PreppComm
Amateur Radio

The MMX Multi-Band Morse Code Transceiver With keyboard

Morse Made Easy™

With Industry-Leading High Noise Immunity Decoder

Frustration-Free Morse Code At Last!

Introducing the new **MMX Multi-band Transceiver** from **PreppComm**! Configurations of one to three bands, with 80, 40, and 20 meter plug-ins available.

The **MMX** is a completely self-contained QRP multi-band capable transceiver, with keyboard input for control and text, a color GUI touchscreen for navigation, control, and display of transmitted and received text, and display of functions and menus, 28 screens in all.

There are many unique features built into the MMX that are not available on any other transceiver on the market. It utilizes three microprocessors to provide amazing automation and functionality to make operating with CW **fun and easy**. It also provides one of the best platforms for learning to send and receive Morse Code yourself, while you actually get to use the transceiver to communicate with others!

And best of all, it's now MULTI-BAND!

Controls and Input/Output

Front Panel

Rear Panel

Unique Features

- **License-based transmitter limits**: during station setup, you indicate your license level, and this info is used to prevent accidental transmission on unlicensed frequencies
- **Automatic capture of received station call letters**: based on normal code sequence during station ID's
- **Auto analysis of received code speed and hand:** after a short period of capturing a sample of the received code, all captured data is decoded and displayed - nothing is lost during the auto analysis period.
- **Transmit speed automation**: the MMX calculates your comfortable typing speed, and uses it to throttle the transmitter if the received speed exceeds it. Otherwise, transmit speed is set to received speed.
- **76 character pop-up type-ahead buffer:** with transmit speed throttled, the operator can utilize the type-ahead buffer, allowing time to think and correct errors before they reach the transmitter.
- **Powerful built-in CALL microprogram:** a standard General Call (calling CQ) and a Directed Call (calling a specific station) simplifies operation.
- **Powerful built-in ANSwer microprogram:** this provides a "validate-answer" function to establish two-way communication when answering a CQ, and automatic station ID for back and forth during a QSO.
- **Built-in INFO microprogram**: this single keystroke function generates a full sentence containing all the standard information: name, QTH, rig, antenna to reduce typing repetitive information.
- **Powerful Rig Programming Language (RPL):** unlike many "macro" features, RPL allows you to automate rig functions, including customizing the CALL and ANS microprograms, creating special microprograms for contests or net operations, of course text macros, and more.
- **Full 3.5" color LCD touchscreen**: 10 lines of word-wrapped color-coded text displays your outgoing text and incoming text. Interactive controls, status text, and LED's for complete confidence on the air. Everything is included, the decoder, the encoder, the controls, the receiver and transmitter in one small unit!
- **High noise immunity and selectivity**: unlike all other Morse Code decoders we are aware of, the MMX decoder can operate in high band noise environments. Selectivity is between ~90-180 Hz, so stations close together can be separately decoded.
- **Powerful code practice system**: the KEY IN feature allows transmitting both computer generated and manual code, but it also allows you to send code to the receiver. This unusual arrangement engages the built-in decoder between your keying and the display. The result is amazing - you have a clear view of how your code is perceived by others! A powerful mechanism for improving your hand!

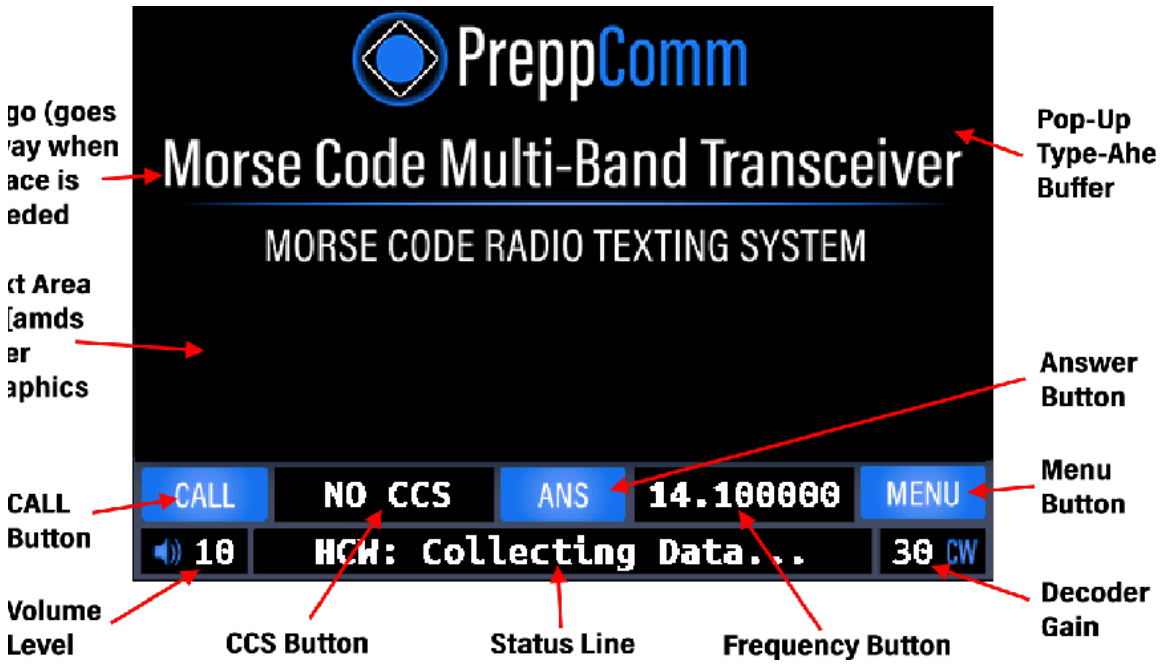
Like the MMX, the **DMX-40**
Sitting Atop its Protective Lid

The lid snaps on over the top panel, and protects the LCD and LED's from damage during transport or when not in us. The lid can also serve as a stand for the MMX during operation. A stand accessory is also available.

Specifications

- **Advanced Direct Conversion SDR Receiver**: with custom bandpass filter, balanced mixer, and low-noise preamp giving sensitivity ≈ 0.3 μV, -118 dBm or better.
- **GUI**: 3.5″ color touchscreen LCD, Main Screen plus 27 function screens.
- Included keyboard for control, text input, shortcuts
- **Weight**: 11 oz with protective lid.
- **Size**: 3.8″ x 5.2″ x (1.3″ w/o lid, 2.25″ w/lid).
- **Power Consumption**, receive: 1.4/0.96 watt, LCD backlight ON/OFF
- 80 meter band: 3.5 MHz - 4.0 MHz. SWL receiver range: 2.45 - 5.6 MHz
- 40 meter band: 7.0 MHz - 7.3 MHz. SWL receiver range: 4.9 MHz - 10.22 MHz
- 20 meter band: 14 MHz - 14.35 MHz. SWL receiver range: 9.8 MHz - 20.09 MHz
- 80M **Power Output @ 13.8V: approx. 2 W, 350 ma total power drain (key down)**
- 40M Power Output @ 13.8V: approx. 3 W, 500 ma total power drain (key down)
- 20M Power Output @ 13.8V: approx. 1.5W, 350 ma total power drain (key down)
- Key up power @ 13.8V approx. 110 ma.

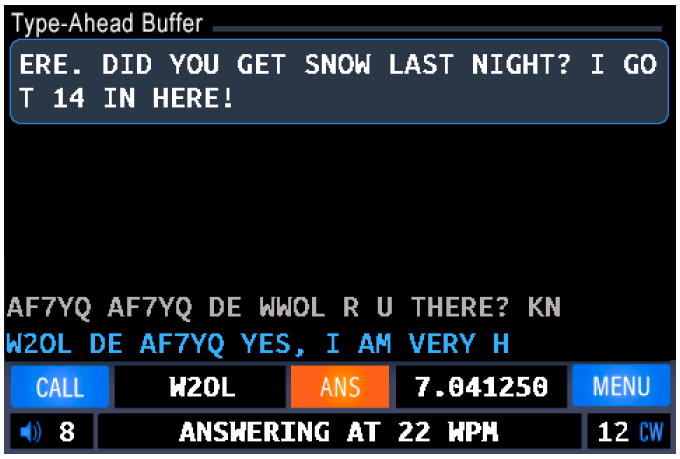
Main Screen



Main Screen: CCS is Captured Call Sign. Filled manually or from decoding a call sign. Pop-up type-ahead buffer covers top 4 lines of the screen when transmitting in ANSwer mode. Small o's in Frequency Button indicate frequency step size = 100 Hz. Button used to display RIT mode after transmit, and manual selection of 40 meter band or External Mode.

Sample GUI Screens

QSO in Progress: W2OL asked if AF7YQ was there. AF7YQ responded, with "yes, I am very here. Did you get snow last night? I got 14 in here!" Note outgoing is blue, incoming is gray. Transmitter only sent "I am very h" so far, and has to send the rest of the type-ahead buffer. AF7YQ has already pressed ANS the second time to indicate no more input is coming from the keyboard. Thus, when the last "!" Is sent, the MMX will remove the type-ahead pop-up and automatically send the station ID to hand it back to W2OL.

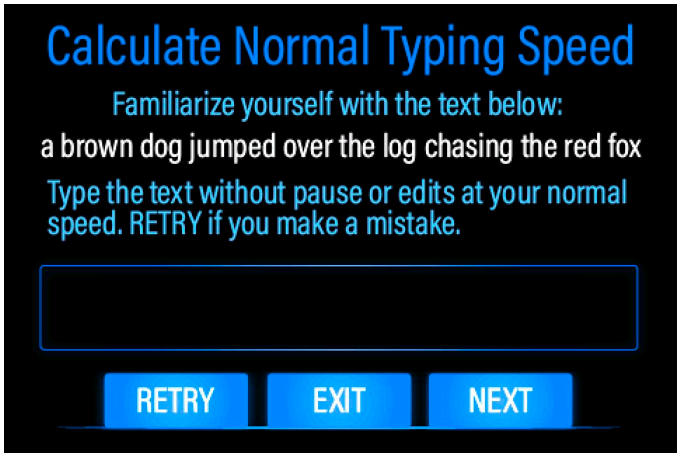


QSO in process: AF7YQ local, W2OL remote

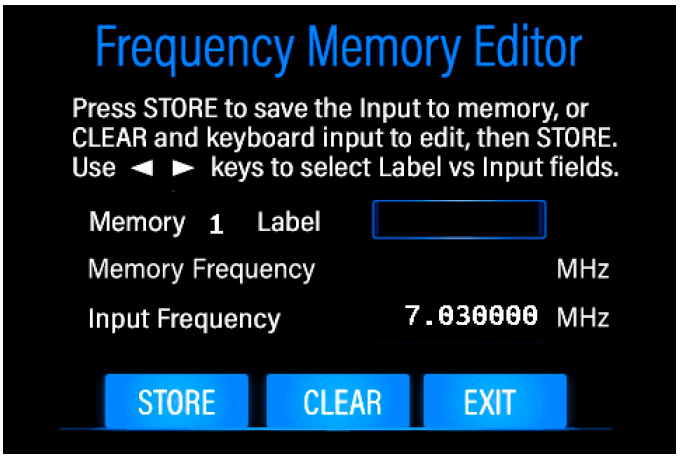
Main Menu

Main Menu, accessed from the MENU button on the Main Screen. Local Station Setup allows user to enter his call sign, name, QTH, rig and antenna, as well as license level. HELP brings up a second help menu. TYPING SPEED allows you to measure your typing speed. MHz Memories accesses the frequency memory list and editor. VFO Adjust accesses the VFO calibration screen. MICRO-PROGRAMMING access the microprogram subsystem, including the lists of microprograms and the microprogram editor.

Typing Speed: This screen allows you to type in the displayed sentence several times until you can do it without making mistakes. Then, you type it at a comfortable speed. When you complete that task, the MMX automatically switches to another screen, showing the suggested value. The suggested value is actually lower than your actual speed, because you are not typing from memory, and you think you are taking a test - both of which makes you type faster. So we compensate, so you can relax a little when typing. You can always edit the value to any value you prefer.



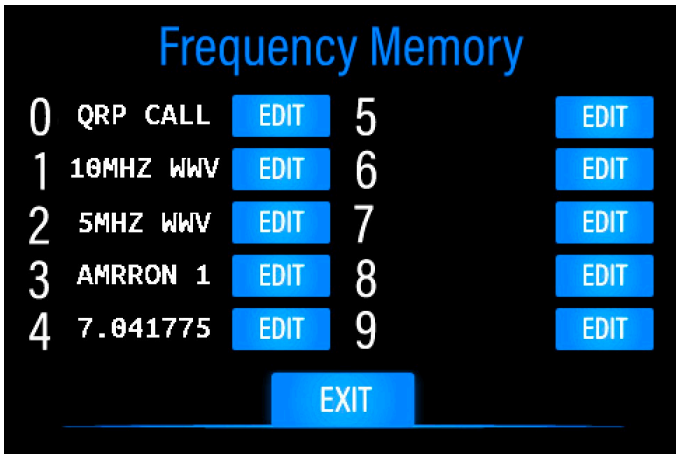
Typing Speed Calculation Screen



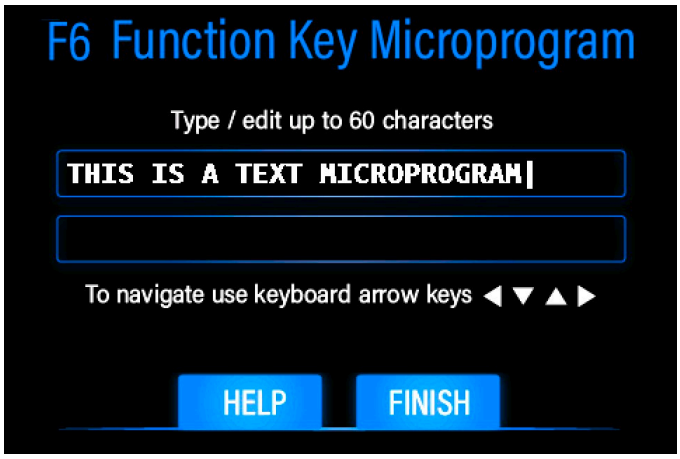
Frequency Memory Editor

Frequency Memory Editor: This screen allows you to edit the frequency value and the label for the frequency memory. There are 10 memories per band. Here, you see the value 7.03 MHz, the current value of the VFO, ready to store in memory 1, and the label field is ready to receive up to 9 characters as a label, such as QRP CALL for example. The editor is directly accessed from the keyboard via a shift-number key, or via a button on the Frequency Memory List page (see below).

Frequency Memory List: This screen shows all 10 of the available memories for the current band. Here we show both labeled memories, unlabeled memories such as memory 4, and empty memories (5-9). The EDIT buttons access the Frequency Memory Editor. Touching a label or frequency loads the VFO to that frequency and returns to the Main Screen.



Frequency Memory List



Microprogram Editor

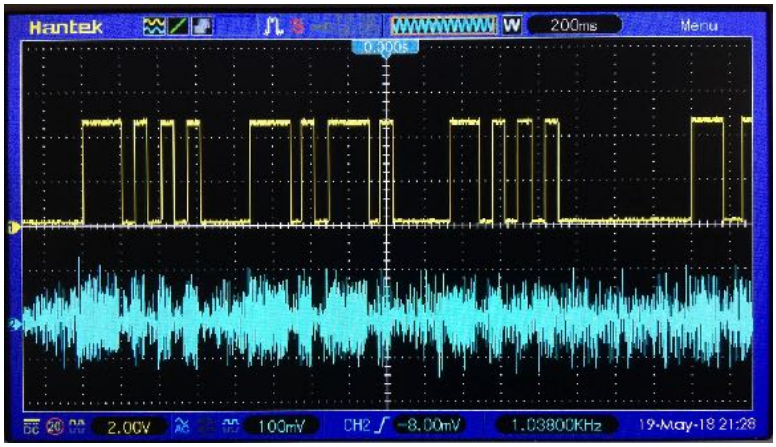
Microprogram Editor: This screen allows entering and editing microprograms of length 1 to 60 characters. While 60 characters may not seem like much, remember that all RPL commands are very short, many are single character commands. This F6 microprogram is just an example of a short text micro-program, often called a macro. Many complex and powerful functions can be created from the RPL command set plus text. This screen can be accessed via shift-Fn key, or from the Microprogram List, not shown, but similar to the Frequency Memory List, but for microprograms instead. Microprograms can also be chained or called by other microprograms, allowing much longer functions.

More Features

- **Receiver Incremental Tuning (RIT)** after transmitting, allows user to make fine adjustments without changing transmit frequency.
- **Upgrade Existing Transceivers to Full Morse Code Capability** by connecting to the AUDIO-IN and KEY-OUT connections and switching to External Mode. This eliminates the band limitation of the MMX.
- **Single Keystroke Default Transmit Speed** for first outgoing call. Alternatively, a different value can be keyed in, and the value can be optionally set as the new default.
- **Power Saving auto LCD Backlight Shut-Off** after 3 minutes of no activity to conserve battery power. Single key restores backlight.
- **Powerful and Unique Signal Processing**: The MMX combines a unique approach to the analog signal processing chain to optimize the resulting digital signal for processing by the proprietary digital signal processing. Following the digital signal processing is the hand processing algorithm, which measures 5 basic characteristics of the sender's hand, plus the speed, to ensure reliable human CW decoding. The combination allows decoding under noise band conditions, with weak signals and high N/S ratios
- **Supports Most ProSigns and International Characters**. In addition, additional codes for seldom-used characters are included.
- **Tone Out control**: The Tone Out for both computer generated and Morse key generated via the KEY-IN connector can be turned on or off, either by the keyboard or the Morse key.

Sample Scope Trace

Decoding in Noise: This scope photo shows the decoder correctly decoding a signal that is smaller than the noise. On the left side, you can see the signal fairly well. On the right side, not so much. This is what we refer to as a medium noise situation. Our decoder operates in a high noise situation, as well, where the noise is significantly stronger than the signal. This photo was taken when we first got the digital filter working. It was a true breakthrough, and it took us over a month to trust it. We checked using a lengthy logic analyzer capture when we thought it was not working. It was working fine in every case. In fact, it led us to solve some ProSigns and other code issues we didn't know we had!



Decoder Scope Trace