

15x10.5cm

ALINCO, INC.

Yodoyabashi Dai-bldg 13F
4-4-9 Koraibashi, Chuo-ku, Osaka 541-0043 Japan
Phone: +81-6-7636-2362 Fax: +81-6-6208-3802
<http://www.alinco.com>
E-mail: export@alinco.co.jp

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ALINCO



VHF FM Transceiver
DJ-W18

VHF/UHF FM Transceiver
DJ-W58

Instruction Manual

Thank you for purchasing your new Alinco transceiver. Please read this manual carefully before using the product to ensure full performance, and keep this manual for future reference as it contains information on after-sales service. In case addendum or errata sheets are included with this product, please read those materials and keep them together with this instruction manual for future reference.

Introduction

Please be informed that this manual has been edited with dealer-use in mind. The product is delivered to consumers after being programmed by dealers. The product is blocked and not functional in ex-factory state due to regulations.

Please read this manual completely from the first page to the last, to learn all the functions the product offers. It is important to note that some of the operations may be explained in relation to information in other chapters. By reading just one part of the manual, you may risk not understanding the complete explanation of the function.

Before transmitting

There are many radio stations operating in proximity to the frequency ranges this product covers. Be careful not to cause interference when transmitting around such radio stations.

■ Lightning

Any person is not safe outdoor during thunderstorm and lightning. This condition is getting worse if somebody keeps a hand-held radio, chances of being hit by lightning are doubled since lightning may hit a radio antenna as well. At this time, there is no hand-held radio having any kind of protection against lightning current (which is higher than 10 kA). Note also that no car provides adequate protection of its passengers or drivers against lightning as well. Therefore, Alinco will not take responsibility for any danger associated with using its hand-held radios outdoor or inside the car during lightning.

■ IP67 Dust and water proof

About IP67 rating

6: Dust tight / No ingress of dust; complete protection against contact. Test duration of up to 8 hours based on air flow using specified powders.

7: No water penetration / Submerge the device for 30 minutes at a depth of 1 meter from the fresh water's surface.

The IP67 designation provides for limited dust and fresh water proofing of the radio, antenna and battery pack when integrated, as specified above. This compatibility is factory guaranteed for a period of one year provided all specified conditions of use are respected, any accessories connected must be specified genuine Alinco accessories and the device has not been disassembled by the consumer. The device is designed to remain operational when used in rain, severe weather or in accidental cases of dropping it in wet place when used in extreme conditions and is in no way stating that you should attempt to use the device under water or submerge the radio for cleaning. Warranty will not cover devices that are damaged due to negligence or misuse of the product. Never remove the small label attached on the rear chassis of this product, or cover it with other materials. This label is essential to adjust an air pressure inside to secure dust/water proofing. A periodical, professional maintenance is recommended when the ingress protection is very important to you.

Note: This model only waterproof when MIC-SP jack cover is tightly closed to body.

■ Covering ranges

You may expect a range of approx 3km (2 miles) or more at high-power when located on a flat, noise-free place like on a beach. However, it may vary drastically depending on how to wear and carry the radios, surrounding locations/conditions and static noise levels (below or near power transmission lines), etc. In urban areas with many buildings or inside a building, such covering range may become drastically short even to several tens of meters.

■ IMPORTANT NOTICE

Dealer Programming

The utility software may be available to distributors/dealers only. USB programming cable is required. The manufacturer will not release the software to unauthorized party so please contact your dealer for details. This product may be delivered to the consumer after being preprogrammed with the operating parameters, then certain operation may be disabled for user-accesses. This is the Commercial radio mode, and it may not work as described in this booklet. The manufacturer and distributors are not aware of details of such dealer-programming. Therefore, please contact to your dealer in case any technical assistance may be necessary.

Self-interference







Due to self-interference, sensitivity of following frequencies are lower than the declared specification. 156.000MHz, 416.000MHz, 442.000MHz, 468.000MHz.

Features

- Output power selectable for DJ-W18, 5W/ 2W / 1W
- Output power selectable for DJ-W58, 5W(VHF) / 4W(UHF) / 2W / 1W
- 200 programmable channels
- Li-Ion battery pack and stand-charger as standard accessories
- Alphanumeric name tags
- FM broadcast 76-108MHz receiver built-in
- Selectable Battery-save parameters
- Busy Channel Lockout
- CTCSS/DCS Encode/Decode, DTMF
- VOX built-in
- Emergency, Alarm signal, Various scan modes, Key lock, Wide/Narrow operations

WARNING










To prevent any hazard during operation of Alinco's radio product, in this manual and on the product you may find symbols shown below. Please read and understand the meanings of these symbols before starting to use the product.


 Danger	This symbol is intended to alert the user to an immediate danger that may cause loss of life and property if the user disregards the warning.
 Alert	This symbol is intended to alert the user to a possible hazard that may cause loss of life and property if the user disregards the warning.
 Caution	This symbol is intended to alert the user a possible hazard that may cause loss of property or injure the user if the warning is disregarded.
	Alert symbol. An explanation is given.
	Warning symbol. An explanation is given.
	Instruction symbol. An explanation is given.



Alert


■ Environment and condition of use


-  Use of this product may be prohibited or illegal outside of your country. Be informed in advance when you travel.
-  It is recommended that you check local traffic regulations regarding the use of a radio equipment while driving. Some countries prohibit or apply restrictions for the operation of radios and mobile-phones while driving.
-  Do not use this product in close proximity to other electronic devices, especially medical ones. It may cause interference to those devices.
-  Keep the radio out of the reach of children.
-  In case a liquid leaks from the product, do not touch it. It may damage your skin. Rinse with plenty of cold water if the liquid contacted your skin.
-  Never operate this product in facilities where radio products are prohibited for use such as aboard aircraft, in airports, in ports, within or near the operating area of business wireless stations or their relay stations.
-  The manufacturer declines any responsibilities against loss of life and/or a property due to a failure of this product when used to perform important tasks like life-guarding, surveillance, and rescue.
-  Do not use multiple radios in very close proximity. It may cause interference and/or damage to the product(s).
-  Risk of explosion if battery is replaced with an incorrect type. Dispose of, or recycle used batteries according to your local regulations.


 The manufacturer declines any responsibilities against loss of life and property due to a failure of this product when used with or as a part of a device made by third parties.


 Use of third party accessory may result in damage to this product. It will void our warranty for repair.

■ Handling this product


 Be sure to reduce the audio output level to minimum before using an earphone or a headset. Excessive audio may damage hearing.


 Do not open the unit without permission or instruction from the manufacturer. Unauthorized modification or repair may result in electric shock, fire and/or malfunction and voids warranty.


 Do not operate this product in a wet place such as in a shower room. It may result in electric shock, fire and/or malfunction.


 Do not place the product in a container carrying conductive materials, such as water or metal in close proximity. A short-circuit to the product may result in electric shock, fire and/or malfunction.


■ About chargers

 Do not use adapters other than having the specified voltage. It may result in electric shock, fire and/or malfunction, Never turn on the radio while charging.

 Do not plug multiple devices using an adapter into a single wall outlet. It may result in overheating and/or fire.

 Do not handle adapter with a wet hand. It may result in electric shock.


 Securely plug the adapter into the wall outlet. Insecure installation may result in short-circuit, electronic shock and/or fire.

 Do not use the adapter if the plug or socket contacts are dirty. Overheating and/or short-circuiting may result in fire, electric shock and/or damage to the product.


■ In case of emergency

In case of the following situation(s), please turn off the product, switch off the source of power, then remove or unplug the power-cord. Please contact your local dealer of this product for service and assistance. Do not use the product until the trouble is resolved. Do not try to troubleshoot the problem by yourself.

- **When a strange sound, smoke and/or strange odor comes out of the product.**
- **When the product is dropped or the case is broken or cracked.**
- **When a liquid penetrated inside.**
- **When a power cord (including DC cables, AC cables and adapters) is damaged**







 For your safety, turn off then remove all related AC lines to the product and its accessories from the wall outlet if a thunderstorm is likely.

■ Maintenance





 Do not open the unit and its accessories. Please consult with your local dealer of this product for service and assistance.


Caution

■ Environment and condition of use

-  Do not use the product in proximity to a TV or a radio. It may cause interference or receive interference.
-  Do not install in a humid, dusty or insufficiently ventilated place. It may result in electric shock, fire and/or malfunction.
-  Do not install in an unstable or vibrating position. It may result in electric shock, fire and/or malfunction when/if the product falls to the ground.
-  Do not install the product in proximity to a source of heat and humidity such as a heater or a stove. Avoid placing the unit in direct sunlight.
-  Be cautious of a dew formation. Please completely dry the product before use when it happens.
-  Electronics devices such as solar panels and LED light bulbs may generate high levels of RF noise that may cause an interference. This is not a defect of receiver circuits of our product.

■ About transceiver

-  Be cautious of the whip antenna when carried in your shirt-pocket etc. It may make contact with your eye and cause injury.
-  Do not connect devices other than specified ones to the jacks and ports on the product. It may result in damage to the devices.
-  Turn off and remove the power source (AC cable, DC cable, battery, cigar cable, charger adapter etc.) from the product when the product is not in use for extended period of time or in case of maintenance.
-  Never pull the cord alone when you unplug AC cable form the wall outlet.

-  Use a clean, dry cloth to wipe off dirt and condensation from the surface of the product. Never use thinner or benzene for cleaning.



- Check with your local waste officials for details on recycling or proper disposal of the electronics product, battery-packs and accessories in your area.

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STANDARD ACCESSORIES

Standard Accessories

DJ-W18	DJ-W58
<ul style="list-style-type: none">EA-250 Whip antennaEBP-101 Li-ion battery pack (7.4V,1800mAh)EDC-219 Rapid charger standEDC-220 AC AdapterEBC-51 Belt Clip	<ul style="list-style-type: none">EA-249 Whip antennaEBP-101 Li-ion battery pack (7.4V,1800mAh)EDC-219 Rapid charger standEDC-220 AC AdapterEBC-51 Belt Clip

NOTE: Accessories may differ depending on the version you have purchased. Please contact your local dealer for details of standard accessories and the warranty-policy before purchase.


BATTERY INFORMATION

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Charging Operation

The battery is not charged at the factory, please charge it before use. Charge the battery for the first time after purchase or extended storage (more than 2 months) may not bring the battery to its normal operating capacity. After repeating fully charge/discharge cycle for two or three times, the operating capacity will reach the best performance. The battery life is over when its operating time decreases even though it is fully and correctly charged and it must be replaced with a new one.

Battery Charger Type

Please use ALINCO's designated charger, other models may cause explosion. After installing the battery, when the radio displays  low battery, please charge the battery.

Notice for Charging Battery

- ▲ Do not short circuit the charger. Never attempt to remove the casing from the battery, otherwise the warranty is void and you risk serious damage to yourself and properties.
- ▲ The ambient temperature should be between 5°C and 40°C while charging. Charging outside this range may not fully charge the battery.
- ▲ Always switch off the transceiver before charging. Otherwise, it may not charge correctly.
- ▲ To avoid interfering the charging procedure, please do not cut off the power or take out the battery during charging.
- ▲ Do not recharge the battery if it is already fully charged. This may shorten the life of the battery or damage the battery.
- ▲ Do not charge the battery or transceiver if it is damp. Dry it before charging to avoid danger.

○ BATTERY INFORMATION

Caution

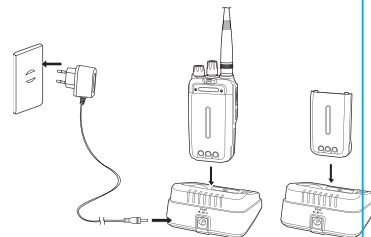
- Risk of explosion, generation of heat or leak of chemicals inside if the battery is replaced by an incorrect type or reverse polarity. Use always the recommended types of batteries in this manual only.
- The battery pack isn't fully charged when shipped. It must be charged before use.
- Charging should be conducted in a temperature range of +5°C to +40°C (+41°F to +104°F).
- Don't modify, dismantle, incinerate or immerse the battery pack in the water as this can be dangerous.
- Never short circuit the battery pack terminals, as this can cause damage to the equipment or lead to heating of the battery which may cause burns.
- Unnecessary prolonged charging (overcharging) can deteriorate battery performance.
- The battery pack should be stored in a dry place where temperature is in -10°C to +45°C (-14°F to +113°F) range. Temperatures outside this range can cause the battery liquid to leak. Exposure to prolonged high humidity can cause corrosion of metal components.
- Battery-packs are a consuming part. When its operating time becomes considerably short after a normal charge, please consider that the pack is exhausted and replace it with a new one.
- The battery pack is recyclable. Check with your local waste officials for details on recycling options or proper disposal in your area.
- Use specified genuine chargers only to charge battery packs. Use of other chargers may cause damage to products, you and your property.
- Never carry battery packs together with conductive articles such as metals in a same bag to prevent from short-circuiting. Put the packs only in nylon bags to carry them safely.
- Even if you do not use the battery pack for a long time, charge it at least once every three months to prevent deterioration.

○ BATTERY INFORMATION

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How to Charge

1. Plug the AC adaptor into the AC outlet, then plug the cable of AC adaptor into the DC jack, there without indicator light. (waits to charge).
2. Slide the battery or transceiver with battery into the charger, make sure the battery terminals are in contact with the charging terminals. LED turns into RED (charging).
3. It takes about 4 hours to fully charge the battery, and LED turns OFF when the charge is complete.



Warning: Never charge while the radio is turned on. When turned on, the charger can't detect the charging voltage properly and LED fails to indicate charge status correctly.

NOTE:

- ▲ Trouble means battery heating, short circuit or charger malfunction. Remove the battery pack from the charger immediately and contact to your local dealer for services.
- ▲ The max trickle pre-charging time is 30 minutes. In case the red indicator continues to blink longer, please stop charging and consult with your local dealer for services.
- ▲ It is known that Li-Ion battery packs heat up over 400°C by itself when kept in a temperature of over 80°C for extended period of time. Although the packs are protected against overheating with a protective circuit, never leave the battery packs in a car or similar locations in hot seasons.
- ▲ Li-ion packs may deteriorate by over 30% regardless of conditions after 3 years. This is a nature of Li-ion pack and not a defect of the product.

○ BATTERY INFORMATION

- ▲ The charger is to charge the battery pack only. It is not an AC adapter to operate the radio. Never attempt to transmit the radio with using the charger as it will cause the damage to the charger and a repair/replace may become necessary.
- ▲ The charge should be conducted in an ambient temperature with a proper air-conditioning in an extremely hot or cold seasons.
- ▲ Try charging the battery pack only when having trouble charging with the radio. In case the radio may have troubles, the charge can't be conducted properly. If the battery pack can be charged alone, please take the radio to your local dealer for services.

(((How to Store the Battery

1. The battery should be kept in the status of 50%-100% charged when storing.
2. It should be kept in cool, dry environment and remove it from the transceiver.
3. Keep away from source of heat and direct sunlight.

WARNING

- ▲ Do not short circuit battery terminals.
- ▲ Never attempt to remove the casing from the battery pack.
- ▲ Never assemble the battery hazardous in explosive atmosphere as, spark may cause explosion.
- ▲ Do not put the battery in hot environment or throw it into fire, it may also cause explosion.

Note : Battery pack discharges faster when it is attached to the radio. Please always remove it from the radio when not in use.

○ PREPARATION

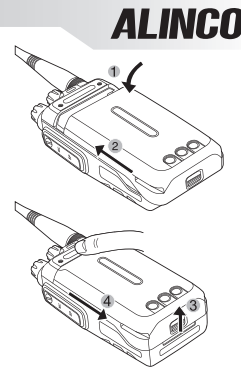
(((Installing / Removing the Battery

■ Installing the Battery:

Align the catches on the unit with the grooves on the battery pack, slide the pack forward and close the latch until it clicks.

■ Removing the Battery Pack:

Push the latch in the direction of the arrow, and pull out the battery pack.



(((Installing / Removing the Antenna

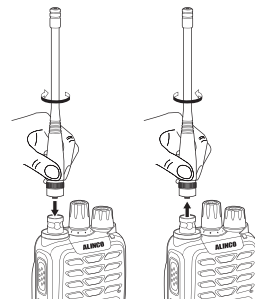
■ Installing the Antenna:

1. Holding the antenna by its base.
2. Align the grooves at the base of the antenna with protrusions on the antenna connector.
3. Slide the antenna down and turn it clockwise until it stops.
4. Confirm that antenna is securely connected.

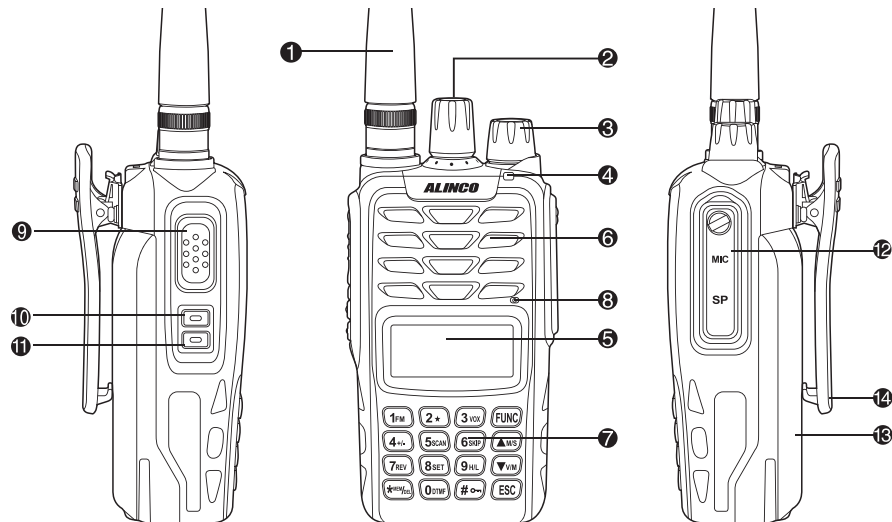
■ Removing the Antenna:

Turn the antenna anticlockwise to disconnect the antenna.

NOTE: Do not use third-party antenna as it may radiate more RF that exceeds SAR limit guidances.



◦ GETTING ACQUAINTED



NOTE: Please do not close the microphone hole.

◦ GETTING ACQUAINTED

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- ❶ Antenna (marked CH)
- ❷ Main dial (marked VOL)
- ❸ Power / Volume Switch
Rotate it clockwise to turn on transceiver, rotate it anticlockwise until clicks to turn off the transceiver. When transceiver is power on, rotate it clockwise to increase volume, anticlockwise to reduce.
- ❹ TX/RX indicator, RX is Blue, TX is Red
- ❺ LCD display
Displays current frequency/channel and operations
- ❻ Speaker
- ❼ Keypad
Enters desired frequency/channel or operations by keypads
- ❽ Mic
- ❾ PTT key
Press PTT key to talk, release this key to receive.
- ❿ PF1 key
- ⓫ MONI key
- ⓬ Speaker/Microphone jack, programming cable jack
- ⓭ Battery
- ⓮ Belt Clip

○ BASIC OPERATIONS

☞ Turn the Radio On & OFF

Turn [POWER/VOLUME] knob clockwise to turn on power. A beep sounds and shows current setting on the display. Turn counterclockwise till it clicks to turn off power.



☞ Adjusting Volume

Under power-on state, turn [POWER/VOLUME] knob to adjust volume. Press [MONI] key to hear the noise for audio level setting. Turn [POWER/VOLUME] knob clockwise when too low, counterclockwise to reduce if too loud

NEVER USE EARPHONE while adjusting audio level. The max audio output is 1W, and it's loud enough to hurt your eardrums.

You may feel a static shock when wearing an earphone in a dry atmosphere but it's not a defect of product but a cause of nature. It is the same shock you feel typically when opening a door of a car in certain conditions.

☞ Switch between Main band and Sub band

Under standby state, press **[MIS]** key to switch channel between Main band and Sub band.

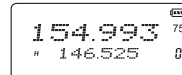


○ BASIC OPERATIONS

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☞ Switch between Channel mode and VFO mode

Under standby state, press **[V/M]** key to set main band as Channel mode (Memory mode) or frequency mode (VFO).



☞ Selecting Memory Channel

Channels must be programmed in advance to operate. If not pre-programmed, refer to P.15 and edit them as necessary. In channel mode or FM channel mode, turn the main dial to select a desired channel. Turn it clockwise to change channels upward, counterclockwise to downward. Only programmed channel numbers appear and skips blank channels.

Use numerical keys to directly select the desired channels. To set 01, press 001. To set 30, press 30 and press 199 to set 199.

☞ Selecting VFO Frequencies

In VFO or FM radio frequency mode, turn main dial to select a desired frequency. Turn the main dial clockwise to change upward, counterclockwise to downward in order of preset step see P.25 to change step value.

**NOTE: Channel step: 2.5K, 5K, 6.25K 10K, 12.5K, 20K, 25K, 30K AND 50KHz in total 9 options.
FM radio step frequency is 50KHz.**

o BASIC OPERATIONS

In VFO mode, you can directly input frequency by keypad.

Example: To enter 155.120, press [1][5][5][1][2][0]. By pressing the last [0], a dot appears after the MHz unit and the frequency is set. When an invalid numbers are entered, the display will return to the current state and an error beep sounds.

(((Receiving

When a signal is received on the frequency that you selected, TX/RX indicator lights green and S-meter shows signal strength, then the received signal can be heard. When receiving in SUB band, a "★" icon appears at the bottom left of the display. Use [MONI] key when receiving a signal but not hearing, CTCSS and DCS are temporary cancelled and allows you to monitor the signal.

(((Transmitting

Use [MONI] key and monitor the channel you are going to transmit and make sure the channel is clear. Press the [PTT] key. The red TX indicator turns on while transmitting. While holding down the [PTT] key, speak into the unit at normal voice from the distance of about 5cm. Release the [PTT] key to receive.

NOTE: Talking too loud or undertone may result poor audio at receiving side.

o BASIC OPERATIONS

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(((Emergency Alarm

Under standby state, press and hold [PF1] key until LED lights up solid red, emergency alarm function is started. Transceiver emits emergency sounds. Press [PTT] key or power off transceiver to exit alarm.

(((Transmit tone burst

Press and hold [PTT] key, then press [PF1] to transmit selected tone burst tone. The tone frequency can be set to 1750Hz / 2100Hz / 1000Hz / 1450Hz.

(((MONI Key Function

Following functions may be assigned to the MONI key.

1. Squelch off: Press and hold [MONI] key in 5 seconds, squelch will be temporary off and you can hear background noise. Press [MONI] key again, squelch will be on.
2. Monitor: Press [MONI] key, you can hear background noise. Release [MONI], squelch is mute.
3. Turn the power on while holding the [MONI] key to enter to the set mode.

○ BASIC OPERATIONS

⦿ Edit channel

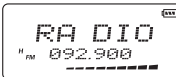
1. Under frequency mode (VFO), enter desired frequency and settings, press **FUNC** key, the top left corner of LCD displays "**F**" icon, press ***MEM/CH** key to switch into channel mode, LCD displays "**MEN CH**" and channel number flashes.
2. Turn main dial or input the number directly to select the desired channel number to store.
3. Press **FUNC** key to store the channel number.

⦿ Delete channel

1. Under standby state and in channel mode, press **FUNC** key, the top left corner of LCD displays "**F**" icon, press ***MEM/CH** key, LCD display "**DEL CH**" and channel number flashes.
2. Turn main dial or input the number directly to select the desired deleting channel number.
3. Press **FUNC** key to delete the channel number.

⦿ Turn On/ Off FM Radio

Under standby state, press **FUNC** key, the top left corner of LCD displays "**F**" icon, then press **1FM** key, LCD displays "**RADIO**" and current FM radio frequency, FM radio function is on.



Repeat above operation to turn off FM radio.

When FM radio is on, Re-start transceiver, FM radio function will still on.

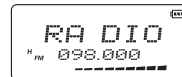
You can listen to the FM radio in the background (any incoming call will silence the FM radio) by pressing the [PTT] button .

○ BASIC OPERATIONS

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⦿ FM Channel Searching

When transceiver in FM radio mode, press **FUNC** key, LCD displays "**F**" icon, then press **5SCAN** key to start FM searching. Scan stops when receiving a signal. Repeat to search another station. While searching, turn the dial clockwise to scan upward, counterclockwise to scan downward.



⦿ Turn On/ Off AM

Under standby state, press **FUNC** key, the top left corner of LCD displays "**F**" icon, then press **2*** key, LCD displays "**AM**" and current AM frequency, AM mode is on. Repeat above operation to turn off AM.

When AM mode is on, normal transmitted function and received function are disabled. Only AM frequency can be received.

⦿ AM Channel Searching

When transceiver in AM mode, press **FUNC** key, LCD displays "**F**" icon, then press **5SCAN** key to start AM searching. Scan stops when receiving a signal. Repeat to search another station. While searching, turn the dial clockwise to scan upward, counterclockwise to scan downward.

◦ BASIC OPERATIONS

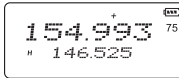
☞ Voice Operated Transmission (VOX)

Under standby state, press **FUNC** key, the top left corner of LCD displays "**F**" icon, then press **3 VOX** key, the top middle of LCD displays "VOX" and VOX function is on. Repeat above operation to turn off VOX function. When VOX function is on the transmitting can be started by voice, no need to press [PTT] key.

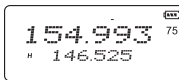
☞ Offset Frequency Direction Setup

In VFO mode, under standby state, press **FUNC** key, the top left corner of LCD displays "**F**" icon, press **4 +/-** key to choose offset frequency direction. There are 3 options, positive offset, minus offset, shut off offset.

1. (+) Positive offset: Indicates TX frequency is higher than RX frequency.
When enabling reverse function, the RX frequency is higher than TX frequency.
2. (-) Minus offset: Indicates TX frequency is lower than RX frequency. When enabling reverse function, the RX frequency is lower than TX frequency.
3. None: Indicates that offset is not in use.



154.993⁺
" 146.525



154.993⁻
" 146.525

NOTE: This function is invalid in channel mode.

◦ BASIC OPERATIONS

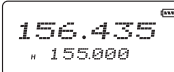
ALINCO

☞ Frequency/Channel Scan

Under corresponding mode, press **FUNC** key, the top left corner of LCD displays "**F**" icon, then press **5 SCAN** key to start frequency scan or channel scan.

1. Frequency Scan

Scans all VFO range in order of step and stops when an incoming signal is detected. Turn dial clockwise to scan upward, counterclockwise to downward. When the signal is gone, it resumes scanning after 5 seconds. Press any numerical key or ESC to stop scanning.



156.435⁺
" 155.000

2. Channel Scan

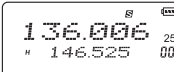
Scans all preprogrammed channels and stops when an incoming signal is detected. Turn dial clockwise to scan upward channel number, counterclockwise to downward. When the signal is gone, it resumes scanning after 5 seconds. Press any numerical key or [ESC] key to stop scanning.

NOTE: Refer to P.32 "Scan modes" to select scan resume conditions.

☞ Channel Scan Skip

Under channel mode, press **FUNC** key, the top left corner of LCD displays "**F**" icon, then press **6 SKIP** key to set the current channel as channel scan skip. Repeat above operation to cancel channel scan skip.

1. LCD displayed "**S**" icon means the current channel will not be scanned.
2. "**S**" icon disappeared means the current channel will be scanned.



136.006^S
" 146.525

○ BASIC OPERATIONS

☞ Frequency Reverse

Under standby state, press **FUNC** key, the top left corner of LCD displays "**F**" icon, then press **7REV** key to set the current channel as frequency reverse, repeat above operation to turn off frequency reverse.

- When "+" offset frequency is on and then turn on reverse function, top corner of LCD will flash "-" icon.

- When "-" offset frequency is on and then turn on reverse function, top corner of LCD will flash "+" icon.

- When current channel is opening the frequency reverse function, TX frequency and RX frequency is interchanged, if CTCSS/DCS signaling is set, it will also interchange.

155.125
" 145.100 15

☞ TX Power selection

Under standby state, press **FUNC** key, the top left corner of LCD displays "**F**" icon, then press **9HL** key to choose High/Low power for current channel.

1. When LCD displays "**L**" icon, it means low power is chose.

2. When LCD displays "**H**" icon, it means high power is chose.

3. When LCD displays "**M**" icon, it means Middle power is chose.

146.525
" 136.006 25 03

146.525
" 136.006 25 03

146.525
" 136.006 25 03

☞ Keypad lock

Under standby state, press **FUNC** key, the top left corner of LCD displays "**F**" icon, then press and hold **#ON** key until a beep sounds, and LCD displays "no" icon, keypad is locked. Repeat above operation, "no" icon disappears, key lock function is cancelled.

173.987 5
" 136.006 25 no

○ BASIC OPERATIONS

ALINCO

NOTE: When keypad is locked, only PTT key/ **FUNC** key/ main dial are usable.

☞ DTMF code Transmit and Enquiry

1. Press **FUNC** key, the top left corner of LCD displays "**F**" icon, then press **0DMF** key, LCD displays DTMF data and group number (total 16 groups) of current group.

2. Turn main dial to choose desired group and DTMF data, press [PTT] key to transmit selected DTMF signaling. If current group not edit DTMF data, LCD displays the current group number and "**EMPTY**".

EMPTY
01

When DTMF function is on and transceiver is receiving a signal which matched to DTMF code, the top of LCD will display "📞" icon and you can hear the call.

To create group DTMF use PC software.

FUNCTION MENU SETUP

The operating methods are as follows:

1. Press **FUNC** key, the top left corner of LCD displays "**F**" icon, then press **8SET** key to enter function menu.
2. Press **▲MS** / **▼VW** choose desired function menu function.
3. Turn main dial to select desired setting.

Note:In CTCSS/DCS setting, Press ***MEMO** to select CTCSS, DCS or OFF. When select DCS press **#On** to switch between positive and negative code.

4. Press **FUNC** to confirm the selection, then press **ESC** key to exit menu.

Menu No.	LCD Display	Function	Options	Description
1	R-CDC	CTCSS/DCS Decode	OFF	No CTCSS/DCS Decode
			67Hz-254.1Hz	50 groups fixed CTCSS decode
			D023N-D754I	104 groups DCS decode
2	T-CDC	CTCSS/DCS Encode	OFF	No CTCSS/DCS Encode
			67Hz-254.1Hz	50 groups fixed CTCSS encode
			D023N-D754I	104 groups DCS encode
3	STEP	Frequency step size setup	2.5K-50K	9 options in total (VFO mode only)
4	W/N	Wide / Narrow Band Selection	WIDE/NARROW	Wide band/Narrow band
5	BEEP	Keypad Voice prompt setup	ON/OFF	Turn on/off
6	LIGHT	LCD Backlight	ON/OFF	Always on/off
			AUTO	Backlight will automatically closed after a period.

FUNCTION MENU SETUP

ALINCO

7	COLOR	LCD Backlight Color	BLUE/ORG/PUR	Blue/Orange/Purple
8	TOT	Time-Out-Timer	OFF	Turn off time-out timer
			30-270 S	Total 9 levels for optional, each interval is 30S step up
9	OFFSET	Offset Frequency Setup	0-99.995MHz	Frequency range is 0-99.995MHz
10	VOX LV	Voice Operated Transmission (VOX) Setup	1-9	Total 9 VOX levels for optional
11	VOX D	VOX Delay Setup	0.3S-3S	0.3S/0.5S/1.0S/1.5S/2.0S/3.0S
12	LOCK	Keypad Lock	Manual	Manual Keypad lock
			Auto	Keypad automatic locked after a period
13	CHNAME	Editing Channel Name	a~z / A~Z / 0~9 / ! / !#/\$/%/(/) / + / - / ; / & / / / < / = / > / ? / @ / [/ ¥ /] / ^ / _ / * / , / ,	In channel name display mode, will display the edited channel name.(Channel mode only)
14	VOICE	Voice Announcement Setup	ON/OFF	Turn on/off
15	BCLO	Busy Channel Lockout Setup	BCL/BTL/ OFF	3 options

FUNCTION MENU SETUP

16	TBST	Repeater Signaling Setup	1000Hz/1450Hz/1750Hz/2100Hz	Tone plus frequency is 1750Hz/2100Hz/1450Hz/1000Hz
17	SAVE	Battery Save Setup	ON/OFF	Turn on/off
18	SCAN-M	Scan Model Setup	TO/CO/SE	3 options
19	SQL	Squelch Level Setup	0-9	Total 10 SQL levels for optional

Default Settings

Menu No.	LCD Display	Default
01	R-CDC	OFF
02	T-CDC	OFF
03	STEP	10KHz
04	W/N	Wide
05	BEEP	ON
06	LIGHT	ON
07	COLOR	Orange
08	TOT	OFF
09	OFFSET	10MHz
10	VOX LV	6

Menu No.	LCD Display	Default
11	VOX D	3Sec
12	LOCK	Manual
13	CHNAME	Blank
14	VOICE	OFF
15	BCLO	OFF
16	TBST	1750Hz
17	SAVE	ON
18	SCAN-M	TO
19	SQL	9

FUNCTION MENU SETUP

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CTCSS/DCS Decode Setup

By using this function with CTCSS/DCS encode feature, you hear only signals that are sent with matching tones. (Such operations are often referred to as Tone-Squelch or DCS squelch)

- After pressing **FUNC** key, the top left corner of LCD displays "**F**" icon then press **8SET** key.
- Press **▲MIS** / **▼VIM** key to choose menu 01 and display "R-CDC".
- Turn main dial to select desired setting.
- Press ***MIS** key to choose the desired CTCSS / DCS decoding tone. When selecting CTCSS turn main dial to select desired tone. When selecting DCS press **#PWR** key to switch between positive and negative code. Then turn main dial to select desired code. See appendix for details of available tones and codes.
- Press **FUNC** key to confirm then press **ESC** key to exit.

R-CDC
OFF 01

R-CDC
67.0 01

R-CDC
D023N 01

R-CDC
D023I 01

T-CDC
OFF 02

T-CDC
67.0 02

T-CDC
D023N 02

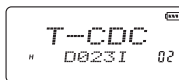
CTCSS/DCS Encode Setup

- After pressing **FUNC** key, the top left corner of LCD displays "**F**" icon then press **8SET** key.
- Press **▲MIS** / **▼VIM** key to choose menu 02 and display "T-CDC".
- Turn main dial to select desired setting.
- Press **1FM** key to choose the desired CTCSS / DCS encoding tone. When selecting CTCSS, turn main dial to select desired tone. When selecting DCS press

FUNCTION MENU SETUP

key to switch between positive and negative code. Then turn main dial to select desired code. See appendix for details of available tones and codes.

5. Press **FUNC** key to confirm then press **ESC** key to exit.



NOTE: you may set the encoding and decoding tones separately.

Frequency Step

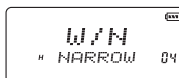
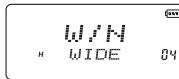
1. After pressing **FUNC** key, the top left corner of LCD displays "**F**" icon, then press **8SET** key.
2. Press **▲MS** / **▼VM** key to choose menu 03 and display "**STEP**".
3. Turn main dial to select desired setting.
4. Press **FUNC** key to confirm then press **ESC** key to exit.

Available steps are 2.5K, 5K, 6.25K, 10K, 12.5K, 20K, 25K, 30K and 50KHz. This parameter is not available when the radio is in the Channel mode.



Wide/ Narrow FM Mode

1. After pressing **FUNC** key, the top left corner of LCD displays "**F**" icon, then press **8SET** key.
2. Press **▲MS** / **▼VM** key to choose menu 04 and display "**W/N**".
3. Turn main dial to select desired setting.



FUNCTION MENU SETUP

ALINCO

Available parameters are 12.5KHz(narrow) and 25KHz(wide).

4. Press **FUNC** key to confirm then press **ESC** key to exit.

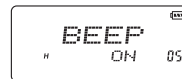
Beep sounds

1. After pressing **FUNC** key, the top left corner of LCD displays "**F**" icon, then press **8SET** key.
2. Press **▲MS** / **▼VM** key to choose menu 05 and display "**BEEP**".
3. Turn main dial to select desired setting.

ON: Beep sounds is enabled.

OFF: Beep sounds is disabled.

4. Press **FUNC** key to confirm then press **ESC** key to exit.



LCD Backlight

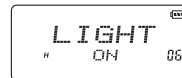
1. After pressing **FUNC** key, the top left corner of LCD displays "**F**" icon, then press **8SET** key.
2. Press **▲MS** / **▼VM** key to choose menu 06 and display "**LIGHT**".
3. Turn main dial to select desired setting.

AUTO: Backlight will automatic closed after a period.

OFF: Always off.

ON: Always on.

4. Press **FUNC** key to confirm then press **ESC** key to exit.



FUNCTION MENU SETUP

LCD Backlight Color

There are three kinds of backlight color for optional.

1. After pressing **FUNC** key, the top left corner of LCD displays " **F** " icon, then press **8SET** key.
2. Press **▲MIS** / **▼VIM** key to choose menu 07 and display "COLOR".
3. Turn main dial to select desired setting.

ORANGE: Orange backlight

PURPLE: Purple backlight

BLUE: Blue backlight

4. Press **FUNC** key to confirm then press **ESC** key to exit.



Time-Out-Timer (TOT)

The purpose of Time-out-Timer is to restrict transceiver for continuous long-term transmission. When the continuous transmission time is beyond the preset time, transceiver is forced to stop transmitting and make a beep sound.

1. After pressing **FUNC** key, the top left corner of LCD displays " **F** " icon, then press **8SET** key.
2. Press **▲MIS** / **▼VIM** key to choose menu 08 and display "TOT".
3. Turn main dial to select desired setting.

OFF,30~270S of TOT for optional, each interval is 30 seconds.

4. Press **FUNC** key to confirm then press **ESC** key to exit.

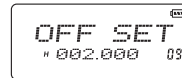


FUNCTION MENU SETUP

ALINCO

Offset Frequency

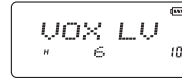
1. After pressing **FUNC** key, the top left corner of LCD displays " **F** " icon, then press **8SET** key.
2. Press **▲MIS** / **▼VIM** key to choose menu 09 and display "OFF SET".
3. Press ***MEM/SEL** key to enter next menu, input desired offset frequency by keypad.
Available parameters are 0.00 to 69.995MHz in step size selected in menu 09.
4. Press **FUNC** key to confirm then press **ESC** key to exit.



Voice Operated Transmission (VOX)

When this function is on, the transmitting can be started by voice, no need to press [PTT] key.

1. After pressing **FUNC** key, the top left corner of LCD displays " **F** " icon, then press **8SET** key.
2. Press **▲MIS** / **▼VIM** key to choose menu 10 and display "VOX LV".
3. Turn main dial to select desired setting.
1~9 : Total 9 VOX levels for optional.
1 is most sensitive, 9 is less sensitive that requires more voice level to activate VOX.
4. Press **FUNC** key to confirm then press **ESC** key to exit.



NOTE: VOX is not usable in noisy areas as it may start transmitting by the back noise.

FUNCTION MENU SETUP

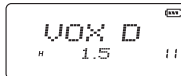
Voice Operated Transmission (VOX) Delay Time

If transceiver returns to receive mode instantly after VOX calling, it may cause calling voice missing. To avoid this problem, user can set a suitable delay time.

1. After pressing **FUNC** key, the top left corner of LCD displays "**F**" icon, then press **8SET** key.
2. Press **▲MS** / **▼VM** key to choose menu 11 and display "VOX D".
3. Turn main dial to select desired setting.

0.3S-3S: Total 6 levels .

4. Press **FUNC** key to confirm then press **ESC** key to exit.




Keypad lock

1. After pressing **FUNC** key, the top left corner of LCD displays "**F**" icon, then press **8SET** key.
2. Press **▲MS** / **▼VM** key to choose menu 12 and display "LOCK".
3. Turn main dial to select desired setting.

MANU (Manual): keypad can be locked by manual operation.

AUTO: Keypad will be automatically locked after 20 seconds without any manipulation on the radio.

4. Press **FUNC** key to confirm then press **ESC** key to exit process.
5. To activate keypad lock by manual operation, under main screen press **FUNC** key, the top left corner of LCD displays "**F**" icon, then hold **#0** till the radio emits a beep sound. The bottom left corner of LCD displays "  " means radio keypad is locked.

FUNCTION MENU SETUP

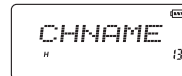
ALINCO

6. Repeat above operation to un-activate keypad lock function.

NOTE: When keypad is locked, only PTT / PF1 / MONI and **FUNC** key are usable.

Editing Channel name

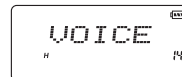
1. After pressing **FUNC** key, the top left corner of LCD displays "**F**" icon, then press **8SET** key.
2. Press **▲MS** / **▼VM** key to choose menu 13 and display "CH NAME".
3. Turn main dial to select desired setting. Press [*] key to confirm current character and move to next character. Press [#] key to edit the previous character.
4. Press **FUNC** key to confirm then press **ESC** key to exit.



NOTE: This feature is available only in the Channel modes. Channel name with a maximum of 6 characters.

Voice Announcement

1. After pressing **FUNC** key, the top left corner of LCD displays "**F**" icon, then press **8SET** key.
2. Press **▲MS** / **▼VM** key to choose menu 14 and display "VOICE".
3. Turn main dial to select desired setting.
ON: Voice announcement is enabled.
OFF: Voice announcement is disabled.
4. Press **FUNC** key confirm and exit then press **ESC** key to exit.



FUNCTION MENU SETUP

Busy Channel Lockout

This function prohibits the transmitting when the channel is busy.

1. After pressing **FUNC** key, the top left corner of LCD displays " **F** " icon, then press **8SET** key.
2. Press **▲MIS** / **▼VIM** key to choose menu 15 and display "BCLO".
3. Turn main dial to select desired setting.

BTL: Signaling busy lock. It suspends transmitting when receiving a signal but incorrect signaling tones.

BCL: Carrier busy lock. It suspends transmitting when receiving any signal.

OFF: PTT operation is always possible without busy channel lockout.

4. Press **FUNC** to confirm and exit then press **ESC** key to exit.



Tone Burst Frequency

This function is used for waking up sleeping repeater, it needs a certain intensity of Tone Burst to wake up sleeping repeater. In general, as long as the repeater has been waked up, no need to transmit Tone Pulse again in preset time.

1. After pressing **FUNC** key, the top left corner of LCD displays " **F** " icon, then press **8SET** key.
2. Press **▲MIS** / **▼VIM** key to choose menu 16 and display "TBST".
3. Turn main dial to select desired setting.

1750Hz, 2100Hz, 1000Hz, 1450Hz, 4 kinds of Tone Burst for optional.



FUNCTION MENU SETUP

ALINCO

Battery Save

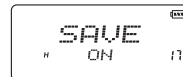
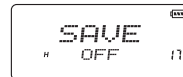
User can setup battery save ratio according to requirements. The standby time can be extended when enabling battery save function, but if save ratio setting too high, it may cause voice missing. After pressing **FUNC** key, the top left corner of LCD displays " **F** " icon, then press **8SET** key.

1. Press **▲MIS** / **▼VIM** key to choose menu 17 and display "SAVE".
2. Turn main dial to select desired setting.

OFF: Battery Save is disabled.

ON: Battery save ratio is adjusting automatically.

3. Press **FUNC** key to confirm then press **ESC** key to exit.



Note: When transceiver is receiving a signal, this function is disable.

Scan Model Setup

There are three kinds of scan dwell time for optional.

1. After pressing **FUNC** key, the top left corner of LCD displays " **F** " icon, then press **8SET** key.
2. Press **▲MIS** / **▼VIM** key to choose menu 18 and display "SCAN-M".
3. Turn main dial to select desired setting.

TO: Time operation scan, when scanning matched signal, transceiver will stop scanning for 5 seconds then resume scan process.



FUNCTION MENU SETUP

CO: Carrier operation scan, when scanning matched signal, transceiver will stop scanning till the carrier signal disappears, after carrier signal disappeared, transceiver will continue to scan next channel/ frequency.

SE: Search scan, when scanning matched signal, transceiver will stop to scan at this carrier frequency and exit scan process.

4. Press **FUNC** key confirm and exit then press **ESC** key to exit.

Squelch level

This function is used for setup intensity of receiving signals, transceiver will hear calls when receiving signal intensity achieve preset data, otherwise, transceiver will keep mute.

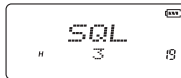
1. After pressing **FUNC** key, the top left corner of LCD displays " **F** " icon, then press **8SET** key.

2. Press **▲M/S** / **▼V/M** key to choose menu 19 and display "SQL".

3. Turn main dial to select desired setting.

0~9: 10 levels of squelch in total for optional, "0" is minimum setup value (normally open)

4. Press **FUNC** key to confirm then press **ESC** key to exit.



FUNCTION MENU SETUP

ALINCO

Display Setup (Channel Mode)

There are three kinds of display modes for optional.

1. Press [MONI] key to turn on radio, hold [MONI] key until transceiver emits a sound.

2. Press **▲M/S** / **▼V/M** key to choose "DSP" indication on LCD.

3. Turn main dial to select desired setting.

FREQ: Frequency+ Channel mode.

CH: Channel number + Channel mode.

NAME: Channel number + Name tag mode.

4. Press **FUNC** key to confirm press **ESC** key to exit.



Resume Factory Default

You can make all the settings of transceiver return to the factory default settings when transceiver can not work normally because of wrong operation or error setup.

1. Press [MONI] key to turn on radio, hold [MONI] key until transceiver emits a sound.

2. Press **▲M/S** / **▼V/M** key to choose "RESET" indication on LCD

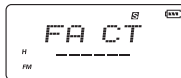
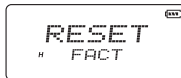
FUNCTION MENU SETUP

3. Turn main dial to select desired setting.

FACT: Resume all items to factory default, including channel and background settings.

Press **FUNC** key to enter to next menu, LCD displays "____" indication to request password, input from keypad with password is: 000000.

INIT: Resume background settings to factory default, channel operations are keeping. Press **FUNC** key to confirm current selection.



AUXILIARY FUNCTIONS

ALINCO

Cable Cloning

With this function, you can copy the programming data of the transceiver to another one; it can copy parameters and memory programming data to another transceiver.

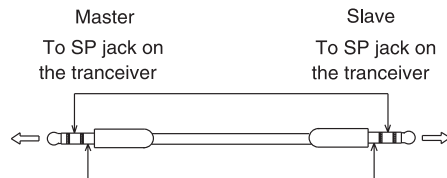
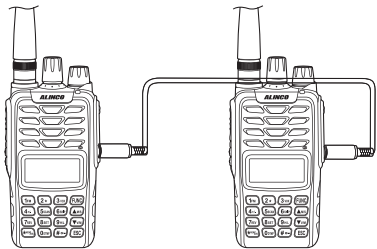
Connection: use wire cloning cable of your own to connect main transceiver with sub-transceiver through reading / writing programmable interface.

1. In power off state, connect two transceivers by cable follow the below diagram. Then turn on sub transceiver.
2. For main transceiver: At the same time hold [PF1] key and turn on power to get in "**CLONE**" mode. LCD displays "**CLONE**". Press [PF1] key to start transfer data from main transceiver to sub transceiver.
3. After data copies completely, main transceiver stays in this mode preparing to next copy, restart main transceiver to exit copy mode and sub transceiver returns to normal mode.
4. Power off transceivers, take over cable line and link to another sub-transceiver which you want to copy. If data can not transfer successfully, power off main transceiver and sub-transceiver, check the cable line and repeat the process.

◦ AUXILIARY FUNCTIONS

📡 Cable cloning instruction

Connect the cable to SP jack



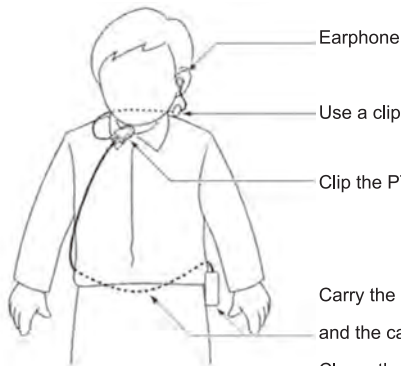
NOTE: Commonly available 3.5mm ϕ stereo miniplug audio cable is usable.

◦ OPTIONAL ACCESSORIES

ALINCO

- EA-249 Whip antenna (VHF/UHF)
- EA-250 Whip antenna (VHF)
- EBP-101 Li-ion battery pack (7.4V,1800mAh)
- EDC-219 Rapid charger stand
- EDC-220 AC Adapter
- EBC-51 Belt Clip
- EME-56A Earphone Microphone
- EMS-76 Speaker Microphone

◦ RECOMMENDED INSTALLATION OF EARPHONE MICROPHONE



Earphone

Use a clip to fix with collar.

Clip the PTT unit closer to your mouth.

Carry the radio on the side or the back of your body,
and the cable should go around the back as shown.

Clamp the excessive length of cable at your waist

◦ TECHNICAL SPECIFICATION

ALINCO

For DJ-W18

General	
Frequency Range	VHF: 136~174MHz
Channel Capacity	200 channels
Channel Spacing	25KHz (wide band) 12.5KHz (narrow band)
Phase-locked Step	2.5KHz, 6.25KHz
Operation Voltage	7.4V DC \pm 20%
Battery Life	More than 10 Hours(1800mAh), by TX 5(Sec)-RX 5(Sec)-Standby 90(Sec) working cycle
Frequency Stability	\pm 2.5ppm
Operation Temperature	-20°C ~ +60°C
Size	118x59x38mm (with battery pack)
Weight	approx. 230g (with battery pack and antenna)

Receiving Part		
	wide band	Narrow band
Sensitivity (12dB SINAD)	-12dBu	-9dBu
Adjacent Channel Selectivity	\geq 60dB	\geq 60dB
Intermodulation	\geq 55dB	\geq 55dB
Spurious Rejection	\geq 70dB	\geq 70dB
Hum & Noise	\geq 45dB	\geq 35dB
Audio Power Output	1000mw /10%	
Transmitting Part		
	wide band	Narrow band
Power Output	5W/2W/1W	
Modulation	16K Φ F3E	11K Φ F3E
Hum & Noise	\geq 40dB	\geq 35dB
Spurious Emission	\leq -27dB	\leq -27dB
Audio Distortion	\leq 10%	

TECHNICAL SPECIFICATION

For DJ-W58

General	
Frequency Range	VHF: 136~174MHz UHF: 400~470MHz
Channel Capacity	200 channels
Channel Spacing	25KHz (wide band) 12.5KHz (narrow band)
Phase-locked Step	2.5KHz, 6.25KHz
Operation Voltage	7.4V DC \pm 20%
Battery Life	More than 10 Hours(1800mAh), by TX 5(Sec)-RX 5(Sec)-Standby 90(Sec) working cycle
Frequency Stability	\pm 2.5ppm
Operation Temperature	-20°C~ +60°C
Size	118x59x38mm (with battery pack)
Weight	approx. 230g (with battery pack and antenna)

Receiving Part		
	wide band	Narrow band
Sensitivity (12dB SINAD)	-12dBu	-9dBu
Adjacent Channel Selectivity	\geq 60dB	\geq 60dB
Intermodulation	\geq 55dB	\geq 55dB
Spurious Rejection	\geq 70dB	\geq 70dB
Hum & Noise	\geq 45dB	\geq 35dB
Audio Power Output	1000mw /10%	
Transmitting Part		
	wide band	Narrow band
Power Output	4W/2W/1W(UHF) 5W/2W/1W(VHF)	
Modulation	16K Φ F3E	11K Φ F3E
Hum & Noise	\geq 40dB	\geq 35dB
Spurious Emission	\leq -27dB	\leq -27dB
Audio Distortion	\leq 10%	

TROUBLE SHOOTING GUIDE

ALINCO

Problem	Corrective Action
No power	A.The battery may be exhausting. Recharge or replace the battery. B.The battery may not be installed correctly. Remove the battery and install it again.
Battery power dies shortly after charging.	The battery life is finished. Replace the battery pack with a new one.
No sound after using earphone. for a while	Earphone jack is broken. Please contact with local dealers to repair.
Cannot talk or hear other members in your group	A.Different frequency or channel, please change it. B.Different CTCSS / DCS / DTMF, please reset it. C.Out of communication range.
Receiving intermittent with in big noise	Out of communication range or obstruct by tall buildings or in big noise.

◦ ATTACHED CHART

📶 CTCSS Frequency Chart

1	OFF	12	94.8	23	136.5	34	177.3	45	218.1
2	67.0	13	97.4	24	141.3	35	179.9	46	225.7
3	69.3	14	100.0	25	146.2	36	183.5	47	229.1
4	71.9	15	103.5	26	151.4	37	186.2	48	233.6
5	74.4	16	107.2	27	156.7	38	189.9	49	241.8
6	77.0	17	110.9	28	159.8	39	192.8	50	250.3
7	79.7	18	114.8	29	162.2	40	196.6	51	254.1
8	82.5	19	118.8	30	165.5	41	199.5		
9	85.4	20	123.0	31	167.9	42	203.5		
10	88.5	21	127.3	32	171.3	43	206.5		
11	91.5	22	131.8	33	173.8	44	210.7		

◦ ATTACHED CHART

📶 104 groups DCS frequency chart

023	025	026	031	032	036	043	047	051	053
054	065	071	072	073	074	114	115	116	122
125	131	132	134	143	145	152	155	156	162
165	172	174	205	212	223	225	226	243	244
245	246	251	252	255	261	263	265	266	271
274	306	311	315	325	331	332	343	346	351
356	364	365	371	411	412	413	423	431	432
445	446	452	454	455	462	464	465	466	503
506	516	523	526	532	546	565	606	612	624
627	631	632	654	662	664	703	712	723	731
732	734	743	754						