

# The Bike Tour Survival Guide for Hams

By Lee Besing, N5NTG

info@SanAntonioHams.org



This simple guide is intended to provide some serious, but sometimes humorous guides for the ham radio operator who works large events like the long distance bicycle tours. Examples of these tours in my area would include the Valero Bike to the Beach (formerly called MS150) in October, the BPMS150 Houston to Austin in April, the Wildflower 100 in April, the La Vernia Wild West Hammerfest in September, or the American Diabetes Association's Tour de Cure in May.

The larger, more organized events have SAG Vans, Break Points (or rest stops) plus a Start / Finish line. This guide will focus on what ham radio operators typically will be doing, not how to organize one of these events per se.

## Points To Help You To Be Better Prepared And Self Sufficient:

- **Bring your own water or soft drinks** with you, plus light snacks. If the event is lasting all day, ask about food being provided so that you won't get a hungry surprise when no lunch shows up. Note: You might be able to get ice, water and some snacks if stationed at a break point, or visiting one in your SAG, especially toward the end when the break point shuts down. See more about this later.
- **Bring sunscreen.** Yes, even ham radio operators can get sunburned while talking on the radio under a tarp at a Break Point, or even while driving a SAG van.
- **Carry a backpack or fanny pack.** If your assignment is not at a fixed location, or in a assigned vehicle, you won't be able to tote around a suitcase or cooler with your stuff.
- **Bring extra H/T batteries AND a spare radio / antenna** if available. I promise you that finding a wall recharger or replacement radio gear in the middle of a 150 mile bicycle tour isn't as easy or convenient as you might think.
- **Bring some spare cash** to cover supplies you forgot to bring, buy food if you get hungry, or sunscreen, if you forgot that you were not immune to being sunburned. Don't expect to always find a working and convenient ATM machine around every corner when you need one.
- **GPS for SAG drivers** might be convenient, but not required.
- **Dual Band / Dual VFO radios are recommended.** The ability to listen to two 2-meter frequencies, or combination VHF/UHF frequencies at the same time is almost a must! The Kenwood DM-700 is an example of such a radio. You may wish to be on the Net Frequency, but also keep the SAG simplex frequency on, without running 2 radios.
- **High Gain Antennas preferred for better signal.** We're going to be out in the middle of no-man's land, and repeaters are being stretched to their limit in some cases. Having a good antenna will make the difference. If running base, get the antenna up in the air on a mast.

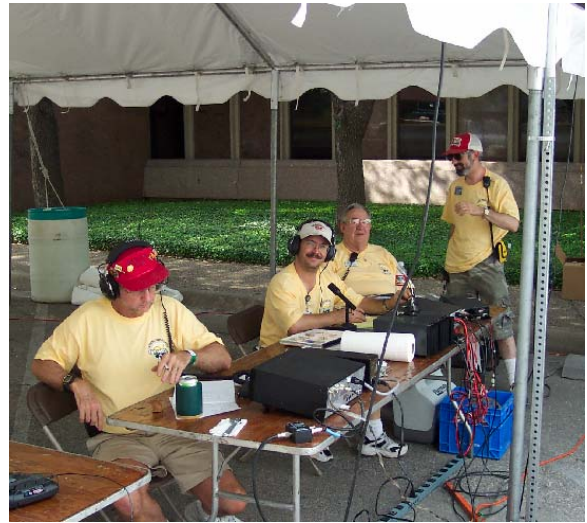
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## Net Control Station

The Net Control Station for this type event will typically be set up at the Finish Line or one of the Break Points. If you are working As the Net Control Station (NCS), be prepared for long term operations with battery backup available in case of power failure. Head sets are good to have, especially if you are in a high noise environment, or near other folks who you might not want to hear all that goes on the radio. If you are running multiple radios, with multiple operators as show in the photo here, you must have head sets to cut down on the noise between radios.

*(Photo of hams at the Austin Finish line for 2007 BPMS150)*

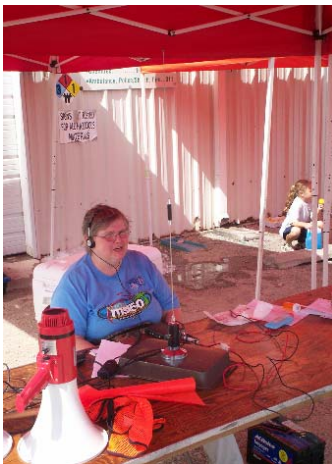


Not all locations have AC power, so sometimes NCS will operate using a generator or out of the ham's vehicle using battery power. Don't forget to check the gas gauge or restart your vehicle's engine to recharge the battery every couple of hours, or you might not be leaving after the last rider does. Check out the planned area ahead of time; bring your own pop-up awning / tarp, table and chairs as needed.

You should plan on using a base station style antenna, or one of the W2IK type antennas, aka field day style, if you are very far away from the repeater being used. Multiple repeaters used? Better plan on having a radio with dual channel capabilities, or use multiple radios. And don't try to run a complex NCS operation by yourself without having one or more backup operators available for relief or when it gets really busy.

## BREAK POINT OPERATORS / REST STOPS

This assignment is one of the easier ones to handle, and possibly one of the less exciting ones. You set up before the event starts, and shut down after the last rider has cleared your break point. You may, or may not have commercial AC power, so plan on using battery power from your vehicle. Typical communications will be regarding the need for riders to be picked up by a SAG, medical emergencies requiring assistance (like an ambulance or other medical support), or supplies needed (water, ice, medical, etc.). This guide has included several photos showing operators set up under different conditions, so be flexible in how you can set up.



*(left, photo of KC5QPQ at Valero Bike to the Beach break point taken in 2007. Right, photo of W5QQ during the 2008 BPMS150 event)*

**Contact your Break Point Captain upon arrival.** When you get to your assigned location, you need to do three things, find your Break Point Captain so they know who you are, figure out the best place to set up your station (and then don't plan on moving for awhile), and find out where the port-potties are so you are not in the wind path. Most hams prefer to set up near the bike repair and medical tent area, since those are the two most common areas for riders to gather. Depending on the layout of your site, you might be better setting up near the edge where the designated SAG Stop might be.



**Expecting Windy Weather?** Secure your antenna poles and pop-up awnings so that a gust of wind won't blow them over. During the 2008 BPMS150, W5QQ found out the hard way when his SAG Stop Awning (not his radio station setup) blew over in a gust of wind, almost clipping a rider on the way down. He had his radio gear secured (blue tarp in background of photo), but the SAG Stop pop-up awning was just sitting on pavement and that huge sign caught the wind after it gusted over 40mph. Be prepared to secure your tarp / awning to prevent this from happening to your station.

## SHADOW OPERATORS

A Shadow Operator is Ham Radio operator who follows an event official around. Usually this is someone in the function of the Race / Tour Director, Medical Director, Supply / Logistics Director, etc. Some events, like the San Antonio Marathon, will have shadows assigned to additional functions, and others have less. Shadows should wear comfortable shoes and be prepared to chase their designated official all over the place. Having a clip board or notepad to take notes is mandatory. Having a headset to listen / talk on radio so that the radio traffic doesn't interfere with the official's business.

I've seen some hams during the San Antonio Marathon wearing vests with pockets, or a small backpack, with their extra batteries and other supplies. One shadow during that event had to ride a bicycle to keep up with his designated official cause the guy would not stay long in one area for any reason.



**Pre-program your radios before the event.** You probably won't have time to reprogram your radios during the event, unless there is a last minute frequency change, and you will look more professional to your event official if you already have the needed frequencies on hand.

In some cases, the official will request that you let them listen to the radio direct, saving you the need to repeat what is happening. Expect during pending emergencies, such as calling for Life Flight or other medical emergencies, for your Official to request to listen direct. With some of the events, such as the Valero Bike to the Beach, the official may have a designated vehicle to ride in, so the shadow should be ready to install a mobile radio w/ magnetic mount antenna, plus carry an HT with extra batteries.



Depending on which event official your assignment is to shadow, you will either be extremely busy, extremely bored, or someplace in between. The good news is that shadows for event officials usually have access to water, snacks, and areas of the event that most participants might not get entrance into.

## SAG VAN DRIVER / NAVIGATOR

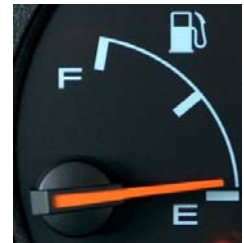
Driving or riding in a SAG Van is a common function at the larger events. This assignment has some serious duties that other positions may not have, and might require you to spend money out of your pocket for fuel. You have to drive in/out of crowded areas where riders will literally drop their bikes in front or behind your van. You will share a crowded road with other traffic, and thousands of riders. You will be looking over your shoulder to know who is coming up behind or beside you, and you can't get spooked by having a patrol car pacing you with their red lights on, or being waved thru a red light by a uniformed police officer.



But it has the side benefit of you keeping busy most of the time, meeting riders, helping out very grateful riders found on the side of the road or needing a lift to the next break point. You have the flexibility of being able to stop at a fast food joint for a quick bite, and to carry a fully stocked cooler with you, plus having room for more personal gear than some other assignments might offer. If you are on a two-day event, you will need more personal gear than a partial or one-day event might require.

### Plan On Buying Fuel

Most events that rent SAG vans for us to drive, or ask you to drive your own vehicle with a bike rack on the back, will reimburse your fuel expense. If you don't know for sure, ask before you agree to accept this assignment. My first time I was a SAG driver, nobody told me that I needed to pay for my own gas and then wait a few weeks for reimbursement, and that was before gas prices went up. Key work here is "reimburse", which means you should plan on bringing some extra cash or credit card to buy gas with. The larger 15 passenger vans typically get 12-15mpg and most drivers will run up 600-800 miles in one weekend, while driving a 150 mile bicycle event. SAG drivers averaged \$125-\$175 during the 2007 Valero Bike to the Beach event, and fuel prices have skyrocketed since then. During the 2008 BPMS150 event, I used nearly \$200 in fuel, but I did have to drive to Houston the night before from San Antonio, and that cost \$55 alone in fuel just to get to Houston.



*"The BPMS150 has usually designated one or more fuel stations along the route in Houston and La Grange, so you can refill your marked vehicle (more on that later) wearing your official t-shirt, and simply sign for the fuel. But sometimes you won't be able to time the refills to match up with the availability of "free gas", so plan on spending your own \$\$ even on this event. Other events are thinking about adopting this method, but weren't doing it as of date of this article."*

### Radios & Antennas

You should try to use a dual band, dual channel, VHF/UHF amateur mobile radio with a high gain magnetic antenna on the roof. Some events use more than one radio frequency, such as simplex channel for SAG to Break Point, or SAG to SAG, and reserving the repeater(s) for Net or Medical operations. Mobile radios are recommended since H/T's are not usually dependable when you are operating further away from the repeater than you normally do when in town.

**Dual Band / Dual VFO radios are recommended.** The ability to listen to two 2-meter frequencies, or combination VHF/UHF frequencies at the same time is almost a must! The Kenwood DM-700 is an example of such a radio. You may wish to be on the Net Frequency, but also keep the SAG simplex frequency on, without running 2 radios. Some SAG drivers have been known to run 2 or 3 radios, but let their Ham Navigator handle the radio traffic while they concentrated on the vehicle and bicycle traffic.

**High Gain Antenna is preferred for better signal.** We're going to be out in the middle of no-man's land, and repeaters are being stretched to their limit in some cases. Having a good antenna will make the difference. If running base, get the antenna up in the air on a mast. Bring a spare in case you lose one, or another ham needs one half way thru the course.

Use a step ladder so you can get up to the roof with your antenna and light bar (if you have one) and don't scratch the roof! I tend to bring my own with me, carried inside the SAG van, as do a few others, so you probably won't need to bring your own on the course, but you will need one to set up your antennas, etc., and to take them down.

Run the coax and power lines thru the side window, not the door that the riders will be using! Put up an extra antenna just in case you "lose" one during the ride. Separate your APRS antenna by putting it at the other end of the van from your normal 2-meter antenna. Remember those vans are really tall, so don't put a really long antenna up there without a good strong magnetic mount, and then don't drive under any low hanging awnings at the fast food joint or gas station.

Put the light bar in the center or toward the back, cause it's more important that someone coming up behind your slower moving vehicle sees your light, than it is for riders ahead of you to see it.



Most vans have multiple cigarette lighters for power sources, but most hams have found using a mobile radio on more than low power will blow the fuse, and then you are off the air. Therefore, most of us who do this each year, will run 10-12 gauge power cords direct from the battery, thru the door or inside thru the engine compartment. I've built a power cord set with big clamps on the battery end, fuses in-line, and Anderson power pole connectors on the other end. Then I plug that into an adapter that lets me plug in multiple radios / lights using Anderson power pole connectors (standard connector used by ARES / REACT operators).

## Decorate!

One of my pet peeves during these events, when you have dozens of identical white vans running up and down the highway, is knowing which SAG van is which. And the riders have problems when they leave belongings (like their helmet or cell phone) behind, and then say "I left it in that white van."

*(Photo of multiple SAGs for the Valero Bike to the Beach)*



During one of the first BPMS150 (Houston – Austin) rides I drove a SAG for, one of the hams parked his van at the Addick Park & Ride at 5am, walked over to get his packet of "signs and stuff", turned around to go back to his van, but all of a sudden where there had been just his van, now there was 20 identical white vans. And of course, he had left his keys in the van, so he had to go down the line looking for the one that had his stuff sitting in the back. This is one of the reasons I decorate my SAG the night before. The other reason is that you sometimes get moisture on the glass from the morning dew that early, and you can't write on the glass (see examples below) unless you dry it off first.

## The solution? Decorate your SAG!

There are several accepted ways of doing this.

- Print paper signs on your computer and tape to the windows. Be careful what tape you use, cause some will leave sticky residue (like duct tape) and others won't stick if it rains.
- Use vinyl stick-on numbers at least 10" high.
- Use white shoe polish to write on the windows (Don't write on the paint!). Use the "KIWI Scuff Cover" white shoe polish (available in 2.5oz squeeze bottle shown at right), not the "whitener", available from any department store for a few bucks. Keep a paper towel handy to erase mistakes. This can be easily removed after the event by visiting a self-serve carwash, or by simply pouring water on the window and using a paper towel to wipe off.
- Use color Glass Markers available from Wal-Mart or your local Hobby Supply store. One Internet source found was <http://www.dickblick.com/zz213/01/> Be sure NOT to use Permanent Markers, or you might get charged for the "repair" afterward.
- Put a Mascot in your front window, but don't block your view. See photos below from the 2008 BPMS150 showing 2 mascots.



*Decorated SAG Vans from the 2008 BPMS150*



## Motorcycle Marshals



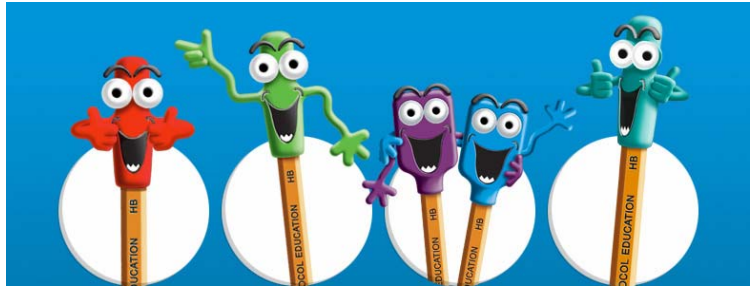
The Motorcycle Marshals play a very important role to improve rider safety by being able to maneuver thru traffic, provide minor road side bicycle repairs, and rapidly respond to trouble calls. In recent years, more of the M&M's have obtained their ham radio licenses, which in turn, has increased their ability to interface with Net Control and SAG vans.

(Top photo of Marshals waiting to hit the road, the morning of 2007 Day 2 during the Valero Bike to the Beach. Photo at right, a Marshal staged in La Grange for the Day 2 start on the 2008 BPMS150 event.)



## RADIO NET PROTOCOL TIPS

Here is a list of our favorite tips for operating on a Radio Net.



- **Always call Net Control first** while a net is in operation. Ask permission before calling another station on the net frequency.
- **Always use ONLY your tactical call** when calling net control station (NCS), but remember to use your personal call sign when finished.
- **Don't use your personal call sign** when initiating or first responding to a call from NCS, **but DO use it when finished.**
- **Listen to the instructions of Net Control.** They may want things done differently than what he put on this list.
- **Don't "quick-key".** Leave a pause in between when the other station un-keys and you key up.
- **Don't think out loud on the air.** Engage brain before engaging your microphone.
- **Be mindful that other radio operators are not the only ones listening** to you speak on the air. SAG Passengers and MS Staff can hear you too. Save the complaints and insults for one-on-one conversations in private.
- **Do give Rider #'s** when requesting or reporting action, to avoid duplication in reports. We've had times when multiple reports come over the radio for similar situations, but the location is slightly different. This item may vary by event, so ask Net Control for instructions first.
- **Don't give Rider Names** over the air. Respect their privacy. If names are needed, use a cell phone or other more secured method of communications than over the ham radio.
- **Know where repeater coverage changes** from one frequency to another, and notify NCS on the old repeater that you are leaving, and notify the NCS on the new repeater that you have switched over.
- **Notify NCS when you are taking a break,** or will be away from the radio for a time. If you're just popping out to load a rider in your SAG, that isn't as important as a BP operator who won't be available for more than a few minutes.
- **Anticipate the needs of your Break Point** re supplies or riders to be picked up. If you hear NCS asking each BP for specific information (like level of supplies or number of riders), start collecting that info ASAP instead of making NCS repeat the question for you.



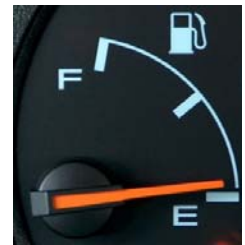
## SAG Driver Tricks & Tips

- **Reset your Trip Mileage Counter when you leave a Break Point.** This lets you know exactly how far you are from a BP when someone calls in a need for picking up someone on the side of the road. It's easier to say you are 3.4 miles past Break Point 3, than it is to say you are between BP3 and BP4 next to a field with wildflowers and 2 horses in it. Obviously if you are the SAG driver that likes to flip back and forth, never making it to a BP, you can't use this method.



- **Use your GPS.** During the 2008 BPMS150, one of the Motor Marshalls gave his GPS coordinates during a medical call for Life Flight services, thus enabling the chopper to arrive exactly at the correct location along the highway.

- **Watch your gas gauge** and refill if you get below 1/4 tank. Remember that gas stations out in the middle of nowhere will be more rare, and thus more expensive, to obtain fuel. Fill up before you leave town, fill up at the end of Day 1, and fill up as needed on Day 2 before turning rental van. Watch the rental contract carefully to see what you need to do regarding refilling fuel. Some places say "match what went out" (i.e. if half tank going out, need half tank returning), others say "must have 1/4 tank minimum when returning", so there is no reason to over fill the tank in these cases. Remember "reimburse" means spend now, get paid back later.



- **Alternate Bike Handlebar direction when loading in rear of SAG van.** Use bungee cords to secure bikes so they don't fall over and "get friendly" with the other bikes, or get damaged. Keep your personal gear over to the side, or up front under the bench seats. The San Antonio based events normally remove 2 of the 4 bench seats from the rear of the SAG van. Enterprise Rental does not like to store more than 1 of those seats, so you might have to find a place at home to store the 2nd seat. CAPP Rental will normally store the seats for you. Houston BPMS150 likes to remove 3 rows of seats, leaving only a single bench to seat 3 riders, but I personally prefer to be able to seat up to 6 riders with seat belts safely, while being able to carry their bikes in the back. (Yellow tool box in photo is actually an APRS unit) Tandem or recumbent bikes take different treatment when loading, and you won't be able to carry as many bikes at the same time if one of these bikes gets picked up by your SAG.



- **Carry some basic bike tools with you.** If you feel mechanically inclined, or simply want to offer the tools to the riders who know how to make most minor repairs themselves, bring some simple tools, such as various sized Allen wrenches, Crescent wrench, screw drivers, bicycle pump (with adapter for the newer skinny connectors) able to hit the 110psi pressure needed, etc.

- **Arrange your radios securely on the front dash, or center console, where the driver / navigator can easily see the displays.** Double faced tape has been used, but you should be careful about tape residue. One of the operators (Mehgan, KE5KDR) mounted her radios to a board, and set the board w/ radios up on the front dash. (Photo of KE5KDR with her radios, riding as navigator for her father)



- **Bring a medium sized cooler,** stock up with ice and bottled water, etc. Sometimes you can scrounge these supplies or refills from the break points, especially if you arrive just as one is closing down. Don't be bashful about asking a BP volunteer for "donations", after all your riders need this stuff. Carry some snacks with you for your riders and you will be very popular with them. And yes, you can usually keep the leftovers to take home with you.

- **Watch the A/C air temperature in the back of your SAG van.** Hot tired riders won't want it as cold as a meat locker in the back, or they might have temperature shock. Ask the riders how the temperature is for them, and adjust the rear controls as needed.

- **Drive Slow & Carefully.** What's your hurry anyway? Riders aren't going anywhere very fast, and you can't shut down for the day until all the riders clear the finish line. Keep an eye on the side and rear mirrors and **let your navigator handle the riders getting loaded** while on side of the road. Riders will usually help load your van, or help load other rider's bicycles into your van by holding the end nearest the seats.



- **Observe the speed limit and law enforcement directions** from uniformed law enforcement officers at traffic intersections. You are responsible for any traffic tickets or accidents that happen while you are driving the SAG van, but the sponsor's insurance will cover the accidents, not yours.
- **Don't pull too far off the road,** especially if it rained recently or you might get stuck in the mud.

- **Never backup into traffic, or while on side of the highway.** Other drivers' experience proves that you won't always see some obstacle, such as a traffic sign or mailbox. Let the rider come to you, or send your navigator go help them.

- **Don't stop in the way of the riders.** When you pull over on the side of the road to load riders, pull off the road safely where you can, but don't stop in front of a pack of riders or they might run into your van.

- **Don't drive too close to the rider in front of you.** They like to pretend they are all alone on the road.

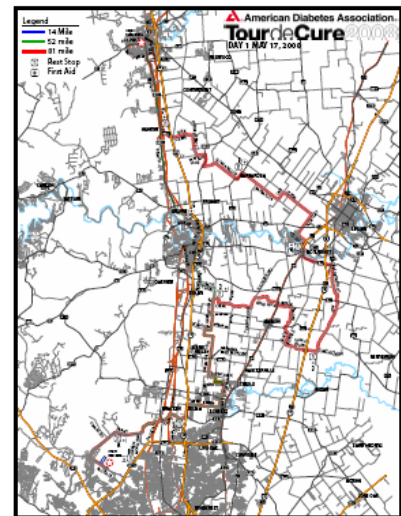
- **Look before opening your side doors.** Don't open your driver door when a rider is zipping up next to your van.

- **Control your rear doors when open.** Wind from passing vehicles can cause your rear doors to slam shut unexpectedly, or



swing wide open, causing danger to you, your riders, or passing riders. During one BPMS150, a door slammed wide open while another SAG van was maneuvering around it. Body damage resulted to both vans.

- **Use insect repellent spray on your shoes and socks**, especially for your navigator, and then watch carefully to keep from stepping in any obvious ant hills. Ants like to be tracked into the van from the bikes or shoes, and you really don't want to find them climbing up your leg after you started driving once more.
- **Use Suntan Lotion.** Just because you are riding inside a SAG Van, doesn't mean you won't get burnt. Wear suntan lotion especially on your arms and face. Your arm next to the window will be likely to be sun burned.
- **Use your Amber Flashing Light & Flashers.** Amber lights are optional, but when used you ought to mount them in the center or near the back of the roof of your SAG van. Drivers too near won't be able to see it flashing up on top if it is at the front of your van. It's more important that drivers BEHIND you see it, than for drivers in front of you to see it. Don't leave it running very long if the motor isn't running, or you might end up with a dead battery. Keep your 4-way flashers blinking while moving or parked on side of road. Turn off blinkers when van is sitting at BP unattended.
- **Bring Your Cell Phone Charger.** Got one of those 12 volt auto charger adapters for your cell phone? Bring it with you because if you move off network into "roam mode", your battery life will shorten and you might want that cell phone option at some time.
- **Flat Tires?** It's usually faster to change your own flat tire, or call on the radio for help from other SAG drivers, than it is to wait for the Rental Company's road service when you are out in the middle of nowhere. You did reset the trip odometer when you left that last BP so you can describe where you are, didn't you?
- **Keep your SAG van keys with you.** Don't get out of the SAG van without taking your keys with you. Riders loading into or out of a van have been known to accidentally lock the doors, and that can be rather embarrassing to have to flag down help because you can't get to your radios. Lock your SAG van when you leave it unattended, or your radio equipment might accidentally grow legs by itself.
- **Plan Ahead.** Before you head out for your first SAG driver experience, spend some time on the Internet downloading and printing out the maps or course instructions for the route. Most events will provide the t-shirt(s) and maps in advance of the event. Some events provide wrist bands to enable you to get free meals during the event. Bring some extra cash just in case you can't find an ATM machine or the store won't take your credit card.
- **Volunteer Forms / Paperwork.** Complete your paperwork before the event. Make a photo copy of your drivers license and vehicle insurance card (to prove you are insurable). The sponsor's insurance will cover your driving, not your own, but you need to provide a copy in most cases.
- **Wear the event's t-shirt & wrist band** during the event to identify you as an official volunteer so that you can get into restricted areas and get your meals provided. You might not want the food provided, so be prepared to "eat out".



- **Opportunity to Socialize with other Hams.** Most all of the events will have a group of the hams, SAG drivers, BP operators, get together at an area restaurant for food and refreshments each evening, or even breakfast on Day 2.
- **Get Some Sleep** the night before, and after Day 1, cause you don't want to be the tired driver with delayed response times around all these riders and moving vehicles.
- **Make Your Hotel Arrangements Early.** Verify with other hams what the usual arrangements might be for over night. It



varies by event sponsor. Houston will put out of town Hams up at the Crowne Plaza hotel on Friday, and the Camp Lone Star cabins on Saturday. Tour de Cure will put Hams up in the Texas State University's Dorm Rooms, 2 persons per room. Other events may require you to make your own arrangements, and pay for your own arrangements. See if you can arrange to share a room to cut costs. Some SAG drivers for the Valero Bike to the Beach will drive to another town (away from the overnight city) due to extremely high hotel costs, or even drive back to San Antonio over night. Don't be afraid to ask another ham for advice.

- **Don't Forget to Conga!** Huh, you ask what's that? It has been a tradition for all of the SAG vans, Motorcycle Marshalls, Ambulances, Police vehicles and the Turtle at the end, to line up near the finish line, and then follow the last rider thru the finish line. This is not mandatory, but it is fun. And if you are still around (not released early) at the finish line on DAY 2, feel free to jump on it. We usually try to line up the vans numerically, but with the Turtle at the end where it belongs.



## Common Terms / aka Alphabet Soup

- **SAG** – I've heard different definitions for these three letters "Support and Gear", "Special Assistance Group", etc. But basically the SAG van will pick up riders along the route or at break points to transport them further up the road where they can get their bike repaired, get some food or rest, etc.
- **Turtle** – A Turtle is the tactical call sign for the last SAG van bringing up the rear behind the slowest rider. Typically the Turtle will also be running APRS so that it can be tracked more easily than asking them on the radio every 5 minute for a location report.
- **Conga** – Celebration at end of tour where the SAG vans, Motorcycle Marshals, Police and other vehicles follow the last rider into the Finish Line.
- **Break Point** – Another name for Rest Stop. Usually set up along the route about every 10 miles or so, depending upon terrain and availability of suitable facilities to set up the tents and porta-potties.
- **Porta-Potties** – If you don't know what these items are, well, you aren't missing much unless you need to use them. If you are setting up to operate your ham radio at a Break Point, make sure you are up wind from these puppies, or you may strongly regret it later.
- **Butt Butter** – Vaseline or similar item for the riders to rub on chapped areas of their anatomy.
- **BioFreeze** – Special muscle relaxing ointment that riders use rubber gloves to apply to their body. Gloves used because it would otherwise be absorbed into the skin of their hands..

