

STEALTH KIT

No RF Ground Required

**Smart
Tuning,
Emergency
Antenna
Loop,
Tactical
HF Kit**



For Full HF Range
From 2.5 to 60 MHz



For any HF transceiver
up to 100 watts



Cat. #54-23

The STEALTH Kit

Thank you for choosing the American made, SGC STEALTH Kit. We are confident that you will be happy with your purchase and assure you of our full commitment to customer service. Since 1971, SGC has been designing and manufacturing a wide range of HF SSB communications products. Our goal is to provide reliable equipment, which is competitively priced and which fits the need of the radio user.

With the STEALTH Kit, SGC has provided an all-in-one, convenient antenna solution. The STEALTH Kit is perfect for emergency use, when an urgent communications command center must be setup in minutes. The STEALTH Kit contains everything a novice or professional needs to erect an antenna in any location—and provides performance equivalent to most dipole antennas!

And, in keeping with its' name, the STEALTH Kit is an ideal antenna solution for restricted areas, such as condominiums and gated communities where dipoles and towers are forbidden. Or, use the STEALTH in city apartments where access to roofs or large open areas is restricted. The STEALTH Kit is also a great antenna solution when you are on vacation. Whether in an RV or a hotel room, the STEALTH Kit is a “Grab and Go” box - filled with everything you need to complete your communications center.

We are proud of the STEALTH Kit as it provides an antenna system that is automatic, easy to install and easy to use. Any location, any radio and any situation - the STEALTH Kit is the perfect choice for a quick and convenient antenna solution.



Pierre Goral
President
KI7UA

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Quick Start

1. Locate a proper area where you would like to erect your loop antenna. Initially the system could be operated with the antenna lying on the floor.
2. Connect your coupler to the transceiver and a suitable 12VDC power supply. This can be the same source as the power supply to the radio if it is a 12VDC unit. Avoid regulated linear or switching power supplies as they may be susceptible to RF radiation and may lose regulation and apply higher voltage than permissible. Power supplies may also lose regulation at peak modulation and cause intermittent operation.
3. Connect your loop antenna to the two terminals of the coupler; one hot side, one ground side. Both have a wing nut terminal to allow easy attachment.
4. If urgent operation is required, transmit on an emergency frequency with the antenna on the ground. Although this setup is not efficient, it will allow you to easily establish a communication link in an emergency.
5. Configure your antenna in single or multiple loops (not to exceed four loops).
6. Elevate your system to any surrounding high points such as a tree, roof, top of car, ceiling, mast, etc. Attach with 4 ropes and clips provided. The coupler can also be elevated using the fifth piece of rope.
7. After your initial contact, you may improve your antenna installation following the guidelines in this manual.

1.0 Introduction

The **Smart Tuning, Emergency Antenna Loop, Tactical HF Kit - STEALTH** - antenna kit is a high-frequency antenna for situations where a full size antenna is not possible. Its main features are:

- Easily configured to the space available
- Groundless - no RF ground required
- Easy to install - kit contains all necessary items
- Automatic operation
- Easy to use - no meters or lights to watch, no buttons to push
- Wide bandwidth - 2.5 (and lower for non-amateur radio usage) to 30 MHz
- High performance - can match the performance of a full size dipole

STEALTH is a loop antenna chosen for its radiation efficiency and because it does not require an electrical ground. It can be horizontal or vertical mounted for short and long range communications needs.

An important use of STEALTH is as an emergency antenna. STEALTH is easy to install and easy to operate. Its small size makes it easy to transport and quick to install.

But STEALTH was also designed for...

The amateur radio user who is struggling with Homeowners' "Covenants, Conditions & Restrictions". A stealth antenna can be installed with no visible signs of its presence, in developments where erected antennas are forbidden.

Those living in an apartment or similar limited environment. STEALTH provides an effective antenna in small spaces. It can be installed in an area as small as 5 feet by 5 feet.

Use as an effective, ready to go, compact vacation antenna.

Offices, farms, etc. It can be used where other antennas are not practical.

1.1 Disclaimers

RF Burns can occur if the output terminals or antenna wire of the SG-237 are touched while transmitting. Use caution to avoid injury and burns.

Prolonged exposure to RF should be avoided. Those persons using heart pacemaker devices should avoid RF exposure.

To avoid injury and damage to equipment: Whenever possible, we strongly recommend reducing transmit power. Preferably, 10 to 25 watts should be used and will generally provide good communications. If using an outside antenna, 100 watts can be used without any harmful consequences.

If for any reason a particular setup or frequency does not provide the expected results, minor changes can significantly improve performance. For example: move the radio as far away as possible from the coupler or antenna; avoid coiled power or coaxial feed cables; reconfigure setup, etc.

SGC accepts no responsibility for performance or results from the STEALTH Kit. SGC accepts no responsibility for any unlikely damage or injury resulting from the use of the STEALTH Kit.

2.0 Specifications

- Antenna loop perimeter: 80' (24m)
- Maximum square configuration - 20' (6.1m)
- Minimum square configuration - 5' (1.5m)
- Number of turns - 1 to 4
- HF frequency range - 2.5 to 60 MHz.
- Maximum power - 100 watts
- Package size 3.5" x 10" x 15" (8.9cm x 25.4cm x 38.1cm)
- Package Weight 5lbs. (2.3kg)

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Performance and results may vary and SGC does not warrant any installation or any result. SGC reserves the right to change the specifications without notice.

3.0 Supplied Items

- SG-237 Smarttuner HF Antenna coupler and manual.
- 80' (25m) of loop antenna wire.
- 4 - antenna mounting clips and 20' (6m) ropes attached
- 30' (9.14m) of nylon support rope with clip
- 12 - Releasable cable ties
- 2 - spare antenna mounting clips



4.0 Installation

4.1 Advance Preparation for emergency use

Plan your emergency station before you need it! You should consider things like:

- Equipment - Have you selected the equipment to be used in an emergency situation? Is that equipment able to withstand possible abuse? Do you have all power sources immediately available and, in the case of batteries, are they fully charged?
- Cable extensions - Do you have AC cords long enough for typical situations? Is your coax long enough or should you have some extensions? If your installation will be battery powered, do you have cables to reach them and also the cables needed to maintain the charge on them?
- Connector installation(s) - Have you installed all connectors on all the cables which might be needed?
- Where are your emergency supplies - Are they in one, quickly retrievable location? Or do you have them scattered around?

Do not wait for an emergency to happen - be ready. Test everything including STEALTH. Be fully prepared to react in the event of an emergency.

4.1 Antenna Installation

There are several factors which need to be considered before installing the antenna and some can affect others.

WARNING!

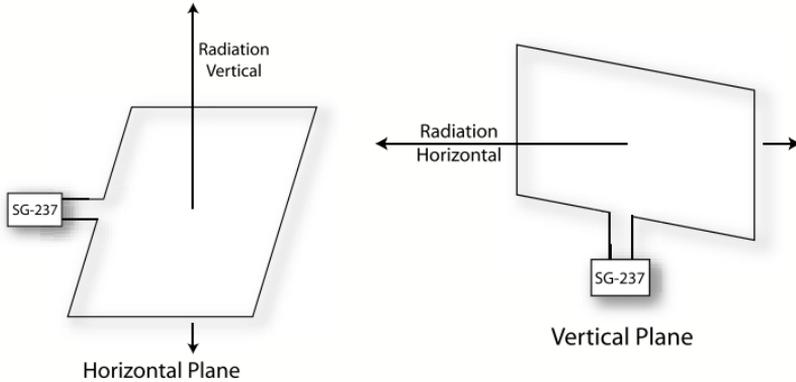
Never mount any antenna near power lines or utility wires. Any materials, ladders, ropes, feedlines, etc., which come in contact with power lines can conduct voltages that can be fatal.

Stay away from all power lines.

4.1.1 Antenna Orientation

Because the signal radiation of a loop antenna is perpendicular to the plane of the loop, how you orient the antenna should be determined by your communication needs.

This is called polarization. A loop mounted horizontally is considered to be vertically polarized as the signal is primarily radiated vertically and will provide more effective short distance communications. Likewise, a loop mounted vertically is horizontally polarized as its signal is primarily radiated horizontally and is better for long range communications.



4.1.1.1 Horizontal - for less than 500 miles (830km)

If your needs are expected to be less than 500 miles (830km), the best results can be obtained by orienting the antenna so the plane of the loop is horizontal.



Horizontal triangular plane - for vertical radiation, the coupler is supported by rope, approx. 25 ft. in the center of the back segment.

4.1.1.2 Vertical - more than 500 miles (830km)

Use this type of antenna when you need to maintain long range communications of 500 to 5000 miles (830km to 8300km).



Vertically mounted two-turn loop. The coupler is installed in center of lower section antenna.

4.1.2 Shape of the antenna loop

The ideal shape of the antenna for this situation would be a single turn circle. However, this would require complicated mounting.

Most needs can be fulfilled with a one-turn square, rectangle or triangle shape. When there are limitations on what the size and shape of the loop can be, it might be necessary to reduce the size by making the loop two, three or four turns.

4.1.3 Antenna directivity

Like any antenna, a loop antenna is directional. As the size of the loop is reduced, by configuring it as two, three or four turns, the directivity becomes more significant.

4.1.4 Height of antenna

As is the case with all antennas, the rule of thumb is “the higher the better”. You should attempt to make the lowest point of the loop at least 10 feet (3mtr) above ground.

4.1.5 Inside or outside

If possible, the antenna should be located outside and clear of any structures for maximum effectiveness. If you find this impossible, and you must locate the antenna inside, consider the following:

- Ensure that the antenna will be at least 4 inches (10cm.) away from any larger metal objects such as a corner column or window support.
- Does the ceiling or roof of the room contain metal material? This can have a negative effect on the performance of the antenna.
- Is there any metal within the outside walls of the building? This can also have a negative effect.

4.1.6 Environment

Your physical environment can influence how you mount STEALTH. For example, in a rainy area, an outside mounted antenna would need to be mounted as high as possible to avoid interaction with the wet ground. In a desert, where it is dry, this would be less of a consideration.

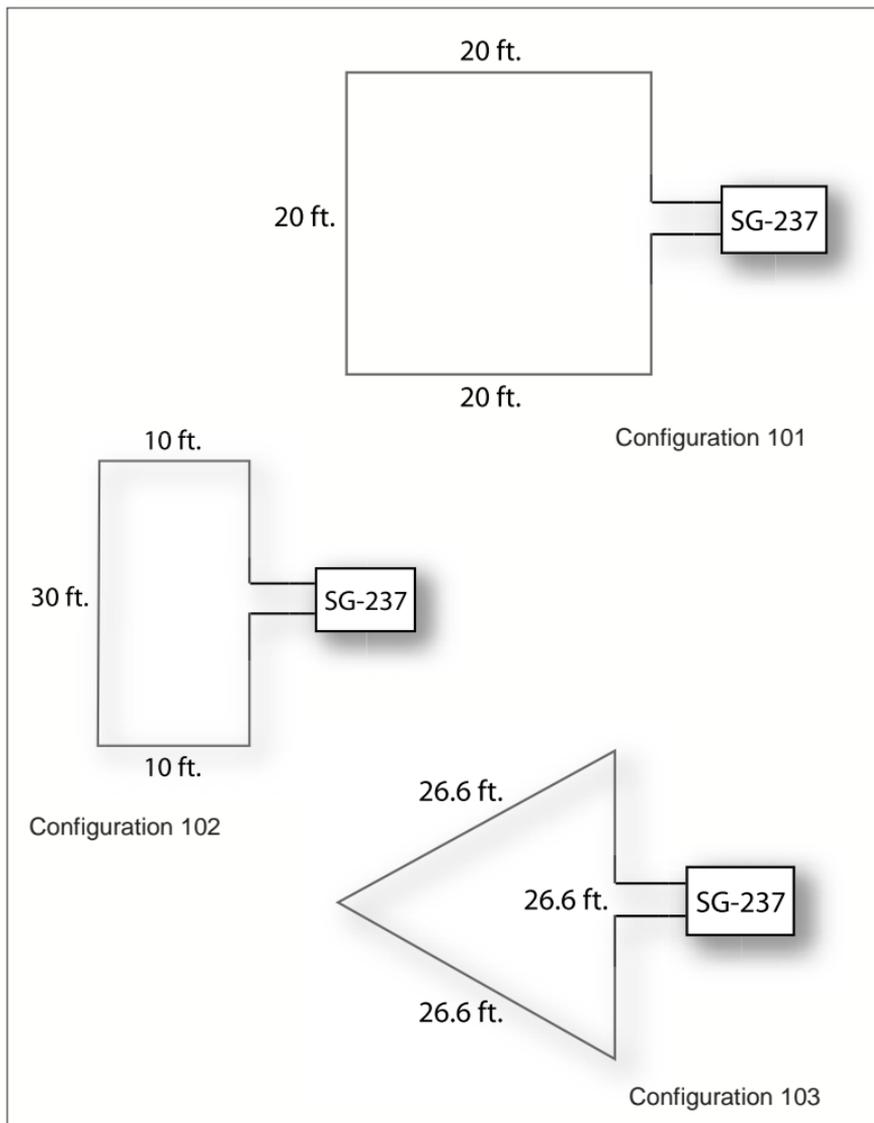
4.2 So what should I do?

The above descriptions are the ideal situations and may not always be obtainable. You should make every effort to install the antenna in an optimum way.

Although a square or rectangular antenna loop is generally more effective, a triangular loop can also be used. If necessary, shape the antenna as two-turn or three-turn loop and lay it on an inside floor. It will not be as efficient as possible but you should be able to conduct effective communications.

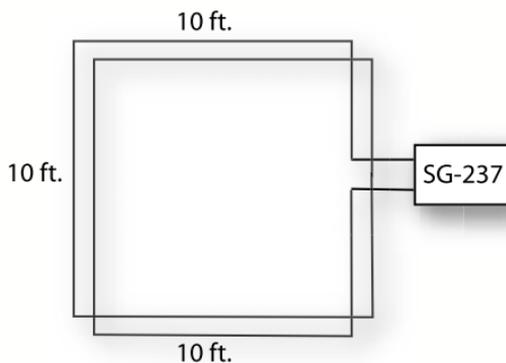
The sketches below show possible shapes.

One Loop Configurations

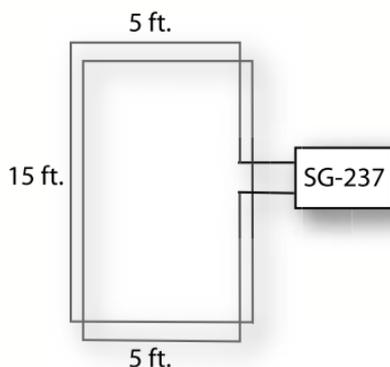


These configurations are the most common and are used for installations outside and away from buildings.

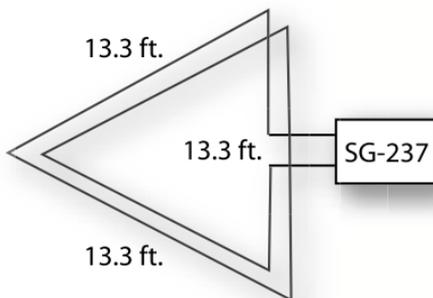
Two Loop Configurations



Configuration 201



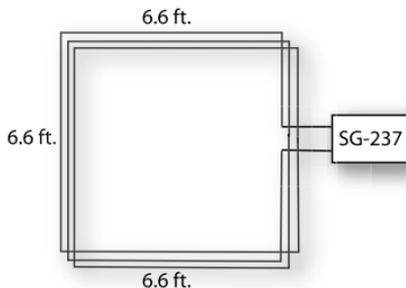
Configuration 202



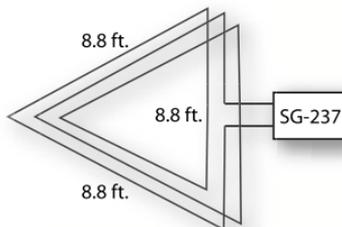
Configuration 203

The two turn loop is primarily used for inside situations. It is also a very convenient installation for vacationing, a small patio, or even a greenhouse.

Three Loop Configurations

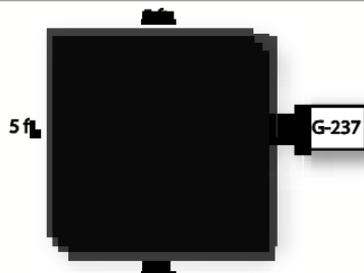


Configuration 301

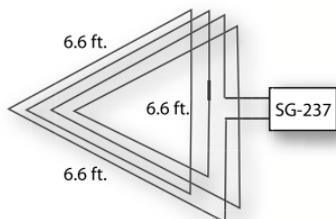


Configuration 302

Four Loop Configurations



Configuration 401

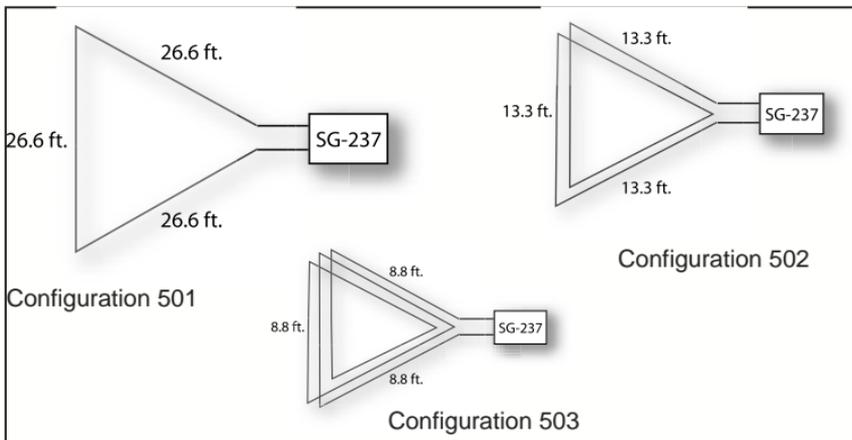


Configuration 402

The three and four turn loops are almost always indoor antennas and are very convenient for situations where there is a limited amount of space available. This will be of significant importance for the office or apartment user where they can be mounted near a window or door.

Coupler Connection Point

In the case of the triangular configurations above, the coupler is shown connected at a mid point of one of the legs which is the suggested point. If necessary, it can also be connected at a corner of the triangle. Testing has shown that the corner connection performs better when the coupler is connected at a midpoint of one of the legs or segments. (Configurations 501, 502 & 503 will perform better than 302 & 402.)



Tip: one drawback when connecting the coupler at a corner of a triangular configuration is that the support ropes for the coupler can become long and difficult to install properly.

If you have obtained the STEALTH for emergency use, practice installing the antenna. This will benefit you when it comes to an actual emergency situation.

4.3 Sample installation

WARNING!

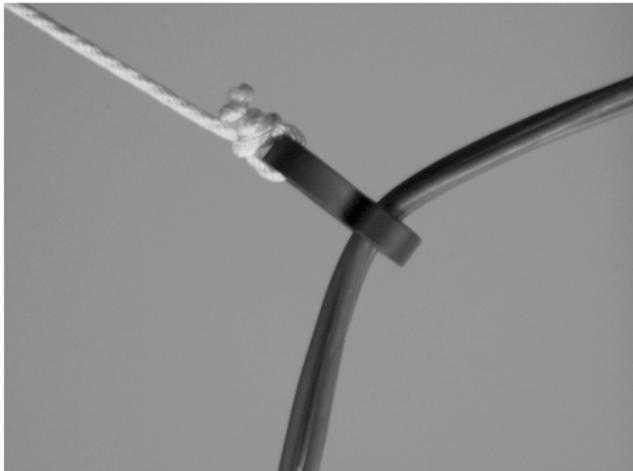
Never mount any antenna near power lines or utility wires. Any materials, ladders, ropes, feedlines, etc., which come in contact with power lines can conduct voltages that can be fatal.

Stay away from all power lines.

For the limited space available, a three-turn square loop antenna, mounted vertically, for long range communication needs, is to be assembled with the coupler resting on the floor.

This will show how to construct the antenna so that emergency operations can begin as quickly as possible. You will then be shown how to finish the installation for better performance.

- Form the antenna wire into the approximate desired shape and size and slightly knot the ends of the wire together for later attaching to the coupler.
- Attach four support ropes at corners of antenna using the supplied antenna clips. The wires will easily snap into the clips.



The two loops of the antenna wire have been strapped into a support clip.

- Raise the antenna as much as possible and secure the ropes.

The antenna, which was formed on the floor, is being raised to its final position.



- Secure the lower corners of the antenna.

In this sample installation, the support ropes were attached to 2 chairs.



- Attach the coupler to ends of antenna wire and lay it on the floor.



The antenna has been raised to its final position and ends have been connected to the coupler which is lying on the floor.

- Attach the cable from the coupler to the radio and connect the coupler power leads - see section 4.4.

Do not coil any cables! Doing so can make them susceptible to the radiated signal from the antenna and they can have a negative effect on the performance of the antenna and radio system.

At this point in the construction of the antenna, which required 15 minutes to accomplish, emergency operation is possible.

When time permits, the installation should be completed to improve the performance of the antenna by...

- Only in an emergency should coupler be hung by antenna wire. A 30 foot rope has been provided to support the coupler mechanically and provide relief to the antenna wire. Attach a section of rope through mounting holes on each side of the coupler.

A support rope has been passed through the mounting holes of the coupler.



And secure the ropes so the coupler is supported.

- The corners of the antenna loop located near the floor can be raised.



The lower corners of the antenna have been attached to two chairs which are then moved to form the antenna into its final shape.

The test results of this three-turn vertically mounted antenna can be found in Appendix A

4.4 SG-237 Smartuner HF Antenna Coupler Installation

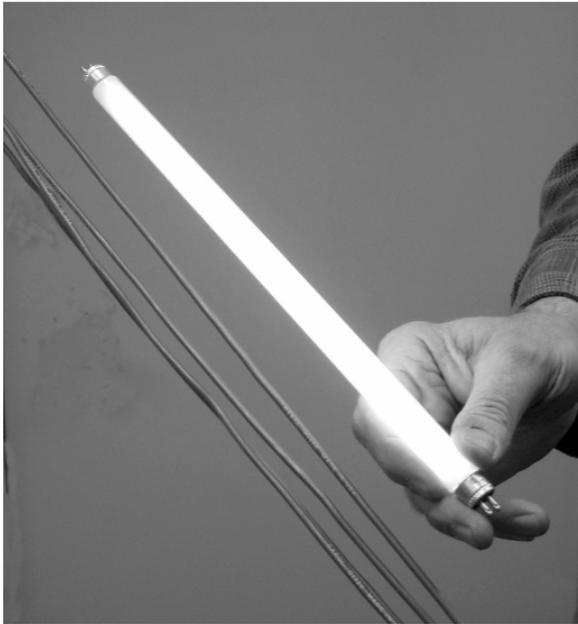
Read the SG-237 manual, which is included, as it provides detailed information which can be helpful to your installation.

The coaxial connector at the end of the coupler cable can then be securely attached to the radio equipment.

The red wire should be attached to a +12 volt power source and the black wire to ground.

4.5 Tips, Do's and Don'ts

- **Do not coil any cables**, even those which are not part of the antenna. Doing so can make them susceptible to the signal radiated by the antenna and could impact the performance of the antenna and the radio system.
- If an “RF Burn” - it feels like a sting - is experienced by touching the radio while transmitting, eliminate potential RF by grounding the radio by attaching one or more 15 to 40 foot wires (not supplied) to the ground terminal of the radio.
- When shaping the wire for a multi-turn antenna, it will be much easier to accomplish if you can get another person to help. Form the loops, then alternate shaking and gently pulling the wire until all of the loops are the same length.
- To verify that the antenna is radiating a signal, any 5 to 100 Watt fluorescent light tube can be used. By moving the bulb around the perimeter of the antenna you will find spots where the bulb lights up indicating the presence of radiated RF power. Intensity of light increases with power in the antenna and on lower frequencies.



For RF radiation detection, the fluorescent tube has been moved around the loop until a position was found where the bulb glowed.

- Knot the ends of the supplied antenna wire together before attempting to shape or install the antenna. Once the antenna has been raised into position, the knot can be removed and the coupler attached to the ends of the wire.
- Whenever nylon rope is cut, the ends will quickly become unraveled. This can be eliminated by slowly warming the ends with a small flame until the rope is melted slightly. You may use a match or a lighter for this purpose.
- The coupler should be supported by a section of rope passed through its mounting holes. Do not allow it to hang unsupported from the antenna wire.
- When the installation of STEALTH will be a two-turn or three-turn configuration, forming the loops first will make the installation much easier to accomplish.

Appendix A (pg. 31) contains photographs of sample configurations and performance test results.

5.0 Adjustable Directive Loop Antenna

A small, highly directive, four-turn loop antenna can be constructed for indoor or outdoor use. The Adjustable Directive Loop Antenna can be used in a room as small as 10 by 10 feet. It can be hung from the ceiling with the supplied rope for *orientation* of the antenna for the *best receiving or transmitting signal*. By listening to a station, the operator can simply rotate the antenna for best signal strength or intelligibility.

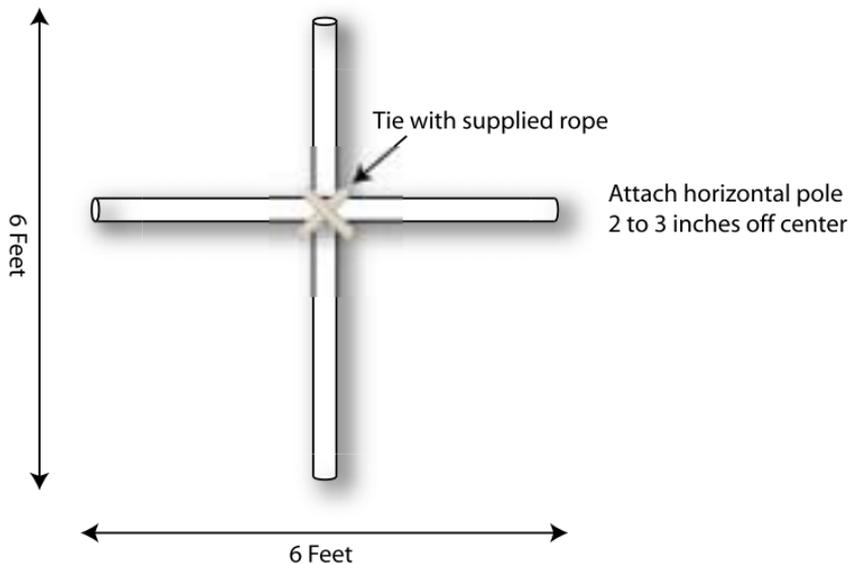
When used indoors, appliances may cause local interferences or radio frequency pollution which could substantially impair the incoming signal. In this situation, the antenna can be oriented to minimize the interference and enhance the incoming signal. Also, when reaching the contact station, a test can be performed by asking the contact station for a signal report. Rotating the antenna in 45 degree increments is the best way to determine the best radiation direction.

Direction of the angle is perpendicular to the plane of the antenna with directivity gain varying from 6 to 12db for a 4-turn loop antenna. This depends on the operating frequency - the lower the frequency the higher the directivity.

For this construction, two wooden flagpoles, sticks or plastic plumbing tubes of 6 feet long would be required and a hookup point on the ceiling, 7 feet or more above the ground.

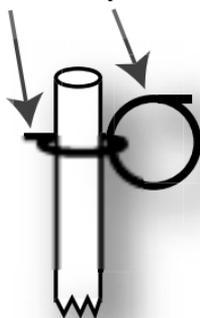
The following pages describe this type of installation.

First construct the cross section of the two sticks by using the supplied rope - on the vertical stick by approximately 2 to 3 inches above the center.

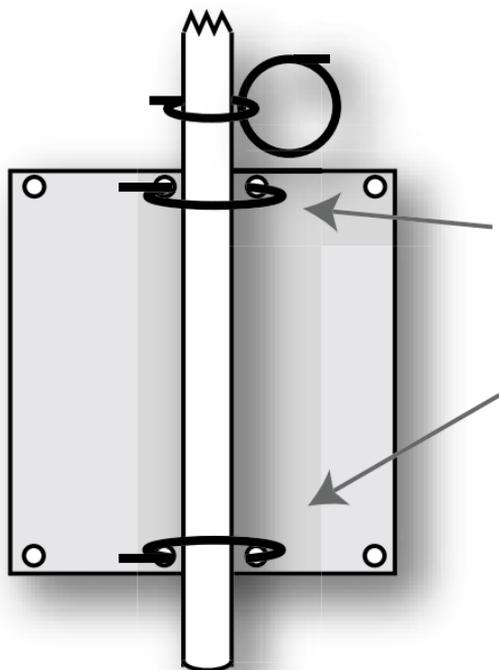


Next, use two of the supplied cable ties at the end of each pole; one to go around the pole and to hold the other in place. Four sets of two will be required, one set for each of the four ends of the poles.

Tie-Wraps



Attach the cable ties 2 inches from three ends of the pole. For the fourth side (the bottom), place the cable ties 14 to 15 inches from the end of the pole. This will create a 4 by 4 foot loop approximately.

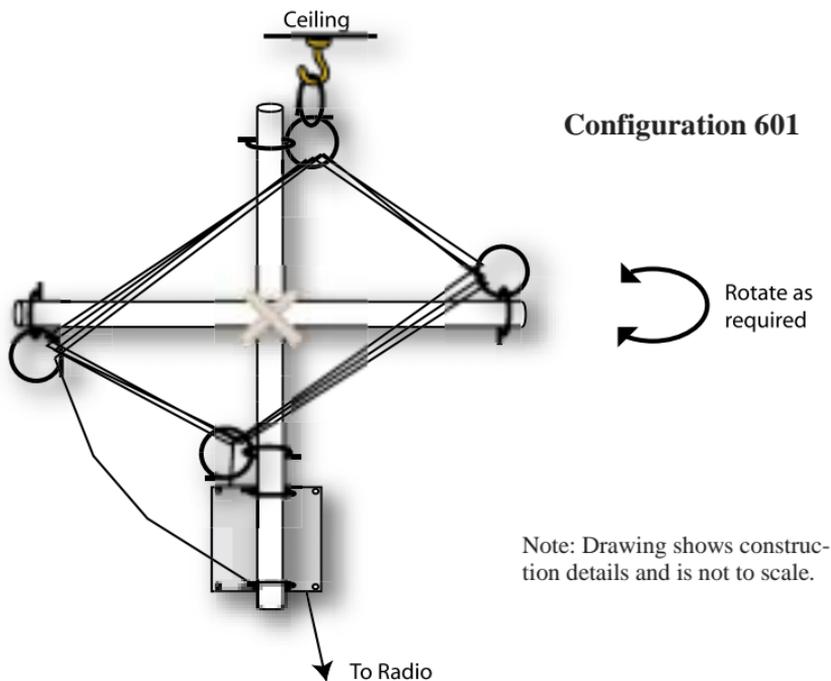


Attach SG-237
with tie-wraps
or rope provided

Next, on the bottom below the cable ties, attach the coupler vertically with rope or more cable ties.

Now, attach the antenna wire to the coupler output and loop the antenna five times through the loops previously made. When completed, attach the end of the loop antenna to the couplers ground terminal. If any wire is left, pass it through an additional cable tie or just let it hang from the lowest part of the loop. If the antenna ends up too short to get to the ground terminal, remove it from the last cable tie and go directly to the ground terminal.

This setup is an effective way to improve the connections.

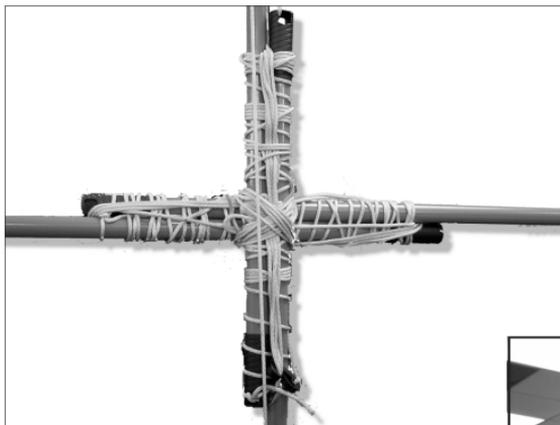


Rotate the antenna until the best direction is achieved. Then, secure it with an additional rope attached to a nearby object such as a window or door.

Note: Any materials can be used for this setup with the exception of metal. Test performances expected are similar to the four loop antenna described on page 35.

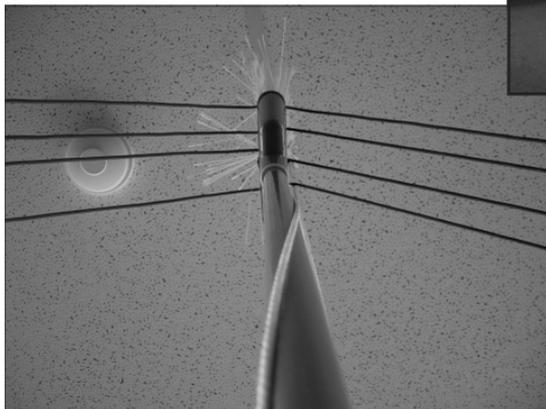
5.1 Directive Loop Antenna Improvised with Four Brooms

This is an example of a 15 minute improvisational setup using wooden brooms in a very small area.



These are the steps used to install our sample setup.

1. Tie four brooms together in a criss-cross fashion using the ropes provided.
2. Loop the antenna wire around the brooms four times. Use the bristles to keep each loop of the wire apart.





3. Hang system from ceiling using cable ties provided.
4. Attach tuner to antenna wires.
5. Attach the coupler to the lower broom.
6. Attach coupler to radio.
7. Rotate system horizontally until the best connection is received.



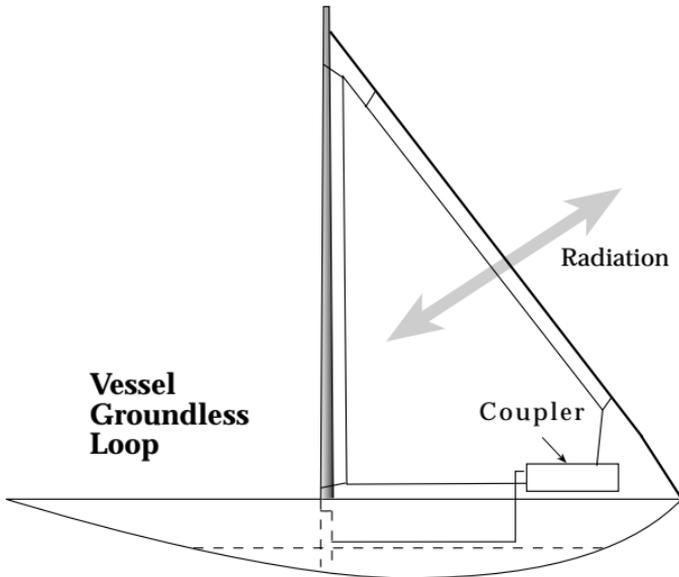
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5.2 General Applications

Most of the loop antennas described can be used anywhere, on board boats, aircraft and cars.

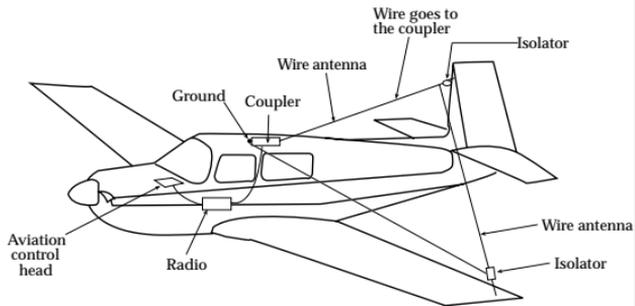


For example, the loop antenna can be configured on a sail boat from the top of the mast to the front or back of the vessel, with the coupler located on the deck avoiding installation of expensive backstay isolators.

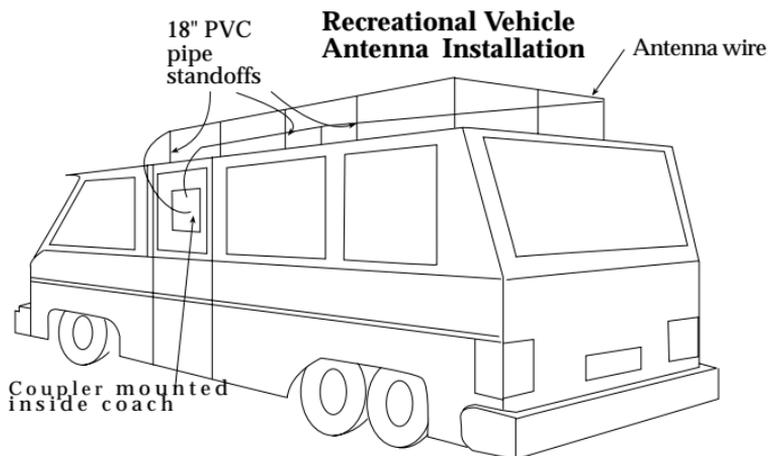
Lower mast connection to coupler RF ground

Fixed Wing Aircraft

On an airplane the antenna could be configured using a single or multi-loop triangular configuration from the cockpit to the top of the tail. Antenna wire supplied could be replaced by stronger bronze phosphorus cables (for airplanes faster than 80 miles per hour).

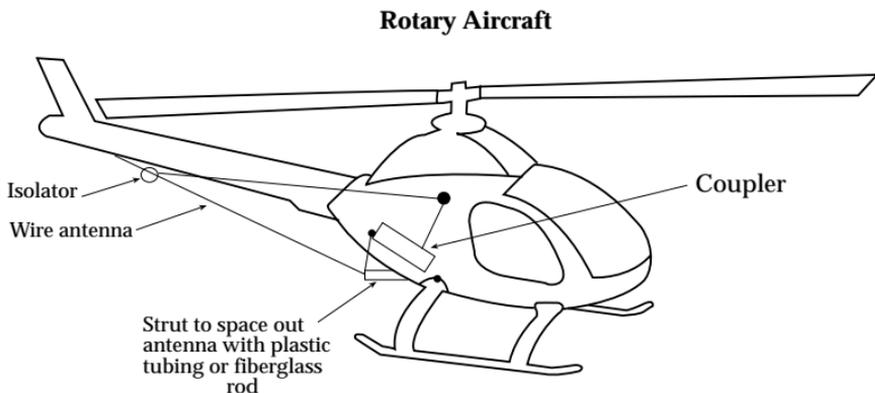


The antenna could be mounted on the top of a car or camper using short plastic mountings of 4" to 8" in length and elevating it from the roof of the vehicle.



Use a separate ground strap or wire for the body and the chassis to the ground of the coupler.

Helicopters can also be fitted with a triangular configuration from the front to the back of the underside of the aircraft body.



6.0 SGC Limited Product Warranty **and Software License - 1Year Parts & Labor**

This manual is produced as a guideline for the Smart Tuning, Emergency Antenna Loop, Tactical HF Kit - STEALTH Kit. Performance and results may vary and SGC does not warrant any installation or any result. This manual is subject to change without notice. You have purchased an SGC product together with a license to use the software installed in that product. Please return the warranty registration card that accompanies this product so that we can ensure that you receive proper warranty service and important notices that may affect the product. This SGC product is warranted to be free from defects in workmanship and material for a period of days from the original buyer's date of purchase. In the event of a defect, malfunction or failure of which SGC receives notice during that time period, SGC, at its option, will repair or replace the product free of charge to the buyer. The buyer must contact SGC for a Return Material Authorization (RMA) and deliver the product back to SGC with this RMA number and written proof as to the date of purchase. SGC will ship a new or repaired product to the buyer, reserving the discretionary right to return a newer model that offers at least equal performance. The foregoing warranty extends to the original buyer and does not include (a) buyer's cost to return the product to SGC, (b) buyer's cost to remove or reinstall the product for warranty work, or (c) added costs of special expedited shipment that may be requested by the buyer. Except for the limited warranty stated above, and to the full extent permitted by the law, SGC disclaims any other express or implied warranties and liability for any incident, consequential, special or exemplary damages in connection with its product, even if SGC or its agents are advised that such damages are foreseeable. (Note: some states do not allow exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you.) There is no warranty with respect to (a) the product's transmission range or geographical coverage which can vary by location, (b) non-performance caused by using an inadequate or improper antenna or grounding system, or (c) routine maintenance, periodic adjustments and performance testing of the product or system. SGC customarily charges a flat fee for repairs performed outside of the warranty coverage. To inquire about such charges, please contact SGC. SGC warrants that the SOFTWARE included in this product will perform in substantial accordance with the documentation. SGC grants to the original end user of its product a non-exclusive worldwide license to operate the software installed therein. This license shall be transferred to any person or entity that subsequently acquires lawful ownership of the product. This license shall be limited to the using of the software for contemplated operation of SGC's product. This license does not permit any end user to (a) modify or adapt SGC's software or to merge it into another program, (b) reverse engineer, disassemble, or otherwise attempt to discover SGC's software source code, or (c) sub license or otherwise transfer SGC's software for any use other than operating the product originally purchased from SGC.

7.0 Appendix

The appendix contains seven sample configurations and the results of the testing.

- One-turn loop antenna mounted horizontally outside, 12 feet above the ground. Tested at 20 watts. (page 31)
- Three-turn loop antenna mounted vertically inside a building. Tested at 20 watts. (page 32)
- One-turn loop antenna mounted horizontally outside, 12 feet above ground. Tested at 100 watts. (page 33)
- Three-turn loop antenna mounted vertically inside a building. Tested at 100 watts. (page 34)
- Four-turn loop antenna mounted vertically inside a building. Tested at 100 watts. (page 35)
- Four-turn loop antenna mounted vertically inside building, operating from 50 to 54 MHz. Tested at 20 watts & 100 watts (page 36)
- Adjustable Directive Loop Antenna, mounted inside. (page 37)

Appendix A

Antenna Installation: One-turn triangular loop mounted 12 feet horizontally above ground. Used SG-2020 transceiver.

	Bottom of band f (MHz)		Middle of band f (MHz)		Top of band f (MHz)	
	Fwd	Ref	Fwd	Ref	Fwd	Ref
80	3.510 MHz 20w	.7w	3.750 MHz 20w	.7w	3.990 MHz 20w	0
VSWR	1.1:1		1.1:1		1:1	
40	7.010 MHz 21w	.2w	7.150 MHz 21w	.1w	7.290 MHz 21w	1.3w
VSWR	1:1		1:1		1.1:1	
30	10.110 MHz 21w	0	10.125 MHz 21w	0	10.140 MHz 21w	0
VSWR	1:1		1:1		1:1	
20	14.010 MHz 23w	0	14.175 MHz 22w	.2w	14.340 MHz 20w	2.1w
VSWR	1:1		1:1		1.2:1	
17	18.078 MHz 21w	0	18.118 MHz 21w	0	18.158 MHz 21w	0
VSWR	1:1		1:1		1:1	
15	21.010 MHz 21w	0	21.225 MHz 20w	0	21.440 MHz 20w	1w
VSWR	1:1		1:1		1.1:1	
12	24.900 MHz 20w	.1w	24.940 MHz 20w	.1	24.980 MHz 20w	.1
VSWR	1:1		1:1		1:1	
10	28.010 MHz 19w	.6	28.850 MHz 19w	1.2	29.690 MHz 21w	0
VSWR	1.1:1		1.1:1		1:1	

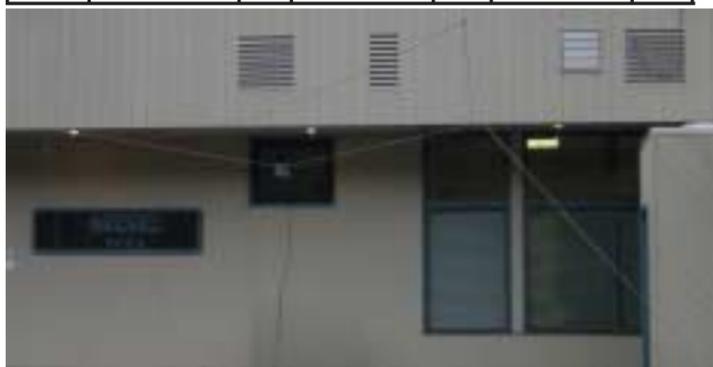
Notes:

Lowest Usable
Frequency =
2.6 MHz

Fwd = 20.2w

Ref = .2w

SWR = 1.02:1



Antenna Installation: Inside three-turn square loop mounted vertically. Used SG-2020 transceiver.

	Bottom of band f (MHz)		Middle of band f (MHz)		Top of band f (MHz)	
	Fwd	Ref	Fwd	Ref	Fwd	Ref
80	3.510 MHz 18w	.2	3.750 MHz 17w	5.1	3.990 MHz 17w	1
VSWR	1:1		1.9:1		1.1:1	
40	7.010 MHz 18w	.9	7.150 MHz 19w	2.2	7.290 MHz 19w	.5
VSWR	1.1:1		1.3:1		1.1:1	
30	10.110 MHz 18w	.2	10.125 MHz 18w	.1	10.140 MHz 18w	0
VSWR	1:1		1:1		1:1	
20	14.010 MHz 18w	0	14.175 MHz 18w	0	14.340 MHz 18w	.2
VSWR	1:1		1:1		1.1:1	
17	18.078 MHz 18w	0	18.118 MHz 18w	0	18.158 MHz 18w	.2
VSWR	1:1		1:1		1:1	
15	21.010 MHz 17w	1.9	21.225 MHz 17w	1	21.440 MHz 17w	1
VSWR	1.3:1		1.1:1		1.1:1	
12	24.900 MHz 16w	0	24.940 MHz 16w	.1	24.980 MHz 16w	0
VSWR	1:1		1:1		1:1	
10	28.010 MHz 14w	5	28.850 MHz 18w	1.7	29.690 MHz 17w	0
VSWR	2.1:1		1.2:1		1:1	

Notes:

Lowest Usable
Frequency =
2.4 MHz

Fwd = 18w

Ref = 3w

SWR = 1.4:1



Antenna Configuration: One-turn triangular loop mounted 12 feet horizontally above ground. Used IC-736 Transceiver.

	Bottom of band f (MHz)		Middle of band f (MHz)		Top of band f (MHz)	
	Fwd	Ref	Fwd	Ref	Fwd	Ref
80m	3.510 MHz 110w	0	3.750 MHz 110w	0	3.990 MHz 110w	8
VSWR	1:1		1:1		1.2:1	
40m	7.010 MHz 110w	0	7.150 MHz 110	0	7.290 MHz 115	0
VSWR	1:1		1:1		1:1	
30m	10.110 MHz 45w	0	10.125 MHz 44w	0	10.140 MHz 42w	0
VSWR	1:1		1:1		1:1	
20m	14.010 MHz 120w	0	14.175 MHz 115w	8w	14.340 MHz 75w	18w
VSWR	1:1		1.2:1		1.6:1	
17m	18.078 MHz 120w	0	18.118 MHz 120w	0	18.158 MHz 123w	4w
VSWR	1:1		1:1		1.1:1	
15m	21.010 MHz 110w	3w	21.225 MHz 107w	4w	21.440 MHz 120w	0
VSWR	1.1:1		1.1:1		1:1	
12m	24.900 MHz 120w	1w	24.940 MHz 122w	1w	24.980 MHz 124w	1w
VSWR	1.1:1		1:1		1:1	
10m	28.010 MHz 110w	5w	28.850MHz 110w	3w	29.690 MHz 110w	4w
VSWR	1.1:1		1.1:1		1.1:1	

Notes:

Lowest usable frequency = 2.6 MHz

Fwd = 110w

Ref = 3w

SWR = 1.06:1



Antenna Installation: Inside three-turn square loop mounted vertically.
Used IC-736 Transceiver.

	Bottom of band f (MHz)		Middle of band f (MHz)		Top of band f (MHz)	
	Fwd	Ref	Fwd	Ref	Fwd	Ref
80	3.510 120w	1w	3.750 120w	0	3.990 121w	0
VSWR	1:1		1:1		1:1	
40	7.010 123w	1w	7.150 125w	2w	7.290 116w	0
VSWR	1:1		1:1		1:1	
30	10.110 110w	2w	10.125 115w	6w	10.140 113w	7w
VSWR	1:1		1.1:1		1.1:1	
20	14.010 120w	0	14.175 113w	0	14.340 111w	3w
VSWR	1:1		1:1		1.1:1	
17	18.078 120w	0	18.118 122w	0	18.158 125w	1w
VSWR	1:1		1:1		1:1	
15	21.010 120w	0	21.225 116w	0	21.440 119w	2w
VSWR	1:1		1:1		1.1:1	
12	24.900 116w	4w	24.940 116w	5w	24.980 116w	5w
VSWR	1.1:1		1.1:1		1.1:1	
10	28.010 112w	5w	28.850 90w	9w	29.690 115w	0
VSWR	1.1:1		1.2:1		1:1	

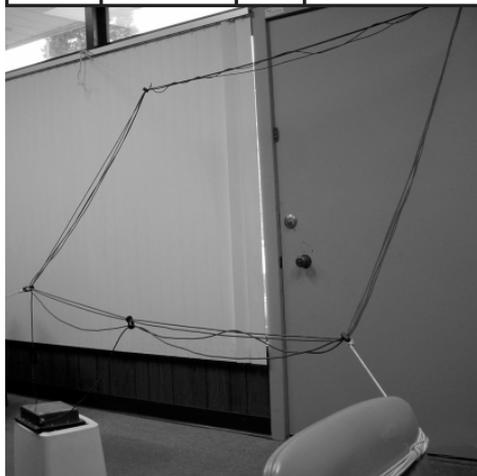


Notes: There was a mild RF burn on the 10 MHz frequencies; it was eliminated by laying 3 wires on the floor as a ground which was connected to the ground terminal on the transceiver.

Lowest usable frequency = 2.5 MHz
Fwd = 113w
Ref = 9w
SWR = 1.17:1

Antenna Installation: Four-turn vertically mounted antenna, mounted inside, using IC-736.

	Bottom of band f (MHz)		Middle of band f (MHz)		Top of band f (MHz)	
	Fwd	Ref	Fwd	Ref	Fwd	Ref
80	3.510 MHz 104w	2w	3.750 MHz 104w	2w	3.990 MHz 100w	5w
VSWR	1:1		1:1		1.1:1	
40	7.010 MHz 100w	3w	7.150 MHz 100w	6w	7.290 MHz 105w	2w
VSWR	1.1:1		1.1:1		1:1	
30	10.110 MHz 80w	14w	10.125 MHz 80w	14w	10.140 MHz 75w	14w
VSWR	1.4:1		1.4:1		1.5:1	
20	14.010 MHz 107w	1w	14.175 MHz 108w	4w	14.340 MHz 104w	0w
VSWR	1:1		1.1:1		1:1	
17	18.078 MHz 104w	1w	18.118 MHz 104w	0w	18.158 MHz 105w	1w
VSWR	1:1		1:1		1:1	
15	21.010 MHz 105w	7w	21.225 MHz 107w	3w	21.440 MHz 107w	2w
VSWR	1.1:1		1.1:1		1:1	
12	24.900 MHz 110w	4w	24.940 MHz 110w	4w	24.980 MHz 105w	7w
VSWR	1.1:1		1.1:1		1.1:1	
10	28.010 MHz 95w	8w	28.850 MHz 100w	6w	29.690 MHz 105w	4w
VSWR	1.2:1		1.1:1		1.1:1	



Lowest usable frequency =
2.5 MHz

Fwd = 102w

Ref = 5w

SWR = 1.1:1

High End Frequency Test (6 meter)

Antenna: Three turn vertically mounted inside. Tested using Alinco DR-M06

50.01 MHz	Fwd = 19w	Ref = 1w	SWR = 1.1:1
51.00 MHz	Fwd = 16.7w	Ref = 1.5w	SWR = 1.2:1
52.00 MHz	Fwd = 19.8w	Ref = 1.6w	SWR = 1.2:1
53.00 MHz	Fwd = 15w	Ref = 3.7w	SWR = 1.7:1
53.99 MHz	Fwd = 19w	Ref = 1.9w	SWR = 1.2:1

Antenna: Four turn vertically mounted inside. Tested using Alinco DR-M06

50.01 MHz	Fwd = 19w	Ref = .4w	SWR = 1:1
51.00 MHz	Fwd = 20w	Ref = 2.5w	SWR = 1.3:1
52.00 MHz	Fwd = 17.5w	Ref = 3.5w	SWR = 1.5:1
53.00 MHz	Fwd = 18.5w	Ref = 3.7w	SWR = 1.5:1
53.99 MHz	Fwd = 18.5w	Ref = .5w	SWR = 1.1:1



Antenna Installation: Adjustable Directive Loop Antenna, mounted inside.

	Bottom of band f (MHz)		Middle of band f (MHz)		Top of band f (MHz)	
	Fwd	Ref	Fwd	Ref	Fwd	Ref
80	3.510 MHz 16w	.5w	3.750 MHz 16w	.2w	3.990 MHz 16w	1.2w
VSWR	1.1:1		1.1:1		1.1:1	
40	7.010 MHz 16w	.1w	7.150 MHz 16w	.1w	7.290 MHz 16w	.1w
VSWR	1.1:1		1.1:1		1.1:1	
30	10.110 MHz 16w	.1w	10.125 MHz 16w	1.2w	10.140 MHz 16w	0w
VSWR	1.1:1		1.1:1		1:1	
20	14.010 MHz 16w	.1w	14.175 MHz 16w	0w	14.340 MHz 16w	0w
VSWR	1.1:1		1:1		1:1	
15	21.010 MHz 15w	.8w	21.225 MHz 15w	1w	21.440 MHz 15w	.1w
VSWR	1.1:1		1.1:1		1.1:1	
12	24.900 MHz 14w	1.2w	24.940 MHz 14w	1w	24.980 MHz 14w	1w
VSWR	1.1:1		1.1:1		1.1:1	
10	28.010 MHz 13.5w	1w	28.850 MHz 14w	1w	29.690 MHz 14w	.6w
VSWR	1.1:1		1.1:1		1.1:1	



Lowest usable frequency =
2.650 MHz

Fwd = 18w

Ref = 3w

SWR = 1.4:1

8.0 Global Reference Database

To illustrate and substantiate the results and performance of the loop antennas described in this book, SGC has established a special online database describing contacts used with this equipment. This database will effectively inform any user of the results that they could expect using the STEALTH Kit. Anyone can add their contacts made to this database for the entire world to see.

For more information on this database go to www.sgcworld.com/stealth

9.0 Conclusion

The STEALTH KIT can be used in any emergency situation and be erected in 15 minutes. In an urgent situation, lay the SG-237 Smartuner and the antenna on the floor in a distorted round or square loop of approximately 20 by 20 feet, and establish communications immediately. Later, the antenna system can be erected following the guidelines in this book to provide better and more reliable communication.

The addition of our Global Reference Database (www.sgcworld.com/stealth) will give first time users a better understanding of the outstanding capabilities of HF Radio Communication in an emergency situation or by simply contacting others around the world.

The STEALTH Kit can be used throughout the complete HF Spectrum from 2.5 to 60 MHz in any commercial, industrial, marine, aviation, vehicular, government, military or residential application.

10.0 Further Reading

For more information regarding HF technology, these publications and all of our manuals are available to download for free at www.sgcworld.com

These publications include:

- *The HF Users Guide*
- *Go Mobile at 500 Watts*
- *DSP Facts and Equipment*
- *Smartuners for Stealth Antennas*

11.0 Special Thanks

SGC would like to thank the following people for their field tests and feedback to create the STEALTH Kit:

- David Allred, N1EXQ
- Randy Davenport, KA4NMA
- Terry Dettman, WX7S
- Gary Evans, KA4YDO
- Bruce Franklin, KG7CR
- David Hatch, W9ZRT
- David Ingram, K4TWJ
- Gordon West, WB6NOA
- Don Wilson, N9ZGE
- Larry Winslow, W0NFU



Notes:

Notes:



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Supplied Items

SG-237 Smarttuner HF Antenna coupler and manual.



80' (25m) of antenna wire

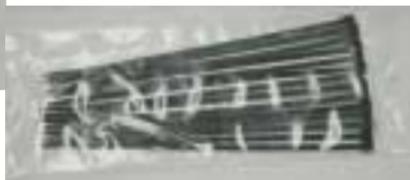
4 - antenna mounting clips and 20' (6m) ropes attached

30' (9.1m) of nylon support rope with clip



2 - spare antenna mounting clips

12 - Reusable cable ties



The Smart Tuning, Emergency Antenna Loop, Tactical HF Kit - STEALTH - is a high frequency antenna package for situations where a full size antenna is not possible.

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Web: www.sgcworld.com

- Easily configured to whatever space is available
- Groundless - no RF ground required
- Easy to install - kit contains all necessary items
- Automatic operation
- Easy to use - no meters or lights to watch, no buttons to push
- Wide bandwidth - 2.5 (and lower for non-amateur radio usage) to 30 MHz
- For any HF Transceiver - up to 100W
- High performance - will match the performance of a full size dipole

