

INSTRUCTION

MODEL **MX-21S**

21MHz SSB/CW HAND-HELD TRANSCEIVER

Introduction:

Model MX-21S is a QRP 21MHz SSB/CW Transceiver featurized size and light weight for optimum portable use and yet ensuring highly reliable performance. Although the output power is 2W, you can surely enjoy relatively long distance QSO when transmitting from altitude like mountain or hill. The circuit composition is well comparable to that of much larger transceiver except for power amplifier circuit and a variety of optional accessories will give you added enjoyment of this transceiver.

The MX-21S has been carefully engineered and manufactured. But, before attempting to operate his transceiver, please read the instructions carefully so that you can enjoy dependable operation for many years to come.

Specifications:

(General)

Frequency	: 21MHz Band
Wave Mode	: SSB (USB), CW
Semiconductors	: 4 IC, 13 TR, 6 FET, 37 Diodes
Power Supply Voltage (Battery built-in)	: 8.4VDC - 9VDC SUM-3 x 6 pieces or NiCad NR-AA x 7 pieces
" " " External Source:	: 9.5V DC
Power Consumption	: RX..70mA(At No Signal) TX...620mA Max.
Frequency Stability	: ±500Hz (Initial) ±100Hz/30 minutes at 25 degree C after initial
Aerial Impedance	: 50 ohms
Dimensions & Weight	: 66W x 39H x 142D mm 590g (incl. batteries)

(Transmitter)

Maximum Output Power	: 2W
Spurious Radiation	: - 40dB maximum
Modulation	: Balanced Modulation
Carrier Suppression	: 40 dB minimum
SSB Suppression	: 40 dB minimum

(Receiver)

Receiving Method	: Single Super
Sensitivity	: S/N 15dB minimum at 0.5uV input
Intermediate Frequency	: 11.2735 MHz

(Local Oscillator)

Oscillation Method	: Variable Crystal Oscillation
Output Frequency	: 32MHz Band

(Accessories provided - for complete set)

- | | |
|---|------------------------|
| (1) Connecting Cord for External Power Supply | (4) Instruction Manual |
| (2) SUM-3 battery x 6 pieces | (5) Guarantee Card |
| (3) Dummy Battery (Space Adaptor) | |

Caution Before Use:

1) Power Supply

This transceiver is driven by DC8.4-9V (Built-In Battery) Power Source. When using an external power supply, be sure to use a regulated DC Power Supply of 9.5VDC(or 10VDC) 650mA minimum. When power is fed from car battery or fixed station power source of 12-14VDC, please also do not forget to use a DC-DC converter to get 9.5VDC. The DC-DC Converter will be optionally available. Please specify the model FM-1. When operating this transceiver with UM3 Cells(6 pcs.), remove the battery cover with your thumb finger and install the batteries observing the proper polarity together with space adaptor(dummy battery). When using Ni-Cad batteries, install the 7 pieces of NR-AA type (UM-3 Size 450mAh) without using the space adaptor.

The maximum operating time with SUM-3 (6 pcs.) batteries is around 2-4 hours and with Ni-Cad Batteries, 3-4 hours.

2) Antenna

Be sure to use 21MHz band antenna with 50 ohm impedance. The connector used is BNC type. If you would use M-type connector, use an adaptor plug from BNC to M optionally available. Please specify model PM-1. For short distance QSO the rod antenna model AN-21 will be optionally available. It is recommendable to use outside di-pole antenna for our "PICO-TRA" series HF Transceivers.

Controls & Functions:

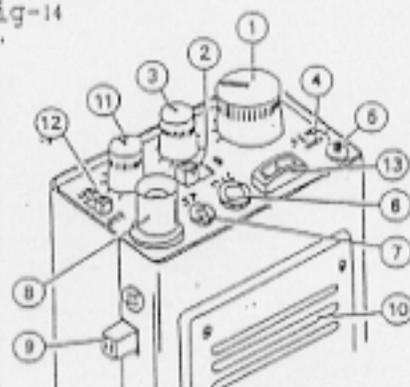
(1) Tuning Knob

This is a frequency tuning knob for both transmit and receive. The dial indication is calibrated at 5KHz each apart. When the band switch (2) is set to "A", frequency continuously covers 21.20-21.25MHz, which is provided to "A" Channel.

The dial calibration indicates under "+KHz".

For example, when the white indicator line on the knob point '40', it means 21.24MHz. The calibration from "50" to "100" shown in the upper side is used for the band switch at "B" position, available with optional crystals, like 21X-25S covering 21.25-21.30MHz. When using other crystals, add or reduce its difference.

Fig-14



(2) Band Switch

(3) Power Switch/Volume Control

The Power is off when at "OFF" position. Turning it clock-wise will turn power "ON". Further rotation will turn up the volume.

(4) Transmitting Check Indicator (SEND)

When pushing the stand-by switch (9) at SSB Mode, this indicator light up. At CW mode, when pushing the stand-by switch(9) and Key-Switch(button)(5) or CW Keyer simultaneously, this indicator also lights up.

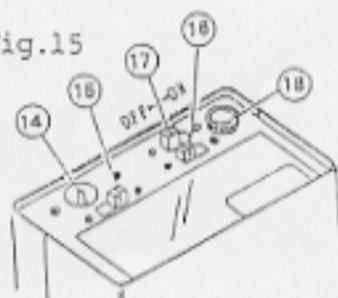
(5) Key Switch for CW

The mini CW Keyer is built-in. Use it when you do not have an external keyer.

(6) External Stand-By Terminal, MIC. Terminal "MIC".

The terminal to be used with MS-1 (or MS-2) Speaker/microphone optionally available. If you want to make yourself the External Lock-Standby for CW or External control microphone for SSB mode operation, please wire as per the sketch right hand. The 3.5mm stereo plug is required. (For wiring, please refer the fig. 16)

Fig.15



(7) External Speaker Terminal, "SP"

Use this terminal for use with ear-phone and external speaker. (Impedance, 8 ohm) The plug should be 2.5mm single type. When using optional Mic. MS-1, the plug of speaker side should be inserted.

(8) Antenna Terminal

Connect the 50 ohms antenna. (or optionally available.)

(9) Stand-By Switch(Push-to-Lock/Push-to-Release)

TX/RX Selector Switch. Pushing the switch (Lock position) enables you to transmit. Another push(release) allows you to receive.

(10) Built-In Speaker & Condensor Microphone

(11) RIT Knob

Use this knob for variation of RX frequencies without any change TX frequency (2-500Hz). The frequency of TX and RX is the same when the knob is stopped at the center(Click feeling). When knob is turned clockwise(+), the RX Frequency will be changed to higher than TX frequency. Turn this knob anti-clockwise(-), the RX frequency will be lowered against TX frequency. Normally set to the center position. Be sure to keep the position of this knob "0"(Center) when calling QSO.

- (12) Noise Blanker Switch "NB"
The complete set is provided with noise blanker built-in. For kit-form this switch is workable for Noise Blanker unit optionally available. (NB-2S) Set the switch to "ON" when there are pulsing noises like car ignition noises. Normally, set it "OFF" position.
- (13) "S" & "RF" Meter
When RXing, this works as "S" Meter(Lower Side Calibration to be read) and TXing, it works as "RF" meter for checking of transmitting. The calibration has no relation with power indication.
- (14) External Power Supply Terminal
When power is fed externally, insert a plug with Red and Black cord. The external power supply voltage should be 9.5VDC(or 10VDC) 650mA minimum.
- (15) Function Switch
- * When battery operation, set it to "BATT", and do not connect anything to External Power Supply terminal (4).
 - * When using external power source, set it to "BATT" and connect the external power plug to External Power Supply Terminal (14).
 - * When charging the Ni-Cad Battery, set it "CHARGE" and connect the plug of charger to the terminal (14).
- (16) Mode Switch
For SSB operation, set the switch to SSB position. And set it to CW in the CW Mode.
- (17) Attenuator Switch
Use it for avoiding the "MASKING" of small signals by the input of big power when using an big antenna. Normally set it to OFF.
- (18) External Key Terminal "KEY"
Use this terminal with a 3.5mmø stereo plug inserted when operating with external keyer. Please refer to Fig.17.

FIG. 16

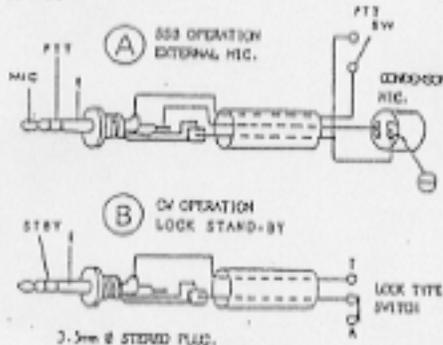


FIG. 17

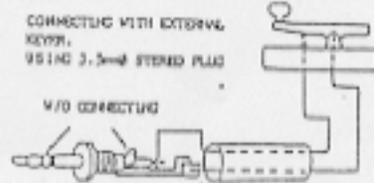
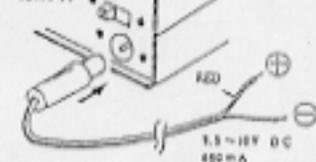


FIG. 11
FUNCTION (BATT)



SSB MODE OPERATION:

Set the Mode switch to SSB and pressing the Stand-by switch will get you ready to transmit. Speaking into the microphone will transmit the USB mode wave. Pushing the switch again will get it released returning to receive mode. The RF Meter deflects when speaking into microphone.

CW OPERATION:

Set the Mode switch to CW operation. Use the tuning knob to get "beat sound" of about 700Hz to Zero in to a party to communicate. Use the stand-by switch in the same manner as operation in the SSB mode. Pressing the keyer will enable you to transmit CW signal.(The "SEND" indicator lights up in Red.) (Not Break-In Method.) If it is inconvenient for you to operate the keyer with pressing the Stand-by Switch, it is recommendable to connect External Lock Stand-By Switch to the External Mic. Terminal as the sketch(Fig.16). The semi-breakin and side-tone unit is optionally available.

HOW TO CHARGE THE NI-CAD BATTERY:

- 1) The battery is only NR-AA type(UM3 type size) 500mAh. The charging time through 12-14VDC power supply (charger) is around 14-16 hours.
- 2) Set the Function Switch to "CHARGE" position. Connect the External Power Plug provided with this unit to External Power Supply Terminal of the transceiver.
- 3) The Red Line should be connected to DC12-14V (+) side and other(black) to (-) side.
- 4) After 14-16 hours, the charging will be finished. Be sure to set the power switch of transceiver to "OFF" position, when charging. Reset the FUNCTION Switch to "BATT" side after charging.

Optional Accessories

1) Vxo Crystals available as standard options are as follows.

<u>P No.</u>	<u>Frequency Coverage</u>
21X-00	21.00 - 21.05MHz for CW
21X-05	21.05 - 21.10 " " "
21X-10	21.10 - 21.15 " " "
21X-15	21.15 - 21.20 " " SSB
21X-25	21.25 - 21.30 " " "
21X-30	21.30 - 21.35 " " "
21X-35	21.35 - 21.40 " " "
21X-40	21.40 - 21.45 " " "

2) Carrying Case with Hand Strap P/No. IM6

3) Adapting Plug/DC-DC Converter P/No. PM-1

This comes with a BNC-to-M type adapting plug, an encased DC-DC Converter for 9.5V converted from 12-14V and Belt Hook.

4) External Speaker Microphone with..... P No. MS-1
Press-to-Talk Switch

5) Noise-Blanker Unit P/No. NB-2S

6) Miniature-sized pocketable P/No. AN-21
Rod Antenna

7) 10W Linear Amplifier P/No. PL-21S

* Specifications:

Final Stage	: 2SC1945 x 1
Final Stage Input Power & Voltage	: 20W 13.8V
Wave Mode	: A3J A1
Output Power	: 10W
Input Power	: 2W
In/Output Impedance	: 50 ohms
Semiconductors	: 4 TR., 1 IC, 9 DI.
Power Source	: 13.8V DC
External Dimensions	: 110W X 39H X 142D mm
Weight	: 520g
Additional Circuits	: TX/RX LED Monitoring 9.5V DC Terminal

9) CW Semi-Break-in Circuit & P/No. CW-2S
Side-Tone Circuit

* Specifications:

Semiconductors	: 7 TR., 4 DI.
Battery	: 9V DC (006P)
Power Consumption	: 18mA
External Dimensions	: 39W X 39H X 142D mm

10) Mobile Rack with Bracket P/No. PR-3
(for MX-21S & PL-21S & CW-2S)