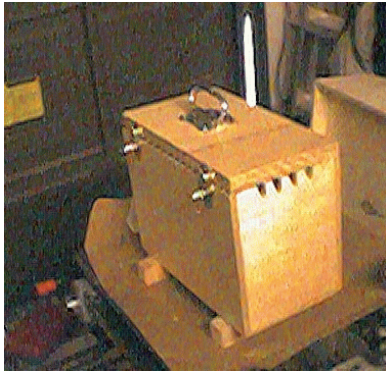


ATM Projects: The Power Box
submitted to the RASC-KC newsletter Regulus
Published in the 2000 July issue
Kevin Kell

ATM Projects: The Power Box by Kevin Kell

I was browsing through the web one day and came across the idea of a portable power box. Looked like a good plan as having the battery outside leads to curious people wanting to see what happens when they drop a wrench or other metal object across the terminals (Starfest '99). So I took the concept, added room (a compartment inside) to hold my 110vac power inverter (200watts) and 12vdc 3 plug adapter. Why? You now have a complete power unit that can run telescopes, radios, computers, TV's and other devices out in the field all in one place with no little bits and pieces to keep track of. In addition it is safer enclosed with a smaller chance of shorts and dampness/dew. The results are shown below.



Inside is a 40 amp hour deep cycle rechargeable lead battery. Canadian Tire supplies the two colour coded alligator clips to 12vdc female plug. Canadian Tire also supplies the 3 jack adapter with male plug. The 110vac inverter came from a local photo shop and plugs into the 12vdc adapter. The positive clip comes off the terminal for on/off master control. A red LED (25mA) with an inline 470 ohm (yellow, violet, red) resistor ($V=IR$; $R=V/I$ = $12v/0.025A = 470$ ohm) is installed in the lid and 24 gauge wires are connected to the two alligator clips. This gives an at-a-glance indication if the unit is on. Four slots are cut on the right side wall to allow cables in. Normally to connect a new load, open the lid, make the connection, run the cable through the slot and close the lid. This keeps all the electrical pieces inside protected from the dew and damp. It also allows for any potentially dangerous hydrogen gas to vent.

Construction info:

The size of the box depends mainly on the size of your battery. I used 3/8" one side good plywood for the sides, top bottom and the inside divider. The top is actually two layers of plywood to give enough thickness for the handle screws, piano hinge and front clasps. Wood was glued together and nailed with countersunk finishing nails. Wood filler went into the holes and was sanded afterward. A piano hinge joins the lid and back side. A folding handle is on the top (at the centre of mass balance point, NOT the geographical centre, as the battery is off to one side of the box) and two clasps on the front hold the lid down. 4 coats of varathane went on after sanding and 4 felt pads stuck on for feet. The internal dividing wall does not extend full height to allow for the power cables to cross over from the battery to the storage compartment.

Electrical details:

The 3 plug 12vdc adapter comes with a fuse. Recharging is accomplished by hooking up a

standard battery charger to the battery and charging normally. In the field I use a small 5watt solar panel during the day to top it off (normally it would take 80 hours of sun to completely charge this battery). My battery charger will do it in about 6-10 hours. See the web site below for more details, pictures and a parts list:

<http://www.path.queensu.ca/~kell/>

(Next month comes an article on the observing table)