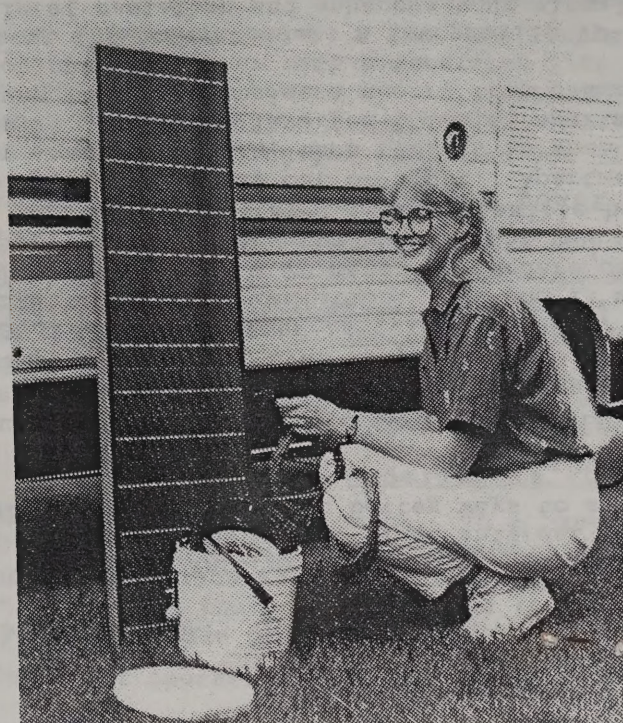


Antenna Special!

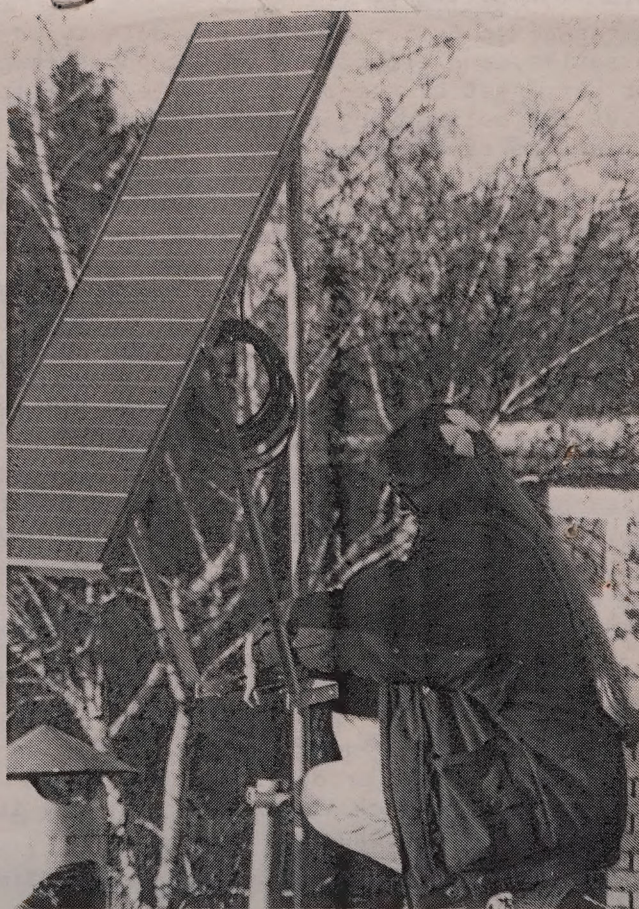
AntennasWest Box 50062, Provo, UT 84605

Telephone (801) 373-8425



Bob
73
June

Be QRV in minutes with products from AntennasWest.



Carefree Solar Power is now a reality for home, portable, and remote stations.

Antenna Installation Made Easy

When it comes to hanging antennas from available supports, there is an easy way.

No need to risk life and limb to climb trees or scale walls. No need to drop a big bill to buy a bow, nor to practice endlessly to learn how to use it. No need for three hands to hold sling shot, sinker, and spool. There's a simple way to launch antennas into the sky that is both effortless and easy. With the QRV system, one person working alone can install an antenna in minutes. And the method's not hard to learn, really, because it's so natural.

Q R V - Q L Quick-Launch

Antenna Installation System



Technical Manual
Q R V - Q L
Antenna Installation System

\$29.95
add
\$5 Air Ship

(801)373-8425

AntennasWest
Box 50062, Provo, UT 84605

One Person
installs
in minutes.

Re-usable
Ready for Action
Fast & Easy to Use
Eliminates Climbing

The method is in the QRV-QL Antenna Installation Kit. When you see the kit, you'll see a clean white pail with checklists printed on its sides. A bright yellow line is tied to the handle and disappears under the tight fitting lid.

Examine the sturdy smooth-sided pail that serves as stowage container and launch line carrier. On one side you find the launch checklist, on the other you find the packing list that makes sure your system is complete each time it's stored.

This pail is more than a container because it's also an integral part of the launching system. It holds the bright yellow launch line carefully laid in layers in its bottom. When you place it on the ground in front of you, it feeds out the line without drag, twist, snag, inertia, or friction. Take a good look at the launch line. One hundred feet of it are already layered in the bottom, and there is a bobbin with another 100 feet of it too. Hold the

ANTENNAS WEST

Speed-Mail Address: Box 50062 Provo, UT 84605 Telephone (801) 373-8425

Here's our latest information packet. We appreciate your inquiry and hope to count you among our customers. Your interest and feedback help us improve and grow by stimulating us to think of better ways to serve and new solutions to offer.

Where's the Beam?

Did you know you can get good DX results without a tower and without a beam? The trick is to use an antenna that gives low angle radiation even if it has to be unobtrusive or worse yet even if you have to keep it completely out of sight. One great low profile performer is our HalfSquare, a two element antenna that gives gain in addition to DX angle radiation. Ten and 11 meter versions are small enough to fit inside the house. Even a 20 meter HalfSquare can be effective for DX when it's no higher than the roof. And the more height you can give it the better it will perform.

Take a look at the Sparky-J. This flexible half-wave DX performer can be hung down inside a tree, completely out of sight. Apartment dwellers can lower it out the window when they want to operate, then reel it in when done. A 10 or 11 meter Sparky is short enough to be used as an inverted-L inside apartments or attics. A single 15 meter Sparky hung invisibly inside a cherry tree has been bagging DX on 10, 12, 15, and 20 meters for one nearby ham with a tuner.

What about the lower bands? A low profile 80-40-30 or 40-30-20-17 meter beam lowers your angle of radiation and enhances your signal, and it goes up quickly in the space of a simple dipole. Call for a quick assessment of what can be done in your situation.

QRV Slinky Indoor Antenna for Apartment, Motel, Attic & Portable Use

How about working all bands from 40 thru 10 meters with a 15-ft long indoor antenna? If you're stuck in an apartment, this could be the answer for staying on the air. Extend it in a minute when you want to operate, then in less than three seconds it slides out of site when not in use. Take the QRV Slinky Indoor Antenna on your next trip. It weighs only a pound and a half and fits in a small corner of a suitcase. It can go up in two minutes inside a typical motel room. QRV Slinky is simple, fast, versatile, and effective, and it comes complete with feedline and all hardware needed for permanent or temporary no-holes mounting. To order a QRV Slinky, send \$21.95 plus \$4.00 for delivery by air mail. Add \$7.95 more if you also want the 80-meter extender kit at the same time.

Antenna Launching Made Easy

Putting an antenna up can be a fast and simple operation with the QRV-QuickLaunch Antenna Installation kit. No need to risk life and limb, no need to buy a bow or slingshot, nor to learn how to use it. With QRV-QL one person working alone can install an antenna in only a few minutes. The system is natural and easy to learn. The kit includes everything you need, and you'll use it year after year.

Let the Sun Power your Station

Our Solar Power systems deliver power for any style of operating-- from backpack portable to contest expeditions. Noiseless, instantaneous, dependable solar power makes portable operating fantastic! And it's a tremendous plus for the home station too. Take a good look at our improved 23-watt bullet-tested basic solar power supply for only \$319.95. It's completely assembled, and ready to use. Just let the sun shine on it. Begin with the basics, and expand as you wish, right up to 150 watts or more. Call for special arrangements on multiple unit orders.

Ordering is Easy and Fast

To order send your personal check. In a hurry? Call. Even when I'm not able to answer myself, you can tell me what you want and I'll hop to it as soon as possible.

Remember, I take pride in doing things right--If for any reason you're not satisfied, simply re-pack the product the way it came and send it back; I'll replace it or return your purchase price.

Best wishes for operating fun!

Jim Stevens, KK7C

Morning orders help us make same day shipping

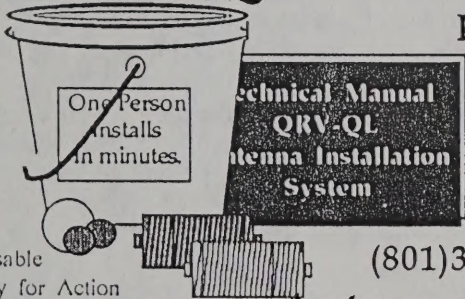
Antenna Installation Made Easy

When it comes to hanging antennas from available supports, there is an easy way.

No need to risk life and limb to climb trees or scale walls. No need to drop a big bill to buy a bow, nor to practice endlessly to learn how to use it. No need for three hands to hold sling shot, sinker, and spool. There's a simple way to launch antennas into the sky that is both effortless and easy. With the QRV system, one person working alone can install an antenna in minutes. And the method's not hard to learn, really, because it's so natural.

Q RV-QL *Quick-Launch*

Antenna Installation System



\$29.95
add
\$5 Air
Ship

(801)373-8425

AntennasWest
Box 50062, Provo, UT 84605

Re-usable
Ready for Action
Fast & Easy to Use
Eliminates Climbing

The method is in the QRV-QL Antenna Installation Kit. When you see the kit, you'll see a clean white pail with checklists printed on its sides. A bright yellow line is tied to the handle and disappears under the tight fitting lid.

Examine the sturdy smooth-sided pail that serves as stowage container and launch line carrier. On one side you find the launch checklist, on the other you find the packing list that makes sure your system is complete each time it's stored.

This pail is more than a container because it's also an integral part of the launching system. It holds the bright yellow launch line carefully laid in layers in its bottom. When you place it on the ground in front of you, it feeds out the line without drag, twist, snag, inertia, or friction. Take a good look at the launch line. One hundred feet of it are already layered in the bottom, and there is a bobbin with another 100 feet of it too. Hold the

launch line between your fingers. It's a limp, twist-free, snarl resistant braid. Although it's nearly 1/8" in diameter and highly visible, it feels as light as fisherman's fly line.

Reach in and take the flame red projectile in you hand. Its weight, slightly more than a baseball's, is calculated to make it easy to throw yet heavy enough to pull your launch line through the densest fir trees. It's perfect spherical shape means it won't gyrate when it hits a limb. That feature prevents your line from wrapping 'round and becoming lodged in brush or branches. The projectile's fluorescent non-natural color lets you spot it easily in foliage or on the ground. The bright yellow safety cover for use near people or buildings slips smoothly over the projectile and reduces the likelihood of injury or property damage.

Take out the spool of black rot-proof antenna support line. Its smooth double-dacron braided cover resists UV and slides over rough bark without snagging. It won't kink and won't snarl. It holds knots well, but is easy to untie. Out in the weather this line neither shrinks nor stretches--it stays the way you put it. With 200 feet you have plenty to raise your antenna high and tie off the ends to available supports. Once you have tried this double dacron line you won't want to use anything else.

Open the 28-page illustrated Antenna Launching Manual. Step-by-step it shows the simple procedures that enable first time users to place antennas 35 to 50 feet in the air in a matter of minutes. Using these techniques experienced launchers have succeeded in suspending antennas from trees over 90 feet high. All this while working alone and without ever taking a foot off the ground.

It took years of testing to discover the principles that make antenna launching easy, to find the right materials, and to reduce the system to something anyone can use without special training. There is nothing wasted, nothing that gets used up, nothing over-engineered or under-engineered. The QRV-QL Antenna Installation system is so simple, it is elegant.

Order Form

To order, simply enclose your check for \$29.95 plus \$5.00 for delivery by priority mail to any destination in the US. For Canadian destinations add \$3 more. For other contries send \$10 for shipping.

Call.....Name.....Tel (.....).....

Street.....Apartment.....

City.....State.....Zip.....

OmniLoop™ Antennas

- GAIN
- 160-10 Coverage
- Low Visual Impact
- Extremely Low Noise
- Efficient at Low Heights
- Easy No-Kink Installation
- Delta, Diamond, Quad, or Penta
- Horizontal, Vertical, or Sloping
- Balanced AirLine or Direct Coax Feed
- Increasing Gain and DX on each Higher Band

Easy to Install

- Everything included
- Failsafe visual instructions
- No measuring or cutting required
- Just solder two feedpoint connections

Quality Components

- Kinkproof, no-corrode, *QuietFlex* wire
- Weathersealed and insulated to 2500 volts
- Efficient insulated air dielectric feedline or Drip shielded coax feedpoint connector

OmniLoop is a closed loop antenna that's a full wavelength long on 160, 80 or 40 meters. Here's why an OmniLoop may be just the antenna you need:

- OmniLoop is an efficient broadband radiator, *even when low to the ground.*
- Second, OmniLoop has a low impedance resonance on *all* harmonics of its fundamental frequency. A dipole by contrast has low impedance resonances only on its odd harmonics.
- OmniLoop starts out with 2 dB of gain over a dipole on its fundamental frequency. Gain is higher if the antennas are less than a quarter wave off the ground because dipole efficiency plummets while OmniLoop stays efficient.
- Also, OmniLoop's gain over a resonant dipole increases with increasing frequency of operation, so when used on its harmonics, OmniLoop's power advantage over a dipole increases.
- For a horizontal OmniLoop, that's not the end of the good news, because as frequency of operation rises, OmniLoop's radiation angle drops lower and lower, producing increasing DX results that can rival a multielement beam antenna mounted on a 100-ft tower.
- Another nice feature is that OmniLoop can be strung up in unusual places and still perform well. Low to the ground--as low as 5 or 10 feet above the ground or *even*

under ground in basements or parking garages--performance is startlingly better than any alternative.

- And OmniLoop is forgiving. For most situations, particularly when mounted horizontally, perfect symmetry is not essential. Just hang it in the configuration providing the greatest enclosed area for greatest bandwidth and efficiency. (A square encloses more than a triangle, and a pentagon more than a square. A circle is the ideal.)
- An OmniLoop fed with air dielectric line through a transmatch is an efficient antenna on any frequency higher than its fundamental, even if it isn't harmonically resonant (A 40 meter loop operated on 30 or 17 meters, for example). And OmniLoop is easy for your tuner to match, because its feedpoint impedance never gets as high as those of an antenna that has free ends.
- Finally, the smallest OmniLoop can still be used effectively on bands below its resonance, which means you can have full 160-10 coverage even with loops as small as the 40 meter OmniLoop that's a mere 35 ft on a side when laid out as a square.

AntennasWest (801) 373 8425
P. O. Box 50062, Provo, UT 84605

Order Form for OmniLoops and Accessories

OmniLoops come in two versions--1. Balanced *AirLine* feed for maximum efficiency and 2. Direct coax feed.

- *AirLine* version is complete with 100 ft insulated air dielectric feedline.
- Coax feed version has custom feedpoint insulator with integral drip shielded SO-239 coax connector (Order 75-ohm coax feedline separately). When ordering specify your feed option.

All OmniLoops provide gain and full 160-10 coverage. Choose the model that Fits your Space.

OL160 OmniLoop (When ordering specify balanced line or coax feed version) 99.95
 Length 560 ft. Space Required: Delta--187'/leg; Quad/Diamond--140'/leg; Penta--112'/leg.

Loop resonates on 160 meters and provides broad harmonic resonances on or near all higher amateur bands. Radiation is omnidirectional on all bands when mounted horizontally. Gain over a dipole at lowest resonance is 2 dB and increases with frequency of operation, while radiation angle drops, giving progressively better DX performance from 80 meters up. Rejects man made electrical interference, natural static, and charged particle noise for exceptionally quiet reception on all bands.

OL80 OmniLoop (When ordering specify balanced line or coax feed version) 79.95
 Length 290 ft. Space Required: Delta--97'/leg; Quad/Diamond--73'/leg; Penta--58'/leg

Loop resonates on 80 meters and has broad harmonic resonances on or near all higher amateur bands. Radiation is omnidirectional on all bands when mounted horizontally. Gain over a dipole at lowest resonance is 2 dB and increases with frequency of operation, while radiation angle drops, giving progressively better DX performance from 40 meters up. Rejects man made electrical interference, natural static, and charged particle noise for exceptionally quiet reception on all bands. Includes Marconi Adapter. Use with transmatch for 160 meters.

OL75 OmniLoop (When ordering specify balanced line or coax feed version) 79.95
 Length 275 ft. Space Required: Delta--92'/leg; Quad/Diamond--69'/leg; Penta--55'/leg

OL40 OmniLoop (When ordering specify balanced line or coax feed version) 69.95
 Length 142 ft. Space Required: Delta--47'/leg; Quad/Diamond--36'/leg; Penta--28'/leg

Loop resonates on 40 meters and provides broad harmonic resonances on 20, 15, and 10 meters. Power gain over a dipole at lowest resonance is 2 dB with additional pattern gain and directionality if mounted in the vertical plane. With transmatch it works all WARC bands with gain. Includes Marconi Adapter for 75/80 and 160. Rejects man made electrical interference and atmospheric and charged particle static for unusually quiet reception.

Antenna Accessories

• **QRV QL QuickLaunch Antenna Installation Kit** \$29.95

A system for hanging wire antennas quickly from available supports up to 65 feet high, the kit eliminates the need for exceptional strength and requires minimal exertion. The system also eliminates climbing, and the need to learn difficult skills such as the accurate use of bow and arrow, slingshot, etc. Contains high visibility fluorescent projectiles, twilight view kink proof launch line, safety protector, 200 ft 250-lb test UV proof black double dacron line, and a line carrier/storage container. Manual explains most effective use and safety precautions. Reusable--nothing more required.

• **Double Dacron 250 lb Support Line** \$11.95

Two hundred foot spool of this custom made braided UV-proof non-stretch line. Only 3/32 inch in diameter, it is easy to work with and will not snarl. Once you've tried it, you won't want to use anything else. Buy two spools for \$19.95.

• **Feedline Extension** \$24.95

A 70-ft foam dielectric RG-11U 75-ohm coax feedline extension complete with presoldered top quality connectors and mating dual female straight adapter for easy connection to existing feedlines or other cables. One end is weather sealed with durable and flexible self-amalgamating weather seal material.

• **Marconi Adapter kit** \$5.95

This quickly assembled kit makes Marconi feed simple. Just screw PL-259 from antenna into one side and coax from transmatch into other side. Four terminal flange makes it easy to connect ground, radials or counterpoise as desired.

Name _____		
Call _____	Phone _____	
Street _____	Apt _____	
City _____	State _____	Zip _____

Circle desired items and add.	
Merchandise Total	_____
6.75% sales tax (Utah residents)	_____
Add \$5.00 shipping & handling for items	_____
TOTAL	_____

Give street address for UPS. Add \$5 for 2nd Day Air. Write check to AntennasWest, Box 50062, Provo, UT 84605 Tel 1-801-373-8425

AntennasWest

TigerTail™

Range Extender for Handheld Radios

- Snaps on Handheld Transceivers
- Lowers Radiation Angle
- Boosts Signal from Flex, 1/4 wave, and 5/8 wave Antennas
- Improves both Receive *and* Transmit
- Adds No Bulk or Height--Weights only 1/3 oz.

- Easy to Use
- Unobtrusive & Easily Concealed
- Improves Low Power Performance
- Saves your Battery Pack

Try it. See and hear the difference.

Set your Transceiver to the repeater with the weakest signal. Key it up and measure the signal strength. Remove the flex, quarter-wave, or 5/8 wave antenna temporarily from the handheld. Slip TigerTail over the antenna connector, then replace the antenna. Key up the repeater, and measure signal strength again. You can hear and see the difference.

How does it work? Simple. TigerTail is the missing half of your antenna. Without it, the ground bus on the transceiver circuit board (too small) and your body (a lossy radiator at best) are all your antenna has to work against. But with TigerTail in the picture, antenna efficiency jumps, and your signal is radiated low to the ground instead of shooting off into the clouds. You can hear and see the difference.

See and Hear the Difference

7.95

Patent Pending

ANTENNASWEST
1500 North 150 West, Box 50062
Provo, UT 84605 (801) 373 8425

AntennasWest TechNote Series

Up-to-date reports on antennas and related topics, TechNotes explain essential principles and show constructional details. TechNotes contain source lists to simplify the search for appropriate materials, Ever practical installation guidelines show how to obtain best results in practice. Where indicated, an anoted bibliography is included to support further research.

TechNotes Available

#121b	"A Grab-N-Go Emergency/Portable Multiband Antenna System," 16pp.	\$6.95
#122b	"Simple HalfSquare Wire Beams for Long Distance HF Communications," 32pp.	\$6.95
#123c	"Slinky Helical Antennas for Portable and Small Space Use," 20pp.	\$5.95
#124d	"Building & Installing G5RV Antennas for Effective Multiband Performance," 36pp.	\$6.95
#125	"Solar System Design Considerations for Radio Communications," 16pp.	\$5.95
#126	"Effective Windom Antenna Design & Construction," 16pp.	\$6.95
#127b	"Antenna Installation Made Easy: How to build and	\$5.95

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Order by Mail: Send check or money order with name and address to P. O. Box 50062, Provo, UT 84605.

Order by Phone: Call Order Hotline (1-800-926 7373) and pay with Visa, Master, or Discover card. No CODs.

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Telephone 801 373 8425 · FAX 801 375 4664

To order, circle desired items and add.

Merchandise Total

Add \$5.00 shipping and handling.

Total

Call.....Name.....Tel (.....).....
Street.....Apartment.....
City.....State.....Zip.....

DX Helper™

DX Software for your Macintosh Computer

By Randy Stegemeyer, W7HR

DX Helper is a comprehensive DX information software package for the Macintosh which will serve your needs far into the future. Written by an active DX'er (over 310 countries worked on the *current* list), DX Helper gives you all the features you need while taking advantage of the MAC environment for simplified operation. Besides typical "beam heading and distance" data, there is a world map with the current sun location and "gray-line" to show you just what is happening *now*, as you sit down to operate. The gray-line and sun position will automatically update every ten minutes, if you like. In addition, other essential data is shown, including latitude and longitude, sunrise and sunset times, CQ zone, GMT offset time for the selected country, whether or not 3rd-party traffic is allowed, and the current estimated Maximum Usable Frequency (MUF). Besides the scrollable list of DXCC countries, you can position the cursor over any point on the world map and see the latitude and longitude, bearing and distance, sunrise and sunset times, and MUF to that point! A double-click of the mouse and the world map is replaced with an MUF-vs-TIME 24-hour propagation chart for the selected DXCC country or map location. Now you can know when it will pay to get up at 3 AM to listen for that DXpedition or if you could just as well stay in bed! DX Helper will even remind you at 17 minutes past the hour to turn on WWV to get the latest solar flux and propagation data!

Prefer a "great-circle" map for quick directional reference? No problem. Just click the "AZ-EQ" box and the rectangular map display is replaced with an azimuthal-equidistant display *custom computed for your exact QTH!* Prefer a wall chart of beam headings to all DXCC countries? Easy. DX Helper will print one on your Imagewriter, all on a single page for fast reference. Customized for *any* QTH, of course! A distance chart is available, too! You could even go into business *selling* these things!

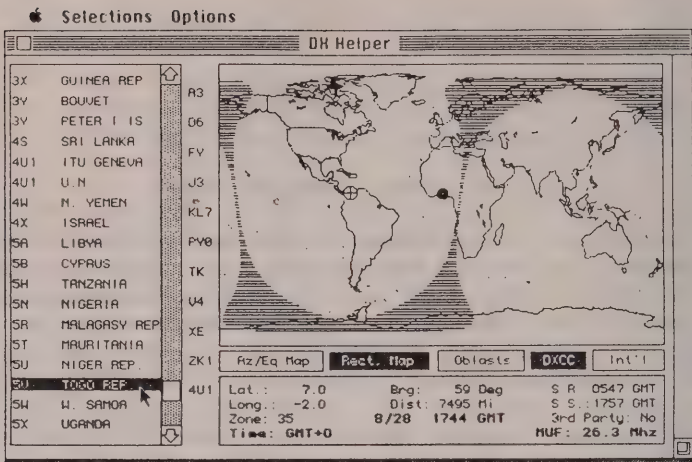
But we're just getting started! No MAC DX program would be complete without a comprehensive international prefix identifier. Heard a strange call that's not on the standard lists? Select the "INT'L" box and see a scroll bar containing all internationally-assigned prefixes and the mystery will be solved! Besides identifying the country, additional info such as islands or territories are also listed, if applicable.

How about all those Russian Oblasts that everyone is talking about? Or even figuring out which CQ zone a Russian station is located in? Just select the "Oblast" box and the scroll bar will display a breakdown of Russian call signs, with data showing Oblast number and name, and CQ zone! No more guesswork.

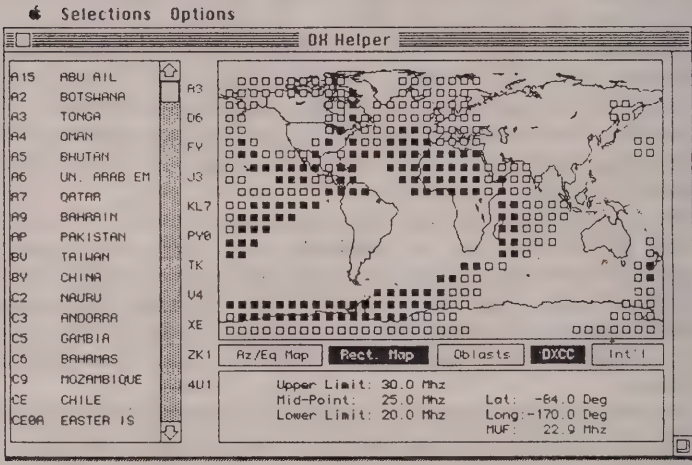
Ever wonder just *where* the band is open to? Or which areas are likely to be most productive for new DX *at the moment?* Just select a range of frequencies (such as 13 to 15 Mhz) and use the "MUF/Area" option to display a map of the earth showing the *areas* where the band is most likely open to *now!*

It's no secret that most of the best DX is in the lower part of the bands, often in the lower 25-Khz. But that Extra Class ticket requires 20-WPM! What to do? Select DX Helper's "Code Practice" option and let your MAC send CW to you while it prints it on the screen! Select the speed you want and away you go. You can even select your favorite pitch!

DX Helper is the only DX program you will ever need. If you are a DX'er with a MAC, you can't afford to be without DX Helper!



DX Helper Screen Display



MUF -vs- AREA Display

Equipment: 512K memory, double sided disk drive, imagewriter or laser printer.

Make check or money order payable and send to: AntennasWest, P. O. Box 50062, Provo, UT 84605. Utah residents add 6.25% sales tax.

Please send a copy of DX Helper. Enclosed find \$49.95 for postpaid delivery.

Name _____ Call _____

Address _____

City _____ State _____ Zip _____

I use a Mac: 512 _____ Plus _____ SE _____ Mac II _____

Order Hotline 1-800-926 7373, Visa & MasterCard accepted

QuicKit G5RV Antennas

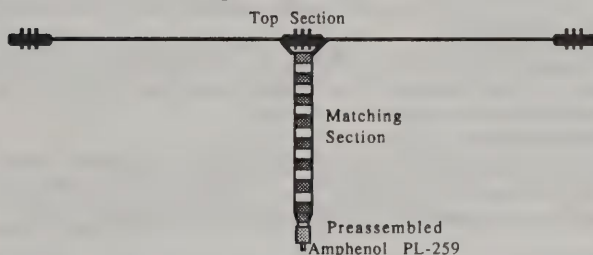
Fast and Easy to Make

- Everything included.
- Failsafe visual Instructions.
- No measuring or cutting required.
- Assemble the complete antenna in minutes.
- Just solder two connections and you're ready for multiband action.

Quality Components

- Flexible, kinkproof, no-corrode, low noise wire.
- Entirely weathersealed and insulated to 2500 volts.
- Preassembled matching section includes weathersealed PL-259.

The QuicKit G5RV



Choose the Model giving the band coverage you need:

- Full Size G5RV** The 102 ft top and 34 ft matching section give dipole coverage from 3.5 to 28 MHz, and Marconi coverage of the 1.8 MHz band.
- Half Size G5RV** The 51 ft top and 17 ft matching section give dipole coverage from 7 to 28 MHz, and Marconi coverage of the 3.5 MHz band.
- Quarter Size G5RV** The 26-1/2 ft top and 8-1/2 ft matching section give dipole coverage from 14 to 50 MHz, and Marconi coverage of the 7 MHz band.

Eliminate the guesswork and keep the fun of antenna building with a QuicKit from AntennasWest!

Order Form for *QuicKit* Antennas and Accessories

QuicKit G5RV Antennas

- **Full Size G5RV:** \$35.95
The 102 ft top and 34 ft matching section give dipole coverage from 3.5 to 28 MHz, and Marconi coverage of the 1.8 MHz band with accessory Marconi Adapter.
- **Half Size G5RV:** \$25.95
The 51 ft top and 17 ft matching section give dipole coverage from 7 to 28 MHz, and Marconi coverage of the 3.5 MHz band with accessory Marconi Adapter.
- **Quarter Size G5RV:** \$19.95
The 26-1/2 ft top and 8-1/2 ft matching section give dipole coverage from 14 to 50 MHz, and Marconi coverage of the 7 MHz band with accessory Marconi Adapter.

QuicKit Antenna Accessories

- **Antenna Launcher:** \$14.95
Make your own antenna launcher. Kit contains all the hard-to-find parts--two fluorescent red .375 lb spherical projectiles, 200 ft snarl proof half-weight fluorescent yellow launch line, safety cover, and instructions. Assemble a safe, versatile and effective launcher in minutes.
- **Double Dacron 250 lb Support Line:** \$11.95
Two hundred foot spool of this custom made braided UV-proof non-stretch line. Only 3/32 inch in diameter, it is easy to work with and will not snarl. Once you've tried it, you won't want to use anything else. Buy two spools for \$19.95, five for \$39.95.
- **Coaxial Feedline Extension:** \$24.95
A 70 foot length of 95% braid low loss RG-8m 50-ohm coaxial cable with presoldered top quality Amphenol PL-259 connectors and mating dual female straight adapter for easy connection to existing feedlines or other cables. Both ends are weather sealed with a durable and flexible custom weather boot.
- **Zepp Feedline Extension:** \$22.95
An 84 foot length of insulated 450 ohm balanced feedline for minimum feedline loss. Hand assembled with presoldered top quality Amphenol PL-259 connectors at each end and mating dual female straight adapter for easy connection to *QuicKit* G5RV, dipole or loop feedpoint at one end and transmatch at the other end. Both connectors are weather sealed.
- **Marconi Adapter kit:** \$5.95
This quickly assembled kit makes Marconi feed simple. Just screw antenna connector into one side and coax from transmatch into other side. Four-terminal flange makes it easy to connect ground, radials or counterpoise as available.

Order Form

To order, circle desired items and add.

Merchandise Total

Add \$5.00 shipping and handling.

Total

Call.....Name.....Tel (.....)

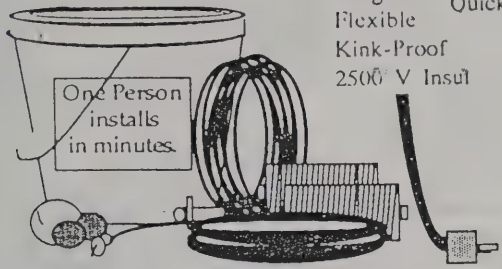
Street.....Apartment.....

City.....State.....Zip.....

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QRV Emergency Antenna Packs

80-10 \$99.95
40-10 \$89.95



Tough
Flexible
Kink-Proof
2500 V Insul

Packs contain Multiband Antenna, coax feedline, daeron support line, QuickLauncher, Tech Manual.

Ready for Action
Easy to Match
Full Legal Power
No Lossy Traps
Weather Sealed
Never Corrodes
Low Noise

◇ 80-10 Version \$99.95
 Frequency coverage: 80, 40, 30, 20, 17, 15, 12, 10 meters as centerfed doublet.
 Space Requirements: Flat top installation 102 ft span. Inverted-V 72 ft span.
 Minimum space requirement for horizontal square mounting 26 ft per side. Minimum requirement for vertical mounting: Height plus Length sum of 60 ft. Details in tech manual.

◇ 40-10 Version \$89.95
 Frequency coverage: 40, 30, 20, 17, 15, 12, 10 meters as centerfed doublet.
 Space Requirements: Flat top installation 51 ft span. Inverted-V 36 ft span.
 Minimum space requirement for horizontal square mounting 13 ft per side. Minimum requirement for vertical mounting: Height plus Length sum of 30 ft. Details in tech manual.

Common Elements of All QRV Emergency Antenna Packs

- Quick Launch system: Projectile, spare, 200 ft launching line, safety cover, line carrier, 200 ft UV-proof double daeron support line.
- Feedline extension: 70 feet RG-8X 50 ohm coax with weather sealed connectors and double female adapter.
- SWR: Reasonable match to coax at base of vertical section in high flat-top configuration. User supplied transmatch easily compensates for reactance and variations due to height, site, and configuration.
- Power Rating: 2000 Watts PEP in amateur bands.
- Insulation: 2500 volts, fully covered and weather sealed from end to end.

Order Form

To order, circle desired items and add. Merchandise Total _____

Add \$10 shipping for Emergency Antenna Pack and \$5 for other items.

Call.....Name.....Tel

Street.....Apart.....

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ANTENNASWEST Box 50062, Provo, UT 84605 (801) 373-8425

DX HALF SQUARE MONOBAND ANTENNAS FROM ANTENNASWEST

DX HalfSquares focus radiation at lowest DX angles, producing maximum signal strength at distances between 2000 and 5000 kilometers. DX HalfSquares require no radials, are unobtrusive, and simpler than a dipole to install.

✓ 10 METER DX HALFSQUARES \$39.95

This antenna measures 16' long by 9' high and has a broad resonance centered near 28400 KHz.

✓ 15 METER DX HALFSQUARES \$39.95

This antenna measures 23' long by 12' high and has a broad resonance centered near 21150 KHz. The manual explains how it can be adjusted for use on the 12 meter band.

✓ 20 METER DX HALFSQUARES \$49.95

This antenna measures 34' long by 18' high and has a broad resonance centered near 14100 KHz. The manual explains how it can be adjusted for use on the 12 meter band.

✓ 40 METER DX HALFSQUARES \$69.95

This antenna measures 67' long by 35' high and has a broad resonance centered near 7100 KHz. The manual explains how it can be adjusted for use on the 30 meter band.

ALL-BAND ANTENNA PRODUCTS FROM ANTENNASWEST

✓ QRV 160-10 ALL BAND ANTENNA \$59.95

Kink-proof and weather sealed high efficiency antenna covering all bands from 160 through 10 meters. Antenna length is 102 ft. Ready made Marconi Adapter simplifies 160 meter use.

✓ QRV 80-10 ALL BAND ANTENNA \$49.95

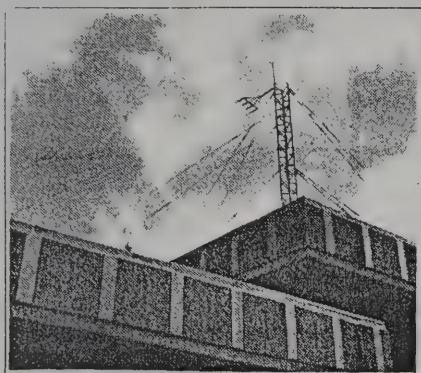
Half-length version of popular QRV 160-10 Antenna covers all bands from 80 through 10 meters. Length is 51 feet. Ready made Marconi Adapter simplifies 80 meter use.

✓ QRV-QL ANTENNA INSTALLATION KIT \$29.95

The QRV-QL Quick Launch Antenna Installation Kit eliminates climbing and heavy exertion, simplifying the installation of all wire antennas. It includes everything you need to hang a wire from available supports and keep it there. Kit contains reusable fluorescent projectiles, twilight view launch line, safety cover, 200 ft spool double dacron twistproof support line, detailed manual. Use this durable and long lasting system again and again

QuickKit G5RV Antennas

- Full Size G5RV: \$35.95
The 102 ft top and 34 ft matching section give dipole coverage from 3.5 to 28 MHz, and Marconi coverage of the 1.8 MHz band with accessory Marconi Adapter.
- Half Size G5RV: \$25.95
The 51 ft top and 17 ft matching section give dipole coverage from 7 to 28 MHz, and Marconi coverage of the 3.5 MHz band with accessory Marconi Adapter.
- Quarter Size G5RV: \$19.95
The 26-1/2 ft top and 8-1/2 ft matching section give dipole coverage from 14 to 50 MHz, and Marconi coverage of the 7 MHz band with accessory Marconi Adapter.



AERIALS

An antenna review: The GAP all-band HF vertical

These guys have solved a problem associated with verticals. That is, an awful lot of RF is wallowing around and dropping into the dirt instead of going outward bound.

The GAP gets the feedpoint up (they must have been reading my columns of a few years back). It really is a dipole (center fed) turned vertically. About 32 feet in length, and weighing but 16 pounds, Lil and I had no problem getting it up, that is, after putting it together; give yourself more than the 30 minutes promised in the brochure.

How does it perform? Sweepstakes, 1990: 01, 02, 03, 04, 05, 06, 07, 07. Like a hot knife through butter.

While that might not seem like much to the full gallon and five elements on top of a 125 ft. tower, gang, remember that this is 100W, a vertical, and I was going up and down the band, waiting for the other exchange to finish before jumping in.

I was just a barefoot boy answering the CQ callers. They just kept coming back to me. POW! POW! POW!

I'd work a station and then stay on the frequency and hear MANY stations calling the one I'd just worked. Another thing I'd do is (having a short call, I can get away with this): wait just a split second until I could hear the rumble of many stations calling — then I'd throw my call in and the pursued station would come right back to me.

I am almost struck with disbelief myself. I mean, this is a vertical. But

then, it's a vertical with a big difference, as I'd again work two stations in a clock minute. Throughout the contest, I gave it a workout on every band. I worked just about everything I heard.

I started calling CQ (on 20) and worked stations at :45, :46, :48, :50, :50, 51. Frankly, I found the moving up and down more like a chase, so I went back to that. There's always the question, "Is it the antenna or the conditions?" That's why I like to test an antenna during contest conditions. In a competitive situation you really know what is happening. Are you getting beat up? Standing in long lines to work some station? Are the really loud stations, after you finally get through to them, asking for repeats and fills? Or is all just zip, zip, zip, zip? This GAP really beats loading up a chain link fence or metal bunk beds. But, then when you phase two sets of bunk beds . . . but that's another story.

Seriously, this was all too easy. I've decided that next year I'll work only the "A" (lower power) stations and no "B" (higher power) stations. I'll give to the needy, not the greedy.

I look through the log and see :58, :59, :00. I also see :40, :41, :42. There's an :18, :19, :20, :21. Later there's a :19, :20, :21, :22, :23, and more like that.

Well, I missed one state. That's no fault of the GAP. Maybe I wasn't in the right place at the right time. Was it on when I was reading the newspaper? Or while I was getting a good night's sleep?

So, there's my adventure with the GAP. I was indeed pleased. If I were a whole lot younger and I had two of those GAPs phased, I'd tell those contest hotshots to . . . look out!

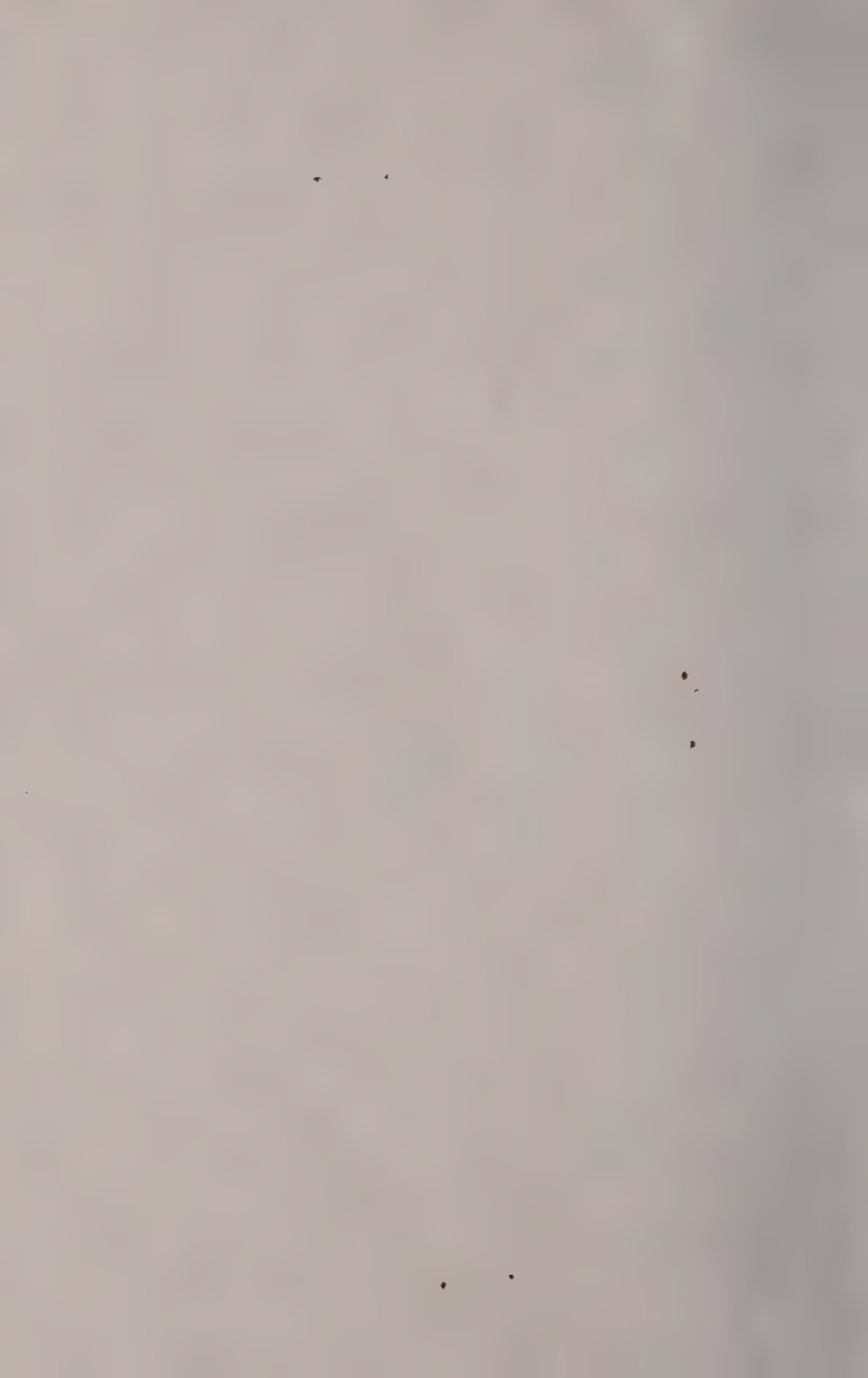
(Kurt N. Sterba, hamdom's mystery man, wears his cloak of anonymity so that he may go on the air testing antennas and not be met by pals giving overly generous signal reports or by knaves saying "You sound terrible, go back to your shopping cart antenna.") Only \$219

ANTENNAS WEST

1500 North 150 West, Box 50062
Provo, UT 84605 (801) 373 8425

GAP DX-VI

The GAP



TNT

The No-Tune Windom Antennas

No pruning.

No tuning.

No knobs to twist.

TNT is No-Tune on 80 cw, 40, 20, 17, 12 & 10. TNT/2 is No-tune on 40, 20 & 10. Work other bands w/ tuner. DX & Gain rise w/ frequency.

Ready to Use Now

Kink-Proof

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Wx-Sealed

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Low Noise

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WindomTechNote #126

\$6.95 ppd USA

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TNT

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P&H

TNT/2

\$79⁹⁵

+\$7

Windom

68 ft. long

P&H

Order
Hotline

800-926-7373

No-Tune High Frequency Antenna System

- Frequency coverage:** High Frequency 80, 40, 20, 17, 12, & 10 meter amateur radio bands.
- Construction:** The antenna is 137 feet long. It is made of #14 QuietFlex antenna wire, which is highly flexible, kinkproof, and insulated to 3000 volts. The antenna is fed through an impedance matching balun located at a distance 45 feet from one end of the antenna. The feedpoint is completely encapsulated and weather proof. An eyebolt on the feedpoint facilitates support. End insulators may be unlocked and relocated without cutting or soldering. The antenna is pre-tuned at the factory.
- Feedline:** The 97-foot RG-8x (.75 velocity factor) feedline supplied serves as the linear matching transformer which provides low feedpoint impedance for the 15 meter band. If a longer feedline is required, extend with 50 ohm coaxial cable. If a shorter line is required, shorten the cable supplied. When shortening or lengthening feedline follow this guideline in order to preserve the low impedance match on the 15 meter band: Extend or shorten feedline in increments or decrements of half wavelengths at 21.000 MHz calculated at the propagation velocity of the feedline section added or removed. (Add or subtract in multiples of 23.4 ft x appropriate velocity factor).
- Gain:** The TNT Windom displays unity gain relative to a half-wave dipole in the same configuration on the 80 meter band. It exhibits increasing gain over a resonant half wave radiator on succeeding higher bands as the major lobes become sharper and occur at successively tighter angles relative to the wire.
- Power Rating:** 500 Watts PEP in amateur bands. If operation at higher power levels is desired, replace feedline with an appropriate length of solid dielectric RG-8, RG-213 or similar 50 or 75-ohm cable. Feedpoint support is essential when such heavy cables are used.
- VSWR:** Typically under 2.0:1 for all HF bands except 15 & 30 meters which may be tuned by means of user supplied transmatch. Respect power limitation.
- Installation:** Install at height of 25 ft or greater and in a straight line. Support ends with non conductive double dacron line. Take advantage of trees as supports by using the QuickLaunch Antenna Installation System. Support feedpoint if possible. Limit tension at antenna ends to 60 lbs and allow 5-ft sag if the feedpoint is not supported.
- If straight-line installation is not possible, install as a horizontal "Z", slide end insulators in a few feet and let ends hang free, or install as inverted-V. Keep antenna as horizontal as possible to preserve efficient radiation on upper bands.
- Radiation Pattern:** At heights below 50 feet, radiation pattern is essentially omnidirectional and at high angles for frequencies below 7 MHz. Above 7 MHz radiation concentrates in four major lobes diagonal to the wire and taking off at low angles. The higher the frequency, and the higher the antenna, the lower the angle of take-off. Expect solid coverage in all directions on 80 and 40 meters, and increasing distance with an enlarging local skip zone for successively higher bands. For most effective communication with locations beyond 2500 miles, orient antenna wire toward the desired compass direction.
- Technical Support:** Call *AntennasWest* Tech Support at (801) 373 8425

ORDER BY MAIL OR PHONE

Name _____
 Call _____ Phone _____
 Street _____ Apt _____
 City _____ State _____ Zip _____

TNT Windom Antenna & Feedline	\$89.95
Double Dacron 200' spool	11.95
Merchandise Total	_____
6.25% sales tax (Utah residents)	_____
* Add \$7.00 shipping & handling	_____
Check, MO, Visa/MC TOTAL	_____

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QSLs

*Two-Color
Rainbow Assortment*

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QSL Order Worksheet. Fill in Blanks and Check Spelling, then call in order.

City _____			County _____			State _____		
Call Letters _____								
Name _____		Street _____		City _____		State _____		Zip _____

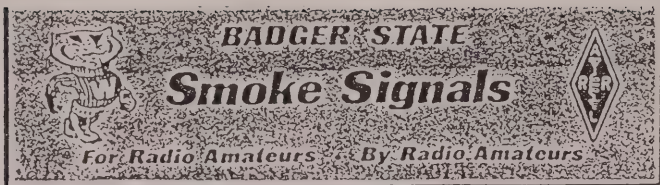
To order by mail, circle quantity, deadline, and price. Enclose check.

<i>We Ship</i>	<i>NextDay</i>	<i>2nd Day</i>	<i>NextWeek</i>
100	\$29.95	\$24.95	\$19.95
200	\$39.95	\$34.95	\$29.95
400	\$49.95	\$44.95	\$39.95
500	\$54.95	\$49.95	\$44.95
1000	\$99.95	\$89.95	\$79.95

**We pay Air Mail
on all US deliveries.**

Overnight air shipment
add \$10.

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PRODUCT REVIEW:
NEXTDAY QSL CARDS

AntennasWest has initiated a unique fast-turnaround QSL service called Next-Day QSLs. With a simple telephone call, a ham in the United States can order QSLs for next-day shipment and second day delivery.

This, unusual service is made possible by means of a unique integrated process designed specifically for fast turnaround of individual orders. Every step, from layout to plate making to printing to cutting and packaging, is under one roof where it can be monitored at all times.

Finished cards speed to their destination by priority mail, expedited by a 24-hour regional postal sorting and dispatching center. Next Day Air delivery is also available.

NextDay QSL designs are classic and cleanly proportioned versions of the DXCC standard card layout. The typeface is

sharp, and each call sign is professionally kerned for easy recognition and artistic balance. All cards are printed in two colors on a rainbow assortment of pastel card stock selected for eye appeal and easy writing quality.

The most popular design is reproduced here. Special formats have been created for prominent display of club insignia.

Thule, Greenland

OX/N1FBY

Confirms
 Two-Way Radio Contact
 Reception Report

Name	Date	UTC	Time	Mode	PSTI	Power	QSL
<small>Equipment</small>		<small>Antenna</small>					

Alan E. Frank, 2337 West Forth Street, Williamsport, PA 17701, USA

To order NextDay QSLs, call (801) 373-8425, or write to AntennasWest, P.O. Box 50062, Provo, UT 84605. NextDay QSLs may also be ordered through amateur radio stores.

Ham clubs which display sample cards and make them available to their members receive donations and other benefits.

THE POWERPOLE MODULAR CONCEPT

The Powerpole is a unique connector, designed with flexibility in mind.

Each Powerpole module is a single pole connector half, which can be assembled in customized multi-pole configurations. Variations of nests, combinations and polarization are possible, while maintaining excellent vibration resistance, high reliability and strength.

Hermaphroditic

The Powerpole modular concept uses identical, interchangeable, genderless halves which allow for design flexibility, speed of assembly, ease of ordering and inventory control.

Stackable and Color Coded

Single-pole modules lock together using molded-in dovetails. Use as many modules as you need - no need to buy extra poles. Optional colors provide visual orientation or color codes for wire harnesses.

Self Polarizing

Powerpole modules can be mated only the right way!

Unique Contact Design

Quality silverplated copper contacts retained by stainless steel leaf springs are ideal where frequent disconnects or high repeatability with low voltage drop (contact resistance) are required.

Complete Range of Sizes

Models rated at 15, 30 and 60 amperes. There are Powerpole modules for every wire size from #20 AWG to #6, solid or stranded.

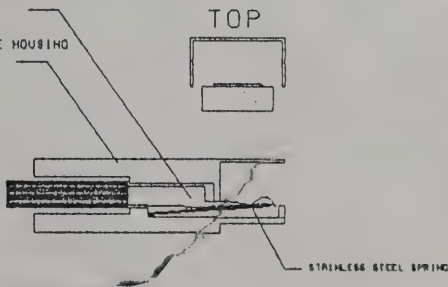
High Voltage Rating

Powerpole connectors are rated for 600 volt operation! AC or DC applications.

SILVER PLATED CONTACT

POLYCARBONATE HOUSING

TOP



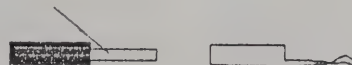
The POWERPOLE Connector System
Distributed by:

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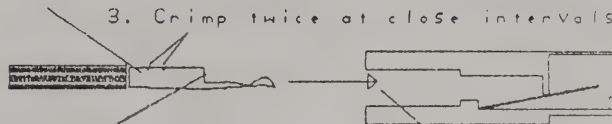
ASSEMBLY

1. Strip and tin the wire



2. Insert into the contact

3. Crimp twice at close intervals

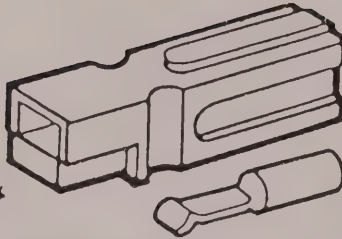


4. CAREFULLY flow solder into the crimp

5. Insert into the housing until the spring clicks home

Defacto 12 volt DC standard: Tops up stacked side by side, RED (+) on the RIGHT viewed looking into mating end of connectors.

Quick Interconnect



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• Fool-Proof • Fast • Genderless • Color coded • 30A Silver • Reliable •
Switch from mobile to shack in seconds. Interchange power supplies and rigs in moments. Interconnect battery, charger, controller, solar panel, generator, backup / conventional power instantly in any combination. Create custom multi-pole connectors in seconds w/ lego-like stacking. Easy crimp/solder, assembly. No special tools required.

Sold in Sets of 2
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10 \$ 19⁹⁵
sets

20 \$ 36⁹⁵
sets

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ANTENNAS WEST

Provo, UT 84603-1144 (801) 373-8425

CO DX!

You want to work DX consistently without a tower and without an amplifier? A QRV-DX HalfSquare may be the key. In fact you may even find yourself working DX you never even heard before. And although it doesn't require great height and is unobtrusive, it is a whole antenna with full-sized results.

I'm eager to have you try the antenna because I designed and constructed it specifically to produce DX results, and it really does. If you're in a problem location like many of us, it's easy to conceal, but the DX can't hide from it. Also, because of the way it is built, it is so easy to install that some users claim to have put it up in as little as 10 minutes.

I have tested my HalfSquares in all sorts of terrain under all sorts of conditions. I strung them up in an high rise apartment, from a balcony of a second story apartment, from an 3rd story office in a commercial building with acres of fluorescent lights. I strung it across a parking lot in the middle of the night. I have hung it from rock outcroppings on a treeless desert island, in a northwest rain forest, in a swamp in the Rhine river lowlands, in back yards, and hidden under the eaves in picky neighborhoods and snoopy motels. I kept improving it till I was confident that I had the DX antenna that is easiest to use and delivers the most DX Bang for the buck.

I've tried hundreds of antennas and hundreds of methods for launching them. Your QRV-DX HalfSquare is the fastest, most adaptable DX antenna you'll ever see. It is made to satisfy a desire to be working DX now rather than next year when you have the budget for a tower and a tribander or next month when your buddies can find time to come over to help you put them up.

Don't get me wrong--there's nothing wrong with a tribander. In fact it will beat the HalfSquare hands down if your goals are to rotate it at the touch of a finger or use the same antenna as a beam on more than one band. But if you want to work DX in the direction broadside to your HalfSquare, that tribander may well end up taking the back seat.

I'll never forget my first test on 15 meters from a portable location in Germany. I stretched the HalfSquare out along the outside wall of the apartment, supported from a fishing rod out the bathroom window on one end and from a bamboo pole tied to the balcony on the other end. It was only 5 feet out from the reinforced concrete wall of the building, and its ends were just high enough that the neighbors on the ground floor couldn't grab them to pull it down.

I connected a 15 foot piece of coax to the feedpoint, brought it in through the window, and screwed it straight onto my transceiver. The band was so quiet I thought something was wrong. I called CQ on 21.025 and back came a JA saying I was the first European signal he had heard that day. I was 599 barefoot in Tokyo and his kilowatt and 3 elements were 569 in Frankfurt.

"What was that antenna, you say, old man? --a *Half-What?*" he repeated. When he said good-bye, a string of JA's began calling me, each tail-ending the next. An hour later their KW signals were the same strength as mine. Soon I heard them beginning to work Europeans 600 miles further east. Finally I heard them working the DL's who were using quads and tribanders. Interestingly I could hardly hear any of the Europeans until I switched to a dipole.

Why was I the first signal heard when the band opened? Why was my signal so much stronger than theirs at that moment? And why could I hardly hear the nearby Europeans that were so strong on the dipole? Because the HalfSquare focuses its radiation and listening power at low DX angles between 10 and 25 degrees, angles so low that for a tribander to give similar performance, it would have to be more than a full wavelength high.

When you think about the engineering, expense, and visual impact of a 20 meter monster array up sixty to one hundred twenty feet, you're pleased as punch to compete head to head using a Half-Square only 20 feet above ground. And you really smirk when you know you can beat the tribanders to the prize if you just raise your HalfSquare.

If you have a tribander, don't feel bad. You have a great antenna that serves you well not only for DX but for close-in contacts too. But if there is a part of the world you want to work but can't, if you

want to be first man through to China every day when the band opens, if you want to run traffic to Antarctica on schedule every day, or if you're already succeeding at doing all this and want to do any of it from a portable location, you could use a HalfSquare to great advantage. And your HalfSquare will deliver the DX for less than it costs for the coax to your beam.

What is this? you ask. Has Jim Stevens invented some new killer DX antenna? No. All the basic electrical principles behind the HalfSquare have been known for more than 50 years. The idea of a two element broadside array is almost as old as Marconi. And there are still hams out there spending hundreds of dollars for a pair of lossy ground mounted phased verticals with buried radials and buried coaxial phasing lines.

The trick of standing the verticals on their heads and running a virtually lossless phasing line through the air between them was post-Marconi, but it has still been around for decades. Back before I was a pup Woody Smith proposed an imposing system like that with three vertical elements and called it a bobtail curtain. Then twenty years ago, Bob Vester found that his bobtail worked just as fine if he threw away one of the legs and half the phasing line. That pleased him, because the result was a lot more manageable while being just as performant. He called what was left a Half-Square.

But for all those years, anyone who tried a bobtail or a Half-Square was fussing around out in the garden, with a feed system made out of chicken wire mats, plastic freezer boxes, variable capacitors, parallel tuned circuits, and taps on coils--hardly the stuff to get a bandwagon rolling.

When I got working on the HalfSquare ten years ago, I found out that there is an easier way to feed it, a way that works at any site without any chicken wire and without any trial and error. That's one of the reasons your QRV-DX HalfSquare is so simple to set up and so quick to put on the air. There is no hocus-pocus or hype here--The design is simple, based on well known and well tested principles. It has been proven by the test of time. And--as you yourself will be able to attest--it delivers the DX.

Someone might ask, if you're talking about low angle radiation from a vertical, wouldn't a trap vertical be just as good? Or how

about something fast to put up, like a trap sloper tied to my car's bumper just like in the picture ads? Well someone might think a self supporting trap vertical is quicker to put up, until they have to make measurements, assemble it, test for SWR, readjust, test for SWR, readjust, etc.

As for the trap sloper tied to the bumper, you would still have to get one end up in a tree anyway. And at that point you're half way to getting your HalfSquare up--just find one more support point and you can be in business with an antenna that quadruples your DX signal strength, losing none of it in ground losses at the feedpoint.

Thinking it through, you know that an ordinary base fed quarter wave vertical or trap sloper is no more than half an antenna. They depend on the ground to provide the other half. That's their weakest point, because unless you're on a ship at sea, a good ground system is a major investment in effort, time, and money, and even at that it is never perfect. And even with a super ground system, it will have a resistance high enough to cut your radiated power to a fraction of what you put into the feedpoint. That's part of the reason that base fed verticals, even the ones that cost \$250 or more, rarely radiate more than twenty percent of the power you put into them. Most of the rest is lost in induced ground currents and in the 10 to 20 ohms resistance of the ground connection. (Nobody hears the lost signal, it just warms the worms.) And if an antenna has got traps to shorten it, you can expect to lose a little bit more power that doesn't get radiated.

Don't get me wrong, anyone using a base fed vertical or trap sloper antenna is still 599 somewhere once in a while. But if you want consistent DX performance, your QRV-DX HalfSquare does a lot more for you. You see,

1. Your QRV-DX HalfSquare is not a half an antenna, it is a whole wavelength of antenna, judiciously folded to direct your power where you want it.
2. It's a high efficiency antenna that actually radiates 95% of the power you put into it. That means it radiates from 4 to 6 times as much power as you'll get out of the typical base fed vertical.

3. Its twin radiators firing in phase concentrate the radiation into a broadside beam more than 4 dB stronger than you'd get with a single vertical radiator of the same efficiency. *(And you'll get more gain if you're in the clear over a good ground.)*
4. Because the high radiating portion of your HalfSquare is at the top, not at the base, your radiated power clears obstructions and gets to its destination.

The truth is, I've put a lot of work into making sure your Half-Square puts the power where it needs to go. That's partly because I'm so scotch about wasting energy. But it's also because I'm involved in emergency communications, and use a ten pound solar powered station for emergency portable work. If I'm putting five watts or less into the antenna, I don't have any to throw away. It all has to go where it's supposed to.

And there's still something more to brag about. Everyone knows that ordinary vertical antennas pick up man made electrical noise. The HalfSquare, however, is quieter because that kind of noise is cancelled out by the design. When you try it, you will see for yourself that this is an amazingly quiet antenna.

And on receive, the HalfSquare rejects signals arriving at angles higher than 45 degrees (that means signals coming from nearby and from out to about 600 miles). From total rejection, attenuation of incoming signals continues in decreasing but noticeable magnitude out to a distance of approximately 1500 miles, after which signals are progressively reinforced. When I switch to my Half-Square out here in Utah, it sounds as if Japan, Hawaii and the east coast all just moved in next door, Texas and Ohio are still a ways away, and the California kilowatts have just been swallowed up by the ocean.

That's why I've got to warn you that this is not a multipurpose cure-all antenna. This is a DX-grabbing antenna. Don't expect to have a great field day if you set one of these up in Ohio. From that location you'll work ten times as many stations with a low dipole. But if you want to work the All Asia contest from Georgia without being bothered by kilowatt QRM from New York, Illinois and the northwest, your HalfSquare will deliver the goods.

Just to hear it play is an experience!

To be honest, there's another warning I've got to give you. The HalfSquare has two equal broadside lobes, one on each side. That means that if you are sitting in Minnesota and trying to work India over the north pole, you might get some QRM from Brazil, Argentina, and Antarctica coming in from the back side. Now if that's going to be a problem, it's only fair for me to warn you.

If you were holding a QRV-DX HalfSquare in your hands right now, you could see that it is no ordinary assembly of wire and insulators. It's made of expensive carefully chosen materials that will last. It is precision measured and hand assembled. Each connection is first secured mechanically, then it's bonded electrically, finally it's potted with a special light weight material that adds more strength and seals out weather permanently. Your connections won't work loose or corrode.

In spite of expense, the wire has been carefully chosen to give strength but at the same time, not to spring, snap back, coil up, kink, stick you in the eye, or snarl as you work with it. Take it between your fingers and twist it. Just try to make it take a kink. It won't.

Run your fingers along the slippery tough insulation that covers it. Acid rain and the invisible pollution that corrodes the surface of ordinary antenna wire cannot penetrate that tough cover that protects your HalfSquare investment. Note the thickness of the insulation. For electronic use like you are putting it to, it's rated at 2500 volts. Just think what that means in terms of protection if ever an accident occurred.

And there's more to that insulation than safety. It means being able to hear the small signals better because it eliminates charged particle static that raises your receive noise floor every time the wind blows dust, smoke, rain or snow against your antenna. But there's more--That insulation is a vital guarantee of continued performance. Most people don't realize it but the corrosion that builds up on ordinary stranded antenna wire acts like a semiconductor. When the wind blows, the antenna sways causing the strands to rub together. That generates noise. The noise starts within a few months of initial installation and builds up relentlessly over the months. This won't happen with the QRV-DX HalfSquare--still.

another reason why your halfSquare stands out a quiet antenna and stays a quiet antenna over the years!

What this boils down to is that your QRV-DX HalfSquare is a completely thought-out DX-grabbing antenna that you can install in minutes. It is constructed so that it will be durable, yet it's made in such a way that you can put it into action easily without any help.

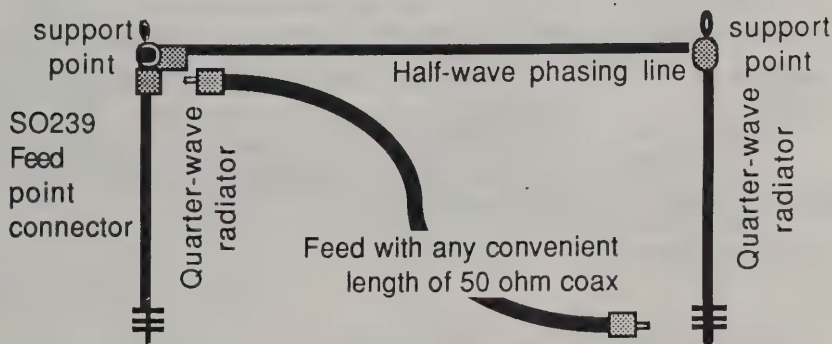
Maybe a HalfSquare isn't the solution to working piles of DX from your location, but the odds are very high in its favor. But the best way for you to see what it can do for you in your situation is to order one, take it out of its package, and give it a whirl.

How about it? Send in your order and see for yourself what I'm talking about. If your QRV-DX HalfSquare is not the easiest DX antenna you ever put up, if you don't work DX like you never did before, if you are not completely satisfied that you got your money's worth, then take it down, repack everything like it was, and send it all back to me. I'll return your purchase price.

73 and DX to you!

Jim Stevens, KK7C

P.S. Here are the technical specifications. They will give you an idea of what a HalfSquare looks like and how you would connect it up. The 45 page Technical Manual that accompanies the antenna gives detail I can't pass on here.



Broadside View QRV-DX HalfSquare Antenna. When installed, the phasing line is extended horizontally and the radiators at either end

hang down vertically. Maximum radiation is broadside, i.e., perpendicular to the plane of the antenna, or toward you as you look at the diagram above.

Frequency coverage: Single band, 40 through 10, WARC bands included*.

Radiation Pattern Major lobes are perpendicular to the phasing line and at low angles. Polarization is vertical. Gain over a single top-fed vertical quarter wave is 4dB. Gain over a base fed vertical quarter wave is generally 2 or more dB greater, depending mainly on the quality of the ground radial system used for the base fed antenna. Gain over a horizontal dipole at the same height as the phasing line for radiation at angles 15 degrees and lower is approximately 12 dB. There is an overhead null.

Dimensions: Shaped like half a square: Top section, one half wave length, Vertical sections: one quarter wave.

Space Requirements: A half wave span broadside to desired DX direction. Height should be a quarter wave or higher. Half Squares for different bands may be nested or fed from same feedline. Manual gives details.

10 Meters	15 Meters*	20 Meters*	40 Meters*
Length 16'	Length 23'	Length 34'	Length 68'
Height 9'	Height 12'	Height 18'	Height 35'
\$39.95	\$44.95	\$49.95	\$69.95

* modifiable for next higher WARC band. Instructions supplied.

Feedline: Any convenient length of 50 ohm coaxial cable.
SWR: Normally less than 2:1 across band. Variations due to height, site, and configuration adjusted by means of user supplied transmatch.
Power Rating: 2000 Watts PEP.

ANTENNAS WEST

P. O. Box 1144, Provo, UT 84603-1144 (801) 373-8425

You want an effective easily erected 160 thru 10 meter antenna that requires no assembly and goes up easier than the simplest dipole? Whether you want it for temporary or permanent installation, here it is--the QRV 160-10.

In the event that your interests lie only in the higher frequency bands, there is also a half size version giving 80-10 coverage. So read on as I explain what the QRV 160-10 can do for you. Then check the specifications table to decide whether the full size or the half size version best meets your requirements.

I want you to order one, take it out of its wrapper, put it up on your site, connect it to your rig, and give it a try. If the QRV 160-10 is not the easiest and most adaptable all-band antenna you ever put up, if you are not completely satisfied, then take it down, repack everything like it was, and send it all back to me. I'll send your money back.

You need to try the antenna because that's the best way for you to prove for yourself what it will do in your situation. I truly believe that no other all-band antenna will outperform it, no other all-bander is more easy to work with, no other all-bander is so adaptable to site constraints, and no other all-bander will last like the QRV 160-10.

Whether you have lots of space or must work with very little, the QRV 160-10 will fit and deliver results. And even with all its adaptability, it is a whole antenna with full-sized results.

I have tested it in all sorts of terrain under all sorts of conditions. I strung it up in high rise apartments, in jungles, and motels. I propped it up with driftwood on beaches, and hung it from rock outcroppings on a treeless desert island. I kept improving it till I was confident that I had the antenna that any amateur could use to be QRV easily on all bands.

In my 35 years in amateur radio, I've tried hundreds of antennas and hundreds of methods for launching them. If you use the QRV 160-10 with its optional QRV-QL Quick Launch system (see catalog), you will have the fastest, most adaptable all band antenna sys-

tem there is. It's a system that will pay off, whether it's for Field Day, a real emergency or to satisfy a desire to be on the air now rather than next week or next month when a friend can come over for your antenna party.

If you were holding a QRV 160-10 in your hands right now, you could see that it is no ordinary assembly of wire and insulators. It's made of carefully chosen materials that will last. It is precision measured and hand assembled.

Each feedpoint connection is first secured mechanically in a bullet-proof Lexan matrix, then it's bonded electrically, finally it's potted inside a weatherproof housing with a special light weight material that adds more strength and seals out moisture and contaminants permanently. Your connections won't work loose or corrode.

In spite of expense, the wire has been carefully chosen to give strength but at the same time, not to spring, snap back, coil up, kink, stick you in the eye, or snarl as you work with it. Take it between your fingers and twist it. Just try to make it take a kink. It won't. The more experience you have had with antennas, the more you will appreciate this feature.

Run your fingers along the slippery tough insulation that covers it. Acid rain and the invisible pollution that corrodes the surface of ordinary antenna wire cannot penetrate that tough cover that protects your QRV 160-10 investment.

Note the thickness of the insulation. For electronic uses like you are putting it to, it's rated at 2500 volts. Just think what that means in terms of protection if ever an accident occurred.

And there's more to that insulation than safety. It is a vital guarantee of continued performance. Most people don't realize it but the corrosion that builds up on ordinary stranded antenna wire acts like a semiconductor. When the wind blows, the antenna sways causing the strands to rub together. That generates noise. The noise starts within a few months of initial installation and builds up relentlessly over the months. That is a nonproblem for this antenna--still another reason why the QRV 160-10 starts out a quiet antenna and stays a quiet antenna over the years.

What this boils down to is that your QRV 160-10 is a completely thought-out all-band antenna built tough to last, yet engineered so you can easily and quickly install it without any help.

Well, if ease of installation is so important, why is this better than an all band trap vertical? Or a trap sloper tied to my car's bumper like in the picture ads? When it comes to the self-supporting trap vertical, you have to make measurements and assemble it, then find a support for it in a clear area, and string out the radial system. Then you have to tweak and test, tweak and test. As for the trap sloper tied to the bumper, there may be no assembly, but you would still have to get one end up in a tree anyway. Since that's all you need for a sloping or V installation of the QRV 160-10, what would you gain by using only half an antenna?

That's the point-- you know that a base fed trap vertical or trap sloper antenna is no more than half an antenna. It depends on a ground system of radials or a counterpoise like your car to supply the other half. That's part of the reason that such antennas, even the ones that cost \$250 or more, seldom radiate more than twenty percent of the power you put into them.

The QRV 160-10 is a completely different story. It is a whole antenna with its high current portion up in the air where it will radiate, not down at ground level where part of your signal warms the worms or is absorbed in obstructions.

The QRV 160-10 uses no traps to achieve multiband performance. Above 80 meters, it will be radiating 95% or more of the energy you pump into it -- that means 5 or 6 times the radiated power of the vertical or sloper we've been talking about.

Don't get me wrong, anyone using a base fed vertical or trap sloper antennas is still 599 somewhere once in a while. But if you want to radiate all the power you've paid for on all bands, take a good look at the QRV-160-10.

So when it comes right down to the work of putting an antenna system on the air and counting the results it produces, the apparent convenience you may have seen in the ads is often not very real--and it comes at the price of performance. That's where your

QRV 160-10 will shine--while built with convenience in mind, it is an efficient all band performer.

Okay, if you want to talk about efficiency, how does this stand up against the old timers' favorite the centerfed Zepp? Well, the answer is quite simple. If you feed your QRV 160-10 at the base of the impedance transformer, that's exactly what you'll have--just that the dimensions of the QRV 160-10 not only make it 35% shorter, but also make it the easiest centerfed Zepp you ever tried to load. It's so easy to load that that even the ordinary automatic antenna tuners of today bring it into resonance in a snap.

The truth is, I've put a lot of work into making sure your QRV 160-10 puts the power where it needs to go. That's partly because I'm so scotch about wasting energy. But it's also because I'm involved in emergency communications, and use a ten pound solar station for emergency portable work. If I'm putting five watts or less into the antenna, I don't have any to throw away. It all has to count.

To test out the QRV 160-10 in the heat of action, I took it out into the Oregon woods for Field Day. Using the QRV QL launching system, I placed its center at 75 feet. Then working the ends around and under the branches, I stretched them out and tied them off to tree trunks to form an inverted V. Fifteen minutes from go, I was on the air with my ten pound station.

Over the next 24 hours, I operated on the 80, 40, 20 and 15 meter bands, contacting 196 stations across the country using only 950 milliwatts of output power--less than a pocket flashlight consumes. That, my friend, is the bottom line: the QRV 160-10 gets the message out when the chips are down.

Maybe you're saying, "I want to believe you, Jim, but it just sounds too good to be true. Have you really invented some incredible unheard of wonder-antenna?"

No. I didn't need to. The basic electrical idea of the QRV 160-10 was mentioned in the Collins Radio manuals of the 1930's. Twenty years later an antenna based on the same principles was independently introduced in England by Louis Varney, G5RV. That idea begins of a $3/2$ wave dipole on 20 meters giving the 102 ft flat top. This is fed at the center with a one wavelength (30 ft) linear

impedance transformer. This combination gives a reasonable match to coax feed on many bands, without the use of lossy traps.

As a bonus, it provides increasing gain and progressively lower angle DX radiation on each higher band--something those trapped multibanders can't do. Today in fact, antennas based on this Collins/G5RV design outsell all other multiband antennas on the market. The design is simple, and it has been proven by the tests of time and wide usage.

Maybe you're saying, 'Even if it's smaller than a center fed Zepp, that's a big antenna--102 feet in length! I don't have that much space.' Small spaces can present some big challenges, but the QRV 160-10 has been engineered so it can be employed to your advantage in very small spaces, and the technical manual spells out how to do it.

Is the height available at your site limited? Are there two trees for a flat top but only a span of 60 feet? or only 35 feet? or still less? Situations like that are a piece of cake--The manual shows how you can get superb performance from you QRV 160-10 even in these sorts of locations.

Do you have to conceal the antenna? The QRV 160-10 is entirely black and non reflective so it will be easy to hide. Must you mount it in an attic or completely inside your apartment? That's been done unobtrusively, safely, and effectively too. The QRV 160-10 has been designed for successful deployment in precisely such difficult situations--situations that would rule out or destroy the effectiveness of ordinary antennas. And as you can see, its 2500 V insulation serves for more than one purpose.

In fact, its designed-in adaptability extends to every detail of its construction. Even the materials from which it is made are the result of careful search and testing in the field with sites like yours in mind--the wire bends without kinking, its special slide-and-lock insulators permit the legs to be bent and tied off in many different configurations. The manual anticipates challenges and tells how to cope with them. You can even install the QRV 160-10 antenna in a space as small as 26 feet by 26 feet and get a little gain to boot (recommended small space DX configuration #7 in the manual).

I mention these examples because they show the adaptability engineered into the QRV 160-10. And they should give you an idea as to how you can use it to achieve your communication objectives even if you are facing severe constraints. And there's the half size version too, in exchange for the 160 meter coverage it halves all the dimensions, so it could be just what you need, if your space restrictions are severe.

The QRV 160-10 loads as a dipole on all bands between 3.5 and 30 MHz because the various components of the antenna working together tend to compensate for each other, thereby eliminating extremely high or extremely low impedances at the base of the linear transformer where it is fed. Since the exact feedpoint impedance depends not only on frequency, but on the configuration, height, and surroundings in each installation, simply use your transmatch to bring it into a perfect 1:1 match wherever you desire to operate. With its Marconi Adapter fixed in place in the feedline, the QRV 160-10 loads on 160 meters as a top loaded vertical T antenna, giving a very good account of itself.

Well my friend, it's taking longer to tell about the QRV 160-10 than to put it up in the air at a tricky location. But I want you to feel right about trying this antenna. Listen to what some of the early users told me:

John Collins, KN1H, wrote "I put up the QRV 160-10 a couple of times in a couple of places. I'm impressed with the construction. It goes up easily with no kinks or snags and is really easy to tune on all bands. For a portable Field Day antenna the QRV 160-10 is ideal, completely assembled with the nice slippery wire and no sharp edges. The second time I put it up it took only ten minutes because I had rolled it all up in one coil, feedline and all. It was a simple matter of shooting the line over a tree and unrolling the antenna as I hoisted it up. A simple pocket-sized L network tunes it to 1:1 easily on all bands. In all cases the QRV 160-10 was easier to match than my 80 meter centerfed Zepp, especially on 40 and 20."

Fred Turpin, K6MDJ, wrote, "I rushed to put the antenna up just before a storm to see how it would stand up, and I got it into a flat top configuration at about 35 feet. It rode out 60 mile-per-hour wind, rain, ice, and snow with no moisture getting through any of the connections. I wired it into my antenna switch so I could compare instantaneously with my long wire, and it performed superior on all bands."

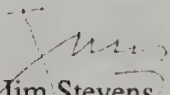
Bob Hall, KE7RB, called to say, "The first night I had your QRV 160-10, I set up in the KOA campground down in the valley at Salt Creek. It was getting dark fast, so I didn't even try to launch it - just threw the ends 8 to 12 feet up over branches, and pulled the center up so it wouldn't fall down. I screwed it into the tuner and dipped it for 20 meters. Within minutes I had had contacts with New Zealand, Ontario, Minnesota, and Arizona. I got to thinking that if it worked that well portable, it ought to work better at home.

"So when I got home I threw it up on top of the roof, just lying there out of sight. Today I'm getting signal reports like I never got before on 20 meters. My \$150 vertical never gave me a 59 report anywhere, but I've been getting 59 reports from all over. I just talked with a UA9 in Kazan who gave me a 59. I'm putting the trap vertical on the two meter swap net Tuesday night."

These people have been having as much fun with the QRV 160-10 as I have. I think you will too. Maybe the QRV 160-10 or its cousin the QRV 80-10 isn't a solution to your antenna problem, but they have a lot going for them. And the best way for you to see what a QRV 160 or 80-10 will really do for you in your situation is to order one, take it out of its package, and give it a whirl.

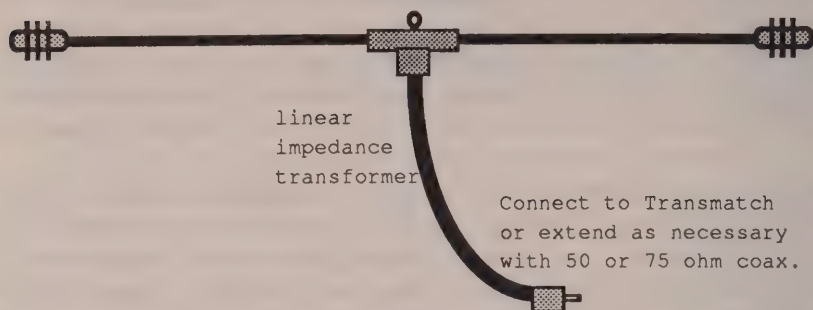
How about it? See for yourself what I'm talking about. If your QRV 160-10 is not the easiest, most adaptable all-band antenna you ever put up, if you are not completely satisfied with its performance, then take it down, repack everything like it was, and send it all back to me. I'll return your purchase price.

73 and let me hear from you soon,


Jim Stevens, KK7C

P.S. Here is the QRV 160-10/ QRV 80-10 Product Specifications Sheet. The Technical Manual explains the relationship between communication objectives, configuration, and height. It also shows eight recommended configurations, the smallest of which is a 26 foot square. Take me up on my offer and see for yourself how easily you can adapt the QRV 160-10 to your situation and get good results.

Specifications: QRV 160-10 & QRV 80-10 All-Band HF Antennas



Frequency coverage: QRV 160-10: 80, 40, 30, 20, 17, 15, 12, & 10 meters as centered doublet, 160 thru 30 meters as T with Marconi adapter.
 QRV 80-10: 40, 30, 20, 17, 15, 12, & 10 meters as centered doublet, 80 thru 30 meters as T with Marconi adapter.

Dimensions: QRV 160-10: Top section: 102 ft. Vertical section: 30 ft. In-line Inverted V requires 72'

QRV 80-10: Top section: 51 ft. Vertical section: 15 ft.

minimum of 36 ft.

Vertical, semi-vertical, and other configurations accommodate unusual installation sites or provide special radiation patterns.

Minimum Space: QRV 160-10: Folded horizontal mounting requires a 26 /ft square. Folded vertical mounting: Height plus Length sum of 55 feet.

QRV 80-10: Folded horizontal mounting requires a 13 /ft square. Folded vertical mounting: Height plus Length sum of 27 feet.

Feedline: Feed directly from transmatch or through any convenient length of 50 or 75 ohm coaxial cable.

Power Rating: 2000 Watts PEP in amateur bands.

Tuning: Variations due to frequency, height, site, and configuration adjusted by means of user supplied transmatch.

AntennasWest

Provo, UT 84603-1144 (801) 373-8425

Imagine a noiseless five pound solar power supply made of space age materials that for the next 25 years can keep your repeater on the air continuously or your home radio station on the air up to 15 hours a week--with no electricity bills, no noise, no maintenance, no worries. That's just what a Solar Power Supply from AntennasWest can do for you. And if you throw in the fact that it can be unobtrusively attached to the roof of your house or RV or tossed in a closet till needed, you have a flexible approach to power independence.

I'm Jim Stevens from AntennasWest, and I've teamed up with Sovonics, the producer of the most versatile and indestructible solar panels in the world to provide your ham station with electric energy independence by harnessing the sun.

I got into solar power for myself in the days of shattering crystals and monstrous rigid panels made as heavy as a gas generator so they wouldn't break if the wind blew too hard. Only a dreamer could love them in those days.

But the dream of yesterday has now been replaced with a solar power generation system that's as practical and convenient as a sun shade on a Camper. This system can deliver a degree of energy freedom for your ham station that means emergency preparedness, carefree operation and trouble free power for years to come. And that's what I'm writing to tell you about.

Won't solar panels break? That's a good question, because all solar cells used to be fragile and easily broken, and that's still a risk--except for the panel I'm writing you about. When Sovonics, the company that makes the panel for our AntennasWest Solar Power Supply, said good-bye to silicon crystals and glass they took a big business risk. But they ended up creating a panel out of stainless steel that is completely shatterproof--a panel so flexible and so indestructible that under test it continued to operate even when riddled with bullet holes.

Frankly, until this panel appeared, I saw nothing that would interest more than a few experimenters who were willing to take chances. There wasn't yet a product I could propose to you with full confidence. But that's why I'm now so excited about what has happened. With the arrival of the flexible no-crystal shatterproof panel, there is at last a solid long term solution to power independence for the amateur station.

So what does your Solar Power Supply Do?

First let me give a little background. Production of electricity from the sun has interested scientists ever since the discovery of the selenium cell 100 years

ago. Cadmium sulfide cells came next, followed by silicon, first in crystalline, then amorphous form. Manufacture of these cells for satellites and space vehicles created an industry. As production methods improved, electrical output increased and the cost per watt dropped, making solar cells economically interesting for more and more applications. After space vehicle power came power generation at remote telecommunications relay stations, then navigational aids, remote warning signals, and pipeline protection.

With increased efficiency in converting the sun's rays to electricity and the arrival of the unbreakable panel, today's small one foot wide by four foot long AntennasWest Solar Power Supply can deliver enough electricity to be a dependable solution for many ham stations, whether fixed, portable or RV-mobile.

Now a Solar Power Supply, like any other power supply, has no storage capability in itself. It delivers electrical current only when the sun is shining. That's why you will normally use the power supply to charge a 12 volt battery instead of supporting the load directly. In this regard it is like any other generator or charger that gives power only when its motor is running. The advantage of a Solar Power Supply is that it will be running quietly whenever the sun is shining, silently replacing the power you use and keeping your batteries charged to full capacity. And your Solar Power Supply keeps on doing it and doing it and doing it without maintenance or further expense.

How much power will your AntennasWest Solar Power Supply produce?

Like a generator solar panels are rated in terms of watts, the measure of electrical power. The amount of electrical energy that can be generated in a given amount of time is measured in watt-hours or kilowatt-hours (like on your bill from the electric company). The basic single-panel AntennasWest Solar Power Supply is rated at 23 watts. In practice, this rating is less than peak power output under perfectly aligned noonday summer sun. It is very close to the power you could expect to be generated when the panel is lying horizontal under full sun high in the sky. Less power is generated when the sun is low in the sky, veiled, or when clouds pass in front of it. In winter when days are shorter and the sun is low in the sky, power production drops 40% of the summer rate if the panel remains lying horizontal. But tilting the panel toward the equator to compensate for the lower sun position brings winter output to the same level as summer horizontal panel production.

In my sunny Utah location a single-panel Solar Power Supply properly angled will produce 1700 Kilowatt-hours of electric power over its twenty-five year expected life. The simple expedient of leaving the panel horizontal all year round will result in half that amount. By inclining the panel 40 degrees toward the equator, I can recover two thirds of the difference. For simplicity we use the output of one horizontally mounted panel as our standard of measurement, even

⇒ figuring what that costs at today's power rates means that my solar system is a bargain!

though we know that by simply inclining the panel we can do much better if we need to.

Usually the easiest way to visualize what an AntennasWest Solar Power Supply will do for you is to think in terms of Ampere-Hours of charging current delivered to your 12 volt battery. Here's what a single panel system lying flat on a horizontal roof will produce in an typical day:

Table 1--Av. Daily Amp-Hrs of Battery Charge
From one 23-watt Horizontally Mounted Panel

Location	Season			
	Spring	Summer	Autumn	Winter
Utah-California	9.6	11.4	7.0	5.0
Gulf Coast	8.0	10.0	6.4	4.4
Tennessee	6.8	8.8	5.2	3.2
Minnesota	6.4	8.4	4.0	2.8
Massachusetts	6.4	8.0	4.0	2.8
Western Europe	6.4	8.4	4.4	2.4
Mediterranean	9.6	9.6	8.8	5.6

The meaning of these figures becomes evident when you compare them with the amount of power your transceiver actually consumes on a daily basis.

How much solar power does it take to run my station?

Most solid state transceivers and station accessories are made to function on 12 volts DC. If you have that kind of station, solar power will be simple to install. To see how much solar generating capacity you need, start by listing the equipment you want to power from the sun in column 1 of Table 2 below. Check how many amperes of current each item draws when in use. Equipment manuals often give this information. You can verify it by inserting an ammeter in the power line, checking the amount of current drawn during receive and during key down transmit at the power levels you use. List these data in column 6.

Then, during your next operating session, keep a log of the amount of time you actually spend transmitting as opposed to receiving, and calculate the proportion. For most hams this figure is from 20% to 30% of their operating time, which works out to between 12 and 20 minutes per hour. Contrary to what you might expect, studies of emergency portable operation have indicated that even less transmitting and more listening are done during emergencies. Once you have figured the proportion that characterizes your operation, enter in column 2 the number of minutes in a typical hour that you would spend transmitting in each mode.

The biggest current drain takes place when your transmitter is operating "key down," so to assess your power needs, you should begin by determining how many minutes per hour of operation your equipment is actually drawing full key down current. If you are using CW or SSB, even while you are transmitting your key is not down all the time. In fact, the actual key down period or duty cycle for CW transmission periods is less than 50%. Also for SSB transmission the same 50% figure is a good estimate. FM and RTTY call for a full 100% transmit duty cycle, as indicated in the table.

To determine how many minutes of the typical hour your transmitter is actually drawing key down current, multiply the duty cycle percentage by the minutes (column 3) spent transmitting in each mode. put this figure in column 5. During all the remaining minutes of the hour, whether transmitting or receiving, your equipment will actually be consuming electricity at the equivalent of the receive rate. So once you have figured the minutes per hour of equivalent key down time, simply assign the remainder of the hour to the receive mode.

After you multiply the equivalent transmit and receive minutes by their respective current drain figures, sum the two. That is the estimated current consumption of your station during sixty minutes. Divide by 60 to get the result in ampere hours.

Table 2

Station Consumption in Ampere Hours per Hour of Operation

1	2	3	4	5	6		
Equipment	mode	Mins used	Duty Cycle	Mins	Amps Drain	Amp/ Mins	Amp/ Hrs
<u>Xmitter</u>	CW/SSB	....	50%	...	...	...	...
"	FM/RTTY	....	100%	...	...	...	...
<u>Receiver</u>	-	.x.	100%	...	...	...	...
.....	-
.....	-
.....	-
.....	-
.....	-

TOTAL AMP-HOURS CONSUMED IN AVERAGE HOUR _____

The final figure in Table 2 above is the number of ampere hours of electricity your station consumes during a typical hour of operation. It means that for every hour you operate your solar power supply will need to replace that much

power to your battery. If you operate an average of one hour per day, your solar power supply will need to deliver that much or more on an average daily basis.

Many stations are used intensively for a weekend, then left unused during a whole week. If that is the case, you should figure your electrical generation needs for the whole week. For maximum battery life, choose one that is rated for at least 60% more Ampere-Hours capacity than you will consume on a typical weekend. The battery will supply stored energy during the period of heavy use, while your Solar Power Supply will continuously replace what was removed, completely recharging the battery over the weekday rest period.

To get some perspective, let's use my simple home and portable stations as examples.

Solar Power for a Simple 100-watt Home Station

I have a standard 100 watt output transceiver for my home station, and I operate only CW and SSB. In normal operation I listen a lot more than I transmit, in fact, when I measured it, I came out transmitting only 15% of the time. But to be conservative, I'll say 20% for this example. Since I use a vintage Vibroplex bug, there is not current used by a keyer, and my clock runs on a little battery that lasts a year and is self contained. So this bare bones station can serve as a starting point for your thought, I've outlined its power requirement in the table below.

Comparing the current requirement of my station with the Solar Power Supply output give in Table 1, and being located in Utah where the sun shines plenty, you will see that the basic Solar Power Supply lying flat on the ground should support three hours a day of station operation on a continuous basis during the summer. Or if I had the strength I could run a 20 hour weekend contest every week with no trouble. To keep up that rate of activity during the other seasons, I should install my panel with a 40 degree tilt. But I just can't get on the air that much, so my battery is always at its top.

KK7C Home Station Power Consumption per Hour

1	2	3	4	5	6	7	8
Equip Item	Mode	Mins Used	Duty Cycle	Equiv Mins	Drain (Amps)	Amp/ Mins	Amp/ Hrs
<u>Xmitter</u>	CW/SSB	12.5	50%	6.3	20	126	2.1
<u>Xceiver</u>	-	.....	100%	53.7	2	107	1.8

TOTAL AMP-HRS CONSUMED PER HR OF OPERATION 3.9

If you are situated in a more dreary location, Table 1 will give an idea as to what your solar power supply could generate. In most locations a single or double panel solar power supply would have no trouble generating enough for an average of a couple of hours of operation per day for a bare bones station like mine.

In deciding how much solar charging capacity you really need, you should increase the above figures by some percentage to account for power lost in battery self discharge. If your battery is in top condition, this amount is small, but if you want to be on the safe side, provide for about 20% more solar power than you intend to consume, and you will have an adequate system.

I usually go QRP on the road, and don't mess with the heavy rig. Instead I grab my little flea market Argonaut 509 and take off. That's what I use for Field Day and other good weather contests, since I like to go to mountain tops or islands in the Great Salt Lake where I can test out my exotic antenna ideas. When doing a contest portable, I end up transmitting more than normal, since my antennas give me enough gain to play "big gun", even when I'm running less than 5 watts out. The 500 mA lamp I run during night time operation is the biggest load I have. And I use a homebrew automatic CQer. Just to be conservative I'll figure them in at full time use, to give a maximum drain.

KK7C Portable QRP Station Power Consumption per Hr

1	2	3	4	5	6	7	8
Item	Mode	Mins Used	Duty %	Equiv Mins	Drain (Amps)	Amp/ Mins	Amp/ Hrs
Xmitter	CW/SSB	25	50	13	1.0	13	0.22
Receiver	-	....x...	1 00	47	0.2	10	0.17
Lamp		60	1 00	60	0.5	30	0.50
AutoCQer		25	1 00	25	0.2	5	0.1

TOTAL AMP-HOURS CONSUMED PER HOUR OF OPERATION 0.99

As can be seen, it doesn't take much to keep this station going for an hour. And during daylight operation, our power consumption is cut in half because I don't need the lights. In practice all I need is a light weight 15 AH gel cell and an inclined solar power supply to support 24-hour operation.

Your station and style are probably different. If, when you add up your daily current consumption, you come out with 15 Ampere-Hours, you would need a two panel system to maintain the charge on your battery under continuous daily use. But if you use your station mainly on weekends, with only an occasional week-day QSO, one panel may serve you well enough, since your battery will be topped up during the long periods between weekends.

Fill in Table 2 with your data to know how much solar generating capacity your station will need. After that it will be a simple step to make your station as independent as the sun when it comes to electric power.

What about the Battery?

Where do I get the battery? What kind and how many do I need? Batteries are so heavy that it is always best to get them locally, since the only inexpensive way to ship them is on a full pallet. If you have an extra car battery, you can use it. It doesn't have the capacity or the life of a deep cycle battery, but it will work.

But when you want to tool up right and build a dependable system, look for a deep cycle battery. True deep cycle batteries are not designed to deliver large peak currents for starting engines, but to give continuous current over a long period of time. Deep cycle battery capacity is given in Ampere-Hours at the 20 hour discharge rate, and they will give more than rated capacity if you are drawing less than the rated current. When charged with an AntennasWest Solar Power Supply and discharged in radio service, these batteries can keep their original capacity for years.

The best deep cycle batteries for a system with moderately large capacity are six-volt golf cart batteries. A pair in series is needed for a 12 volt system, and will cost between \$130 and \$150. A typical pair will have a capacity of 220 Ampere-Hours at the 20-hour discharge rate of 11 amperes.

If you need less capacity or value portability, the most convenient deep cycle batteries are called Marine Batteries, Trolling Batteries, or RV batteries. These are 12-volt batteries designed to run the lights and appliances of an RV or a fisherman's small electric trolling motor. This is the type of battery I use for my station. In the chart below I have listed the choices normally available. The brand name may vary, but nearly all these batteries are actually made by the same company, so their specifications will correspond closely with one of the batteries listed below.

All these batteries come with carrying handles and wing nut battery posts for convenience. The Stowaway model has sealed electrolyte that cannot be spilled. This is a very nice feature for a battery stored under the table in a posh radio room. Some brands of this battery have a convenient "green eye" charge indicator. Note that sealed electrolyte batteries are never to be fast charged. The Solar Power Supply is designed to provide exactly the type of charging action that preserves their capacity and gives maximum life.

Deep Cycle Battery Characteristics

Characteristic	GNB Model			
	AP-34	AP-80	AP-105	Stowaway
Capacity Rating	34 AH	80 AH	105 AH	100 AH
Construction	-----low maintenance lead-acid----sealed			
Approx local Cost	\$30	\$50	\$60	\$75
Life (x Car Battery)	na	na	3-4	4-5
Load	Hours at Continuous Load			
1.3 Amps	30	75	95	93
2.5 Amp	14	36	45	42
5 Amp	6.8	16.0	21.0	20.0
10 Amp	2.6	6.9	9.3	9.0
15 Amp	1.9	4.2	5.8	5.0
20 Amp	1.2	2.7	3.5	3.4
25 Amp	.7	2.0	2.7	2.7

There are other types of batteries designed for portability, compactness, or freedom from maintenance. Most of these have lower capacity, and in general cost a great deal more per AH, so I recommend that you look first at the batteries listed above.

To decide how much battery capacity you need, start with the hourly load you calculated in Table 2 and multiply by the number of hours you want to be able to operate on a daily basis. This is the amount you want to draw from your storage battery each day. To allow for a couple of contiguous sunless days, multiply this figure by 3. This is the amount you want to be able to draw from your battery between charges if you have to. Since battery life is longest if you deplete your battery by no more than 40 percent of its nominal capacity, divide the desired draw by .4. There you have the recommended Ampere-Hour capacity of your battery (ies).

Using my home station as an example the figures would be as follows: 4AH per hour of operation x 2 hours per day = 8AH. Three days without sun would mean 24 AH of draw. If that is to represent only 40% of the total battery capacity, I divide by .4 to get 60AH as the minimum capacity for my system. An 80 AH RV battery would do the job well.

If I want to be able to run a whole 24-hour contest binge on a cloudy day, I would need to draw $24 \times 4 = 96$ AH, and the recommended battery bank capacity would be 240 AH (96 divided by .4 = 240). I could come close enough to that capacity with a pair of 105 AH RV batteries in parallel or a pair of golf cart batteries in series, and some sunlight would make up the difference.

Correct Charging Means Maximum Battery Life & Performance

A little background will help you see why we go to the expense of building a state-of-the-art charge regulator right into the QRV Solar Power Supply.

How fast your battery gets old is only partly a question of how long it has been in service. If it is always kept charged, never overcharged or charged too quickly, it hardly ages at all. Heavily used batteries maintained with the controller circuit we build into your QRV Solar Power Supply have kept their original capacity for *over 5 years without measurable degradation.*

To appreciate what this means, remember that deep cycle battery manufacturers say their batteries normally lose about 1% of their capacity on each discharge/charge cycle. The cause is not the fact of being discharged, it is the conventional charging and charge maintenance procedure. So let's review what normally happens when normal charging methods are employed.

A battery consists of positive plates, negative plates and a water and acid mixture called the electrolyte. A battery is in a discharged or dead state when both plates are mostly lead-sulfate and the electrolyte has a large proportion of water. When the battery is in this condition and no current is flowing, the water and acid mixture will be uniform throughout the cell.

When a charging current is applied, the positive plate begins converting to lead dioxide while the negative plate will convert to lead. The sulfuric acid concentration will increase in the electrolyte as the water is used up in the plate conversion process. And as the water molecules directly adjacent to the plates are used up, new molecules must drift in from areas of the cell having higher water concentration.

As long as the water molecules can migrate to the plates at a rate sufficient to utilize the charging current available, the battery will charge without damage. But if the current flow exceeds the water diffusion rate, the excess energy will be manifested as hydrolysis--water molecules will be torn apart, releasing oxygen and hydrogen. The oxygen will be attracted to the positive plate while the hydrogen is drawn to the negative plate. This pure oxygen reacts with lead molecules in the positive plate creating lead oxide. Any lead converted to lead oxide is permanently removed from the electrical process, thus reducing the capacity of the battery. Further, the plate is eroded because dislodged particles of lead oxide drop to the bottom of the reservoir, where they accumulate until they short out the battery. Meanwhile, the eroded plates buckle and bend. The buckling action can also result in a shorted cell.

➤ Note that long before the cell fails, its capacity to store and deliver electrical energy is being eroded in direct proportion to the amount of lead oxide formed.

And the formation of lead oxide is the result of conventional charging processes that force more current through the battery than it can utilize. Even conventional trickle charging of a full battery does this.

We want your Solar Power Supply to be a long run carefree solution to providing power for your station. We want it to be efficient, rapid and gentle enough for sealed batteries and gel cells. That's why we build KA8IDB's SunSelector charge controller right into the basic QRV Solar Power Supply. Because of it you can hook the system up to your battery and forget it without a worry.

Here's how KA8IDB's regulator works. Beginning with a discharged battery, it will apply full available charge current with no diodes or other current consuming elements in the charge path. As the battery charges, the water is consumed, the plates convert, and the terminal voltage begins to rise.

Before the battery reaches the point at which hydrolysis will occur, the controller opens the charge path completely. This is necessary because the water directly adjacent to the plates has been used up faster than new water can migrate from other regions of the cell. The process has to be stopped till the water molecules have time to migrate. As the water migrates, the terminal voltage decreases. When it reaches a predetermined low point, the controller again closes the charge path allowing full current to flow into the battery. Again as the acid to water ratio increases the terminal voltage begins to climb. Before hydrolysis can occur, the circuit is again opened to allow water to migrate.

As the process continues, the charging action will continue to occur but will take place less often. Eventually, the off time will exceed the on time by many times. At this point, the battery is full and is simply being maintained by short shots of current exactly compensating the battery's self discharge rate. Destructive overcharging that erodes battery capacity is eliminated. This controlling process is independent of your battery's age, amp-hour capacity and system wire resistance.

What this means is that you can use the convenient sealed batteries and gel cells without worry of destroying them, and you can extend the life of your batteries well beyond manufacturer's ratings. So with a QRV Solar Power Supply there is a chance that you will wear out before your battery does.

It's easy to get started with Solar power

From what I've said so far, you can see that with the AntennasWest Solar Power Supply getting started with solar power is simplicity itself. Take one AntennasWest Solar Power Supply and a deep cycle battery. Put the battery on the floor under your rig, and the solar panel where it gets plenty of sun. Place the controller where you can observe it's display panel. Attach its output wires

to the battery terminals and its input wires to the cable from your solar panel, and you are in business.

With regard to the panel, there's really no need to fear buying too little and absolutely no need to buy too much, since you can start small and add on without risk. For example if you begin with a basic single panel 23 watt Solar Power Supply and find that station requirements increase or turn out to be higher than expected, you can add another panel--in fact up to four more 23 watt panels in parallel to your original one, thus multiplying the charging capacity of your system. These upgrades may be made with the simple addition of a two jumper wires. The original charge controller will continue to promote maximum charge rates while preserving the life of your battery.

For a repeater or remote station, it is best to calculate your requirement carefully and run a week long test in an accessible location before scaling the mountain side. Still, adding a supplemental panel is relatively easy.

So, not only is it easy to start out with solar power, your solar system can grow as your needs grow. There is no need to fear you're buying too little to start with, and absolutely no need to buy too much. You can start small and add on without any risk at all.

And if you just want to "stick in a toe" to get some solar power experience, I have some smaller capacity panels that can be used to power handheld radios or keep a conventionally charged battery topped up. You'll see them on the order sheet.

Sounds great, but can I really count on Solar Power?

When I saw the first generation of amorphous silicone coatings on glass I thought Wow! There it is. But then I asked, what if I drop it? or a kid hits it with a rock? All my money would disappear in flying splinters. I kept my hand in my pocket and waited.

Then in April last year I saw the panel I'd been waiting for. I looked it over carefully, talked with people that were making them and using them. I studied the engineering test results. When I read the test results I knew that here at last was something I could propose to people as a real solution.

Here was a panel that could take abuse, but was so light I could lift it with my little finger. Here was a panel that Pacific Gas and Electric had tested in competition with Arco and Chronar modules. After six months of outdoor exposure its output had stabilized above its rated power while the others were down more than 25% and still degrading. Here was a panel made of cells that when baked at 300 degrees Fahrenheit for 1000 hours in a joint Jet Propulsion Labs / Clemson University study came out less susceptible to long term degradation

than any competing cells. Even Detroit Edison and Wisconsin Power and Light Companies were testing the panels to assess their potential for commercial electricity production.

When a pistol happy hunter from Michigan couldn't stop his panel from producing by shooting it full of holes, I was convinced. Here was the technology that could produce electricity at a reasonable price and still take the punishment that real life in the outdoors can provide. This is what I had been waiting for. So I worked out a way for me to bring you the AntennasWest Solar Power Supply.

First, in Sovonics' continuous process, thin stainless steel sheet would come off a roll and receive layer after layer of semiconductor coating, building up a tandem cell thinner than a human hair. The grid pattern would be added, then the sheet cut into cells, electrically connected, laminated to 1/8-inch aluminum sheet backing, covered with 50-year weather protecting transparent polymer, and folded into a framed panel. Electrical connection boxes would then be added to the back, and the unit tested and shipped to AntennasWest.

At AntennasWest, we would test one more time, cut corner reinforcers and mounting spacers, drill and grommet a cable access hole, measure, cut and attach the power cable, add the charge controlling circuitry, write and insert the technical manual, and place the panel in its reinforced shipping carton. at that point your Solar Power Supply would be ready and waiting to go to work for you.

Hold it in your Hands

If you were holding the AntennasWest Solar Power Supply in your hands at this moment, the first thing you would notice is how light it is. Lift it--it weighs less than five pounds. Flex it, thump it. Even though it is light and easy to handle, its guts are tough--super tough.

Run your fingers over its smooth, transparent outer coating. Panels covered with this material instead of glass were placed in service in 1960 and are still doing their job. This is a serious space age material of extreme toughness and weatherability. It allows the sun's power producing rays to reach the current producing silicon cells, while protecting from the weather. This covering extends without a seam or a break over the whole panel, even around the corners to the back of the frame. That means nothing is going to creep under it and eat away at what produces your power.

Give it a good thump in the center. Unlike glass faced panels, this panel will never shatter. That means that your investment in power independence is going to last, no matter what hits it.

Below the protective surface is the heart of your Solar Power Supply-- seven microscopic layers of sophisticated semiconductor substrate which all together are thinner than a human hair. The seven layers form tandem current producing cells stacked one on top of the other on a durable corrosion proof stainless steel sheet. When this is bonded to the aluminum frame the result is a panel that is sophisticated yet not fragile, strong yet flexible.

Related to its flexibility is the fact that all connections are at the outer edges, near the black border. In conventional solar panels, there are little connections between discrete cells. These break when the temperature changes abruptly because the materials expand and contract at different rates. There is no such risk with your panel--another reason why it will outlast competing panels and provide years and years of trouble-free electricity.

So, even though it's not made heavy, there is virtually no way to stop this panel from generating, short of crunching it up, running over it with a tank--or keeping it in the dark.

There is more to discover as you look at the back side. Notice the small bumps showing through the aluminum sheet. These bumps reveal the presence of bridging diodes. The diodes serve a special function absent in competing solar panels, and their presence means more power to you. In ordinary panels, cells are connected directly in series. The consequence is that if a leaf falls on one cell and shuts down its output, the output of the whole panel is shut down. Similarly with a conventional panel, if a shadow falls across one cell of the panel the whole output is cut back. But your AntennasWest Solar Power Supply would keep on working with only a slight reduction in power being supplied because of its bridging diodes.

Okay, How can I install it?

You don't have to. Your AntennasWest Solar Power Supply comes with a 30 foot cord all ready to connect to your battery. Just attach the wires, put the panel out in the sun, and you'll be charging ahead. When you want to pick up and move, just coil up the cord and stow the panel in your closet.

But, you say, I really want to install it--put it up on top of my house or RV where I can forget it and let it work for me whenever the sun is shining." A good idea--and it's an easy half-hour job, because when we deliver your QRV Solar Power Supply, we give you the screws, the corner reinforcers, the spacers and a complete book of instructions showing how to attach it to your roof. If you want to get fancy, we offer you a sturdy adjustable mast mount for repeater and home sites as an option.

Is that all there is to it?

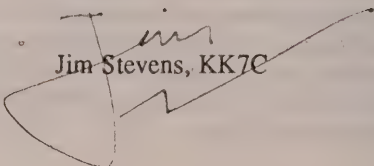
It really is. This is a new age. You can enjoy a degree of trouble free energy independence that just wasn't possible even a year ago. You can let the sun keep your station on the air. And all this freedom can't be shattered. Once you've got it, it's yours for keeps.

I'm so sure that you will be satisfied that I want you to try it at my risk.
Here's what I propose:

1. Fill out the order and information forms below and send them in with your check.
2. I'll immediately ship your AntennasWest Solar Power Supply.
3. Slide it out of its box. See how light and easy it is to handle. Feel the smooth clear space age polymer protecting its flexible generating surface. Rap it with your knuckles right in the center--see why your dreams of energy freedom won't shatter with a careless mistake, a boy's well-aimed rock or a wise-guy's bullet.
4. Uncoil the power cord and connect it to your battery.
5. Place your Solar Power Supply in the sun and enjoy the silence and independence of nature while it charges your battery to power your rig.
6. Turn on your receiver. Compare the noise level with solar power and with commercial mains power. See what a difference it can make for small signal reception. Enjoy the sound of solar power.
7. If you decide this isn't the most convenient, the most carefree way to power your station--or if you decide that energy independence isn't worth what you paid for it, just roll up the power cord, slip it all back inside the shipping crate the way it came, and return it to me. I'll refund your purchase price.

That's all there is to it. Send in your check or call me at (801) 373-8425 to place your order. You'll be glad you did.

Sincerely,


Jim Stevens, KK7C

ANTENNASWEST SOLAR PRODUCTS

• **SOLAR POWER SUPPLY BASIC MODULE** \$319.95
Polymer encapsulated shatterproof 23-Watt Sovonics Solar Panel equipped with 30-ft low loss cable for connection to 12 volt battery. Potted KA8IDB SunSelector charge regulator installs between panel down lead and storage battery to produce fastest safe charging and extend the life of your battery. Includes standard panel mounting hardware and complete technical manual. Capacity can be expanded by the simple addition of up to four additional solar panels (see below). Ready to connect.

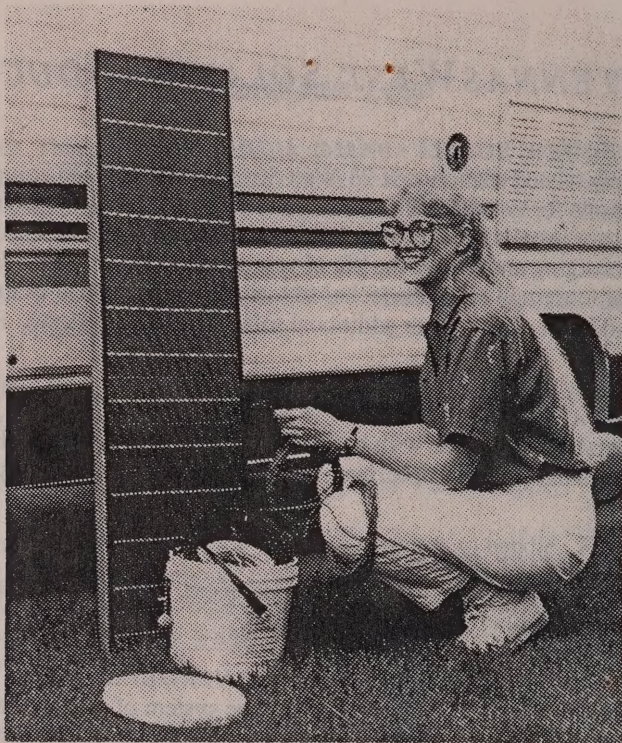
• **ADDITIONAL 23 WATT SOLAR PANEL** \$219.95
Ready for parallel connection with basic Solar Power Supply Panel. Exact match for panel above but without cable, manual or current booster. Includes jumper wires.

• **OPTIONAL MAST MOUNTING KIT** \$34.95
For mounting panel to 1-1/8" to 2" dia vertical mast. Adjustable for optimum angle. Easiest mounting and orienting method.

• **KA8IDB-SUNSELECTOR CHARGE CONTROLLER** \$69.95
The SunSelector Charge Controller uses a unique system of sensing battery condition to control battery charging voltage and current for fastest non destructive charging and charge maintenance. Install permanently connected between battery and any charging source. The KA8IDB SunSelector Charge Controller radically extends battery life beyond manufacturers specifications. Can be used with any charger with up to 8-amp delivery capacity and any number of parallel-connected batteries. For solar power systems this charge controller completely eliminates diode requirement with its associated power loss. It will control up to 5 of the 23-watt panels listed above (8 Amps) or any assortment of panels delivering 8 amperes or less of charging current. (A 16-amp version is also available at \$79.95).

• **PANEL PROTECTION DIODE** \$4.95
Low voltage drop Schottky diode to prevent current from batteries from flowing back through panels at night or when they are shaded. Not needed if you are using the KA8IDB charge controller or if the panel includes one already. Simply insert in diode in power lead of unprotected panels and you have no more cause to worry about potential damage.

• **SPECIAL SITUATIONS & QUANTITY DISCOUNTS** CALL
You may have a special need that deserves a custom solution--a high capacity installation or a mountain retreat. Perhaps you need a flexible curved panel that precisely fits the hatch cover of your sailboat, or you need a large waterproof folding unit. Because there are flexible Sovonics panels designed for many purposes, we can supply one to match your specific need. Just give me a call and we'll show you a solution. And if you're ordering more than three units of any item, call me for the quantity discount.



Be QRV in minutes with products from AntennasWest.

-----ORDER- FORM-----

Okay, Jim, I'll try the items checked off above at your risk. My check is enclosed. If I'm not satisfied for any reason, I'll simply return them in original condition and you'll send back my purchase price. (Utah residents add 6.75% sales tax.)

Add \$10 shipping and handling for each basic power supply or 23-watt solar panel. For other shipments send only \$5 shipping and handling.

To ensure fast UPS delivery give full street address.

Name Call Phone

Street

City St. Zip.

ANTENNASWEST Provo, Utah 84603-1144 (801) 373-8425

Brooklyn, New York

Kings County

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KB2MKT

Confirms Two-Way Radio Contact Reception Report

Radio	Date	UTC	MHz	Mode	RS(T)	Power	QSL
Equipment				Antenna			

NextDay QSLs™ (801) 373-8425

Andrew Katz, 7 Kansas Place, Brooklyn, NY 11234, U. S. A.

