
VHF Airband Transceiver

JHP-500/520

Operation Manual

JRC *Japan Radio Co., Ltd.*

FCC ID: CKEJHP-520 MANUAL

<Introduction>

- Before using this product, be sure to thoroughly read this instruction manual to ensure correct use.
- After reading this instruction manual store in a safe place so that it can be referred to whenever necessary.
This instruction manual will come in useful if you are unsure of an operation during use or if some trouble occurs.
- JHP-500/520 can receive and display VOR signals of equisignal localizers. Using this operating mode, however, does not make the device an air navigation system according to flight safety regulations.

<Before Use>

Carefully read the Precautions Upon Use before using the equipment to ensure proper use.
The cautions show here describe how to avoid injuring yourself or others while using the equipment, and how to avoid damaging the equipment. Be sure to follow these instructions.
The follow warning and caution labels indicate the degree of equipment damage or personal injury that can occur if you do not follow the safety instructions and use the equipment improperly.

	WARNING	This label indicate there is a possibility of death or serious injury if the proper procedures are not followed.
	CAUTION	This label indicate there is a possibility of injury or damage to the equipment if the proper procedures are not followed.

Examples of Icons

- | | | | | |
|---|---|---|---|---|
|  |  |  |  |  |
| CAUTION
ELECTRIC SHOCK | DISASSEMBLY
FORBIDDEN | DISASSEMBLY
FORBIDDEN | REMOVE PLUG | REMOVE PLUG |
- △ Icons tell you that caution (including DANGER and WARNING) is urged.
The actual details of the caution are pictured inside the icon. (The icon on the left indicates that caution is urged to prevent electric shock.)
- Icons tell you that a certain action is forbidden.
The actual details of the forbidden action are pictured either inside or near to the icon. (The icon in the left indicates that dismantling is forbidden.)
- Icons tell you that a certain action is compulsory.
The actual details of the compulsory action are pictured inside the icon. (The icon in the left indicates that the power plug must be removed from its outlet.)

<Precautions Upon Use>

⚠WARNING

- ⊘ Do not use any cable other than the supplied Battery charger or option's Desktop charger.
Doing so can result in fire or electric shock.
- ⊘ Do not scratch, tear, modify, excessively bend, yank, or twist the charger cord, or allow it to become excessively hot.
Doing so can damage and tear the cord, resulting in igniting, electric shock, or equipment failures.
- ⊘ Do not set anything heavy on the charger cord or connector cords, or sandwich them between objects. Doing so can damage and tear the cords, resulting in igniting, electric shock, or equipment failures.
- ⊘ Do not use the charger cord if the cord or plug is damaged, or if it fits loosely in the outlet. Doing so can result in a short circuit and start fire.
- ⊘ Only use the specified supply voltage. Using a different supply voltage can cause the equipment to ignite or burst into flames.
- ⊘ Do not exceed a charging time of 15 hours. Doing so can cause the equipment to ignite or burst into flames.

⚠WARNING

- ⊘ You are forbidden to subject the cell to any of the following when handling the Battery
 - Uses other than specified
 - Burning of Battery
 - Heating above 70°C
 - Short-circuiting
 - Disassembly, damage and deformation by applied pressure
 - Exposure (e.g. leaving the cell outside or in a hot, humid environment)
 - Water leakage
 Failure to observe the above handling precautions may cause the battery to explode, ignite or emit gases that are harmful to the human body.
If the battery emits gases, avoid inhaling the gas, and immediately ventilate the surrounding area.
- ⊘ Do not disassemble nor remodel this product. Illegal remodeling not only results in a fire according to the Regulations, but also can result in fire, electrocution or malfunction.

⚠ WARNING

⚡ When connecting the DC power cord, be sure the positive (+) and negative (-) polarities are correct. Connecting the cord with the polarities set backwards can result in igniting, electric shock, or equipment failures.

⚡ The equipment will become very hot if it is used for an extended period of time. Be careful not to allow children or other adults in the area to touch the equipment. Touching the equipment can burn the skin. The equipment should be installed in an area with good ventilation.

⚡ Using the product while it is emitting smoke, emitting a strange odor, or otherwise functioning abnormally can result in fire or electric shock. In the event of such problems, immediately turn the power OFF and be sure to remove the power plug from the electric outlet. Next, contact your dealer. Do not ever attempt to fix the product yourself.

⚡ If you hear thunder, turn the power switch OFF and remove the charger plug from the AC outlet as a safety precaution. Doing so can result in electric shock.

⚡ Never touch the equipment or its Charger plug with wet hands. Doing so can result in electric shock.

⚠ CAUTION

⚡ Do not install the product in locations such as those listed below. Doing so can result in fire or electric shock, or cause the product to fail.

- Locations which are exposed to direct sunlight, in the path of heaters, or otherwise exposed to hot air
- Locations with poor ventilation
- Locations which are subject to large amounts of moisture or dust
- Locations in the vicinity of objects which could change in shape or ignite if heated
- Locations in the vicinity of flower vases or other objects containing water
- Unstable locations

⚡ Do not open the product case. Opening the case can result in injury or electric shock, or damage the equipment. Also, may invalidate the equipment guarantee.

⚡ Do not sit on the product or place anything on top of it. Doing so may cause the product to fall or be knocked over, resulting in injury or damaging the equipment.

⚡ Do not drop or bang the product. Doing so can result in injury or damage the equipment.

⚡ Do not touch areas of the equipment which are not described in this manual. In particular, do not touch the interior of the equipment. Doing so can cause the equipment to fail.

⚡ Do not use headphones when using the product for a long time. Doing so can impair hearing.

⚠ CAUTION

❗ Do not install the product near televisions, radios, or computers. Doing so can cause radio frequency interference in the product or nearby electronic devices.

❗ As a safety precaution, turn the power OFF and remove the charger plug from its outlet before cleaning the exterior of the product. Wipe off dust, etc. with a dry towel. If the exterior is extremely dirty, use a neutral detergent soaked in water. Never use paint thinner, benzene, or alcohol. Doing so can cause the equipment to fail.

❗ Be sure to hold the power cord or connector cable by its plug when inserting or removing it. Failure to do so can result in electric shock, or cause a short circuit and start a fire.

❗ Ground terminals should be as thick as possible and installed securely. Wire runs should be as short as possible. Never connect a ground terminal to a gas pipe, wire conduit, etc. Doing so can result in explosion or electric shock in the event of a failure or electric leak.



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1. Introduction
 - JHP-500 is a VHF Air Band Transceiver with Weather Channel reception.
 - JHP-520 is a VHF Air Band Transceiver with Weather Channel reception, VOR reception and VOR display.

2. Features
 - The frequency can be quick selected using the keypad or the channel selector.
 - 100 channels memory location with the frequency and the character.
 - VOR mode allows the angle of approach of the aircraft to be displayed on the LCD.

3. Standard Composition / Accessories

Items	Model No.	Qty	Remarks
Transceiver	JHP-500/520	1	
Antenna	NAV-151	1	
Wall charger	NBB-484	1	700mAh
Ni-Cd battery	NBB-487	1	
Belt clip		1	
Hand strap		1	
Protective case		1	
Headset adapter		1	English
Instruction Manual		1	

3.2 Options

Items	Model No.	Remarks
Cigarette DC Adapter	CFQ-6132	12VDC Input
Ni-Cd battery	NBB-487	700mAh
Ni-MH battery	NBB-479	1,200mAh
Desktop charger (Rapid)	NBB-486	
Alkaline battery pack		
Speaker Mic	NVT-145	9pcs

4. Specifications

4.1 Specifications

4.1.1 General

Frequency range

NAV band 108.000~117.975MHz
 COM band 118.000~136.975MHz
 Weather Channel (10CH)
 WX01 162.550MHz, WX02 162.400MHz
 WX03 162.475MHz, WX04 161.850MHz
 WX05 162.425MHz, WX06 162.450MHz
 WX07 162.500MHz, WX08 161.525MHz
 WX09 161.775MHz, WX10 163.275MHz

12V±10%

Transmitting: approx. 1A

Receiving: approx. 250mA

Standby: approx. 60mA

typ. 50Ω

±10ppm

25kHz

100

AM (8K00A3E), FM (11K0F3E)

Mode



"FROM" is displayed if the aircraft is on a course away from the VOR Station (in VOR or CDI operation).

FROM

Operating temperature
Dimensions
Weight

-10°C to +55°C
65 (width)×155 (height)×38 (depth)mm
(include Ni-cd battery)
approx. 450g (include Ni-cd battery)

4.1.2 Transmitter
Output power

5W (PEP)

4.1.3 Receiver
Sensitivity
Selectivity

2.0µV for 20dB
6dB: 12kHz or more
70dB: 25kHz or less

Intermediate Frequencies

First IF: 21.7MHz
Second IF: 450kHz
0.5W/8Ω

AF output power

4.2 Abbreviations

VOR

VHF Omni Range :
The standard short-range navigation support system.
This system allows for determining the bearing of the
VOR station in flight of the aircraft.

CDI

Code Deviation Indicator:
By selecting CDI mode, you can display the deviation
between the station and the aircraft.

VOR TO

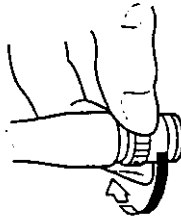
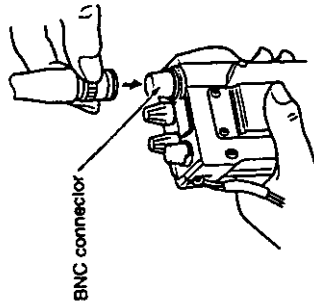
"TO" is displayed if the aircraft is on a course towards
the VOR Station (in VOR or CDI operation).

5. Installation

5.1 Installing the Accessories

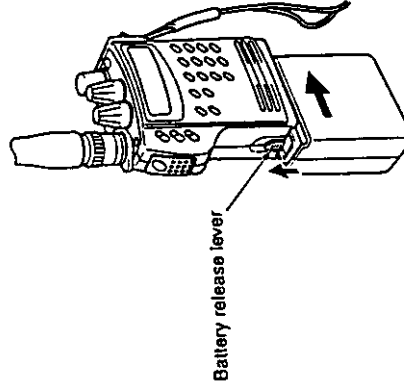
- Antenna (NAV-151)

Rotate the antenna clockwise until it stops.



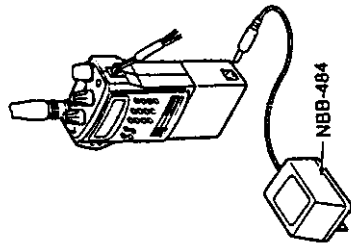
- Battery (NBB-487)

Hold up the battery release lever and attach the battery pack.

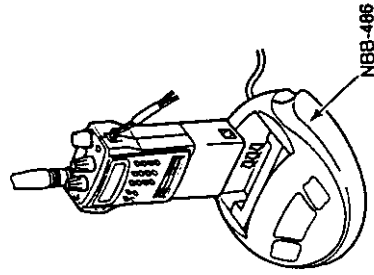


5.2 Battery Charging

- General notes for charging the battery:
 1. Do not charge at ambient temperature below 0°C or above +40°C.
 2. Do not operate JHP-500/520 while charging the battery.
- Charging use the battery charger NBB-484.
Connect the NBB-484 to JHP-500/520's charger plug.
Charging time : approx. 10 hours.
(Note : Do not exceed a charging time of 15 hours.)

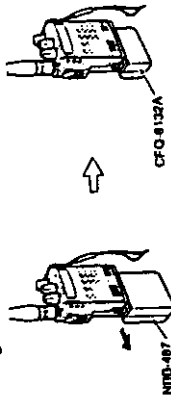


- Charging use the Desktop charger NBB-486.
Insert JHP-500/520 to NBB-486's charger holder.
Charging time : approx. 2 hours.

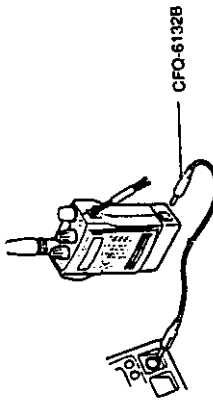


5.3 Cigarette DC Adapter (CFO-6132)

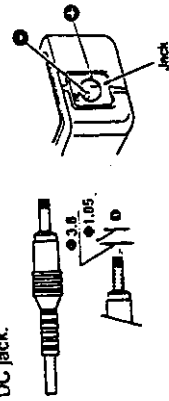
1. Change to the CFO-6132A from the NBB-487.



2. Connect the DC CABLE (CFO-6132B) to the CFO-6132A DC jack and cigarette jack.
attention: Only 12VDC input.



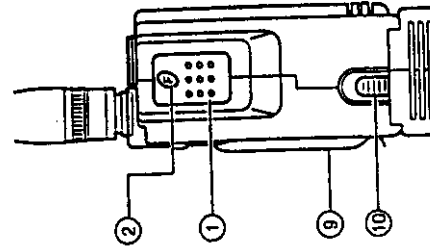
3. DC jack.



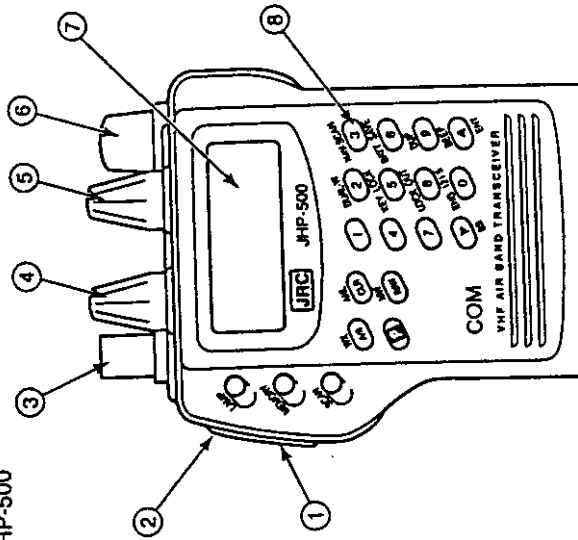
6. OPERATION

6.1 PANEL LAYOUT

JHP-500

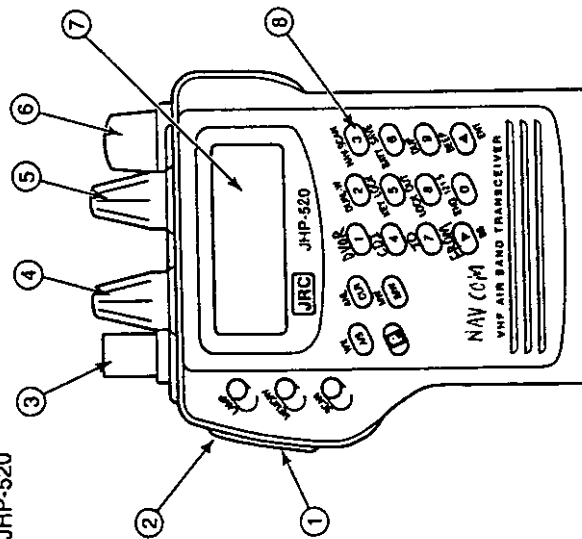


- ① PTT pushbutton (Press To Talk)
- ② Function switch (FUNC)
- ③ Antenna connector (BNC TYPE)
- ④ Squelch knob (Squelch control)
- ⑤ Volume knob (Power ON/OFF and Volume control)
- ⑥ Channel selector
- ⑦ LCD
- ⑧ Keypad
- ⑨ Bell clip
- ⑩ Battery release lever

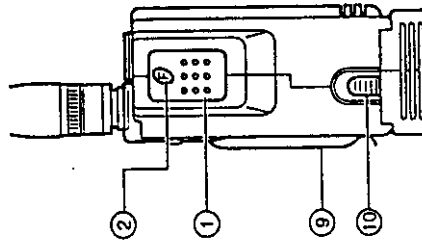




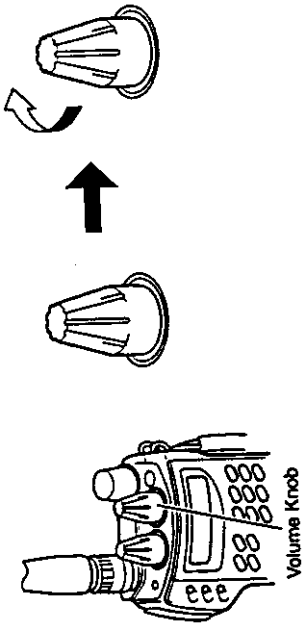
JHP-520



- ①PTT pushbutton (Press To Talk)
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- ③Antenna connector (BNC TYPE)
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- ⑤Volume knob (Power ON/OFF and Volume control)
- ⑥Channel selector
- ⑦LCD
- ⑧Keypad
- ⑨Belt clip
- ⑩Battery release lever



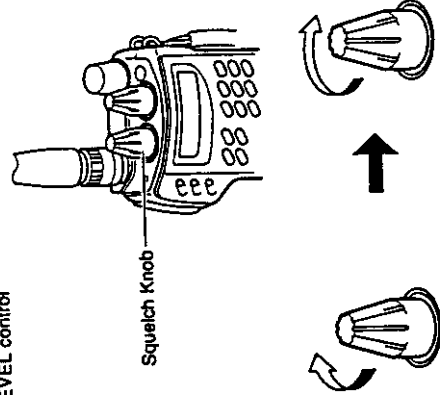
6.2 Operating the JHP-500/520
6.2.1 POWER ON/OFF and Audio LEVEL control



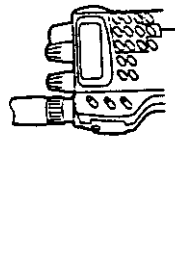
- Power ON
Turn the volume knob clockwise.
- Power OFF
Turn the volume knob counterclockwise.
- Audio level control
Turn the volume knob clockwise or counterclockwise.
Clockwise: Increase audio level.
Counterclockwise: Decrease audio level.

6.2.2 Squelch (SQL) LEVEL control

Control the squelch knob to eliminate noise in no-signal state.
The further this squelch knob is turned to the right, the deeper
squelch level becomes.

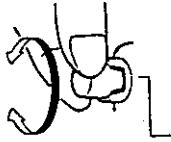


6.2.3 Frequency selection



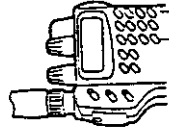
10Keys

1. Setting the frequency by the 10 keys.



Channel Selector

2. Setting the frequency by the channel selector.



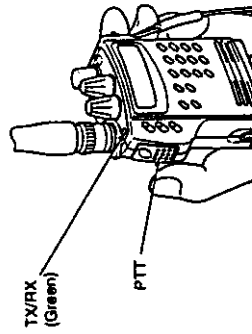
UP/DOWN Keys

3. Setting the frequency by the UP/DOWN keys.

6.2.4 Communication

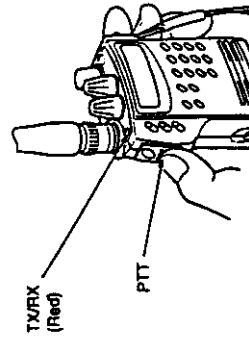
1. Receive

- Set the frequency.
- The noise can be heard from speaker when the squelch is opened.
- Release the PTT switch.



2. Transmit

- Set the COM band frequency, then press the PTT switch to transmit.
- The PTT switch is inoperative at frequency outside the COM band. (118.000 ~ 136.975MHz)





8.3 Operation Guide

1. Power on.
2. Basic functions.
3. First & Second key Functions.
4. Memory Functions.
5. Duplex operation.
6. Scanning function.
7. DVOR Indicator (This function have only the JHP-520).

Item	Operation	LCD	Notes:
1. Power on. 1.1 Power on.	Turn the volume knob clockwise.	F ~ SAVE AHL BATT LOW LOCKOUT ACT STBY 100.000 M DUP DVOR CDI TO FROM 000 0000000000000000 ACT 118.000	All indicators on the display turn on for about 2 seconds.
1.2 Power off.	Turn the volume knob counter clockwise.	ACT 118.000	Then the last set data is displayed. No indicator on the display and power off.

Item	Operation	LCD	Notes:
2. Basic functions. 2.1 Emergency frequency. 2.1.1 Setting.	Press [E] [0] .	121.500 M	The emergency frequency is displayed. If the emergency frequency is selected, the keylock function is cancelled.
2.1.2 Clearing.	Press [CLR] .	ACT 118.000	The previously set frequency is displayed.
2.2 Frequency selection by ten keys. 2.2.1 Setting the active frequency.	Press [0] to [9] to set a frequency. Example) To set 118.275MHz: (1) Press [1] .	ACT 1	"1" is displayed. If an invalid frequency is set, the error tone sounds and the previously set frequency is displayed.

Item	Operation	LCD	Notes:
	② Press 1 , 0 , 2 subsequently.	ACT 118.2	The LCD displays the pressed keys.
	③ Press 7 . The last digit is automatically set.	ACT 118.275	The decimal point is displayed when the frequency setting is complete.
		ACT 118.000	If the digit before last is invalid, the error tone sounds and the previously set frequency is redisplayed. If you attempt to set an invalid frequency, the error tone sounds and the previously set frequency is redisplayed.
	If you enter two or more digits and then press ENT . Example) Press 1 , 2 , ENT . • You can set a frequency in the range 108.000 to 136.975MHz.	ACT 120.000	If invalid, the error tone sounds and the previously set frequency is redisplayed.

Item	Operation	LCD	Notes:
2.2.2 Clearing the active frequency setting.	Press [CLR] .	ACT 11	The previously set frequency is displayed.
2.2.3 Correcting a digit when entering a frequency.	Press [BS] while entering a frequency.	ACT 118.000	The last entered digit is cleared and a new value can be entered. Pressing [BS] after entering only one digit has the same effect as pressing [CLR] .

Item	Operation	LCD	Notes:
2.2.4 Setting a frequency using the UP/DOWN keys.	Starting from the last frequency setting press ▲ or ▼ .	ACT 118.025	Pressing ▲ increases the frequency by one step. Pressing ▼ reduces the frequency by one step. The frequency steps can be set independently for COM and NAV bands.
	Press and hold ▲ or ▼ .	ACT 118.050	Press and hold ▲ or ▼ for approx. 1 second for fast scanning.
	Press and hold ▲ or ▼ . • Between 108.000 and 136.975MHz, the frequency is set in steps. • If you press hold ▲ at the highest frequency, the lowest frequency is selected. • If you press ▼ at the lowest frequency, the highest frequency is selected.	ACT 127.275	Press and hold ▲ or ▼ for approx. 2 seconds for fast scanning at the frequency step $\times 4$.

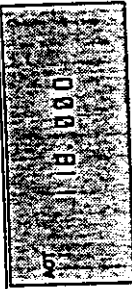
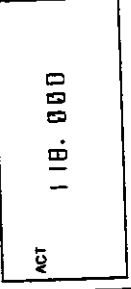
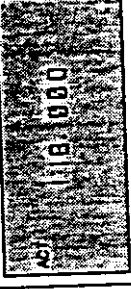
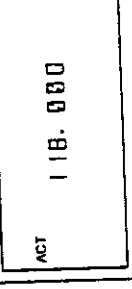
Item	Operation	LCD	Notes:
2.2.5 Setting active frequency using the channel selector.	Turn the channel selector clockwise to increase frequency. Turn the channel selector counter-clockwise to reduce frequency.	ACT 118.000	Operating the keys alternates between active and standby frequency and displays the newly set active frequency. The error tone sounds and Active/Standby frequency is not switched under memory mode.
2.2.6 Active or standby frequency selection.	Press [NS] . Example) Changing between an active frequency of 118.000 MHz and a standby frequency of 127.275 MHz.	ACT 127.275	Standby frequency is last active frequency (COMNAV/WX).
2.3 Setting the weather channel. 2.3.1 Setting the weather channel using the 10 keys.	Press [F] [NS] .	WX-02	The previously set weather channel is displayed and "ANL" turns off.

Item	Operation	LCD	Notes:
	Press [0] to [9] to set the weather channel.	WX - 0	If you enter 0 or 1 on first digit, data indicator starts blinking.
		WX - 10	If you enter 2 to 9 on first digit, weather channel is selected.
	Press [ENT] after entering first digit.	WX - 0 1	The weather channel is set.
2.3.2 Clearing the weather channel setting.	Press [CLR] or [BS] .	WX - 0 2	The previously set weather channel is displayed.

Item	Operation	LCD	Notes:
2.3.3 Setting a weather channel using the UP/DOWN keys.	Starting from the last channel setting press  or . Press and hold  or . • If you press  at the highest channel, the lowest channel is selected. • If you press  at the lowest channel, the highest channel is selected. Turn the channel selector clockwise or counterclockwise.	WX - 01 WX - 01	Pressing  increases the channel by one step. Pressing  reduces the channel by one step. Press and hold  or  for approx. 1 second for fast scanning.
2.3.4 Setting a weather channel using the channel selector.			
2.3.5 Clearing the weather channel setting.	Press  or  .  .	ACT 118.000	The previous sel channel is displayed.

Item	Operation	LCD	Notes:
2.3.6 Setting/ Clearing LOCK OUT of weather channel.	Press [F], [B].	WX - 01	"LOCKOUT" displays. Press [F], [B] again. "LOCKOUT" turns off.
2.3.6 Weather channel display.	Enter weather channel in case frequency is displayed under memory mode.	WX - 01	"WX-01" is displayed.
	Set weather channel in case character is displayed under memory mode.	162.550 01	Frequency and channel number are displayed.
2.4 Receive.	Turn the squelch knob clockwise to set the frequency.	ACT 11B. 025	The noise can be heard from speaker.

Item	Operation Adjust squelch knob.	LCD	Notes:
2.5 Transmit.	Adjust squelch knob.	ACT 118.025	The noise can not be heard from speaker.
	Set a frequency in the COM band, then press the PTT switch to transmit.	ACT 118.025	LED is lighted red.
	Release the PTT switch to return to reception mode.	ACT 118.025	Return to receive. R
	The PTT switch is inoperative when a frequency outside the COM band is selected (e.g. : 162.550 MHz).	ACT 162.550 01	Transmit operation is not possible.

Item	Operation	LCD	Notes:
2.6 Backlighting ON /OFF.	Press the [LAMP] to turn backlighting on momentarily.		The LCD backlighting turns on.
	Press [E], [LAMP] to turn backlighting on continuously.		The backlighting automatically turns off after about 5 seconds if no key is pressed. If keys are operated, the backlighting is automatically turned off about 5 seconds after the last key has been pressed.
	Press [LAMP] and [E], [LAMP] to turn backlighting off.		Backlighting remains on.
			Backlighting turns off.

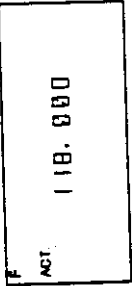
Item	Operation	LCD	Notes:
3. First & Second Key Functions. 3.1 First Function overview.	Press [F] and the following keys to select the first function : JHP-500 2 :Selects Dual Watch mode 3 :Starts NAV band scanning 5 :Selects KEYLOCK on/off 6 :Selects Battery save mode 8 :Selects LOCKOUT on/off 9 :Duplex operation on/off 0 :Sets the emergency frequency. ▲ :Turns the key tone on/off. A/S :Receives weather band CLR :Turns the noise limiter on/off IMW :Writes data to memory LAMP :Backlighting turns on continuously	F ACT 11B. 000	Pressing [F] displays the indicator "F" on the LCD and selects the first function. Pressing [F] again cancels the first function. The first function is also cancelled if no other keys are operated within 3 seconds.

Item	Operation	LCD	Notes:
JHP-520	:Selects DVOR mode :Selects Dual Watch mode :Starts NAV band scanning :Selects CDI mode :Selects KEYLOCK on/off :Selects Battery save mode :Selects TO mode :Selects LOCKOUT on/off :Duplex operation on/off :Sets the emergency frequency. :Turns the key tone on/off. :Selects FROM mode :Receives weather band :Turns the noise limiter on/off :Writes data to memory :Backlighting turns on continuously See (Item 7.1) DVOR function.		
3.1.1 DVOR mode selection. (JHP-520 only)			
3.1.2 Dual watch mode.	See (Item 6.6) Dual watch function.		

Item	Operation	LCD	Notes:
3.1.3	Starting NAV band scanning.		
3.1.4	CDI mode selection. (JHP-520 only)		
3.1.5	KEYLOCK ON/OFF.	ACT 118.000	The keylock symbol is displayed. All keys except the function switch, the light switch and the PTT switch become inoperative.
	Press [F] and [5] subsequently.	ACT 118.000	The keylock symbol extinguishes and the keylock function is cancelled. You can also press [F] and [CLR] to cancel the keylock.
	Press [F] and [CLR] again.	SAVE ACT 118.000	The "SAVE" indicator turns on and the battery save mode turns on.
3.1.6	Battery save mode.		

Item	Operation	LCD	Notes:
	Press [F] and [6] again.	ACT 118.000	The "SAVE" indicator turns off and the battery save mode turns off.
3.1.7 To mode. (JHP-520 only)	See (Item7.1) DVOR function.		
3.1.8 LOCKOUT ON/OFF.	See (Item4.5.3) memory function and (Item2.3.6) setting the weather channel.		
3.1.9 Duplex operation mode.	See (Item5) duplex operation.		
3.1.10 Setting the emergency frequency.	See (Item2.1) setting the emergency frequency.		
3.1.11 Receives weather band.	See (Item2.3) setting the weather channel.		

Item	Operation	LCD	Notes:
3.1.12 Key tone ON/OFF.	Press [F] and [▲] .	ACT 118.000	On: Press [F] then [▲] Off: Press [F] and [▲] once again.
3.1.13 FROM mode. (JHP-520 only)	See (Item 7.1) DVOR function.		
3.1.14 Continuous backlighting ON.	See (Item 2.6) backlight function.		
3.1.15 Noise limiter ON/OFF.	Press [F] then [CLR] .	ANL ACT 118.025	The "ANL" indicator turns on and the automatic noise limiter turns on.
	Press [F] then [CLR] again.	ACT 118.025	The "ANL" indicator turns off and the automatic noise limiter turns off.

Item	Operation	LCD	Notes:
3.1.16 Storing data in memory.	See (Item4) the memory function "Storing Data in Memory".		
3.2 Second function overview.	Press and hold [F] for at least 2 seconds, then press the following keys to select their second functions : 1 :Selects battery 2 :Sets COM frequency stops 3 :Sets NAV frequency steps 4 :Selects memory scanning 5 :Selects TX power SCAN :PAUSE In Scan operation ON/OFF		"F" blinks on the display. The second function is set. Pressing [F] again deactivates the second key operation. The second function is also cancelled if no other keys are pressed within 3 seconds.

Item	Operation	LCD	Notes:
3.2.1 Selects battery.	Press and hold [F] for at least 2 seconds, then press [1].	Primary battery Secondary battery 2 ACT 18. 000	The currently selected battery is displayed. If no key is pressed, the previously set frequency is displayed after about 5 seconds
	Press [▼] or turn channel selector to set the type of the battery, then press [ENT]		Press [▼] to select the battery type Press [ENT] to set. If no key is operated within about 5 seconds or if [CLF] is pressed, the previous display is restored.

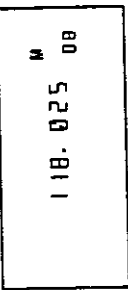
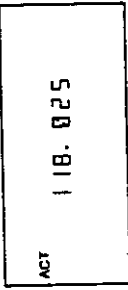
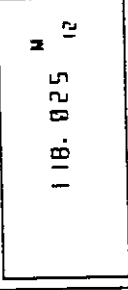
Item	Operation	LCD	Notes
3.2.2 Setting the COM band frequency step.	Press and hold [F] for at least 2 seconds, then press [2] .	2 25	The currently selected data is displayed. If no key is pressed within 5 seconds, the previous display is restored.
	Selects step use [▼] or channel selector.	2 50	To change the frequency step each time, [▼] is pressed or turn channel selector. Available steps are 10, 20, 25, 50 and 100kHz. Channel selector : Clockwise : 10→20→25→50→100 Counterclockwise : 10←20←25←50←100
	Press [ENT] .	2 25	Pressing [ENT] stores the selected step. The previous display is restored.
		ACT 1 18.000	If [CLR] is pressed or no key is operated within 5 seconds, the previous display is restored.

Item	Operation	LCD	Notes:
3.2.3 Setting the NAV band frequency step.	Press and hold [F] for at least 2 seconds, then press [3]	3 25	The currently selected data is displayed. If no other keys are operated within 5 seconds, the previous display is restored.
	Selects step use [▼] or channel selector.	3 50	To change the frequency step each time, [▼] is pressed or turn channel selector. Available steps are 10, 20, 25, 50 and 100kHz. Channel selector : Clockwise : 10→20→25→50→100 Counterclockwise : 10←20←25←50←100
	Press [ENT]	3 100	Pressing [ENT] stores the selected step. The previous display is restored.
		ACT 118.000	If [CLR] is pressed or no key is operated within 5 seconds, the previous display is restored.

Item	Operation	LCD	Notes:
3.2.4 Memory scanning selection.	Press and hold [F] for at least 2 seconds then press [4] .	4 ALL 4 CRP 4 ALL ACT 118.000	Operating the keys displays the currently selected status. ALL means : Scanning of all memory locations. Group means : Scanning within a group of ten. Example : Memory location No. 23 is selected. The memory locations No. 20 to 29 are scanned. If no key is pressed within 5 seconds, the previous display is restored. Press [▼] or turn channel selector to select the scanning methods : scanning of all memory locations [ALL] or of individual memory groups. Pressing [ENT] stores the selected step. The previous display is restored. If no key is pressed within 5 seconds or [CLR] is pressed, the previous display is restored.
	Use [▼] or channel selector to select the scanning method. Press [ENT] to store the selected method.		

Item	Operation	LCD	Notes:
3.2.5 Selects TX power.	Press and hold [F] for at least 2 seconds then press [5].	ACT 1 18. 000	"LOW" is displayed and select low power.
	Press and hold [F] for at least 2 seconds then press [5] again.	ACT 1 18. 000	"LOW" is bunked and select high power.
3.2.6 PAUSE in scans operation ON/OFF.	Press and hold [F] for at least 2 seconds then press [SCAN].	P UN	Operating the key displays the currently selected status. If no other keys are operated within 5 seconds, the previous display is restored.

Item	Operation	LCD	Notes:
	Use ▼ or channel selector to set ON/OFF. Press ENT to store the selected method.	P OFF ACT 118.000	Use ▼ or channel selector to set ON/OFF. Press ENT to store the selected method. If no key is pressed within 5 seconds or CLR is pressed, the previous display is restored.

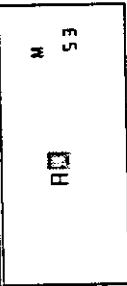
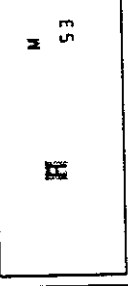
Item	Operation	LCD	Notes:
4. Memory function. 4.1 Instant memory write.	Press [IMW]		"M" blinks on the display. The smallest unregistered memory number is displayed and registered. "WX-01" is displayed under Weather channel mode.
4.2 Storing data in memory.	Press [F] and [IMW]		Previous status is returned after the display is held for 0.5 seconds after pressing [IMW] . Weather channel frequency and number are displayed under weather channel mode.
4.2.1 Entering the channel number using the 10 keys.	Press [0] to [9] to enter the number of the memory location. Example) Storing data in channel No.12 ① Press [1] ② Press [2]		"M" blinks on the display. The previous set memory number and frequency are displayed.
			The entered data is displayed. Entering a second digit displays the memory number and the currently set frequency.

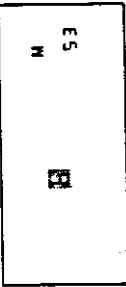
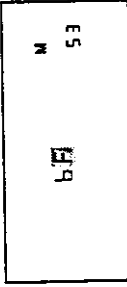
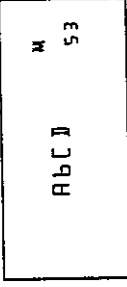
Item	Operation	LCD	Notes:
4.2.2 Changing the Memory Numbers.	Enter one digit, then press [BS] and [CLR] .	118.025 M 09	Operating the key restores the display. Then the memory channel number can be entered. The previously stored data is displayed.
4.2.3 Using [▼] .	Press [▼] or turn channel selector to select memory channel number.	118.075 M 10	Pressing [▼] or turning channel selector clockwise the memory number by one.
	Press and hold [▼] .	118.175 M 11	Pressing [▼] scans rapidly through the memory numbers. (The memory No. is increased by "1" each 100ms).
4.2.4 Store frequency.	Press [ENT] .	118.000 M 53	Pressing [ENT] stores the frequency in the displayed memory channel. "WX-01" is displayed under weather channel mode.

Item	Operation	LCD	Notes:
4.2.5 Input character.	Press ten keys to input character. The maximum four characters are available. Example) Input "AFKP". ① Press [1]		Alter pressing [ENT] , the data is displayed for about 0.5 seconds and inputting character is available. (First digit blinks on the display.)
	② Then, Press [2] [3] [4]		"A" blinks on the display.
4.2.6 Correct one (1) character.			"AFKP" is displayed.

Item	Operation	LCD	Notes:
4.2.7 Characters and keys.	Press BS while input character. You can input following characters, total 48 kinds. Characters and keys are as follows. 1: A, B, C, D, E 2: F, G, H, I, J 3: K, L, M, N, O 4: P, Q, R, S, T 5: U, V, W, X, Y 6: Z, -, /, ., (space) 7: 0, 1, 2, 3, 4 8: 5, 6, 7, 8, 9 9: (,), ., !, =, ^ 0: ~, P, E, f		The character on the cursor is deleted and you can input the correct one.

Item	Operation	LCD	Notes:
	Example) Press [1]		"A" blinks on the display
	Then, press [1] again.		"B" blinks on the display. "C", "D", "E" is changed pressing [1] and returned to "A".
4.2.8 Movement of Inputting digit.	Press [AS] to move Inputting digit. The cursor is moved to 1st, 2nd, 3rd, 4th digit and returned to 1st place by pressing [AS]. Example) Input 1st Place "A" 2nd Place "B" () Press [1]		"A" blinks on the display.

Item	Operation	LCD	Notes:
4.2.9 Input character turning channel selector.	②Press MS		The cursor is moved to 2nd digit . 2nd digit blinks.
	③Press 1 twice.		"B" is displayed.
	Turn "channel selector" clockwise.		"A" blinks on the display. In case channel selector is turned counter clockwise, "B" blinks. In case channel selector is counterclockwise again, "A" blinks. Namely, in case channel selector is turned clockwise, next character indicates.
			

Item	Operation	LCD	Notes:
	Press [1]		"A" blinks on the display
	Turn "channel selector" clockwise.		"B" blinks on the display.
	Press [2]		"F" blinks at 2nd digit.
4.2.10 Storing character.	Press [ENT]		Pressing [ENT] stores the character in the displayed memory number.

Item	Operation	LCD	Notes:
4.2.11 Cancelling writing data into memory.	Press, [F], [INW], or press [CLR].	ACT 118.000	After pressing [ENT], the data is displayed for about 0.5 seconds. The previously set memory number is displayed.
	• Max 100 memories are available. • The frequency of COMNAV and weather channel No. are available. • At duplex mode, both active and standby frequency can be registered.	ACT 118.000	The previously set frequency is displayed.
4.3 Memory operation.	Press [MEMORY]	ACT 118.025 M 00	"M" blinks and the last set memory number or instant memory number is displayed.

Item	Operation	LCD	Notes:
4.3.1 Selecting a memory channel using the 10 key.	Press [0] to [9] to enter the memory channel number. Example) Retrieving the contents of memory channel no. 12. ①Press [1] ②Press [2]	ACT M 118. 025 11	After you entered the first digit, the memory number indicator starts blinking. After you entered the second digit, the selected memory is completely displayed. If you enter the unmemorized number, ----- is displayed on the LCD.
4.3.2 Changing the selected memory number.	Enter one digit, then press [CLR] or [BS] .	ACT M 118. 975 12	Operating the keys restores the status prior to entering the memory number. The memory number can then be entered once again. The selected memory is displayed.
4.3.3 Selecting a memory channel using [▲] and [▼]	Press [▲] or [▼] or turn channel selector to select a memory channel.	ACT M 118. 025 00 ACT M 118. 225 09	Operating the keys displays the data of the next channel.

Item	Operation	LCD	Notes:
	Press and hold ▲ or ▼	ACT 118.500 M 10	Pressing and holding the keys for more than 1 second scans the channels rapidly (100ms per channel). During fast scanning the contents of the scanned channels are displayed on the LCD. Free memory locations are skipped.
4.3.4 Switching Indicator.	Press IMW	ACT NR T M 10	Frequency / Character on the display is switched.
	Press IMW again.	ACT 118.500 M 10	
4.3.5 Quitting memory operation.	Press CLR or MEMORY to quit.	ACT 119.000	The previously set frequency is displayed.

Item	Operation	LCD	Notes:
4.4 Deleting a memory channel.	Select the memory channel to be deleted. Press and hold [E] for at least 2 seconds, and then, press and hold [CLR] for 1 second.	ACT 118.500 M 10 ACT - - - - M 10	Operating the keys displays the frequency as
4.5 Correct character in memory. 4.5.1 Correcting character.	Set memory number which you would like to correct character. Press and hold [E] for at least 2 seconds, and press [MW] .	ACT NR 1 M 10 ACT NR 1 M 10	The first digit blinks. Key operation is the same as memory operation.

Item	Operation	LCD	Notes:
4.5.2 Clearing to correct character.	Press [CLR]	ACT NR 1 M 10	The previously set character is displayed.
4.6 Setting / Clearing LOCK OUT In Memory Operation.	Press [F] and [8] • The channel which sets LOCK OUT can not be scanned.	ACT 1 18. 500 M 10 LOCKOUT	"LOCK OUT" is displayed. Press [F] and [8] again to clear LOCK OUT.
4.7 Memory duplex. 4.7.1 Confirming standby frequency.	Press memory number which stored duplex.	ACT 1 18. 000 M 20 DUP	
	Press [N/S]	STBY 1 19. 500 M 20 DUP	"STBY" blinks and the standby frequency is displayed on the LCD.

Item	Operation	LCD	Notes:
4.7.1 Clear confirming standby frequency.	Press [CLR] .	ACT 118.000 DUP M 20	The current status is displayed. If no key is pressed within 3 seconds, the previous settings are displayed.
		ACT 118.000 DUP M 20	The previous settings are displayed.

Item	Operation	LCD	Notes:
5. Duplex operation 5.1 Duplex operation on.	Press [F] , then [9] .	ACT 127. 275 DUP	"DUP" is displayed. In duplex operation the standby frequency to the COM band.
	Press and hold the PTT switch.	STBY 118. 275 DUP	Standby frequency is displayed. In case active frequency is NAV band, "DVOR" is turned off. (JHP-520 only)
	Release the PTT switch.	ACT 127. 275 DUP	Active frequency is displayed. In case active frequency is NAV band, "DVOR" is displayed. (JHP-520 only)
5.2 Frequency setting.	Active frequency can be set in duplex operation.		

Item	Operation	LCD	Notes:
5.3 Duplex operation OFF.	Press [F] , then [8] .	ACT 127.275	The "DUP" indicator turns off.
5.4 Confirming standby frequency.	Press [A/S] .	STBY 118.275 DUP	"STBY" blinks and the standby frequency is displayed on the LCD.
		ACT 118.000 DUP	The current status is displayed. If no key is pressed within 3 seconds, the previous settings are displayed.
5.5 Clear confirming standby frequency.	Press [CLR] .	ACT 118.000 DUP	The previous settings are displayed.

Item	Operation	LCD	Notes:
6. Scanning function. 6.1 Starting scanning.	Press [SCAN] or [F] , then [2] or [3] . While scanning, turn channel selector. Turning clockwise is the same as pressing [▲] . Turning counterclockwise is the same as pressing [▼] . Press [CLR] or [PTT] .	ACT 1 18. 000 SCAN ACT 1 18. 000 SCAN ACT 1 18. 000 SCAN ACT 1 18. 000	The scan indicator is displayed and scanning is started. Press [SCAN] to scan COM / NAV / MEMORY / WX. Press [F], then [2] to scan at Dual watch mode. Press [F], then [3] to scan NAV band. When a signal is detected, signal and frequency is displayed. Pressing [▲] changes the scanning direction from low to high. Pressing [▼] changes the scanning direction from high to low. Pressing [CLR] turns off the "SCAN" and stops scanning. The active frequency is the frequency of the channel selected when scanning stops. Press [PTT] to transmit at the frequency when scanning stops if it is COM band.

Item	Operation	LCD	Notes:
6.2 Scanning methods. 6.2.1 Busy scan.		ACT 118.000 SCAN	"SCAN" is displayed. When a signal is detected, scanning stops, but resumes within approx. 3 seconds after a signal is not detected.
6.2.2 Pause scan.		ACT 118.000 SCAN	"SCAN" blinks. When a signal is detected, scanning stops, but resumes after approx. 5 seconds even if the signal continues to be received.
6.2.3 Selecting scanning.	See 2nd function. (Item 3.2.4)		
6.2.4 Starting scanning channel.	In case COM / Memory / WX / NAV		Start scanning from the next channel or frequency. Channel 5 Start -- Channel 6 Channel 7 Channel 8 In case 5th channel set, the scan starts from 8th channel.
	In case Dual watch mode		Standby frequency and active frequency are scanned by turns.

Item	Operation	LCD	Notes:
6.3 Scanning the COM band.	Select the COM band, then start scanning.	ACT 118.275 SCAN	Pressing [F] and [▲] starts scanning upward from the frequency one step higher than the active frequency. The same applies to the downward direction. Scanning is performed between 118.000 MHz and 136.990 MHz.
6.4 Scanning the memory. 6.4.1 All channels.	Select memory operation, then start scanning.	ACT 118.000 SCAN 05	The channels 01 to 99 are scanned. The memory number except LOCKOUT is set, is scanned upward from the memory number. In case the character is not stored, the frequency is displayed.
6.4.2 Channel groups.	Select memory operation, select the group to be scanned (select one channel number from the desired group of ten), then start scanning.	ACT 118.000 SCAN 23	The corresponding memory channels are scanned. The memory number except LOCKOUT is set, is scanned upward from the memory number. In case the character is not stored, the frequency is displayed.
6.5 Scanning the weather channel.	Select weather channel, then start scanning.	WX - 02 SCAN	The channels 01 to 10 are scanned. The memory number except LOCKOUT is set, is scanned upward from the memory number.

Item	Operation	LCD	Notes:
6.6 Dual watch. (DW)		STBY 118.000 SCAN	The standby frequency and the active frequency are scanned by turns. (500ms) While scanning active frequency, "ACT" is displayed. While scanning standby frequency, "STBY" is displayed. - In case set the dualwatch, the memory operation is cancelled. - After the scanning is finished, the active frequency is displayed.
6.7 Scanning the NAV band.	Select the NAV band, then start scanning.	ACT 108.000 DVOR SCAN (Above display for JHP-520)	Pressing [F] and [A] starts scanning upward from the frequency one step higher than the active frequency. The same applies to the downward direction. Scanning is performed between 108.000 MHz and 117.990 MHz.

Item	Operation	LCD	Notes:
7. DVOR Indicator. (JHP-520 only) 7.1 DVOR function. 7.1.1 Bearing display.	Enter the frequency of the VOR station. (NAV band)	ACT 050' 100. 000 DVOR TO ACT ... 100. 000 DVOR TO ACT 230' 100. 000 DVOR FROM	The DVOR indicator and the angle relative to 0° North are displayed. "FROM" is displayed the VOR station bearing in relation to the aircraft is not within ±90° of the target course. "TO" is displayed the VOR station bearing in relation to the aircraft is not within ±90° of the target course. If the distance to the VOR station is too large or if the frequency is not correct, "... " is displayed. (Neither "TO" nor "FROM" is indicated) Switching to "TO" using F and Z Switching to "FROM" using F and V
	Press F and Z or F and V while bearing display.		

Item	Operation	LCD	Notes:
7.2 CDI function. 7.2.1 Course display.	Enter the frequency of the target VOR station (NAV band). Press [F], then [4].	ACT 000.000 DVOR TO ACT 000.000 CDI TO ACT 000.000 CDI	Operating the keys displays the CDI indicator instead of VOR. Operating the keys displays the CDI indicator instead of VOR. The DVOR bearing is displayed. To change the frequency quit CDI mode using [F] and [1]. If the distance to the VOR station is too large or if the set frequency is not correct, "OFF" is displayed. (Neither "To" nor "FROM" is displayed)

Item	Operation	LCD	Notes:
7.2.2 Entering the target course. (1) Numerical entry of three digits.	Press the corresponding keys [0] to [9] to enter the target course. Example) Setting 123° ① Press [1] ② Press [2] then [3]	ACT 100.000 CDX TO 1 ACT 100.000 CDX TO 123° ACT 100.000 CDX TO 105.8°	The entered data is displayed. The target bearing is completely entered. "To" or "FROM" and the course deviation indicator are turned on. If you enter an angle outside the range from 0° to 359° the error tone sounds and the previously set course is displayed.

Item	Operation	LCD	Notes:
	Enter one or two digits, then press [ENT] .	ACT 00B° CDX TO 1 10B. 000	The course is displayed with a "0" at the beginning.
		ACT OFF CDX 10B. 000	In case "OFF" is displayed on the angle bearing, "OFF" is displayed if the desired course or the previously set course is displayed for 0.5 second.
(2) Setting the course using [▲] and [▼] .	Set the course using [▲] or [▼] .	ACT 059° CDX TO 1 10B. 000	Press [▲] to change the angle by 1° (up). Press [▼] to change the angle by 1° (down). "To" or "FROM" and the course deviation indicator are turned on.
	Press and hold [▲] or [▼] for more than 1 second.	ACT 059° CDX TO 1 10B. 000	For last counting press and hold the keys for some seconds; quick change of the angle displays.

Item	Operation	LCD	Notes:
7.2.3 Course Deviation Indicator.	Select CDI mode.	ACT 108.000 CDI TO 1 050° 1 050° 4 050° 44 050° 444 050° 4444 050° 44444 050° 444444 050° 4 050° 44	In CDI mode, the deviation (between target and actual course) is displayed in the bottom part of the LCD. If "OFF" is displayed, no deviation is displayed. Deviation : up to 1.9° to the left or to the right. Deviation : 2.0° to 3.9° to the right. Deviation : 4.0° to 5.9° to the right. Deviation : 6.0° to 7.9° to the right. Deviation : 8.0° to 9.9° to the right. Deviation : 10.0° to 11.9° to the right. Deviation : more than 12° to the right. Deviation : 2.0° to 3.9° to the left. Deviation : 4.0° to 5.9° to the left.

Item	Operation	LCD	Notes:
		050°	Deviation : 6.0° to 7.9° to the left.
		1050°	Deviation : 10.0° to 11.9° to the left.
		1050°	Deviation : 8.0° to 9.9° to the left.
		1050°	Deviation : more than 12° to the left.

Item	Operation	LCD	Notes:
7.2.4 "TO" and "FROM" Indication.	Select CDI mode.	ACT 050° 108.000 CDI TO ▲ ACT 108° 108.000 CDI FROM ▲	"TO" is displayed if the VOR station bearing in relation to the aircraft is within $\pm 90^\circ$ of the target course. "FROM" if the VOR station bearing in relation to the aircraft is not within $\pm 90^\circ$ of the target course. Example) Entered course = 058°

Item	Operation	LCD	Notes:
7.2.5 Automatic Bearing Setting System function.	Select CDI mode. If "To" is displayed, press [F], then [7]. If "FROM" is displayed, press [F], then [v].	ACT 050° 100.000 CDI TO A ACT 050° 100.000 CDI TO I	Operating the keys sets a new target course considering the current course and the deviation. New target course = current course ± deviation.