



Orbit

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The Journal of the Radio Amateur Space Program



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OSCAR AND IC451A (The Perfect Couple)

ICOM presents a multifunction multimode base station transceiver for use either as part of an OSCAR satellite link on mode B or J, or for use with your favorite 440MHz FM repeater, the IC451A incorporates features customers ask for most.

- 3 Memories with Memory Scan.
- Programmable Band Scan.
- Squelch on SSB! Silent Receive when no signal is present.

- Variable Repeater Split.

Imagine programming 2 of your favorite SSB QSO frequencies as well as the OSCAR 8 mode J downlink beacon into memory, and silently scanning these frequencies while working other bands in your shack.

The IC451A may be ordered from your authorized ICOM Dealer in either 430-439.9999MHz or 440-439.9999MHz models.



MEMBER OF THE ICOM GROUP OF COMPANIES



1112 11th St., Bellevue, WA 98004
5921 Sawerswood Drive, Dallas, TX 75234

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The right design — for all the right reasons. In setting forth design parameters for ARGOSY, Ten-Tec engineers pursued the goal of giving amateurs a rig with the right features at a price that stops the amateur radio price spiral.

The result is a unique new transceiver with selectable power levels (convertible from 10 watts to 100 watts at the flick of a switch), a rig with the right bands (80 through 10 meters including the new 30 meter band), a rig with the right operational features plus the right options, and the right price for today's economy—just \$549.

Low power or high power, ARGOSY has it. Now you can enjoy the sport and challenge of QRPp

operating, and, when you need it, the power to stand up to the crowds in QRM and poor band conditions. Just flip a switch to move from true QRPp power with the correct bias voltages to a full 100 watt input.

New analog readout design. Fast, easy, reliable, and efficient. The modern new readout on the ARGOSY is a mechanical design that instantly gives you all significant figures of any frequency. Right down to five figures (± 2 kHz). The band switch indicates the first two figures (MHz), the linear scale with lighted red bar-pointer indicates the third figure (hundreds) and the tuning knob skirt gives you the fourth and fifth figures (tens and units). Easy. And efficient—so battery operation is easily achieved.

The right receiver features. Sensitivity of $0.3 \mu\text{V}$ for 10 dB S+N/N. **Selectivity:** the standard 4-pole crystal filter has 2.5 kHz bandwidth and a 2.7:1 shape factor at 6/50 dB.

Other cw and ssb filters are available as options, see below. I-f frequency is 9 MHz, i-f rejection 60 dB. **Offset tuning** is ± 3 kHz with a detent zero position in the center. **Built-in notch filter** has a better than 50 dB rejection notch, tunable from 200 Hz to 3.5 kHz. An optional noise blanker of

utes on all bands. **3-function meter** shows forward peak power on transmit, SWR, and received signal strength. **PTT** on ssb, **full break-in** on cw. **PIN diode antenna switch.** **Built-in cw sidetone** with variable pitch and volume. **ALC control** on "high" power only where needed, with LED indicator.

Automatic normal sideband selection plus reverse. **Normal 12-14V dc** operation plus ac operation with optional power supply.

The right styling, the right size. Easy-to-use controls, fast-action push buttons, all located on raised front panel sections. New meter with lighted, easy-to-read scales. Rigid steel chassis, molded front panel with matching aluminum top,

bottom and back. Stainless steel tilt-up bail. And it's only 4" high by 9½" wide by 12" deep (bail not extended) to go anywhere, fit anywhere at home, in the field, car, plane or boat.

The right accessories—all front-panel switchable.

Model 220 2.4 kHz 8-pole ssb filter \$55; Model 218 1.8 kHz 8 pole ssb filter \$55; Model 217 500 Hz cw filter \$55; Model 219 250

Hz cw filter \$55; Model 224 Audio cw filter \$34; Model 223 Noise blanker \$34; Model 226 internal Calibrator \$39; Model 1125 Dc circuit breaker \$15; Model 225 117/230V ac power supply \$129; Model 222 mobile mount, \$25; Model 1126 linear switching kit, \$15.

Model 525 ARGOSY — \$549. Make the right choice, ARGOSY—for the right reasons **and** low price. See your TEN-TEC dealer or write.

Here's a Concept You Haven't Seen In Amateur Radio For A Long Time— Low Price.



New TEN-TEC Argosy \$549

the i-f type has 50 dB blanking range. **Built-in speaker** is powered by low-distortion audio (less than 2% THD)

The right transmitter features. Frequency coverage from 80 through 10 meters, including the new 30 meter band, in nine 500 kHz segments (four segments for 10 meters), with approximately 40 kHz VFO overrun on each band edge. **Convertible power:** 100 or 10 watts input with 100% duty cycle for up to 20 min-

TEN-TEC, INC.
SEVIERVILLE, TENNESSEE 37862

New 2-meter direction.



A compact transceiver with FM/SSB/CW plus...

TR-9000

The exciting TR-9000 2-meter all-mode transceiver combines the convenience of FM with long-distance SSB and CW in a very compact, affordable package, ideal for mobile installation. With its fixed-station accessories it becomes the obvious choice for your ham shack.

TR-9000 FEATURES:

- **FM, USB, LSB, and CW**
All the popular 2-meter modes.
- **Extended frequency range**
Covers all 2-meter Amateur frequencies as well as MARS and CAP frequencies (simplex and any repeater split) between 143.9000 and 148.9999 MHz.
- **Digital dual VFOs**
With selectable tuning steps of 100 Hz, 5 kHz, and 10 kHz, convenient for each mode of operation.
- **Digital frequency display**
Five, four, or three digits, depending on selected tuning step.
- **Scan of entire band**
Automatic busy stop and free scan.
- **Five memories**
M1-M4... for simplex or ± 600 kHz repeater offset. M5... for nonstandard offset (memorizes transmit and receive frequency independently).
- **SSB/CW search**
Sweeps between 0 and 9.9 kHz around the selected frequency in 100-Hz steps, while the main knob selects in 10-kHz steps. Easy way to find SSB or CW activity.
- **UP/DOWN microphone**
"Beep" sounds with each frequency step. (Supplied with TR-9000.)
- **Effective noise blanker**
Suppresses pulse-type noise on SSB and CW.
- **Improved receiver front-end characteristics**
Low-noise, dual-gate MOSFET and two-stage monolithic crystal filter.
- **RIT control**
Receiver incremental tuning, to tune only the receiver slightly off frequency in the SSB/CW mode. Functions on memory, also.
- **RF gain control**
Threshold-type control, permitting accurate S-meter readings on SSB/CW and FM modes.
- **CW sidetone**
Enables monitoring of keying during CW operation.
- **Automatic AGC selection**
AGC time constant selected automatically with MODE switch (slow for SSB and fast for CW).
- **HI/LOW power switch**
10 watts/1 watt RF output on FM/CW. Always 10 watts on SSB. Improved power module for reliable and stable linear RF output.
- **LED indicators**
VFO A/B, RIT, ON AIR, and BUSY.
- **Rear-panel accessory terminals**
Key, memory back-up voltage, tone input, standby, external speaker, DC supply voltage, and antenna.
- **Compact size**
Only 6-11/16 inches wide by 2-21/32 inches high by 9-7/32 inches deep.
- **Adjustable-angle mobile mount**
With quick-release levers for easy removal.

More information on the TR-9000 is available from all authorized dealers of Trio-Kenwood Communications, Inc., 1111 West Walnut Street, Compton, California 90220.

 **KENWOOD**
...pacesetter in amateur radio

Matching accessories for fixed-station operation:

- PS-20 power supply
- SP-120 external speaker
- BO-9 System Base... with power switch, SEND/RECEIVE switch for CW operation, backup power supply for memory retention (BC-1 backup power adaptor may also be used for this application), and headphone jack



Specifications and prices are subject to change without notice or obligation.



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Our Cover: Ulrich Mueller, DK4VW, and Wilfred Gladish laying out the x10 artwork for
the Mode-L transponder front end.

SATELLITES & 73

For the most informative articles
on satellites... **73**

73 MAGAZINE

73 Magazine has more articles on satellites than any other ham magazine. A sampling of articles from the past shows why 73 has the leading edge:

*The Satellite TV Primer — thousands watch satellite TV every day... here's how they do it and what they see.

*Here's a "TWIST" — an OSCAR antenna with a difference.

*Low-Cost Receiver for Satellite TV — this modular design uses readily available technology.

*The Europa B Two Meter Transverter — work OSCAR 2m SSB with this British import.

Plus 73 has two monthly features devoted to the satellite enthusiast:

*OSCAR Orbits — a listing of OSCAR's orbital dates

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...tion to satellites.

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