A1-221124

Manufacture:

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Electrical and electronic equipment and batteries should be recycled at a facility capable of handling these items. Contact your local authority for details of disposal rules.

Printed in China

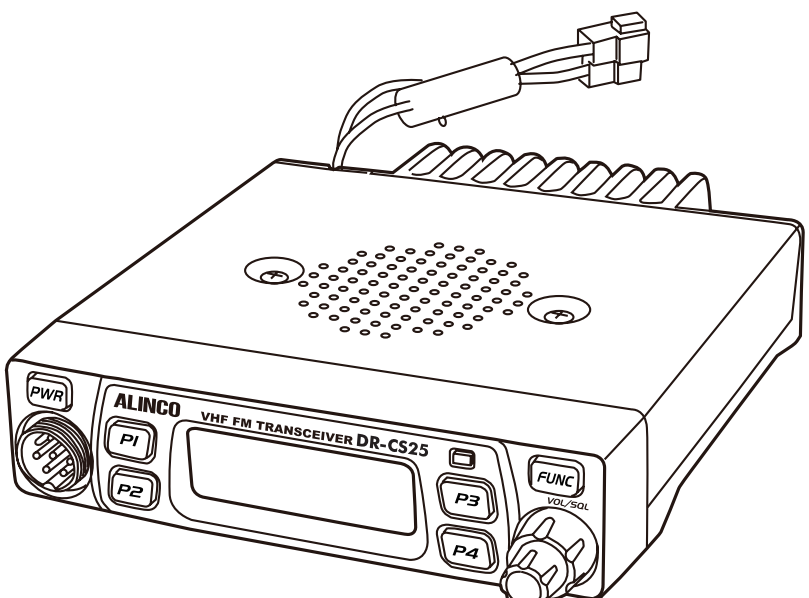
ALINCO

222MHz FM Mobile Transceiver

DR-CS25

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 services. 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.



[**MEMO**]

Introduction

Thank you very much for purchasing this excellent Alinco transceiver. Our products are ranked among the finest in the world. This radio has been manufactured with state of the art technology and it has been tested carefully at our factory. It is designed to operate to your satisfaction for many years under normal use.

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 previous 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.

■ Covering ranges

It may vary drastically depending on the type and location of antenna system. Please consult your dealer for details as DR-CS25 requires an external antenna.

■ Lightning

Any person is not safe outdoors during thunderstorms and lightning. 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 radios outdoors or inside the car during lightning.

■ Electromagnetic Interference/Compatibility

During transmissions, your radio generates RF energy that can possibly cause interference with other devices or systems. To avoid such interference, turn off the radio in areas where signs are posted to do so. DO NOT operate the transmitter in areas that are sensitive to electromagnetic radiation such as hospitals, aircraft, and blasting sites.

■ Enclosure protection

This transceiver is NOT water and dust protected. Avoid contacts with water and dust, and if wet or dirty, immediately wipe them out with clean dry cloth. This product is NOT anti-explosive.

Never use in close vicinity to explosive gas, combustible dust,on an oil rig or in an open mine.

■ About Utility Software

The utility software may be available and programming cable is optional.

Please ask to your dealer for details.

Features

- **Ultra compact, Output power selectable 50W/20W/10W**
- **PC-programmable 200ch**
- **Alphanumeric name tags**
- **Bright and color-selectable display**
- **Wide variety of selective calling features built-in; The 2-Tone, 5-Tone, 51 CTCSS, 1024 DCS, 4 Tone-burst tones and DTMF/ANI decode**
- **Radio stun/kill/revive functions**
- **Multi-function, backlit microphone enables direct frequency entry & more from keypads**
- **Packed with useful features like various scan modes, key-lock, narrow bandwidth and more!**

Conformity Symbols

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

An amateur radio operator license is required to operate this device.

Comformity information

Manufacturer:

ALINCO, Inc. Electronics Division

Yodoyabashi Dai-bldg. 13F

4-4-9 Koraibashi, Chuo-ku,

Osaka 541-0043 Japan

Check with your local waste officials for details on recycling or proper disposal in your area.

Compliance Information Statement

FCC WARNING

This equipment generates or uses radio frequency energy.

Changes or modifications to this equipment may cause harmful interference unless the modifications are expressly approved in the instruction manual. The user could lose the authority to operate this equipment if an unauthorized change or modification is made.

INFORMATION TO THE DIGITAL DEVICE USER REQUIRED BY THE FCC

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can generate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer for technical assistance.

Information in this document is subject to change without notice or obligation. All brand names and trademarks are the property of their respective owners. Alinco cannot be liable for pictorial or typographical inaccuracies. Some parts, options and/or accessories are unavailable in certain areas. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Electromagnetic Interference/Compatibility

Electronic devices are susceptible to electromagnetic interference (EMI) if they are not adequately shielded or designed for electromagnetic compatibility. Because this transceiver generates RF energy, it can cause interference to such equipment.

- Turn OFF your transceiver where signs are posted to do so. Hospitals and health care facilities use equipment that is sensitive to electromagnetic radiation.

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.

■ Environment and condition of use

❗ An amateur radio operator licence is required to operate this device.Please consult with your dealer about radio laws and regulations before purchase.

⚠ ALERT

■ Environment and condition of use

🚫 Do not drive while handling the radio for your safety. It is recommended that you check local traffic regulations regarding the use of radio equipment while driving. Some countries prohibit the operation of radio while driving.

🚫 Do not use this product in close proximity to other electronics 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.

❗ Use of this product may be prohibited or illegal outside of your country. Be informed in advance when you travel.

❗ The manufacturer declines any responsibilities against loss of life and/or property due to a failure of this product when used to perform important tasks like lifeguarding, surveillance, and rescue.

🚫 Do not use multiple radios in very close proximity. It may cause interference and/or damage to the product(s).

🚫 Never install this product in a place that may obstacle proper functions of car safety devices such as seat belts and air bags.

❗ 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 before operating. 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.

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

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

Do not touch the heatsink (on/around the unit mostly found on mobile-base units) as it may become very hot during/after the operation that may risk burn your skin.

■ About power-supply:

Use only appropriate, reliable and certified power supply of correct voltage and capacity.

Do not connect cables in reverse polarity. It may result in electric shock, fire and/or malfunction.

Do not plug multiple devices including the power-supply into a single wall outlet. It may result in overheating and/or fire.

Do not handle a power-supply with a wet hand. It may result in electric shock.

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

Do not plug the power-supply into the wall outlet if the contacts are dirty and/or dusty. Shortcircuiting and/or overheating may result in fire, electric shock and/or damage to the product.

Do not modify or remove fuse-assembly from the DC-cable. It 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. Unauthorized repair voids warranty.

- 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 including the antenna 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 audio products such as TV, radio and stereo. 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.

Do not modify, dismantle, incinerate, or immerse the batteries that may be used in accessories you use with this product.
Please check your local regulations for details on recycling option or disposal of the batteries in your area.

■ About radio

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 from 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. Use cleaners recommended to audio-video devices in case very dirty.

■ About power-supply

Use only reliable power supply of specific DC output range and be mindful of the polarity of the cables and DC jack.

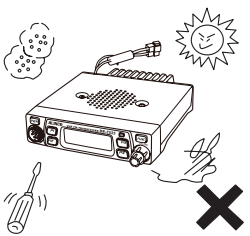
Always turn off the power supply when connecting or disconnecting the cables.

When using an external antenna, make sure that the antenna ground is not common with the ground of the power supply.

Do not put magnetic cards like credit card, magnetic key etc. on/around the radio. It may risk deleting data from the cards.

Attention

- Do not remove the case or touch the interior components. Tampering can cause equipment trouble.
- Do not use or keep the radio where it is exposed to direct sunlight, dusty places, or near sources of heat.
- Even though a heat protection circiut is buil-in, this product is not a 100% duty transmitter.
- When the internal temperature excesses, it turns to the MID power setting automatically to prevent over-heating.



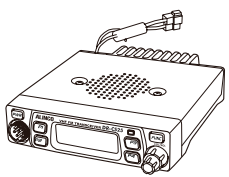
CONTENTS

CONTENTS

SUPPLIED ACCESSORIES

Carefully unpack to make sure the following items are found in the package in addition to this manual:

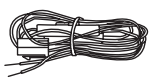
- Transceiver DR-CS25



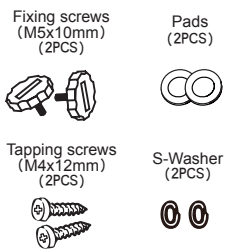
- Microphone EMS-74 (with DTMF keyboard)

- Mobile Mounting Bracket

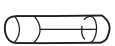
- DC Power Cable with Fuse Holder(ADUA38)



- Hardware Kit for Bracket



- Spare Fuses(15A)



The standard accessories may vary slightly depending on the version you have purchased. Please contact your local authorized Alinco dealer should you have any questions. Alinco and authorized dealers are not responsible for any typographical errors there may be in this manual. Standard accessories may change without notice.

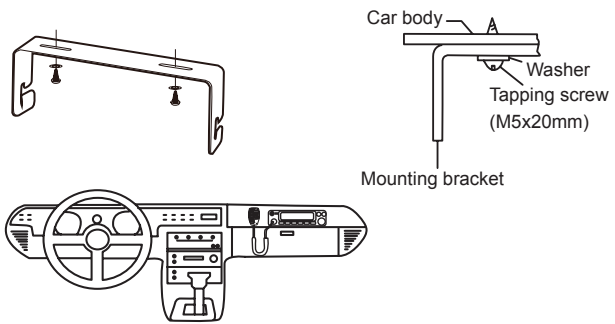
Warranty Policy: Please refer to any enclosed warranty information or contact your authorized Alinco dealer / distributor for the warranty policy before purchase.

■ In order to operate this product, a properly tuned antenna, its feedline with hardwares and in case of fixed station a 20A-class power supply are necessary.
Please consult with your dealer for details.

MOBILE INSTALLATION

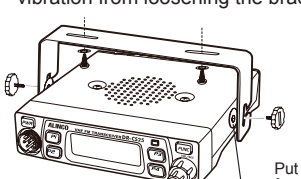
The transceiver may be installed in any position in your car, where the controls and microphone are easily accessible and it does not interfere with the safe operation of the vehicle. If your vehicle is equipped with air bags, be certain your radio will not interfere with their deployment. If you are uncertain about where to mount the unit, contact your vehicle's dealer.

1. Install the mounting bracket in the vehicle using the supplied self-tapping screws (2pcs) and flat washers (2pcs).



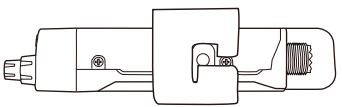
2. Position the transceiver, then insert and tighten the supplied fixing screws.

▼ Double check that all screws are tightened to prevent vehicle vibration from loosening the bracket or transceiver.



Caution:
Use only the provided screws otherwise you risk damaging the circuit board, components or fall-off of the unit.

▼ Determine the appropriate angle of the transceiver, using the screw hole position on the side of the mounting bracket.



CAUTION: RF Hazard Warming

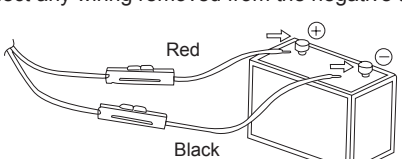
The electro-magnetic (radio Frequency) exposure level of this device may exceed the European standards of the hazard level when transmitting at the high-power setting while connected to a unity gain antenna at a distance of 63cm or less from the operator. Furthermore, the hazardous RF exposure level depends on the conditions of the combination of the antenna gain, distance from the operator, output setting and installation environment, therefore the operator may be exposed to stronger RF even at a distance of more than 63cm. For safety purpose, it is recommended that the antenna be installed outside of, and as far as possible from, the operator's area. Avoid using an excessively high-gained antenna in case the distance between the operator and the antenna is very limited. Always use the minimum necessary output power for communications.

DC POWER CABLE CONNECTION

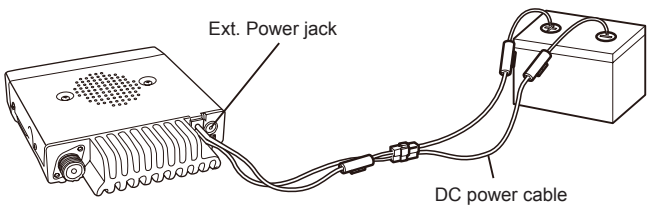
MOBILE OPERATION

The vehicle battery must have a nominal rating of 12V. Never connect the transceiver to a 24V battery. Be sure to use a 12V vehicle battery that has sufficient current capacity. If the current to the transceiver is insufficient, the display may darken during transmission, or transmitting output power may drop excessively.

1. Route the DC power cable supplied with the transceiver directly to the vehicle's battery terminals using the shortest path from the transceiver.
   ▼ Never use the cigarette lighter socket as a DC source.
   ▼ The entire length of the cable must be dressed so it is isolated from heat, moisture, and the engine secondary(high voltage) ignition system/cables.
2. After installing cable, in order to avoid the risk of damp, please use heat-resistant tap to tie together with fuse box. Don't forget to reinforce whole cable.
3. In order to avoid the risk of short circuit, please cut down connection with negative (-) of battery, then connect with radio.
4. Confirm the correct polarity of the connections, then attach the power cable to the battery terminals; red connects to the positive (+) terminal and black connects to the negative (-) terminal.
   ▼ Never remove the fuse holders from the cable.
5. Reconnect any wiring removed from the negative terminal.



6. Connect the DC power cable to the transceiver's power supply connector.
   ▼ Press the connectors firmly together until the locking tab clicks.

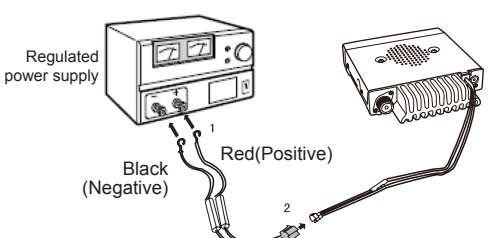


FIXED STATION OPERATION

In order to use this transceiver for fixed station operation, you will need a separate 13.8V DC power supply (not included) , Please contact local dealer to require.

The current capacity of your power supply must be 12A or more.

1. Connect the DC power cable to the regulated DC power supply and ensure that the polarities are correct. (Red: positive, Black: negative).
   - ▼ Never directly connect the transceiver to an AC outlet.
   - ▼ Use the supplied DC power cable to connect the transceiver to a regulated power supply.
   - ▼ Do not substitute a cable with smaller gauge wires.



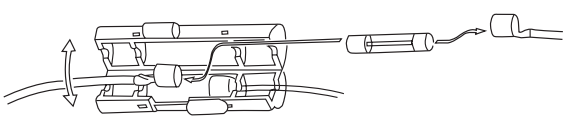
DC power cable with fuse holder

2. Connect the transceiver's DC power connector to the connector on the DC power cable.
   - ▼ Press the connectors firmly together until the locking tab clicks.

NOTE Be sure to turn off both the transceiver and power supply before start setting and connections.

REPLACING FUSES

If the fuse blows, determine the cause, then correct the problem. After the problem is resolved, replace the fuse. If newly installed fuses continue to blow, disconnect the power cable and contact your dealer for assistance.



Fuse Location	Fuse Current Rating
Transceiver	15A
Supplied DC power cable	15A

Only use fuses of the specified type and rating, otherwise the transceiver could be damaged.

NOTE If you use the transceiver for a long period when the vehicle battery is not fully charged, or when the engine is OFF, the battery may become discharged, and will not have sufficient reserves to start the vehicle. Avoid using the transceiver in these conditions.

POWER SUPPLY VOLTAGE DISPLAY

After being connected to an appropreate power source, press PWR key to turn on. Press and hold P3 key for 2 seconds to display the supplied voltage.

The display immediately changes as the voltage supply changes, It also displays voltage during transmission.

The transceiver will return to its normal operation when the power is turned ON/OFF or repeat above operation.

Important: The range of displayed voltage is from 9V to16V DC. Because the displayed value is estimated, please use a voltmeter when a more precise reading is desired.

ANTENNA CONNECTION

Before operating, install an efficient, well-tuned antenna. The success of your communication will depend on the type of antenna and its correct installation.

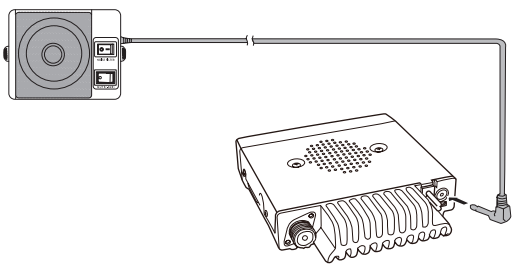
Use a 50Ω impedance antenna and low-loss coaxial feed-line that has a characteristic impedance of 50Ω, to match the transceiver input impedance. Coupling the antenna to the transceiver via feed-lines having an impedance other than 50Ω reduces the efficiency of the antenna system and can cause interference to nearby televisions, radio receivers and other electronic equipment.

NOTE: Transmitting without first connecting an antenna or other unmatched load may damage the transceiver. Always connect the antenna to the transceiver before transmitting.
All fixed stations should be equipped with a lightning arrester to reduce the risk of fire, electric shock, and transceiver damage.

ACCESSORIES CONNECTIONS

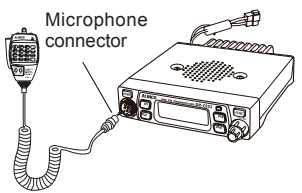
EXTERNAL SPEAKER

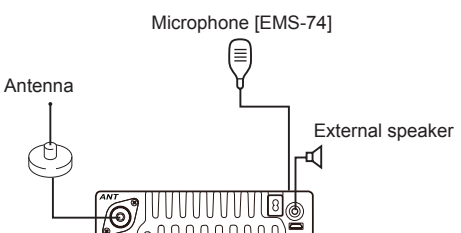
If you plan to use an external speaker, choose a speaker with an impedance of 8Ω. The external speaker jack accepts a Φ3.5mm (1/8") mono (2-conductor) plug.



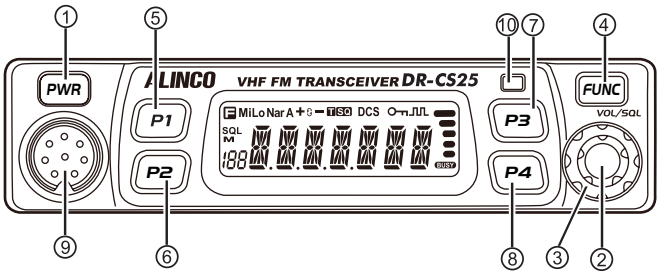
MICROPHONE

For voice communications, connect a provided microphone into the socket on the front of the main unit. Turn the ring firmly on the plug until it locks. Attach the supplied microphone hanger in an appropriate location using the screws included in the screw set.





FRONT PANEL



• Basic Functions

NO.	KEY	FUNCTION
1	PWR(Power)	Power on/Off
2	VOL Knob	Adjust audio level
3	SQL Knob	Adjust Squelch level
4	FUNC	Various functions
5	P1	Switches between VFO mode and Memory mode
6	P2	Changes frequency by 1MHz order
7	P3	Sets CTCSS and DCS values
8	P4	Call channel
9	Data Terminal /Mic.connector	Data reading/writing, cloning and Microphone connection port
10	TX/RX indicator	RX is Green / TX is Red

Functions that require pressing FUNC key until F icon appears then press the following key.

NO.	KEY	FUNCTION
1	P1	MW(Setting memory channel data)
2	P2	Deleting memory channel
3	P3	Keypad lockout
4	P4	High/Middle/Low power

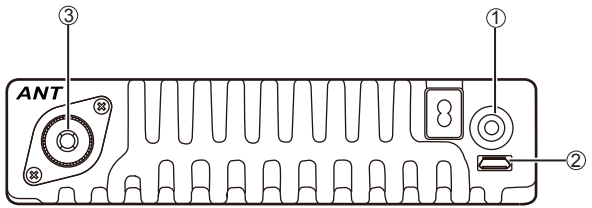
Functions that require holding for over 2 seconds the following key.

NO.	KEY	FUNCTION
1	FUNC	Goes to FUNCTION MENU
2	P1	SCAN
3	P2	Frequency Offset
4	P3	Power voltage monitor
5	P4	--

FUNCTIONS OF P1-P4 KEYS ARE PROGRAMMABLE AS YOU PREFER BY USING THE UTILITY SOFTWARE

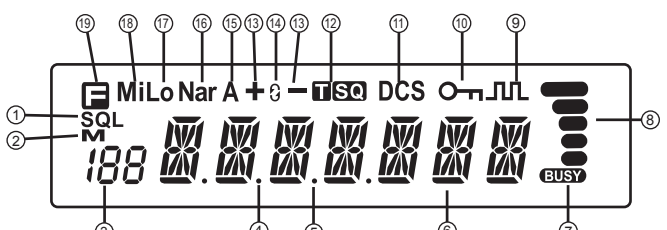
FACT reset will return the key assignments to default as listed here. See P.22 for details.

REAR PANEL



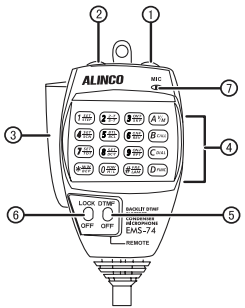
NO.	Jack Connectors	FUNCTION
1	Ext. Sp	Terminal for optional external speaker.
2	Not in use	(Not in use)
3	Antenna Connector	Connection for 50Ω coaxial cable and antenna.Connector is PL/M.

DISPLAY



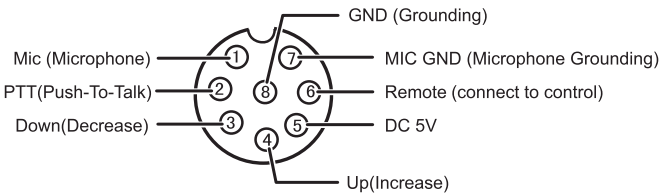
NO.	KEY	FUNCTION
1	SQL	(Not in use)
2	M	Memory mode.
3	188	Indicates the channel number in memory mode.
4	Dot	Channel skip.
5	Decimal point	Indicates the decimal point of frequency and the scanning function.
6	8.8.8.8.8.8	Indicates the frequency or memory name.
7	BUSY	Signal is being received or monitoring.
8		Signal strength of receiving and transmitting. Strength of receiving or transmitting signals.
9		(Not in use)
10		Keypad lock .
11	DCS	Set DCS function.
12	TSQ	Set CTCSS function.
13	+ –	Offset frequency direction.
14		(Not in use)
15	A	Auto power off.
16	Nar	Narrow mode.
17	LO	Low power.
18	Mi	Middle Power.
19	F	Function key is activated

MICROPHONE



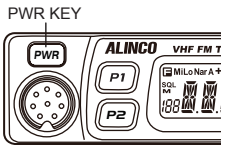
NO.	KEY	FUNCTION
1	UP	Increase frequency, channel number or setting value.
2	DOWN	Decrease frequency, channel number or setting value.
3	PTT	Push-To-Talk key to transmit.
4	Numerical Keyd	Input VFO frequencies and other various oprations.
5	DTMF ON/OFF	Switches between DTMF and function operations.
6	LOCK Switch	Locks all keys excep PTT.
7	MIC	Microphone element is located.

MIC Connector Diagram(in the front view of connector)



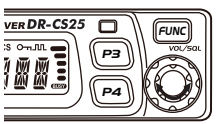
SWITCHING THE POWER ON/OFF

Press the PWR switch to power on. Press the PWR key for 1 second to turn off.



ADJUSTING THE VOLUME

Turn the VOL knob clockwise to increase the audio level, counterclockwise to decrease.

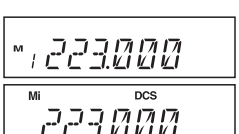


ADJUSTING SQUELCH LEVEL

A squelch eliminates white-noise (the background noise when a signal is not received). Higher level settings will keep the squelch "closed" more tightly for quieter monitoring, but weak signals will not be heard. Lower settings allow weaker signals to "open" the squelch but noise may also cause it to open. By rotating the **SQL** knob, adjust the squelch level to the desired level.

SWITCH BETWEEN VFO AND MEMORY MODE

In standby, press P1 key or Microphone's A/M key until appear **M**, this indicates current frequency in Memory mode. Repeat above operation to switch between Frequency mode (VFO) and Memory mode.



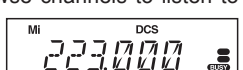
ADJUSTING FREQUENCY/CHANNEL

1. In frequency (VFO) mode, you can change the current frequency to the desired one through microphone [UP / DOWN] key. Press UP key to increase frequency and press DOWN key to decrease frequency. In another way you also can directly input the desired frequency by MIC's numeric keys. Press P2 key, the KHz order digits will be masked. In this status, Microphone [UP / DOWN] key will increase or decrease frequency quickly by 1MHz step.
2. In memory mode, you can change the current channel to the desired one through microphone [UP / DOWN] key. Press UP key to the forward channel and press DOWN key to the backward channel. In another way you also can directly input the desired channel by MIC`s numeric keys. For example, choosing CH1, press [0] [0] [1] .

NOTE Available steps are 2.5K, 5K, 6.25k, 8.33K,10K, 12.5K, 20K, 25K and 30K. When you want to exit from adjusting frequency mode, perss P2.

RECEIVING

Select the desired receiving frequency or browse channels to listen to ongoing communications. The S-meter shows relative signal strength between BUSY and 5th segment when the transceiver detects an incoming signal.



TRANSMITTING

Press MIC's MON key to monitor for a while to confirm the channel desired is not busy. Press Mic's MON key to return standby status,Then press and hold [PTT] key to speak into microphone.

▼ Speaking too loud distorts, too undertone won't modulate enough your voice.

NOTE While transmitting, LED lights RED and TX-meter shows relative power level. Release PTT to receive.

TRANSMITTING TONE BURST TONE

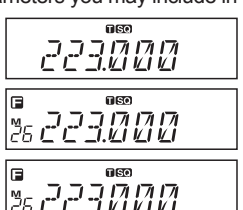
Press and hold [PTT] key, then press Microphone DOWN key to transmit selected tone-burst tone. Pre-programming is necessary.

TRANSMITTING OPTIONAL SIGNALING

Press and hold [PTT] key, then press Microphone UP key to transmit pre-stored and selected DTMF/2Tone/5Tone optional signaling. Preprogramming is necessary.

MEMORY CHANNEL PROGRAMMING

1. Be sure the undesired functions are turned off before programming. Memory channels hold setting like signaling and power settings.
2. If you wish to include settings such as signaling and power in the memory, Set them to the VFO in advance to the memory programming operation. Refer to the list on the right for parameters you may include in a memory channel.
3. Press FUNC key, LCD appears F, M and current channel appear on LCD. Flashing M means the current channel is empty.
4. Press UP or DOWN Key to select the desired channel number to store.
5. Press P1 key, F, M icon and channel number disappears and beep sounds twice.
6. Press P1 key again to confirm that the memory channel is properly stored.



MEMORY CHANNEL FUNCTION LIST

- Band Width
- TX Power
- CTCSS/DCS Encode / Decode
- Optional Signal
- TX Off
- Scan Skip
- Reverse / Talk Around
- Busy Channel Lock-Out

In memory mode, the setting may be changed temporary but changing a channel or turning off the radio will cancel the operation and returns to programmed setting.

MEMORY CHANNEL DELETING

1. Under Memory mode, input by MIC's numeric keys to select channel to be deleted. For example, choosing CH1, press [0] [0] [1].
2. Press FUNC key, LCD appears F icon, then press P2 key, current memory will be deleted and a beep sounds twice. M icon flashing means current memory channel is deleted. Can not delete all memory channels, at least one channel will be saved.

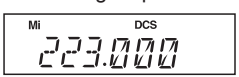
SQUELCH OFF(MONITOR FUNCTION)

Press (✱) key to disable squelch, press (✱) key again to resume squelch. While monitoring, all signaling features are temporary released.

FREQUENCY SCAN

Scans all VFO frequencies in regard to the preset tuning step.

1. In VFO mode, press (P1) until starts scanning.

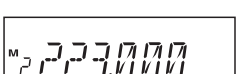


2. Press Microphone [UP / DOWN] key to change scan direction.
3. Press any key except (PWR) and (FUNC) key to stop.

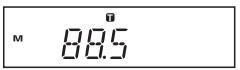
MEMORY SCAN(CHANNEL SCAN)

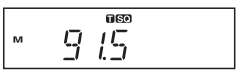
Scans all memory channels unless Memory skip feature is selected for a given memory.

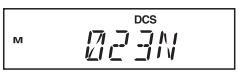
1. In memory mode, press and hold (P1) key for over 2 seconds to enter into channel scan.
2. Press Microphone [UP / DOWN] key to change scan direction.
3. Press any key except (PWR) and (FUNC) key to exit.



CTCSS/DCS ENCODE AND DECODE SETUP







Many repeaters require CTCSS or DCS tone encoding to access the system. Tone decoding features are often used to filter unwanted signals. In this mode, regardless of the main squelch status, the audio can be heard ONLY when the matching tone/ code signal is received. The combination of CTCSS squelch and DCS function is not available; only one or the other may be used for a given channel. Tone settings can be programmed in memory channels. In memory mode, the setting may be changed temporary but changing a channel or turning off the radio will cancel the operation and returns to programmed setting.

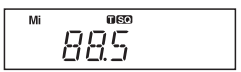
1. Press (P3) key. The current setting will be displayed with **T/SQ/DCS** icons and relative frequency/code.
2. Select T icon to set the encoding tone.The number below represents the tone frequency in Hz. Use [UP / DOWN] keys to select the desired encoding tone.If the repeater requires only encoding tone, press [PTT] to set and operate.
3. To set tone squelch, Press (P3) key again to display SQ icon. Select decoding tone frequency that can be set different from encoding tone. Press [PTT] to set and operate tone-squelch.
4. Press it again so that the 3-digit number and **DCS** icon is displayed. This is the DCS code, and it enables DCS encoding and decoding.

Press [UP / DOWN] keys to change codes. Press any key (Except **FUNC / PWR / TS / DCS**, **UP / DOWN** keys) to enter the setting and return to original status. The **T/SQ/DCS** icon will remain on the display to show the current selective-calling status. To exit, simply use the (P3) key and press it until the relative status icon **T/TQ/DCS** disappears.

The standard set of 50 different CTCSS tones are available. DCS encode/decode cannot be separated. The list of selectable tones and codes is shown on Appendix at the end of this manual.

CTCSS SCAN

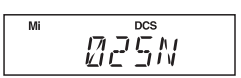
While receiving CTCSS signal, press (P3) key to select T or **TSQ** then hold (P3) key until starts scanning. Once finding a matching CTCSS tone, a voice will be heard and resumes scanning after 15 seconds.



Press any key except (PWR) and (FUNC) key to exit.

DCS SCAN

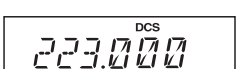
While receiving DCS signal, press (P3) key to select DCS then hold (P3) key until starts scanning. Once finding a matching DCS code, a voice will be heard and resumes scanning after 15 seconds.



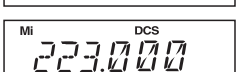
Press any key except (PWR) and (FUNC) key to exit.

HIGH/MID/LOW POWER SETTING

Press (FUNC) key to display icon, then press (P4) key to switch between high/Mid/low power.

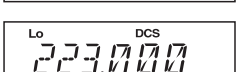


None: Transmits in high power 50W



Mi: Transmits in middle power 20W

Lo: Transmits in low power 10W

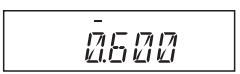


OFFSET DIRECTION AND OFFSET FREQUENCY SETUP

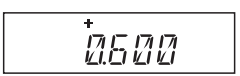
Repeater receives a signal(UP-LINK) on one frequency and re-transmits on another frequency(DOWN-LINK). The difference between these two frequencies is called the offset frequency. If the UP-LINK frequency is higher than DOWN-LINK frequency, the direction is positive, If it is lower, the shift direction is negative.

NOTE This operation is possible also in the memory mode but temporaly. Changing frequencies or turning off the radio will reset the setting.

1. Press and hold (P2) key for over 2 seconds, LCD displays offset direction and offset frequency.



2. Repeatedly press (P2) key to select positive offset or negative offset.



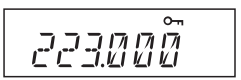
3. When LCD displays " + " icon, it indicates positive offset, which means transmitting frequency higher than receiving frequency.
4. When LCD displays " - " icon, it indicates negative offset, which means transmitting frequency lower than receiving frequency.
5. Mic's [UP / DOWN] key to change offset frequency in accordance with the step setting.
6. Press any key except (FUNC) and (P2) key to set and finish setting.

In memory mode, this operation can be temporarily available.

KEYPAD LOCKOUT

To avoid unintentional operations, this function will lock all keys except [FUNC] and [PWR].

1. Press [FUNC] key until LCD displays F icon, then press [P3] key until LCD displays 🔑 icon.



2. Repeat above operation, 🔑 icon disappears, indicating keypad lockout function is invalid.

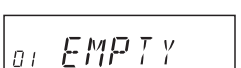
AUTO-DIALER SETUP

Auto-dialer is to automatically transmit preprogrammed and stored DTMF tone codes. Easier way is to use "**DTMF set**" menu in the PC utility software.

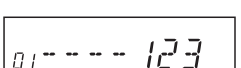
14

To program codes manually, press [C DIAL] key on your microphone. 2 digit numbers and EMPTY or codes appear on the display.

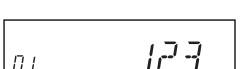
1. Press [UP] / [DOWN] key to choose group you wish to edit. Up to 16 Auto-dialer memories are available. The display scrolls when the 7th digit is entered. The numbers 0-9, --, A-D, * and # can be stored up to a total of 24 digit in a group.
2. Press [C DIAL] key to program the DTMF codes you wish by using microphone's keypads.



3. After editing, press [PTT] key to send programmed codes.



4. Press [P4] to store the codes and exit, or use [UP] / [DOWN] keys to continue programming.



EMERGENCY ALARM

This transceiver has 4 optional Alarm modes that can only be set using programming software. Press pre-programmed key to display "**ALARM**" to operate. Repeat above operation or turn off the transceiver to cancel the alarm.

HOW TO USE FUNCTION MENU

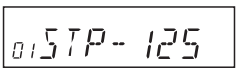
1. Press and hold [FUNC] key for over 2 seconds to enter the FUNCTION MENU SETUP.
2. Press [P3] or [P4] to select the desired menu. [P3] key to forward and [P4] key to backward menus.
3. Press UP / DOWN to select the desired parameter.
4. Press any key except [PWR], [P3], [P4], UP, DOWN key to exit.

Menu No.	LCD Display	Default
01	STP (Channel Step)	5K
02	T (DTMF,2 TONE, 5 TONE Of RX)	OFF
03	2TONE (TX)	00
04	5TONE (TX)	00
05	DTMF (TX)	01
06	SPK (Signal Combination)	SQ
07	POWER	HIGH
08	BAND	20K
09	TX	ON
10	LOCK(Busy Channel Lock Out)	OFF
11	Editting Channel Name	-
12	REV (Reverse TX/RX)	OFF
13	TALK (Talk Around)	OFF
14	D (DTMF Self ID Enquiry)	001
15	F (5 TONE Self ID Enquiry)	12345
16	BEEP (Beep Sound)	ON
17	TOT (Time Out Timer)	3 Minutes
18	APO (Auto Power Off)	OFF
19	SPD (DTMF Transmitting Time)	50
20	COL (Display Color)	ORG
21	SCAN	T0
22	TB (Tone-Bust Tones)	1750
23	DSP (Display Mode Setup)	FR
24	CODE	OFF
25	BOOK (Address List)	-
26	RESTORE	-

NOTE Some of features can be also operated through the microphone keys. It is recommended to read Chapter 8 (p.23) together with this chapter.

FREQUENCY STEP SETUP

Only in VFO mode, this function is valid.



1. Press and hold [FUNC] key for over 2 seconds to enter setting menu.
2. Press [P3] / [P4] key to choose No.01 menu, LCD displays "**STP--125**".
3. Press UP / DOWN to select the desired frequency channel step. Available steps in KHz are: 2.5(shown as 2K5), 5, 6.25(62), 8.33(83), 10, 12.5(125), 20, 25, 30 and 50.
4. Press any key except [PWR], [P3], [P4], UP, DOWN key to exit.

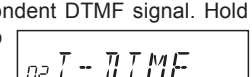
NOTE 01 STP menu won't appear when the radio is in memory mode.

RECEIVING DTMF, DTMF ANI, 2TONE OR 5TONE SIGNALING

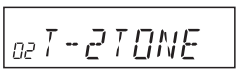
DTMF/5Tone/2Tone signalling are used for selective-calling. DTMF and 5Tone signalling can be applied for other advanced features such as ANI, PTT ID, group call, remotely stun, remotely kill, revive,...etc.

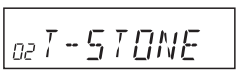
NOTE Tone code settings should be performed in advance to Signaling operations by PC programming. Manual code setting is not available.

1. Press and hold [FUNC] key for over 2 seconds to enter into setting menu.
2. Press [P3] / [P4] to choose No. 2 menu, LCD displays "**T-OFF**" .
3. Press UP / DOWN to select the desired setup.
   - ▼ "DTMF": The channel will be mute by a DTMF signal. The speaker won't sound until receiving a correspondent DTMF signal. Hold [**PTT**] then press [**UP**] directly to transmit the pre-stored DTMF tones.



▼ "2TONE": The channel will be mute by a 2-Tone signal. The speaker won't sound until receiving a correspondent 2-Tone signal. Hold [**PTT**] then press [**UP**] to transmit the pre-stored 2-Tone signal.





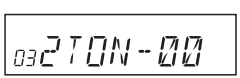
▼ "5Tone": The channel will be mute by a 5-Tone signal. The Speaker won't sound until receiving a correspondent 5-Tone signal. Hold [**PTT**] then press [**UP**] directly to transmit the pre-stored 5-Tone signal.

4. Press any key except PWR, P3, P4, UP, DOWN key to exit.

SENDING 2-TONE CALL

1. Press and hold FUNC key for over 2 seconds to enter setting menu.

2. Press P3 / P4 key to choose No.03 menu, LCD displays "**2TON XX**", "**XX**" indicates the preprogrammed groups.



3. Press UP / DOWN to select the desired 2-TONE group, Press PTT to transmit selected group.

4. Total:32groups, 00-31, Default: 00.

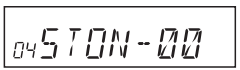
5. Press any key except PWR, P3, P4, UP, DOWN key to exit.

NOTE 2-TONE will be operation parameters must be edited by programming software prior to the practical operation.
This function is to only query edited group or name.

SENDING 5-TONE CALL

1. Press and hold FUNC key for over 2 seconds to enter setting menu.

2. Press P3 / P4 key to choose No.04 menu, LCD displays "**5TON XX**", "**XX**" indicates the preprogrammed groups.



3. Press UP / DOWN to select the desired 5-TONE group, Press **[PTT]** to transmit selected group.

4. Total:100groups, 00-99, Default:00.

5. Press any key except PWR, P3, P4, UP, DOWN key to exit.

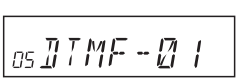
NOTE 5-TONE operation parameters must be edited by programming software prior to the practical operation.

SENDING DTMF CALL

1. Press and hold FUNC key for over 2 seconds to enter setting menu.

2. Press P3 / P4 key to choose No.05 menu, LCD displays "**DTMF XX**", "**XX**" indicates the operation parameters must be.

3. Press UP / DOWN to select the desired DTMF group.



4. Total:16groups, 01-16, Default:01.

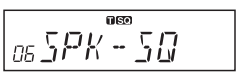
5. Press any key except PWR, P3, P4, UP, DOWN key to exit.

SIGNALING COMBINATION SETUP

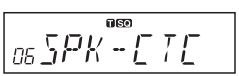
This function is to improve the level of protecting the radio against receiving irrelative signal.

1. Press and hold FUNC key for over 2 seconds to enter setting menu.
2. Press P3 / P4 key to choose No.06 menu, LCD displays "**SPK--SQ**".
3. Press UP / DOWN to select the desired combination.

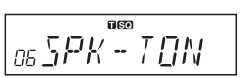
   If select "**SQ**", it indicates you can hear the calling from caller when receive a matching carrier.

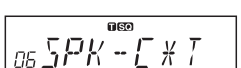
   ▼ If LCD displays "CTC", it indicates you can hear the calling from caller when receive a matching carrier and CTCSS/DCS signaling .

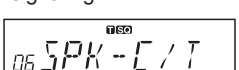
   ▼ If LCD displays "TON", it indicates you can hear the calling from caller when receive a matching carrier and DTMF/2TONE/5TONE signaling .

   ▼ If LCD displays "C/T", it indicates you can hear the calling from caller when receive a matching carrier and CTCSS/DCS and DTMF/2TONE/5TONE signaling.

   ▼ If LCD displays "C/T", it indicates you can hear the calling from caller when receive a matching carrier and either CTCSS/DCS DTMF/2TONE/5TONE signaling.

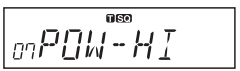
   

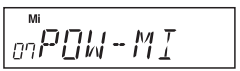
4. Press any key except PWR, P3, P4, UP, DOWN key to exit.

NOTE This function is available only for pre-programmed units with Tone-signals and CTCSS/DCS selective calling.

HIGH/MID/LOW POWER SELECTION

1. Press and hold FUNC key for over 2 seconds to enter setting menu.
2. Press P3 / P4 key to choose No.07 menu, LCD displays "**POW--HI**".

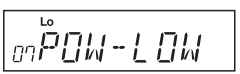
   

3. Press UP / DOWN to select the desired setting.

   HI: High TX Power (50W)

   MI: Middle TX Power (20W)

   LOW: Low TX Power (10W)

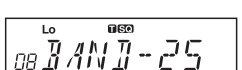
4. Press any key except PWR, P3, P4, UP, DOWN key to exit.

BAND-WIDTH SELECTION

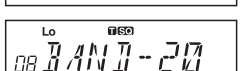
Select suitable bandwidth in accordance with your local band-plans.

1. Press and hold FUNC key for over 2 seconds to enter setting menu.
2. Press P3 / P4 key to choose No.08 menu, LCD displays "**BAND--25**".
3. Press UP / DOWN to select the desired setting.

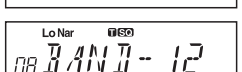
   25:Band width is 25KHz(Wide band)

   20:Band width is 20KHz(Middle band)

   12:Band width is 12.5KHz(Narrow band)

4. Press any key except PWR, P3, P4, UP, DOWN key to exit.

NOTE "25" is hardly used in amateur radio. Be sure to select 20 or 12 to avoid interferring stations nearby. Default setting is 20.

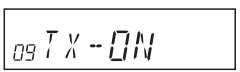
TX OFF SETUP

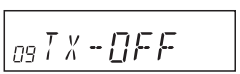
This function is to prohibit the transmission and to use the radio as a receiver.

1. Press and hold FUNC key for over 2 seconds to enter setting menu.
2. Press P3 / P4 key to choose No.09 menu, LCD displays "**TX-ON**".
3. Press UP / DOWN to select the desired setting.

   On:In current channel, press PTT to transmit

   OFF:In current channel, PTT is invalid.



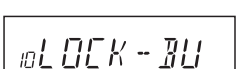


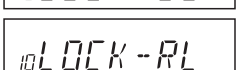
4. Press any key except PWR, P3, P4, UP, DOWN key to exit.

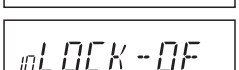
BUSY CHANNEL LOCKOUT

BCLO is to disable transmitting while receiving. Once the channel is busy and you press PTT, the radio will beep as warning and holds transmitting until receiving signal is gone.

1. Press and hold FUNC key for over 2 seconds to enter setting menu.
2. Press P3 / P4 key to choose No.10 menu, LCD displays "**LOCK--OFF**".
3. Press UP / DOWN to select the desired setting.







- ▼ BU: Enable BCLO, Carrier lockout, transmitting is inhibited when current channel receives a carrier.
- ▼ RL: Enable BTLO, transmitting is inhibited when current channel receives a carrier but dis-matching CTCSS/DCS.
- ▼ OFF: Busy channel lockout is disabled. It can transmit in any receiving status.

4. Press P2 key to confirm and exit.

EDITING CHANNEL NAME (AVAILABLE ONLY IN MEMORY MODE)

1. In memory-mode, press and hold FUNC key for over 2 seconds to enter setting menu.
2. Press P3 / P4 key to choose No.11 menu, LCD displays cursor and flashing.
3. Press UP / DOWN to select the desired letter, press P2 key to confirm selected letter and enter into next edition, press P1 to return forward edition.
4. After edition, press FUNC key to exit.

NOTE In Frequnecy display (VFO)mode, this menu is not available.

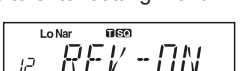
REVERSE TX/RX

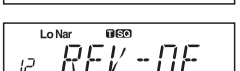
This function is used to check if you can talk without using a repeater. TX frequency turns to RX frequency & RX frequency changes to TX frequency. CTCSS/DCS setting is respected also.

1. Press and hold FUNC key for over 2 seconds to enter setting menu.
2. Press P3 / P4 key to choose No.12 menu, LCD displays "**REV—OF**".
3. Press UP / DOWN to select the desired setting.

   ON:Enable Frequency Reverse

   OFF:Disable Frequency Reverse.



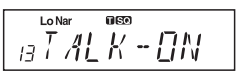


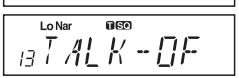
4. Press any key except PWR, P3, P4, UP, DOWN key to exit.

TALK AROUND

This is to talk simplex on the RX frequency of the duplex setting, in case of repeater failure or out-of-range.
By Talk Around function, you can directly communicate with other radios in your group in case the repeater is not activated or when you are out of the repeater range. The transceiver will transmit on RX frequency with its CTCSS/DCS signaling.

1. Press and hold FUNC key for over 2 seconds to enter setting menu.
2. Press P3 / P4 key to choose No.13 menu, LCD displays "**TALK—OF**".
3. Press UP / DOWN to select the desired setting.
   ON:Enable Talk Around
   OFF:Disable Talk Around
4. Press any key except PWR, P3, P4, UP, DOWN key to exit.



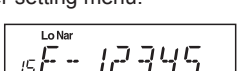


RADIO'S DTMF SELF ID ENQUIRY

1. Press and hold FUNC key for over 2 seconds to enter setting menu.
2. Press P3 / P4 key to choose No.14 menu, LCD displays "**D--XXX**". XXX is radio's DTMF SELF ID.
3. Press any key except PWR, P3, P4, UP, DOWN key to exit.

RADIO'S 5TONE SELF ID ENQUIRY

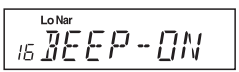
1. Press and hold FUNC key for over 2s to enter setting menu.
2. Press P3 / P4 key to choose No.15 menu, LCD displays"**F--XXXXX**", "**XXXXX**" is radio's 5TONE SELF ID.
3. Press any key except PWR, P3, P4, UP, DOWN key to exit.

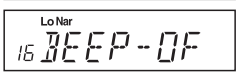


BEEP SOUND

The beep provides confirmation of entry, error status or malfunctions of the radio. You can enable or disable beep sounds.

1. Press and hold FUNC key for over 2 seconds to enter setting menu.
2. Press P3 / P4 key to choose No.16 menu, LCD displays "**BEEP--ON**".
3. Press UP / DOWN to select the desired setting.
   ON:Enable beep sounds.
   OFF:Disable beep sounds.
4. Press any key except PWR, P3, P4, UP, DOWN key to exit.

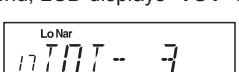




TOT (TIME-OUT TIMER)

TOT prohibits the users from transmitting after a certain period of time has elapsed. When the time is over, transmitting stops and automatically returns to receiving. Until the PTT is released once and pressed again, the radio will not transmit.

1. Press and hold FUNC key for over 2 seconds to enter setting menu.
2. Press P3 / P4 key to choose No.17 menu, LCD displays "**TOT--3**".
3. Press UP / DOWN to select the desired timer setting.
   Timer:1-30min,each level 1min
   OFF: Disable TOT
4. Press any key except PWR, P3, P4, UP, DOWN key to exit.



APO (AUTO POWER OFF)

Once APO is activated, the radio will be automatically switched off when the pre-set time is elapsed.

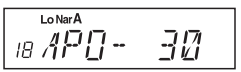
1. Press and hold [MONI] key for over 2 seconds to enter setting menu.
2. Press [P3]/[P4] key to choose No.18 menu, LCD displays "**APO--OFF**".
3. Press UP / DOWN to select the desired setting.

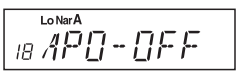
   30MIN:Auto power off after 30m

   1HOUR:Auto power off after 1h

   2HOUR:Auto power off after 2h

   OFF:Disable Auto power off





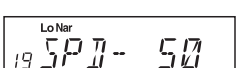
4. Press any key except [PWR], [P3], [P4], UP, DOWN key to exit.

DTMF TRANSMITTING TIME

1. Press and hold [FUNC] key for over 2 seconds to enter setting menu.
2. Press [P3]/[P4] key to choose No.19 menu, LCD displays "**SPD--50**".
3. Press UP / DOWN to select the desired setting, in miliseconds.

   30/50/100/200/300/500, which indicates the time for sending each DTMF signal & the interval between each DTMF being sent.

4. Press any key except [PWR], [P3], [P4], UP, DOWN key to exit.



DISPLAY IIIUMINATION COLOR SETTING

This is to select the display illumination color.

1. Press and hold [FUNC] key for over 2 seconds to enter setting menu.
2. Press [P3]/[P4] key to choose No.20 menu, LCD displays "**COL--ORG**".
3. Press UP / DOWN to select the desired color. Display changes color while selection.

   ORG: Orange

   SAK: (Sakura) light pink

   WHI: White

   OFF: NO backlight

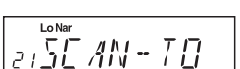
4. Press any key except [PWR], [P3], [P4], UP, DOWN key to exit.

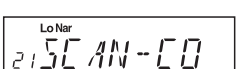
SCAN RESUME TIME SETUP

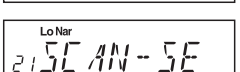
There are 3 kinds of scan resume conditions.

1. Press and hold [FUNC] key for over 2 seconds to enter setting menu.
2. Press [P3]/[P4] key to choose No.21 menu, LCD displays "**SCAN--TO**".
3. Press UP / DOWN to select the desired Scan Resume Time.

   TO: Timed Scan, it resumes scanning after receiving 5 seconds or when the signal is gone, which ever faster.







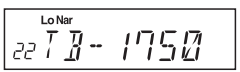
   CO: Busy Scan, it resumes scanning when the receiving signal is gone.

   SE: Stops scanning when a signal is received.
   Manual operation is necessary to resume scanning.

4. Press any key except PWR, P3, P4, UP, DOWN key to exit.

TONE-BURST TONES

1. Press and hold FUNC key for over 2 seconds to enter setting menu.
2. Press P3/P4 key to choose No.22 menu, LCD displays "**TB--1750**".
3. Press UP / DOWN to select the desired tone frequency. Available tones are 1000,1450,1750 and 2100Hz.



4. Press any key except PWR, P3, P4, UP, DOWN key to exit.

DISPLAY MODE SETUP

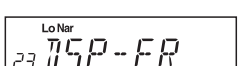
There are 3 different display modes: Frequency+Memory mode, Memory mode & Frequency mode + Memory mode.

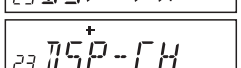
1. Press and hold FUNC key for over 2 seconds to enter setting menu.
2. Press P3/P4 key to choose No.23 menu, LCD displays "**DSP—FR**".
3. Press UP / DOWN to select the desired mode.

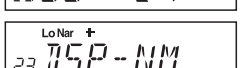
   FR: Frequency mode+Memory mode.

   CH: Memory mode.

   NM: Frequency mode + Memory mode (if it is named a name tag, name tag will be shown).







4. Press any key except PWR, P3, P4, UP, DOWN key to exit.

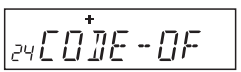
STARTING PASSWORD (USELESS IF PASSWORD IS NOT ASSIGNED)

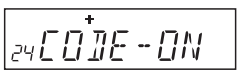
Enable this function, you have to insert a matching PASSWORD to enter into normal status when radio is turned on.(The PASSWORD can be assigend by programming software only.)

1. Press and hold FUNC key for over 2 seconds to enter setting menu.
2. Press P3/P4 key to choose No.24 menu, LCD displays "**CODE-OF**".
3. Press UP / DOWN to enable/disable PASSWORD setup.

   ON: Turn on PASSWORD setup

   OFF:Turn off PASSWORD setup



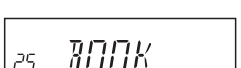


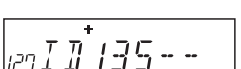
4. Press any key except PWR, P3, P4, UP, DOWN key to exit.

ADDRESS LIST

You store desired ID and corresponding ID name in address list. The LCD displays ID corresponding name if radio received ANI calling and find matching ID in address list.

1. Press and hold FUNC key for over 2 seconds to enter general setting menu.
2. Press P3/P4 key to choose No.25 menu, LCD displays "**BOOK**".
3. Press P2 to enter into ID setting, press P3/P4 to select the desired group (00-127, total is 128 group ID). Press UP / DOWN to select desired number, press P3 confirm and move cursor to next edition, press P4 return to forward edition, press P1 to clear out all digits.





4. After finishing edition, press to confirm and enter into edition of current group's ID corresponding name.Press UP / DOWN to select desired letter, press (P3) to move cursor to next edition, press (P1) to clear out all letters. 00-127, total 128 group ID and corresponding ID name.
5. Press (P2) to confirm and return into main menu. Repeat above Step 3 and Step 4 operations to edit multi-ID and corresponding ID name.
6. Press (FUNC) key to return to standby status.

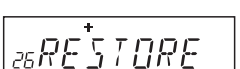
RESTORE(RESET)

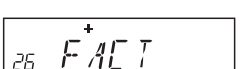
If your radio seems to be malfunctioning, resetting the microprocessor may solve the problem. When performing the reset, you may lose memory data and stored information. Use PC software to save the memory and setting data whenever you edit setting for this reset purposes.

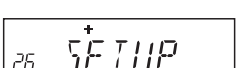
1. Press and hold (FUNC) key for over 2 seconds to enter general setting menu.
2. Press (P3)/(P4) key to choose No.26 menu, LCD displays "**RESTORE**".
3. Press UP / DOWN to select the desired operation.

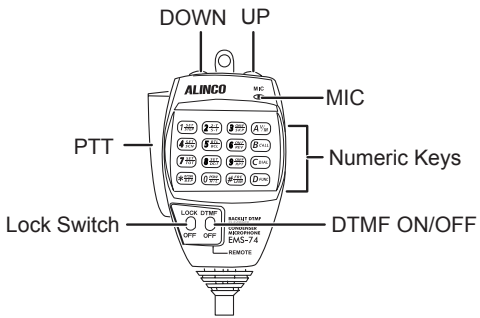
   FACT:Resume factory default for channel, signaling and general setting.

   SETUP:Return initial setup for No.16-No.24 general setting menu.
4. Press any key except (PWR), (P3), (P4), UP, DOWN key to exit.









Following operatins are available using keypads on the EMS-74 microphone.

KEYPAD LOCK

SLIDE the switch to lock position, The lamp is turned off and all keys are locked except PTT.

TRANSMITTING DTMF BY MICROPHONE KEYPAD

Slide DTMF key to DTMF position, press and hold the [PTT] key, transmitting the desired DTMF signaling by the numeric key directly.

NOTE The keypad operation is suspended in DTMF position.
The transmitting tone doesn't sound from the mic or your radio.

FUNCTION SETUP BY MICROPHONE KEYPAD

Squelch off:In standby, press (*MON/REP) key, the squelch is disabled when BUSY icon flashed in LCD, Press (*MON/REP) again to enable squelch and the BUSY icon disappears.

SWITCHES BETWEEN VFO AND MEMORY MODE

In standby, press (A/M) key to switch between memory mode and Frequency mode (VFO).

SHORT CALLING

Press PTT switch and UP key to transmit the selected DTMF/ 2TONE /5TONE in current channel.

TRANSMITTING DTMF CODE

In standby, press (C/DIAL), LCD displays DTMF data and group. Press [UP / DOWN] key to select the desired transmitting DTMF group, then Press PTT to transmit.

If no DTMF data in current group, LCD displays "EMPTY", press (C/DIAL) key again and input desired DTMF code by keypad, press PTT to transmit and store DTMF data.

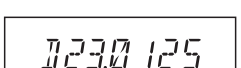
FREQUENCY STEP

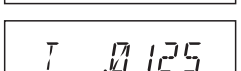
Only in VFO mode, this function is valid.

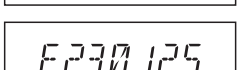
1. Press (D/FUNC), then press (1/STEP), LCD displays "**STP--10**".
2. Press UP / DOWN to select the desired frequency channel step.
3. Press any numeric keys to save and exit.

OPTIONAL SIGNALING

In standby, press (D/FUNC), then press (2/T-F) to add optional signaling, repeat above operation to set DTMF, 2TONE or 5TONE signaling.







* D: DTMF
* T: 2-tone
* F: 5-tone

Press and hold [PTT] + [UP] to transmit Optional signal.

See P15 "RECEIVING DTMF, DTMF ANI, 2TONE OR 5TONE SIGNALING".

NOTE This function can be temporarily used in memory mode. Once the radio is turned off or switched to another channel, the temporary setting will be erased and back to initial settings.

SCAN SKIP (TO EXCLUDE SELECTED CHANNELS FROM MEMORY SCANNING)

In memory mode, press (D FUNC) then press (3 ONE SKP), decimal point appears. It means current channel is scan skip. Repeat above operation to set scan or scan skip in current channel. Decimal point dissapears when the channel is available for scanning.

FREQUENCY/CHANNEL SCAN

In corresponding mode, press (D FUNC) then press (4 SET SCN) key to start scanning.

In scanning mode, press UP / DOWN to change scan direction.

Press [PTT] to stop scanning.

BUSY CHANNEL LOCKOUT

Refer to P.18 for details.

1. In standby, press (D FUNC), then press (5 BTL BCL) to enter into Busy Channel Lockout.
   Same parameters BU/RL/OFF as explained in P.18 are available.
2. Press [UP / DOWN] to select the desired value.
3. Press number keys to confirm and exit.

REVERSE TX/RX

Refer to P.18 for details.

1. In standby, press (D FUNC), then press (6 ONE REV), LCD displays "**REV—OF**".
2. Press [UP / DOWN] to select the desired value.
   ON:Enable Frequency Reverse
   OFF:Disable Frequency Reverse
3. Press number keys to confirm and exit.

TOT (TIME-OUT TIMER)

Refer to P.19 for details.

1. In standby, press (D FUNC), then press (7 SET TOT) LCD displays "**TOT-X**".
2. Press [UP / DOWN] to select the desired value.
3. Press number key to confirm and exit.

CTCSS/DCS ENCODE AND DECODE

1. In standby, press (D FUNC), then press (8 SET DCT) to enter into CTCSS/DCS Encode and Decode.
2. Repeat above operation to set as below:
   - ▼ LCD displays T icon, it indicates CTCSS encode set in current channel.
   - ▼ LCD displays T and SQ icon, it indicates CTCSS encode and decode set in current channel.
   - ▼ LCD displays **DCS** icon, it indicates DCS encode and decode set in current channel.

3. In corresponding icon, press [UP / DOWN] to select the desired CTCSS/DCS encode and decode.
4. Press (✱), (A/M), or (C DIAL) to confirm and exit.

TALK AROUND

Refer to P.19 for details.

1. In standby, press (D FUNC), then press (9 ONE/RPT) key, LCD displays "**TALK--OF**".
2. Press [UP / DOWN] to select the desired setting .
   ON:Enable Talk Around
   OFF:Disable Talk Around
3. Press number key to confirm and exit.

BEEP SOUND

Refer to P.19 for details.

1. In standby, press (D FUNC), then press (✱), LCD displays "**BEEP--XX**".
2. Press [UP / DOWN] to turn on/off BEEP prompt.
   BEEP—OF: turn off the beep;
   BEEP—ON: turn on the beep.
3. Press number key to confirm and exit.

HIGH/MID/LOW POWER SELECTION

1. In standby, press (D FUNC), then press (0 POW/H/L), LCD displays "**POW-XX**".
2. Press [UP / DOWN] to select the desired power.
   HI:High Power
   MI:Middle Power
   LOW:Low Power
3. Press number key to confirm and exit.

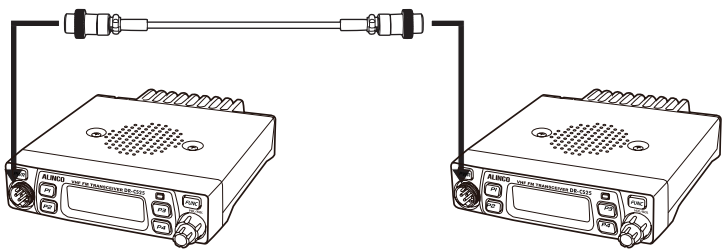
LCD BACKLIGHT

1. In standby status, press (D FUNC), then press (# FRE/LAM) LCD displays "**COL-XX**" .
2. Press [UP / DOWN] to select desired backlight.
   ORG:Orange
   SAK: Sakura (Blight Pink)
   WHI:Whilt
   OFF:No backlight
3. Press number key to confirm and exit.

9 Cable Clone

This feature clones the programmed data and parameters in the master unit to slave units.

1. An optional EDS-29 cloning cable and PC programming is necessary to activate cloning function to the master unit. Make a master unit by setting and programming it as desired. Turn off both units. Connect the cable between the DATA jacks on both units.
2. Master unit: Press programmed CLONE function key (Program the Key by PC) or other way that press and hold Power(On)+ FUNC+ P2 key at the same time to enter into cloning mode. LCD displays "**CLONE**".



3. Press master unit's [**FUNC**] key, LCD displays "**CLONEXX**". Slave unit displays "**CLONEXXX**". When the cloning is successfully finished, the slave unit will restart. Turn off the power, disconnect the cable and repeat step 3 operations to clone the next slave unit.

NOTE This function is useful to clone many units in enviornment where PC is not available. This feature is popular to commercial land mobiles.

10 OPTIONAL ACCESSORIES

- EDS-29 Clone cable
- ERW-12 PC cable
- EMS-74 Microphone (spare)

KEY FUNCTION

The function of key combinations can be changed by PC software. Below is the default setting.

Key Combination	Short press	Hold for over 2 seconds	FUNC+
FUNC	"F" is indicated.	Goes to setting menu	--
P1	V/M	SCAN	MW(Setting memory channel data)
P2	MHz	Frequency Offset	Deleting memory channel
P3	TS/DCS	Power voltage monitor	Keypad lockout
P4	CALL	--	High/Middle/Low power

TROUBLE SHOOTING

Problem	Possible Causes and Potential Solutions
(a) Power is on, nothing appears on Display.	+ and - polarities of power connection are reversed. Connect red lead to positive terminal and black lead to negative terminal of DC power supply.
(b) Fuse is blown.	Check and solve problem resulting in blown fuse and replace fuse with a new one.
(c) Display is too dim.	Set the LCD backlight parameter properly.
(d) No sound comes from speaker.	• Squelch level too high. Decrease squelch level. • Selective-calling like TSQ activated. Press Micro's (✱ MW/REF) key to monitor.
(e) Key and Dial do not function.	Key-lock function is activated. Cancel Key-lock function.
(i) Rotating Dial will not change memory channel.	Transceiver is in CALL mode. Press (A V/M).
(g) PTT key is pressed but doesn't transmit.	• Microphone connection is poor. Connect microphone properly. • Antenna connection is poor. Connect antenna properly.

Please contact your dealer when a technical assistance may be necessary.

12 Specifications

General	
Frequency Range	TX : 222-225.9975MHz RX : 220-259.9975MHz
Number of Channels	200 channels
Channel Spacing	25KHz (Wide Band) 20KHz (Middle Band) 12.5KHz (Narrow band)
Channel step	2.5KHz,5KHz, 6.25KHz, 8.33KHz, 10KHz, 12.5KHz, 15KHz, 20KHz, 25KHz, 30KHz, 50KHz
Operating Voltage	13.8V DC ±15%
Squelch	Carrier/CTCSS/DCS/5Tone/2Tone/DTMF
Frequency Stability	±2.5ppm
Operating Temperature	-20℃~+60℃
Dimensions(WxHxD)	140(W)x35(H)x180(L)mm
Weight	about 0.910Kg

NOTE Specifications are subject to change without notice due to advancements in technology.

Receiver		
	Wide band	Narrow band
Sensitivity (12dB Sinad)	≤0.3μV	≤0.35μV
Adjacent Channel Selectivity	≥70dB	≥60dB
Intermodulation	≥65dB	≥60dB
Spurious Rejection	≥70dB	≥70dB
Audio Response	+1~-3dB(0.3~3KHz)	+1~-3dB(0.3~2.55KHz)
Hum & Noise	≥45dB	≥40dB
Audio distortion	≤5%	
Audio power output	>2W@10%	
Current drain (Max)	< 0.6A	

Transmitter		
	Wide band	Narrow band
Power Output	50W/20W/10W	
Current drain (Max)	< 10A	
Modulation	16KΦF3E	11KΦF3E
Adjacent Channel Power	≥68dB	≥60dB
Hum & Noise	≥40dB	≥36dB
Spurious Emission	≥60dB	≥60dB
Audio Response	+1~-3dB(0.3~3KHz)	+1~-3dB(0.3~2.55KHz)
Audio Distortion	≤5%	

51 GROUPS CTCSS TONE FREQUENCY(HZ)

62.5	67.0	79.7	94.8	110.9	131.8	156.7	171.3	186.2	203.5
229.1	69.3	82.5	97.4	114.8	136.5	159.8	173.8	189.9	206.5
233.6	71.9	85.4	100.0	118.8	141.3	162.2	177.3	192.8	210.7
241.8	74.4	88.5	103.5	123.0	146.2	165.5	179.9	196.6	218.1
250.3	77.0	91.5	107.2	127.3	151.4	167.9	183.5	199.5	225.7
254.1									

1024 GROUPS DCS CODE

000	001	002	003	004	005	006	007
010	011	012	013	014	015	016	017
020	021	022	023	024	025	026	027
030	031	032	033	034	035	036	037
040	041	042	043	044	045	046	047
050	051	052	053	054	055	056	057
060	061	062	063	064	065	066	067
070	071	072	073	074	075	076	077
100	101	102	103	104	105	106	107
110	111	112	113	114	115	116	117
120	121	122	123	124	125	126	127
130	131	132	133	134	135	136	137
140	141	142	143	144	145	146	147
150	151	152	153	154	155	156	157
160	161	162	163	164	165	166	167
170	171	172	173	174	175	176	177
200	201	202	203	204	205	206	207
210	211	212	213	214	215	216	217
220	221	222	223	224	225	226	227
230	231	232	233	234	235	236	237
240	241	242	243	244	245	246	247
250	251	252	253	254	255	256	257
260	261	262	263	264	265	266	267
270	271	272	273	274	275	276	277
300	301	302	303	304	305	306	307
310	311	312	313	314	315	316	317

320	321	322	323	324	325	326	327
330	331	332	333	334	335	336	337
340	341	342	343	344	345	346	347
350	351	352	353	354	355	356	357
360	361	362	363	364	365	366	367
370	371	372	373	374	375	376	377
400	401	402	403	404	405	406	407
410	411	412	413	414	415	416	417
420	421	422	423	424	425	426	427
430	431	432	433	434	435	436	437
440	441	442	443	444	445	446	447
450	451	452	453	454	455	456	457
460	461	462	463	464	465	466	467
470	471	472	473	474	475	476	477
500	501	502	503	504	505	506	507
510	511	512	513	514	515	516	517
520	521	522	523	524	525	526	527
530	531	532	533	534	535	536	537
540	541	542	543	544	545	546	547
550	551	552	553	554	555	556	557
560	561	562	563	564	565	566	567
570	571	572	573	574	575	576	577
600	601	602	603	604	605	606	607
610	611	612	613	614	615	616	617
620	621	622	623	624	625	626	627
630	631	632	633	634	635	636	637
640	641	642	643	644	645	646	347
650	651	652	653	654	655	656	657
660	661	662	663	664	665	666	667
670	671	672	673	674	675	676	677

700	701	702	703	704	705	706	707
710	711	712	713	714	715	716	717
720	721	722	723	724	725	726	727
730	731	732	733	734	735	736	737
740	741	742	743	744	745	746	747
750	751	752	753	754	755	756	757
760	761	762	763	764	765	766	767
770	771	772	773	774	775	776	777

NOTE **N** is positive code, **I** is negative code, total: 1024groups.

[MEMO]