AR-2002

OPERATING MANUAL

AOR, LTD. 2-6-4 MISUJI, TAITO-KU TOKYO 111, JAPAN

You are the proud owner of our latest product. Please read this operating manual carefully before placing your receiver in service.

Operating Manual

1. Major features

* Continuous coverage from 25MHz to 550MHz and from 800MHz to 1300MHz.
* Accurate receiving frequency by PLL synthesiser circuit.
* Multi-functional LCD display for receiving frequency, scan, mode, search, etc.
* A totally new keyboard with push buttons making frequency entry and receiver operation much easier.
* Professional class receiver performance, e.g. receiver sensitivity, selectivity, spurious rejection and two-signal characteristics.
* Wide variety of receiving modes
Wide FM (TV broadcast, FM broadcast)
Narrow FM (Business band, Amateur Radio)
AM (VHF/UHF Air Band, CB)
* State of the art design by use of latest electronic components and circuitry.
* Go-anywhere versatility thanks to light compact design.
* Front panel 10 step LED "S" meter.
* Manual frequency control by shaft encoder in addition to UP/DOWN buttons.
* Socket for optional RS232 interface board on rear panel.

2. Operating precautions.

The receiver is designed for use on 12 V DC only. Always use the correct power cord, making sure that positive and negative connections are made correctly. For home use, a properly regulated AC power supply is essential. The power supply voltage should be 12-14 V dc output. Disconnect the power supply from the mains, if the receiver is not being used. Take care to avoid spillage or leakage of liquids into the receiver. Special care should be taken to prevent liquid entry via the power jack.

3. Caution for proper handling of the set.

 Avoid any place in the direct sun or near to heating instruments where temperature may rise over 60 degrees Celsius. Temperature may go up to 100 degrees or more inside a car with all windows closed if in the direct sun, and this may cause deformation of the case and damage other parts of the unit. Avoid also places where water splashes, high moisture and dust are expected.
 Clean the set with soft cloth. Never use any chemicals to clean the set such as thinner and benzene which may damage the cabinet surface.
 We recommend you use an external aerial when you wish to pick up signals from a distance, or weak signals. Your dealer can advise on suitable aerials. When an external aerial is erected, be careful not to erect close to nearby power lines, telephone lines or buildings.
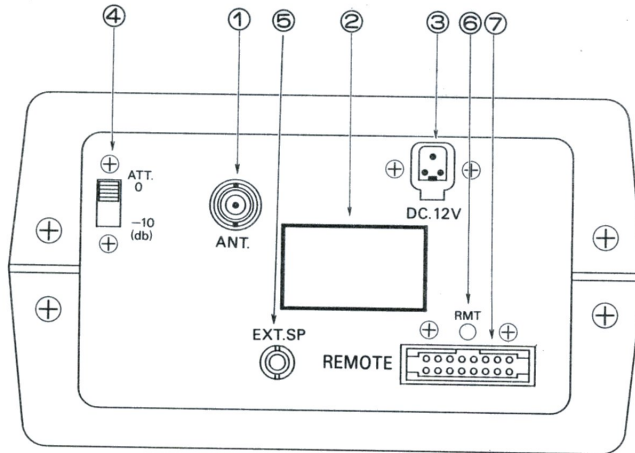
4. Control

1. POWER   Power switch
2. SQL   Squelch control
3. VOL   Volume control
4. ⌒   Earphone jack
5. SIGNAL   Signal strength meter
6. KEY LOCK   Keyboard operation is locked when this indicator lamp is on.
7. 1-9   Key to input numeral information such as frequency and time
8. LCD   Display of frequency, channel number, etc.
9. DOWN   Key to shift to lower frequency
10. UP   Key to shift to higher frequency
11. CLK SET   Key to set time
12. 5 kHz, 12.5 kHz, 25 kHz   Key to select spacing of frequency to search
13. AM   AM reception
14. ENTER   Entry key to input frequency, channel, time, etc.
15. WFM   Wide FM reception
16. DELAY   Key to hold frequency for a short time after signal stops.
17. NFM   Narrow FM reception
18. SPEED   Key to select speed of scan, search, etc.
19. SEARCH Key to switch SEARCH on/off.
20. MANUAL Key to stop various functions, and to input manual channel selection
21. SCAN   Key to start scanning
22. PRIORITY Key to switch Priority function on/off.
23. LOCK OUT Key to delete unwanted channels for programmed scan

24. CLOCK   Key to show clock display.
25. LIGHT   Illuminate LCD display
26. KEY LOCK Key to lock other keyboard functions
27. LOWER   Key to set lower frequency for programmed search
28. UPPER   Key to set upper frequency for programmed search
29. Main tuning knob for manual frequency selection (tuning conrol)
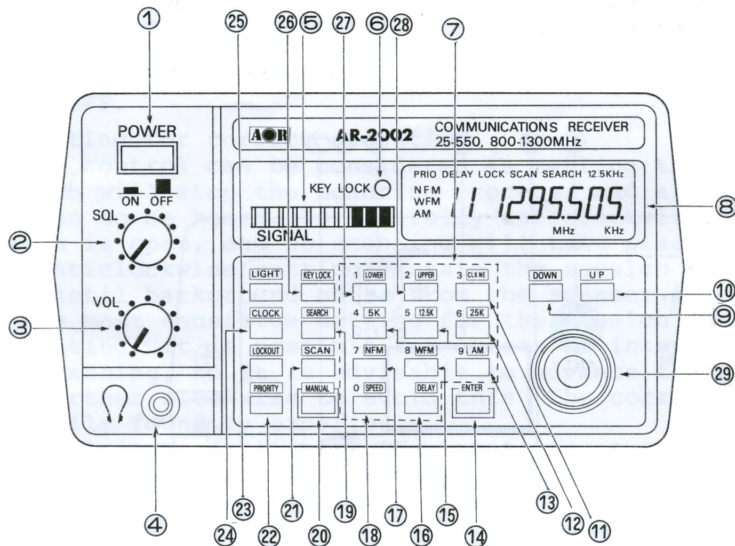
5. Rear Panel Control

1. ANT   BNC type antenna connector
2. Serial number plate
3. DC 12V   12V dc input jack
4. ATT   Attenuator (-10 dB)
5. EXT SP External speaker jack
6. RMT   LED indicator for remote control operation
7. REMOTE Socket for RS232

6. Operation

1. Connect 12 V dc power supply correctly.
2. Squelch control should be turned maximum clockwise prior to power switch is on. Turn on the power switch and rotate to 10 o'clock position.
3. The unit will automatically start scanning between CH01 and CH20 as soon as the power switch is on. (Certain freuquencies are stored at factory for test.)
4. Make sure that LOCK OUT, SEARCH, PRIORITY, DELAY are OFF position (no indication on LCD display). If any of those are ON, turn it to OFF.

Squelch setting for correct operation.
The squelch control can be considered as setting the level of signal which will stop the scanning process, and allow the transmission to be heard. In the fully anticlockwise position, the squelch is open, and no scanning will take place. Starting from the anticlockwise setting, rotate the squelch control clockwise until background noise from the speaker is cut off. This is the most sensitive setting for the squelch control, but at this setting, it is possible for bursts of interference to stop the scanning, so it is advisable to advance the squelch slightly further clockwise to avoid this. The correct setting will be easily found by experience.
Now, your set is ready to work. Explanations as to how to input desired frequencies will follow below.

How to store frequencies in memory bank. (EXAMPLE)
1. If you want to enter 128.80 MHz with AM mode into CH01, depress the buttons in the following sequence;
A. Depress   MANUAL   scan stops
B. Depress   AM ENTER   LCD shows AM mode
C. Depress   1 2 8 . 8 0 ENTER   LCD shows 128.800 and receives signal. Display shows flashing "CH".
D. Depress   0 1 ENTER   The frequency is stored in CH01 and CH on LCD display ceases to flash. Note that channel input should be 2 digits at all times i.g. 01, 02, 03 ...20 and not 1, 2, 3, ...
2. Other examples like 150.125 MHz on NFM into CH02:
A. MANUAL   NFM   ENTER
B. 1 5 0 . 1 2 5   ENTER
C. 0 2   ENTER

3. 468.3625 MHz NFM in CH03
A. MANUAL   NFM   ENTER
B. 4 6 8 . 3 6 2 5   ENTER
C. 0 3   ENTER
4. 82.500 MHz WFM in CH04
A. MANUAL   WFM   ENTER
B. 8 2 . 5   ENTER
C. 0 4   ENTER

CH indicator on LCD does not flash if entry of A and B have been made in the wrong order and no memory is stored. Depress ENTER key and confirm CH indicator is flashing. Please restart the procedure correctly.
20 memory channels are provided.

Selection of receiving frequency
 If you want to listen to an FM broadcast which is on 95.75 MHz,
depress the buttons in the following sequence;
A. MANUAL
B. 9 5 . 7 5   ENTER
C. WFM   ENTER

 How to recall memory channel
 In case you wish to recall frequency stored in memory bank, for
example channel 15, depress keys as follows;
A. MANUAL
B. 1 5   MANUAL
 Caution
 Do not enter 00 and any figure between 21 and 99 in the above

process. Built-in computer will transfer the frequency once
stored in a memory channel to channel 20 to be retained if any
of those figures has been entered by mistake.

 Memory back-up
 A specially made capacitor is employed in the set to preserve
frequencies in the memory bank. There is no need to replace
battery for memory back-up like other scanners of similar type.
Please, however, note that frequency in memory channel will
vanish if power is disconnected for approx. more than one week
owing to discharging of the capacitor.

Scanning

Any frequencies between 25 MHz and 550, and 800 and 1300MHz can be stored in 20 memory channels with designated mode. You can watch frequencies in the memory channels simply by scanning.

SCAN key allows the start of scanning. PRIORITY must be OFF to start scanning.

Depress MANUAL key to stop scanning.

You can advance memory channel manually by depressing MANUAL key. Please refer to LOCK OUT for programmed scan.

A "beep" will follow each keystroke entry indicating correct entry with high tone and wrong entry with low tone .

SEARCH

The AR-2002 is capable of searching either continuously from 25 MHz to 550 MHz, and 800 MHz to 1300 MHz or any programmed frequency range you desire in 5 or 12.5 or 25 kHz steps at your choice.

1. Continuous search

To search between 25 MHz and 550 MHz, and 800 MHz and 1300 MHz in 5 kHz steps for example, depress:

A. MANUAL
B. 5 kHz   ENTER
C. 2   ENTER
D. 1300 ENTER
E. SEARCH

2. Programmed search

To search between 360 MHz and 400 MHz in 12.5 kHz step with NFM, for example, depress:

A. MANUAL
B. LOWER   ENTER
C. 3 6 0 . 0   ENTER
D. UPPER   ENTER
E. 4 0 0 . 0   ENTER
F. NFM   ENTER
G. 12.5kHz   ENTER
H. SEARCH
Direction of search can be determined by depressing either UP or
DOWN key. To change search speed, depress SPEED key. Two
selectable search speeds are provided. Make sure that HIGHER
frequency entered is always higher than LOWER frequency entered,
otherwise, search does not take place.

LOCK OUT
 You can program any combination of memory channels you want to

scan by using LOCK OUT key. For example, if you want to delete
channel 10 from the scanning operation, depress:
A. MANUAL
B. 1 0   MANUAL
C. LOCK OUT
LOCK OUT will appear on LCD display, and channel 10 will be
jumped over. To release LOCK OUT, repeat the same key entry.
LOCK OUT will disappear on LCD display. If you delete all 20
channels from scan operation, scan does not function at all with
PASS on LCD display.

Main tuning knob

Turn this knob to select frequency manually.

PRIORITY

The set is provided with a priority channel. Enter frequency you want to monitor all the time into Channel 01 and depress PRIORITY key. Channel 01 will be monitored at approx. 2 second intervals checking for activity. If a signal appears on Channel 01, the receiver will automatically stop scanning and stay on Channel 01. PRIORITY indication appears on LCD display when it is engaged. P indication also appears alongside CH number when a signal is received on priority channel.

DELAY

DELAY key is used to delay resumption of scanning for approx. 2.5 sec. during a pause in transmission.

NOTE:
Due to internal beat of the receiver, some frequencies may not be received, for example;

47,000MHz, 94,000MHz, 94,980MHz, 141,000MHz, 159,940MHz, 187,990MHz, 219,980MHz, 234,990MHz, 284,940MHz, 469,980MHz, etc.

If excessively strong nearby signals are present, a desired signal may be blocked by receiver desensitization. Use the ATT switch on the rear panel to reduce incoming signal strength.

Time display and how to set the clock

A 24-Hour clock is a built-in feature of the AR-2002.

10   15   20   represents 10h 15m 20sec AM
18   45   50   represents 6h 45m 50sec PM

To display time on LCD, depress:
A. MANUAL
B. CLOCK

Time will not be displayed if PRIORITY is engaged. Disengage PRIORITY in this case.

To release time display, depress any key from the followin:

ENTER   resume frequency displaying
SCAN   resume scanning
SEARCH resume searching

To enter time, for example, 7h 15m 20s AM, depress key in the following sequence;
A. MANUAL   CLKSET   ENTER
B. 0 7 1 5 2 0
C. ENTER   synchronising with 10h 15m 20s by official time source

Another example, 6h 45m 50s PM
A. MANUAL   CLKSET   ENTER
B. 1 8 4 5 5 0
C. ENTER

Time once stored will be retained by memory back-up system, for approx. one week even after the power is disconnected. The LCD does not display the time until the power is reconnected.

7. Specifications

1. Receiving frequency   25-550 MHz,   800-1300 MHz
2. Receiving sensitivity   Narrow FM 0.3uV (12 db SINAD)
                               Wide FM   1.0uV (12 db SINAD)
                               AM   0.5uV (10 db S/N)
3. Receiving selectivity   NFM +-7.5 kHz @ 6 db +-20 kHz @ 70 db
                            WFM +-50 kHz @ 6 db +-250 kHz @ 60 db
                       AM +-5 kHz @ 6 db +-10 kHz @ 70 db
4. Image and spurious rejection   - 50 db
5. Number of memory channel   20 channels
6. Intermodulation   - 50 db
7. Receiver circuitry   PLL Synthesiser
8. Scanning rate   5 channels/sec.
9. Searching rate   1 MHz/6 sec.
10. Audio output   1 W at 10 % distortion
11. Power requirements   12-14 V DC
12. Method of display   LCD
13. Dimensions   138 x 80 x 200 mm
14. Weight   1.2 Kg

8. Optional accessories

1. External antenna   DA-300
2. Mobile mount bracket   MM-1
3. RS232 Remote control unit   RC PACK

9. Trouble shooting

If your receiver does not function correctly, please check the
following points before returning it to the dealer you purchased
it from for repair;

1. Receiver not working at all i.e. no power

* Power plug is not firmly connected.
* If AC adapter is used, check plug is firmly connected to
power socket and lead to receiver is firmly inserted.
* If used on 12 V dc, check polarity.

2. Receiver works, but no audio output

* Volume control is turned right down.
* Squelch control advanced fully clockwise.
* Earphone plug is inserted in the external speaker jack.

3. The set does not function while operating.

* Depress MANUAL key, and try to enter various inputs.
* Turn squelch knob fully clockwise if scan and search do not
function.

MEMO

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