12V Battery Box

This is a substitute for 12V NiCad battery packs with a 7AHr capacity using an old battery case and lead attached to a 12V tool. This is cheaper than a replacement pack and lasts substantially longer.

Building Instructions

A kit of parts is available that has all the required hardware except for case, handle, battery and cable. The cable used is normal mains cable with the green/yellow earth unused. The Battery is a YUASU NP7-12V, National 12V 7.2Ahr or equivalent 12v 7AHr lead-acid gelcell. The case is made of 12mm birch ply or whatever you like.

The kit contains the connectors, terminals and 3mm brass machine screws and nuts.

Most of the instructions are in the form of annotated photographs.



Sides and top inside view detail.



Sides and top outer detail.



Front and end panel. Note difference in size.

7mm holes for 4mm terminal plugs will need to be shaped to fit.



Edge view of sides, top and bottom.



Typical battery. Those finally chosen are made by Panasonic.



Hardware kit. Although technically the live end of each connection should be a socket to avoid any contact with live terminals the voltage is so low it makes it easier to use consistent chassis and cable connector types so the cable is usable either way round. The spade sockets are not crimped as is usual, they are soldered to the wire.



It is easier to use standard mains cable for the leads. The green/yellow wire is cut short. Lengths of the blue and brown wires can be used for the internal connections. Use brown for the +12V and blue for -12V. The leads should be about 2 metres long minimum. Longer leads are OK but don't make them too long else they become cumbersome in use.



Made up leads with the XLR line sockets on each end. The lead can be used either way round. Make sure the cable is securely clamped to the connectors at each end.



A typical charger capable of maintaining a nominal 12V (13.8V) charge at 1A maximum. The two clips are connected to the respective terminal posts.



A typical battery pack, in this case a DeWalt 12V 1.3Ahr NiCd pack. All old NiCd cells are removed but the connection to the tool is preserved. In some cases this may require some work to allow the original connections to be mounted in the empty pack.



Rebuilt DeWalt battery pack.



Diagram of disassembled line connectors. Remember to feed the cable through the end and the clamp before soldering to the connector terminals.



Note the polarity of the connections. The numbers are on both the line socket and the panel plug.



Chassis plug connections. 1 = +12V, 2 = -12V, 3 unused.



View of the assembled box. Any handle may be fitted and the box can be finished as you like. If you use a spray finish remember to stop any spray from going onto the connections.



Box side view.



Front panel view.



Internal view showing foam padding.



Internal view showing wiring and battery fitted.



View showing lead connected to the modified battery pack.



Modified battery pack in position in the drill.



Battery box next to bench on simple brackets with the charger connected.

Appendix

There is a demand for an 18V version which has been designed on paper. This uses 3 off 6V gelcell batteries with switching. On connecting a 6V charger the cells are disconnected from the output connector and connected in parallel so they may be charged off a standard 6v charger. When the charger is disconnected the batteries are connected in series to the output and disconnected from the charger. This protects both the batteries and the charger.

It is possible to use the 18V version to drive both 12V and 18V tools by using pins as follows:-

Pin1 12V +ve Pin2 12 and 18V –ve Pin3 18V +ve

All that is required is to connect the relevant battery pack to either pins 1 or 3 and the common pin 2 for –ve.

The switching is done by an 8 channel solid state relay card designed for use with Arduino microcontrollers. This is available for around £8 which is significantly less than the cost of a 6pole 2way switch capable of handling 10 amps. This card sits in the box in the space above the batteries. The battery box is wider than the 12V version but about the same length and height. The same technique could also be used to make a 12/18/24V box but this would require 4 way XLR connectors at an increased cost.