

AZDEN®

2m FM TRANSCEIVER

PCS-4000

INSTRUCTION MANUAL



JAPAN PIEZO CO., LTD.

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※ This manual was prepared mainly for U.S.A. model.

MAJOR FEATURES

1. C-MOS Microcomputer Control

The built-in microcomputer makes scanning for Busy and Vacant channels possible. Channel operations are all computer-controlled. Once stored in memories, frequencies are retained even when the power is turned off. A long life, rechargeable Ni-Cd battery is used as a memory back-up power supply.

2. Feather touch tuning control key board

All tuning operations are conducted by simply pushing the key(s) which always returns acknowledge tone electronically synthesized when pushed. All keys are illuminated to allow easy access even in the darkness, thus increasing operationability.

3. Two bank, 16 memory channels

Each bank contains 8 memories, so frequencies(channels) up to 16 can be stored, offering advantage for club use. The microcomputer scans each or both banks to find a busy or a vacant channel automatically according to the instructions from the SCAN and M MODE switches. Erasing and rewriting are easily performed.

4. Operating frequency is always displayed

While transmitting, the shifted frequency as determined by the microcomputer is displayed. A microphone having 3 different functions is provided as a standard accessory.

An easy-to-handle palm-control microphone performs the functions of Push-to-Talk, Frequency UP and DOWN and Memory 1A Calling.

5. Green display employed

Frequency display uses 4 digit green LED for optimum visibility under variable ambient light condition and indicates operation frequency. The digital display prevents reading errors.

6. Programmable band scanning

Any two bands arbitrarily selected between the lower and upper limit of the frequency range of this unit can be scanned separately or sequentially by using P SCAN function of the keyboard.

7. One touch priority channel access

Each M1 address on the A & B memory banks allows direct access, so two channels, that may be the channels used most frequently, can be selected by simply touching the M1-A or M1-B key regardless of a current mode of operation or any other operating positions of key and switches.

8. Standard or non-standard frequency shift operations

The microcomputer allows the standard $\pm 600\text{kHz}$ shift operations with the SHIFT key pushed for duplex operation. Furthermore, the computer also allows non standard any frequency shift operations by utilizing its memory functions and "AxB" mode in accordance with the program installed.

9. Memory address indicator

The memory address indicator consisting of a memory bank indicator LED and 8 address indicator LEDs display the channel(s) being used.

10. Selectable 5 or 10kHz channel spacing

Frequency step of 5 or 10kHz(12.5kHz or 25kHz in European Version) is selected with the STEP switch provided on the front panel.

11. 25W/5W switchable power output

Hi/Low power switch selects either 25W or 5W transmit power output, thus minimizing possible interference or saving power consumption.

12. Optional tone call unit available

A space for mounting the optional tone call unit is provided inside the unit for your additional tone call operation. The TONE switch used for this purpose has been already mounted on the front panel of the unit.

CAUTIONS BEFORE USE

Before connecting the unit to a power supply, check that the antenna is securely mounted on your car. Check the external antenna system for short-circuit using an ohmmeter, and then firmly screw the antenna plug into the antenna connector on the rear panel of the unit.

* Check that the antenna cable used is of 50-ohm impedance. We recommend you to use a RG-58/U or RG-8/U or equivalent coaxial cable for the antenna connection.

***Rated voltage of the unit is 13.8V**

Be careful not to connect the unit to an improper power source, as this may cause damage. For mobile use connect the power cable directly to the battery, being careful to observe the proper polarity.

***Check that power supply voltage is 12 to 14V and each lead wire is connected to correct polarity.**

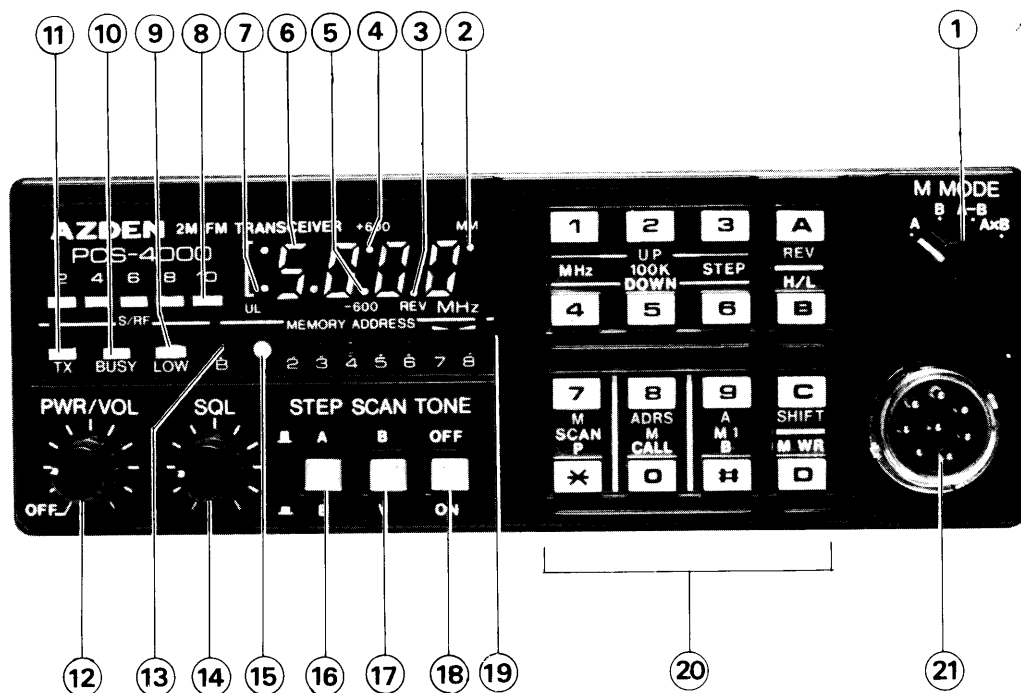
The red lead is for positive + and the black lead for negative —, with maximum rating of $13.8V \pm 15\%$. The unit designed for negative ground circuits only.

***Be sure the unit is properly located**

When using this transceiver as a fixed station, it should not be located in a place directly exposed to sunlight or with excessively high humidity.

When using this unit as a mobile station, avoid locating it where it comes in direct contact with the air flow from the vehicle heater. If a vehicle is parked for a long period under the hot sun, the inside temperature becomes very high. Do not start transmitting until the temperature lowers. Since this unit is to be grounded with the negative terminal, it must not be used in a vehicle that is grounded with the positive terminal without taking proper measures for insulation.

CONTROLS AND SWITCHES AND THEIR FUNCTIONS



(1) Memory Mode Switch (M MODE)

There are two memory banks (A & B) inside the unit and these memories can be used in four ways as shown below:

- With the M MODE switch placed in the "A" position, the "A" memory bank is selected. The "A" memory bank has eight memories and any operating frequencies up to eight will be stored in the memories.
- When the switch is placed in the "B" position, the "B" memory bank is selected with the "B" bank memory LED(13) turned on. The "B" bank has also eight memories and allows 8 operating frequencies to be stored.
- With the switch placed in the "A-B" position, both "A" and "B" memory banks are

selected sequentially, so stations(frequencies) up to 16 can be scanned automatically or selected if they have been stored previously.

- With the switch placed in the "AxB" position, the "A" bank memory is selected during receive mode of operation and the "B" bank memory is selected during transmit mode. Accordingly, if you store a frequency on the "A" bank memory and another frequency(offset frequency you want to operate) on the same address memory of the "B" bank, reception is made with the frequency stored in the "A" bank memory and the transmission is made with the frequency stored in the "B" bank memory. Namely, communication will be made with any non-standard frequency offset if the switch is placed in the "AxB" position.

(2) Memory Mode Indicator (MM)

This serves to indicate that the unit is operating under Memory Mode (with SCAN-M/P, M-ADRS/CALL, M1-A/B button pushed). For further details, see the section entitled "Details of Keyboard"

(3) Reverse Mode Indicator (REV)

This serves to indicate that the unit is operating under Reverse Mode with the REV key pushed. For further details, refer to the section entitled "Details of Keyboard".

(4) + 600kHz Indicator (+ 600)

This serves to indicate that the transmit frequency is 600kHz higher than the receive frequency in transmission. With the indicator turned on, the Frequency Display shows a frequency equal to "receive frequency plus 600kHz" when the Push-to-Talk (PTT) switch is depressed.

(5) - 600kHz Indicator (- 600)

This serves to indicate that the transmit frequency is 600kHz lower than the receive frequency in transmission. With the indicator turned on, the Frequency Display shows a frequency equal to "receive frequency - 600kHz" when the PTT switch is depressed.

(6) Frequency Indicator

This indicator displays the lower four digits of transmit or receive frequency on large LEDs. For example, 5.000 stands for 145.000MHz.

(7) Unlock Indicator (UL)

This indicator lights up when the PLL circuit which synthesizes frequencies is not locked. With the indicator lit up, all transmit and receive operations are disabled to prevent illegal frequency generation or causing possible interference to other parties.

The UL indicator may light up for a short time immediately after the power is turned on, or after a channel change, because the PLL circuit requires a brief time period to be locked. So this intermittent lighting operation is normal. However, there will be some troubles if the Indicator remains to light up for an extended period of time.

(8) Signal Indicator (S/RF)

This indicator displays the input signal strength during reception or a relative power output during transmission, using five LEDs. The indicating level will be affected by the SWR of the antenna system used, therefore, 25W output does not necessarily mean that all five LEDs must be illuminated.

(9) Low Power Indicator (LOW)

This indicator, when turned on, indicates that the low transmit power of 5W is selected. On the other hand, the indicator turned off indicates that the high transmit power of 25W is selected.

(10) Busy Indicator (BUSY)

This indicator lights up when a station is received, thus indicating that the channel is in use.

(11) Transmit Indicator (TX)

This indicator lights up when the PTT switch is depressed, thus indicating that your message is being transmitted.

(12) Power On-Off/Volume Control (PWR/VOL)

When the control knob is placed in the OFF (fully counterclockwise) position, the power is turned off. Rotating the knob clockwise will turn the power on, and further rotation will increase the sound volume from the built-in speaker.

(13) "B" Bank Memory Indicator (B)

This indicator, when turned on, indicates that the memory "B" bank is being selected.

(14) Squelch Control (SQL)

This control is used to eliminate annoying background noise when no signal is present. To adjust the Squelch control properly during reception, first turn the knob counterclockwise until background noise is heard. Then rotate the control slowly clockwise until background noise just disappears. At this point, the receiver will be relatively quiet under no signal condition, but an incoming signal will overcome the squelch action and be heard. Since this control is variable it can be used to

provide varying degrees of sensitivity to incoming signals. As the control is advanced from the extreme counterclockwise position, the squelch action is progressively increased and stronger signals are needed to overcome it. To receive extremely weak signals or to disable the squelch circuit, simply turn the control fully counterclockwise. The squelch control also decides scan stop sensitivity. So stations may be properly skipped by adjusting the squelch control knob during scanning operation.

(15) Memory Address Indicator (1-8)

This unit has two memory banks, each of which has eight memories. The memory address indicator shows which address of the memory (channel or station frequency) is being used in the memory mode of operation. For selection of the memory banks, refer to "Memory Mode Switch".

For example, when the memory address "1" on the memory "A" bank is called up by M1-A key, the address indicator "1" lights up in addition to the memory address last used. While transmitting, for example, through a channel stored in the memory address "1", only the memory address indicator "1" is lit up. For further details, refer to "Details of Keyboard".

(16) Scan Step Switch (STEP)

This switch sets the frequency spacing by which frequency is scanned up or down. With the switch placed in the released out (A) position, the scan step is set to 5kHz (12.5kHz for European version) and with the depressed (B) position 10kHz (25kHz for European).

(17) Scan Mode Switch (B,V)

With the switch placed in the released out (B) position, scanning is carried out over the channels determined by the keyboard switches (SCAN M, P) and the M MODE switch. When an input signal higher than the squelch level determined by the SQL control is received, the scanning stops automatically at the channel for approx. 5 sec, and then resumes scanning automatically. To receive the channel for more than 5 sec, push one of **1**, **2**, **3**, **4**, **5** and **6** keys.

When the switch is placed in depressed (V) position, the scanning is carried out but it skips over busy channels and automatically stops at the first vacant channel encountered. Once a signal enters the vacant channel, the scanning is resumed until the next vacant channel is encountered.

(18) Tone Switch (TONE)

This switch is used to actuates an optional tone encoder if it is mounted inside the unit. Usually place the switch in the OFF position.

(19) Programmable Scan Mode Mark

This indicates programmable scan is carried out between the frequencies stored in M7 and M8 on either memory A and B banks.

(20) Keyboard Switches

The keyboard switches are used to select various operation modes programmed inside the microcomputer.

All the keys are illuminated for easy location in darkness. Refer to "Details of Keyboard".

(21) Control Microphone Connector

This is used to connect the control microphone supplied with the unit. When connecting the microphone plug, do not attempt to force the plug onto the pins, it will slip on easily when the connector is properly aligned up. For detail of the microphone, refer to page15.



Microcomputer controlled, 2m FM
transceiver, PCS-4000 (Front View)

DETAILS OF KEYBOARD

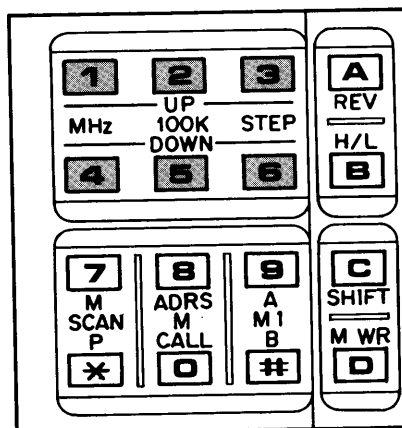
The keyboard is designed to keep proper brightness in the light during the daytime and sufficient brightness in the inside of a car at night. Temperature in the unit will rise slightly due to the illuminating lamp and the power amplifier, but this is normal.

★Acknowledge tone

This transceiver produces an electronic acknowledge tone when a key is pushed to inform the operator of data entry in the micro-computer inside the unit.

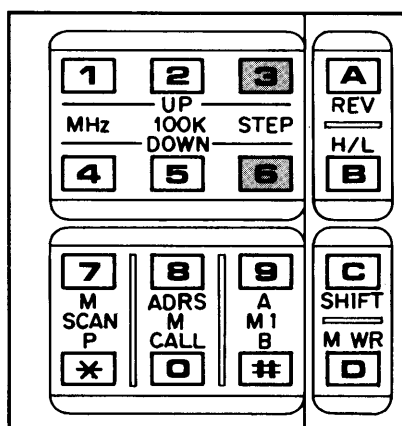
★Changing Channel Frequency. . . Tuning Operation (UP & DOWN)

1. When the STEP (UP) key [3] is pushed once, the operating frequency is moved up by 5kHz if the STEP switch (16) is set to "A" position, or by 10kHz if the STEP switch is set to "B" position.
2. When the STEP (DOWN) key [6] is pushed once, the frequency is moved down by 5kHz if the STEP switch (16) is set to "A" position, or by 10kHz if the switch is set to "B" position.
3. For European version model, the 5kHz step is modified to 12.5kHz, and the 10kHz step is modified to 25kHz.
4. For example, if the STEP (UP) key is pushed 3 times with the STEP switch placed in "B" position, the frequency will be changed by 30kHz upward, or if the STEP (DOWN) key is pushed 15 times, the frequency will be changed by 150kHz downward. However, the STEP key does not affect the MHz digit.
5. When pushing 100kHz STEP (UP) [2] or (DOWN) [5] key once, the operating frequency is moved up or down by 100kHz step, but these switch do not affect the MHz digit. For example, pushing the 100kHz UP [2] key 3 times while the unit is operating at 145.800MHz will change the frequency to 146.100 (6.100 is displayed) MHz.
6. When pushing the MHz (UP) [1] key or MHz (DOWN) [4] key each time, the leftmost digit on the frequency indicator moves by 1MHz step up- or downward, respectively, thus changing the channel from low band to high band or vice versa within the specified assigned band (Refer to the specifications). However, the 100kHz or lower digits are not changed with these keys.

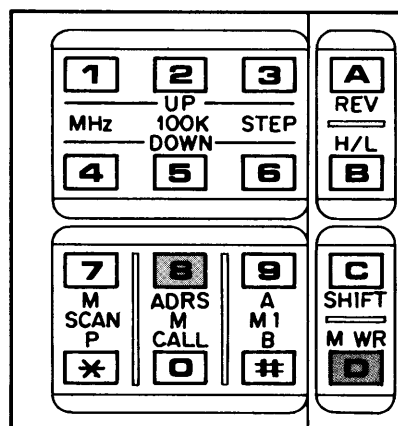


★Rapid Channel Change... (UP, DOWN)

By holding down the STEP (UP) [3] or the STEP (DOWN) [6] key for more than a half-second, the frequency is automatically changed up or down at a rate of eight steps per second. As the desired frequency is approached, release the key. Then repeatedly push the UP or DOWN key until the desired frequency is obtained.



For example: Store 145.560MHz in the memory M3 on the B bank. First, obtain 5.560 display on the frequency indicator by using the UP or DOWN keys. Next, place the M MODE switch in the "B" position ("B" LED lights up) and push the memory address key MADRS [8] several times until the M3 indicator lights up. Finally push the memory write M WR [D] key. As the result, 145.560MHz is stored in the M3 memory on the B bank with the indication of 5.560 on the frequency indicator.



★How to Write in Memory

This unit is provided with two memory banks, A and B, each of which has eight memories M1 to M8. So any operating frequencies up to 16 can be stored for convenient programmed memory operations.

To store frequencies in the memories, proceed as follows:

1. Decide a frequency to be stored, and then obtain the frequency on the frequency indicator by using UP or DOWN keys, refer to "Channel Changing (UP-DOWN)".
2. Determine one of memory banks A or B by placing the M MODE switch in the "A" or "B" position.
3. Push the memory address key ADRS [8] on the keyboard until a desired memory address indicator is turned on.
4. Push the memory write key M WR [D] on the keyboard, then the frequency will be stored on the specified memory.

★Memory Scanning... M SCAN

Pushing this key will start scanning of the memory addresses with the scanning mode determined by the SCAN (B-V), M MODE, etc. switches. The scanning starts directly after the address which is displayed on the memory address indicator.

For example: Assume 144.100, 144.200, 144.300, 144.400, 144.500, 144.600, 144.700 and 144.800MHz are stored in the memories M1, M2, M3, M4, M5, M6, M7, and M8 on the memory bank A, respectively; and 145.100, 145.200, 145.300, 145.400, 145.500, 145.600, 145.700 and 145.800MHz are stored in the memories M1, M2, M3, M4, M5, M6, M7 and M8 on the memory bank B, respectively.

1. When M2 on the A bank is lit and the M MODE switch is placed in the "A" position, the scanning is carried out from 144.300 MHz, 144.400MHz...144.800MHz, 144.100 MHz..., in this sequence.

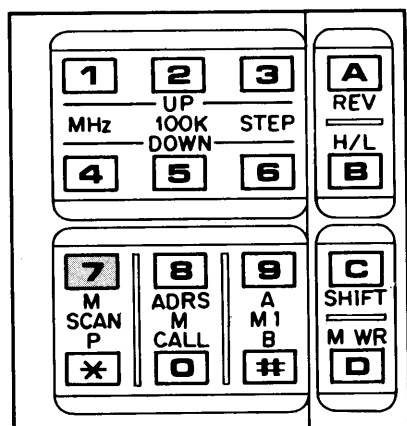
2. when the M MODE switch is placed in "B" position and M5 (of B bank) is lit, the scanning is carried out from 145.600MHz, 145.700MHz...145.800MHz, 145.100MHz... in this sequence.
3. When the M MODE switch is placed in "A-B" position and M2 is lit with B bank indicator not lit, the scanning is carried out from 144.300MHz... 144.800MHz, 145.100 MHz...(B bank LED is lit up)... 145.800MHz, 144.100MHz(B bank LED is turned off)...in this sequence.
4. When the M MODE switch is placed in "AxB" position, the scanning is carried out over the frequencies stored only in the A bank memories.

During all above scanning mode of operations, if the SCAN mode switch is placed in the "B"(Busy) position, the scanning stops automatically for approx. 5 sec when the unit receives a station. Whereas, if the SCAN mode switch is placed in the "V" (Vacant) position, the scanning stops automatically at the first vacant channel encountered.

To stop the scanning manually, push one of [1], [2], [3], [4], [5], and [6] keys. Actuating the key again will perform the function indicated near the keyboard.

When you push another function key such as M1-A or M1-B (used to call the content of M1 on A or B bank) while scanning, the scanning stops immediately and the frequency indicator displays the content of M1-A or M1-B. Thus, you are ready to communicate immediately using the channel.

The scan stop threshold level is determined by the squelch control knob, so adjust the knob properly.



★Programmable Band Scanning. . . P SCAN

By pushing the P SCAN key [✱], a specified frequency band between two frequencies stored in the memory M7 and M8 can be scanned repeatedly.

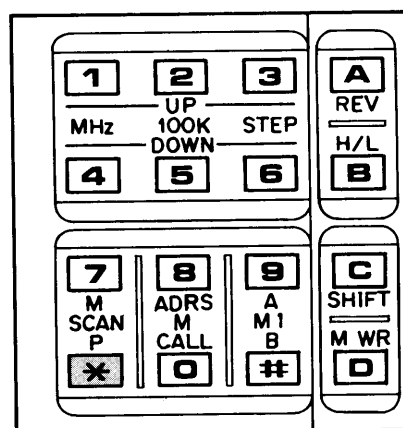
For example: if two frequencies "U" and "V" ($U < V$) are stored in the memories M7 and M8 on A bank memories, respectively; and other frequencies of "X" and "Y" are stored in the M7 and M8 memories on B bank, respectively, the frequency band between U and V are scanned with the M MODE switch placed in "A" position, and the band between "X" and "Y" is scanned with the M MODE switch placed in "B" position.

With the M MODE switch placed in "A-B" or "AxB" position, both bands between "U & V" and "X" & "Y", or the band between "U" & "V" are scanned, respectively.

The scan stop mode depends upon the position of the SCAN (B = Busy, V = Vacant) switch set, and the scan stop sensitivity is determined with the SQL control knob.

To stop the scanning push one of [1], [2], [3], [4], [5], and [6] keys.

To manually change the frequency, push UP or DOWN key as usual after the scanning is stopped.

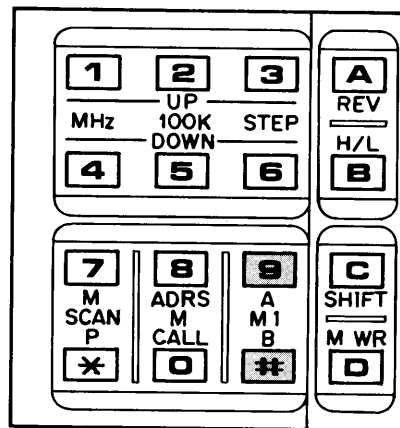


★ Calling Frequency Stored. . .

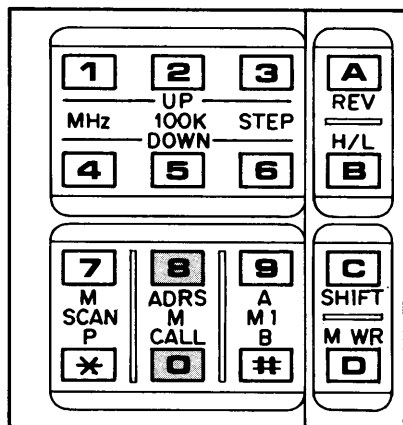
M ADRS & M CALL

When calling a frequency stored one of 16 memories, first, place the M MODE switch in "A" or "B" position depending on the memory bank to be selected. Push the M ADRS [8] key repeatedly until a specified memory address indicator lights up. Then push M CALL [0] key and the frequency stored in the memory is called up and displayed on the frequency indicator.

Returning from the memory mode to the manual mode, push one of [1], [2], [4], [5], [6], key once.



Note: During M CALL key is actuated (or MM indicator is turned on), the key [3] performs the same function as that of M ADRS key.



★ Calling Priority Channel Stored in M1. . . M1-A & M1-B

Two priority channels (frequencies) are provided in the M1 memory on both A and B memory banks for quick access to the channels used frequently.

To call the priority channel frequency stored in the M1 memory on "A" bank, simply push the M1 A [9] key, then the channel frequency stored is directly called up and displayed on the frequency indicator regardless of any current operation mode.

In the similar way, to call another priority channel stored in the M1 on "B" bank, push M1 B [8] key.

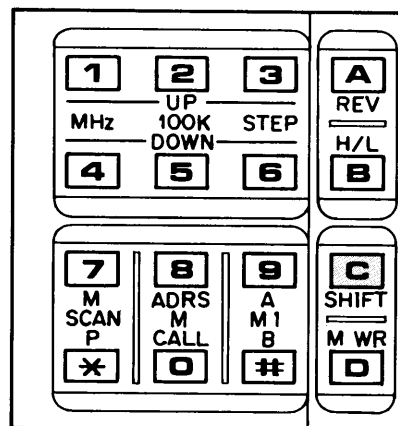
To return to the manual mode, push one of [1], [2], [4], [5], and [6], keys once.

★ ± 600 kHz Shift. . . SHIFT

This key is used to offset the transmit frequency by ± 600 kHz from the receive frequency. When the SHIFT key [C] is pushed once + 600 kHz indicator (4) is turned on and the transmit frequency is shifted by + 600 kHz when the PTT switch depressed.

Pushing the key [C] again makes - 600 kHz indicator (5) turn on and shifts the transmit frequency by - 600 kHz, when the PTT switch is depressed.

To disable the shift operation for normal simplex operation, push the key [C] one or twice until the + 600 kHz or - 600 kHz indicator is turned off.



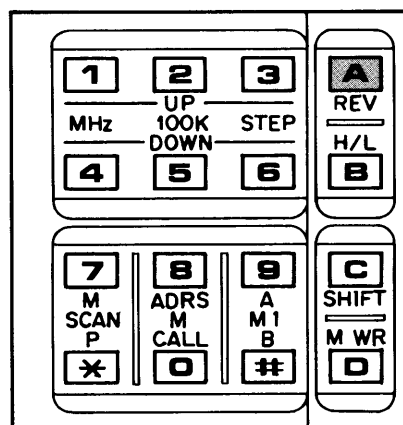
★Reverse Mode Operation...REV

This key allows transmit and receive frequencies to be reversed.

For example, assume that a receive frequency of 145.200MHz is set on the frequency indicator and + 600kHz offset is also set for the transmit operation. This means that the reception is carried out at 145.200MHz and the transmission is carried out at 145.800MHz.

With the REV **A** key pushed, each receive and transmit frequency is reversed, namely, reception is made at 145.800MHz and transmission is made at 145.200MHz.

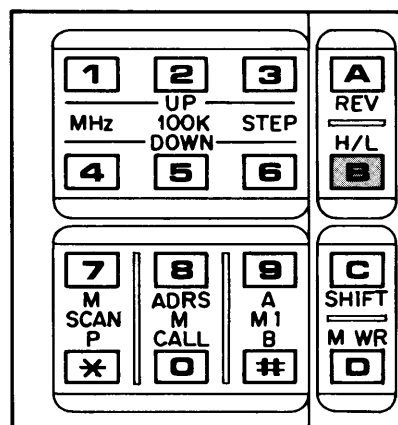
To disable the reverse operation, push the REV **A** key again, the REV indicator LED is turned off and indicates that the reverse mode is disabled.



★Transmit Power Switching... H/L

This key selects transmit power output of either 25W or 5W. When the power of the unit is turned on, the LOW power indicator LED (9) is turned on and the low power output of 5W is automatically selected. To select the high power output, push the H/L **B** key once, then the LOW power LED will be turned off, thus indicating the high power is selected.

To select the low power again, push the H/L key again.



★Band Scan Offset

Band scanning can be carried out even in repeater offset mode by storing + or - 600kHz in memory address M7 and M8 on either bank A or B.

Example:

Store 146.100 and + 600kHz in M7
Store 146.200 and - 600kHz in M8
Scanning Step = 5kHz

When scanning begins at the frequency stored in M7, frequency indicator displays 6.100 and also + 600kHz indicator (4) will light up. Then, it keeps on displaying 6.105, 6.110, 6.115... up to 6.200 while - 600kHz indicator (5) remains lit up, then back to 6.100 with + 600kHz indicator lit up, resuming the same scanning as above.

In memory address 7 (M7), 6.100 of simplex mode can be stored and + or - 600kHz along with upper limit frequency can be stored in M8.

In short, channels (frequencies) just after that stored in M7 always carry offset memory information stored in M8.

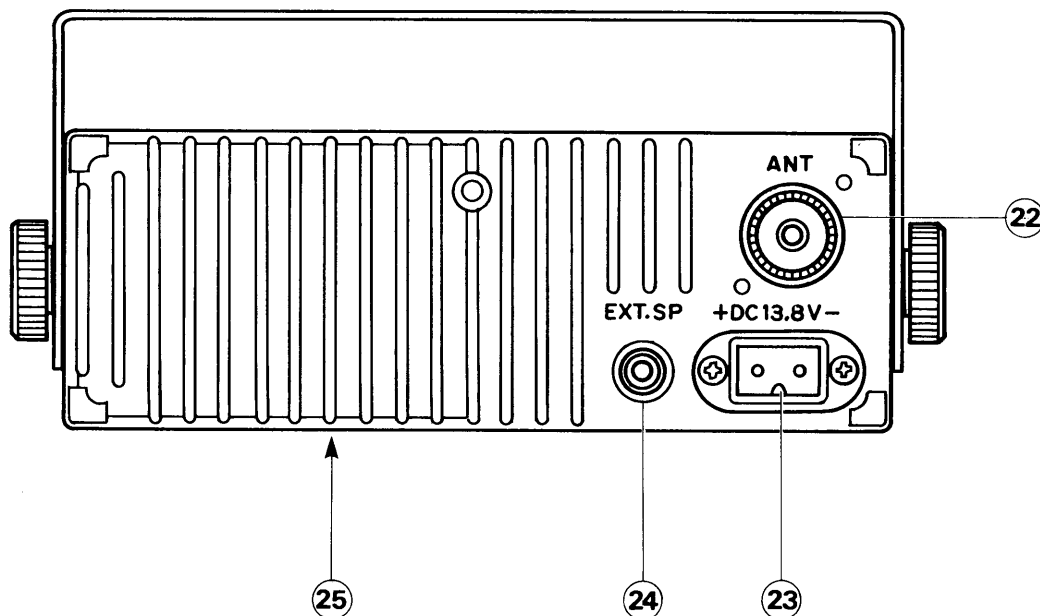
Auto Patch Operation

During transmit, the keyboard functions as a 16 key auto-patch when the mic push-to-talk lever is depressed, each key causes the transmission of a standard pair of tones. The letters **A**, **B**, **C** and **D** designate 4 tone pairs not in the older 12 key systems.

The 16 tone pairs have deviation of plus or minus 3kHz (factory set) but is internally adjustable. The tones are not audible from the speaker as they are sent. To use the auto-patch, first press the push-to-talk lever. Then using the keypad, dial the desired sequence of digits to access the repeater auto-patch system, when dial tone appears, dial the desired telephone number.

(For additional information, contact your local repeater club.)

REAR PANEL CONNECTORS



(22) Antenna Connector

The antenna connector is a SO239 type designed to mate with a PL259 type connector. The impedance of the antenna and the cable used should be 50 ohms. Some degree of mismatching is tolerable, but a severe mismatching will reduce the power output of the unit. The cable length should be kept as short as possible to minimize power dissipation.

(23) Power Connector

The unit is designed to be powered from $13.8V \pm 15\%$ DC, 5A or more power supply. The red lead of the power cord is positive and the black is negative ground. When connecting the power cord to the power supply, be careful not to reverse the polarity.

Should the polarity be connected incorrectly, the 10A fuse connected in the positive power lead will blow to protect the unit. Never use a fuse other than the specified one.

(24) External Speaker Jack

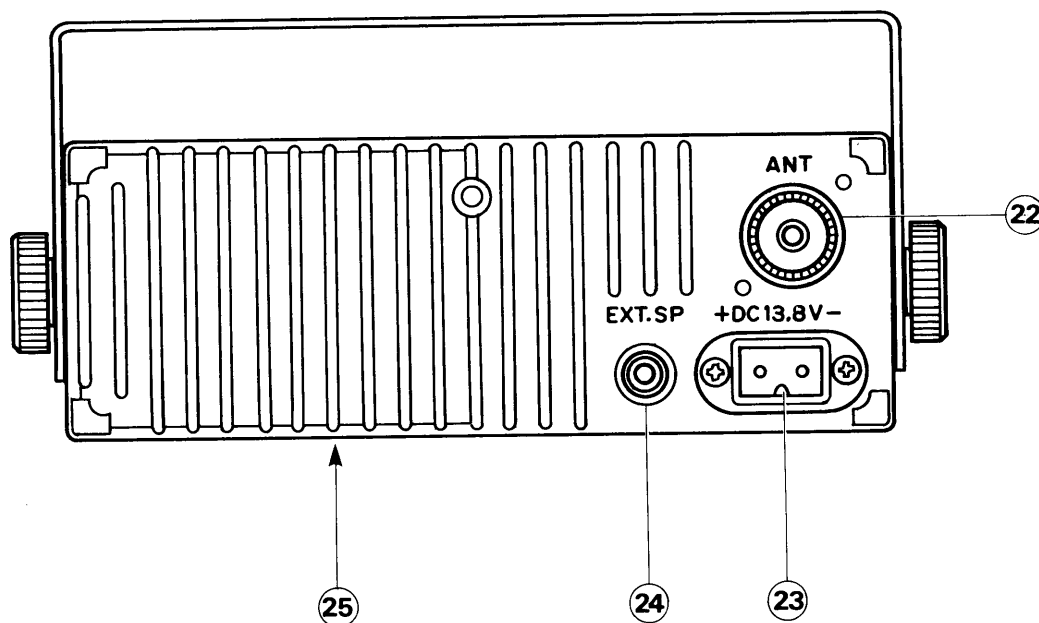
This jack accepts a 3.5mm dia. mini-plug for connecting an external speaker to this unit. Connecting the plug to the jack automatically disconnects the built-in speaker.

(25) Built-in Speaker (Bottom of Unit)

Since the sound holes face downward, the unit should be located so as not to block these holes.

The speaker is of 8 ohm impedance type.

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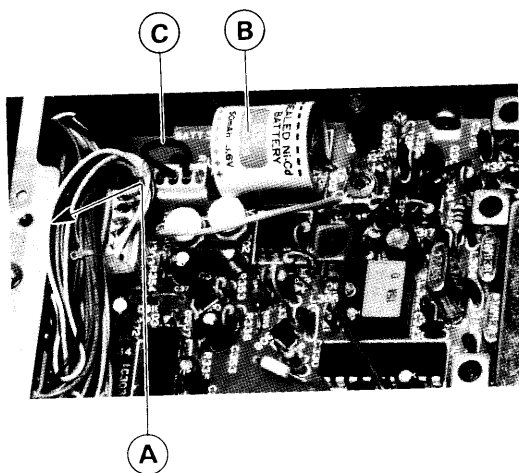
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(25) Built-in Speaker (Bottom of Unit)

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The speaker is of 8 ohm impedance type.

★HOW TO BACK UP MICROCOMPUTER MEMORY AND HOW TO CHARGE BATTERY



A C-MOS microcomputer (A) is employed in this unit. To take advantage of the power-saving characteristics of C-MOS, this unit is provided with a nickel-cadmium battery(B). It serves to back up the memory by the user. The nickel-cadmium battery has been fully charged before it leaves our factory, so that no recharging is required for six months. However, after this unit has been stocked or displayed in the shop for a long period of time, the battery must be recharged. After once charged, it is automatically charged each time the unit is operated. The battery is serviceable for more than three years in usual operating conditions.

★Method of initial charge (Generally, the battery will not require initial charge):

Remove the bottom cover of the unit and carefully detach the 4P connector equipped with loop lead (C).

Insert the 4P connector (supplied) equipped with red and black leads (1m) in place of the detached connector, and connect the red lead with the plus terminal of 13.8V power supply or a battery(12V) and black lead with the minus terminal, thereby starting to charge the battery.

Desirable charging time is 12 to 15 hours. However, the battery can be used for backing up the microcomputer memory by quick charge(5 to 6 hours).

After charging the battery, remove the charging connector in reverse order from above. Turn on the power switch and insert the 4P connector with loop lead while checking that "5.000" is displayed.

If charged with the polarity reversed, the nickel-cadmium battery will be damaged. While the unit is operated, the battery is automatically supplied with a current (1/15 of usual charging current) for recharging.

Note: Be sure to turn OFF the power switch of the UNIT in case of charging.

★How to back up memory and how to prevent malfunction:

The content of memory stored by the user is backed up by the nickel-cadmium battery. However, if the unit is supplied incorrectly by mistake, the microcomputer or memory may sometimes malfunction.

If the microcomputer or memory malfunctions due to the abovementioned cause, take the following steps:

- (1) Turn off the power supply.
- (2) Remove the bottom cover of the control unit.
- (3) Remove the 4P connector(C) with loop lead.
- (4) Turn on the power supply.
- (5) Check that the content of every memory is 5.000, with a display of "5.000".

After checking this state, insert the 4P connector with loop lead, with the power applied (where "5.000" is displayed).

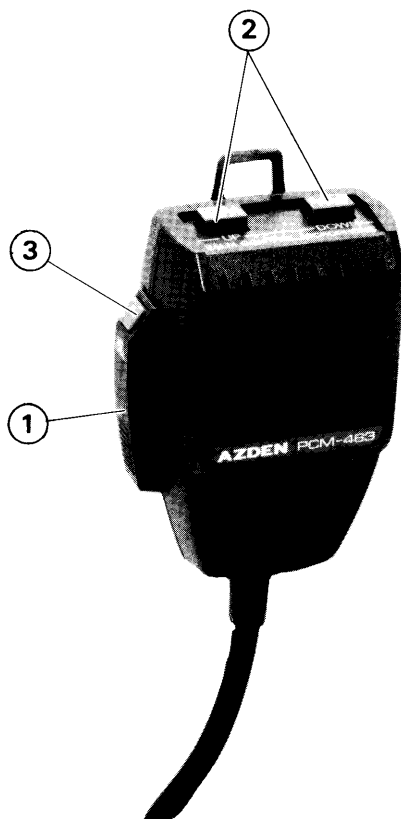
Then, store your desired frequency in the memory.

IMPORTANT

If the memory back-up battery voltage lowers, the memory or display operation may fail to function properly. So if this is observed, immediately charge the battery.

MICROPHONE PCM-463

A multi-functional microphone is provided as a standard accessory. However your own microphone can be used with the transceiver through an optional microphone connector.



(1) Push-to-Talk Switch Lever

To transmit, depress the Push-to-Talk (PTT) switch and speak slowly and clearly in your normal tone of voice with the microphone about two inches from your mouth.

Depressing the PTT switch turns the TX indicator LED on the front panel, indicating that the transmitter is in operation.

(2) UP/DOWN Buttons

These UP and DOWN buttons function in the same way as those of STEP (UP) [3] and STEP (DOWN) [6] keys on the keyboard of the unit's front panel.

Depressing the UP or DOWN button each time, the frequency indicated on the frequency indicator is changed by the frequency step determined by the STEP switch on the front panel.

Holding either one of buttons for more than a half-second allows rapid frequency change.

(3) M1-A CALL Button

This M1 A CALL button has also the same function as that of M1 A priority key on the front panel key board.

By depressing the button, the priority channel stored in M1 memory on the bank A is directly called up regardless of current operation mode of the unit. Thus quick access to the channel which may be used frequently can be attained.

OPERATIONS

Reception

Before turning the power on, place the controls and switches as follows, and check that the antenna is correctly connected.

- P WR/VOL: Turned fully counterclockwise
- SQL: Turned fully counterclockwise
- STEP A-B: Any position
- SCAN B-V: B(Busy) position

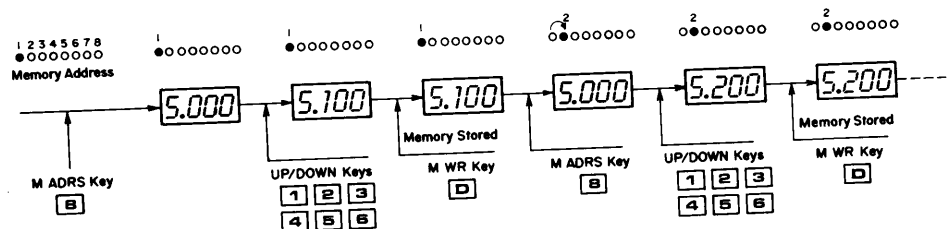
Make sure the microphone plug is connected firmly to the microphone jack on the front panel.

★How to Program the Memory

Suppose you want to write following frequencies in the memory bank "A":
 M1, 145.100MHz; M2, 145.200MHz; M3, 145.300MHz; M4, 145.400MHz; M5, 145.500MHz;
 M6, 145.600MHz; M7, 145.700MHz; M8, 145.800MHz.

- (1) Assume that 145.500 is stored in all memories. Turn the power on.
- (2) Place the M MODE switch in "A" position.
- (3) Push Memory address key M ADRS repeatedly until memory address indicator LED "1" is turned on.
- (4) Push UP or DOWN key properly until frequency display of 5.100 is obtained on the frequency indicator.
- (5) Push memory write (M WR) key, and 145.100MHz will be stored in the M1 address memory.
- (6) Push memory address (M ADRS) key to advance the memory address to M2.
- (7) Push UP key until 5.200 is displayed on the frequency indicator.
- (8) Push M WR key, and 145.200MHz will be stored in the M2 memory.
- (9) Repeat procedures in the same way to store the remaining frequencies in the remaining memories M3 via M8.

Note: When storing frequencies in the "B" bank memories, place the M MODE switch in the "B" position. Then repeat steps as shown above.



★How to Use Priority Channels

Two channels can be designated for your own private priority channels, which may be channels used most frequently. First, decide the channel frequency(s) and then store the channel(s) in M1 memory(s) on either or both memory bank(s) A and B.

Example: Assume one of your priority channel is 145.330MHz, and another is 145.500MHz.

- (1) First, store the 145.330MHz in the M1 address on the memory bank A with M MODE switch placed in the "A" position, as shown in preceding section.
- (2) Next, store the 145.500MHz in the M1 address on the memory bank B with M MODE switch placed in the "B" position.
- (a) To call up 145.330MHz, simply push M1-A key on the keyboard. The frequency 145.330MHz will be displayed regardless of any current mode of operation and you can communicate with your party through this channel.
- (b) To call up 145.500MHz, simply push M1-B key, then frequency 145.500MHz will be displayed on the frequency indicator in the same way as above.

★How to Scan Channels Memoried

Assume that memories M1-M8 on the "A" bank has been stored with frequencies 144.100 through 144.800MHz as mentioned under "Memory Scanning... M SCAN" in this manual.

Example:

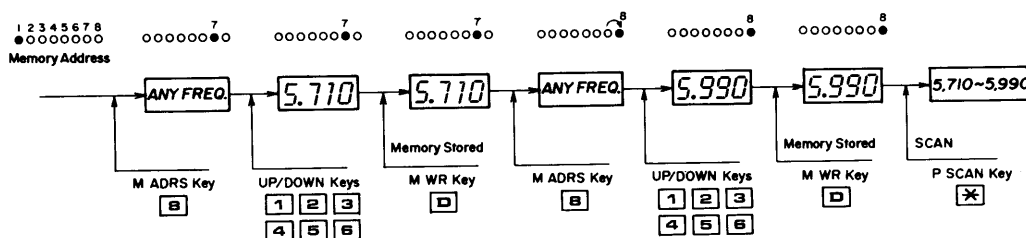
- (A) To scan all M1 through M8 memories on the "A" bank with SCAN STOP mode of "Busy".
 - (1) Place the M MODE switch in "A" position.
 - (2) Place the SCAN switch in the released "B" position.
 - (3) Push M SCAN  key. (Scanning will be started.)
- (B) To scan all M1 through M8 memories on the "B" bank, simply place M MODE switch in the "B" position.
- (C) To scan all M1 through M8 memories on both "A" and "B" memory banks, place M MODE switch in "A-B" position.
- (D) When you want to scan for a vacant channel, place the SCAN switch in the depressed "V" position. (For further details, refer to "Memory scanning- M SCAN".)

★How to Scan a Specified Band

Example: Assume you want to scan channels from 145.710MHz to 145.990MHz using the memory bank A.

- (1) Place M MODE switch in "A" position.
- (2) Push AD RS **[8]** key repeatedly until memory address indicator M7 is turned on.
- (3) Push UP or DOWN key properly to obtain frequency display of 5.710 on the frequency indicator.
- (4) Push M WR **[D]** key.
- (5) Push AD RS **[8]** key once to turn M8 indicator on.
- (6) Push UP key(s) properly until frequency display of 5.990 is obtained.
- (7) Push M WR **[D]** key.
- (8) Push P SCAN **[*]** key. (scanning will be started.)

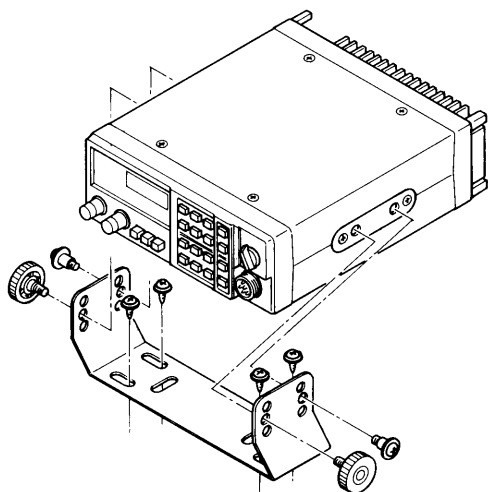
Note: 1. Place SCAN stop mode switch in "B" position when you want to find busy channels, or in "V" position to find vacant channels.
 2. The scan stop level is adjusted with SQL knob.
 3. For another mode of P SCAN, refer to "Programmable Band Scanning... P SCAN".
 4. When storing frequencies in M7 and M8, always store lower frequency in M7 memory.



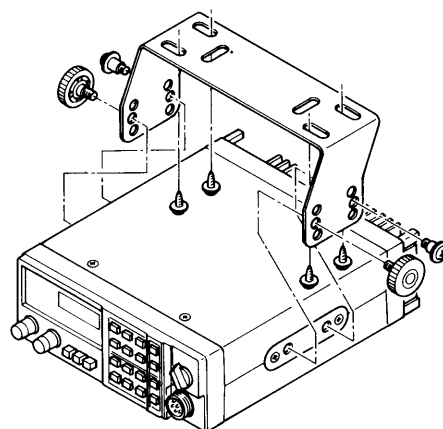
HOW TO INSTALL THE UNIT

1. Choose a convenient location that is protected from moisture and heat, and be sure that the unit will not interfere with your driving. Decide in advance the best way to route the antenna cable.
2. The mounting bracket may be used in two ways as shown below.
Use the bracket as a template to mark where the mounting holes will be drilled.
3. Secure the bracket with self-tapping screws and washers.
4. Mount the unit with two washer-screws and two thumb screws. (Adjust tilt angle by properly selecting mounting holes as required.)
5. Connect antenna plug to antenna jack on rear of the unit.
6. Connect DC power plug to the DC 13.8V jack located on rear of the unit. This transceiver is designed for 12V DC use with negative ground electrical system only.

WARNING: Do not operate the unit before connecting antenna. Also make sure the unit is in the OFF position when making power and antenna connections.

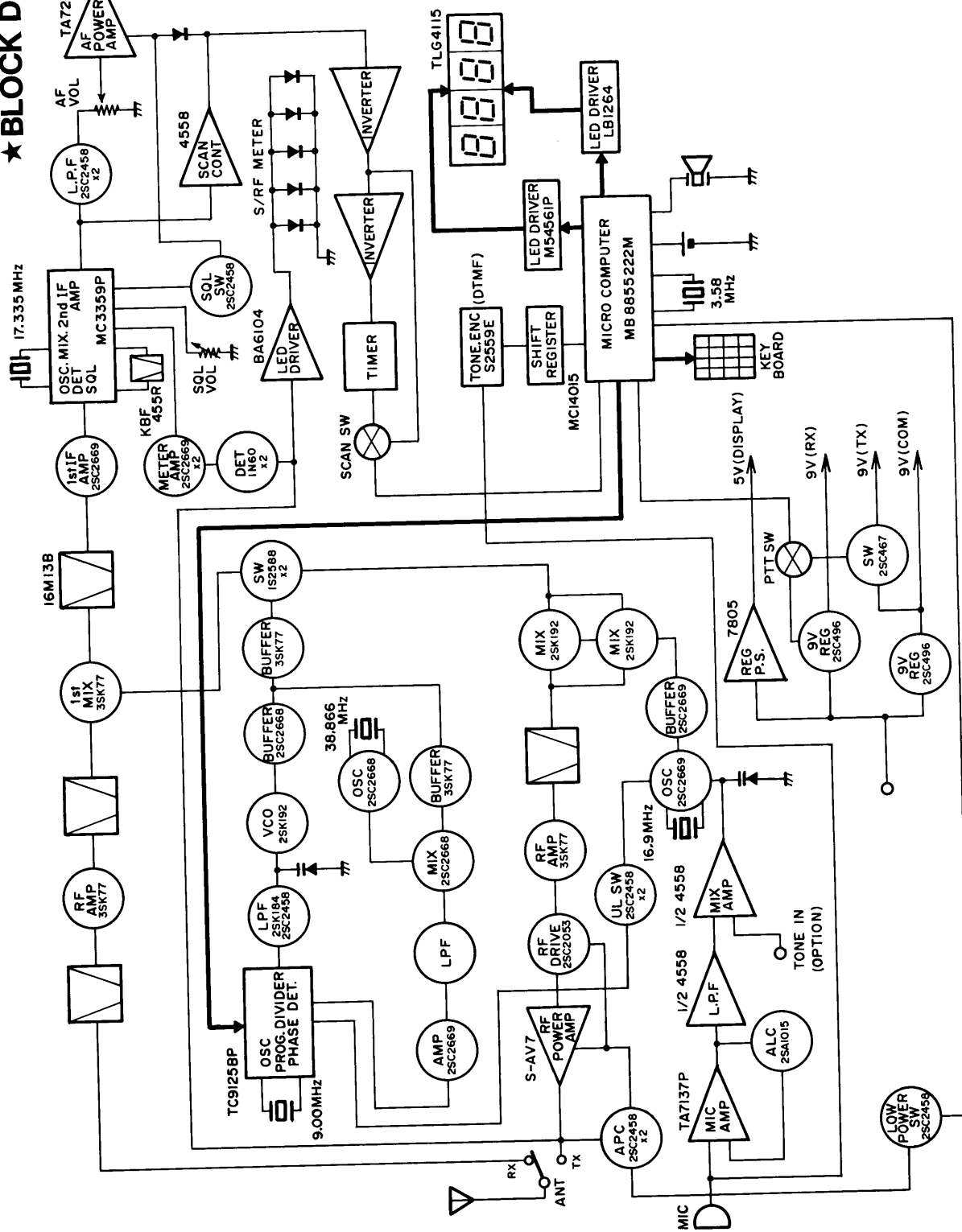


FLOOR MOUNT



UNDER DASH MOUNT

★ BLOCK DIAGRAM



★ SPECIFICATIONS

(General specifications)

- Semiconductors IC 15 pcs.(including μ -COM 1)
FET 9 pcs.
Tr 34 pcs.
Di 70 pcs.
- Frequency band 142.000 to 149.995 MHz (U.S.A)
144.000 to 145.9875 MHz (Europe)
- Operating ambient temperature range -10°C to $+50^{\circ}\text{C}$
- Power supply voltage 13.8V $\pm 15\%$
- Grounding polarity Minus
- Current consumption 0.6 A max. for reception
6.0 A max. for transmission
- (Transmitter)
 - Transmitting output 25W(HIGH)(144 ~ 148MHz)
5W(LOW)
 - Modulation method Variable reactance frequency modulation
 - Maximum frequency deviation $\pm 5\text{KHz}$
 - Spurious Better than -60dB with respect to fundamental
 - Antenna impedance 50 Ω
 - Type of emission F3

- Microphone used 500 Ω dynamic type
- Tone Option(U.S.A) Europe : 1750Hz, $\pm 5\text{KHz}$ deviation

(Receiver)

- Receiving system Double superheterodyne system
- Intermediate frequency First : 16.90MHz
Second : 455KHz
- Receiving sensitivity 0.2 μV (144 ~ 148MHz)
(12dB SINAD)
RF input : 1 μV or less for 30dB S/N
- Selectivity $\pm 6\text{KHz}$ or more at 6dB down
 $\pm 15\text{KHz}$ or less at 60dB down
- Audio output 2W or more (8 Ω load and 10% distortion)

(Dimensions and Weight)

- Dimensions 50(H) $\times$ 140(W) $\times$ 172(D)mm
(except projections)
- Weight Approx. 1.3kg

*Notice : Specifications are subject to change without notice for further technical improvement.

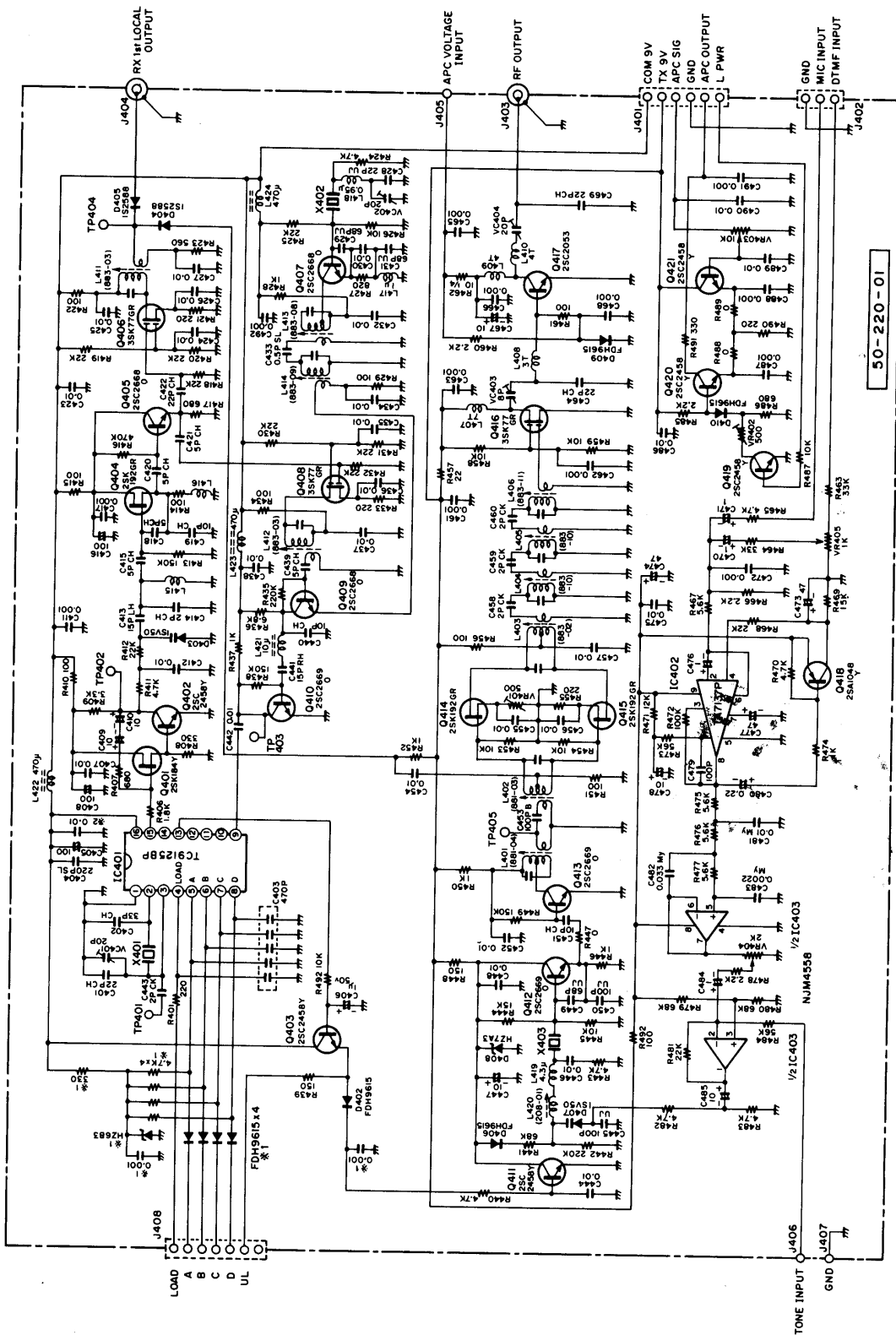
LIST OF ACCESSORIES

- (1) Microphone PCM-4631
- (2) Microphone hanger1
 - Hanger mounting screw2
- (3) DC power cord (with fuse, 10A) 1.5m1
 - Spare fuse, 10A2
- (4) Mounting Bracket1
 - Washer-screw2
 - Thumb screw2
 - Mounting tapping screw4
 - Washer4
- (5) 4-P connector for back up Batt. charge1

PA

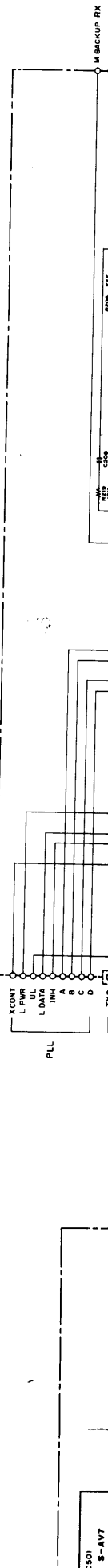


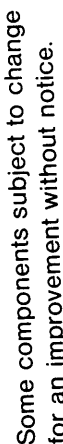
PLL/TX



50-220-01

CONT





	R0	R1	R2	R3
K3	MHz UP	100KHz UP	KHz UP	REV
K2	MHz DN	100KHz DN	KHz DN	H/L
K1	M SCAN	M ADRS	M12 CALL	SHIFT
K0	P SCAN	M CALL	M18 CALL	WRITE

	K1	K2	K3	STEP
	0	0	0	5K
	S	0	0	10K
	0	S	0	12.5K (EU ONLY)
R5	S	S	0	15K
	0	0	S	20K
	S	0	S	25K
	0	S	S	40K
	S	S	S	50K

PROCESSING MOBILE TRANSCIVER

PCS-4000

SCHEMATIC DIAGRAM ⁰¹

①