

## MFJ-9410 Ten-Meter Transceiver

By Bob Grove W8JHD

**A**fter successful high-power, global contacts become routine, amateur radio operators often ponder the question, what could I accomplish using only low power?

The question is answered with a bold “quite a bit!” now that the sunspot cycle is returning and the ten meter band sporadically perks with signals. Ten meters is a favorite band among many seasoned hams who have discovered that it’s not the power, but band conditions that formulate successful contacts.

While power levels of all conventional multiband ham transceivers can be reduced, it seems like overkill to possess a 100 watt transceiver and crank it down to only a few watts. Besides, that box remains big and heavy!

Several companies respond to the lure of QRP (low power communications) with cute little rigs, and this month we’re going to take a look at one of them. The model 9410 from MFJ Enterprises is an example of several low-power, single-band transceivers available from that company.

Measuring 6-1/2”W x 2”H x 5-3/4”D and weighing about two pounds, the 9410 is inviting for back packing, picnicking, mobile/portable applications, emergency contingencies, and even as an ancillary radio in the shack.



The control panel is simplicity itself. A tuning knob adjusts the frequency (28.3-28.6 MHz), and a volume control selects comfortable audio from the internal 3” speaker.

A dual-function panel meter reports incoming signal strengths in S units, and also shows the audio processing level during transmit so that the microphone gain control can be set properly.

A key jack is provided for the dedicated CW operator, although an optional break-in module is required to activate that mode. A five-pin DIN connector is provided for a 600 ohm microphone for voice operation in the upper sideband (USB) mode.

The rear panel sports a conventional SO-239 (“UHF”) female antenna connector, a microphone gain control, a standard DC power jack (12-16 VDC), a headphone jack for noisy environments or private reception, and an RCA connector to activate an external RF amplifier if higher power operation is required.

The receiver is a single-conversion superheterodyne, and it’s hot! Sensitivity is 0.15 microvolts (-6 dB @ 2.3 kHz bandwidth), so reliable weak-signal reception is no problem. Audio power to the internal speaker is 1/2 watt, and its AGC-tempered gain has 70 dB dynamic range.

Current drain in the receive mode is 150 mA; disconnecting the meter-illuminating light substantially reduces the current for battery operation.

The transmitter produces 20 watts of PEP output while drawing about 2 amps of current from a 12 volt source. Filtering reduces spurious-signal output by 60 dB, and speech enhancement is provided by RF compression (syllabic rate).

### ❖ What’s in the case?

The 9410 is fully analog; there’s not a single digital device on the circuit board (See attached photo). The receiver’s four-pole bandpass filter, followed by a low-noise amplifier, allows the 28.3-28.6 MHz spectrum to mix with a 38 MHz VFO, thus providing a 10 MHz intermediate frequency (IF) which, in turn, is shaped by a six-crystal ladder filter for a 2.3 kHz bandwidth. A 10 MHz BFO mixes with the IF signal to derive the audio.

The transmitter utilizes a conventional balanced modulator coupled to a 10 MHz LSB filter; this signal is mixed with a 38 MHz VFO to generate a 28 MHz signal. A heterodyne VFO mixes 6.3-6.6 MHz from a tunable oscillator with a crystal-controlled 32 MHz signal, which is then filtered to pass 38.3-38.6 MHz.



### ❖ Let’s try it out

As a long-time fan of ten meters, I thought that this radio looked like just the rig to take on trips. I decided that the perfect package would be to complement the MFJ-9014 transceiver with an MFJ-290 mobile mike and an MFJ-4110 AC power supply.

MFJ’s power supply configuration is interesting. The main transformer (#407-1109) converts 120 VAC to 14 VAC, not DC as with most power supplies. A separate accessory, the MFJ-4110 “adapter,” (a full-wave bridge rectifier/filter) then converts the 14 VAC to 13.8 VDC to power the transceiver.



When the package arrived, setup was quick and easy – just plug it in and turn it on! Connecting the rig to my GAP Titan all-band vertical, I surveyed the ten meter band and heard a strong signal from Texas.

With great expectations, I squeezed the mike button and called the station. He responded! How about that – this thing actually works! That was the good news.

But the signal report I received was troubling; although it was strong enough to be heard, the Texan reported distorted audio. Nothing he could be specific about, it just didn’t sound right.

Following that contact, I called another station and, sure enough, he reported distorted audio as well. Stations from California and Illinois provided the same report. Was there a problem with the rig? The mike? I decided to do some testing.

With a 50 ohm dummy load connected to the transceiver, I listened to my voice through another receiver. It sounded distant and shrill. Unfortunately, I didn’t have another mike to try, so I contacted MFJ to effect their “No Matter What™” warranty policy.

After receiving the authorization, I forwarded the rig and mike to the factory, and within days it was returned postpaid with an informative note. Apparently, a new source for microphones did not properly match this series of transceivers, but the problem was being addressed by replacements. My rig had been thoroughly tested and was returned to me with a different mike.

Impressed with the speed and personal attention I was given, I was eager to put the transceiver on the air. I wasn't disappointed.

The first station I called – another Texan – immediately responded and gave me a strong signal report with excellent audio! The rig was fine – the mike had been the problem all the time. And as I finish this review, I've just gotten off the air after an enjoyable contact with a station in Minnesota who also gave me a fine signal report.

I'd have to look pretty hard to find fault with this rig. While it does drift slightly in frequency over time, a touch of the front-panel's fine-tuning control easily compensates for that. But after all, it's an analog oscillator, not crystal-synthesized, and the small drift is certainly tolerable.

## ❖ The bottom line

It's cute, it works well, and it's priced right. Nothing more needs to be said other than to listen for me on ten meters with my new MFJ-9410!

MFJ-9410 transceiver MFJ-290 mike, \$289.95; MFJ-4110 power supply, \$59.95. Also available from Grove Enterprises.

## KAITO KA801 REVIEW

Many small, portable, AM/FM radios have been made with shortwave added as a secondary feature. It's always a pleasure to introduce a model that considers shortwave an important primary feature. Such is the new Kaito KA801, a thin pocket portable with many assets going for it, including a sturdy, soft-finished case.

It's small and light, measuring 4.3"H x 2.6"W x 0.6"D and weighing only 4 ounces, making it an attractive accessory. The backlit LCD is large and bold, viewable from several angles. A flip-out stand allows vertical positioning for bedside or desktop viewing. A soft velvet draw-string pouch is included for carrying the radio safely.

The 801 has full 87-108 MHz FM stereo (a set of stereo ear buds is included) and 520-1710 kHz AM coverage, as well as 2.3-23 MHz shortwave AM. An internal ferrite loop captures the AM signals, and a telescoping whip captures the FM and shortwave broadcasters.

225 memory presets allow storage of favorite frequencies – 100 on MW and SW, and 25 on FM. An AC adapter charges the internal, replaceable,



3.7V lithium battery. Battery charge life is approximately 8 hours of playing time.

Station tuning methods may be selected to suit your fancy – key-activated up or down automatic searching, or thumbwheel manual tuning. Successive presses of the SW key provides band stepping through the shortwave broadcast bands.

All settings may be locked by a sliding key on the side of the radio.

## ❖ MP3/WAV capability

Whether you want to use the digital recorder function for voice notes, recording off air, or loading your favorite stereo music from a computer, up to 2 GB of files may be recorded in its internal memory: that's some 140 hours at 32 kps. A standard USB2.0 connector allows interfacing to a computer.

## ❖ A busy LCD

The large display is loaded with information, which changes depending upon the mode of operation currently selected. In power-off status, battery charge level, local time to the second, as well as month and day are shown. An alarm/sleep timer function is included and can activate recording.

During shortwave operation, the frequency in megahertz (5 kHz increments), meter band, time, and relative signal strength (for the first ten seconds of new signal reception) are displayed. On medium wave, frequency in kilohertz, time, and relative signal strength (for the first ten seconds of new signal reception) are shown.

The MP3 recorder/player function shows folder and file numbers, volume level, playing status and playing time.

## ❖ The bottom line

I enjoy having this electronic companion with me when I take my collies for a walk. Its audio is clean and crisp from its internal speaker, and I can plug in the ear buds (provided) for personal listening, or stereo MP3/WAV and FM reception.

For longer periods away from my musical CDs, I can load hours of classical music into the MP3/WAV memory.

While no portable shortwave receiver will provide the performance of a dedicated desktop



receiver connected to an outdoor antenna, the 801 gives a good accounting of itself. Just extend the 13" telescoping whip and prepare for global reception of the stronger international broadcasters.

Local AM reception is certainly acceptable as well, and the internal ferrite bar antenna offers sharp rejection of unwanted interference as the radio is rotated in its upright position.

All in all, this radio is a real pleaser at an extraordinarily low price. The Kaito KA801 is available for only \$79.95 at Grove Enterprises.

## SANGEAN CL-100 AM/FM/WEATHER RADIO

What? Another clock radio? Well, yes and no. Yes, this compact bedside accessory does tell the time, and it can be set with its alarm, snooze, and sleep time functions, and it does receive AM and FM broadcasts, but it also contains a weather receiver with SAME alert for your specific location. All NOAA weather channels are stepped through at the press of a panel key. In fact, virtually all functions are selected by easy key presses.

A 22" telescoping whip antenna, which can be swiveled to any position, assures optimum FM and NOAA weather reception. For even greater signal strengths, a pair of antenna and ground screw terminals is provided for an external AM antenna, and an RCA jack allows the connection of an external FM/weather antenna.

There are five memory channels each for AM and FM stations, with an autosearch function included. Station formats are displayed (name, radio text message), as are clock time and date. Three LEDs visibly announce the presence of weather warning, advisory, and watch transmissions. The wide-viewing-angle LCD display has both brightness and contrast controls.

Three separate 1/8" (3.5 mm) jacks are provided for earphones, an external weather alert, and input for an auxiliary source of audio.

The little CL-100 is powered by 6 volts, provided either by the 120 VAC wall adapter (included) or by four AA cells (not included). Dimensions are 7"W x 2"H x 4-1/2"D.

## ❖ The bottom line

We were favorably impressed with the little multi-function radio. It's easy to program, has clean audio even at high listening levels, and the receiver offers high sensitivity for weak-signal reception.

The Sangean CL-100 AM/FM/Weather radio lists for \$79.95, but it has a street price between \$60 and \$70 from MT advertisers.

