

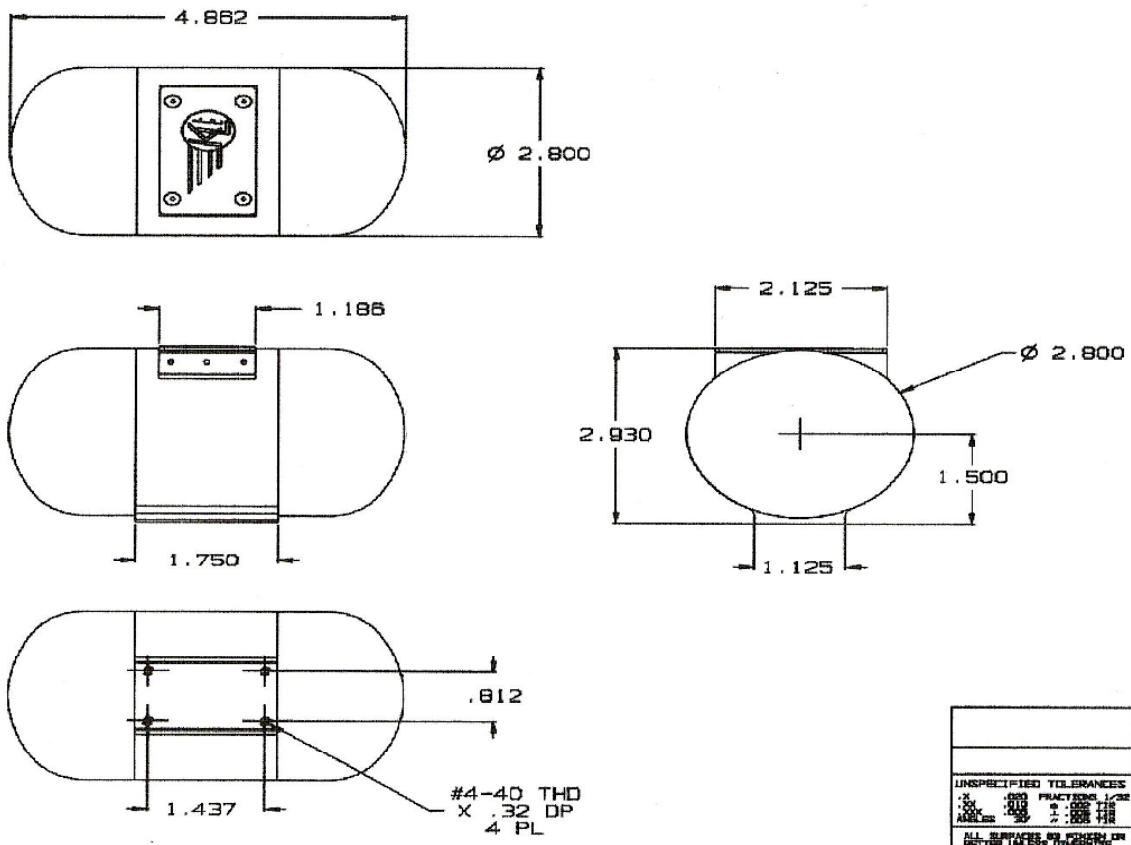
INTRODUCTION TO YOUR KENYON GYROSCOPIC STABILIZER

THE STABILIZER is a precision instrument which significantly increases the effectiveness of cameras, binoculars and other hand-held optical equipment. Two gyro wheels, one in each end of the device, stabilize against pitch and yaw motions, minimizing hand tremor and vehicular movement.

When properly attached to a camera, the Stabilizer substantially extends the observer's range of discrimination. Objects may be clearly identified at a much greater range.

To get the most out of your stabilized camera, relax and let the instrument do the work. Hold your camera lightly and move it slowly, about the speed at which you would pass a full cup of water. Any sudden movement will cause a jumpy reaction by the gyro, nullifying the stabilizing effect.

The stabilizer will provide a long life of trouble-free service when properly treated. No maintenance is required as the unit is hermetically sealed. However, care should be taken to keep rough handling to a minimum as the life of a precision gyroscope deteriorates rapidly when mishandled. Read carefully and adhere to the operating instructions that follow.



KS-2 and KS-4
Outside Gyro dimensions
and dimensions for mounting
hole pattern for the mounting
bracket with thumbscrew

-----VERY IMPORTANT!-----

The (4) 4-40 threaded holes x .32 deep should never be drilled deeper or you might drill through the frame and release the helium inside the gyro.

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Binocular Bracket (Top) for KS-2 & KS-4



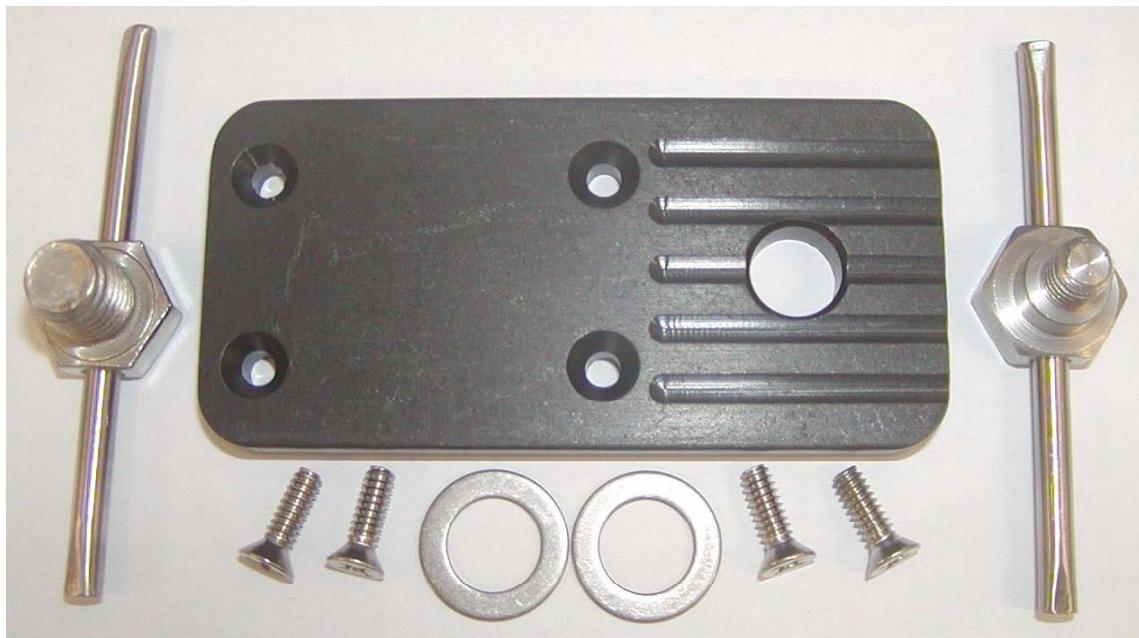
Standard Bracket (bottom) for KS-2 & KS-4

**4-40 thread x 1/2" long stainless steel flat head screws
Knurled thumbscrew with 1/4-20 thread**

**All items are made by Kenyon Laboratories (except screws)
and are made of lightweight quality aluminum and black hard**

coated for a long life of use.

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KS-6 & KS-8 Mounting Plate

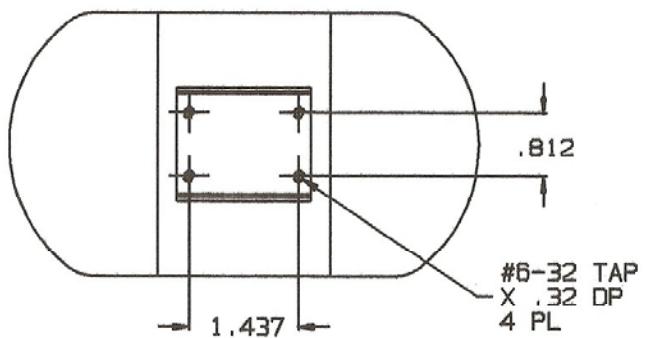
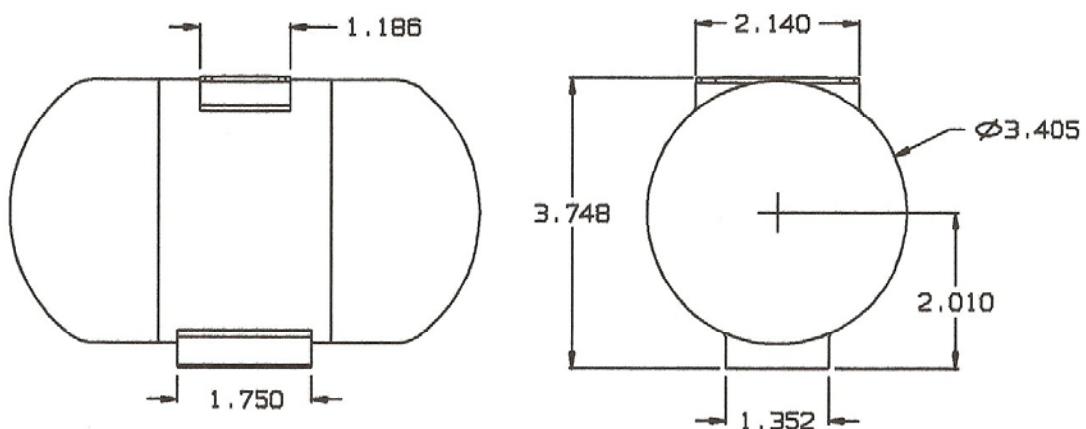
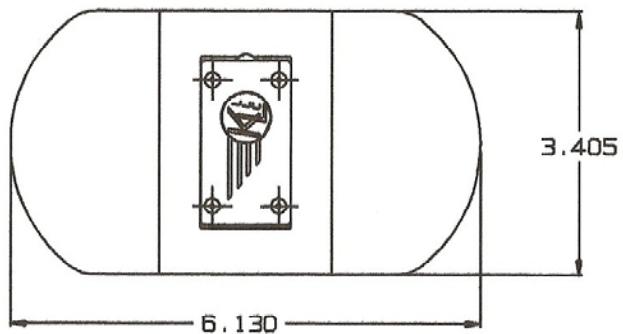
**1/4-20 Tommy Bar
3/8-16 Tommy Bar**

**6-32 thread x 7/16" long -
stainless steel flat head philips head screws
Washers for shims if necessary**

**Mounting plate is made by Kenyon Laboratories and is
made of lightweight quality aluminum and is black hard
coated for a long life of use.**

**Dimensions:
3.1 " x 1.5" x .25" thick**

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UNSPECIFIED TOLERANCES		
X	.000	FRACTION 1/64
X	.000	0 .000 725
X	.000	1 .000 725
X	.000	2 .000 725
X	.000	3 .000 725
X	.000	4 .000 725

ALL SURFACES TO FLOOR OR
MATERIAL LINES OTHERWISE
SOLID LINE

KS-6 & KS-8

Outside Gyro dimensions and dimensions
for mounting plate screw holes.

-----VERY IMPORTANT-----

The (4) 6-32 threaded holes x .32 deep should never be drilled deeper or you might drill through the frame and release the helium inside the gyro.

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OPERATING INSTRUCTIONS

Always be sure battery is fully charged!

- 1. KS-2 or KS-4 Gyro:** Attach the Gyro to the camera or binoculars using the thumb screw on the Gyro and putting it into the tripod recess on the camera.

KS-6 or KS-8 Gyro: Attach the Gyro to the camera using the tommy bar screw that fits your camera tripod recess
(each kit is supplied with a $\frac{1}{4}$ - 20 and a 3/8 - 16 tommy bar with extra screws).

Washers are also supplied just in case your tripod recess is shallower than the length of the tommy bar screw.

- 1. NOTE: The Gyro must be positioned with the longitude axis of the lens- i.e. The Gyro must be in line lengthwise to the lens of the unit.**

Snug up the thumb screw or tommy bar securely *Check this connection occasionally while using the Gyro as it will “walk” otherwise and must be in proper alignment with the lens at all times. Always be sure all 4 screws are securely tightened in the mounting plate!

2. Attach the plug end of the Gyro cable to the inverter on the top of the battery-- there are two receptacles, but only one will fit the Gyro's 3 pin XLR plug.

***Only a power source providing 115 volts and 400 cycles per second is permissible for the Gyro's operation-- the use of any other power source will damage the unit.**

3. Plug the battery pig-tail into the 4 pin plug on the inverter.
4. Push the switch on the side of the inverter box and the LED light should appear green - you will hear the Gyro begin to warm up. Wait 10 - 12 minutes for the Gyro's wheels to achieve their high maximum RPM's. The high pitch will level off in pitch when it reaches its maximum RPM's.

Any rapid movement other than up and down will make the wheels jerk about until the unit comes to rest again. Violent or rapid rotational movement of the stabilizer when it is in operation will bring it hard to the internal stops-- which you will feel, or if extreme, will actually damage the instrument to such degree that a complete rebuilding of the unit is necessary.

Some practice is required before you can achieve maximum proficiency in the use of the Stabilizer. Look through the viewfinder at a distant object. Notice that the Gyro will keep that object in your line of vision quite comfortably. The Gyro will not permit the unit to be nose heavy (pitch). Then try panning. Do this in a slow manner so that the unit does not jerk -- you will find that at whatever angle you desire to pan, skywards, horizontal or lower than the horizon, the gyro will not deviate from your chosen plane(yaw).

The Gyro will take a bit of getting used to, but by following the above instructions you should be able to obtain excellent

results--with complete freedom of movement.

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SPECIAL CONSIDERATIONS

To reduce fatigue in holding the unit during sustained viewing, a bungee (elastic) cord may be attached to any convenient point above the observer to support the weight of the camera and Stabilizer. The bungee cord will be attached to the camera-stabilizer combination at a point as close as possible to their combined center of gravity.

In any experimentation with the application of the Stabilizer, the unit must be free to move in all three axes as it is when held in the hands or suspended by an elastic cord. **Do not mount the unit on any rigid support or use any leverage type aiming device as a pistol grip or shoulder stock, etc. As this restricts the movement of the instrument and prevents it from functioning properly.**

CHARGING INSTRUCTIONS

TO CHARGE THE BATTERY, unplug the battery pigtail connector from the top of the inverter and plug into the similar receptacle on the charger. Plug the power cord into the wall socket. Our new **Cell-Con** chargers can automatically sense the voltage input of 100-240VAC(NOT our old chargers, you need to switch them manually). So when traveling, you need not be concerned with the different power requirements in different countries. When the LED light has turned green, the battery is fully charged. The charger voltage is at standby level, which means the charger can continue to be connected to the

battery without causing harm to either.

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Fully charged, the 12 volt 7amp hour battery supplied with the Kenyon Gyro kit should operate the KS-2 & Ks-4 for about five (5) hours and the KS-6 & KS-8 for about 2 ½ - 3 hours at 70 degrees Fahrenheit.
Using a dual output inverter with 2 gyros will cut your operating time in half.

-----**IMPORTANT**-----

Extremely hot or cold temperatures are hard on a battery. If the battery is discharged completely, too many times, it will greatly reduce the life of the battery. It should always be stored fully charged at room temperature. Once a month, put battery on charger to make sure it is fully charged.

CHARGER SPECS:

Cell-Con Model 452240-SB 12v Lead Acid Charger:
6 hour charge time, automatically senses input voltage for universal use and is CE approved.

100 - 240VAC, 50-60 Hz input
14.7 VDC output

Cell-Con Model 459940-SB 12v Lead Acid Charger
Rapid Charger
3 hour charge time, automatically senses input voltage for universal use and is CE approved.

100 - 240VAC, 50 - 60 Hz input
14.7 VDC output

NOTES:

The battery is shipped in a fully charged condition. It is recommended that you put it on the charger till the LED light turns green before putting the battery in service to assure full capacity.

-----**IMPORTANT**-----

Always store the battery fully charged. A discharged battery can be damaged if stored in that condition longer than 48 hours. A fully charged battery may be stored at room temperature (68° , 20 °C) for 16 months or about 10 months at 86° Fahrenheit, 30 ° C. Store battery preferably at 70 ° F or below -- avoid storage at temperatures above 100°F.

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SPECS:

KS-2 & KS-4 - 115-120V input 400 Hz. Starting amp draw is about 1.2 - 1.3 amps and drops to about .8 amps at full running speed.

KS-6 & KS-8 - 115-120V input 400 Hz. Starting amp draw is about 2.6 - 2.7 amps and drops to about 1.6 amps at full running speed.

INVERTER SPECS:

The serial number sticker on the side of the inverter indicates which type of inverter and can be coded with either -

KP-4 = Kenyon Powerpack (all components sold as a kit, except gyro, will have the same serial number, which includes 12v inverter, battery and charger), thus the name powerpack.

KI-12-4 or KI-28-4 = an inverter that was sold separately.

IMPORTANT -These inverters are meant to run both the KS-2 & KS-4 gyros and are NOT meant to run a KS-6 or KS-8.

The same rules apply to the KP-6 or KI-12-6, 14v and 28v inverters. These inverters are meant to run a KS-6 or KS-8 gyro and NOT a KS-2 or KS-4.

All dual and quad output inverters are designed to run any combination of the above 4 gyros.

FUSE REQUIREMENTS

KS-4 12V input: 126-128 volts; AC output no load -2 amp fuse

KS-4 28V input: 126V AC output no load;- 2 amp fuse

KS-6 12V input: 127-130V; AC output;- 3 amp fuse

KS-6 14V input: 127-130V AC output; -3 amp fuse

KS-6 28V input: 126V; AC output no load;- 3 amp fuse

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Dual output inverters require a 6 amp fuse

Quad inverters require a 15 amp fuse

Fuse holder is located on the side of the inverter box. It is marked “fuse” and has an arrow indicating the direction it turns, which can be done with a small screwdriver, dime or penny.

KS-2 & KS-4 SPECIFICATIONS MECHANICAL CHARACTERISTICS :

STABILIZATON: Stabilizes against motions of pitch (hobby horse) and yaw (fishtail).

KS-2 provides stabilization for equipment weighing up to 2 pounds.

KS-4 provides stabilization for equipment weighing up to 4-6 pounds.

SIZE: 2.8" diameter x 4.86" long x 2.93" high not including mounting bracket and thumbscrew.

GYRO

WHEELS: Two precision- balanced gyros. Speed: approximately 21,000 rpm within 10 to 12 minutes after power is applied.

CONSTRUCTION: Aluminum alloy, hermetically sealed housing. Precision ball bearings on all moving parts.

WEIGHT: KS-2 - 1.8 lbs.
KS-4 - 2.41 lbs.

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ELECTRICAL CHARACTERISTICS:

VOLTAGE: 115 volts, 400 Hz., Approx. 1.2 amps at start up dropping to approx. .8 amps at full running speed. 6 hours running on a fully charged Power Pack.

VERY IMPORTANT

If the Stabilizer continues to draw relatively heavy current after start- up and the amp draw does not drop off as it should, the instrument is not functioning properly and should be returned to the manufacturer for repair. An amp meter reading is required only if a malfunction is suspected.

KS-6 & KS-8 Mechanical Characteristics

STABILIZATION: Stabilizes against motion of pitch (hobby horse) and yaw (fishtail).

KS-6 provides stabilization of equipment weighing up to 8 pounds

KS-8 provides stabilization of equipment weighing up to 12 pounds.

SIZE: 3.4" diameter x 6.13" long x 3.748" high not including mounting plate.

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GYRO WHEELS: Two precision balanced gyros.

Speed: Approx. 21,000 RPM within 10-15 minutes after power is applied.

CONSTRUCTION: Aluminum alloy, hermetically sealed housing. Precision ball bearings on all moving parts.

WEIGHT: **KS-6 ...3.41 lbs.**

KS-8...5.12 lbs.

ELECTRICAL CHARACTERISTICS:

VOLTAGE: 115 volts, 400 Hz., Approx. 2.6 amps at start up dropping to approx. 1.6 amps at full running speed. 2 ½ - 3 hours running on a fully charged Power Pack.

TROUBLESHOOTING

WHAT TO DO WHEN THE GYRO WON'T RUN:

Always be sure battery is fully charged!

1. If possible, check the battery voltage. Volt meter should read 12-14 volts, no load on 20 volt setting, under 10.5 volts will ruin battery if operating gyro. If you can't test battery, go to step 2.
2. Plug battery pigtail or other DC source into the inverter and turn on. It should make a low buzzing sound. LED light should be green. If the LED light is orange or red, you are at about 10.5 volts or under.

DO NOT RUN GYRO! Charge battery.

3. If the LED light does not light up at all, yet the inverter still makes the low buzzing sound, you can still use the inverter, but you will not know when your power is running out. You should return inverter to the factory for repair as soon as possible. This is an inexpensive repair with a quick turnaround.

If the inverter makes a noise go directly to the next step 4: If no noise comes out of the inverter, first check the continuity of the battery cable.

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Sometimes there is a stress break inside the cord that cannot be seen on the outside. If defective, replace. Send back to the factory for cord replacement or you may contact us to purchase a new cord if you want to do it yourself, but you will need to have the ability to solder and must be careful or YOU WILL GET HURT. If the cord is okay, do the following:

Check the fuse located in fuse holder on side of inverter (a 2 amp fuse for the KS-4 inverter and a 3 amp fuse for the KS-6 inverter. Duals require 6 amp and quads require 15 amp.). Remove old fuse and replace if necessary. If after replacing the fuse and the inverter still does not operate, check all connections one last time and return to factory. If you open the inverter up, look for wires that may have become disconnected or melted. **Be very careful not to scratch the large wound toroid, this will cause a short, making the inverter inoperable and the toroid will need replacing. This is the heart of the inverter and the most expensive component, so check for any nicks in the wires.**

If there is a pungent, bad smell, you have toasted a transistor and both transistors will need replacing. Sometimes the whole circuit board will need replacing if the resistors look burnt.

4.) Plug in the gyro cord. If the inverter is working and the gyro still does not start, wiggle the gyro cord (possible broken wire sometimes you cannot see the problem). Check cord by removing the four 2-56 flat

head screws from the gyro name-plate, exposing the connections*****Do not touch the copper tube***** (it looks like a ground wire, but it is actually a copper tube that if cut or broken will release the helium from within the gyro. It usually has a bit of solder on it to seal the helium in the gyro. If the helium is released from the gyro, the gyro will run about half speed). Remove the gyro coil cord by unsoldering the connections and test each lead with an ohm meter.

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Very Important!

When soldering or unsoldering gyro cord from the gyro, do not apply too much heat to the pins. Just enough to do the job. They are glued into the frame and too much heat can compromise the glue and release the helium inside. Also, keep the cord wires soldered near the top of the pins, not at the bottom. It does not matter if you switch the wires when resoldering, they are putting out AC current.

Test the wires in this order:

Connector pin holes are numbered 1,2 & 3.

Connector is grounded and the frame has a grounding lug attached under the nameplate. Wires should be soldered securely.

- 1) white to pin #1
- 2) black to pin #2
- 3) black to pin #1

There should be continuity for the first two and none for the last--if there is a reading on # 3, there is a short in the cord. Shake or wiggle the cord during testing.

NOTE: Check for solder around the pins hanging down onto the frame, this can cause a short. Or if there is a suspected internal short, return to factory for repair.

Running the Gyro from alternative 12, 14 or 28 volt sources:
IE: Car, boat or aircraft

1. The inverter must be for either 12 volt DC system or a 14 or 28 volt system. For example: a KI-12-4 translates to a Kenyon Inverter for a 12 volt power source for a KS-2 or KS-4 Gyro, A KI-28-6 translates to a Kenyon Inverter for a 28 volt power source for a KS-6/8 Gyro. Do not mix them up or you will damage inverter.
2. If you are using a cigarette cord adapter you need only plug the inverter to your DC source using the adapter end--it is properly polarized already.
3. If you are using an open- ended cord from a 12 volt battery (car or boat) **note that the white wire is always positive** and it is soldered into pin #4 on the inverter end. Yes, there are tiny numbers located on the face of the 4 pin XLR connector. **Do not reverse polarity.** If you use the black wire on the positive terminal of the battery it will blow the inverter's fuse and perhaps fry a transistor.

4. If you are using your own connectors to receive power from your 12, 14 or 28 volt airplane--take great care and know that the white wire is positive and the black wire is ground.

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NOTES:

The battery is shipped in a fully charged condition. It is recommended that an initial charge till the green light comes on be added before putting the battery in service to assure full capacity.

Always store the battery fully charged. A discharged battery can be damaged if stored in that condition longer than 48 hours. A fully charged battery may be stored at room temperature (68° , 20° C) for 16 months or about 10 months at 86° Fahrenheit, 30° C. Store battery preferably at 70° F or below -- avoid storage at temperatures above 100° F.

REMEMBER, WHEN RUNNING OFF EXTERNAL 12/28 VOLT SOURCE, DON'T CROSS THE WIRES!

*****SPECIAL NOTE*****

In order to use the battery for longer than the usual running time, one can cycle the battery, i.e. Run the unit up to speed, use it for a bit, then turn the inverter off-- using the now coasting gyro for up to 7+ minutes still utilizing its stabilizing capabilities and when it seems to weaken, turn the inverter back on to bring the unit back up to full speed. One can hear the unit level off at it's maximum 21,000 RPM. The battery power needed to get the unit back up to speed is much less than from a dead start-- and by such cycling can increase the battery's use for the day. OR, you may start the gyro up using the cigarette adapter cord and plug into your car's 12 volt receptacle to get it up to speed before plugging into your battery pack

supplied with the kit.

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KS-2 & KS-4
with Attached Inverter



The KS-2 & KS-4 with attached inverters are ideal for using in remote control applications or where space and weight is an issue. With the inverter attached, you eliminate the bulk of the gyro cord that would normally plug into the inverter and would use the red and black wires coming out of the inverter to attach directly to your battery or other power source. It is important to note that RED is POSITIVE and BLACK is NEGATIVE in this application.

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The inverter itself is 2 1/4" x 2 1/4" x 2 1/4" and only adds less than a half of a pound of weight to the gyro. Although we sell them without a battery, we can provide a battery on request. You would have the option of having a straight cord with 4 pin male XLR connector (any length up to 11 feet, you make that choice) or a 24" retractable coil cord with same connector that will stretch to approximately 9 feet. OR - either cord choice from above with a cigarette adapter plug in place of the XLR connector to plug directly into a 12 volt power source such as a car, boat or aircraft.

NEW
12 & 28 volt KWIK START Inverters

The new dual output Kwik Start inverters are designed to get two gyros up to full running speed in about 9 minutes, (approximately 5 minutes for one gyro). This is about half the time it takes for our regular inverters to provide the same speed.

Start up sequence:

- 1) LED glows amber**
- 2) 4 second diagnostic- 2 seconds high speed then 2 seconds low speed**
- 3) LED glows green**
- 4) Normal cycle begins**
- 5) High speed for approximately 9 minutes or until inverter senses gyros are up to full running speed and then switches to low speed.**

The battery is sampled every 10 seconds

Green = voltage is good

**Red = voltage falls below 10.6 volts for the 12v inverter
falls below 22 volts for the 28v inverter**