Making a Cheap 50Mhz vertical from a CB Halfwave Antenna.

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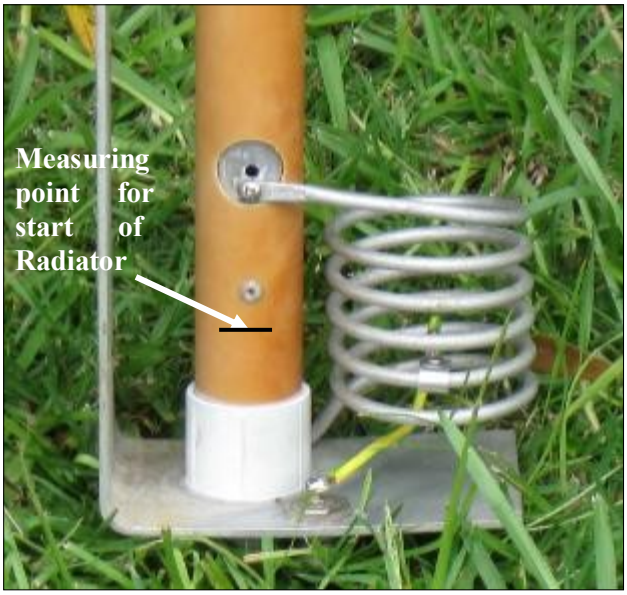
The aluminium half wave CB vertical should not be passed up at junk sales as can be the basis of many homebrew aerial projects for the Radio Amateur. This six meter version can be tuned for the SSB or FM sections and can easily be tuned to cover 2Mhz of the selected part of the band. It is not effected by rain or moisture and has proved to be a reliable aerial with low angle radiation pattern for DX. To start with all top sections of aluminium were removed from the aerial to make it more manageable in the workshop. The major part of the modification is to change the matching coil from 10 to 6.5 turns. If the coil and connections are corroded as mine was it is probably best to remove the coil and clean up the connecting points. The coil is usually made from aluminium tubing so some care must be exercised not to crack or snap it. I also had to replace the tapping clamp and the SO-239 RF socket due to excessive corrosion. Once I had the coil removed , I checked physically that the planned cutting point would still align with the radiator connection and made the cut 6.5 turns from the base. I naturally had to gently straighten the last half turn to fit the to the radiator. At this point the cut end (radiator end) was pressed flat in the vice so it would mate with the radiator tube. Just check again to make sure it still matches the connection points on the top and bottom of the coil. A hole was drilled in the flat sections at both ends of the coil to allow stainless steel, self tapping screws to be used to secure the coil back in it's original position. No doubt the coil will need a gentle stretch lengthwise to fit exactly. The tap clamp I made from a an 8mm wide by 30mm long strip of 1mm thick aluminium scrap that was handy. A hole was drilled in each end then the strip was folded into a "U" shape to fit over the coil. A stainless steel solder lug and self tapper screw where used to solder the feed point to and secure it to the coil. As you can see in the picture a piece of copper earth wire was used between the SO-239 feed point and the tap. Next I had to change the radiator to equal one half wave length at 50.200Mhz. This is my case was a simple matter of inserting the next section of the radiator I had removed previously plus a small section of aluminium tubing that fitted neatly in the tip. You might have to cut a segment off the third section of the original radiator to fit in the top of your six metre version. Each joint should be secured with a single stainless steel self tapping screw for weather proof continuity. The normal radiator height for half wave at 50.200Mhz should be approximately 2800mm or 110 inches. In some cases especially for FM (53Mhz) the radiator may need to be slightly shorter (approximately 2500mm) as the matching coil adds to the length slightly. For me the 2800mm length was fine as I moved the coil tap point up to 2.5 turns from the bottom which provided



a perfect match at 50.2Mhz. When measuring the radiator length please note that the bottom of it stars just below the coil connection point. (see picture) This can be checked by inserting a tape measure into the bottom of the aerial to gauge how far up the insulating tube the vertical section starts. Now all that maybe required is two new TV mast clamps (mine were totally rusted) and you are ready for the final tune up. I mounted my new aerial 6 metres above the ground and checked the tuning. The antenna was resonant too low in frequency so several upward adjustments of the tapping point brought the SWR and resonance to 50.2Mhz at the 2.5 turns position. For adjustment to the FM section I would suggest the radiator be shortened to 2600mm and the tap be about 1.5 to 2 turns from the base before attempting to tune the aerial to 53Mhz. The SWR should drop to 1.1 to 1 with 100 watts when adjusted correctly but start with low power to protect the transceiver finals first.

So there you are, a cheap, simple but reliable, Omni-direction six metre antenna from a recycled CB aerial. Have fun!