

HACKNEWS

HIGHVELD AMATEUR RADIO CLUB

PO Box 1111, Bedfordview, 2008

November 2004

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COMMITTEE

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Sunday morning BULLETINS - 145.7875 MHz & 7062 KHz @ ±08h45.

COMMUNICATION IS THE NAME OF THE GAME

Meeting The last formal meeting combined with the SSC club was held at the repeater highsite in Risania, Johannesburg. All had a look at the ZS0JOG Digipeater and the 438.850Mhz 70cm repeater. Most interesting. There is a wonderful view from the repeater especially towards the South and East. Thanks to Ton for organizing it all.

The end-of -year social do was discussed. Remember to bring along the following. **1-**Seating. **2-**Something to braai. **3-** Anything stronger than that which comes in a brown bottle. **4-** 2 litre bottles filled with water and frozen. **5-** The ladies a salad of your choice. Also raincoats and umbrellas to keep the rain away.

A new committee for the SSC was chosen. Congratulations to Yvonne ZR6TBL as chairperson and ZS6REX as her assistant. Good luck guys.

A certain amount of discussion was taken up with the future training of PDP in amateur radio. Most members agreed to assist when the time came.



Above. 70cm cavities
Right. Current tower



.....
Right. Proposed new 70cm repeater site

The combined get together held at the TAC on Saturday was well supported with amateurs from Secunda and Vaal Triangle areas attending. The SARL HF contest was also on at the same time which made the local bands quite busy. The weather changed at lunch time and it started to Rain. All Gerry's equipment was rushed to safety. The day ended off with a combined HARC and SSC Meeting.



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(International Space Station)

Beacon: 628.000

Beacon: 632.000

Uplink: 145.990 (Packet+APRS)

Uplink: 145.200 (Region 1 voice)

Uplink: 144.490 (Region 2/3 voice)

Uplink: 139.208

Uplink: 121.750 (Voice NFM)

Uplink: 231.000

Downlink: 145.800 *(Voice+packet+APRS)

Downlink: 143.625 (Voice NFM)

Downlink: 143.635

Downlink: 130.167 (Voice NFM)

Downlink: 247.000 (EVAs)

Downlink: 463.000 (TV-1)

Downlink: 436.000 (TV)

Downlink: 400.100 (ESA Global)

Notes: Should be completed in 2004. Packet activity now active and some voice comms heard.

Found this info in the Satscape program.

The "Overport Switcher" --A Cheap Power Supply

by Garth Wheeler, ZS5GMW mackley@icon.co.za or zs5gmw@hotmail.com

Need an inexpensive bench supply that will also run an HF rig for under R300.00

Well, read on! PC power

supplies are getting cheap and used "chassis" are piling up in landfills, decreasing the prices for older units. The switching supply in a 'larger' PC can easily be modified to serve as a bench supply or even run a 100 Watt solid state HF rig.

Getting the Parts

You'll need to procure a PC power supply, MINIMUM 250 Watts (300 or more preferred). I bought a 300-Watt unit Saturday, May 19 at a local surplus house for R20.00 (This price was from this particular house and "...your mileage may vary...") While you are there pick up a set of binding posts (25 cents each), a 15 Watt 2- or 3-ohm resistor (50 cents, get a metal cased one with mounting tabs or holes), a power switch if you supply does not have one (75 cents), four stick-on rubber feet (10 cents each), a toroid core about 1.5 inches in diameter (FT140-43, 50 cents) and a power cords (R6). The total is R30.00 plus tax; a well-stocked junk box can reduce this overall price.

Before making any modifications, make sure you have a working unit. Test the supply by loading the 5-volt side so that the regulator works. Here's how: Verify that the supply is not plugged in! Remove the power cord and put it out of reach. Solder the 2- or 3-ohm, 15-Watt resistor across a red wire (5 volts) and a BLACK wire (ground).

Connect a Multimeter across a YELLOW wire (+12) and a BLACK wire (ground). Plug in a power cord and power up the supply if it has a switch). You should measure 12 volts and the fan will run. If you're this far, we can proceed - if it does not work, get another supply and try again.

Starting the Modifications

Unplug the power cord from both the wall outlet and the supply, and set it aside. Unsolder the 15-Watt resistor and set it aside for now. Open up the supply - it will be dirty and will need to be "(blown out)". Disassemble the unit as much as possible and clean the supply chassis and the fan. An old toothbrush comes in handy here, as will a cheap paintbrush; better yet, you could use a can of compressed air. Be careful not to bend any component leads or to brush too hard - it does not take much to get the tumbleweeds out (read: use compressed air).

Wires Wires Everywhere

Either 12 volts or 5 volts power the fan, and you should leave these fan wires intact. If the PC board is not marked with voltages where the many wires emanating from it, you can probably assume the following colour scheme: RED wires are 5V, YELLOW wires are +12V, and BLACK wires are ground. Other coloured wires may have -5V and -12V, but you won't be using these. In fact, you should unsolder (or clip off) all wires(but two RED, three BLACK and two YELLOW)! You can now remove these extra wires, and snip off the PC motherboard connectors from the seven wires still coming from the supply's PC board. This should clear away lots of space for you to finish up the job.

Mounting the Power Resistor

Mount the power resistor to clear area on the inside of one of the chassis sides. Use screws, nuts and washers so that the heat generated in the resistor will be "SINKED" to the metal side of the supply chassis. Solder a RED (+5V) and BLACK (ground) wire to the resistor and use heat shrink tubing or tape to insulate the connections in case they come in contact with anything else (e.g., heat sink, case or other components.) The 5-volt portion of the supply has to have a load for regulation to occur and this resistor provides it.

Mount the Connectors and Controls

In this section you'll be drilling holes in the supply chassis for mounting the binding posts, power switch, fuse holder and possibly a meter. Before you drill any holes, consider the internal layout of the supply, being aware of heat sinks and vertically mounted parts that you'll need to avoid while installing the extra components. I mounted two binding posts on the 'front' of the supply, but if the back (i.e. the power cord side) has more space, or if it is your preference, go for it. Be careful to avoid internal heat sinks and board mounted components.

After mapping out the holes for the new connectors and controls, drill the holes in the panel being careful to thoroughly remove all metal chips from the PC board and chassis area. Connect the binding posts to the PC board with #14 'house wire' or other heavy wire in an enlarged hole from the 'former' YELLOW (+12V) and BLACK (ground) wires. If you look at the PC board you can see a common area from which all the +12V YELLOW wires emanated. In a similar manner the ground (BLACK) and +5V (RED) wires all emanated from common PC board area. When you enlarge a hole for the newer heavier gauge wires, be sure not to get too close to neighbouring copper traces Alternatively you could use the remaining yellow and black wires coming off the pc board. I wound these wires coming from the PC board around a toroidal core (FT140-43) to help ensure that RF "hash" wasn't going to get into the radio being powered by the supply. Twelve to 15 turns will do it. There is usually an on-board miniature fuse - mine is 3.5A. I removed it and wired the ends of its holder to a panel mounted fuse holder on the front of my supply and put a 3AG fast-blow fuse in it. I broke the YELLOW (hot) AC line and installed a 5- amp toggle switch on the front panel for convenience. Your supply might already have a power switch. If you want voltage and current meters, mount and wire these now. The voltage meter connects across the output binding posts (i.e., in Parallel). The ammeter is in series with the positive post +. The "+" meter terminal to the board and the "-" meter terminal to the RED binding post. Check all wiring and remember that there are lethal voltages in this small box!!

Increasing the Terminal Voltage

At this point you have a 12-volt bench supply, capable of supplying at least 12 amps. BUT many mobile radios will not work or will not operate at full output power with only a 12V supply as they are spec'd for 13.8V (automobile voltage). You'll probably be able to adjust your supply to provide this increased terminal voltage.

There is usually a single regulator used for both the 5V and the 12V portions of the supply and changing its

voltage divider resistors will change both supplied voltages. As we are not concerned with the 5V side, this is not an issue! Locate the regulator IC - it's usually a "house numbered" part. If your supply has a "voltage adjust" pot, you're in great shape and you can easily put the supply up to 13.8V. Otherwise, get a copy of the manufacturer's data sheet on the IC (mine was a National Semiconductor part) to determine the correct values to use, and then follow the traces from the pins on the regulator to find the control resistors. This is a vague description, but I replaced two components and the output went from 12.0V up to 13.5V (close enough to 13.8V). When I put a "12-volt load" on this supply, I found that it was able to maintain 13.2V up to a load of 15 amps (200 Watts).

The voltage drops to 12.5V at a load of 17 amps. The heat sink gets warm to the touch - caution: some heat

sinks are “(HOT)” at B+ levels! With a load of 17.5 amps, the 3.5 amp fuse on the ac side of the supply let go.

With a 350W supply, 20 amps (continuous) can be reached. The 5V supply now draws minimal power, with the lion’s share being available for the 13.5V terminal output. Further increases in load current are not feasible as we are reaching the limitations of the PC board traces for current.

Batten Down the Hatches!

Now that you’re done making the mods to turn your PC supply into a custom HF rig accessory, you can button up the chassis. Be careful not to pinch any wires during reassembly. Take your time and use nylon ties to keep wiring away from heat sinks and the fan blades. If you build this supply, please send me an e-mail describing how it worked out for you and what modifications you made. Some additional ideas include an over-current limiter and an output fuse or circuit breaker.

Garth Wheeler ZS5GMW

(With thanks to the Highway Amateur Radio Club. November 2004 issue of Hotline)

Annual subscriptions For those who have forgotten this is just a reminder. Agreed by all those present at the AGM it was decided after discussing the proposed budget that the 2004/2005 year subs will be R100.00.

To those clubs who send us their news letters a very big thanks. They are PEARS – QSX, Highway – Hotline, Pretoria – Watts and Sandton – Dipole.

If there are any clubs on our mailing list that have a newsletter please send us a copy.

If there is anyone out there who knows how to get rid of the dotted line on page 2 please let me know. Seems to happen every time I use cut & paste.

73

Berridge
ZS6BFL