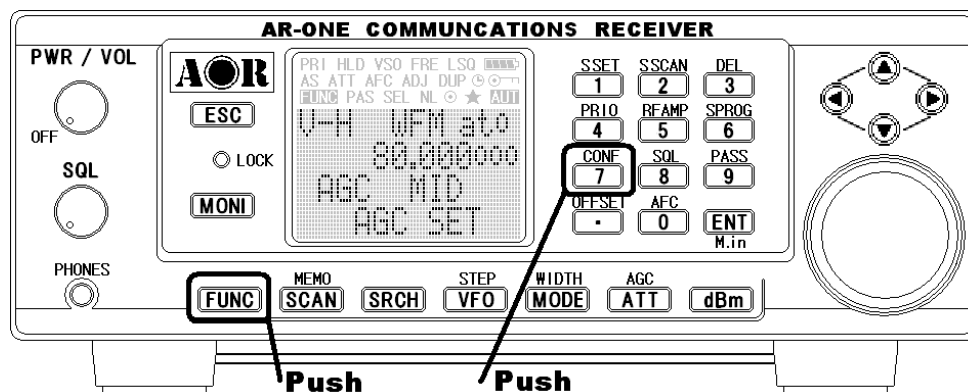
Push the **ENT** key to accept the data and return to a standard display. Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (De-Emphasis).

6-14 Configure Audio De-emphasis

This is really only applicable to FM mode and affects the **sharpness** of recovered audio.

The FM transmissions in different world areas have different defaults for de-emphasis.

For example, a value of 750 is selected in Europe, other settings may result in the recovered audio sounding very muffled.

The available range is as follows: THRU, 25μS, 50μS, 75μS, and 750μS

The audio de-emphasis can be set to auto mode to select the proper setting automatically. The default is **AUTO**.

To access the configuration menu, push the **FUNC** key and then push the **7** key.

Push the down arrow key to move the cursor to the "**De-Emphasis**" selection point.

This menu is to configure the audio de-emphasis.

Use the main tuning dial, the right arrow key or the left arrow key to select the desired de-emphasis setting (AUTO / THRU / 25uS / 50uS / 75uS or 750uS).

Push the **ENT** key to accept the data and return to a standard display. Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (PRIO-CH).

6-15 Configure PRIO-CH (Priority Channel)

The priority function enables you to carry on scanning, searching or monitoring while the

AR-ONE checks a selected frequency for activity (taken from one of the 1,000 memory channels periodically).

The priority checking is accomplished by momentarily tuning the receive circuit to the priority frequency to see if it is **active**. If activity is found, the AR-ONE will remain on the active frequency until the signal disappears. If no activity is detected, the receiver returns to the VFO frequency, scan channel or search bank from where it originated.

The priority function has a large number of applications and is particularly useful for keeping an eye on a distress frequency while scanning or searching another frequency band.

Note: Depending upon the frequency and mode stored as priority, an audible **click** may be heard when the priority function is in operation. This is quite normal and is caused by the internal switching of circuitry necessary to accomplish the frequency change (as two frequencies cannot simultaneously be monitored).

6-15-1 Engaging Priority channel

Once engaged, the frequency is checked for activity periodically by the preset period that is set by the configuration menu.

To engage the priority function, push the **FUNC** key and then push the **4** key.
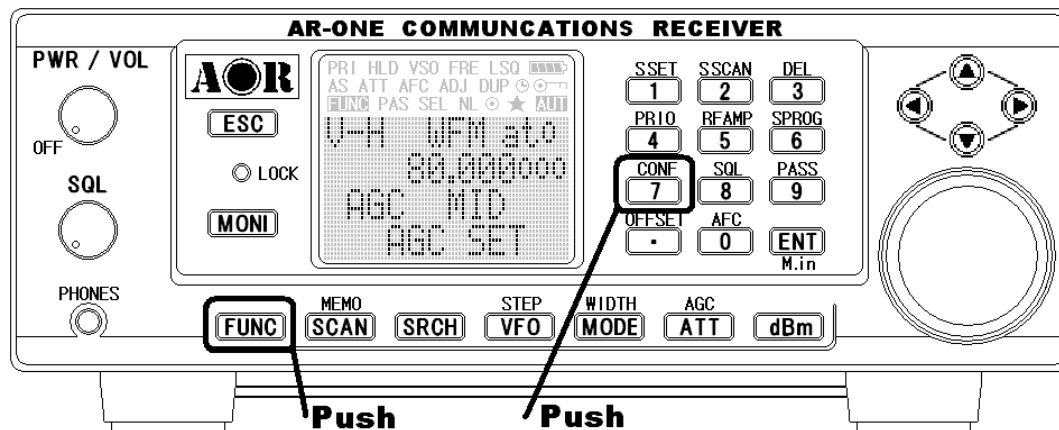
Push the down arrow key to move the cursor to the "**PRIO-CH**" selection point.

This menu is to configure the priority channel.

Use the main tuning dial, the right arrow key or the left arrow key to select the desired priority channel. Push the **downward** key to select the time interval. Use the main tuning dial, the right arrow key or the left arrow key to select the desired time interval for the priority channel.

Push the **ENT** key to accept data and return to a standard display. Alternatively, push the **ESC** key to abort entry, or, push the **down arrow** key to move to the next item on the configuration menu (IF output).

6-16 Configure IF output frequency

The function enables you to tap the 2nd IF signal (10.7MHz) or the 3rd IF signal (455KHz) from the BNC (marked as 10.7MHz) type connector on the rear panel. The 10.7MHz of the 2nd IF signal is to be used with the optional SDU5600 spectrum display unit for signal analysis. The bandwidth at 10.7 MHz is +/- 5 MHz from the center frequency (10 MHz total).

6-16-1 Selecting IF output frequency

To select the IF frequency, push the **FUNC** key and then push the **7** key.
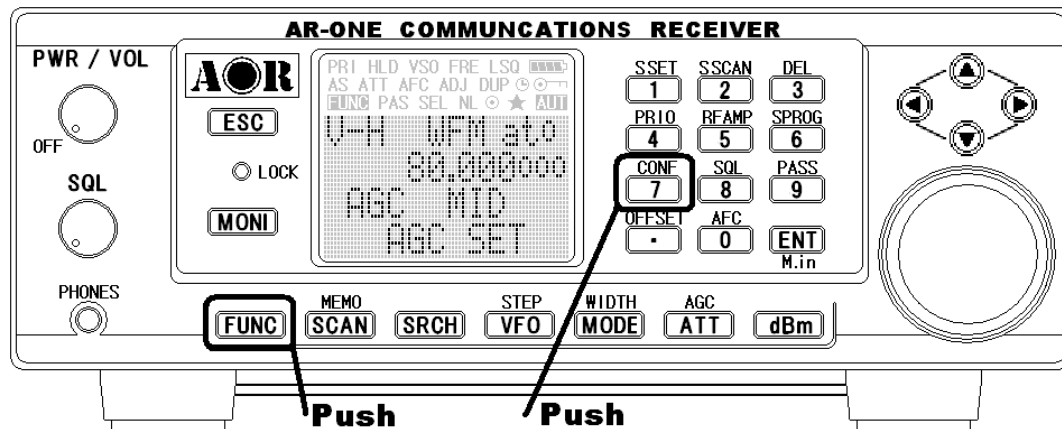
Push the down arrow key to move the cursor to the "**IF out SEL**" selection point.

Use the main tuning dial, the right arrow key or the left arrow key to select either 455kHz or 10.7 MHz.

Push the **ENT** key to validate. Alternatively, push the **ESC** key to abort entry. Or, push the **down arrow** key to move to the next item on the configuration menu (Reference Signal).

6-17 Configure reference signal source

The function enables you to select the reference signal of the receiver. The AR-ONE has a built-in stable reference oscillator, however, an external high stability 10 MHz reference (such as off-air atomic coupled) can be accepted from the SMA connector (marked as **10 MHz IN**) on the rear panel of the AR-ONE.

Push the down arrow key to move the cursor to the "**REF SEL**" selection point.

Use the main tuning dial, the right arrow key or the left arrow key to select the desired reference signal source (internal or external). The default is INT.

Push the **ENT** key to accept data and return to a standard display. Alternatively, push the **ESC** key to abort entry.

7 Computer control

Connect the AR-ONE (any of the 2 serial sockets) to your computer's serial port, using a RS-232C cable terminated in a 9-pin plug.

The RS-232C parameters may be defined using the CONFIGURATION menu. Baud rates (data transfer speed) may be set to 9600, 19200 or 38400 bps. 19200 bps is the factory default. It is also possible to set an 'address' to facilitate connection of up to 99 AR-ONE receivers to a single port for custom operation, the addresses may be set between the limits of 01 to 99 with 00 representing single radio operation.

7-1 How to send an RS-232C command

Each command comprises of two upper case letters (header) along with operations as required. All commands use ASCII code which **MUST BE IN UPPER CASE** (except for the up arrow key, down arrow key, right arrow key, left arrow key and remote ID command (^A) which are non-printable and use the control codes of ASCII). A terminal program such as Windows Hyperterminal should be set as follows:

Baud rate	9600, 19200 or 38400 bps (this must match AR-ONE)
DATA BIT	8
STOP BIT	2
PARITY	NONE
XFLOW	NONE

Make sure that "local echo" is turned on. On Windows Hyperterminal you can access this setting at: FILE > PROPERTIES > SETTINGS > ASCII SETUP. Check the box labeled "Echo typed characters locally" and validate with OK.

7-2 Power on the AR-ONE

There are 2 switches to set ON:

-On the back of the receiver, labeled "MAIN". The switch's green LED should light.

-On the front panel's "PWR/VOL" knob. Turn it slightly clockwise until you feel a click. The receiver's LCD and keys will light after about 4 seconds.

Now you can send any command from your PC's Hyperterminal software.

All commands **MUST BE IN UPPER CASE.**

A multiple command entry is only valid where specified. Where a multiple command entry is allowed, each command MUST be separated with a space "h20" (HEX DECIMAL). Each command is completed and a [CR] or [CR][LF]. Although there is no local echo, either [CR]

or specified response should come back from the receiver after confirming the correct command. If no response has been gained after a short while, the receiver has failed to receive the command properly. Send a [CR] then re-send the command. Should problem persist, check your connections and try reducing the RS-232C baud rate.

7-3 Detailed RS-232C command listing of the AR-ONE

X	Power on	x: any key to power on the AR-ONE (it takes 4 sec.)
QP	Power off	Power off
^Ann	Remote ON	Hex value 0x01 Accept a value nn in the range of 00-99 for remote connection
EX	Remote off	Remote off
IDnn	Remote ID	To set: IDnn<CR>, nn: 00-99. To read:ID<CR>

RX MODE

Vx	Select VFO	To set: Vx<CR>, x:A – J (default :A)
MRmnn	Memory mode	m: 0 – 9 (memory bank), n: 00 – 99 (memory channel) (default: 000)
MSm	Memory scan mode	m: 0 – 9 (memory bank), (default: 000)
SM	Memory select mode	
SSmm	Search mode	mm: 01 – 40 (search bank), (default: 01)
To read: RX <CR>		
Response: Memory manual mode MR MXmnn RFnnnnnnnnnn STnnnnnn Aun MDn BWn ATn AMn TMxxxxxxxx		
Memory scan mode MS MXmnn RFnnnnnnnnnn STnnnnnn Aun MDn BWn ATn Amn TMxxxxxxxx		
Memory select mode SM MXmnn RFnnnnnnnnnn STnnnnnn Aun MDn BWn Atn Amn TMxxxxxxxx		
Search mode SSmm RFnnnnnnnnnn STnnnnnn Aun MDn BWn Atn Amn TTxxxxxxxx		
VFO mode Vx RFnnnnnnnnnn STnnnnnn Aun MDn BWn Atn Amn (default: VFO-A)		

FREQUENCY

RF	RFnnnnnnnnnn (entry in Hz format)	(VFO mode only)
RF	RFnn.nn (entry in MHz format)	(VFO mode only)
Vx	Vx nnnnnnnnnn (entry in Hz format)	x: A – J (VFO)
To read: RF <CR>		
Response: RFnnnnnnnnnn (Hz)		

STEP FREQUENCY

ST	STnnnnnn (entry in Hz format)	(not available in search mode)
ST	STnn.nn (entry in kHz format)	(not available in search mode)
ST	STnn …nn (entry in kHz format)	(not available in search mode)
To read: ST <CR>		
Response: STnnnnnn (Hz)		

AUTO MODE

AU	AUn	n: 0 Auto mode off
		n: 1 Auto mode on
To read: AU <CR>		
Response: AUn		

OPERATION MODE

MD	MDn (n: 0 - 6) Auto mode will be disabled by this command
	n=0 FM (BW=16kHz,HPF=50Hz,LPF=3kHz,De-emphasis=750μS)
	n=1 AM (BW=6kHz, HPF=50Hz, LPF=3kHz, De-emphasis=THRU)
	n=2 CW (BW=0.5KHz, HPF=50Hz, LPF=3kHz, De-emphasis=THRU)
	n=3 USB (BW=3kHz, HPF=50Hz, LPF=3kHz, De-emphasis=THRU)
	n=4 LSB (BW=3kHz, HPF=50Hz, LPF=3kHz, De-emphasis=THRU)
	n=5 WFM (BW=200kHz, HPF=50Hz, LPF=12kHz, De-emphasis=75μS)
	n=6 NFM (BW=8.5kHz, HPF=50Hz, LPF=3kHz, De-emphasis=750μS)
To read: MD <CR>	
Response: MDn	

BANDWIDTH

BW	BWn (n: 0 – 8) Auto mode will be disabled by this command
	n=0 0.5kHz
	n=1 3.0kHz
	n=2 6.0kHz
	n=3 8.5kHz
	n=4 16kHz
	n=5 30kHz
	n=6 100kHz
	n=7 200kHz
	n=8 300kHz
To read: BW <CR>	
Response: BWn	

HPF (High Pass Filter)

HP	HPn (n: 0 – 3 & F) Auto mode will be disabled by this command
	n=0 50Hz
	n=1 200Hz
	n=2 300Hz
	n=3 400Hz
	n=F AUTO
To read: HP <CR>	
Response: HPn	

LPF (Low Pass Filter)

LP	LPn (n: 0 – 3 & F) Auto mode will be disabled by this command
	n=0 3KHz
	n=1 4KHz
	n=2 6KHz
	n=3 12KHz
	n=F AUTO
To read: LP <CR>	
Response: LPn	

AGC (Automatic Gain Control)

AC	Acn (n: 0 – 2)
	n=0 AGC - OFF
	n=1 AGC - FAST
	n=2 AGC - SLOW
	n=3 AGC - MIDDLE
To read: AC <CR>	
Response: ACn	

DE-EMPHASIS

EN	ENn (n: 0 – 5) Auto mode will be disabled by this command
	n=0 $25\,\mu$ S
	n=1 $50\,\mu$ S
	n=2 $75\,\mu$ S
	n=3 $750\,\mu$ S
	n=4 THRU
	n=5 AUTO
To read: EN <CR>	
Response: ENn or Enmn (m=5, AUTO)	

RF ATT (Attenuator)

AT	ATn (n: 0 –3)
	n=0 0dB
	n=1 10dB
	n=2 20dB
	n=3 AUTO
To read: AT <CR>	
Response: ATn	

RF AMP (Amplifier)

AM	AMn (n: 0 – 2)
	n=0 RF AMP OFF
	n=1 RF AMP ON
	n=2 RF AMP AUTO
To read: AM <CR>	
Response: AMn	

BFO FREQ (Beat Frequency Oscillator Frequency)

BF	BF +/-nnnn (nnnn: 0000 - +/- 3000Hz)
	Available in CW, LSB, USB mode only
	Default: CW +800Hz, USB +1500Hz, LSB -1500Hz
To read: BF <CR>	
Response : BF +/-nnnn	

N – SQ (Noise Squelch) THRESHOLD

RQ	RQnnn (nnn: 000 – 255) Default: 000 (OFF)
To read: RQ <CR>	
Response: RQ nnn	

L – SQ (Level Squelch)

DB	DBnnn (nnn: 000 – 255) Default: 000 (OFF)
To read: DB <CR>	
Response: DB nnn	

AF GAIN

AG	Agnnn (nnn: 000 –255) Default: 255
	Note: The volume control knob must be turned fully counterclockwise
To read: AG <CR>	
Response: AG nnn	

MANUAL GAIN (10.7 MHz AGC)

MG	MGnnn (nnn: 000 – 255) Default: 255
	Note: Available only when the AGC is set to OFF
To read: MG <CR>	
Response: MG nnn	

RF GAIN

RG	RGnnn (nnn: 000 – 255) Default: 255
	Note: The volume control knob must be turned fully counterclockwise
To read: RG <CR>	
Response: RG nnn	

IF GAIN

IG	IGnnn (nnn: 000 – 255) Default: 255
To read: IG <CR>	
Response: IG nnn	

SQUELCH SELECT

SQ	SQn (n: 0 or 1) Default: 0 (noise squelch)
	n=0 Noise Squelch mode
	n=1 Level Squelch mode
To read: SQ <CR>	
Response: SQn	

SIGNAL LEVEL

LM	**To read: LM <CR>**
Response	NSQm LMnnn - When the noise squelch is selected (nnn: 000 – 999)
	LSQm LMnnn - When the level squelch is selected (nnn: 000 – 999)
	m: 1 When the squelch is closed
	m: 0 When the squelch is opened

AUTO SIGNAL LEVEL

LC	LCn
	n:0 Auto Signal Level off
	n:1 Auto Signal Level on While n is set to 1, and the squelch opens, the signal level and frequency information is sent to the PC
To read: LC <CR>	
Response:	LCn
	SQm LMnnn RFnnnnnnnnnn
	m: 0 Noise squelch mode m: 1 Level squelch mode nnn: signal level from 000 to 999 nnnnnnnnnn: frequency

AUTO BACKLIT

LA	Lan (n: 0 - 2)
	n: 0 LAMP OFF
	n: 1 LAMP ON (Default)
	n: 2 LAMP AUTO (Will go off in 5 seconds after the squelch is closed)
To read: LA<CR>	
Response: LAn	

BACKLIT ON/OFF

BL	BLn (n: 0 or 1) Available when LA is set to 2 (Auto).
	n: 0 BACKLIT OFF
	n: 1 BACKLIT ON (Default)
To read: BL<CR>	
Response: BLn	

BACKLIT DIMMER

LD	LDn (n: 0 or 1)
	n: 0 NORMAL (Default)
	n: 1 DIMM
To read: LD<CR>	
Response: LDn	

LCD CONTRAST

LV	LVnn (nn: 00 – 31) (Default: 12)
To read: LV<CR>	
Response: LVnn	

BEEP LEVEL

BV	BVn (n: 0 – 9) (Default: 5)
To read: BV<CR>	
Response: BVn	

SPEAKER SELECT

SO	SOn (n: 0 – 3) (Default: 3)
	n: 0 FRONT OFF, REAR OFF
	n: 1 REAR ON
	n: 2 FRONT ON
	n: 3 FRONT ON, REAR ON
To read: SO<CR>	
Response: SOn	

EXTERNAL SPEAKER

PO	Pon (n: 0 or 1)
	n: 0 OFF (Default)
	n: 1 ON
To read: PO<CR>	
Response: POn	

DELAY TIME (SCAN DELAY AND SEARCH DELAY)

DD	DDn.n (n.n: 0.0 – 9.9 second) Default: 2.0 sec.
	nn: FF (hold)
To read: DD<CR>	
Response: DDn.n or DDFF	

FREE SCAN

SP	SPn.n (n.n: 0.0 – 9.9 second)
	n.n: 0.0 FREE SCAN OFF (Default)
	n.n: 0.1 – 9.9 sec.
To read: SP<CR>	
Response: SPn.n	

SIGNAL METER DISPLAY

SF	SFn (n: 0 – 2)
	n: 0 ANALOG DISPLAY
	n: 1 DIGITAL DISPLAY in dBμV (Default)
	n: 2 DIGITAL DISPLAY in dBm
To read: SF<CR>	
Response: SFn	

DUPLEX MODE

OF	Ofnnx (nn: 00 – 47) (00: OFF)
	x: + or - (Offset direction)
To read: OF<CR>	
Response: OF xnn	

DUPLEX FREQUENCY

OL	OLmm nnnnnnnn00 (mm: 01 - 19)
	nnnn…n: Offset frequency (in 100Hz step, <1GHz)
To read: OL<CR>	
Response: OLmm nnnnnnnnnn (10 digits)	

SIGNAL LEVEL UNIT (in dB μ V) – Read only

LU	LU nnn (-nnn – nnn) dB μ V
To read: LU<CR>	
Response: LU nnn	

SIGNAL LEVEL UNIT (in dBm) – Read only

LB	LB nnn (-nnn – nnn) dBm
To read: LU<CR>	
Response: LB nnn	

SEARCH DATA SETTING – Write only

SE	SEnn (nn: 01 – 40) Bank number
	SLnnnnnnnnnn (Lower Frequency), SUnnnnnnnnnn (Upper Frequency), Aun, STnnnnnn, MDn, BWn, ENn, ATn, AMn, ACn, TTxxxxxxxx (Enter text as needed)
Example: SE01, SL0124500000, SU0123900000, AU1, ST002500…	
Note: Refer to individual command for details of each field.	

SEARCH DATA LIST – Read only

SR	SR Read search data of the current search bank
	SRnn (nn: 01 – 40) Search data in search bank 1 - 40
	SRn (n: 1 - 10) Search data in search bank 1- 10
	SR% Search data in all search banks
	SRn SLnnnnnnnnnn Sunnnnnnnnnn AUn MDn BWn ATn AMn TTxxxxxxxx SRn --- (Blank)

PASS FREQUENCY – Write only

PW	PW Register a current freq. to Pass freq.
	PWnnnnnnnnnnnn Register the freq. to Pass freq.

PASS FREQUENCY LIST – Read only

PR	PRnn (nn: 01 – 40) Bank number
	PR00 nnnnnnnnnn
	PR01 nnnnnnnnnn
	PRmm (mm: 00 – 49) Last channel will be 49 or blank (- - -)

DELETE PASS FREQUENCY – Write only

PD	PDmmnn (mm: 01 – 40) Bank number
	(nn: 00 – 49) Pass channel
	PDmm%% (mm: 01- 40) Bank number
	Delete all pass frequencies on designated bank number

DELETE SEARCH DATA WITH PASS FREQUENCY – Write only

QS	QSnn (nn: 01 – 40)
	Delete search data and pass frequency on designated search bank
	QS%%
	Delete all search data and pass frequencies on all search banks

TRANSFER THE CURRENT SEARCH DATA TO VFO – Write only

SV	SVn (n: 0 – 9)
	n: 0 VFO – A
	n: 1 VFO – B
	n:9 VFO – J (Default)

MEMORY DATA SETTING – Write only

MX	MX -- Write the current receiver data to the current bank and channel
	MXmnn -- Write the current receiver data to the designated bank and channel
	(m: 0 – 9) Bank number
	(nn: 00 – 99) Memory channel
[Example]: MXmnn RFnnnnnnnnnn (Frequency), Aun, STnnnnnn, MDn, BWn, ENn, ATn, AMn, ACn, Gan, TMxxxxxxxx	

MEMORY DATA LIST – Read only

MA	MAn (n: 0 – 9) Bank number, memory data between CH00 to CH10.
	MA Memory data for bank number higher than 10
[Example]: MXmnn MPn GAn RFnnnnnnnnnn AUn MDn BWn ATn AMn TMxxxxxxxx	

SELECT MEMORY ON/OFF

GA	GAn (n: 0 or 1) Memory select On/Off
	n: 0 OFF
	n: 1 ON
To read: GA<CR>	
Response: GAn	

SELECT MEMORY LIST – Read only

GR	GRnn (nn: 00 – 99) Memory channel on the designated bank
	GR%% All channels (100 channels maximum)
	GRn (n: 0 – 9) List of 10 channels data
	GR Next 10 channels data
[Example]: GRnn mxx … nn (nn: channel number, m: memory bank, xx: memory channel)	

DELETE MEMORY – Write only

MQn	MQn (n:0 – 9) Bank number
	MQ%% All banks

TRANSFER MEMORY DATA TO VFO – Write only

MV	MVn (n: 0 – 9)
	n: 0 VFO – A
	n: 1 VFO – B
	n: 8 VFO – I (Default)
	n: 9 VFO – J

SCAN/SEARCH RE-START

SG	SGn
	n= 0 (default) no operation, scan does not automatically resume
	n= 1 scan resumes after 2 seconds, or after the time set with the DD command.
To read: SG<CR>	
Response: SGn	

SELECT PRIORITY CHANNEL

PP	PPmnn
	m= 0-9 bank number
	nn= 00-99 channel number
To read: PP<CR>	
Response: PPmnn RFnnnnnnnnnn (NORMAL) or RF--- (BLANK)	

AFC ON/OFF

AF	AFn
	n= 0 (default) AFC is off
	n= 1 AFC is on (except for WFM mode)
To read: AF<CR>	
Response: AFn	

IF-OUT SELECTION

| IF	IFn
	n= 0 (default) 10.7MHz
	n= 1 455KHz

8 RESET

Should the AR-ONE appear to behave strangely, normal operation may be easily achieved by resetting the microprocessor. Two scenarios may be encountered due to power transients etc:

1. **Symptom**: LCD remains on, no control of the keypad.

   Action: Remove any connection to external power and leave it for approximately 30 seconds. Reconnect power and switch on again. Normal operation should be restored but the last used frequency will be lost, the AR-ONE will restore the last but one frequency to display.

2. **Symptom**: The AR-ONE fails to power up.

   Action: Try the suggestions given in (1) then hold the **ESC** key while powering up the AR-ONE to 'Soft reset' the microprocessor.

Should AR-ONE still appear to behave strangely, try a 'hard reset' of the microprocessor, as follows:

Remove the receiver's top cover and push the reset button while the receiver is powered ON (see picture below).
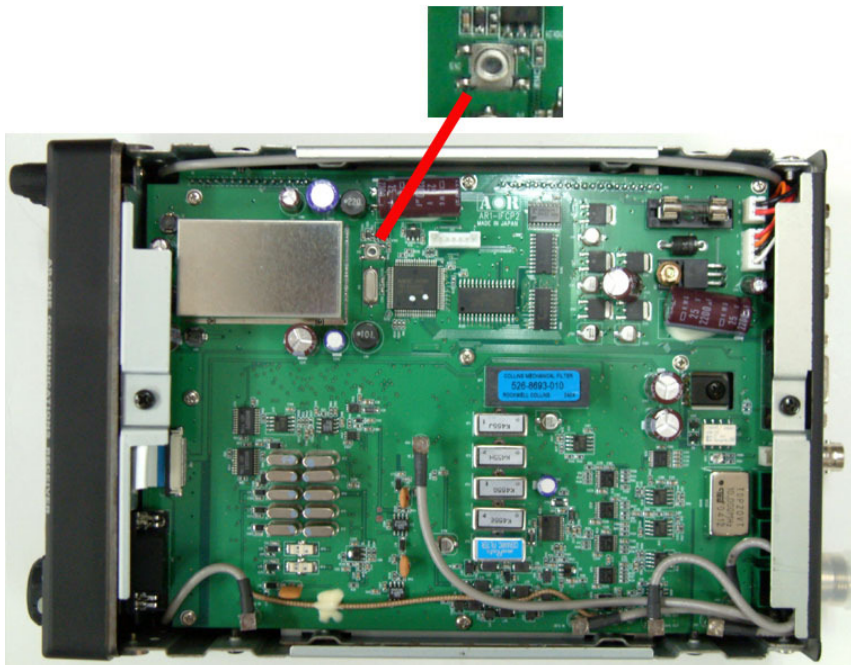
Put the receiver's top cover back into place.

9 SPECIFICATIONS

Configuration:	Triple conversion super heterodyne
Frequency coverage:	10 KHz ~ 3.3 GHz (no gap)
Receive mode:	AM, NFM, WFM, USB, LSB, CW, DATA
Sensitivity:	<u>AM: – 10 dB S/N, NFM: – 12 dB SINAD, CW/SSB: – 10 dB S/N</u>

                             10 ~ 40 kHz: CW 22.3 μ V

                             40 ~ 100 kHz: AM – 4.5 μ V, CW – 1.5 μ V

                             100 kHz ~ 40 MHz: AM 2.5 μ V, SSB/CW – 0.7 μ V, NFM – 0.89 μ V

                             40 MHz ~ 1 GHz: AM – 0.89 μ V, SSB/CW – 0.4 μ V, NFM – 0.5 μ V, WMF – 1.5 μ V

                             1GHz ~ 2.5 GHz: AM – 0.7 μ V, SSB/CW – 0.32 μ V, NFM – 0.4 μ V, WFM – 1.5 μ V

                             2.5 GHz ~ 3.3 GHz: AM – 0.9 μ V, SSB/CW – 0.35 μ V, NFM – 0.5 μ V, WFM – 1.5 μ V

IF frequencies:	1st IF: 754 MHz / 265 MHz
	2nd IF: 10.7 MHz
	3rd IF: 455 KHz
Frequency steps:	1, 10, 50, 100, 500 Hz, 1, 2, 5, 6.25, 9, 10, 12.5, 25, 50, 100 KHz (Non-standard: up to 1 MHz, 1Hz incremental)

Selectivity:

BW	- 6 dB	-60 dB
0.5 KHz	0.5 KHz >	< 2 KHz
3 KHz	3KHz >	< 6 KHz
6 KHz	6 KHz>	< 20 KHz
8.5 KHz	8.5 KHz >	< 30 KHz
16 KHz	16 KHz >	< 40 KHz
30 KHz	30 KHz >	< 70 KHz
100 KHz	100 KHz >	< 450 KHz
200 KHz	200 KHz >	< 600 KHz
300 KHz	300 KHz >	< 900 KHz

Spurious Sensitivity:	60 dB >
Adjacent Selectivity:	55 dB >
Dynamic Range:	90 dB >
Spurious emission:	< - 57 dBm
3rd IP:	+ 2 dBm > (- 1 dBm > above 2.5 GHz)
Frequency stability:	+/- 0.1 ppm (-10 ~ 50℃)

THD:	20 dB> (< 10 %)
Audio Output:	2.0 W (at 8 ohms, THD < 10 %)
Power requirement:	13.5 V DC, < 2 A. (@ 1 W audio output)
Antenna impedance:	50 Ω
Antenna Connector:	N type
IF output level:	-20 dBm (10.7 MHz or 455 kHz)
Ext. freq. standard input:	10 MHz (0 dBm +/- 3 dB)
Control interface:	RS-232C (9600, 19200 or 38400 bps). Default is 19200 bps.
Operating temperature:	-10 ~ 50℃ (14 ~ 122℉)
Dimensions:	156(W)x58(H)x234(D)mm, 6.1"(W)x2.3"(H)9.2"(D) (Projections excluded)
Weight:	1.9 kg (4.2 lb)
Filter bandwidth:	0.5, 3, 6, 8.5, 16, 30, 100, 200, 300 kHz (nominal)
Memory channels:	1000 (10 banks)
Scan/search rate:	25 steps/sec

IF-OUT SIGNAL LEVEL ACCURACY:

The on screen SIGNAL level values (dBuV or dBm), as well as the SIGNAL level values streamed through the RS232C port to the PC, are only approximate.

For better accuracy in signal level values, connect a spectrum analyzer such as SDU5600 to the receiver's IF OUT port.

Make sure that both the AR-ONE and SDU5600 (or similar) are set to communicate at the same RS232C port speed.

The signal level value accuracy through the AR-ONE's "IF OUT" is as follows:

RF Input = −47dBm

	BAND	RX Freq.(MHz)	10.7M_out Range
1	0 − 1.7	0.9	−65 ～ −50
2	1.7 − 25	11.0	−65 ～ −50
3	25 − 60	42.0	−52 ～ −35
4	60 − 108	84.0	−52 ～ −33
5	108 − 142	125.0	−52 ～ −33
6	142 − 174	158.0	−52 ～ −33
7	174 − 224	199.0	−52 ～ −33
8	224 − 335	279.0	−52 ～ −33
9	335 − 480	407.0	−52 ～ −33
10	480 − 690	585.0	−52 ～ −33
11	690 − 1030	865.0	−52 ～ −33
12	1030 − 1696	1363.0	−52 ～ −33
13	1696 − 3300	2501.0	−52 ～ −33

If you wish to send these signal level values to the PC, it is advised to connect your PC to the spectrum display's RS232C port, not to the RS232C port of AR-ONE.
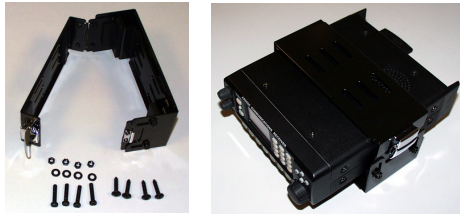
(Specifications are subject to change without notice or obligation.)

10 OPTIONAL ACCESSORIES

- ➢ **EXT-ONE** Separation kit (includes a control head adapter and 16 feet separation cable)
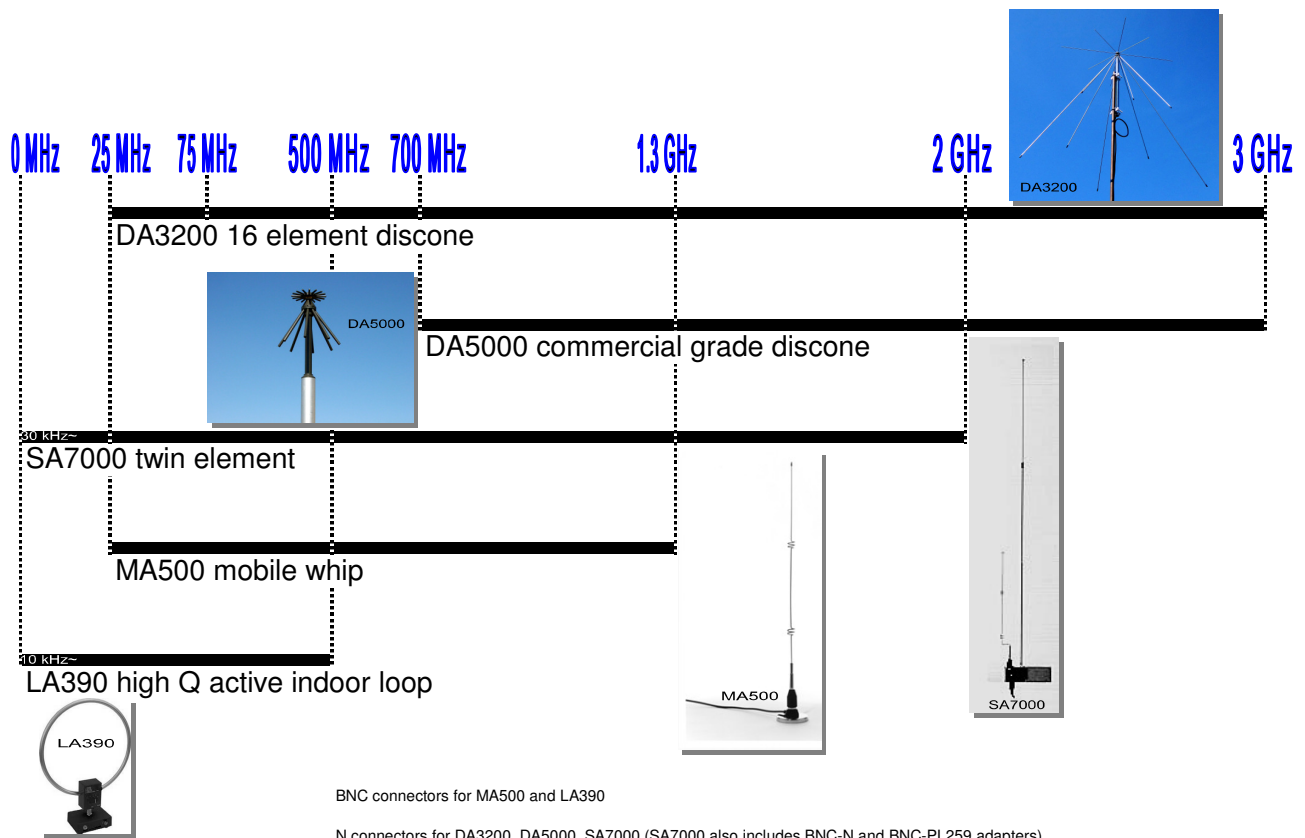

- ➢ **MM8600** Mobile mounting bracket (receiver not included)

- ➢ **PSU-ALPHA**   AC adapter

- ➢ **ANTENNAS**

DA3200 16 element discone

DA5000 commercial grade discone

SA7000 twin element

MA500 mobile whip

LA390 high Q active indoor loop

BNC connectors for MA500 and LA390

N connectors for DA3200, DA5000, SA7000 (SA7000 also includes BNC-N and BNC-PL259 adapters)

11 LIMITED WARRANTY (USA only)

AOR USA, Inc. (AOR) warrants the AR -ONE as described below:

AOR will repair or exchange equipment as a result of defects in parts or workmanship for a period of one year from the date of original retail purchase from an authorized AOR dealer.

Exclusions

The following items are not covered by the AOR limited warranty:

1. Products that are damaged through accident, abuse, misuse, neglect, or user modifications.
2. Problems that arise through failure to follow directions in the owner's manual.
3. Exposure of the product to adverse or severe weather conditions, including lightning, temperature extremes or water, including rainfall or immersion.
4. Exposure to toxic materials, biohazards, radioactive materials or other contamination.
5. Repairs attempted by parties other than AOR or its authorized personnel.
6. Damage that results from improper installation, including improper voltage and/or reversed polarity, or exposure of a receiver to signal levels exceeding specifications.
7. Damage resulting through the use of accessories from manufacturers other than AOR.
8. Equipment that has had serial numbers removed or altered in any way.
9. Damage that occurred as a result of shipment. Claims must be presented to the carrier.
10. AOR is not responsible for any costs arising from installation or reinstallation of the equipment, nor for any consequential (such as loss of use) damage claims.

Obtaining Warranty Service

1. You are responsible for shipping the product to AOR and any related costs.
2. Warranty claim must be accompanied by a legible copy of the original product purchase receipt.
3. You must include a description of the problem(s) encountered with the product.
4. You must include your name, a valid ground shipping address (including zip code) and telephone contact information.
5. AOR will ship the repaired (or replaced) product by ground transport.

Limitations

Any and all implied warranties, including those pertaining to merchantability and utility for a specific purpose are limited to the duration of this limited warranty.

AOR's limits on warranty pertain only to the repair or, at its option, replacement of defective products. AOR shall not be liable for any other damages, including consequential, incidental or otherwise, arising from any defect.

Some states do not allow limitations on how long an implied warranty lasts and may not allow the exclusion of incidental or consequential damages. As such, the above limitations may not apply in every case. This warranty gives you specific legal rights and you may have other rights that apply in your state.

If you have questions about this limited warranty, or the operation of your AOR product, contact AOR at (310) 787-8615 during normal business hours (9 am ~ 5 pm Pacific Time Zone), or write to AOR, 20655 S. Western Ave., Suite 112, Torrance, CA 90501. You may also send a fax to AOR at (310) 787-8619. Additional information is available at the AOR web site: www.aorusa.com

We suggest attaching your purchase receipt to this half of the warranty card and that you keep this information in a secure location.

AOR Model Number _____

Serial Number _____

Dealer Name _____

Purchase Date _____