MOBILE TRACKING EQUIPMENT or "Bumper Beepers".....by The Mad Phone-man
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You remember the little "bug" installed on the bad guys car in the James Bond flicks that allowed Bond to follow the car from a distance? Well this file is a tutorial on them.

First, they do exist, I've built my own, but even the best commercial units intended for law enforcement purposes wont do what the Bond model purports to do, that is, give a printout on a moving map showing the route driven by the bug toter.

The basics of the unit are the transmitter, which is about the size of a pack of cigarettes and is held on via a magnet. And a receiver, using 2 identical antennas, coupled to a center zero meter which gives a heading towards the transmitter. More on these later.

The receiver/display unit is used by pilots, amateur radio operators, and law enforcement and security personnel to track the movements of the transmitter
usually at short ranges, the civil air patrol uses these units to find downed aircraft by tracking the emergency beacon, activated by the impact of the crash. Amateurs play "hunt the fox" to keep illegal transmitters out of the ham bands. Law enforcement personnel track the movement of people, drugs, and weapons by attaching a transmitter to the object (or suspect's car) to be followed.

The transmitter is usually a small VHF or UHF battery operated package dangling a 19" flexible antenna (about the thickness of piano wire). The transmitter does not "beep" per say, but transmits a continual carrier. The FBI uses 167.xxx mhz for theirs and the local DA uses the intercounty police freq of 155.37. I have seen military models that use 149.xxx mhz around here (air force).

Now the receiver:
Two identical antennas mounted on the chase vehicle (usually magnetic mounts) feed a pair of PIN diodes that feed a phase detector which samples the receiver's IF output. When the received signal is directly in front of you, signals arrive at exactly the same time at each antenna. This is calibrated to read center 0 on the meter. (Incidentally the unit can't tell if the signal is in front or in back of you, so the need to make sure you follow the subject reasonably closely is apparent). If the bug travels say to 10 o'clock on the compass rose, the needle will swing to 4 o'clock on the meter. The object here is to always drive towards zero and you follow the bug in the most direct direction. With a little practice,you can follow a subject on an adjcent street without loosing him.
The meter swings because the signal arrives later at one antenna than the

other, causing a voltage change in the phase detector (an Exar Radio-teletype decoder chip in my model).

Some recent units ive seen have Light emitting diodes in a 360 degree circle and use 4 antennas. This gives you full circle detection capabilitys as the phase between pairs of antennas is calculated also.

Now, prevention:
The easiest way to detect if you've been planted with one of these little transmitters, is to walk around the car or whatever with a portable frequency counter and check for an alien RF signal. This is also the recommended method to de-bug your home. A small freq counter with 1.2 ghz capabilitys sells for around $100. today. If you do find a transmitter, have fun with it. Stick it on a train heading out of town, a Greyhound bus, or a over the road tractor-trailer rig....my favorite is to stick it on one of their own vehicles and watch them chase themselves....hehehe.