

INSTRUCTION

MODEL MX-14S

14MHz SSB/CW HAND-HELD TRANSCEIVER

Introduction:

Model MX-14S is a QRP 14MHz 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-14S 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 : 14MHz Band
Wave Mode : SSB (USB) , CW
Semiconductors : 4 IC, 13 TR, 6 FET, 37 Diodes
Power Supply Voltage (Battery : 8.4VDC - 9VDC SUM-3 x 6 pieces
built-in) or NiCad NR-AA x 7 pieces
" " " External Source: 9.5V DC
Power Consumption : RX..70mA(At No Signal) TX...620mA Max.
Frequency Stability : $\pm 500\text{Hz}$ (Initial)
 $\pm 100\text{Hz}/30$ minutes at 25 degree C after initial
Aerial Impedance : 50 ohms
Demensions & 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 : 25MHz 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 PM-1. When operating this transceiver with UM3 Cells(6 pcs.), remove the battery cover with your thumb finger and install the batteries opserving 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 aroud 2-4 hours and with Ni-Cad Batteries, 3-4 hours.

2) Antenna

Be sure to use 14MHz 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-14 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

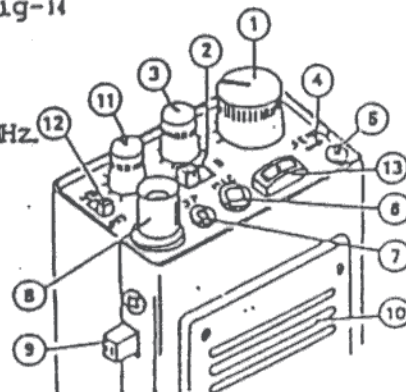
This is a frequency tuning knob for both transmit and receive. The dial indication is calibrated at 5KHz each apart. When the band switch (2) is set to "A", frequency continuously covers 14.20 - 14.250MHz, which is provided.

The dial calibration indicates under "+KHz".

For example, when the white indicator line on the knob point '40', it means 14.24MHz. 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 14X-15S which covers 14.15-14.20MHz.

When you put in other crystals, please add or reduce its difference.

Fig-14



(2) Band Switch

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

(3) Power Switch/Volume Control

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.

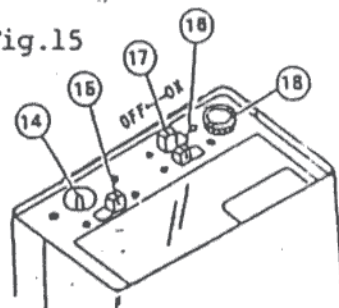
(4) Transmitting Check Indicator (SEND)

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

(5) Key Switch for CW

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



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

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.

(7) External Speaker Terminal, "SP"

Connect the 50 ohms antenna. (or AN-14 optionally available.)

(8) Antenna Terminal

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

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

(10) Built-In Speaker & Condensor Microphone

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.

(11) RIT Knob

- (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 3.5mm stereo plug inserted when operating with external keyer. Please refer to Fig.17.

FIG. 16

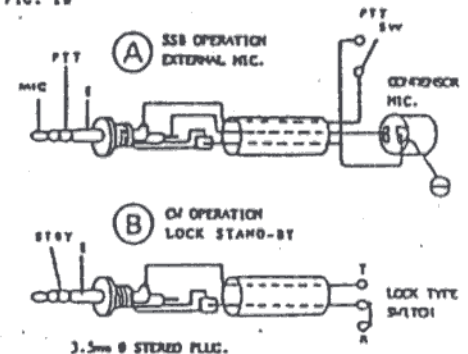


FIG. 17

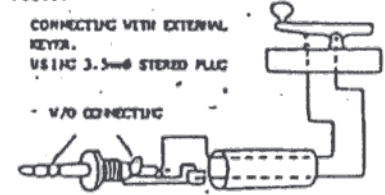
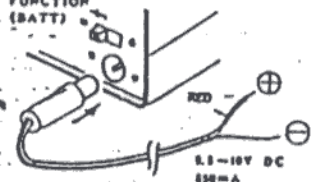


FIG. 11
FUNCTION (BATT)



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.

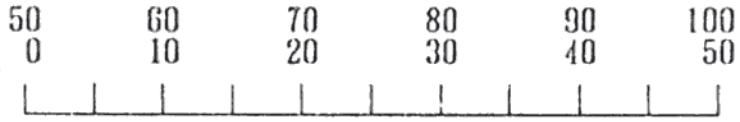
ATTENTION!

BAND SW② (MX-14S)

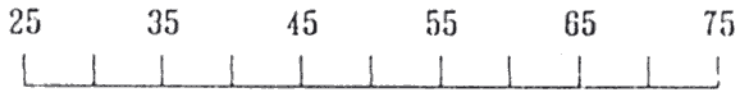
A BAND.....14.025~14.075MHz

B BAND.....14.250~14.300MHz

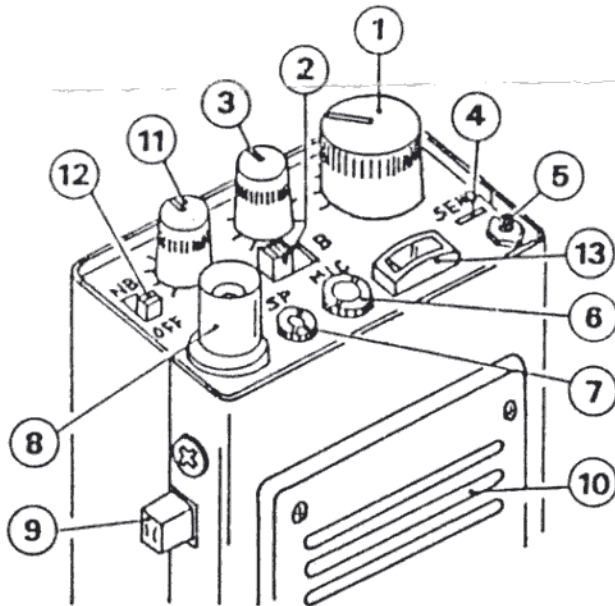
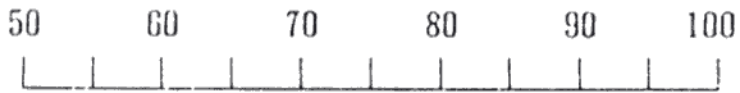
GRADUATION (MX-14S)



A BAND



B BAND



OPTIONAL ACCESSORIES FOR MX-14S:

1) Optional VXO Crystals available as standard options are as follows:

<u>Part Number</u>	<u>Frequency Coverage (50KHz COVERAGE)</u>
14X-00S	14.00 - 14.05MHz - To be mounted on "B" CH. -
14X-05S	14.05 - 14.10MHz
14X-10S	14.10 - 14.15MHz
14X-15S	14.15 - 14.20MHz
14X-25S	14.25 - 14.30MHz
14X-30S	14.30 - 14.35MHz

2) NB-2S (Noise-Blanker unit) * provided with complete set.

3) BM-6 Carrying case with hand-strap.

4) MS-1 External Speaker/Microphone with PTT switch

5) PM-1 Adapting Plug/DC-DC Converter
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.

6) PR-3S Mobile Rack with bracket for MX-series transceiver and PL- series Linear Amplifiers.

7) PL-14S 10W Linear Amplifier

[SPECIFICATIONS]

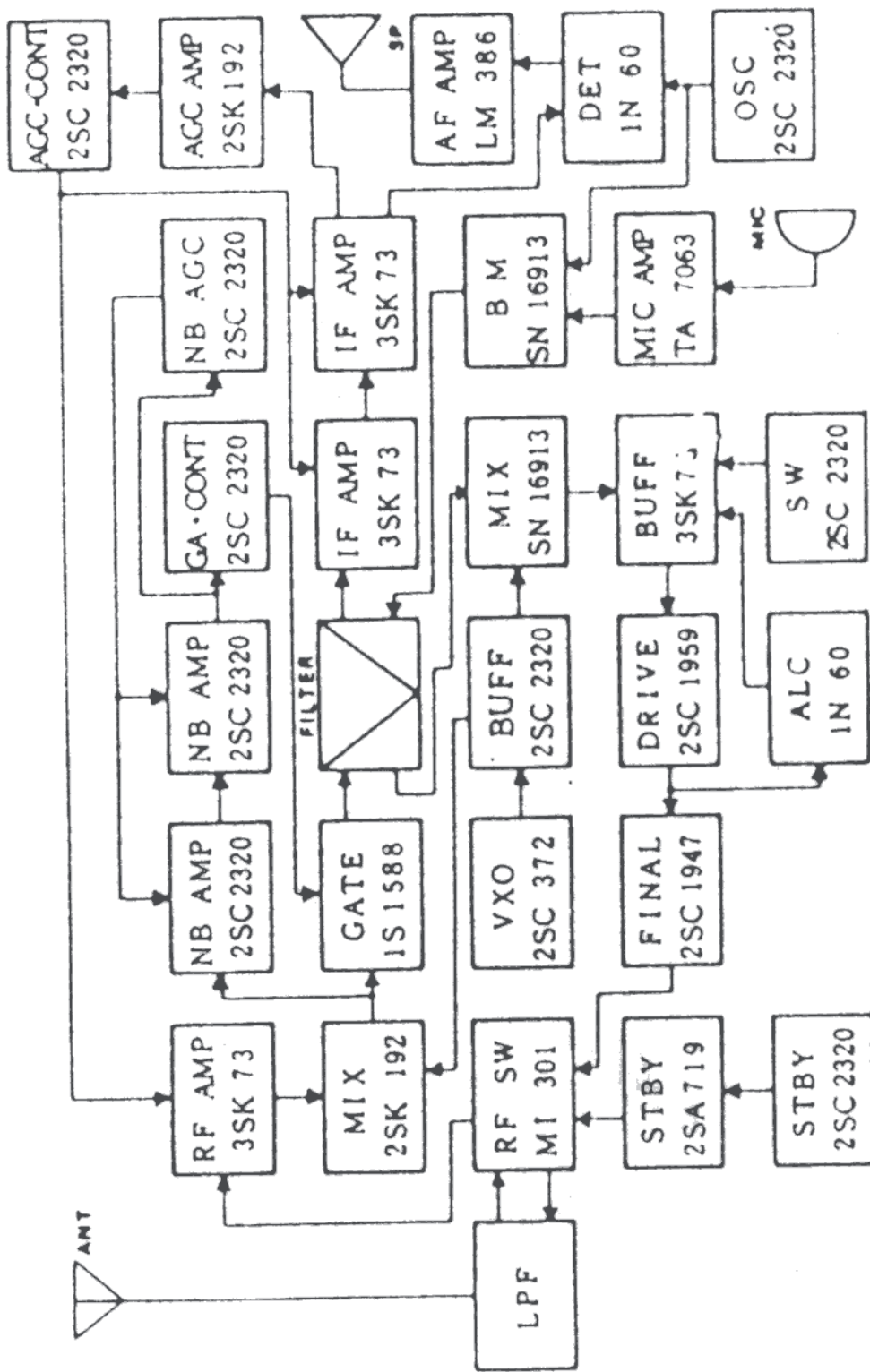
Final Stage : 2SC1945 x 1
Final Stage Input Power & Voltage: 20W 13.8V
Wave Mode : A3J A1
Output Power : 10W
Input Power : 2W
In/Output Impedance : 50 ohms
Semiconductors : 4 TR., 1 IC., 9 Di.
Current Drain : 2.5A Max.
Power Source : 13.8VDC
External Dimensions & Weight : 110W x 39H x 142D mm 520g
Additional Circuit : TX/RX LED Monitoring
9.5VDC Terminal

8) CW-2S CW Semi-Break-In Circuit & Side Tone Circuit

[SPECIFICATIONS]

Semiconductors : 7 TR., 4 Di.
Battery : 9VDC (006P)
Current Drain : 18mA
External Dimensions : 39W X 39H x 142D mm

9) AN-14 Rod Antenna provided with Loading Coil, Length: 135cm



キットは、NB回路はオプションです。

● ピコトラS 使用上の御注意

(1) 後面パネルのFUNCTIONスライドスイッチは、通常運用では必ずBATTにし下さい。

内蔵電池及び外部電源のどちらで運用する場合もBATTにセットします。

(2) ニッカド電池を充電する時は、上記のスライドスイッチをCHARGEに切り換えま

す。
使用するニッカド電池は必ずNR-AA型(相当品)450mAh容量で、充電時間が45mAで14~16時間仕様の物を使って下さい。これ以外の充電方法のニッカド電池は、本機内蔵の充電回路が使えません。

(3) 大型のマングン乾電池を外部電源ジャックから接続したい時は、内部の逆接保護用ダイオードでの電圧降下分を考慮して、合計7本(10.5V)を供給した方がFBです。

Part No	MX-6S	MX-7S	MX-21S	MX-3.5S	MX-28S
Q 3	2SC 2053	2SC 1959	2SC 1959	2SC 1959	2SC 1959
X 1	12.9922MHz	9.1899MHz	16.2670MHz	14.8370MHz	13.2775MHz
X 3	11.2720MHz	11.2720MHz	11.2750MHz	11.2750MHz	11.2750MHz
D 31	IS1588	IS1588	NC	IS1588	NC
D 33	ジャンパ	IS1588	IS1588	IS1588	IS1588
CH 2	100	330	330	331	330
CH 3	"	"	"	"	"
CH 4	"	"	"	"	"
TC 2	トリマ	トリマ	トリマ	トリマ	トリマ
TC 3	"	470P	100P	680P	68P
TC 4	"	400P	220P	NC	100P
TC 5	"	330P	330P	560P	330P
R 21	330Ω	330Ω	330Ω	100Ω	330Ω
R 22	"	NC	NC	330Ω	330Ω
R 24	22Ω	51Ω	51Ω	51Ω	51Ω
R 26	220Ω	100Ω	100Ω	100Ω	100Ω
R 42	2.7K	2.2K	2.2K	2.2K	2.2K
R 44	330Ω	220Ω	220Ω	220Ω	220Ω
R 81	NC	1K	1K	1K	1K
R 83	"	NC	ジャンパ	NC	ジャンパ
R 84	"	Jumper	ジャンパ	180Ω	ジャンパ
C 10	33P	103	103	103	103
C 13	NC	10P	NC	10P	NC
C 14	100P	100P	47P	100P	100P
C 15	30P	220P	100P	"	30P
C 19	47P	56P	56P	82P	39P
C 20	1P	1P	1P	2P	1P
C 22	47P	56P	56P	82P	39P
C 28	22P	150P	33P	82P	18P
C 31	18P	120P	"	180P	18P
C 32	100P	100P	100P	"	100P
C 66	33P	150P	47P	330P	22P
C 94	47P	300P	120P	180P	82P
C 103	33P	150P	33P	560P	22P
C 112	12P	12P	22P	180P	18P
C 129	472	NC	472	12P	22P
C 131	10P	15P	10P	NC	472
C 133	47P	NC	NC	15P	10P
C 135	39P	220P	NC	NC	82P
C 136	22P	150P	56P	330P	68P
C 138	39P	220P	100P	270P	47P
C 139	"	300P	"	470P	82P
C 140	4P	33P	12P	"	82P
C 142	NC	22P	NC	56P	10P
C 143	"	0.5P	1P	100P	NC
C 144	"	NC	39P	0.5P	0.5P
⑨	⑨に接続	connect to 10	⑨に接続	⑩に接続	⑨に接続

ヒコトラス基本回路図

回路及び定数は技術開発などに伴い変更になることがあります。
下記はオプションパーツのXB-2Sの回路を全て含んでいます。

MK-1170 P.C.B

- 2SA 719.....Q 1
- 2SC 372.....Q 2
- 1S1555.....D 9
- 1SS16.....D10,11
- 2SK 73.....Q 4
- 2SK 192A.....Q 5~8
- 2SC2320.....Q 9,10
- 1SV 50.....D 1
- 1K60.....D12~15
- 05Z5.1.....D 4~6

MK-1156 P.C.B

- M1301.....D 7,8
- 2SC945.....Q 1~4
- 1S1555.....D 1
- 1SS16.....D 2,3
- 2K 60.....D 4
- 2SC1947.....Q 4
- 2SK 73.....Q 5~8
- 2SK 192A.....Q 9,10
- EM-1.....D32

