



“If you pull on the base of the antenna and the car moves without the QMS moving on the car, then the straps are tight enough, otherwise readjust them,” suggests SGC.

Another neat mounting of the larger SGC QMS antenna system.



by Gordon West

STRAP ON SOME HIGH-FREQUENCY PERFORMANCE

In the last two issues of *Nuts & Volts*, my review of mobile, high-frequency 3/8 x 24 thread antennas has generated some excellent points and questions from avid high-frequency mobile radio operators. Everyone seems to agree that no little tiny loaded high-frequency whip will have near the performance as a mobile whip dramatically longer and larger. There is no fooling Mother Nature when it comes to the radiation characteristics of a very tall whip versus a very small whip.

But many readers wanted to know more about getting on the air with a high-frequency antenna system that was both transportable quickly from one vehicle to another,

and one that could be retuned to any new band without having to stop the vehicle and fiddle with resonance schemes.

You wanted quick band changing, good efficiency on lower bands, rapid deployment from one vehicle to another without leaving scratches or holes, and a variety of whip configurations that could be real tall for "mobile at rest" installations, but relatively short for "mobile in motion" traveling.

One of the whip systems we tested meets these requirements precisely, so I went ahead and repeated the on-vehicle trials just to make sure it was everything that everyone seemed to have wanted, and the SGC Quick-Mount System

(QMS) has some distinct advantages over any of the other whips I tried on our communications van.

SGC (Bellevue, WA; www.sgcworld.com) is well known for its marine, aviation, ham, and military automatic antenna tuner systems. Their automatic antenna tuners are available as five distinct models, all handling at least 100 watts of voice power output and covering 1.5 MHz through 30 MHz, and even one tuner including the six-meter, 50 MHz band, too.

The SGC founder and owner, Pierre Goral — an avid ham operator — quickly saw the many different applications of his automatic tuners and the need for both the military, as well as the avid radio

operator to get the tuner up and running within five minutes on any type of vehicle. His answer to this challenge was the Quick-Mount System, a strap-on metal black box with capabilities to work with four of his most popular, fully automatic, high-power tuners.

Sometimes professionals call these automatic tuner systems "couplers," and maybe the military calls them ARUs, but it's all the same thing — a remote-mounted black box that will pass applied high-frequency RF power through a detector system, then through the active relay coupler tuning array, consisting of capacitors and inductors, then through an impedance detector and VSWR detector and



Testing the SGC with the AEA antenna scope, showing good tune on 40 meters with the AEA portable analyst.

phase detector all monitored by a central processing unit (CPU) proprietary chip, and an output that normally provides the most efficiency to a proprietary SGC helical-wound, black fiberglass whip.

In simple terms, you say the word "FFFOOOUUURRR" in the mike, and the tuner goes WWWW-HHHRRRRR, and you watch your SWR indicator drop to minimum while simultaneously watching power output on your transceiver go to maximum. This takes about three seconds on a cold first-time tune-up, and less than one second on an automatically memorized re-tune on your favorite frequency with the same electrical connections. Of course, the resultant output signal relies on a big surface area ground and the very tallest whip or wire you can get up into the sky.

The SGC QMS system has been around for several years. I must honestly admit that the first time I saw a vehicle with one of these units strapped on the side corner panel, I thought it looked terribly hokey, and who in the world would ever run with this type of installation as opposed to a more permanent type of mount. I soon found out that this particular tuner

would constantly go on different vehicles in the fleet, and it took only five minutes to get back on the air after a vehicle switch.

I also saw some military installations with the QMS firmly attached to the side of some rather impressive armored vehicles, and this tells me that the equipment stays put even when the tall SGC whip is taking a pounding from low branches over the highway.

The actual tuning assembly is exactly the same as the normal line-up of SGC tuners, but mounted securely inside the QMS black box. The mounting box carries four large suction cups to keep the tuner in place without skidding around on glass or metal. And the suction cups work well – I nearly pulled the glass off of our communications van's back window when I gave it a tug to see how strongly it was holding on!

The black box also carries the 3/8 x 24 threaded receiver for any number of SGC helical-wound-type whips. You could also use a common stainless steel CB-type whip, but we found increased performance with the tuner working into a capacitive loaded helical-wound whip. When we added an intermediate capacitive loading hat, the

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tuner returned to a new setting, and the receiving station over 1,000 miles away could actually hear the slight increase in signal strength.

The SGC QMS box holds on with suction cups and the two required nylon straps. The nylon straps have two hooks at the top, and two hooks at the bottom to hang securely on the top edge and bottom edge of most vehicles. The straps are long enough to accommodate almost any type of gutter or lip you plan to hook into with the metal strap hangers. The metal hangers are rubber-coated so as not to scratch the finish of your vehicle.

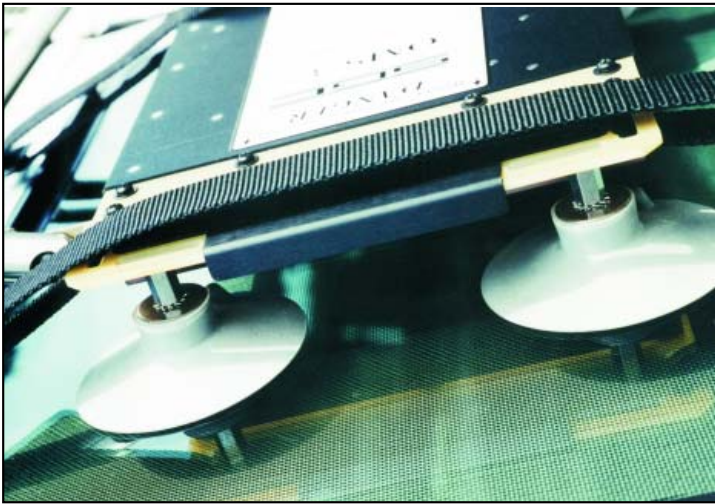
The tuner box also has an adjustable whip receiver that may rotate at almost any angle in order to accommodate almost any type of box mounting. Just be sure to get the box mounted so that the whip receiver is not coming out the bottom!

The straps may be removed from the box and run through the

QMS assembly in a different way in order to accommodate almost any type of mounting. But if you do remove the straps, be sure to note how they were originally passed through the QMS so you can re-duplicate the same mounting scheme. The strong strap self-locking tighteners allow you to dog-down the straps to keep the tuner firmly in place, resting on its four rubber suction cup feet.

If you have an extremely long strap run, the SGC QMS also comes with four rubber black spacers, specifically to tighten up on the strap's hold. I did not need them for

... You wanted quick band changing, good efficiency on lower bands, rapid deployment from one vehicle to another without leaving scratches or holes, and a variety of whip configurations ...



The suction cups on the SGC QMS box keep the base from sliding around.

our van installation, but I suppose they might come in handy in certain installations.

The nice thing about the SGC QMS box and the straps is the capability to try different locations, and see which one provides the best stability for the antenna system. I usually mount it on the left side of a vehicle in order to minimize encounters with overhead branches.

The QMS system comes with coax cable and the 12-volt DC line already attached at the tuner end, so there is no need to disassemble

anything to rapidly get on the air. With other manufacturer automatic couplers, not only do they have the neat way of external vehicle mounting, but none of the cables are attached. This means you must spend several hours just making the watertight seal, and getting things wired up on the inside. With SGC, all of the tuners are pre-wired.

The coax cable goes to the high-frequency transceiver. If it's not long enough, a barrel connection and an extension is all you need. Below 30 MHz, line loss is minimal. The 12-volt red and black

wires go to a switched 12-volt source at your operating station. Most high-frequency transceivers output 12 volts that is switched on after turning on the equipment; and while the output 12 volts DC is rated below one amp of current capability, this is plenty of current to work an SGC autocoupler that typically draws less than 300 mil-amps. But you do want the SGC to power down when you turn off the equipment in order to not accidentally drain your battery if the vehicle is not operated with the tuner in place for several weeks.

The tuner must be grounded with the supplied silver-tinned ground flexible braid. The braid supplied was long enough to easily go to the chassis of our vehicle for a good secure mount. The tuner must be grounded with this strap, and the ground point must be within a few feet of the tuner for everything to work properly. If you don't ground the strap, you will lose major amounts of signal in the tuning elements.

Now it comes time to choose what type of whip you're going to screw into the tuner. The SGC whip features helical loading, and most important, a big rubber-covered spring assembly to take out the shock of the whip hitting branches. SGC stresses the importance of their relatively expensive helical whip as being the only one to go into the 3/8 x 24 threads, and I do agree that their whip versus an equal length stainless steel whip does achieve different relay settings and an increase in output current. Distant stations said they could hear a slight increase when using the SGC whip over a stainless steel whip.

But when I started playing around with capacity hats halfway up my own style whip, the tuner immediately reacted to a different

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The SGC QMS system is fully waterproof for vehicle mounting on the roof.

center-loading and top-loading scheme, and distant stations indicated that my signal began to build. The more wire I could hang on the whip, and the more capacitive loading I could stick up at the tip of the whip, the better my apparent signal strength.

Certainly the SGC helical-loaded whips were most aerodynamic for the automatic coupler QMS system, but if you stop the vehicle and start attaching your own type whips with capacitive top loading, you could very well outdo the more expensive SGC-designed whip. And that's the beauty of the SGC automatic coupler — play around with your antenna radiators, and see what you can do to improve field strength and better signal reports from distant stations. And, if you're really looking for a great signal on 75 meters, attach some wire to the end of any whip, and get the wire up and away from the tuner into a nearby tree, and stand by for excitement! Our signal on 75 meters continued to get stronger and stronger as we added more and more wire to the end of our simple CB-type stainless steel whip.

So, the SGC QMS system is indeed a great performer as advertised; and once you get accustomed to that strange-looking box hanging onto your vehicle, and explain to everyone else what in the world it is, you'll have the capability to be whizzing down the road and instantly go from 10 meters to 75 meters, 75 meters to 40 meters, and then maybe work a little sporadic-E DX on six meters with one coupler that goes all the way up to 60 MHz.

When working other mobile and base stations on 75 meters,

most operators gave me equal signal reports to other mobile stations around me running pre-tuned, center-loaded, very-narrow-resonant antenna system. But I had the capability of going from the bottom of the band to the top of the band, always in resonance, without needing to stop the vehicle and do any whip-tip adjustments. Just a quick few syllables in the mike, and presto, I am on a new frequency with a decent low SWR reading.

Log onto the SGC website and download a huge amount of information that they have put on their system for those of you who want to read a highly technical analysis of how each tuner goes about selecting hundreds of combinations of L and C. If you have questions, just ask, and SGC is not so large a company that you won't get a personal answer back within a day or so. They indeed know what it takes to keep their customers technically satisfied.

So check it out — we have tried it on our communications van, and while the SGC QMS system looks strange, it gives us capabilities of band hopping without ever having to stop the vehicle. **NV**

The SGC straps firmly hold the QMS in place at driving speeds.

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