

On TEST

A new Demon Charger

The success of the earlier Demon Ni-Cad charger has inspired company owner Nick Adams to bring out an even more advanced and full feature charger. The Apex 1 really looks the part. Its stylish case, neat built in display, LED array and feather touch selector switches bring a real touch of high class, high tech. to battery charging.

It's all very well having masses of lamps, buttons and a display, but does it work? For that matter is it any better than a length of wire and a couple of crocodile clips.

I have had one of these new Demon chargers on trial for a few weeks and can report that it has performed outstandingly well. I have been able to sort out my good cells from not so good cells, something until now was left to seeing what was happening on the track. Now I have evidence, and perhaps more important I

can get early indications of a failing Ni-Cad pack.

As well as being able to sort out my ageing packs, this charger provides a wealth of information about the Ni-Cad currently on charge as well as the charging source. How often have you thought that Ni-Cad performance was deteriorating, only to discover (usually too late) that the 12 volt used for charging was about to be destined for the knackers' yard. Now that sort of information is available to you, instantly and during the charging of the Ni-Cad.

A look at the charger

The case is black finished metal with clear, easy-to-read labelling. Ventilation slots are cut into the rear of the main body of the unit and the whole thing is finished off with neat plastic end caps that include built-in handles, not that the unit is that heavy. During extended use in a day of solid racing and charging I

have not detected a significant temperature rise in the case of the charger. This suggests to me that there is some pretty efficient circuitry at work *not* turning power into heat, always the sign of an efficient design.

The case markings make the charger very easy to use, although reading the instructions is, of course, recommended.

Connection to the supply battery (12 volt) is by a built-in cable supplied complete with large crocodile clips. Ni-Cad connection is from terminals at the rear of the charger, you supply the cable with your favourite type of Ni-Cad connector. As with the previous Demon charger an easily accessible external 15 ampere fuse is provided of the automobile type. Should any disaster occur a replacement fuse should be easy to obtain.

This charger seems almost indestructible, and that's a dangerous thing to say. Short of hitting it with a hammer the designers seem to have come up with a virtually foolproof design. For example: reverse the polarity of the input - a buzzer sounds;

the input you can select the 'INPUT VOLTAGE' and measure the supply voltage. A glowing red LED alongside those words on the case tells you what you are measuring. Plug in a Ni-Cad and you immediately start a trickle charge, an indicator lamp tells you what is happening. Before commencing a fast charge, it is a good idea to reset the 'capacity' button, as this button is disabled during the fast charge cycle.

Next select 'PRESET AMP'. Using the 'INCREASE' and 'DECREASE' buttons you can select precisely the charging current you require. I have charged my SCE cells at between 4 and 5 amps, other types of cells need different charging rates to achieve best performance. Once the current selection is made the charger will remember this for about two hours after disconnection of the

Demon charger

12 volt supply battery. For this reason it is a good idea to recheck the setting if you

disconnect the 12 volt battery for any time. As soon as you press the fast charge button a lamp comes on to indicate that you are now fast charging.

A particularly nice safety feature avoiding too high an initial charge is the fact that the charger will not start its fast charge routine unless the Ni-Cad voltage is greater than 4.8 volts. A few minutes of trickle charging usually does the trick to meet this requirement.

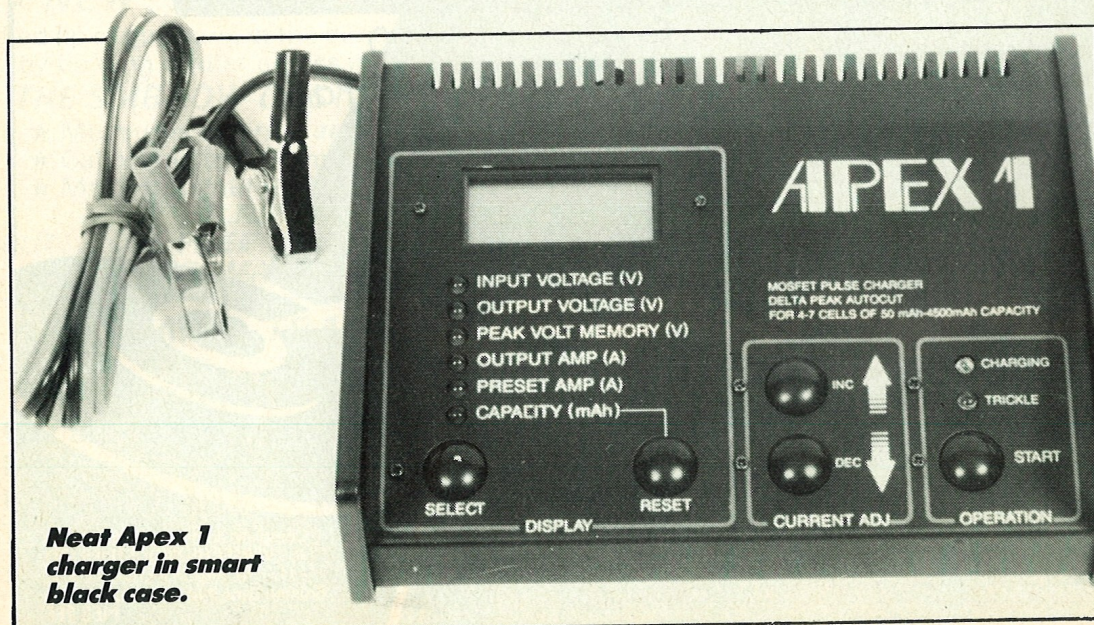
The range of charging current is from 0.5 to 11 amperes, this should allow you to charge just about the complete range of Ni-Cads in RC work (and a few more besides).

One of the useful checks that can be carried out with this charger is by using the 'OUTPUT AMPS' selector. If the display registers just a few amps and will not increase any more this could be a sign of either the 12 volt source battery too low or that the Ni-Cad voltage is too high (i.e. worn out or faulty

reverse the output - a buzzer sounds; short circuit output (with input connected) nothing; short circuit input (with output connected to Ni-Cad) fuse blows.

How do you use it?

As soon as you have a 12 volt battery connected to

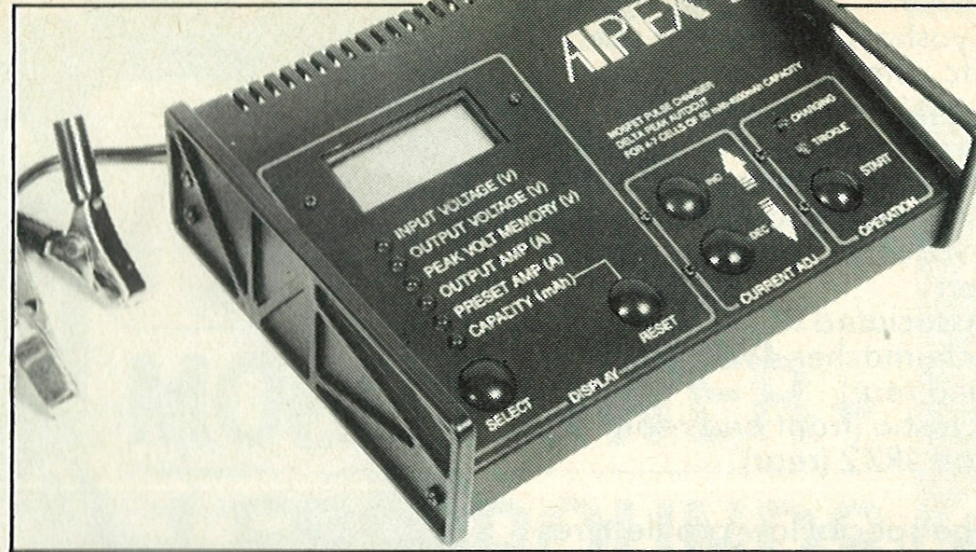


Neat Apex 1 charger in smart black case.

cell).

The selection of the peak voltage gives the switch off point at which the charger reverts to trickle charge. The reason that this charger is a cut above the rest is the way in which it detects the peak voltage. Unlike many other chargers which have a simple analogue voltage comparison circuit, the Apex 1 converts the measured voltage into a digital form which it continuously monitors against the preset reference peak voltage (in digital form). By digitising the voltages a very accurate check and cut-off can be achieved. This reduces the chance of errors and of course disasters. The use of the latest type of MOSFETs coupled to use of digital technology justifies my opening statement that this is a high tech device. By designing a digital system from the start it has been possible to incorporate many more useful features than previously available on a charger in this price range.

The use of the 'PEAK VOLT MEMORY' selector



Charger comes complete with a long lead – very useful when charging from a car 12 volt!

allows you to keep a check on Ni-Cad pack condition. With a new set of cells their internal resistance will be at its lowest, as the set ages or is abused so the internal resistance increases. The effect is to have a full charge peak voltage which as time passes gets higher and higher. By noting the peak voltage each time the Ni-cads are charged you can compare the figure with the previous charge.

Providing you use the same current setting every time you carry out this check you will be able to have a pretty good idea of what is

happening to your Ni-Cads. Of course, the other option is to watch the volt meter continuously making a note of the peak point (a pretty boring job) or have an APEX 1 charger which automatically records the peak voltage. All you need do is read off the value when the charge is complete.

The solid state switchable display functions also include a visual check of actual output voltage as well as capacity of the battery (in mAh). There are a total of six checkable conditions that can be

examined during the charging cycle.

The cost. Well initially I must admit I thought that the £99 price tag was a bit on the high side. However, when you sit back and see exactly what you get for the money.

1. A complete monitoring system of battery and Ni-Cad during and after charging.
2. An almost infinite choice of charging current.
3. Probable the most advanced digital auto peak sensing system using MOSFET devices.
4. Circuitry that provides not only the best shape pulse for charging, but also includes Ni-Cad protection.
5. Charger protection from reverse polarity and short circuits.

There is no way that I can suggest that £99 is not a lot of money, but when compared to other chargers, some at very similar prices there is no denying that this one has just about everything.

Price £99.00. Available from: Demon Products, P.O. Box 12, Aldershot, Hants.