ABERDEEN AND DISTRICT SOARERS

Newsletter No.27

7 Ashgrove Road West

Aberdeen

October 1986

1986 ANNUAL GENERAL MEETING

This year the Agm will be held on Tuesday 11th November at the Hydro Electric Social Club at 185, Crown Street, Aberdeen.

AGENDA

1. Chairman's report
2. Treasurer's report
3. Secretary's report
4. Election of office bearers for 1987
5. 1987 calendar and budget
6. A. O. C. B.

PLEASE NOTE - let's make the turnout of members at this AGM a record - there's much to discuss. We hope to be able to conclude the meeting with an exchange of photos, film and video of club related activities. So look out your collection now.

MAKE A NOTE OF THE DATE - 11th November

MAKE A NOTE OF THE PLACE - 185, Crown Street

THE MACKIE ACADEMY SAGA

8/9/84

Permission to fly model aircraft at the Mackie Academy sports field is granted to G Philip - the CFI. This was given for weekends, when free, and weather permitting - as requested.

From that day forward...flying takes place more and more freuently, as interested people join the club. There are about ten of us now in Stonehaven, flying planes, and in the RAF.

4/7/86

First hint of trouble - a letter was received from the Education department informing us that complaints had been made about the noise, and asking us to restrict our flying to the weekends.

18/8/86

Another letter received from the Education department. It seems that one person is creating a lot of hassle, by writing to Woodhill House, the local Education Office, his (and our!) regional councillor, and the police. - probably Santa Claus as well.

21/8/86

A few of us got togetner at the CFIs house, and composed a letter to send to the local education office. In it, we said that we would try to reduce the noise even further, and also look for another site.

26/8/86

The police have been to the education office yet again, because of further complaints from this "gentleman". We have now been asked to stop flying.

28/8/86

Our regional councillor was paid a visit, MC George Swapp... although he seemed sympathetic, he said "this is a very minor matter..." !!! It also turns out that he and the complainant are elders in the same church, although I'm sure that would not influence him in any way (!).

12/9/86

Got the chance of a new site not too far away, but not until mid-October.

24/9/86

The CFI and I went to the Schools Council meeting, and refuted the claims made that we had 1) been chasing kids away from the tennis area, 2) we had been "buzzing" kids, 3) flying over the complainants house. We got a very sympathetic hearing, some people being almost as angry as we were, that one person could do this to us. We still don't have permission to fly power at the Mackie, but can fly gliders and/or electric power.

The story goes on... watch this space for further developments.

Angus W Brown.

KIT REVIEW - GALAXY 'ORION'

Having learned to fly on a Galaxy Models "Escort" using the basic three functions, I decided, with some reservation, that the time had come to move on to ailerons. Since the Escort had proved to be a very stable design and a delight to fly, I decided to purchase another Galaxy kit and this time chose the Orion, which comes in 4 or 5 functions, the 5th function being flaps.

The kit comes in an unmarked box and the instructions are fairly poor photocopies done on a Gestetner. The plan itself is comprehensive and easy to follow, providing you have previous building experience. Most parts are clearly numbered, although some small parts which were unmarked caused temporary frustration in locating where they should go. The foam wings were covered in high quality veneer, although the supply of the glass bandage without the resin was obviously a hidden way of keeping the cost of the kit down.

FUSELAGE

Building was fairly straightforward with only minor trimming of the various parts. The fuselage is a traditional box solid box construction, although some of the " square" look is reduced by the use of large triangular fillets running the length of the fuselage which allowed the fuselage to be rounded off. The result is a very roomy fuselage with plenty of space for gear, tank etc I chose to fit a 9oz SLEC square tank in preference to the 6oz round tank supplied.

WINGS

The wing roots came together and mated well. Although no additional bracing was specified, I made ply braces for leading and trailing edges and epoxyed these in through small slots cut in the veneer, finishing off with a glass bandage. The result was a very strong centre section. Fitting the torque rods for aileron and flaps proved tricky, requiring deep grooves in the trailing edge, then a strengthening "sandwich" built up over the rods.

The model was finished in Polytex with two coats of glass, resulting in a tough, easily cleaned surface. A new OS40, (good job I've got an understanding better half) was installed, and we were ready for its maiden flight.

Stonehaven's CFI, Graham Philip agreed to take it up, so on a calm evening at Mackie pre-flight checks were completed and an initial takeoff was tried. On the first run, the Orion refused to come unstuck.The engine was adjusted together with a bit more up elevator but still no success. On the third attempt, the flaps were lowered and the model then lifted off successfully. After trimming out and a few gentle manouevres, yours truly took over. Shortly after the engine cut at fairly low altitude. It looked as if we were going to run out of height,so the box was passed back to Graham, who almost had the embarrassment of blacking out Stonehaven as he managed to squeeze BETWEEN the HV lines at the edge of Mackie!

On the second flight, we lost the starboard wheel (so much for collets) and again GP did a remarkable two point landing without damage.
On the third flight, Steven, who is currently learning to fly on the Escort, took over. Some over-enthusiasm resulted in a steeep dive below the viaduct, rescued again in the nick of time just as it was disappearing from sight, by Stoney's CFI.(What would we do without this guy!)

Despite the excitement of the evening, a number of successful flights proved that the Orion is a stable flier, ideal as an aileron trainer, with the added bonus of flaps. Raising and lowering the flaps causes some fairly hefty changes in attitude and the nose has to be held down in the lowered position. Once mastered, however, they allow the Orion to fly very slowly with little loss of height.

The Orion is excellent value at £32.95 for the 5-function version and I hope to clock as many flying hours on it as I did on the Escort.

Tom Macpherson.

NOTES

1. Many thanks to Brian Ord for organising the Slope Fly-in on Saturday 4th October. Cairn O'Mount was the ideal location. After a misty start the day improved steadily and the wind blew straight onto the hill at 10 - 15 kts. An excellent turn out of models and modellers helped to make this a day to remember. Same again next time Brian!

2. Many thanks to Graham Philip for organising the evening out on the 27th September. From all reports a good night - sorry more of us could not be present. We'll try harder next time to avoid double booking our social calendar.

3. A reminder to all who use the club's affiliation to the SAA to effect their insurance cover - your cover expires on the 31st December. To ensure continuity of cover, subs to the secretary (whoever he might be next year) during December please.

4. Whist thanking folks for various things can I express my thanks to those who have contributed to this newsletter. Without you the editor's task is impossible. If your contribution has not yet appeared, it will in due time. PLEASE keep sending in your efforts.

GLIDERS AT LAST!

Tuesday evening 5th August, venue - Shedocksley, weather - flat calm. Only five 'glider guiders' were present and 60% of them were flying power models - UGH! The excuse being the calm weather.

Thanks to Colin Ganley who designed and built an ingenious line tension sensing device for the power winch, calm weather is NO LONGER an excuse for bringing along power models on a calm Tuesday evening.

Meanwhile back at Shedocksley, your's truely attatched his 'Hybrid 2' to the towline and the line tension adjuster screwed down to 6mm of the lowest setting. The master switch was held on with my foot and the slack in the line was immediately taken up and tension felt in the line (not as much as on a taught bungee). The model was launched straight and level to gain flying speed before a touch of up elevator brought the glider into a normal towing attitude. Quite a good height was reached before I took my foot off the master switch and a satisfactory launch gained.

Mike was next to use the winch - a bit apprehensive at first, but another successful launch achieved.

Just to prove that the winch is versatile, Allan Stewart's 'Cobra' was next. The Cobra is no easy tow (just ask anyone who has hand towed it). The tension control was increased to maximum and the Cobra towed up at an alarming rate of knots. A second tow was tried with the tension eased and a better but still fast tow resulted. Subsequent use of the winch has made us more familiar with the tension adjustment and we have now found a setting which will satisfy both the Cobra and a 100S glider.

Having now used the winch on at least four occasions, a few minor modifications will be required to make it into a first class towing machine. I feel that it will be capable of handling the lightest floaters up to quarter scale gliders. Let's hope it will handle the larger machines - I hear that there are a few being built.

Of the numerous people who have used the winch, all have been surprised at how gently their models have been towed up and at the altitude obtained.

Things are so good with this power winch that another is to be constructed. Colin, can you knock up a couple of tension sensing devices please? Now, has anyone got a spare lawnmower petrol engine lying about?

P.S. Have you thought of using Ramin in place of Spruce for your wing spars? Ramin is a hardwood but not as grainy as spruce, but just as stong (if not stronger). I found some in B & Q in the following sizes :-

6mm x 6mm	38p per	2.1m length
6mm x 12mm	44p per	2.1m length
6mm x 18mm	63p per	2.1m length
6mm x 25mm	83p per	2.1m length

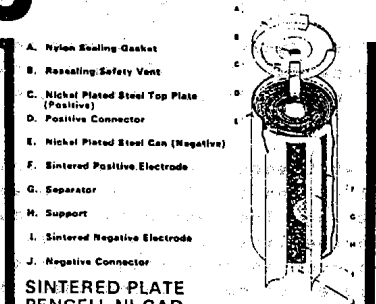
According to George Whelan there are 3mm thicknesses at Ken Kennedy's of Cults.

Brian Ord.

UNDERSTANDING NI-CADS

by Steve Dunne

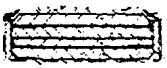
Most radio-modellers use ni-cad batteries for their transmitter — receiver — servo system, yet few seem to understand them in the way that they understand the rest of their equipment. This series of the workings of his ni-cads, without delving into deep technical explanations, and perhaps helping to prevent cases of premature battery failure. To keep explanations simple, this article refers only to radio gear batteries, usually of 500 milliampere — hours, and normal constant current charges of 50 or 60 milliamps. Electric car and electric flight power cells, and their fast charges, require different treatment, and a far more detailed article — perhaps some other time.

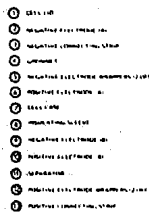


SINTERED PLATE PENCELL NI-CAD

1. What is the difference between button cells and cylindrical cells (pencells)?

The "button" cell has been the traditionally supplied cell for radio systems, and only recently has the cylindrical "pencell" become popular. The button cells we use are technical known as "mass-plate", with double internal electrodes, often known simply as DEACS (D.E.A.C. was an early European ni-cad manufacturer, now renamed VARTA). The pencells are "sintered plate", more efficient, slightly lighter, slightly bulkier when made up into batteries, and much more robust. More detailed differences will emerge below.





HIGH CURRENT DENSITY MASSPLATE PENCELL

2. How long should batteries be on charge?

With normal 50 — 60 milliamp chargers and 500-600 milliamp-hour batteries (as usually supplied), charging should be for 14-16 hours, no matter how little the battery has been used on the previous discharge. This ensures that all the cells are fully charged each time, and entails no risk of damage due to overcharge. If you are not able to be on hand at the end of this period, charge for a few hours longer rather than stop early. A one hundred hour overcharge won't cause any damage. If the battery has been left to completely flatten, a 24 hour charge is advisable. The time to charge? The night before you want to use the model. Ni-cads lose their charge when stood, so it is more suitable to leave charging until you intend to use the power.

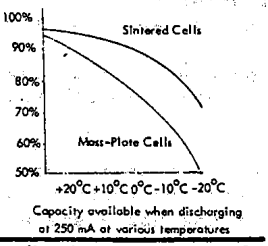
3. How long do batteries keep their charge, and should we 'top-up' the charge if the model is laid up for the winter?

Mass-plate cells (button cells) at room temperature (20°C or 68°F) will lose about 20% of their charge in one month, 33% in three months, and 50% in ten months. Lower temperatures reduce this loss, higher temperatures accelerate it.

Sintered cylindrical cells (pencells) self-discharge much more quickly. Again at room temperature, one might expect 20% loss in 3 weeks, 60% loss in two months, and completely flat within four months. This is not, however, a problem: if the battery is to be used, it should be charged the night before, and if it is to be stored, Ni-cad batteries can be stored in any state of charge — or discharge — almost indefinitely without a significant loss of life. Topping-up charges are unnecessary, and perhaps even wasteful.

4. Is it better to fast-charge or slow charge (trickle charge)?

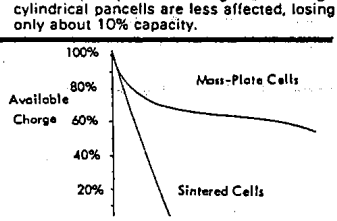
No. Stick to the standard 50 or 60 milliamp charge. Trickle-charging may reduce the useful capacity of the cells, particularly when continuous, and fast-charging, (as well as risking reduction in battery life and capacity when not properly controlled), is inefficient, as manufacturers usually recommend charging to only 70% or 80% of capacity. If you *must* fast-charge, do it properly and carefully — study the manufacturer's instructions!



Capacity available when discharging at 250 mA at various temperatures

5. What effect does temperature have?

Quite a lot! Room temperature is the most efficient charging temperature, although temperatures from +10°C to +35°C are quite acceptable. Charging at extreme temperatures can cause damage. Discharge at our rates is reasonable from -20°C to +45°C, but the most efficient discharge temperature is about +30°C. At freezing point (note — cold weather soarers) button cells can lose 25% of their capacity in radio gear, although cylindrical pancells are less affected, losing only about 10% capacity.



6. How much usage time (discharge time) can we expect from freshly charged batteries?

How long is a piece of string? — A common question, and difficult to answer.

Most transmitters use about 150 milliamps, giving a good three hours of useful "switched-on" time, but receivers vary enormously according to their use. The receiver itself draws only 5 to 15 milliamps, but the servo motors draw considerably more. A series of experiments produced the following results, but they should be treated only as a very general guide (note — in each case one servo was set with a deliberately stiff linkage — just in case!)

(a) 2 channel thermal soarer (intermittent stick use only)
— average current drawn: less than 100mA
— expected battery duration: 5 hours plus (note — transmitter drains first!).

(b) Stable high-wing aircraft (one servo continuous, three servos intermittent)
— average current drain: 150-200 mA.
— expected battery duration: 2½ — 3 hours.

(c) Aerobatic pattern craft (two servos continuous, two servos intermittent).
— average current drain: 230-260 mA
— expected battery duration: 2 hours.

7. What is the life expectancy of the battery?

(a) Mass-plate button cells — 400 to 500 complete cycles of use (i.e. once a week for 8 to 10 years).

(b) Sintered pencells — 800 to 1000 complete cycles. If the cells are only partially discharged on each cycle, the life expectancy is substantially increased. After the periods mentioned, the cells are not useless, but the capacity becomes reduced.

8. Does a stalled servo ruin the battery?

A stalled servo draws about 400 mA or so, and therefore flattens the battery very quickly, but this in itself does not cause damage. If it remains in this state of discharge after the battery flattens, then damage can be caused by cell reversal.

9. What about accidental reverse charging of the battery, or inadvertent complete discharging?

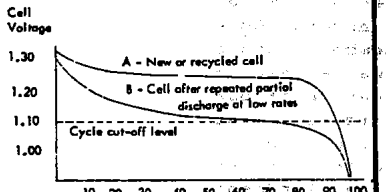
Complete discharging underload, will probably cause one or more cells to reverse polarity, as will reverse charging, but at low rates this may not cause permanent damage. Charge the battery for 24 hours, discharge through a controlled discharger (see below) or cycler, then recharge for 15 hours and again discharge through the discharger. Time this final discharge to ascertain if damage has been caused. I have on two or three occasions accidentally flattened batteries (once by leaving a transmitter switched on all winter!) and in each case the battery has fully recovered (pencells in each case).

10. How do we deal with "memory" in the cells, for example after regular partial discharging?

We don't! The so-called "memory" effect does not happen in practice. Yes — I was surprised too when I first found out. All the manufacturers I have spoken to agree that they are unable to reproduce this effect, except in careful laboratory controlled tests, and surmise that it must be an effect observed before the manufacturing technology reached today's standards.

11. Is there any point in "cycling" a battery?

Yes. Repeated charge and discharge cycles at low levels, such as those experienced in use of radio-controlled models, tend to form the active materials of the cells into relatively large crystals, thus lessening the surface area acted upon. Although it does not appreciably affect the capacity of the battery, it does tend to reduce the discharge voltage, which can adversely affect the operation of the equipment in time. A few controlled cycles at a higher charge/discharge rate, fully discharging the battery each time, reduces the crystals again, effectively revitalising the battery. If a battery cycler is not available, a few discharges through the "controlled discharger" described below, each time followed by a 24 hour charge with your usual (50 mA) charger, provides an acceptable, if not quite so efficient, alternative. This recycling should only be practised once or twice per year, dependent upon how much you use your equipment.



Effect on cell voltage of "large crystal" build-up

cells as fully discharged each time they are used. The cells in a battery are all slightly different in their capacity, and if the weakest cell (i.e. lowest) is not fully recharged each time, it will start to "lag" behind the others in capacity. Eventually this "lag" will cause this cell to discharge completely, partway through the normal discharge cycle, with obviously disastrous results if it happens 'in flight'. Normally this condition of one-cell discharge will cause that cell to reverse its polarity, thus lowering the battery voltage by over 2 volts, but unless left in this state for a long period, severe permanent damage should not result, particularly in pencells. Recharge and check the battery as shown, and remember to charge fully every time in future.

13. How do I check the capacity of the battery without a "cycler"?

Build a controlled discharger. This can be made quite simply, requiring only a few resistors, spare charger plugs, and access to a voltmeter.

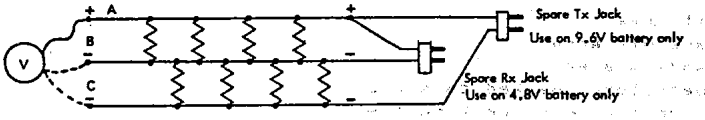
The circuit described below discharges at about 230-240 milliamps, uses cheap resistors, and can be built on veroboard, or even plywood and nails if required! The current draw is similar to the average drawn by aerobatic systems in flight, and should discharge in about 2 hours.

SPARE Tx JACK
USE ON 9.6V BATTERY ONLY

SPARE Rx JACK
USE ON 4.8V BATTERY ONLY

*All resistors 82Ω½ watt 5%
*Operate at room temperature only — one battery pack at a time
Average current drain about 240 mA.

SIMPLE DISCHARGE SYSTEM FOR Tx AND Tx BATTERIES



* All resistors 82Ω ½ watt 5% * Operate at room temperature only – one battery pack at a time
Average current drain about 240 mA.

12. What happens when one cell "goes down"?

In most cases, unless the battery has been severely maltreated, this will have been caused by inadequate charging, i.e. trying to recharge only by the amount the battery has been discharged. Because charging is only about 70% efficient, it takes 14 or 15 hours to put back 500 mA, and it is safer to regard the

To operate: (instructions are for receiver, with transmitter instructions in brackets).

After charging the battery for at least 15 hours, connect voltmeter to points A and B (A and C) on discharger, and connect discharger plug to appropriate battery. The voltmeter should read about 5 volts (10 volts) and with fall to about 4¾ (9½) volts over the next hour and a half or so. As the "end point" is reached, there will be a fall to about 4½ (9) volts over a ten minute period, then a fall to 4.8 (8.0) volts over five minutes or so. This is the final useful voltage. Disconnect battery, and make a note of total time under discharge. Around two hours indicates a good battery, much less indicates low capacity. If low capacity is suspected, recharge for 15 — 20 hours, and repeat the discharge test.

During discharge, check the voltage every ten minutes or so, until the voltage begins its final fall to 4½ (9) volts, then check more frequently. This is quite easy to do while at the workbench, watching T.V. etc, keep a record of the capacity of your batteries for comparison with future checks.

Note: The resistors run quite warm during discharge tests. Any voltmeter 0-10v. d.c. of at least 1000 ohms/volt will do, as in this kind of checking exact readings are not necessary. We do not really need to know whether the capacity is 2 hours, or 2 hours 3 minutes!

14. What does it mean when crystals form on the cells?

This is usually quite harmless, and is caused by minute porosity at the sealing ring. Electrolyte reacts with carbon dioxide in the air, forming crystals of potasium carbonate. Wipe the crystals off with a dry cloth, and smear a little silicone grease on to prevent further growth. Crystals may also be formed on or around the safety vent valve if cells have been abused by gross overcharge or over-discharge, causing the valve to open and lose a little electrolyte. This situation is unlikely to arise in modelling, except on accidental short-circuit of batteries, but if you suspect this has happened, check for loss of capacity with the discharger or cycler.

Finally, I would like to thank the technical staff of the undermentioned companies for the advice and assistance they have given in the preparation of this article. May the power be with you!

SAFT (UK) Limited,
VARTA Limited (formerly DEAC)
BEREC (Special Batteries) Limited, formerly
Ever Ready (Special Batteries) Limited.
Micron Radio Control Limited.
Sandwell Plant Limited.
Ripmax Limited.

EDITOR'S NOTE

"Button" cell ni-cads are also produced in 'sintered plate' construction, but the majority are of the 'mass plate' type. For radio control model applications the 'mass plate' button cells should feature the double cell construction (double internal electrodes). These often have the suffix 'Z' marked on the case i.e. DKZ. Many radio control equipment manufacturers continue to use 'button cell' battery packs and it should not be thought that these are inferior for their purposes — some of this type of battery pack have operated satisfactorily for ten years and more.

The above reproduced from Aug 1980 R.C.M.& E.

DATA PROTECTION ACT

Information contained on computer is name, address and phone number of club members. This list is used ONLY for mailing ADS Newsletters. This list will NOT be released to any other body or individual. Under the above act, we have to advise members that this information is held on computer file, and such advise is hereby given. Should any member not wish his name and address to be retained on this file then the editor should be instruced , and the information will be deleted.

SAFE FLYING PRACTICE

Well folks, another summer season's flying is dead and gone. Its time to put away the Ambre Solaire and sunglasses and dig out the wellies, mitts and balaclava.

I see one of our members sporting a new hairstyle featuring a shaved spot and some fine needlepoint work. On aserious note, John's hairstyle is the result of a nasty and potentially catastrophic accident on Brimmond a couple of weeks ago. John was hit by a small lightweight model whilst flying off the slope. Had any other model been flying that day in the same manner then it is highly probable it could have been fatal.

At this time coincidently there are a number of similar reports in SOARER and other model magazines. Asking around some of the longer serving club members, none can remember such a serious accident. What about all the near misses we've had - don't they count?. I think that the quiet, passive nature of our sport belies the attendant dangers and lulls us into a false sense of security. Yes, we DO use the pit area as the take-off zone. We DO use the take-off zone as the landing zone in spite of acres of available ground. The other great danger is to innocent bystanders. If one of these were injured, the damage to the club could be irrepairable - loss of flying field, law suit etc.

So folks, let's all re-affirm the intention to be a safe club. Follow the basic rules :-

1. Determine the pit area
2. Determine the take-off area
3. Determine the landing area
4. Don't overfly spectators, parked cars etc
5. Keep an eye out for towlines, we know their whereabouts, but what about others in the area

I think the above are only common sense and should be second nature to us. We don't want to turn a casual flying session into a military exersise, but if we don't regukate our own flying we could heve very strict and ruinous regulations imposed upon us by an outside body.

B.A.R.C.S. SLOPE AND THERMAL ACHIEVEMENT

I know that in the club we have quite a few BARCS members and some who arn't (shame). I would like to bring to all members notice the BARCS achievement scheme. This is a graduated award scheme for slope and thermal flying. It gives flyers targets to aim for in achieving levels of flying skill. I feel that as a club we should promate this scheme. It would elevate the overall flying standard of the club and maybe add an edge to the casual flying we do. If there is sufficient interest, I will be quite happy to supply information and to co-ordinate the scheme within the club.

George Whelan