Tecsun Radios Australia

Ailunce HS4 10 Metre Amateur Radio Transceiver User Manual

CONTENTS

FUNCTIONS AND FEATURES

- Large LCD display showing channel number, and frequency
- 60 channels per bank, 6 banks, total 325 channels
- Covers entire 10m band
- Adjustable repeater offset
- Backlit LCD display
- AM, FM, USB, LSB, FM modes and PA function.
- Frequency tuning steps of 10Hz, 100Hz, 1kHz, and 10 kHz
- Multiple clarifier modes TX and/or RX selectable.
- Flexible menu functions and PC programming via USB
- Echo function (compression)
- Squelch and ASQ functions (AM and FM)
- RF gain adjustment
- RF power adjustment
- Scan function, scans all channels for activity.
- Roger Beep function. Inserts a "beep" at the end of every transmission.
- Noise Blanker (NB) and Automatic Noise Limiter (ANL) function
- Dual Watch (DW) function. A convenient method of beacon monitoring.
- Beep prompt signal (Frequency of the tone is selectable)
- +/- 10kHz function (increase frequency by 10kHz), Coarse and Fine adjustment
- SWR, RF signal level and DC voltage display
- Transmitter Time Out Timer (TOT)
- Hi-Cut function to reduce high frequency interference.
- User programmable Emergency channel
- SWR protection
- Input Voltage protection
- Key-lock function
- Voice Operated switch (VOX) function
- CTCSS and DCS code functions
- RX compander
- Adjustable microphone gain
- Receiver noise reduction
- AGC fast or slow setting
- Programmable repeater offset and CTCSS

MOUNTING THE TRANSCEIVER IN A VEHICLE

If you are not confident that you will be able to install this transceiver please use the services of a professional installer. Do not risk damaging your vehicle.

- Mount the transceiver where the controls will be easily accessible. In most cases this will be the side panel of the centre console
- When running power cables, beware of sharp metal edges. Ensure the cable does not foul the seat adjustment mechanism
- To mount the transceiver, use the bracket and thumbscrews provided. This will ensure the transceiver remains fixed in place at all times, even on rough roads.
- Use the rubber washers provided. Insert these washers between the transceiver chassis and the mounting bracket to ensure the transceiver does not move.
- Locate the microphone holder so that the microphone cord does not interfere with any vehicle controls.
- Run the DC cables directly to the battery where possible, even if you have to extend the power leads using a similar diameter wire.
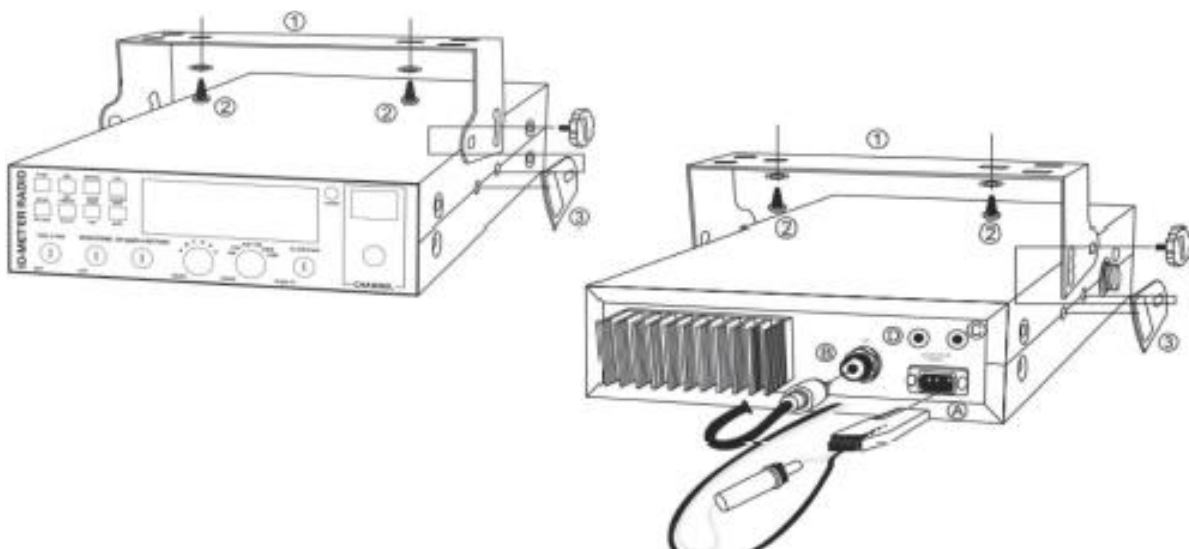
ANTENNA RECOMMENDATIONS AND INSTALLATION

Mobile antennas

Consider using a helical whip antenna. Helical antennas can be made with quite manageable length, much shorter than a resonant whip (not helically wound) that would need to be about 2.5m long.

Any whip antenna requires a ground plane to operate efficiently (eg car roof, bonnet or lid of the boot. There are many antenna mounting brackets for modern vehicles that eliminate the need to drill holes. You might also consider a removable magnetic antenna base.

Base Station antennas

A fixed antenna should be mounted as high as possible and away from metal objects, including the canopies of trees. A base station antenna can be mounted on a length of pipe supported of the side of a building. Be careful to ensure clearance from power lines and observe any local council regulations.

POWER CONNECTIONS

Your transceiver is protected against reverse polarity connection. Modern vehicles are wired negative to ground (vehicle chassis). Check this by making sure the negative terminal of the battery is connected to the engine block and chassis.

The red cable is positive, the black cable is negative. Connect the power lead directly to the battery if possible.

WARNING 12 VOLTS ONLY

Most trucks use 24V DC, often supplied by two 12V batteries in series. In this case take the DC supply across only one battery.

Never replace the original fuse (10A) with one of a different value.

BASIC CHECKS BEFORE TRANSMITTING

1) Connect the transceiver to a 12 volt source, observing the correct polarity.
2) Connect the microphone.
3) Connect the antenna.
4) Turn the transceiver ON.
5) Set the mode switch to CW.
6) Rotate the squelch control fully anticlockwise.
7) Adjust the volume to a comfortable level.
8) Tune to a known channel. Often a beacon frequency will be best.
9) Verify that connecting an antenna increases the received background noise.

5. ADJUSTMENT OF SWR (Standing Wave Ratio)

The antenna you intend to use with this transceiver must be "matched" or tuned to the operating frequency to ensure maximum energy from the transmitter is transferred to the antenna. This means minimizing any energy that is reflected back down the coaxial cable from the antenna to the transmitter, as this can damage the output devices.

This mismatch is called the SWR or Standing Wave Ratio and is simply the ratio of the forward power, compared to the reflected power. Less reflected power is best !

Use a dedicated SWR meter for this adjustment.

To check the SWR, set the transceiver to Channel 20 Bank D, which is approximately mid band and select either AM or FM mode.

Ensure the antenna is clear of tress and nearby metal objects which can influence the SWR reading.

Connect the SWR meter with a short cable terminated in PL-259 plugs between the transceiver and the meter (normally supplied with the meter). Then connect the antenna cable (which will be longer) between the SWR meter and the transceiver.

Set the SWR meter to CAL, connect the microphone and operate the PTT. You should see the meter respond. Adjust the calibration (CAL) knob so that the meter reads **just on** full scale deflection. Change the switch position on the SWR meter to "SWR" and read the level on the meter. A reading of 1 is perfect whilst a reading of 2 is the maximum normally considered acceptable.

If the reading is higher than 2, the length of the antenna needs to be adjusted.

If increasing the channel number (increasing the frequency) causes the SWR to improve ie the reflected power is lower, the antenna is too long. If increasing the channel number causes the SWR to get worse, the antenna is too short.

Most base station antennas have adjustable elements, but most mobile antennas are helically wound. Shortening the antenna is irreversible, so only remove a few millimetres at a time.

Remember to re-calibrate the SWR meter every time a measurement is made of the frequency is changed.

IF YOU ARE NOT CONFIDENT IN ADJUSTING YOUR ANTENNA ENLIST THE ASSISTANCE OF SOMEONE MORE EXPERIENCED FROM THE LOCAL AMATEUR COMMUNITY.

10 METRE BAND PROPAGATION

The 10 metre band can yield very surprising results in terms of DX contacts.

Whilst scanning the band can yield few results, once a call is made the response can be amazing. Seems many DX stations are just waiting to be called !

Depending on the level reflection in the ionosphere, signals can propagate further than normal, during "greyline", the transition from sunlight to darkness. So by working out when greyline occurs at a destination and calling at that time, good results can be achieved.
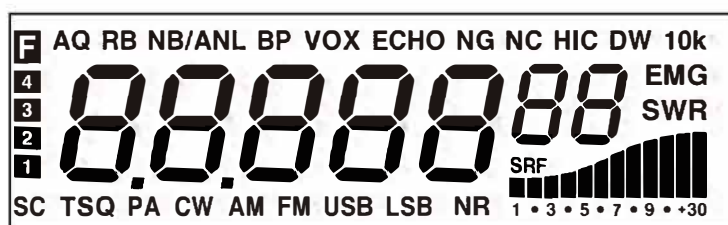
On any HF band ,something you will hear from stations calling CQ is that they will mention "Long Path" or "Short Path" and these two terms need some explanation. Normally stations with a directional antenna will point the antenna towards the target area. This is known as "Short Path" and is the most direct distance to the target. However sometimes better results will be obtained by rotating the antenna to point in the opposite direction, so that the signal has to travel more than halfway around the earth to reach the target. This is called "Long Path".

Sometimes Long Path signals are stronger than Short Path signals, and this is because often Long Path signals travel vast distances over water. Short Path signals reflecting off the F2 layer of the ionosphere can travel 1800-3500Km between hops, so a typical short path might involve 5 or 6 hops, attenuating the signal at each reflection.
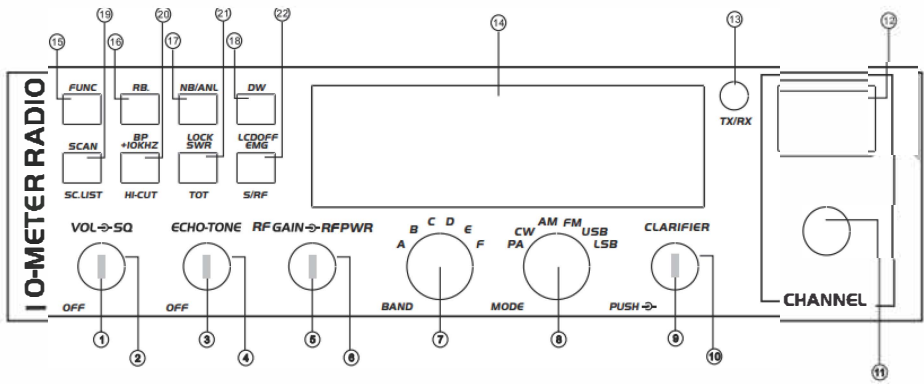
During daylight there are two upper layers in the ionosphere, the F1-layer at approximately 150-200km and the F2 layer at 250-400km. After sunset these two layers merge into the F layer and split up again into F1 and F2 layers at sunrise. During night the F layer loses ionisation density, and the ability to reflect signals back to Earth. But sometimes the F-layer is just dense enough to reflect the signal back, with a less acute angle, causing the signal to be directed to another part of the ionosphere thousands of km's ahead, without reflecting off the ground.

There are many possible means of propagation, and the above is by no means a complete explanation.

EXPLANATION OF CONTROLS AND LCD DISPLAY

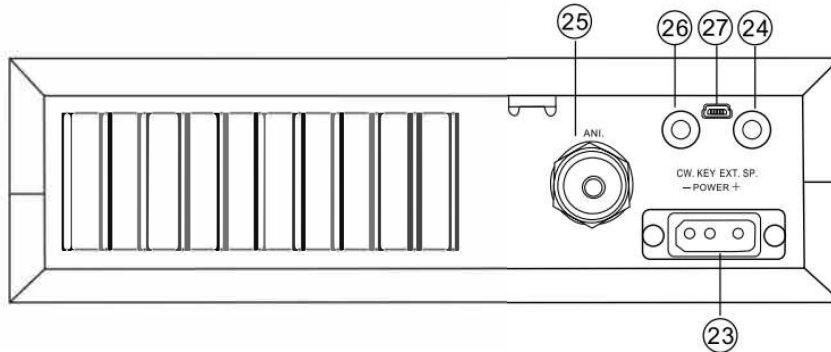| 7 digits	Display frequency and any other information.
Indicating bars	Indicate RX, RSSI, PA, PWR, SWR.
The first decimal point	Appears when the current channel is edited with SCAN DEL.
F	Appears after pressing the FUNC key.
AQ	Appears when the ASQ function is started (only for AM/FM).
RB	Appears when the Roger beep function is started (enabled).
NB/ANL	Appears when the NB/ANL function is started (enabled).
BP	Appears when the BP function is started (enabled).
ECHO	Appears when the ECHO function is started (enabled).
VOX	Appears when the VOX function is started.
NG	Appears when the TX noise gate is started.
NC	Appears when the RX noise compander is started.
HI-CUT	Appears when the HI—CUT function is started.
DW	Appears when the DW function is started.
10K	Appears when the +10KHZ function is started.
EMG	Appears when the EMG channel is used.
SWR	Appears when the SWR is used.
SRF	Appears when the S/RF is used.
SC	Appears when the SCAN is used.
TSQ	Appears when the CTCSS/DCS code is used.
NR	Appears when the RX noise reduction is turned on.
PA、CW、AM、FM、USB、LSB	Indicate different operating modes. 1. Appears when the CLARIFIER function is FINE operation. 2. Appears when the CLARIFIER FUNCTION is a COARSE operation or RT operation. 3. Appears when the CLARIFIER FUNCTION is transmitting frequency regulated.

1.OFF/ON/VOLUME (Inner Dual Concentric)	Rotate clockwise to switch on the radio and set the desired volume level. Under normal operating state, the VOLUME control is used to adjust the output volume obtained either by the transceiver speaker, or the external speaker, or the external PA speaker, if used.
2.SQUELCH (Outer Dual Concentric)	This control is used to cut off or eliminate receiver background noise in the absence of an incoming signal. For maximum receiver sensitivity, it is desired that the control be adjusted only to the point where the receiver background noise or ambient background noise is eliminated. Rotate fully anticlockwise then slowly clockwise until the receiver noise disappears. Any signal to be received must now be slightly stronger than the average received noise. Further clockwise rotation will increase the threshold level that a signal must overcome to be heard. Only strong signals will be heard at a maximum clockwise setting.
3. ECHO (Inner Dual Concentric)	This switch is used to control echo effect.
4. TONE (Outer Dual Concentric)	This switch is used to control intervals of echo sound.
5. RF GAIN (Inner Dual Concentric)	This switch is for adjusting sensitivity during reception. For long distance communications, RF GAIN should be set to maximum. RF GAIN can be reduced to avoid distortion when your correspondent is close by and when he does not have RF POWER. The normal setting of this function is on maximum (fully clockwise).
6.RF POWER (Outer Dual Concentric)	Adjustment of the output power is for AM and FM mode only. Reducing the power is allowed when communicating with a person who has no RF GAIN. The normal position of this function is set to maximum, fully clockwise.
7. BAND SELECTOR	Rotate this switch to select A, B, C, D, E, and F bands of operation.
8.MODE(PA/CW/AM/FM/USB/LSB)	This switch allows selecting the modulation mode PA, CW, AM, FM, LSB, or USB. Your modulation mode has to correspond with one of your correspondents. The mode selector changes the mode of operation of both the transmitter and receiver simultaneously. Frequency Modulation/FM: for nearby communications on a flat open field. Amplitude Modulation/AM: Communication on a field with relief and obstacles in middle distance (the most used). Upper and Lower Side Band/USB-LSB: Used for long distance communications (according to the propagation conditions).
9. CLARIFIER	This is the frequency tuning knob which can be set as different modes (refer to CLA Specifications in Functions Menu for more details).
10.PUSH	This is the PUSH Key which can be set as different modes (refer to PSH specifications under Functions Menu for more details).
11.CHANNEL SELECTOR	Rotate this switch to select any desired channel from forty citizens band channels. The selected channel appears on the LED directly above the channel selector knob.
12.CHANNEL INDICATOR	The numbered LED indicates the selected channel to operate on.
13.RECEIVER/TRANSMIT INDICATOR	When it is receiving, the LED will be green. The LED will be red when it is transmitting.
14.LCD DISPLAY	Display frequency, all kinds of information, and icons.
15.FUNC	This is the functional key. Press and hold this key for 2 seconds to enter Functions Menu Setup (refer to Functions Menu for more details). Press the FUNC key and another individual key to realize the second function silk-screened under the button. For example, press the FUNC key followed by pressing the RB key to realize the BP function. Press the FUNC key followed by DW to realize the LCD OFF function. Details operations are as bellows: Press the FUNC key, "FUNC" icon will appear on the LCD. Release the FUNC key, and then press other keys to realize the second function silk-screened under the button. "FUNC+ Keypad name" wi be used in the following operating instructions.

16.ROGER BEEP OR BEEP FUNCTION	(1) RB Press the "RB" key to enable the "ROGER BEEP" function with the "RB" icon appearing on the LCD. Press the key repeatedly to switch on/off the function. When the RB function is enabled, the radio will automatically transmit the audio signal at the end of your transmission. The listener can note easily that your transmission is over through the signal. (2) FUNC+RB Press the FUNC+RB key to realize the BP Function. It is a prompting function with the "BP" icon appearing on the LCD. The speaker would emit a BEEP for prompting when pressing any key. Press the FUNC+RB key repeatedly to switch on/off the function.
17. NB/ANL or LOCK	(1) Press the NB/ANL key to enable the NB/ANL function with the "NB/ANL" icon appearing on the LCD. Press the key repeatedly to switch on/ off the function. Noise Blanker/Automatic Noise Limiter. These filters allow reducing background noises and some reception interference. (2) FUNC+NB/ANL Press the FUNC+NB/ANL key to realize the Keyboard Lock function. When this function is enabled, all keys are invalid except PTT, BAND SWITCH, and MODE SWITCH. When pressing any key except PTT, BAND SWITCH, and MODE SWITCH, the LOCK icon will display on the LCD. These situations indicate that the keyboard has been locked. Press the FUNC+NB/ANL key repeatedly to switch on/off the function.
18.DW or LCD OFF	(1) The DW (dual watch) function allows automatic alternate monitoring of two channels. Refer to the following procedures to enable this function. To enable the DW function, firstly rotate the SQ control clockwise until the background noise is cut out. Select the first channel to be monitored by using the CHANNEL SELECTOR knob or the channel selector keys on the microphone. Press the DW key and the DW icon will flash on the LCD display. Secondly, follow the above procedures to select the second channel to be monitored. Finally, press the DW key again and the two monitoring channels will be alternately indicated on the LCD. Radio will automatically start monitoring (scanning) the two channels. When a signal is detected on one of the channels, scanning stops and it is possible to listen to the communications on that channel. Press PTT to transmit on this channel. If there is no transmission or detected signal on that channel within 5 seconds (time to resume scanning can be programmed by PC software), the radio will resume scanning. When the DW function is enabled, the DW icon appears on the LCD. To exit the DW function, press the DW key or the PTT key. The scan Type above is the SQ mode under SCA Selection in the Function Menu. If TI mode is selected and the valid signal is detected, the radio will still start scanning when it is time to resume scanning, whether there is a signal or not in the current channel. FUNC+DW When this function is enabled, the LCD display will be switched OFF (LCD OFF). Repeat this operation to switch ON/ OFF the function.
19.SCAN OR Scan.list	(1) SCAN Automatic Scanning of busy channels. Press the SCAN key to enable the SCAN function. Before enabling the SCAN function, firstly rotate the SQ control clockwise till the background noise is cut out. Then press the SCAN key, the radio will automatically scan all channels continuously in the scan list and the SC icon will appear on the LCD. When a signal is detected on a channel, scanning stops on this channel. You can receive the call, and can transmit it on this channel by pressing the PTT key. If there is no transmission or detected signal on that channel within 5 seconds (time to resume scanning can be programmed by PC software), the radio will start scanning again. To exit the SCAN function, press the SCAN key or the PTT key. The Scan Type above is the SQ mode under SCA Selection in the Function Menu. If TI mode is selected and the valid signal is detected, the radio will still start scanning when it is time to resume scanning, whether there is a signal or not in the current channel. (2) FUNC+SCAN SC. LIST (Scan ADD or Delete). Press the FUNC+SCAN key to delete the current channel from the scan list. The first digit on the LCD would display. When Scan function is enabled, the radio will skip the deleted channel. Repeat this operation to Add or Delete channels from the scan list.
20. +10KHZ or HI-CUT	(1) +10KHZ Press this key to shift frequency up by 10khz. When pressing this key, 10KHZ appears on the LCD, and frequency of channels is shifted up by 10 KHZ. Repeat this operation to switch ON/OFF this function. (2) FUNC+ +10KHZ Press the FUNC+10KHZ key to realize the HI-CUT function. Once this function is enabled, the radio would cut out high frequency interference. Its use depends on reception conditions. When this function is enabled, "HI-CUT" will appear on the LCD. Repeat this operation to switch ON/OFF the function.
21.SWR OR TOT	(1) SWR When pressing this key, the "SWR" icon will appear on the LCD. When transmitting, SRF bars indicate SWR value other than PA or PWR value. One bar displayed on the LCD indicates that the SWR value is 1.0. Each additional bar indicates every 0.1 added value. Repeat this operation to switch ON/OFF the function. (2) FUNC+ SWR When pressing this key, TOT ON or TOT OFF will display on the LCD for 2 seconds. Repeat this operation to switch ON/OFF the function. When ON appears on the LCD, users can press the PTT to transmit. Then, the radio will time the transmitting duration. Once the duration is beyond the set TOT time (programmable), the radio will emits a voice prompt to stop transmitting and back to the receiving state automatically. This function aims to protect the radio against power tube damage from super heating caused by long transmission.

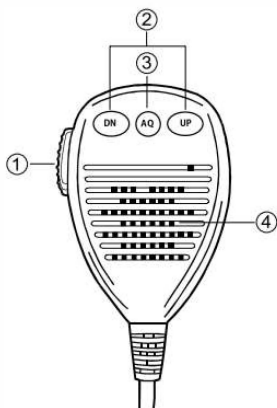| 22. EMG OR S/RF	(1) EMG selects the Emergency Channel Call. When an emergency occurs, switch the radio to a channel set in advance for emergencies. Then the "EMG" icon will display on the LCD. Press the EMG key again to return to the previous channel. (2) FUNC + S/RF .This switch toggles between transmitter power and received signal. When this function is enabled, the "SRF" icon will display on the LCD. Repeat this operation to switch ON/OFF the function.

<Rear Panel>

23. POWER SOC KET	13.8V DC power cable with built-in fuse (10 Amp) to be connected.
24. EXT SP or PA SP	EXT SP Accepts a 4-to-8-ohm, 4-watt external speaker to be connected. When an external speaker is connected to this jack, the built-in speaker is automatically disconnected. PA is used to connect an external speaker. Before operating the PA, you must first connect a PA speaker to this jack.
25.ANTENNA	Accept a 50-ohm coaxial cable with a type of PL-259 plug to be connected.
26.CW KEY	This jack is for Morse code operation; To operate, connect a CW key to this jack and place the MODE switch in the CW position (LCD display icon "CW").
27.CW KEY	*PC connection for software programming.

<PRESS—TO—TALK—MICROPHONE>

The receiver and transmitter are controlled by the Press-To-Talk switch on the microphone. Press the switch to transmit and then release it to receive. When transmitting, hold the microphone two inches from the mouth and speak clearly in a normal "voice". The radios come complete with a low-impedance (150 ohm) dynamic microphone.
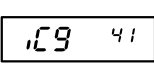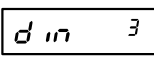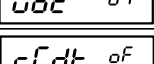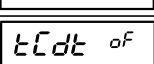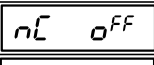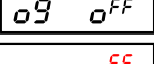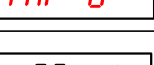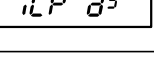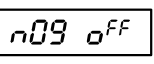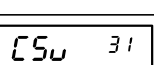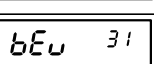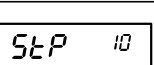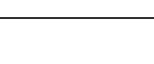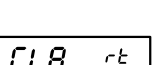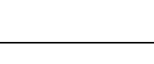

1. PTT	Transmitting key, press to speak, and release to receive a message.
2. UP/DN	These keys allow increasing or decreasing a channel number.
3. AQ	(1) When the radio is receiving a call, press this key to enable the ASQ (Automatic Squelch Control) function. Then, "AQ" will appear on the LCD. Press this key repeatedly to switch on/off the function. (2) When the radio is receiving a call, press and hold this key for over 2 seconds to enable the signal monitoring function. Now, whether the radio receive a signal or not, the radio detects the current channel to check whether the current channel has a weak signal. Release the AQ key to exit this function. (3) Pressing the PTT and AQ key at the same time, the radio emits a single tone. This tone is to help and remind two sides of communication to adjust the frequency. The frequency of this tone is adjustable. (4) ASQ (Automatic Squelch Control) ASQ control setting. It has the same function as the AQ button on the microphone. This jack is for Morse code operation; To operate, connect a CW key to this jack and place the MODE switch in the CW position (LCD display icon "CW")
4. MICROPHONE	The radios come complete with a low-impedance (150 ohm) dynamic microphone.

FUNCTION MENU SETUP

The initial functions and parameters can be changed via the following settings and operations. Please read the following instructions before making any desired amendments.

To enter the Function Menu: under ON state, press and hold the FUNC key for more than 2 seconds, and then release the FUNC key to enter the Function Menu Setup. Under this condition, press the FUNC key to select different functions menu, and CHANNEL SELECTOR Switches to change the data of the Function Menu.

(1) ICG	iCg 41	This menu refers to MIC GAIN function. Users can set the value by software. The higher value goes to higher sensitivity. **64 grades in total (OFF,0-63)** Default: 41
(2) DIM	d in 3	This menu controls the backlight brightness. Level 1, 2, 3, Default: 3
(3) UOL	uoL oFF	This menu controls the VOX sensitivity from level OFF to 9. Default: OFF
(4) UOT	uot 04	This menu controls the VOX delay time from level 1 to 9. Default: 04
(5) RCDT	rCdt oF	This menu refers to RX CTCSS and DCS code setting. Default: OFF
(6) TCDT	tCdt oF	This menu refers to TX CTCSS and DCS code setting. Default: OFF
(7) NC	nC oFF	This menu refers to RX noise compander setting. Default: OFF
(8) NG	oG oFF	This menu refers to TX noise gate setting. Default: OFF
(9) NR	rnr oFF	This menu refers to RX noise reduction setting **6 grades in total (OFF, 1-5) Default: OFF**
(11) ICP	iCP dy	This menu refers to microphone type setting. EL: electronic type, DY: dynamic type Default: DY
(12) NOG	nOG oFF	It refers to TX MON function. Users can set the volume and grade of the TX MON by software. The higher grade goes to louder TX MON. 64 grades in total (OFF,0-63) Default: OFF
(13) CSU	CSu 31	This menu is to adjust the side voice of CW SIDE VOL CW. 64 grades in total. Default: 31
(14) BEU	bEu 31	This menu is to set the volume of prompt voice. 64 grades in total (OFF,0-63). Default: 31
(15) STP	StP 10	This menu is to set the tuning step when adjusting frequency by the CLARIFIER knob Options: 10Hz 、 100Hz 、 1KHz 、 10KHz Default: 10Hz
(16) CLA	CLA rt	This menu is to set functions turned by the CLARIFIER knob. Options are as follows: **FIN:** Fine regulation. When this option is selected, users can fine tune the receiving frequency by rotating the CLARIFIER knob. In the tuning process, the transmitting frequency cannot be regulated by the knob and the "1" icon will appear on the LCD. **RT:** When this option is selected, users can regulate the frequency of both transmitting and receiving. In the tuning process, the "2" icon will appear on the LCD. **T:** When this option is selected, users can only regulate the transmitting frequency. In the tuning process, the "3" icon will appear on the LCD. Default: RT
(17) PUS	PUS StP	This menu is to set functions realized via the PUSH knob. Options are as follows: **COA:** When this option is selected, press the PUSH and turn the CLARIFIER knob to realize the COARSE function. When pressing this key, the "2" icon will appear on the far left of the LCD. Under this condition, rotate the CLARIFIER knob to change frequency of both transmitting and receiving. **T:** When this option is selected, press the PUSH and turn the CLARIFIER knob to change transmitting frequency. When pressing this key, the "3" icon will display on the far left of the LCD. Under this condition, rotate the CLARIFIER knob to change the transmitting frequency only. **STP:** When this option is selected, the PUSH function will change Frequency Tuning Step of the CLARIFIER knob. Press this key, then the corresponding frequency bit will blink. Default: STP
(18) ASQ	ASq oFF	ASQ control setting. It has the same function as the AQ button on the microphone. Default: OFF
(19) TOT	tot 180	This menu is to set transmitting TOT time. When pressing the PTT key at a single time longer than the due time set up in advance, the radio will stop transmitting automatically and the loudspeaker will emit a voice prompt till the PTT key is released. Then, the radio can transmit again. Options: 30-600s Step: 30s Default: 180s

(20) SC	`SC 5�ۮ`	This menu is to set Scan Type. Options are as follows: **SQ:** When SQ is selected, the scan will stop when a valid signal is detected. The radio will resume scanning after the signal disappears for 5s. **TI:** When TI is selected, the scan will stop when a valid signal is detected. The radio will resume scanning 5 seconds later, whether the signal disappears or not. Default: SQ
(21) TSR	`tSr on`	This menu is to choose whether to enable the Transmitting SWR Protection function or not. ON: When ON is selected, the radio will detect the SWR of the antenna. Once the SWR is beyond the SWR set in advance, the radio will prohibit transmitting automatically and the loudspeaker will emit a voice prompt. Then, the "HI S" icon will display on the LCD to remind you that the antenna SWR is too high or antenna does not connect well. OFF: When OFF is selected, SWR Protection function is disabled. NOTE: To protect the radio from long transmission under high SWR, the radio will automatically start SWR Protection once the SWR Value is higher than 20:1. Default: ON (SWR=<10:1)
(22) TDC	`tdC on`	This menu is to choose whether to enable the Power supplied Voltage Protection function. ON: When ON is selected, the radio will detect the supplied voltage. Once the voltage surpasses the voltage set up in advance, the radio would display "DC LO" or "DC HI" to remind you that the voltage is not in a normal state. Meanwhile, the radio will prohibit transmitting and emit a beep prompt. OFF: When OFF is selected, the Power Supplying Voltage is disabled. Default: ON (DC 10.5V-16V)
(23) TLD	`tLd tF`	This menu is to set the content displayed on the LCD when transmitting. **TF:** When TF is selected, LCD will display transmitting frequency when transmitting. SR: When SR is selected, LCD will display SWR value of the antenna when transmitting, for example: "1.2" on the LCD. **BAT:** When BAT is selected, LCD will display Supplied Voltage when transmitting, for example: "13.8DC" on the LCD. **TOT:** When TOT is selected, LCD will display TOT's remaining time when transmitting. And TOT would count down till the remaining time is 0, for example: "170" displayed on the LCD display. Default: TF
(24) RBF	`rbF 1050`	This menu is to select the frequency of Roger Beep. The frequency range is 300KHz-3KHz. The shift step is 10Hz. Default: 1050Hz
(25) RBT	`rbt 500`	This menu is to select Roger Beep Holding Time from 50ms—1000ms. The shift step is 50ms. Default: 500m
(26) CFR	`CFr 1050`	This menu is to select CW Side Tone Frequency from 300Hz-3KHz, the shift step is 10Hz. Default: 1050Hz
(27) TON	`ton 1050`	This menu is to select Transmitting Single-Tone Frequency from 300Hz-3KHz. The shift step is 10Hz. Default: 1050Hz
(28) AGC	`A9E FA`	This menu is to select the S-Meter response speed. FA:Fast speed, SL: Slow speed. Default: FA

RESET FUNCTION (Resume Factory Default)

This Radio offers the RESET FUNCTION to prevent and solve accidental upgrading, as well as provides a solution for customers who changed or activated unconsciously some unwanted function: resuming the original "factory setting" is easy and instantly.
How to Operate:
Method 1 (Background reset)
Step 1: Power off the radio.
Step 2: Press and hold the FUNC and SCAN keys at the same time, followed by powering on the radio.
Step 3: Release the two keys when the LCD displays "RES". All former settings would be replaced by Factory Default value when the LCD displays "REND".

WARNING: All former settings would be replaced by Factory Default value after operating the RESET FUNCTION.

SPECIFICATIONS

General	
Frequency Range	28.000MHz–29.700MHz
Frequency Band	A/B/C/D/E/F
Channel	60 channels (programmable)
Frequency Control	Phase-Locked-Loop Synthesizer
Frequency Step	10Hz 100Hz 1KHz 10KHz
Frequency Tolerance	0.005%
Frequency Stability	0.001%
Temperature Range	–30°Cto +50°C
Microphone	Plug-in dynamic: with push-to-talk /UP/DN/ ASQ switch and coiled cord
Input Voltage	DC 13.8V normal, 15.9V max; 11.7V min Transmit: AM full mod 6A Receiver: Squelched 0.8A SSB 30W PEP output 9A
Size	28*25*6CM
Weight	1.5KG
Antenna Connector	UHF, SO239
TRANSMITTER	
Power Output	AM/CW: 1–12W(adjustable) FM: 1–40W(adjustable) USB/LSB: 1–35W(adjustable)
Modulation	AM FM
Inter-modulation Distortion	SSB: 3rd order, more than –25dB; 5th order, more than –35dB
SSB Carrier Suppression	55dB
Unwanted Sideband	50dB
Frequency Response	AM and FM: 450 to 2500Hz
Output impedance	50ohms, unbalanced
Sensitivity	SSB: 0.25µV for 10dB(S+N)/N at greater than 1/2-watt of audio output. AM:1.0µV for 10 dB(S+N)/N at greater than 1/2watt of audio output. FM: 1.0 µV for 20 dB (S+N)/N at greater than 1/2 watt of audio output.
Selectivity	AM/FM: 6dB@3KHz,50dB @9KHz SSB: 6 dB@2.1KHz,60dB @3.3KHz
Image Rejection	More than 65dB
IF Frequency	AM/FM: 10.695 MHz 1st IF, 455 kHz 2nd IF SSB: 10.695 MHz
Adjacent-Channel	60dB AM/FM &70 dB SSB
RECEIVER	
RF Gain Control	45 dB adjustable for optimum signal reception
Automatic Gain Control (AGC)	Less than 10 dB change in audio output for inputs from 10 to 100,000 microvolt.
Squelch	Adjustable; threshold less than 0.5 µV. Automatic Squelch Control(only AM/FM) 0.5 µV
ANL	Switchable
Noise Blanker	RF type, effective on AM/FM and SSB
Audio Output Power	3 watts into 8 ohms
Frequency Response	300 to 2800 Hz
Built-in Speaker	8 ohms, round.
External Speaker (Not Supplied)	8 ohms; disables internal speaker when connected.

LICENSING REQUIREMENTS

You need an Australian amateur radio qualification to operate this equipment.
In Australia, the ACMA has powers to make technical specifications for radiocommunications equipment under the Radiocommunications Act 1992. However, the primary tenets of the Amateur Radio service are technical investigation, experimentation and self-training; hence, Australian Standards for radiocommunications equipment are not applicable to amateur stations.

No matter what amateur licence (Foundation, Standard or Advanced) you hold, you may possess any piece of equipment manufactured specifically for the global amateur market, provided that you operate it in accordance with the type of licence you hold, even if the item of equipment is capable of operating in certain spectrum segments that are not available to amateurs in Australia.

The latest Regulations handbook for radio Amateurs in Australia can be found here:

https://vkregs.info/wp-content/uploads/2024/08/VK-Regulations-Handbook-August-2024.pdf

RF SAFETY

All transmitters and most receivers radiate some RF energy. Be aware that this energy may interfere with nearby equipment. In particular do not operate this equipment if:

You have a Pacemaker, implantable cardiac defibrillator or other active medical device WITHOUT FIRST CHECKING WITH YOUR DOCTOR.

This transceiver is not "Intrinsically Safe" and should not be used in areas containing a potentially explosive atmosphere. This means areas containing flammable gas, metallic powders, blasting caps, explosives, unvented fuelling areas etc

OPERATING PROTOCOLS AND DECORUM:

Before transmitting on any frequency, always listen first for activity. The frequency you have selected may already be in use, and you may not be able to hear a distant station communicating with a local station. If the frequency is already in use, select an alternative.

ROAD SAFETY

Check with your local state regulations to see if operating this transceiver whist mobile is legal. The onus is on the driver to maintain proper control of the vehicle at all times.

BEACON PROPAGATION

It's a great idea to check 10 metre amateur radio beacon activity to see how good the band conditions are. Check VK6RBP on 28200 Khz and ZL2MHF on 28229 Khz for an indication of propagation.

There is an internation service called the IBP (International Beacon Project) where stations around the world transmit at given times, sequentially on the same frequency (28200 Khz).

IBP Beacons – for current beacon status see https://www.ncdxf.org/beacon/

28200.0 4U1UN UN New York FN30AS 100-0.1 Vertical Omni A1 IBP cycle

28200.0 VE8AT Eureka, Nunavut EQ79AX 100-0.1 Vertical Omni A1 IBP cycle

28200.0 W6WX Mt Umunhum CA CM97BD 100-0.1 Vertical Omni A1 IBP cycle

28200.0 KH6RS Laie, Oahu HI BL10TS 100-0.1 Vertical Omni A1 IBP cycle

28200.0 ZL6B Nr Masterton RE78TW 100-0.1 Vertical Omni A1 IBP cycle

28200.0 VK6RBP 28k SE Perth OF87AV 100-0.1 Vertical Omni A1 IBP cycle

28200.0 JA2IGY Mt Asama PM84JK 100-0.1 Vertical Omni A1 IBP cycle

28200.0 RR9O Novosibirsk NO14KX 100-0.1 Vertical Omni A1 IBP cycle

28200.0 VR2B Hong Kong OL72CQ 100-0.1 Vertical Omni A1 IBP cycle

28200.0 4S7B Colombo NJ06CC 100-0.1 Vertical Omni A1 IBP cycle

28200.0 ZS6DN Pretoria KG44DC 100-0.1 Vertical Omni A1 IBP cycle

28200.0 5Z4B Kiambu KI88MX 100-0.1 Vertical Omni A1 IBP cycle

28200.0 4X6TU Tel Aviv KM72JB 100-0.1 Vertical Omni A1 IBP cycle

28200.0 OH2B Lohja KP20 100-0.1 Vertical Omni A1 IBP cycle

28200.0 CS3B Santo da Serra IM12OR 100-0.1 Vertical Omni A1 IBP cycle

Each beacon transmits once on each band once every three minutes, 24 hours a day.

A transmission consists of the callsign of the beacon sent at 22 words per minute followed by four one-second dashes. The callsign and the first dash are sent at 100 watts. The remaining dashes are sent at 10 watts, 1 watt and 100 milliwatts. At the end of each 10 second transmission, the beacon steps to the next higher band and the next beacon in the sequence begins transmitting.

In addition there is a network of receiving stations around the world monitoring beacons and reporting their results via the internet. This network is called the "Reverse Beacon Network"

See: https://www.reversebeacon.net/ for details.

Channel	Segment A	Segment B	Segment C	Segment D	Segment E	Segment F
01	28.000	28.300	28.600	28.900	29.200	29.500
02	28.005	28.305	28.605	28.905	29.205	29.505
03	28.010	28.310	28.610	28.910	29.210	29.510
04	28.015	28.315	28.615	28.915	29.215	29.515
05	28.020	28.320	28.620	28.920	29.220	29.520
06	28.025	28.325	28.625	28.925	29.225	29.525
07	28.030	28.330	28.630	28.930	29.230	29.530
08	28.035	28.335	28.635	28.935	29.235	29.535
09	28.040	28.340	28.640	28.940	29.240	29.540
10	28.045	28.345	28.645	28.945	29.245	29.545
11	28.050	28.350	28.650	28.950	29.250	29.550
12	28.055	28.355	28.655	28.955	29.255	29.555
13	28.060	28.360	28.660	28.960	29.260	29.560
14	28.065	28.365	28.665	28.965	29.265	29.565
15	28.070	28.370	28.670	28.970	29.270	29.570
16	28.075	28.375	28.675	28.975	29.275	29.575
17	28.080	28.380	28.680	28.980	29.280	29.580
18	28.085	28.385	28.685	28.985	29.285	29.585
19	28.090	28.390	28.690	28.990	29.290	29.590
20	28.095	28.395	28.695	28.995	29.295	29.595
21	28.100	28.400	28.700	29.000	29.300	29.600
22	28.105	28.405	28.705	29.005	29.305	29.605
23	28.110	28.410	28.710	29.010	29.310	29.610
24	28.115	28.415	28.715	29.015	29.315	29.615
25	28.120	28.420	28.720	29.020	29.320	29.620
26	28.125	28.425	28.725	29.025	29.325	29.625
27	28.130	28.430	28.730	29.030	29.330	29.630
28	28.135	28.435	28.735	29.035	29.335	29.635
29	28.140	28.440	28.740	29.040	29.340	29.640
30	28.145	28.445	28.745	29.045	29.345	29.645
31	28.150	28.450	28.750	29.050	29.350	29.650
32	28.155	28.455	28.755	29.055	29.355	29.655
33	28.160	28.460	28.760	29.060	29.360	29.660
34	28.165	28.465	28.765	29.065	29.365	29.665
35	28.170	28.470	28.770	29.070	29.370	29.670
36	28.175	28.475	28.775	29.075	29.375	29.675
37	28.180	28.480	28.780	29.080	29.380	29.680
38	28.185	28.485	28.785	29.085	29.385	29.685
39	28.190	28.490	28.790	29.090	29.390	29.690
40	28.195	28.495	28.795	29.095	29.395	29.695
41	28.200	28.500	28.800	29.100	29.400	29.700
42	28.205	28.505	28.805	29.105	29.405	
43	28.210	28.510	28.810	29.110	29.410	
44	28.215	28.515	28.815	29.115	29.415	
45	28.220	28.520	28.820	29.120	29.420	
46	28.225	28.525	28.825	29.125	29.425	
47	28.230	28.530	28.830	29.130	29.430	
48	28.235	28.535	28.835	29.135	29.435	
49	28.240	28.540	28.840	29.140	29.440	
50	28.245	28.545	28.845	29.145	29.445	
51	28.250	28.550	28.850	29.150	29.450	
52	28.255	28.555	28.855	29.155	29.455	
53	28.260	28.560	28.860	29.160	29.460	
54	28.265	28.565	28.865	29.165	29.465	
55	28.270	28.570	28.870	29.170	29.470	
56	28.275	28.575	28.875	29.175	29.475	
57	28.280	28.580	28.880	29.180	29.480	
58	28.285	28.585	28.885	29.185	29.485	
59	28.290	28.590	28.890	29.190	29.490	
60	28.295	28.595	28.895	29.195	29.495	

Default channel list (after reset)

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SIMPLEX FREQUENCIES

29.120 MHz simplex repeater gateway frequency

29.200 Mhz National calling frequency

29.300 Mhz common calling frequency used from Japan

29.000 Mhz and above, common calling frequency from USA

29.600 Mhz International simples calling frequency

There are also many 10 metre repeaters in operation. As the 10 meter band can open suddenly some repeaters require transmission of a CTCSS tone for access.

REPEATERS-Australia

Output Freq	Input Freq	Callsign	Location	Service Area	Tone
29.120	29.120	VK2RBH	Mt Darling	Broken Hill	88.5
29.120	29.120	VK4RLB	Logan	Brisbane	
29.140	29.140	VK3RRU	Merbein	Mildura	
29.680	29.580	VK4RTQ	Mt Kynoch	Toowoomba	146.2
29.620	29.520/147.675	VK5RSC	Mt Terrible	Adelaide	141.3
29.630	29.530	VK7RMD	Mt Duncan	NW Tasmania	
29.630	29.530	VK2RCZ	Winmalee	W Sydney	
29.640	29.540	VK3RHF	Olinda	Melbourne	88.5
29.650	29.550	VK2RWI	Dural	Sydney	
29.660	29.560	VK3RHF	Bald Hill	Toowoomba	146.2
29.660	29.560	VK4RKC	Ocean View	Brisbane Nth	
29.680	29.580	VK6RHF	Leeming	Perth	179.90
29.680	29.580	VK7RHF	Mt Nelson	Hobart	91.5

BEACONS- Australia and New Zealand

Frequency (Mhz)	Callsign/Ident	Location	Area	Power (W)
28.200	VK6RBP	Roleystone	Perth	100
28.213	VK3RSX	Dunolly	West Victoria	10
28.2565	VK3RMH	Wattle Glen	Melbourne	20
28.260	VK5WI	Elizabeth	Adelaide	10
28.262	VK2RSY	Dural	Sydney	25
28.264	VK6RWA	Whiteman Pk	Perth	20
28.268	VK8VF	Darwin	Darwin	20
28.270	VK4RTL	Mt Stuart	Townsville	5
28.229	ZL2MHF	Upper Hutt	Wellington	10
28.228	ZL3TEN	Aylesbury	Christchurch	20

Programming your HS4 10 metre transceiver

The HS4 transceiver allows user customization of channel data for the 10 metre amateur band.

Frequencies for allocated channel numbers (Tx and Rx), CTCSS/DTS encode and decode frequencies, as well as Echo, Busy, Hi-Cut NB/ANL, RB and scan can all be customized to the user preference.

Programming access is available via the Mini USB port on the rear panel using the programming cable supplied with the transceiver. We have programmed your transceiver to include Australian repeater frequencies including Tx offset and CTCSS where applicable and a specific channel in the EMG position for each sub-band.

The architecture of this transceiver allows for 6 sub-bands within the 10 metre amateur radio ITU allocation. Sub bands A-E contain 60 channels each, whilst sub band F contains 25 channel allocations.

Data can be read from the transceiver and saved on a PC for editing. Edited files can be uploaded to the transceiver, overwriting the original information.

Channel	Segment A	Segment B	Segment C	Segment D	Segment E	Segment F
EMG Ch	Ch 41 IBP Beacon	Ch 31 WICEN	Ch 17 SSTV call	Ch 21 US call	Ch 01 National	Ch 21 Int Call
01	28.000	28.300	28.600	28.900	29.200	29.500
02	28.005	28.305	28.605	28.905	29.205	29.505
03	28.010	28.310	28.610	28.910	29.210	29.510
04	28.015	28.315	28.615	28.915	29.215	29.515
05	28.020	28.320	28.620	28.920	29.220	29.520
06	28.025	28.325	28.625	28.925	29.225	29.525
07	28.030	28.330	28.630	28.930	29.230	29.530
08	28.035	28.335	28.635	28.935	29.235	29.535
09	28.040	28.340	28.640	28.940	29.240	29.540
10	28.045	28.345	28.645	28.945	29.245	29.545
11	28.050	28.350	28.650	28.950	29.250	29.550
12	28.055	28.355	28.655	28.955	29.255	29.555
13	28.060	28.360	28.660	28.960	29.260	29.560
14	28.065	28.365	28.665	28.965	29.265	29.565
15	28.070	28.370	28.670	28.970	29.270	29.570
16	28.075	28.375	28.675	28.975	29.275	29.575
17	28.080	28.380	28.680	28.980	29.280	29.580
18	28.085	28.385	28.685	28.985	29.285	29.585
19	28.090	28.390	28.690	28.990	29.290	29.590
20	28.095	28.395	28.695	28.995	29.295	29.595
21	28.100	28.400	28.700	29.000	29.300	29.600
22	28.105	28.405	28.705	29.005	29.305	29.605
23	28.110	28.410	28.710	29.010	29.310	29.610
24	28.115	28.415	28.715	29.015	29.315	29.615
25	28.120	28.420	28.720	29.020	29.320	29.620/29.520
26	28.125	28.425	28.725	29.025	29.325	29.625
27	28.130	28.430	28.730	29.030	29.330	29.630/29.530
28	28.135	28.435	28.735	29.035	29.335	29.635
29	28.140	28.440	28.740	29.040	29.340	29.640/29.540
30	28.145	28.445	28.745	29.045	29.345	29.645
31	28.150	28.450	28.750	29.050	29.350	29.650/29.550
32	28.155	28.455	28.755	29.055	29.355	29.655
33	28.160	28.460	28.760	29.060	29.360	29.660/29.560
34	28.165	28.465	28.765	29.065	29.365	29.665
35	28.170	28.470	28.770	29.070	29.370	29.670
36	28.175	28.475	28.775	29.075	29.375	29.675
37	28.180	28.480	28.780	29.080	29.380	29.680/29.580
38	28.185	28.485	28.785	29.085	29.385	29.685
39	28.190	28.490	28.790	29.090	29.390	29.690
40	28.195	28.495	28.795	29.095	29.395	29.695
41	28.200	28.500	28.800	29.100	29.400	29.700
42	28.205	28.505	28.805	29.105	29.405	
43	28.210	28.510	28.810	29.110	29.410	
44	28.215	28.515	28.815	29.115	29.415	
45	28.220	28.520	28.820	29.120/29.120	29.420	
46	28.225	28.525	28.825	29.125	29.425	
47	28.230	28.530	28.830	29.130	29.430	
48	28.235	28.535	28.835	29.135	29.435	
49	28.240	28.540	28.840	29.140/29.140	29.440	
50	28.245	28.545	28.845	29.145	29.445	
51	28.250	28.550	28.850	29.150	29.450	
52	28.255	28.555	28.855	29.155	29.455	
53	28.260	28.560	28.860	29.160	29.460	
54	28.265	28.565	28.865	29.165	29.465	
55	28.270	28.570	28.870	29.170	29.470	
56	28.275	28.575	28.875	29.175	29.475	
57	28.280	28.580	28.880	29.180	29.480	
58	28.285	28.585	28.885	29.185	29.485	
59	28.290	28.590	28.890	29.190	29.490	
60	28.295	28.595	28.895	29.195	29.495	

Repeater allocation

Programmed Channels-Tecsun Radios Australia

Tecsun Radios Australia 42/9 Powells Road Brookvale NSW 2100 Australia www.tecsunradios.com.au