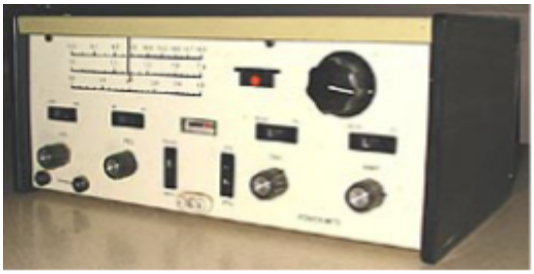
# QRP Community: The Odyssey of the Argonauts

From ARRL Website www.arrl.org (April 29, 2003) By Anthony A. Luscre, K8ZT Contributing Editor

With the recent introduction of Ten-Tec's Argonaut V, let's explore the entire family of Ten Tec's premier low-power radio-- the Argonaut and its relatives.

According to Bulfinch's Mythology, in ancient Greece: " *[I]t was suggested to Jason that he undertake the glorious adventure of going in quest of the Golden Fleece. Jason was pleased with the thought and forthwith made preparations for the expedition. At that time, the only species of navigation known to the Greeks consisted of small boats or canoes. When Jason employed Argus to build him a vessel capable of containing fifty men, it was considered a gigantic undertaking. It was accomplished, however, and the vessel was named Argo, from the name of the builder. Jason sent his invitation to all the adventurous young men of Greece and soon found himself at the head of a band of bold youths, many of whom afterwards were renowned among the heroes and demigods of Greece. They were called the Argonauts, from the name of their vessel."*

Similar to the Argo's simple predecessors, the Ten-Tec Argonaut radio series predecessors consisted of small homebrew and kit QRP radios (often single-band, separate transmitters and receivers and CW-only.) The first Ten-Tec Argonaut was a QRP milestone that combined receiver and transmitter into a solid-state CW and SSB, multiband transceiver package. The travels of Jason's Argonauts' were an odyssey--a long wandering or voyage usually marked by many changes of fortune. The Ten-Tec Argonaut series has also been an odyssey, with five generations and a few tangential relatives. This month's column will explore the Argonaut line and its lineage. In 1968, Al Kahn, K4FW, and Jack Burchfield, K4JU, founded Ten-Tec. In 1969 the company produced a series of modules that hams could use as building blocks in assembling a solid-state low-power (ie, QRP) CW radio. These modules also were used as the basis for Ten-Tec's "Power Mite" (PM) series of solid-state CW transceivers. The PM series was available in three main models (PM-1, PM-2 and PM-3). Variants included additional bands and features.



*The "Power Mite" series, a CW-only transceiver with direct-conversion receiver, began production before the Argonaut 505 and continued as a contemporary for a few years in the early 1970s. [Photo by the author]*

## The Argonaut Models 505 and 509

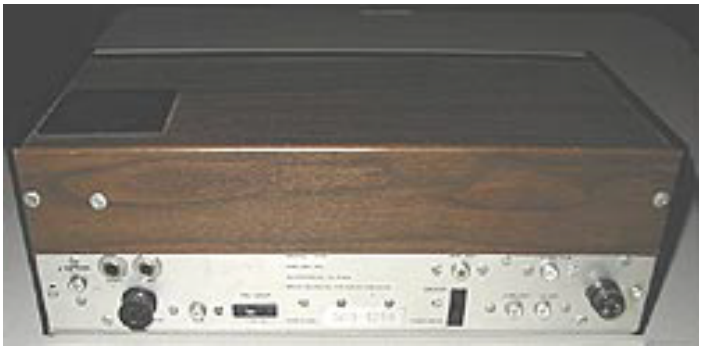
Ten-Tec introduced the first Argonaut in 1971 (see "The Second Coming of the Argonaut" CQ, Nov 1971). The exterior featured an eggshell-white front panel, black lettering and wood-grain laminate top and side panels. Later described as the Argonaut Model 505, the rig was quite an accomplishment for its era. The Argonaut 505 offered all solid-state design, CW and SSB, 80-10 meter coverage, full break-in keying (QSK), a compact package (HWD 4½x13x7 inches) and the ability to operate from a 12-V battery. Power output was 3 and the retail price $288. Construction featured plug-in modules for each section of the transceiver. The receiver was a single-conversion 9-MHz IF superhet design using dual-gate MOSFETs, a

four-crystal cascade lattice filter. The VFO was designed around a permeability-tuned coil oscillator (PTO). As the user changes frequency, a threaded shaft moves a powdered-iron core into or out of a coil. This changes the inductance of the coil and, thus, the frequency.

The RF power amplifier was a broadband design that required no tuning as the user changed bands--a concept almost unheard of in radios of that age. Ten-Tec's advertising summarized it as "all the features you want in a 6-pound package of 1/5 cubic foot."


*Front view of the Ten-Tec Argonaut 509. The physical appearance of the 505 and 509 models is almost identical. Matching accessories: On top of the radio is the Model 208 CW filter. At the left is the Model 210 power supply (1 A regulated). [Courtesy of the Virtual Ten*Tec Museum.*

Its successor, the Argonaut Model 509, debuted in 1973, looked almost identical to the original Argonaut 505. Enhancements included a "hotter" receiver. The retail price was $329. The Argonaut 509 was manufactured in substantial quantities and can be a very good used choice for the beginning QRPer. Used prices typically range from $150 to $275, depending on condition.



## The Argonaut Model 515

The third Argonaut, the Model 515, debuted 1978. Although essentially identical in size from its predecessors, there was a major departure in appearance. The Model 515 sports an all-black case and front panel. Ten-Tec touted new and improved front-end sensitivity, VFO/PTO and an indicator light for RIT (receiver incremental tuning) operation. Ten-Tec divided the 10-meter band into four 500-kHz segments, in part for easier tuning of this wide band. Retail price was $429. The Argonauts 515 remains prized by QRP enthusiasts and Ten-Tec collectors alike. Because fewer than 800 of these units were made, however, the price of a Model 515 on the used market can approach or even exceeds the new purchase price.

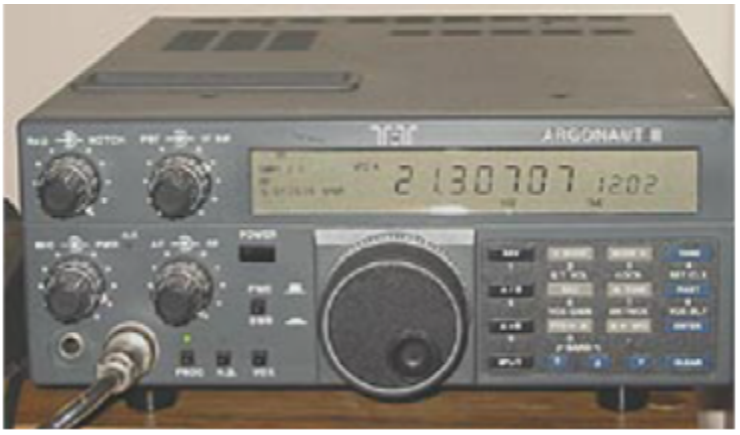
*The Argonaut 515, Model 206A Crystal Calibrator (frequency marker) and Model 208A three-position crystal and notch filter.*

The 515 was my first radio in 1981 when I got my ham ticket. Although I have owned many much more sophisticated and expensive rigs since and only use it occasionally these days, it's still a pleasure to operate. For potential used-radio buyers, all three of the first-generation Argonauts can provide a reliable and inexpensive introduction to QRP on CW and SSB. Two items may need maintenance on these rigs. The first is the main dial cord. The cord has an elastic portion that ages and stretches over time. Symptoms of this problem include a drooping dial pointer or uneven movement. Replacement dial cords remain available from Ten-Tec and are very inexpensive. The replacement job is not difficult, but it is time-consuming because you have to remove all the knobs and the entire front panel. The other problem is the "sticky PTO syndrome" as the lubricant used in the PTO mechanism hardens over time. A repair kit was available from Ten-Tec.

| Five Generations of Ten-Tec Argonauts | | | |
|---|---|---|---|
| **Model** | **Case Style** | **PTO** | **Frequency Synthesized** |
| Argonaut 505 | White. Wide, shallow case (4½ x 13 x 7 inches) with wood grain plastic end caps, analog dial and ruler scale | X | |
| Argonaut 509 | White. Wide, shallow case (4½ x 13 x 7 inches) with wood grain plastic end caps, analog dial and ruler scale | X | |
| Argonaut 515 | Black. Wide, shallow case (4½ x 13 x 7 inches) with black plastic end caps, analog dial and ruler scale | X | |
| Argonaut II (535) | Grey. Narrower, deeper case (3½ x 10 x 11 inches) with LCD display | | X |
| Argonaut V (516) | Black. Smaller almost square case (2½ x 8½ x 7½ inches) with LED display | | X |

## The Argonaut II

The fourth in the line was the Argonaut II or Model 535 (see "Product Review," QST, Jan 1992), which did not arrive until 1991. In the interim, many QRPers had turned to the Ten-Tec Argosy (525 and 525D), but that is a story for another day. The Argonaut II was a radical change from previous Argonauts. It was a 5-W output frequency synthesized rig with digital display, dual VFO, split frequency capability, 48 memories, computer-control port, general-coverage receiver and keyboard frequency entry. An innovative filtering system--know as Jones filtering--allowed for front-panel variable bandwidth and passband filtering adjustment. The Argonaut II had a higher-power twin, the Delta II (Model 536), which featured 100 W output. In comparison to today's radios, the Argonaut II still holds its own in terms of features. A less-than-glowing QST review, variable filter operation atypical (for the time) and a relatively high retail price of $1445 may have contributed to less-than-stellar sales. My own experiences with the Argonaut II have been very

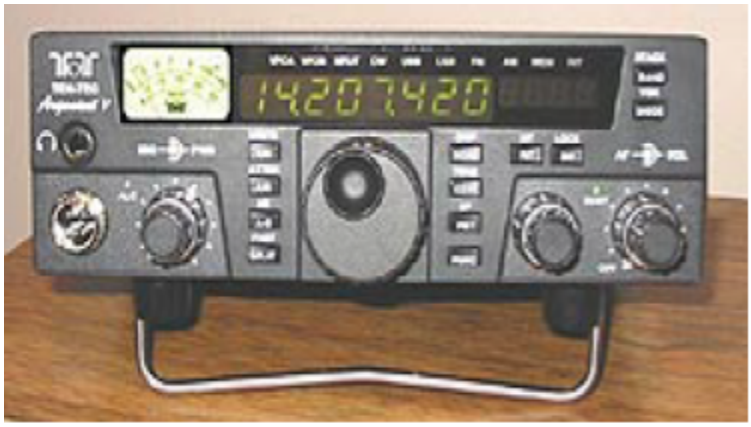



*The Argonaut II (535) was a radical departure in both looks and function from the first three Argonauts.*

positive, but on occasion, I have accidentally misadjusted the filters and was greeted with what I thought was a dead band or radio. Once you get the filter adjustment process down, the rig is a good performer. If you go shopping for a Model 535 or 536 be aware that there have been reports of failure of the luminescent backlighting panel. The radio's computer control scheme is the same as the ICOM 735, so most logging software programs support it.

## The Argonaut V (Model 516)

The Argonaut V (Model 516) was introduced in the fall of 2002 with prices starting at $795 (see "Product Review," QST, Apr 2003). (In the almost 10-year interim between the Argonaut II and the Argonaut V, many QRPers turned to Ten-Tec's low-power version of its Scout. Although this radio is often referred to as the "Argo Scout 556," it really is not part of the Argonaut family.) The Argonaut V is not strictly QRP, as power output can be varied from 1 to 20 W. The Argonaut V follows Ten-Tec's recent trend of software-defined radios (SDRs), such as the Pegasus, Jupiter and the 6N2 Model 526 VHF radios. In an SDR, major functions and features are defined in computer code and stored in a flash read-only memory (flash ROM). To add new features, the user just uploads updated software to the flash ROM from the Internet. As Ten-Tec says, "it's as if your rig rolled off the production line a few minutes earlier. Should the 60-meter band be allocated for amateur radio use, your transceiver will be ready the day the band opens." The Argonaut V makes extensive use of digital signal processing (DSP) for filtering and bandwidth shaping.




*The sleek black Argonaut V with its large bright frequency display is the current production model in the Argonaut odyssey.*

Very similar in appearance and construction to the Model 526, the Argonaut V represents the third major style change in the Argonaut series. The designers made access to digital modes very easy. Simply connect audio cables from the audio in and audio out jacks to your PC sound card and you're ready to do PSK31 and other digital modes without the need for an outboard interface. The Argonaut V has dual VFOs, split-frequency capability, memories, built-in keyer, transmit capability on all amateur bands 160 through 10 meters and general-coverage receive from 500 kHz to 30 MHz. Operating modes include CW, SSB, AM, FM and digital modes. CTCSS tone encoding is built-in or 10meter FM operation or for use with transverters. The same port used to update the radio's flash ROM allows computer control of the radio. N4PY Control Program, an excellent software program by Carl Moreschi, N4PY, allows enhanced operation of the Argonaut V via computer. Web Resources For Argonaut and Ten-Tec resources on the Web you might try Joseph Edmonds, N4NQY's Unofficial Ten-Tec Pages, Paul Valko, W8KC's Virtual Ten*Tec Museum, Ten-Tec's Web site and the Ten-Tec page on my Web site. Two very active mailing lists are available for general discussion of all topics Ten-Tec: and the Ten-Tec516 list, which is devoted to the Argonaut V.