



# THE KNIGHT FLYER



PRESIDENT: GIL LANGE

EDITOR: PAUL CWIKLINSKI

OCT. '87

As the new editor of the KNIGHT FLYER, I want to thank all that have the confidence in my ability to do a good job. I hope I'm able to live to the expectations. If not, I'm open to suggestions.

Thank you, PAUL CWIKLINSKI

THEY ARE HERE!!! YEP FINALLY!!!!

Those long awaited Four Stroke books by Peter Chirm are now in stock. We have two of them.

There is going to be a stricter policy toward the club's library. That being if a member has books out and they are due; that member will not be allowed to take out any other books, until the books due are returned.

Also, in all fairness to other members, the maximum number of books allowed out per member at one time will be two.

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CA GLUE USERS... REMEMBER TO VENTILATE YOUR WORK AREA!!!

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An invitation is extended to ALL club members by the FLYING KNIGHTS AIR SHOW TEAM to: Come out and see what we're all about. If you like what you see, and are interested, you are more than welcome to join us. The Air Show Team meetings are the Friday following the General Meeting. Show Team Meeting start at 7:30 instead of 8pm, and the Show Team meets at the same place as the General Meeting.

## MEETING SCHEDULE.....

October	23	General Meeting
	30	Show Team Meeting
November	13	General Meeting
	20	Show Team Meeting
December	11	General Meeting
		Election night & CHRISTMAS PARTY
	18	Show Team Meeting
January	8	General Meeting

THE FLYING KNIGHTS EXTEND THEIR CONDOLENCES TO JOHN O'CONNELL ON THE DEATH OF HIS WIFE, GEN, THIS PAST MONTH.

## From The Editor's Desk:

PLEASE!! Rules are set for a reason! Whether flying at the North Collins field, Hamburg or any other field, OBEY THE RULES! They are there for your own safety. Also, please be courteous!

I know; I lost a plane this summer because someone was careless and didn't follow the rules. (This person was on the same channel as I and turned his transmitter on while I was flying). Luckily no one was hurt.

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## RADIO RAFFLE--- RADIO RAFFLE

The club has purchased two (2) Futaba conquest 4 channel radios. They are to be raffled off at the December 11 General Meeting. TICKETS are: \$1.00 each or

\$5.00 for six (6)

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FEATURE ARTICLE

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CARE AND FEEDING OF THE NI-CD BATTERY By

REED KALISHER

(From the August '87 Model Airplane  
News)

Although you can't stop ALL equip-  
ment-problems, with a little effort and  
some inexpensive gear, you can greatly  
reduce one of the biggest problems  
you'll encounter- BATTERY FAILURE.

The first thing I'll talk about is  
how Ni-Cd batteries work. I'm not going  
to get all technical about this, but I'm  
sure you can remember how, when you were  
a kid, the toys powered by ordinary  
carbon batteries gradually got weaker  
and weaker until they were useless.

Ni-Cd run pretty close to full output  
with only marginal fatigue until they  
reach their limit. At this point they  
become dangerous, since they'll do a  
sudden nose dive in power, and so might  
your plane.

The reason for this is that at or  
below 1.1 volts per cell, they tend to  
reverse polarity. When this occurs, they  
no longer have any power output, and  
your R/C plane (or car) has Just become  
"free flight".

So, how do you know when to stop  
flying? Well, there are ways of making  
charts and graphs to get an idea about  
your batteries' life expectancy. Or, you  
can count the number of flights and do  
your "best guess" routine.

None of these methods are very  
accurate due to a number of reasons,  
including load and duration variences,  
and battery memory. We'll talk about  
memory a little later on, but first let  
us go over battery life in the field.

Probably the best way to nkow the  
condition of your battery pack is to use  
a measuring device that puts out a  
simulated load and tells how much power  
is available. An Expanded Scale  
Voltmeter (ESV), or a Digital Scale  
Voltmeter (DSV), is the best way. Craft-  
Air\* makes a DSV that's a real bargain  
when compared to the cost of a lost  
ship. There are a few others offered by  
Ace R/C\* and Litco\*, but the Craft-Air

(No. 515) also has a tachometer  
built into it which makes it even  
more useful.

Let's assume your flight pack is a  
typical 500mAh. The pack when charged  
should hold approximately 4.8 to 5  
volts. Your DSV will tell you if you're  
fully charged. As you drain the  
charge, it will drop slowly to about  
4.4 volts. At this point you should  
Stop flying. Below 4.4 volts, the rate  
of discharge increases drastically, and  
at this point polarity reversal could  
occur. Actaully, if you don't have a  
field charger to boost your pac you  
should stop before you reach 4.4  
volts. Be careful not to fall into the  
"memory trap". Let me explain further.

You've been flying for six full  
flights. Your experience tells you  
that you should be able to go for  
three more. (A well conditioned and  
fully charged 500mAh power pack should  
provide about 10 flights of 10- minute  
duration.) The DSV reads 4.6 volts  
remaining. You're only in the air for  
about four minutes when you begin to  
lose it. If you're lucky, you get a  
second chance. What happened? The DSV  
showed plenty of reserve, or did it?

If you typically go home with a  
good reserve of power left in your  
flight pack, say 4.6 volts, the batter  
will give up Its charge faster. Instea  
of falling below 4.4 volts, it will  
display the same behavior at an earlle  
stage, say around 4.6 volts.

This is known as MEMORY. If you  
don't fully discharge the cells before  
4.4 volts (1.1 each) are up, and  
recharging them to full capacity,  
they'll develop tiny spikes inside.  
The engineer who explained this to me  
called it "growing hairs". Anyway,  
these hairs cause minor short circuits  
inside the cell. The more hairs, the  
faster the cell discharges. The hairs  
cause the pack to appear to develop a  
memory in transmitter and receiver  
batteries. They seem to "remember" to  
discharge faster!

This is where the other half of the  
proper care and feeding of a Ni-Cd  
comes in. Imagine your battery as a  
rubber band. If you pick up a new one  
and rapidly stretch it to a length you  
thought it should go to, it will most  
likely snap. If you lubricate it, and

extend it in short stretches first, it'll survive.

Remember to cycle your batteries!! Regular cycling is just like conditioning of rubber bands. Full discharge (to 1.1 volts per cell) and full recharging, or deep cycling, will prevent or erase memories in your battery packs, and help them to perform better. This is because full discharge and recharge will burn off most of the hairs and allow the battery to function normally.

Battery cyclers are offered by Litco (Multi-cycle), and L. R. Taylor (Power Pacer), and Ace (Digi-pacel). They can cost from \$60 to \$90, but are worth every penny. My personal favorite is the Litco Multi-cycler because it switches to a trickle charge when it's complete.

Attach your fully-charged transmitter to one side and the receiver pack to the other. Turn it on, and a timer will count the time it takes to reach 1.1 volts per cell. At this point, it will then recharge the packs to capacity\* Use the manufacturer's recommendations to determine the condition of your battery packs. If you've never cycled your packs, repeat the process until the lifetime reading stops getting longer than the previous cycle. Each complete discharge and recharge should take between 12 to 18 hours.

By the way, cycle your brand new radio and power pack too! Most manufacturers put a charge into the packs to check them, and protect them against reverse polarity. Then they sit in the warehouse and on the store shelves

where they begin to degrade. NEVER presume that the batteries are OK just because they're brand new; cycle them! If you own different brands or models that require different connectors, I recommend you splice-in sets of Dean's connectors. This will allow you to attach any piece of battery equipment at any given time.

Other reasons for premature battery failure include poor linkage hook-ups. If the servo is overworked or stalled, it could pull three to four times the normal amount of juice needed, and drain the flight pack faster. Vibrations and rough landings could also destroy a healthy cell. Inspect the

batteries regularly, keep them well padded, and replace them when in doubt. If you're hanging the planes up for the winter, cycle the cells, then store them in a cool, dry place.

During flying season, cycle about once every four to six weeks. During the non-flying times, cycle them every two to three months, and again before you resume the season. Be careful not to over charge the batteries especially when using "quick" chargers. A regular charger should be rated at about 1/10 of the mAh rating of the complete pack it's charging. A 500 mAh pack charger should be rated at about 50mAh. A quick charger is usually rated about 30%, or in this case 150 mAh. If you don't watch the time on the charge, you'll cook the cells. Some chargers monitor the battery charge level and change to a trickle charge when complete. A trickle is about 1% of the battery pack rating (5 mAh) and can be connected indefinitely. Check the manufacturer's specs for charge time or talk to your local hobby dealer.

These basic rules will not prevent all failures, but cycling and DSV or ESV use combined with physical examination for damage, will extend the Ni-Cd battery life and help it to perform in a very PREDICTABLE MANNER.

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ZAP YOUR MODELS ! NOT YOUR HEALTH ! VENTILATE YOUR WORK AREA.

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DON'T FORGET, ELECTIONS ARE COMING UP. AND DON'T FORGET ABOUT OUR CHRISTMAS PARTY.

ALL AT THE DECEMBER GENERAL MEETING ( 12/11/87 )

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There seems to be a lack of new pilots within our ranks; let's get out there and start flying!

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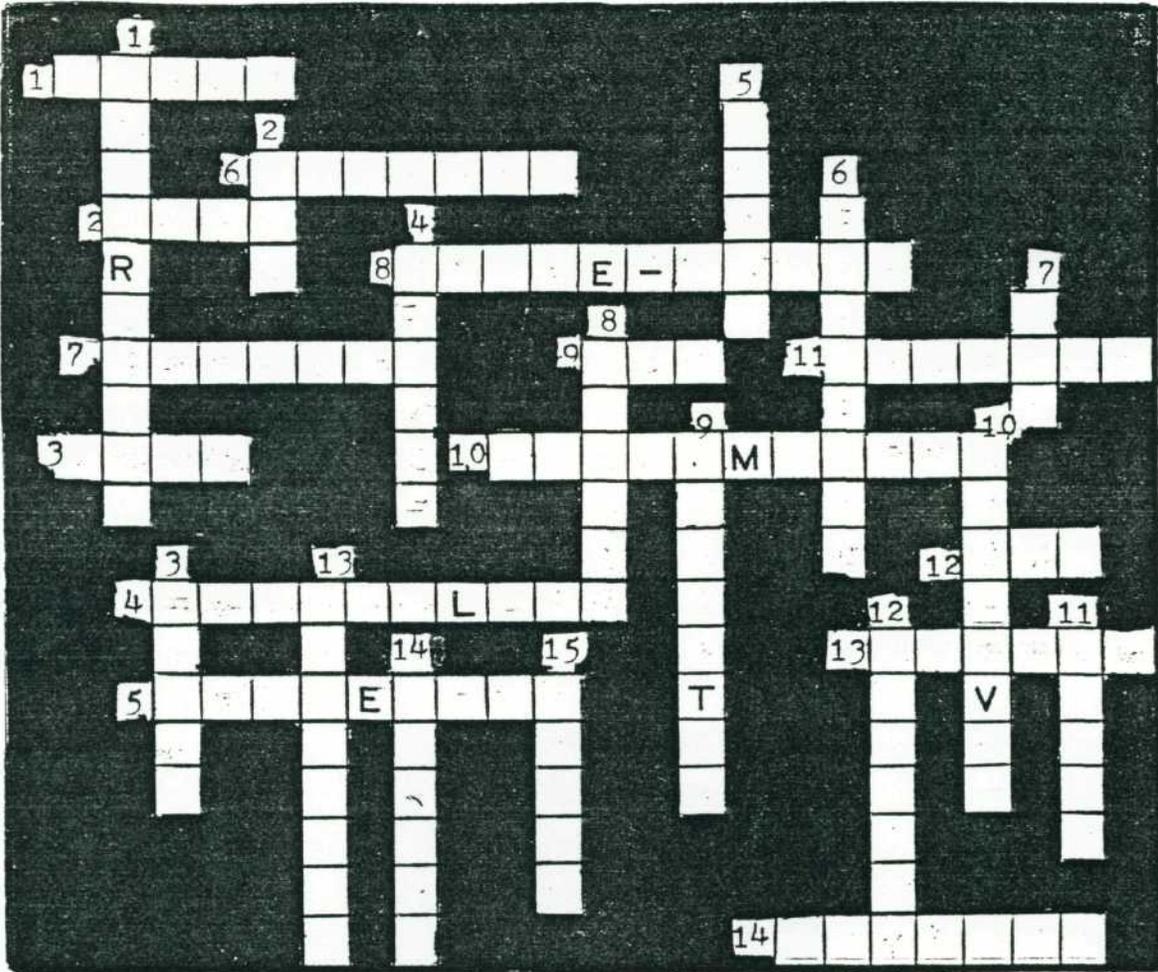
KNIGHT-TIME MIND TEASER

DOWN

- 1) Person that helps beginners learn to fly.
- 2) Organization that is a must membership for flyers.
- 3) Help in take-offs and landings.
- 4) Gearboxes in aircraft used to move control surfaces.
- 5) Rechargable batteries.
- 6) Control surface that helps aircraft climb and dive.
- 7) Instant glue.
- 8) Your batteries should have a good one before you fly.
- 9) Covering material.
- 10) Has antenna and relays command to servo.
- 11) Maintain battery life by doing this.
- 12) Plane manufacturer, mostly scale and rubber powered.
- 13) Kit manufacturer; founder's first name is Carl.
- 14) Steers and turns aircraft; back of fin.
- 15) Happens when aircraft speed is insufficient to maintain lift

ACROSS

- 1) Person who controls airplane.
- 2) Done to aircraft to make it fly true.
- 3) What every new pilot wants most to do.
- 4) Area at field where planes are worked on, fueled and started.
- 5) Located on wing, used to bank or turn aircraft.
- 6) Another name for person who flies plane.
- 7) "Bent-wing fighter" flown by arine named "Pappy".
- 8) Club meet held first weekend In August.
- 9) Abbreviation for group of people interested in flying (like scouting)
- 10) Piece of equipment needed to. give commands to aircraft.
- 11) Like a good wine, another name for old airplanes.
- 12) Yellow high-wing trainer of the 50's.
- 13) Slang for interference.
- 14) WWII fighter named for horse.



The answers to this puzzle will be available at both the October 23rd and November 13th General meetings. Hope you enjoy the puzzle.

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Anything to..sell or are you looking for something In particular?? Submit your ad to the Editor, and we'll post it In the next news letter.

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