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HOW TO CREATE YOUR OWN ROADSIDE EMERGENCY KIT

Have you ever been in this scenario? It's 11:00 p.m.; you're driving on a lone country road that's dark and desolate. You know in an instant that something's wrong. Controlling the vehicle becomes increasingly difficult and you ease the car to the side of the road. Getting out, you see that the left rear tire is flat and you're already running on your spare.

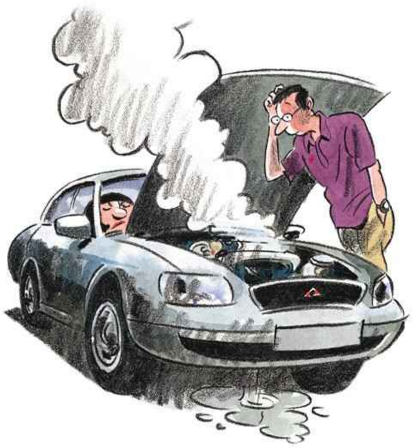
If you're lucky to have an account with the Auto Club and your cellular phone works, or are driving with OnStar, help is only a phone call away. If not, you're either faced with having to hail a passing motorist or spend a night in the boonies. That is, unless you have a well-stocked emergency roadside kit in the trunk of your car.

When it comes to commuting or traveling any lengthy distance, a roadside emergency kit can mean the difference between getting back on the road or being stuck for a long period of time. A roadside emergency kit is the one item that every vehicle should have; yet most of us never carry any of the basic items to help you get back on the road quickly and safely.

Some of the basic items include:

- 12-foot jumper cables
- Four 15-minute roadside flares
- Two quarts of oil
- Gallon of antifreeze
- First aid kit (including an assortment of bandages, gauze, adhesive tape, antiseptic cream, instant ice and heat compresses, scissors and aspirin)
- Blanket
- Extra fuses
- Flashlight and extra batteries
- Flat head screwdrivers
- Phillips head screwdrivers
- Pliers
- Vise Grips
- Adjustable wrench
- Tire inflator (such as a Fix-A-Flat)

- Tire pressure gauge
- Rags
- Roll of paper towels
- Roll of duct tape
- Spray bottle with washer fluid



- Pocketknife
- Ice scraper
- Pen and paper
- Help sign
- Granola or energy bars
- Bottled water
- and heavy-duty nylon bag to carry it all in.

Granted, all these items practically necessitate a Ford Excursion to haul them down the road, but a basic version with two roadside flares, a quart of oil, small first aid kit, extra fuses, flashlight, Leatherman Tool (or any other multipurpose tool commonly containing pliers, wire cutters, knife, saw, bottle opener, screwdrivers, files and an awl), tire inflator, rags, pocket knife, pen and paper and a help sign will take up a minimal amount of trunk space.

A few companies offer pre-assembled emergency roadside kits, ranging from RightTrak's 58-piece Deluxe Auto Safety Kit ($24.00) to the 78-piece Auto First Aid Kit from Home First Aid ($39.95). While these kits contain the basics in a small convenient carrier, you might want to augment yours with a few of the items listed above to suit your needs.

Before you actually use your kit in an emergency situation, take some time to familiarize yourself with the items you've collected and how to use them properly. Also remember that the most important item is your own good judgment - stopping to change a tire in the high-speed lane is only an accident waiting to happen.

Unfortunately, there isn't "one tool for all roadside emergency needs." But with a little planning and a smidgen of trunk space, an emergency roadside kit can often save the day.

CROSSED SIGNALS

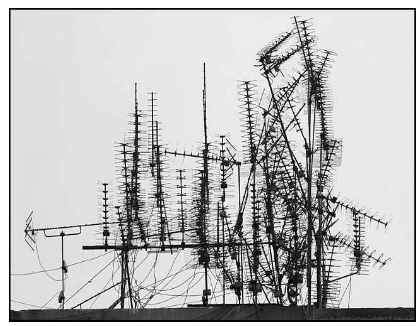
Informational Purposes Only!

December 9, 2010: Recently residents of Bremerton, Washington State (northwest U.S.) were warned they may have problems with wireless electronics (especially garage door openers and keyless care remotes) as the U.S. Navy tests electronic systems on the carrier USS Stennis. The ship has undergone some refurbishment recently at a Bremerton shipyard, and the electronic systems need some testing before the ship puts to sea. This is not a new problem, which is why the navy put out a warning this time. Six months ago, the U.S. held naval exercises off Hawaii. But first, many of the ships involved tested electronics while docked, before going to sea. That's when all the reports came in about garage door openers in

USS John C. Stennis

the area not working. It was interference from the military electronics. But no prior warning was put out. Someone should have known better. Even new civilian broadcasting equipment can be a problem. Late last year, U.S. military personnel and their families in Japan were warned not to use a number of American wireless devices (baby monitors, cordless phones and so on), because they use frequencies too close to those allocated to cell phone service in Japan.

But it's military electronics, which usually don't operate near a lot of civilians, that cause the most difficulties. This sort of thing can be traced back to decisions made years ago, that have only recently turned into a problem. For over half a century, one of the radio frequencies reserved for military use in the United States (380-400 megahertz band), was also used for some consumer electronics. Starting in the 1980s, manufacturers of garage door openers were allowed to use the 390 megahertz frequency, because the openers were very short range (low power) and unlikely to interfere with military radios (or vice versa). But a new generation of military radios has changed all that, by sending out a very powerful 390 megahertz signals. Six years ago, garage door openers were sudden being activated by the new military radios in the United States.



The problem first showed up as new military radios, using the 390 megahertz frequency, were installed on military bases. By now, most bases are using the new radio system. While the Department of Defense believed that the new radios only made garage door remote control systems inoperable, thousands of users reported seeing garage doors open and close by themselves. While the garage door system manufacturers were using the 390 megahertz frequency unofficially (but with the knowledge of the government), they had to change their equipment to use another frequency. But before the gear using the military frequencies could be replaced. Over 50 million garage door systems (those within 80 kilometers of a military base), were involved in the mysterious malfunctions.

There are increasing problems like this, as more wireless equipment comes into use, and the military makes more use of frequencies they have long “owned” but not really worked hard. It's an old problem, and was first noted on a large scale during the 1991 Gulf War. Here, there was a large concentration of military equipment from all the American military services, and foreign armed forces as well. There were several unexpected incidents where frequencies collided in unexpected ways. There was some of this again in Iraq after 2003. There will be more conflicts like this, and some of it will be in combat, with deadly results.]

THIS MONTH'S PROJECT

Capacitance Meter

Though a little complex you will have, when finished, an instrument capable of measuring all but the largest capacitors used in radio circuits. Unlike variable resistors, most variable capacitors are not marked with their values. As well, the markings of capacitors from salvaged equipment often rub off. By being able to measure these unmarked components, this project will prove useful to the constructor, vintage radio enthusiast or antenna experimenter.

The common 555 timer IC forms the heart of the circuit (Figure Three). Its function is to charge the unknown capacitor (Cx) to a fixed voltage. The capacitor is then discharged into the meter circuit. The meter measures the current being drawn through the 47 ohm resistor. The 555 repeats the process several times a second, so that the meter needle remains steady.

The deflection on the meter is directly proportional to the value of the unknown capacitor. This means that the scale is linear, like the voltage and current ranges on an analogue multimeter.

The meter has five ranges, from 100pF to 1uF, selected by a five position two pole switch. In addition, there is a x10 switch for measuring higher values and a divide-by-two facility to allow a better indication on the meter where the capacitor being measured is just above 100, 1000pF, 0.01, 0.1 or 1 uF.

Component values are critical. For best accuracy, it is desirable that the nine resistors wired to the Range switch have a 2% tolerance. If 0A47 diodes are not available, try OA91 or OA95 germanium diodes instead. Construct the meter in a plastic box; one that is about the size of your multimeter but deeper is ideal. The meter movement should as large as your budget allows; you will be using it to indicate exact values. A round 70mm-diameter movement salvaged from a piece of electronic equipment was used in the prototype. The meter you buy will have a scale of 0 to 50 microamps. This scale needs to be converted to read 0 to 100 (ie 20, 40, 60, 80, 100 instead of 10, 20, 30, 40, 50). Use of white correction fluid or small pieces of paper will help here.

The components can be mounted on a piece of matrix board or printed circuit board. Use a socket for the IC should replacement ever be needed. Keep wires short to minimise stray capacitance; stray capacitance reduces accuracy.

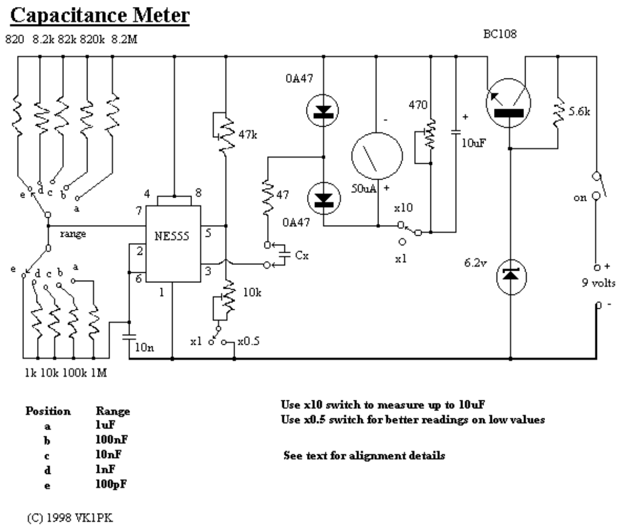
Calibrating the completed meter can be done in conjunction with a ready-built capacitance meter. Failing this, a selection of capacitors of known value, as measured on a laboratory meter, could be used. If neither of these options are available, simply buy several capacitors of the same value and use the one which is nearest the average as your standard reference.

Use several standards to verify accuracy on all ranges.

To calibrate, disable both the x10 and divide-by-two functions (ie both switches open). Then connect one of your reference capacitors and switch to an appropriate range. Vary the setting of the 47k trimpot until the meter is reading the exact value of the capacitor. Then switch in the divide-by-two function. This should change the reading on the meter. Adjust the 10k trimpot so that the needle shows exactly twice the original reading. For example, if you used a 0.01 uF reference, and the meter read 10 on the 0.1 uF range, it should now read 20. Now switch out the divide-by-two function.

If you are not doing so already, change to a reference with a value equal to one of the ranges (eg 1000pF, 0.01uF, 0.1uF etc). Switch to the range equal to that value (ie the meter reads full-scale (100) when that capacitor is being measured. Switching in the x10 function should cause the meter indication to drop significantly. Adjust the 470 ohm trimpot so that the meter reads 10. Move down one range (eg from 0.01uF to 1000pF). The meter should read 100 again. If it does not, vary the 470 ohm trimpot until it does. That completes the calibration of the capacitance meter. Now try measuring other components to confirm that the measurements are reasonable.

With care, an accuracy of five percent or better should be possible on most ranges.



Sorry for the quality of this schematic. For a better copy go to http://i55.tinypic.com/29wqo87.jpg

HAMFEST SCHEDULE

From Tony's World Famous Hamfest List 2011

MARLBORO 2/19 X Whitcomb School - Marlborough, MA 147.27 + pl 146.2

HORSEHEADS 2/26 X Armory - Horseheads, NY 147.36 +

COLCHESTER 2/26 X Hampton Inn - Colchester, VT 145.15 -

THE TROY AMATEUR RADIO ASSOCIATION

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