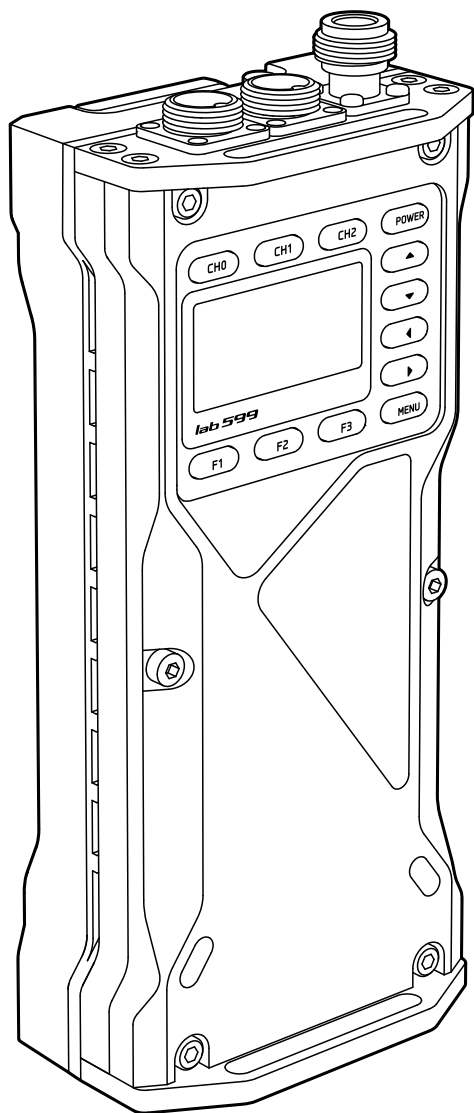




TX500 MP

HF/VHFL
Portable Transceiver

USER MANUAL

Firmware version 1.24

About using the manual



Search by keyword

To find a section, search for keywords such as "interface" or "menus". If you are using Adobe Acrobat Reader to read this document, start your search by pressing Ctrl + F (Windows) or Command + F (Mac).



Navigate through sections

See the full list of sections in the table of contents. To go to a section, select the appropriate topic by clicking the mouse. To return to the table of contents, click on the numbering at the bottom of the page.



Print this document

The document can be printed in high resolution..

LEGEND



Warning



Important



Pay attention

General Information	4
Specification	5
Package Contents	6
Appearance and Controls	7
User Interface	9
Connection and Control	11
Getting Started	11
Basic Control	12
VFO Mode	14
Channel Mode (CH)	15
Transmission Settings	16
Reception Settings	17
Antenna Tuner (ATU)	19
Advanced Control	20
Recorder Function	20
CW Text Message	20
CW Decoder	20
Beacon Mode	21
Channel Programming via PC	21
Reset to Factory Defaults	22
Firmware Update	23
Menu Functions	24
Safety and protection	30

General information

The TX-500MP transceiver is a compact, portable HF radio in a manpack form factor, designed for professionals and enthusiasts who prioritize mobility, operational efficiency, and extended autonomy. The transceiver is based on the time-proved and reliable TX-500 platform.

Transceiver is engineered for operation in harsh conditions: a durable, aviation grade aluminum alloy housing precisely milled to protect against mechanical damage, and the absence of through-holes prevents dust and moisture ingress. Its uniquely low power consumption – up to 100 mA in receive mode – and the BP-550 battery pack provide extended autonomous operation.

The transceiver combines extensive functionality with ease of use for both professionals and less experienced users, thanks to its channel mode with pre-programmed settings. The built-in automatic antenna tuner ensures compatibility with various antennas, including portable ones, enabling quick readiness for transmission, which is especially critical in emergency situations.

The TX-500MP transceiver is an ideal solution for tactical missions, rescue operations, and expeditions to remote or inaccessible areas.

The transceiver provides:

- Two-way radio communication with modulation modes: SSB, CW, AM, FM, DIG.
- Automatic tone interference filtering, noise suppression, and impulse noise reduction.
- Noise suppression: SQL (amplitude squelch), ASQ (automatic squelch), and CTCSS (tone-coded squelch system).
- Operation in channel mode with preset parameters.
- Programming of 100 channels based on frequency, modulation, etc.
- LCD display information: signal strength, volume, and squelch level; SWR level and filter settings; operating frequency and transceiver mode; current time, battery charge level, and voltage; overvoltage, overheating, and SWR limit warnings.

The transceiver features:

- Built-in automatic antenna tuner (ATU), matching range: 6-400 Ohms;
- Low-noise preamplifier with 18 dB gain and a 20 dB attenuator;
- 4 fixed digital filters for reception and 2 filters for transmission;
- Digital speech compressor;
- Protection against high SWR, reverse polarity when connecting an external power source, and overheating;
- PC software for channel programming.

Specification

Main Features:

- Frequency range: 0.5 – 56.0 MHz;
- Supported modes: SSB, CW, AM, FM, DIG;
- Built-in automatic antenna tuner;
- Frequency stability: ± 0.5 ppm (from -10°C to $+60^{\circ}\text{C}$);
- High-performance 32-bit floating-point DSP processor;
- Power consumption in receive mode – up to 100 mA (with screen backlight, no preamplifier, no signal);
- External power supply: DC 9-15V, 1 to 3A in transmit mode;
- High-contrast monochrome LCD display, resolution: 192×96 pixels;
- 100 programmable channels (frequency, modulation, etc.);
- PC software for channel programming;
- Operating temperature range: -10°C to $+60^{\circ}\text{C}$;
- Dimensions (L × W × H): 226 × 90 × 31 mm;
- Dimensions with battery pack (L × W × H): 226 × 90 × 62 mm;
- Weight (without battery pack): 0.55 kg;
- Weight with battery pack and cells: 1.18 kg.

Receiver:

- Continuous reception frequency range: 0.5 – 56.0 MHz;
- Sensitivity (MDS) -136 dBm (nominal, with preamplifier);
- Quadrature mixer with down-sampling;
- Switchable low-noise 18 dB preamplifier and attenuator;
- 4 fixed digital filters;
- Automatic tone noise filter;
- Noise suppression and impulse noise reduction;
- Audio output for external speaker, 3 W nominal.

Transmitter:

- Transmission frequency range: 1 – 30 MHz with ATU; 45 – 56 MHz;
- Adjustable power output: 1 – 10 W (1.5 – 30 MHz); 1 – 7 W (45 – 56 MHz);
- Maximum emission bandwidth: 12 kHz;
- Reliable final amplifier stage with SWR and overheating protection;
- Carrier suppression: >50 dB nominal;
- Harmonic/spurious emissions: >50 dB below carrier;
- Speaker-microphone with PTT;
- 2 fixed digital filters;
- Digital speech compressor.

Package Contents

TX-500MP standard package:

1. HSM-500-GX16 Handheld Speaker-Microphone – 1 pc.
2. AD-511 PWR/DATA/CW Adapter – 1 pc.
(Adapter for connecting AD-504 Power Cable, AD-502 CAT-USB Adapter, and a 3.5mm, 3-pin jack for connecting a CW key).
3. AD-502 CAT-USB Adapter – 1 pc.
(USB adapter for firmware updates and CAT interface control).
4. AD-504 Power Cable – 1 pc.
(Power cable with a fuse for connecting external DC power sources 9-15V).

TX-500MP with battery option:

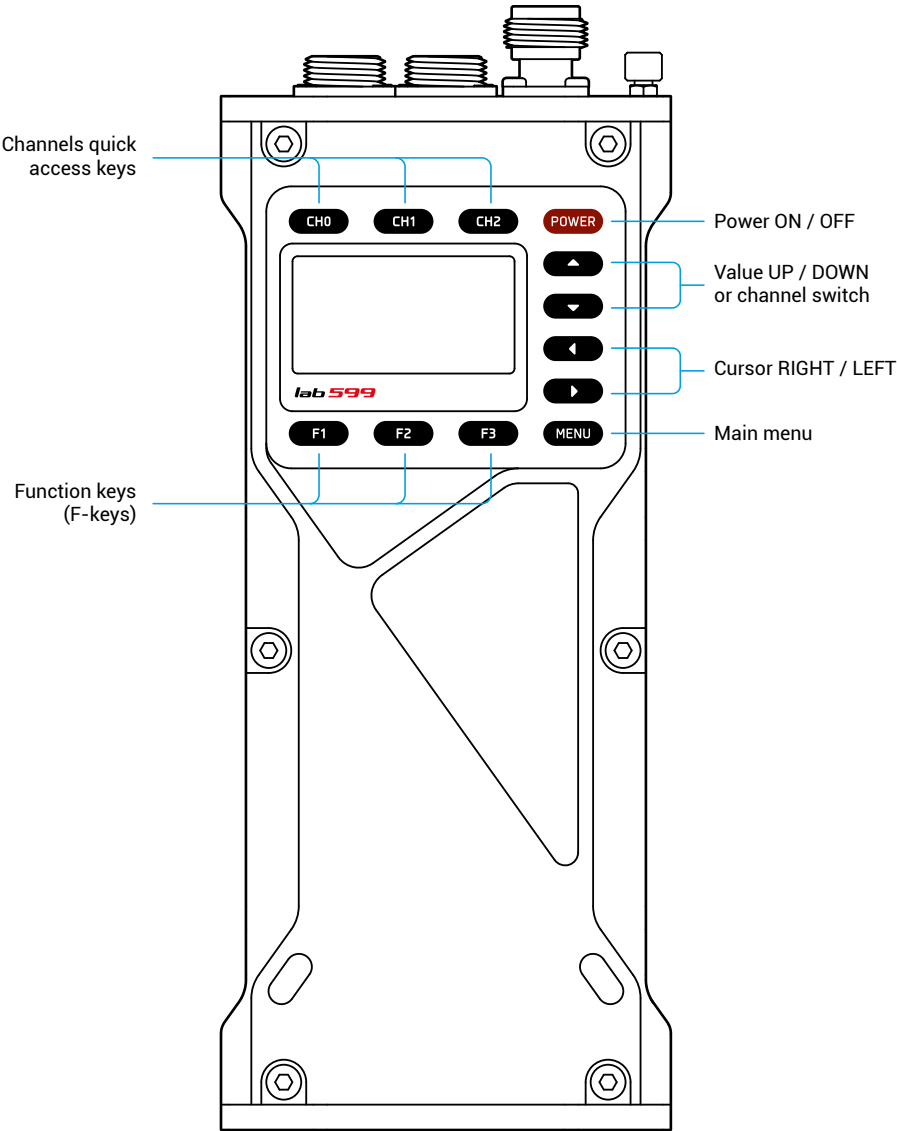
5. Battery Pack BP-550 – 1 pc.
6. Cable UCB-C (C-C) – 1 pc.



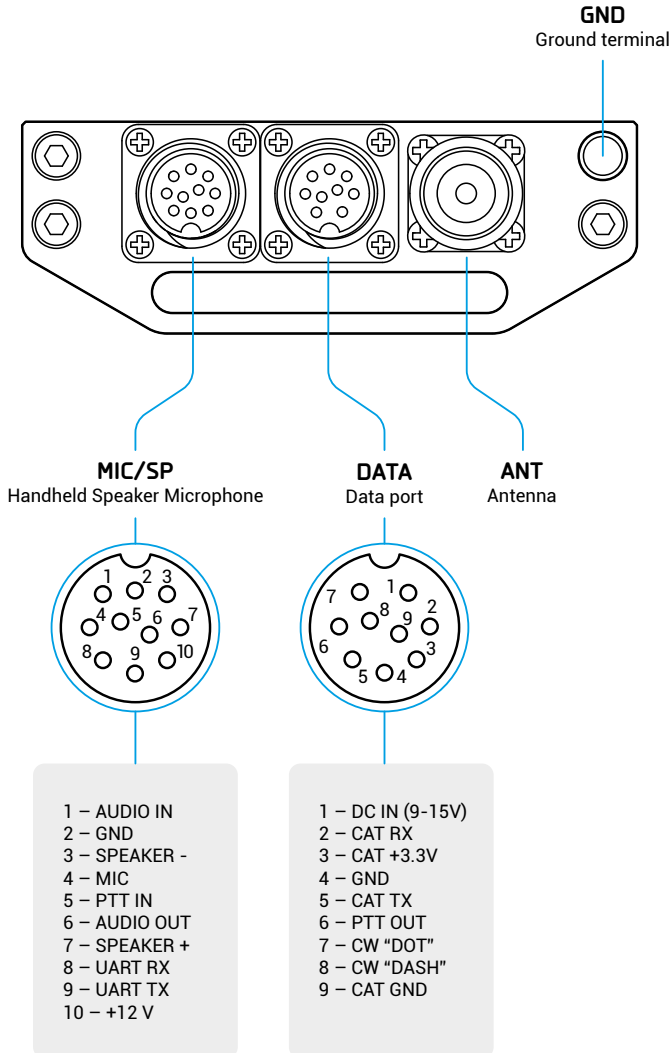
Control and Interface

APPEARANCE AND CONTROLS

Front view

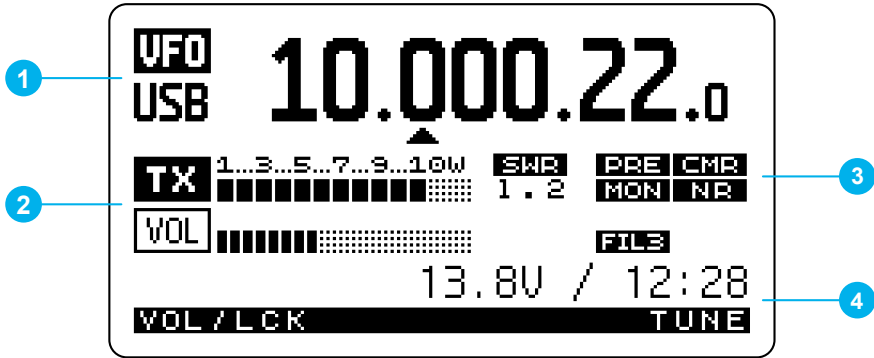


Top view



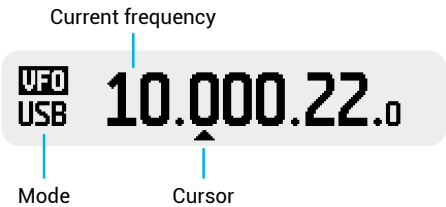
USER INTERFACE

Main Screen

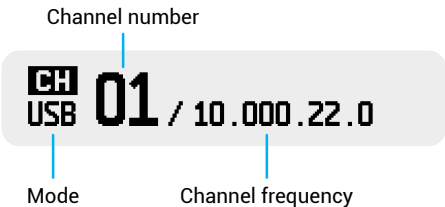


1 — Information Panel

VFO MODE:

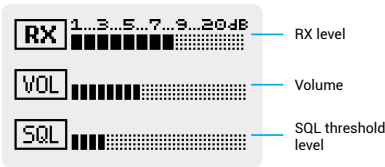


CHANNEL MODE:

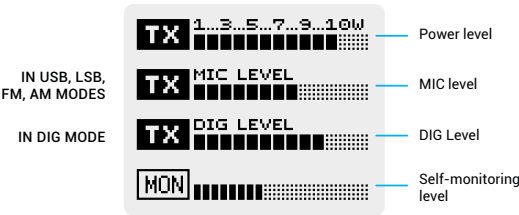


2 — Level Indicators

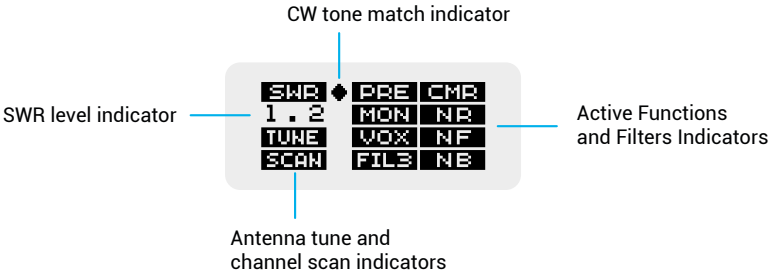
RX MODE



TX MODE

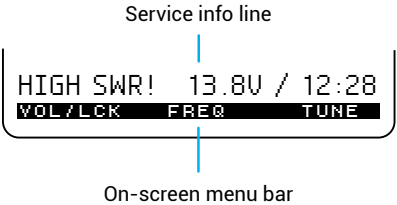


3 — Function Indicators

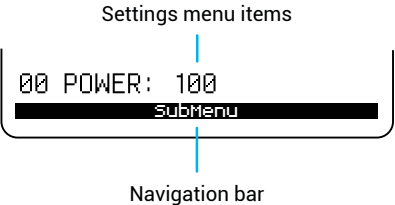


4 — Menu Bar and Navigation Panel

MAIN SCREEN:



MENU MODE:



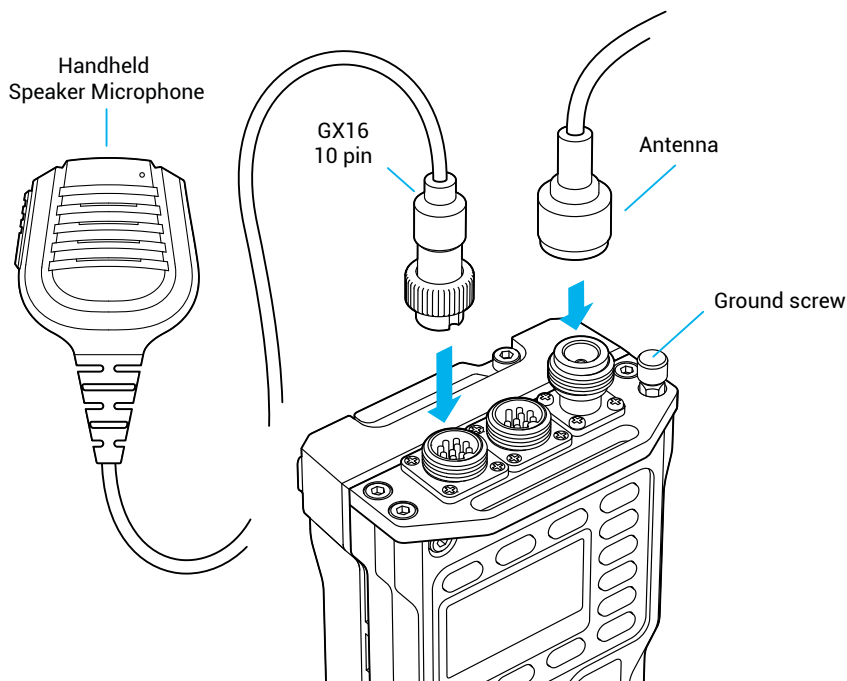
Connection and Control

GETTING STARTED

Connection

1. Connect the speaker-microphone to the MIC/SP port.
2. Connect the antenna to the ANT port.

i When connecting an antenna directly to the transceiver's ANT connector (without a coaxial cable), a counterpoise of at least 2.5 meters in length is required (the optimal length is $1/4$ of the wavelength of the operating frequency). The counterpoise should be connected to the grounding screw.



i When using the TX-500MP transceiver without a battery pack, connect an external power source using the AD-504 cable and the AD-511 adapter included in the package.

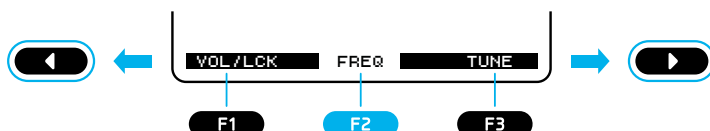
Powering On:

1. Activate the BP-550 battery pack using the PWR key.
2. Within 10 seconds, turn on the transceiver using the POWER key.

BASIC CONTROL

On-Screen Menu

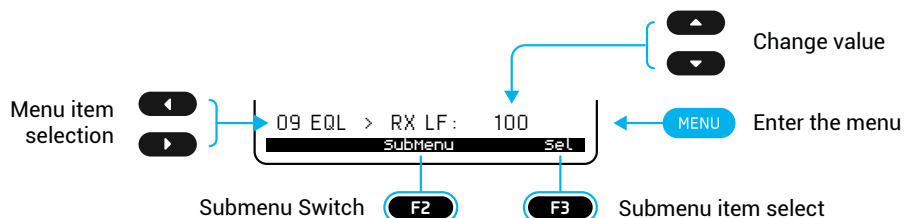
The transceiver's basic functions are accessible via the on-screen menu panel. Functions are distributed across multiple on-screen rows, and menu screens can be switched using the left/right keys.



Function selection is performed using the corresponding function key (F1-F3). The currently active function will be displayed inversely (background color changes) and will remain active after the next power-on. Pressing the key again disables the function.

Main Menu Control

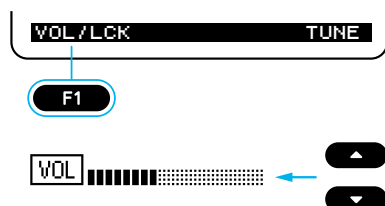
Advanced transceiver settings are available in the main menu. To access the menu, press the MENU **MENU** key. Navigate through the menu list using the LEFT/RIGHT keys. Access submenu options by pressing the F2 **Submenu** key.



To change a parameter value, use the UP/DOWN keys: a short press increases the value by one unit, while a long press increases it by 10 units. To exit the menu, press the MENU **MENU** key again.

Volume Adjustment

To adjust the volume level, activate the **VOLUME** menu item in the lower on-screen menu (the selected item will be displayed inversely). Adjust the level using the UP/DOWN keys. A short press increases the value by 1/3 of a scale division, while a long press increases it by 3 divisions.



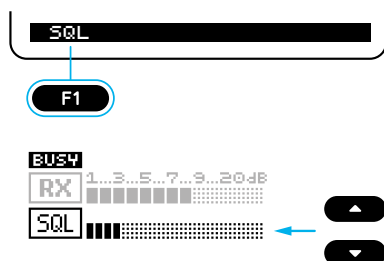


TIP: Activated functions remain active after the transceiver is turned off and on again. For example, to keep volume adjustment enabled by default, leave it active—this way, the UP/DOWN keys will adjust the volume automatically on subsequent power-ons.

Squelch Threshold Adjustment (SQL)

The squelch function suppresses receiver audio until a valid signal is received from a correspondent, eliminating background noise and radio interference. The TX-500MP transceiver supports multiple squelch algorithms: SQL (amplitude squelch), ASQ (automatic squelch), and CTCSS (continuous tone-coded squelch system).

By default, the SQL algorithm is used. Squelch is activated via the on-screen menu by selecting **SQL** and pressing the corresponding function key. The signal threshold level for opening the squelch is adjusted using the UP/DOWN keys and is displayed on the SQL scale. The **BUSY** indicator signals when the squelch opens and a valid signal is received.



Key Lock

To lock the keypad, activate the **VOL/LCK** menu item in the lower on-screen menu by pressing and holding the corresponding function key. A lock icon will appear on the display. To unlock, press and hold the corresponding function key again.

VFO MODE

In VFO mode, users can adjust the frequency, select modulation, set filter bandwidth, and configure other parameters. VFO mode is the default operating mode. To switch to VFO from channel mode, select the **VFO** option in the on-screen menu by pressing the corresponding function key.

VFO Mode Display:



Frequency Adjustment

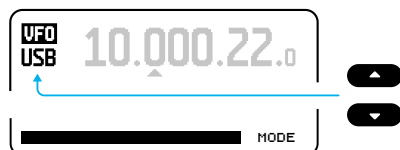
Frequency adjustment is performed using the UP/DOWN keys, modifying the digit currently selected by the cursor.

To move the cursor, activate the **FREQ** function using the corresponding function key. Move the cursor over the desired frequency digit using the LEFT/RIGHT keys, then change the value using the UP/DOWN keys. Deactivate the **FREQ** function by pressing the function key again.



Modulation Selection

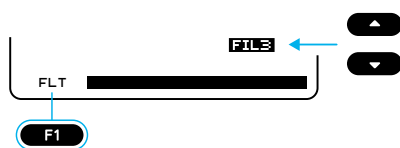
Activate the **MODE** option in the on-screen menu. Use the UP/DOWN keys to select the desired modulation (USB, LSB, CW, CWR, DIG, AM, FM). Deactivate the **MODE** function by pressing the function key again.



Filter Bandwidth Adjustment

To reduce interference and noise, a narrower bandwidth may be required, while a wider bandwidth improves signal reproduction accuracy. The transceiver provides four filter width settings for RX mode and two for TX mode.

To select a filter, activate the **FLT** option in the on-screen menu. Use the UP/DOWN keys to set the desired filter; the corresponding filter number will be displayed on the screen. The setup procedure for TX mode is the same.



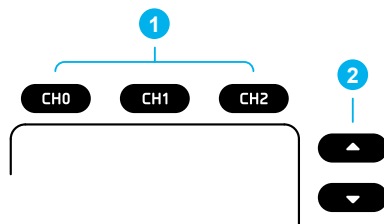
CHANNEL MODE (CH)

In channel mode, users can access 100 programmable memory slots—channels, each storing frequency, modulation, and other settings.

Channel mode (CH) can be activated if channels have been pre-saved, using one of the following methods: pressing one of the quick access keys (CH0, CH1, CH2) or selecting **CH** in the on-screen menu using the corresponding function key.

Channel Switching

1. Quick Switching: Use the quick access keys to switch between the first three channels. The currently active channel will be marked with a special icon on the screen.
2. Default Mode: If no other functions are active, the UP/DOWN keys allow circular channel switching.



Active Channel Search

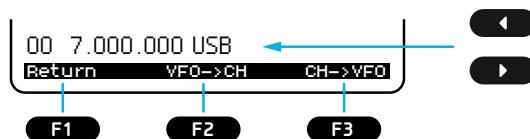
The transceiver features an automatic active channel scan function (SCAN), which sequentially scans channels until it detects an open squelch, indicating a valid signal.

To activate this function, press and hold the UP/DOWN keys. While scanning, the **SCAN** indicator will be displayed on the screen.

Channel Management:

Saving and recalling settings to/from a channel is performed in VFO mode. To do this, activate the CH option in the on-screen menu by pressing and holding the corresponding function key.

Select the channel number to work with using the LEFT/RIGHT keys.



- To save current VFO parameters to the selected channel, press function key F1 → **VFO->CH**
- To transfer the selected channel's settings to VFO, press function key F2 → **CH->VFO**
- To exit channel management, press function key F1 → **Return**

TRANSMISSION SETTINGS

Voice Mode

- **Modulation Selection:** Activate the **MODE** menu item in the on-screen menu using the corresponding function key. Use the UP/DOWN keys to set the required voice modulation: SSB, AM, FM. Exit the **MODE** menu by pressing the function key again.
- **Self-Monitoring (MON):** The self-monitoring (MON) function allows the operator to hear their own signal during transmission. To enable it, go to the main menu, select **MONITORING**, and set the value to **ENABLE**. When active, the **MON** icon will appear on the main screen. The monitoring volume level is adjusted in the same way as the transmission (TX) volume level.



Do not use the handheld speaker-microphone simultaneously with the MON self-monitoring function in voice modes: USB, LSB, AM, FM.

- **Microphone Level Adjustment:** In the main menu, select **GAIN > MIC** and adjust the value using the UP/DOWN keys. A typical microphone level setting is 25.
- **Speech Compressor (CMR):** The speech compressor (CMR) function equalizes the transmitted audio signal by amplifying quiet sounds and attenuating loud ones. This improves speech clarity, especially in variable noise conditions. To enable CMR, go to the main menu, select **COMPRESS**, and set the value to **ENABLE**. The **CMR** icon will appear on the main screen. Compression level is adjusted in the **CMR LEVEL** section using the UP/DOWN keys. **Avoid setting excessively high values, as this may distort the audio.** Start with low values and gradually increase to achieve optimal results.
- **POWER:** The output power level is adjustable between 10% and 100% in the **POWER** menu section. **Do not use MIC gain to set power levels.** Set the microphone level to a fixed value as described above.
- **Voice-Activated Transmission (VOX):** The VOX function automatically activates transmission when a sound signal is detected, eliminating the need to press the PTT button. To enable VOX, go to the main menu, select **VOX > MIC**, and set the value to **ENABLE**. The **VOX** icon will appear on the screen. Signal hold time is adjusted in the **VOX LVL > MIC** menu (value in milliseconds). The VOX level should be set to trigger at a normal speech volume, not random noise. Start with low values (80-90).
- **VOX as Keying Method:** The VOX switch allows selecting between VOX or PTT for transmission and reception in CW mode. Many operators use VOX for quick switching when using a telegraph key or paddle. To enable VOX in this mode, go to the main menu, select **VOX > CW**, and set the parameter to **ENABLE**. The **VOX** icon will appear on the main screen. VOX delay time is configured in the **VOX LVL > MIC** menu (value in milliseconds).
- **CTCSS Tone Squelch:** This squelch system is used in FM mode to eliminate unwanted noise and signals from other radios operating on the same frequency. CTCSS adds a subaudible tone (specific frequency tone) to the transmitted signal, which opens the squelch on the receiver only if the tone matches exactly.

To enable CTCSS in transmit mode (TX), activate the **T-CT** menu item in the lower on-screen menu. The **T-CT** icon will appear on the screen. To configure the subaudible tone, go to the main menu, select **CTCSS > TX** and set the tone frequency using the UP/DOWN keys.

Telegraphy Mode

- **CW Modes (CW, CWR):** To select telegraphy mode, activate the **MODE** menu item in the on-screen menu and choose either CW for standard operation or CWR for reverse mode, which can help mitigate interference from received signals in certain cases.
- **CW Pitch:** Set the sidetone frequency in the CW Pitch menu item within the main menu. The ideal sidetone frequency for most operators is between 600-700 Hz. The receiver's bandwidth will be centered on the selected frequency. Mode **MON** is activated.

Digital Mode

- **DIG Mode:** To select a digital communication mode, activate the **MODE** menu item in the on-screen menu and choose DIG.
- **GAIN:** Set the output level for DIG mode in the main menu under **GAIN > DIG**. The initial recommended setting for DIG level is 20.

RECEPTION SETTINGS

- **RF Gain Adjustment:** The RF GAIN setting is usually left at level = 0. Reducing RF gain can be useful in situations with strong signals or when using digital modes. The gain level is adjusted independently for SSB/LSB, CW/CWR, DIG, AM, and FM modes in the RF section of the main menu..

Squelch Control: The squelch function is activated via the **SQL** menu item by pressing the corresponding function key.

The TX-500MP transceiver includes several squelch algorithms:

1. **SQL (Amplitude Squelch):** This algorithm automatically mutes the receiver audio when the signal is below the set threshold and unmutes it when a sufficient signal level is detected, "opening" the squelch. This is the default algorithm.

The squelch threshold level is adjusted by activating the **SQL** menu item and using the UP/DOWN keys or via the SQL main menu item for SSB/AM and FM modes independently.

2. **ASQ (Automatic Squelch, FM mode only):** This algorithm analyzes the signal based on its frequency spectrum, distinguishing the operator's speech from radio noise and interference. When a valid signal is detected, ASQ automatically opens the squelch.

To activate ASQ, set the "SQ for FM" menu item to "ASQ" in the main menu.

3. **CTCSS (Tone-Coded Squelch, FM mode only):** A sub-tone code-based squelch system that opens the receiver squelch only when the received code exactly matches the transmitter's code.

To activate CTCSS in RX mode, enable the **R-CT** menu item in the lower on-screen menu. The **R-CT** icon will appear on the display.

To set the tone frequency, go to the "CTCSS > RX" section in the main menu and use the UP/DOWN keys to select the desired frequency.

- **Virtual Intermediate Frequency (DIF):** This setting defines the receiver mode and is activated in the main menu under DIF.

ENABLE: This is the standard operating mode using all DSP radio functions. In this mode, a virtual intermediate frequency is offset from the working frequency by several kHz.

DISABLE: When DIF is disabled, the transceiver operates in direct digital conversion mode with slightly reduced performance characteristics.

Filter Selection (FILTER): The filter selection function allows adjusting the reception bandwidth. A narrow bandwidth reduces interference (QRM) and noise (QRN), while a wider bandwidth improves signal clarity.

The RX mode provides four filter settings. To select a filter, activate the **FLT** menu item in the on-screen menu and use the UP/DOWN keys to choose the desired filter. The corresponding filter number will be displayed on the screen.

- **Preamplifier/Attenuator (PRE/ATT):** The preamplifier (PRE) should only be used for very weak signals. The attenuator (ATT) activates a 20 dB RF attenuator, which protects the receiver from strong interfering signals.

To enable/disable these functions, activate the **PRE/ATT** menu item in the on-screen menu and use the UP/DOWN keys to set the desired value. The **PRE/ATT** icon will be displayed on the screen accordingly.

- **Noise Reduction (NR):** The NR function removes random background noise (hissing or static), producing a characteristic "muffled" sound. Higher settings may weaken weak signals.

The function is activated via the NR section in the main menu, and an **NR** icon will be displayed to indicate activation.

- **Noise Blanking (NB):** The NB function suppresses repetitive noise sources such as power lines, household appliances, and vehicle ignition systems.

The function is activated via the NB section in the main menu, and an **NB** icon will appear on the display

- **Notch Filter (NF):** In SSB and AM modes, the Notch Filter (NF) activates an automatic notch filter that detects and suppresses one or more interfering carrier frequencies. The function is activated via the NB section in the main menu, and an **NF** icon will be displayed.

Two NF filtering algorithms are available:

1. **Type 1** – Standard algorithm providing high-quality filtering.
2. **Type 2** – High-performance filtering algorithm with lower signal processing latency.

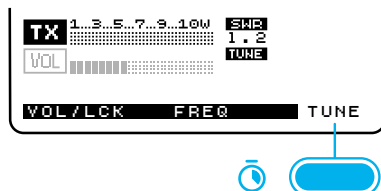
The filter type is set in the "NOTCH FIL" section of the main menu.

ANTENNA TUNER (ATU)

The TX-500MP transceiver is equipped with a built-in antenna tuner (ATU) that matches antennas with different impedances. By default, the tuner is in bypass mode (BYPASS) and inactive. To enable the tuner, press the function key corresponding to the **TUNE** menu item in the transceiver's on-screen menu. The **ATU** indicator will appear on the display.

To start tuning, press and hold the TUNE function key. During tuning, the **TUNE** indicator will be displayed. Once tuning is complete, the current SWR value will be shown briefly on the screen.

To disable the tuner and switch back to bypass mode, press the **TUNE** function key again. The ATU indicator will turn off.



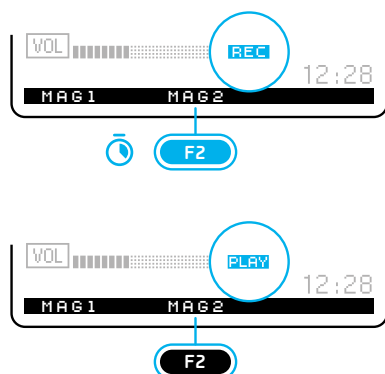
Advanced Control

RECORDER FUNCTION

The transceiver supports the recording and playback of short voice or telegraph messages up to 20 seconds long. Two separate memory slots are available for storing each type of message.

Record: Messages are recorded in the corresponding modes: USB/LSB/FM/AM for voice and CW/CWR for telegraph. To start recording, press and hold the corresponding "MAG" button (1 or 2) for more than one second. The **REC** indicator will appear on the screen, after which you can dictate the message. To stop recording, press the same "MAG" button (1 or 2) again.

Play back: To play back a recorded message, briefly press one of the "MAG" buttons (1 or 2). The **PLAY** icon will appear on the screen. Pressing the button again will stop playback.



Do not use the handheld speaker-microphone together with the MON self-monitoring function. This may cause significant sound distortion and noise.

CW TEXT MESSAGE

The transceiver features a Morse code text message encoding function.

To enter a message, press and hold the "CWST" option to activate it. Use the "Sel" key to position the cursor in the text line. Select characters using the UP/DOWN keys. Complete the input by pressing Return.

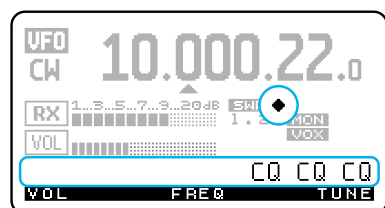
To play back the message, briefly press the "CWST" key.

CW DECODER

The transceiver supports decoding of telegraph messages during both reception and transmission. This function is activated in the main menu under the "CW DECOD" option, and the decoded output will be displayed in the bottom line of the screen. For correct operation, precisely tune to the correspondent's CW tone frequency using the CW tone match indicator.

To enable decoding for reception: Navigate to the "CW DECOD" menu item. Use the SubMenu F-key to select the "RX" mode. Set the "ENABLE" parameter.

To enable decoding for transmission: In the "CW DECOD" menu item, use the SubMenu F-key to select "TX." Set the "ENABLE" parameter.



BEACON MODE

Beacon mode allows for the automatic transmission of pre-recorded messages from the "MAG1" recorder memory slots or "CWST" text CW messages at preset time intervals from 1 to 240 seconds.

To activate beacon mode: Navigate to the main menu item "BEACON." Select the desired beacon mode: CW (telegraph) or MIC (voice). Use the UP/DOWN keys to set the desired signal repetition interval from 1 to 240 seconds. To disable beacon mode, set the value to "Disabled".

When beacon mode is active, the  icon will be displayed on the screen.

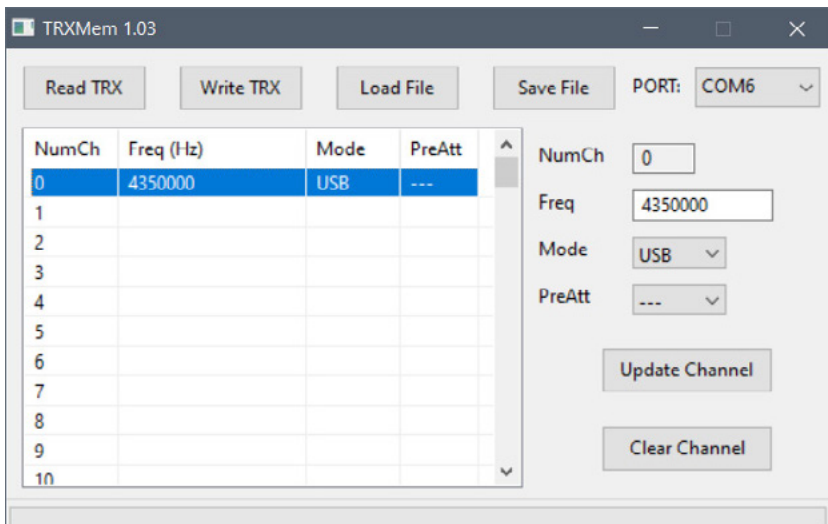
To interrupt automatic transmission: Press the MAG1 or MAG2 key. Press the telegraph key in CW mode. Press the PTT button in voice mode.

CHANNEL PROGRAMMING VIA PC

To manage channels on a PC, use the TRXMem utility. The latest version for your operating system is available for download at lab599.com in the Downloads section.

Getting Started

1. Enable the CAT protocol "LAB599" in the transceiver settings for full compatibility.
2. Connect the transceiver to the computer using the CAT-USB adapter from the package. Ensure that a new COM port appears in the system.
3. Launch the Lab599-TRXMem utility corresponding to your operating system, and select the appropriate COM port from the "PORT" dropdown.



Loading and Saving Settings:

- Read TRX – load the current channel settings from the transceiver.
- Save to File – save the current channel settings to a file (.mem).
- Read File – read previously saved settings from a file (.mem).
- Write TRX – write the loaded or edited channel settings to the transceiver.

Channel Management:

1. Click "Read TRX" to load the current settings.
2. Select the desired memory cell (1–100).
3. In the "Freq" field, enter the desired frequency (in Hz).
4. In the "Mode" dropdown, select the desired modulation.
5. If necessary, activate "ATT/PRE" (enable the preamplifier or attenuator).
6. Click "Update Channel" to save the changes to the selected memory cell.
7. "Clear Channel" – reset the settings of the selected memory cell.
8. After making all changes, click "Write TRX" to transfer the data to the transceiver.
9. To verify, click "Read TRX" and make sure the changes were applied.

RESET TO FACTORY DEFAULTS

To reset user settings to factory defaults, turn on the transceiver by **pressing POWER key while holding the F1 key** until the boot process completes.

Resetting user settings does not affect previously saved channels.

For a full reset, turn on the transceiver by **pressing POWER key while holding both CH0 and F1 keys** until the boot process completes. All user settings and channel data will be erased.

Firmware Update

The latest firmware version and update utility can be downloaded from the Downloads page at www.lab599.com. Updates are cumulative, meaning you can install the most recent version directly without applying previous updates sequentially.

 *Firmware updates require connecting external power directly to the transceiver using the included power cable, even if the Battery Pack is connected – in bootloader mode, the transceiver doesn't sync with the Battery Pack, which shuts down after 10 seconds without feedback.*

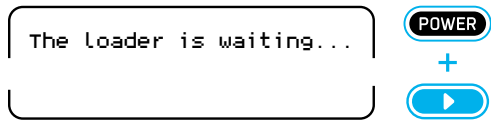
Checking the Current Firmware Version:

The transceiver's firmware version is displayed for a few seconds on the startup screen in the bottom line immediately after powering on.



Firmware Update:

1. Download the latest firmware version.
2. Connect the CAT-USB adapter (AD-502) to your computer and make sure a new COM port appears in the system.
3. Connect the CAT-USB adapter (AD-502) and an external power source to the transceiver using the PWR/DATA/CW adapter (AD-511).
4. Enter the bootloader mode – **Hold the RIGHT button** and turn on the transceiver using the **POWER button**. The message “The loader is waiting...” will appear on the screen.



5. Launch the TRX-Update utility. Select the downloaded firmware file (.fw) and specify the COM port.
6. Click the “Update” button. The update process will be displayed on both the computer screen and the transceiver display. Do not turn off the computer or the transceiver until the update is complete.
7. Once the update is complete, turn off and then turn on the transceiver.
8. Check the firmware version when powering on.

Menu Functions

01. Power Output Power Level

The output power level is set as a percentage (%) of the maximum power, ranging from 10% to 100%.

Default: 100%

02. RF RF Gain Level

The gain level is adjustable independently for each mode: CW / SSB / DIG / AM / FM. Select the mode using the SubMenu F-key and adjust the value within the range of -50 to +5 based on personal preference and reception conditions.

Default: 0

03. Gain MIC / DIG Level (in TX Mode)

- › **MIC:** Microphone level, adjustable between 1 and 100.
- › **DIG:** Digital mode level, adjustable between 1 and 100.

Default: MIC = 25; DIG = 20.

04. METR Display Mode (in TX Mode)

Select the display mode: PWR / MIC / DIG. This setting allows displaying a graphical scale for the corresponding mode.

Default: PWR.

05. AGC Automatic Gain Control

This setting defines the reaction speed of the AGC system: slow to fast. It is adjustable separately for each mode: CW, SSB, and AM, based on personal preferences and reception conditions. The range is from 1 (slow response) to 10 (fast response).

The AGC setting is saved for the current mode and does not change when adjusting AGC in other modes.

Defaults: CW = 5; SSB = 3; AM = 3.

06. MON Enabling Self-Monitoring

Set the value to ENABLE or DISABLE to activate or deactivate the self-monitoring function. When activated, the **MON** indicator will appear on the screen.

Defaults: DISABLE



Do not use a manual speaker-microphone simultaneously with the self-monitoring function MON in voice modes (USB, LSB, AM, FM).

07. CMR Enabling Speech Compressor

Set to ENABLE or DISABLE to activate or deactivate the speech compressor function. When activated, the **CMR** indicator will appear on the screen. The level is adjusted in the CMR Level menu.

Default: ENABLE

08. CMR LVL Speech Compressor Level (SSB only)

Adjust in the range from 1 to 100 based on personal preferences and reception conditions. Typically, the maximum compression level is 40.

Default: 5

09. EQL Equalizer

The equalizer allows adjusting the levels of high (HF), mid (MF), and low (LF) frequencies for both TX and RX modes independently.

➤ **Select RX or TX mode** using the SubMenu F-key.

➤ **Select the channel:** HF, MF, or LF using the Sel F-key.

Adjust the level between 1 and 100 to suit your preferences. For TX mode, you can activate the self-monitoring function (MON) to monitor the settings.

По умолчанию RX: HF = 50; LF = 100; MF = 75.

TX: HF = 100; LF = 100; MF = 100.

10. VOX Enabling Voice Control

Select the CW, MIC, or DIG mode using the SubMenu key and set the value to ENABLE or DISABLE to activate or deactivate voice control. When activated, the **VOX** indicator will appear on the screen.



In CW mode, activated VOX may switch the transceiver to transmit (TX) mode.

11. VOX LVL VOX Level

Select MIC or DIG mode using the SubMenu key and adjust the VOX activation threshold between 1 and 100. A lower value means less signal is required to activate VOX.

Default: MIC=50; DIG=50.

12. VOX DLY VOX Delay

Select CW, MIC, or DIG mode using the SubMenu F-key and adjust the delay value between 100 ms and 10 seconds (with 100 ms increments).

A higher CW VOX delay (e.g., 400 ms) reduces relay clicks. A 100 ms delay enables a fast Semi-Break-in mode.

Default: CW = 400 ms; MIC = 1000 ms; DIG = 100 ms.

13. NB Enabling Noise Blankering

The Noise Blanking function helps eliminate repetitive noises, such as those from power lines, devices, and vehicle ignition systems.

Set to ENABLE or DISABLE to turn the function on or off. When activated, the **NB** indicator will appear on the screen. The level can be adjusted in the menu item NB Level.

Default: DISABLE

14. NB LVL NB Level

Adjust the filter level between 1 and 100 for optimal noise suppression.

Default: 50

15. NR Enabling Noise Reduction

The Digital Signal Processing (DSP) function for noise reduction is most effective in CW mode and may slightly reduce signal accuracy in SSB mode.

Set to ENABLE or DISABLE to activate or deactivate the noise reduction function. When activated, the **NR** indicator will appear on the screen. The level can be adjusted in the menu item NR Level.

Default: DISABLE

16. NR LVL Noise Reduction Level

Adjust the level between 1 and 100 to balance noise suppression with signal accuracy.

Default: 50

17. NF Enabling the Notch Filter

The Notch Filter is an automatic notch filter that detects and removes interfering tones in SSB and AM modes.

Set to ENABLE or DISABLE to activate or deactivate the function. When activated, the **NF** indicator will appear on the screen. Select the filter type in the menu item NOTCH FIL.

Default: DISABLE

18. NOTCH FIL Notch Filter Type

The transceiver has two types of bandpass filters:

- › **Type 1** – Standard mode, providing high-quality filtering;
- › **Type 2** – High-performance mode, with lower latency.

Default: 1

19. SQL Noise Reduction Threshold in SSB/AM/Fm Modes

Select SSB/AM or FM mode using the SubMenu F-key and adjust the threshold value between 1 and 100. The SSB/AM setting also applies in DIG mode.

Default: SSB/AM = 0; FM = 0.

20. SQ FOR FM Noise Reduction Algorithm in FM Mode

This setting allows you to select the noise reduction algorithm in FM mode:

- › **SQL** – Amplitude noise reduction;
- › **ASQ** – Automatic noise reduction.

Default: SQL

21. CTCSS Tone Noise Reduction

The CTCSS noise reduction system operates by transmitting a sub-audible tone on the communication channel, which activates noise reduction when matched on the

receiver. Set the tone frequency independently for TX and RX modes.

Select TX or RX mode using the SubMenu F-key and adjust the tone frequency between 67 and 254 Hz.

Default: 100

22. DIF Virtual Intermediate Frequency

Due to the nature of internal signal conversion, several frequencies may emerge as tones that interfere with reception at specific frequencies. In such cases, we recommend using the DIF function. This mode uses a virtual intermediate frequency that is offset by several kHz from the operating frequency.

Set to ENABLE or DISABLE to activate or deactivate the function. When activated, the **DIF** indicator will appear on the screen.

Default: Disable

23. FREQ REF TCXO Frequency Adjustment

This setting allows for frequency correction of the internal reference oscillator (TCXO 24.576 MHz) if necessary.

Adjust the value in the range from -1000 to +1000 Hz in 1 Hz increments.

24. VFO AM/FM AM and FM Mode Enable/Disable

Many operators do not use AM or FM modes below 29 MHz, especially in Region 1, where IARU recommendations advise against using these modes below 29 MHz.

Set ENABLE or DISABLE to enable or disable AM and FM in VFO mode.

Default: Enable.

25. CW KEY CW key Mode

- › **Type:** Single (manual key) or Auto (electronic);
- › **Auto:** Iambic A or Iambic B;
- › **Rev:** Reverse keying, Disable or Enable.

Default: Type = auto; Auto = Iambic A; Rev = Disable.

26. CW PITCH CW Tone Frequency

Set the tone frequency in the range from 400 Hz to 1200 Hz based on individual preferences and operating conditions.

Default: 700Hz

27. CW SPEED Automatic CW Key Speed

This setting defines the speed of the built-in automatic keyer in characters per minute (CPM). Adjust the speed in the range from 30 to 300 CPM (2–60 WPM).

Default: 100 cpm (20 wpm)

28. CW WEIGHT Dot-to-Dash Ratio

Select the dot-to-dash ratio from 2:1 to 4.5:1

Default: 3:1

29. CW DECOD CW Decoder

The transceiver includes a CW message decoding function in both RX and TX modes.

Select the decoder mode (TX or RX) using the SubMenu F-key and set to ENABLE or DISABLE to activate or deactivate the function. Decoded characters will appear in the lower line of the main screen.

Default: DISABLE

29. CWST Character input of a CW message

Enter text messages for automatic conversion to Morse code and transmission in CW mode.

To input a message:

1. Use the Sel F-key to position the cursor in the text field;
2. Select characters using the UP / DOWN keys.

30. BEACON Beacon Mode

This function allows automatic transmission of recorded voice and CW messages at specified intervals.

Select CW or MIC mode using the SubMenu, set the delay in seconds from 1 to 240. To disable the function, set to DISABLE.

Default: DISABLE

31. BACKLIGHT Display Backlight Brightness

- › **dimly:** low backlight;
- › **brightly:** high backlight;
- › **auto:** by default, low backlight; pressing any key briefly activates the high backlight.

Default: Brightly

32. CONTRAST Display Contrast

Adjust the value in the range from 0 to 50.

Default: 21

33. BEEP KEY Keypress Sound

Set to ENABLE or DISABLE to activate or deactivate the sound signal when pressing keys.

Default: Enable.

34. TIME Clock Setup

Select the Hour / Min (hours / minutes) parameter using the SubMenu F-key, and adjust the value using the UP / DOWN keys.

35. TIME CORR Clock Correction

This setting allows for clock correction if the time drifts. Adjust the value in the range from -63 to +126.

Default: 0.

36. CAT Protocol CAT Protocol Version

The transceiver supports two versions of the CAT protocol for compatibility with various software:

- › **TS2000:** compatibility with the Kenwood TS-2000 protocol command set;
- › **LAB599:** extended command set based on the Kenwood TS-2000 protocol.

Default: TS2000

Safety and Protection

SAFETY REQUIREMENTS

- Do not connect power sources with specifications that do not match the required ones, as well as non-standard (DIY) power sources.
- It is prohibited to connect an antenna to the device during lightning discharges, as well as during strong gusts of wind that cause static discharges.
- It is prohibited to wrap or cover the device during operation.
- It is prohibited to leave the device unattended while a power source is connected.
- Immediately turn off the device in case of smoke, a burning smell, or a significant increase in ambient temperature in the room where the device is located.
- The device must not be accessible to children.

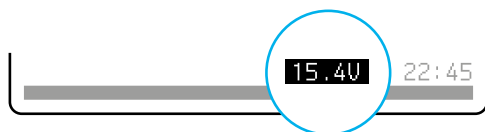
PROTECTION

Overvoltage Protection

If the voltage exceeds 15.0 volts, the transceiver will not allow switching to transmit mode (TX), and the voltage indicator on the display will change to an inverted color scheme. A significant excess (more than 16 volts) may cause the fuse to blow and damage the transceiver! Use a power source or battery with a voltage of 9 to 15 volts and a current of at least 2.5 amperes.



WARNING! Exceeding the supply voltage above 15 volts may damage the transceiver!



Reverse Polarity Protection

If you connect a negative power source or battery instead of a positive one, the transceiver will not turn on. This protection prevents operation but does not cause permanent damage to the device. You must correctly connect the external power source (see the power connector pinout in the "Controls and User Interface" section).

Overheating Protection

The transceiver has internal protection against overheating of the transmitter's output stage. If the device remains in transmit mode for too long, the output stage and the housing may heat up. If the limit value (about 60°C) is exceeded, the transceiver will not allow switching to transmit mode. Once the temperature drops, the transmission restriction will be automatically disabled.



WARNING! In prolonged transmit mode (digital modes), do not obstruct airflow to the rear panel of the transceiver and/or reduce power output..



TIP: Extend both rear legs to enhance air convection..



High SWR Protection

If the antenna impedance differs from 50 ohms and an antenna tuner is not connected, the SWR indicator on the display will show a value greater than 1.0. If the SWR value is 3.0 or higher (the SWR indicator on the display will change to an inverted color scheme), the transceiver will automatically reduce output power. If the SWR value exceeds 3.0, the output power will be further reduced.



WARNING! Ideally, use a tuned antenna with a wave impedance of 50 ohms (maximum output power) or use a matching device (automatic or manual tuner).



The content may be changed.

The current version of the manual is available at the link:
lab599.com/downloads/



If you have any questions about this document,
please contact Lab599 support: support@lab599.com



www.lab599.com