

NTS 220

Operating Manual

N I S H I M U S E N K E N K Y U S Y O C O . , L T D

1 INTRODUCTION

The NTS220 is a QRP 144MHz SSB/CW Transceiver. Its small size and light weight are ideal for portable use. The NTS220 has been carefully engineered and manufactured to be reliable and efficient. If you experience any problems or questions, please contact us so assistance can be provided.

2 SUPPLIED ACCESSORIES

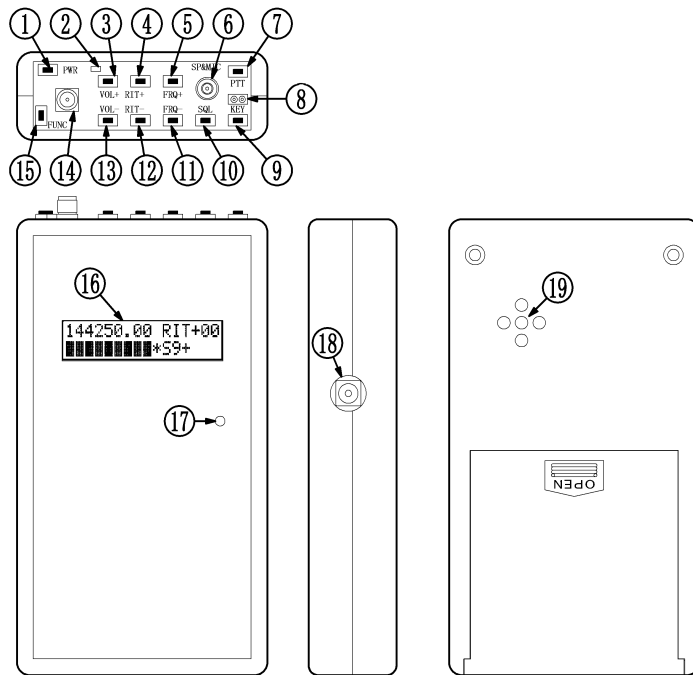
External power connection cable
Connection cable for CW KEY
Connection cable for Handy Microphone Speaker(HM-75 type connection available)
AA batteries (4 pieces)
Warranty

3 SPECIFICATIONS

Frequency Range:	144000.00~144999.95KHz
Emission Modes:	SSB(USB)、CW(Side tone & Semi-break-in)
RF Power Output:	1W(Max)
Oscillation method:	PLL(0.05KHz/Step + FUNC key 2.5KHz/Step. Frequency stability±2.5ppm. Receiver Incremental Tuning.)
Sensitivity:	Under 0.15 μ V(SINAD12dB)
Receiving method:	Single superheterodyne
Supply Voltage:	6VDC(4 internal AA alkaline batteries)
Power consumption:	RX 80mA(standby - no signal) TX 250~700mA Max.
Aerial Impedance:	50 ohms(SMA)
Operating Temp. Range:	-10 °C to +60 °C (+14 °F to +122 °F)
Dimensions:	78W x 27H x 140D mm
Weight:	300g(incl. batteries)
Display Backlight:	Display has illuminated backlighting active during incoming RX signals.

4 Each part name

- 1 PWR switch
- 2 PWR LED
- 3 VOL+ switch
- 4 RIT+ switch
- 5 FRQ+ switch
- 6 SP&MIC jack
- 7 PTT switch
- 8 External KEY terminal
- 9 CW KEY switch
- 10 SQL switch
- 11 FRQ- switch
- 12 RIT- switch
- 13 VOL- switch
- 14 ANT connector(SMA)
- 15 FUNC switch
- 16 Display
- 17 Built-in Microphone
- 18 External power supply jack
- 19 Built-in speaker



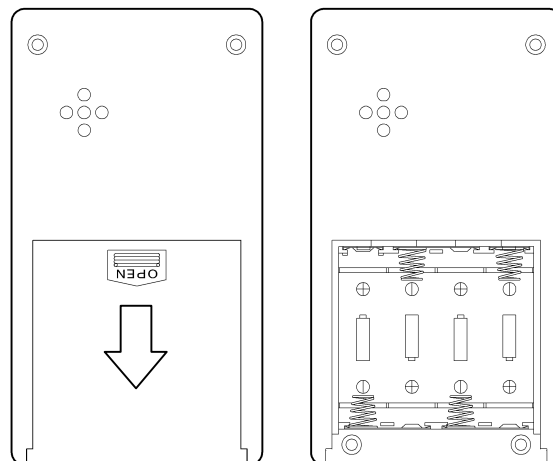
5 ALKALINE BATTERY INSTALLATION

1 First remove the battery cover from the back side of the transceiver. Slide the battery cover, as shown in the illustration.

2 Install the Alkaline AA cells, paying particular attention to the correct polarity of the batteries.

3 Replace the battery cover.

• When the transceiver is to be stored for a long period of time without use, remove the batteries.



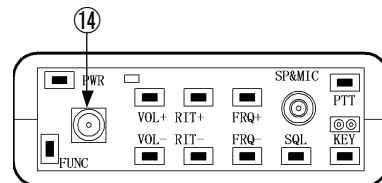
6 EXTERNAL POWER CONNECTIONS

The provided power cable connects to the

Jack(18) on the side. Supply $\left(\begin{matrix} + \\ \ominus \end{matrix} \right)$ DC6.0 V and install a 1A fuse in the middle of the power cable to protect the radio from over current situations..

7 Antenna connector (14)

Connect the 50 ohms antenna. DO NOT apply strong forces to the SMA connector – “finger tight” is perfect. A flexible type antenna or thin coax 'pig tail' adapter is recommended when connecting to a SMA connector.

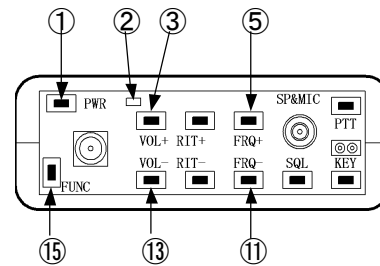


8 RECEIVER OPERATION

a) Basic operation

Press and hold in the PWR switch(1) for one second to turn to the transceiver ON or OFF.

When the PWR switch and FUNC switch(15) are pushed at the same time, the frequency becomes an initial state.(144250.00KHz、 RIT+00)

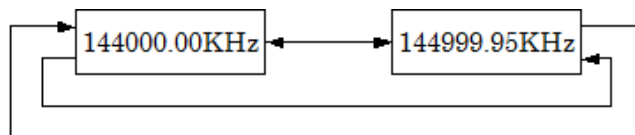


b) Frequency tuning

Push the FRQ+ key(5) or FRQ- key(11) to set the frequency. You can change the operating frequency in 0.05KHz steps. When either FRQ+ key or FRQ- key are pushed for a long time, the frequency will change continuously. In addition, when you push the FRQ+ key (or FRQ- key) and FUNC switch(15) are pushed at the same time, you can change the frequency step size to 2.5 kHz.

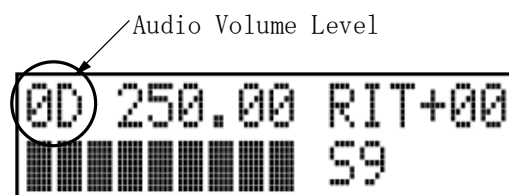
- At the upper and lower limit frequency

If you push FRQ- key (11) at 144000.00KHz, the frequency is changed to 144999.95KHz. If you push FRQ+ key (5) at 144999.95KHz, the frequency is changed to 144000.00KHz.



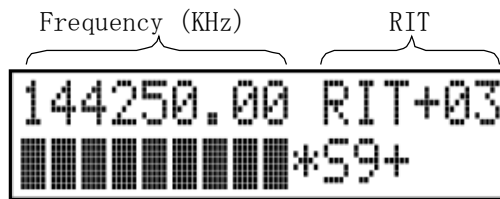
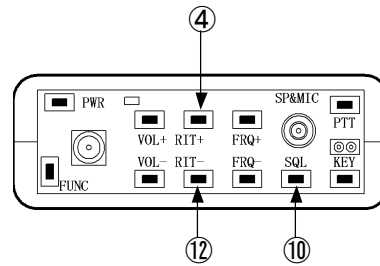
c) ADJUSTING THE AUDIO VOLUME LEVEL

Push the VOL+ key(3) or VOL- key(13) to set a comfortable listening level. When VOL+ key or VOL- key is pushed for a long time, audio volume level will change continuously. When the OL+ key or VOL- key is pushed, the audio volume level is displayed (01 to 70 hexadecimal) to the left of the frequency. If other switches are pushed, the display returns to a frequency designation.



d) RIT (Receiver Incremental Tuning)

Adjust the 'receive offset' higher or lower with RIT+ key(4) or RIT- key(12). This will not change the TX frequency – only the RX frequency will change. The RX frequency steps in 0.05KHz increments with a 15 step maximum range(±0.75KHz).

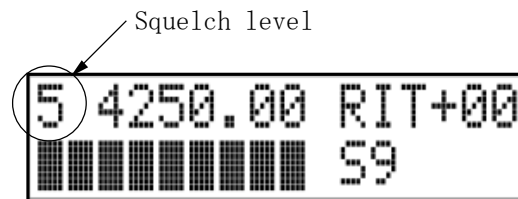


e) ADJUSTING THE SQUELCH

Push SQL switch(10) to adjust the squelch from level 0 to 9.

The initial setting is 0.

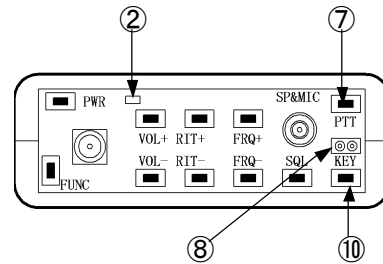
While the squelch circuit is active the display backlight disappears.



9 TRANSMITTER OPERATION

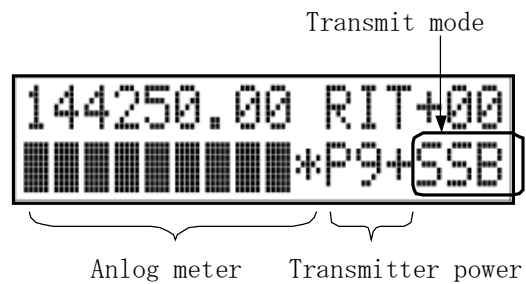
a)SSB TRANSMISSION

Press the PTT switch(7) , and speak into the microphone to transmit a SSB signal. When the PTT switch is pushed, the PWR LED(2) turns on. An external microphone can be used by using the provided converter cable to attach to the radio.



The transmit mode is displayed on the lower right of the display. The transmitter Power is displayed with an analog meter ranging from levels 0 to 9.

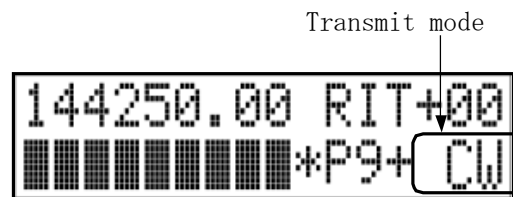
CAUTION: When you transmit, please be sure to connect an antenna or dummy load.



b) CW TRANSMISSION

Press the CW KEY(9) to transmit a CW signal (Semi-break-in).

You can also transmit with an external telegraph key by using the provided cable to connect with the External KEY terminal(8) .



NOTE : CW receive offset in 'CW mode' is possible. To begin the process, first set the RIT receive offset to +00. Then press the FRQ+ key(5) or FRQ- key(11) to find the transmitting station. Adjustment is made in 1KHz steps. Finally, adjust the "beat sound" by using RIT+ key(4) or RIT- key(12).

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We at Nishi Musen Kenkyuujyo Co.,Ltd. are highly skilled in developing various radio instruments.

Especially we have good techniques to design analog circuits for radio.

Our company has been developing and manufacturing several radio instruments for the uses of business customer and Amateur (Ham) Radio hobbyist.

Additionally we are also going to develop and to manufacture some wireless tools, such as "Wireless Terminals" and "Low Radio Power Devices" which no license is required to operate.

Your custom orders are welcome.

[List of our products]

* These products were discontinued.

1. Instruments for the uses of amateur radio hobbyist

- (a) 3.5, 50MHz All Mode Transceiver 10W PSN mode SSB, FM and CW
- (b) 144MHz SSB Handheld Transceiver 1W
- (c) 430MHz SSB Handheld Transceiver 1W
- (d) 1200mhz Up-Converter 0.1W
- (e) 144/430MHz FM Transceiver 1-45W (Mobile and Handheld PLL)

2. Instruments for the uses of business customer

- (a) 60-900MHz Band FM Transceiver 1-10W PLL
- (b) Data Transmission Wireless Device
- (c) 1.9GHz Linear Amplifier 8W (for the PHS base station)

3. Others

- (a) RF-ID Tag. Reader/Writer module for the Tag.
- (b) Underground detector: Equipment for detecting any objects, which buried in the ground.
- (c) Special SG instrument (Multiple Channels, High Stability)
- (d) Receiver/Transmitter unit for IR Laser (50W)

(e) Wireless units, Ultrasonic sensor, IR sensor