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If your company provides products or services of interest to our readers, please contact the ARRL Advertising Department today for information on building your business.

# Shack, Car, or Field...



# Mini Multiband Marvel IC-T90

6M/2M/70CM @ 5.5W • Wide Band RX<sup>†</sup>.495 - 999.99MHz • 500 Alphanumeric Memories • CTCSS & DTCS Encode/Decode w/Tone Scan • Weather Alert • PC Programmable<sup>†</sup>



# High End 2M IC-T22A

2M @ 5W • RX 118-174 MHz Inc. Air Band RX • 40 Alphanumeric Memories • Auto Low Power & Power Saver • Auto Repeater Function • PC Programmable<sup>†1</sup>



# Dual Band IC-T7H

- 2M/70CM @ 6W RX 118-174 MHz & 400-470MHz •70 Alphanumeric Memories
- CTCSS Encode/Decode w/Tone Scan Auto Repeater Function PC Programmable<sup>↑↑</sup>



# Rugged, Easy to Use IC-V8

2M @ 5.5W • 136-174 MHz (RX) • 100 Alphanumeric Memories • CTCSS & DTCS Encode/ Decode w/Tone Scan • Auto Repeater Function • PC Programmable<sup>†1</sup>



# Under \$100 IC-T2H SPORT

2M @ 6W • 40 Alphanumeric Memories • Alkaline Case • CTCSS Encode/Decode w/Tone Scan • Auto Repeater Function • PC Programmable<sup>11</sup>



# True Dual Band Performance IC-W32A

2M/70CM @ 5W • 200 Alphanumeric Memories • V/V, U/U, V/U • True Simultaneous Receive
• DTMF Auto Dialer w/Memory • Auto Repeater Function • PC Programmable<sup>11</sup>



# IC-756PROII Heard it. Worked it. Logged it.

• HF/6M<sup>12</sup> • 100W Output • 32 Bit Floating Point IF DSP & 24 Bit AD/DA Converter
• Dual Receive • Improved 3rd Order Intercept Point • Live Band Scope • 5" TFT Color
Display • Selectable Digital IF Filter Shapes For SSB & CW • Built-in RTTY Demodulator &
Decoder • Separate RX Only Antenna Jack • Auto Antenna Tuner • Digital Twin Passband
Tuning • CW Memory Keyer • VOX • AGC Loop Management • Auto & Manual Notch
• Transverter I/O Port • Digital & Analog Meter • Digital Voice Recorder • And More



# IC-746PRO HF Hot Rod

HF/6M/2M<sup>12</sup> • 100W Output • 32 Bit Floating Point IF DSP & 24 Bit AD/DA Converter
 Improved 3rd Order Intercept Point • Digital Meter • Selectable Digital IF Filter Shapes
 For SSB & CW • Built-in RTTY Demodulator & Decoder • Auto Antenna Tuner • Digital Twin
 Passband Tuning • CW Memory Keyer • VOX • AGC Loop Management • Auto & Manual Notch
 9600 Baud Packet Capable • RX Audio Equalizer • SWR Analyzer • And More



# I⊂−718 Get into HF

- HF<sup>†2</sup> 100W Output Power (40W on AM) RX Coverage 0.03 30MHz
- Digital S/RF Meter Flexible Filter Selection 101 Memories Multiple Scanning Functions
- Front Mounted Speaker IF Shift Mic Compressor RF Gain Control Noise Blanker
- RF Attenuator & PreAmp Auto Notch Filter Ample CW features including Electronic Keyer
- VOX Optional Voice Synthesizer And More

# ...Icom has you covered!



# **NEW IC-7800** HF Masterpiece

• HF/6M • 200W Output • Four 32 Bit Floating Point IF DSPs & 24 Bit AD/DA Converters • Two Identical, Independent Recievers • +40dBm Third Order Intercept Point • Real-time Spectrum Scope • 7" TFT Color Display • Ultra High Stability OCXO • CF Card Slot • Selectable Digital IF Filter Shapes For SSB & CW • Built-in RTTY and PSK31 Modulator & Demodulator • Four Antenna Connectors w/Auto Antenna Selector • Auto Antenna Tuner • Built-in Power Supply • Dual Digital Twin PassBand Tuning ● Triple Band Stacking Register ● And More

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# IC-910H Satellite Ria

• 2M/70CM • 100W Output (75W on 70CM) • Optional 1.2GHz Operation • 9600bps High Speed Packet Port • .11uV Sensitivity • Work Two Bands at Once • CTCSS & DTCS Encode/ Decode w/Tone Scan • Weather Alert • and More



# **NEW IC-2200H** Go Digital or Analog

• 2M • 65W Output • 207 Alphanumeric Memories • Optional Digital Operation & NEMA Compatible GPS interface that allows for GPS Location Reporting • CTCSS & DTCS Encode/Decode w/Tone Scan • Weather Alert • and More



# IC-208H Dual Band with Attitude

- 2M/70CM 55W VHF/50W UHF 500 Alphanumeric Memories • CTCSS/DTCS Encode/Decode w/ Tone Scan
- Wide Band RX† 118-999.990 MHz Remote Control Mic
- Dynamic Memory Scan (DMS) DTMF Encode 10dB Attenuator



# IC-703 **Ultimate ORP**

• HF or HF/6M Versions • 10W~0.1W@13.5V SSB, CW, RTTY, FM / 4W ~ 0.1W @ 13.5V AM • Internal Antenna Tuner • Detachable, Remotable Control Panel • DSP with Auto Notch Filter & Noise Reduction • Automatic Battery Save Mode • and More



# IC-706MKIIG Proven Performer

• 160-10M/6M/2M/70CM<sup>†2</sup> • HF/6M @ 100W, 2M @ 50W. 70CM @ 20W • 107 Alphanumeric Memories • CTCSS Encode/Decode w/Tone Scan • AM, FM, WFM, SSB, CW, RTTY; w/DSP • Auto Repeater • and More



# V/V, U/U, V/U Operation • 2M/70CM • 50W VHF/35W UHF Output • 212 Memories

• CTCSS & DTCS Encode/Decode w/Tone Scan • DMS • Remote Control Mic • Wide Band RX<sup>†</sup> 118-549, 810-999 MHz • Auto Repeater



# IC-V8000 High Power 2M

• 2M • 75W Output • 207 Alphanumeric Memories • CTCSS & DTCS Encode/Decode w/Tone Scan • DMS • Remote Control Mic • FM Narrow Mode • Weather Alert & Channel Scan



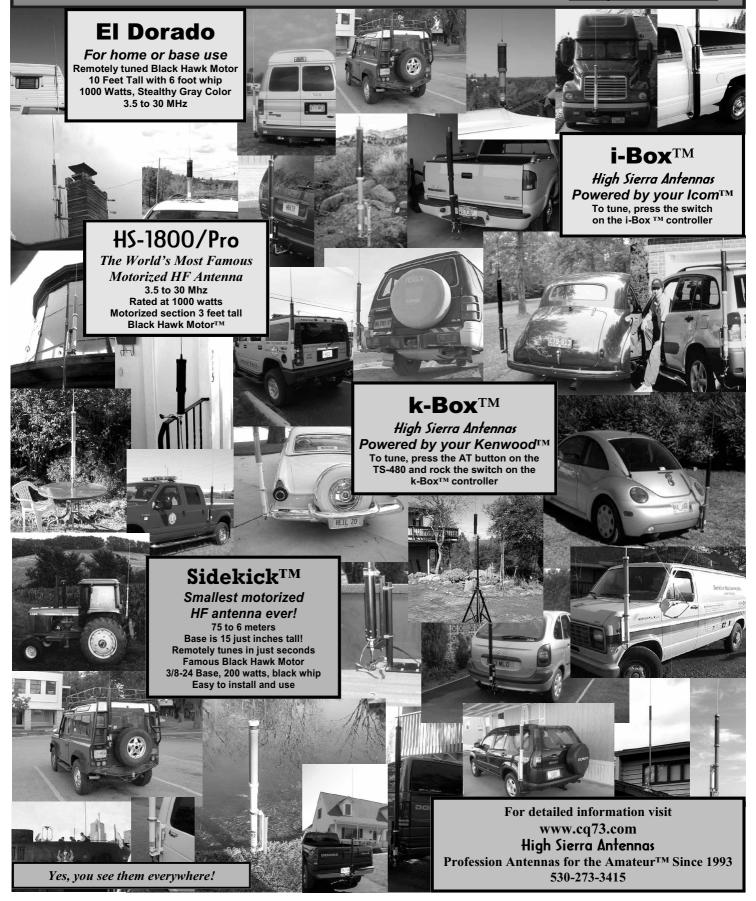
# -2100H 25N 2M On a Budget

- 2M 50W Output 113 Alphanumeric Memories CTCSS Encode/Decode w/Tone Scan • Remote Control Mic • MIL STD
- Auto Repeater Large Keys and Knobs

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# **NEW** from Kuranishi Instruments LTD, Japan BR-200 Professional-Grade SWR/Antenna Analyzer



Perform SWR and impedance measurements with confidence! The BR-200 is a laboratory grade precision test instrument providing a wideband RF signal source for analyzing antenna systems and other equipment without the need for a separate transmitter. • 1.8-170MHz • High precision meter • 500mW 50 Ohm dummy load included • Impedance measurements: 12.5 - 300 Ohm • Connector:

# & Maldol **Dualband and Multiband** Base Antennas



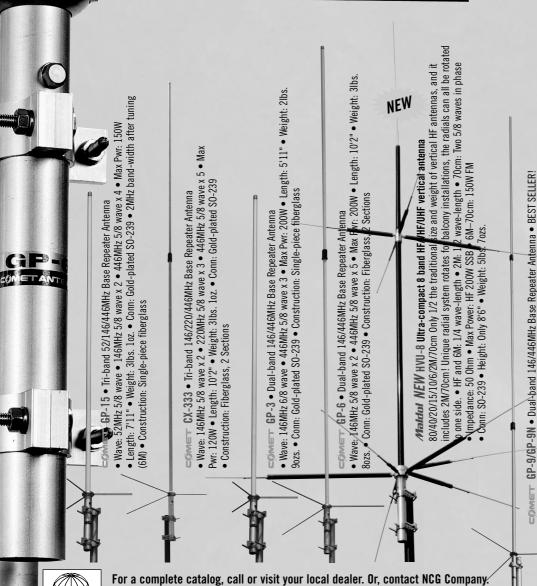
Wi-Fi/802.11b/LAN/HSMM Access Point Antennas

GP-24-3 The same physical high gain 2.4GHz antenna as the GP-24, but with a 3-degree CEDMET GP-24 The standard high gain 2.4GHz access point antenna for maximum range/signal strength ◆ 2400-2500MHz ◆ Length: 5'10" ◆ Weight: 2lbs. 9ozs. ◆ Conn: Gold-plated N-female ◆ electrical downtilt to concentrate the signal to the horizon and below Construction: Heavy-duty white fiberglass radome

Wave: 146MHz 5/8 wave x 3 • 446MHz 5/8 wave x 8 • Max Pwr. 200W • Length: 17'8"
Weight: 5lbs. 11ozs. • Conn: GP-9 Gold-plated SO-239 • GP-9N Gold-plated N-type female

Construction: Fiberglass, 3 Sections

GP-24-S Medium gain access point antenna for applications where maximum distance is not as important as a solid signal around and directly below the antenna. • Length: 3'9" • Weight: 11b 14ozs. • Conn. Gold-plated N-female • Construction: Heavy-duty white fiberglass radome





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- Triband (144/220/440 MHz)
- Receives 2 frequencies simultaneously even on the same band
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- Bar antenna for receiving AM broadcasts
- Special weather channel RX mode
- 435 memory channels, multiple scan functions
- 7.4V 1550mAh lithium-ion battery (std.) for high output<sup>2</sup> and extended operation
- 16-key pad plus multi-scroll key for easy operation
- Built-in charging circuitry for battery recharge while the unit operates from a DC supply
- Tough construction: meets MIL-STD 810 C/D/E standards for resistance to vibration, shock, humidity and light rain
- Large frequency display for single-band use
- Automatic simplex checker
- Wireless remote control function
- Battery indicator Internal VOX MCP software

<sup>1</sup>Note that certain frequencies are unavailable. <sup>2</sup>5W output

# TH-F6A

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Kenwood Corporation

#081104

# MFJ TUNERS

# MFJ-989C Legal Limit Antenna Tuner MFJ uses super heavy duty components to make the world's finest legal limit tuner

MFJ uses super heavy duty components -- roller inductor, variable capacitors, antenna switch and balun -- to build the world's most popular high power antenna tuner.

The rugged world famous MFJ-989C handles 3 KW PEP SSB amplifier input power (1500 Watts PEP SSB output power). Covers 1.8 to 30 MHz, including MARS and WARC bands.

**MFJ's** *AirCore*™ roller inductor, new gear-driven turns counter and weighted spinner knob gives you exact inductance control for absolute minimum SWR.

You can match dipoles, verticals, inverted vees, random wires, beams, mobile whips,



shortwave -- nearly any antenna. Use coax, random wire or balanced lines.

You get everything you've ever wanted in a high power, full featured antenna tuner -widest matching range, lighted Cross-Needle SWR/Wattmeter,

MFJ-989C

95 massive transmitting variable capacitors, ceram-

ic antenna switch, built-in dummy load,  $TrueCurrent^{TM}$ Balun, scratch-proof Lexan front panel -- all in a sleek compact cabinet (10<sup>3</sup>/<sub>4</sub>Wx4<sup>1</sup>/<sub>2</sub>Hx15D in).

MFJ AirCore™ Roller Inductor



gives high-Q, low loss, high efficiency and high power handling.

MFJ's exclusive Self-Resonance KillerTM keeps damaging self-resonances away from your operating frequency.

Large, self-cleaning wiping contact gives good low-resistance connection. Solid 1/4 inch brass shaft, self-align bearings give smooth non-binding rotation. MFJ No Matter What<sup>TM</sup> Warranty

MFJ will repair or replace your unit (at our option) for 1 year.

# More hams use MFJ tuners than all other tuners in the world!

# MFJ-986 Two knob Differential- $T^{m}$ MFJ-949E deluxe 300 Watt Tuner



MFJ-986 *Two* knob tuning (differential \$329<sup>95</sup> capacitor and AirCore™ roller

inductor) makes tuning foolproof and easier than ever. Gives minimum SWR at only one setting. Handles 3 KW PEP SSB amplifier input power (1.5 KW output). Gear-driven turns counter, lighted peak/average Cross-Needle SWR/Wattmeter, antenna switch, balun. 1.8 to 30 MHz. 10<sup>3</sup>/<sub>4</sub>Wx4<sup>1</sup>/<sub>2</sub>Hx15 in.

# MFJ-962D compact kW Tuner



A few more dollars steps you up to a KW tuner for an amp later. Handles 1.5 KW PEP SSB amplifier input power (800W output). Ideal for Ameritron's AL-811H! AirCore<sup>™</sup> roller inductor, geardriven turns counter, pk/avg lighted Cross-Needle SWR/Wattmeter, antenna switch, balun, Lexan front, 1.8-30MHz.  $10^{3}/4x4^{1}/2x10^{7}/8$  in.

# MFJ-969 300W Roller Inductor Tuner



MFJ-969 **Superb**  $AirCore^{TM}$  Roller \$199<sup>95</sup> Inductor tuning. Covers 6 Meters thru 160 Meters! 300 Watts PEP SSB. Active true peak reading lighted Cross-Needle SWR Wattmeter, *QRM-Free PreTune*™, antenna switch, dummy load, 4:1 balun, Lexan front panel. 31/2Hx101/2Wx91/2D inches.

More hams use MFJ-949s than any other antenna tuner in the world! Handles

MFJ-949E 300 Watts. Full 1.8 to 30 MHz \$149<sup>95</sup> coverage, custom inductor switch, 1000 Volt tuning capacitors, full size peak/average lighted Cross-Needle SWR/ Wattmeter, 8 position antenna switch, dummy load, *QRM-Free PreTune*<sup>TM</sup>, scratch proof Lexan front panel. 3<sup>1</sup>/<sub>2</sub>Hx10<sup>5</sup>/<sub>8</sub>Wx7D inches. MFJ-948, \$129.95. Economy version of MFJ-949E, less dummy load, Lexan front panel.

# MFJ-941E super value Tuner

The most for vour money! Handles 300 Watts PEP, covers 1.8-30 MFJ-941E MHz, lighted Cross-Needle SWR/ \$11995 Wattmeter, 8 position antenna switch, 4:1 balun, 1000 volt capacitors, Lexan front panel. Sleek 10<sup>1</sup>/<sub>2</sub>Wx2<sup>1</sup>/<sub>2</sub>Hx7D in.

# MFJ-945E HF/6M mobile Tuner

Extends your mobile antenna bandwidth so you don't have to stop, go outside and adjust your antenna.  $09^{95}$ Tiny 8x2x6 in. Lighted Cross-Needle SWR/Wattmeter. Lamp and bypass switches. Covers 1.8-30 MHz and 6 Meters. 300 Watts PEP. MFJ-20, \$4.95, mobile mount.

# MFJ-971 portable/QRP Tuner

Tunes coax, balanced lines, random wire 1.8-30 MHz. Cross-Needle Meter. SWR, 30/300 or 6 Watt QRP ranges. Matches popular MFJ transceivers. Tiny  $6x6^{1/2}x2^{1/2}$  in.

# MFJ-901B *smallest* Versa Tuner

MFJ's smallest (5x2x6 in.) and most affordable wide range 200 Watt PEP Versa tuner. Covers 1.8 to 30 MHz. Great for matching solid state rigs to linear amps.

MFJ-971 \$9995

MFJ-901B **\*79**95

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Tech Help: (662) 323-0549

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World's tiniest wide range, full-power 150 Watt 80-10 Meter Tuner for coax, random wire. Bypass switch, real air-variable capacitors.41/2x21/4x3 inches.



# MFJ-16010 random wire Tuner

Reversible L-network. Turns random wire into powerful transmitting antenna. 1.8-30 MHz. 200 MFJ-16010 \$4995 Watts PEP. 2x3x4 in.

# MFJ-906/903 6 Meter Tuners

MFJ-906 has lighted Cross-Needle SWR/

Wattmeter, bypass switch.

Handles 100 W FM, 200W SSB. MFJ-903, \$49.95, Like MFJ-906, less SWR/Wattmeter, bypass switch

MFJ-921/924 *VHF/UHF* Tuners

MFJ-921 covers 2 Meters/220 MHz. **MFJ-924** covers 440 MHz. SWR/Wattmeter.  $8x2^{1/2}x3$  in. Simple 2-

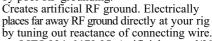


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Eliminates
RF hot spots, RF \$8995

feedback, TVI/ RFI, weak signals caused

by poor RF grounding.



MFJ-934, \$179.95, Artificial ground/300 Watt Tuner/Cross-Needle SWR/Wattmeter.

# 1.8-170 MHz *plus* 415-470 MHz MFJ HF/VHF/UHF Antenna Analyzer

All-in-one handheld antenna test lab lets you quickly check and tune HF, VHF, UHF antennas anywhere. Covers 1.8-170 MHz and 415-470 MHz Measures: SWR... Return Loss... Reflection Coefficient... Antenna Resistance(R), Reactance(X), Impedance(Z) and Phase Angle(degrees) ... Coax cable loss(dB) ... Coax cable length ... Distance to short or open in coax ... Inductance ... Capacitance ... Resonant Frequency ... Bandwidth...Q... Velocity Factor... Attenuation... Has: LCD readout... frequency counter... side-by-side meters... Ni-MH/Ni-Cad charger circuit... battery saver... low battery warning... smooth reduction drive tuning... One year No Matter What™ warranty...

You can instantly get a complete picture, check and tune any antenna from 1.8 to 170 MHz and 415 to 470 MHz -- an MFJ-269 exclusive -- with this rugged easy-to-use handheld antenna test lab! You can measure virtually every antenna parameter.

You won't believe its capability and versatility. This rugged handheld unit literally replaces a workbench full of expensive delicate test equipment.

SWR Analyzer

You can read SWR, return loss, reflection coefficient and match efficiency at any frequency simultaneously at a single glance.

Complex Impedance Analyzer Read Complex Impedance (1.8 to 170 MHz)as series equivalent resistance and reactance (Rs+jXs) or as magnitude (Z) and phase (degrees). Also reads parallel equivalent resistance and reactance (Rp+jXp) -- an MFJ-269 exclusive!

Coax Analyzer

You can determine velocity factor, coax loss in dB, length of coax and distance to

short or open in feet (it's like a built-in TDR).

CoaxCalculator™ lets you calculate coax line length in feet given electrical degrees and vice versa for any frequency and any velocity factor -- an MFJ-269 exclusive!

Use any Characteristic Impedance

You can measure SWR and loss of coax with any characteristic impedance (1.8 to 170 MHz) from 10 to over 600 Ohms, including 50, 51, 52, 53, 73, 75, 93, 95, 300, 450 Ohms -- an MFJ-269 exclusive!

Inductance/Capacitance Meter Measures inductance in uH and capacitance in pF at RF frequencies, 1.8-170 MHz.

Frequency Counter/Signal Source You can also use it as a handy frequency counter up to 170 MHz and as a signal source for testing and alignment.

Digital and Analog displays

A high contrast LCD gives precision readings and two side-by-side analog meters make towers, in cramp places. Fully portable -antenna adjustments smooth and easy.

415 to 470 MHz Range features

Just plug in your UHF antenna coax, set frequency and read SWR, return loss and reflection coefficient simultaneously. You can read coax cable loss in dB and match efficiency. You can adjust UHF dipoles, verticals,

SWR ANALYZER

yagis, quads and others and determine their SWR, resonant frequency and bandwidth.

You can test and tune stubs and coax lines. You can manually determine velocity factor and impedances of transmission lines.

You can adjust/test RF matching networks and RF amplifiers without applying power.

Has easy-to-read LCD logarithmic SWR bargraph and SWR meter for quick tuning.

Much Better Accuracy

New 12-bit A/D converter gives much better accuracy and resolution than common 8-bit A/D converters -- an MFJ-269 exclusive!

Super Easy-to-Use

Select a band and mode. Set frequency. Your measurements are instantly displayed! Smooth reduction drive tuning makes setting frequency easy.

Take it anywhere

Take it anywhere - to remote sites, up battery operated, compact 4Wx2Dx6¾ in., weighs 2 lbs. *Free* "N" to SO-239 adapter.

Has battery saver, low battery warning and built-in charging circuit for rechargeables.

Use 10 AA Ni-MH or Ni-Cad or alkaline batteries (not incl.) or 110VAC with MFJ-1312D, \$14.95.

MFJ SWR Analyzer Accessories

Carrying Case. MFJ-39C, **\$24.95.** Tote your MFJ-269 anywhere with this *genuine* MFJ custom carrying case. Has back pocket with security cover for carrying dip coils, adaptors and accessories. Made of special foam-filled

fabric, the MFJ-39C cushions blows, deflects scrapes, and protects knobs, meters and displays from harm.

Wear it around your waist, over your shoulder, or clip it onto the tower while you work -- the fully-adjustable webbed-fabric carrying strap has snap hooks on both ends.

Has clear protective window for LCD display and cutouts for knobs, connectors.

Dip Coils. MFJ-66, \$19.95. **Plug** these MFJ dip meter coupling coils into your MFJ-269 and turn it into a sensitive, accurate band switched dip meter. Two coils cover 1.8-170 MHz.

Power Pack. MFJ-99C. \$34.95 -- Save \$5! 10 MFJ Ni-MH batteries,

MFJ-1312D AC adapter.

Accessory Pack. MFJ-98, \$54.85 --Save \$5! MFJ-39C custom Carrying case, MFJ-66 dip coils, MFJ-1312D AC adapter.

Deluxe Accessory Pack. MFJ-**98B**, \$77.85. *Save* \$7! Complete accessory pack! MFJ-39C carry case, 10 Ni-MH batteries, MFJ-66 dip coils, MFJ-1312D AC adapter.

# MFJ-259B SWR Analyzer



**\$259.95.** Has most of the features of the MFJ-269, but covers 1.8-170 MHz.

Deluxe Accessory Pack MFJ-99B, \$77.85. Save \$7! 10 Ni-MH batteries, MFJ-1312D AC adapter, MFJ-29C carrying case, MFJ-66 dip coils.

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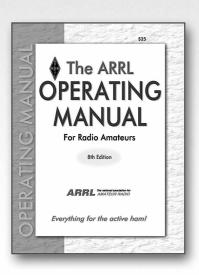
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# APRS—Moving Hams on Radio and the Internet

A Guide to the Automatic Position Reporting System.

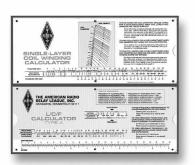
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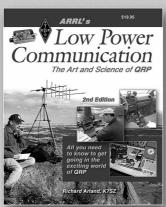


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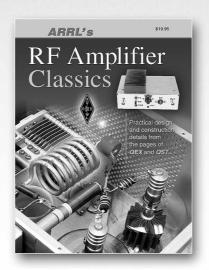
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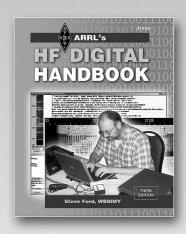
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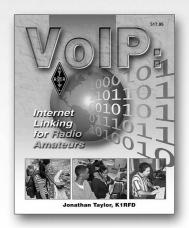
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A handy gadget for the homebrewer's toolbox! Quick and easy circuit calculations.

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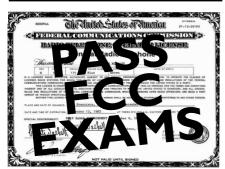


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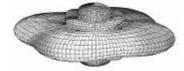
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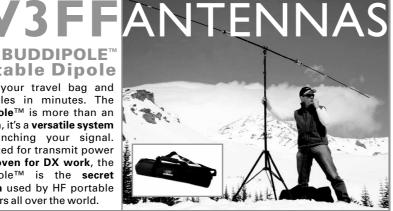


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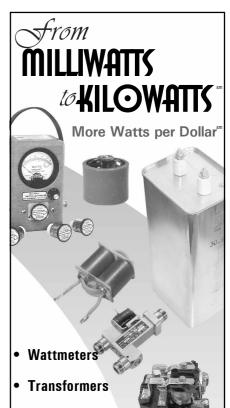




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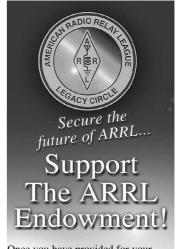
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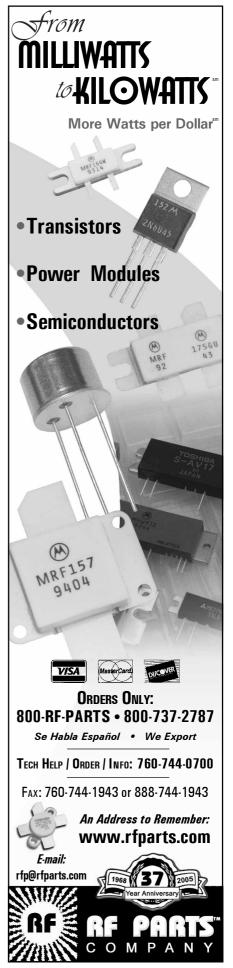


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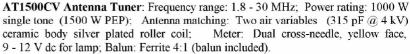
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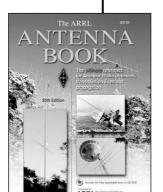
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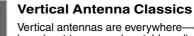
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