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The Next Meeting: Thursday, Jan. 5, Dublin Community Center on Union Lake Road, just north or the village of Union Lake, 7:30 P.M.

Ampeer

SAFETY DEVICES FOR ELECTRIC AIRCRAFT

The following article is from:
Dick Miller
193 Huntzinger Road
Wernersville, PA 19565
November 10, 1994

A major advantage of electric-powered aircraft can also be major safety concern: they start at the touch of a button. I'm sure we all have, at one time or another, inadvertently left our Rx on after completing a flight. This is not a particular problem for an engine as after it has stopped, it cannot be started again without the usual procedure of gassing, spinning and swearing until it's finally airborne again. Electrics, however, have the innate ability to come alive if their Rx's have not been turned off.

This fact was brought to my attention at a recent meet when a pilot had retrieved his plane from the field, returned his TX to the impound area and left. A few minutes later, the plane

came to life and headed toward a group of spectators. Fortunately, it was captured and its Rx turned off. The channel pin had been properly procured by another pilot, but unbeknownst to him, he was controlling more than one plane.

I felt it necessary to do something about this situation and, using Radio Shack parts, designed two fail-safe latches that would disable the motor or its controller for lack of throttle signal. Because of the nature of these units, Bob Kopski recommended operating verification under flying conditions for the various R/C systems; an enormous undertaking that I am not prepared to do. Should one feel so inclined, a SASE will get you copies of both schematics.

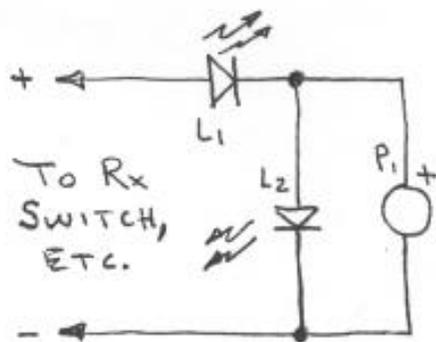
A simpler, less elegant and inexpensive device that provides both audible and visual indications of Rx status can be readily assembled as shown in the accompanying diagram.

What's in this issue?

Safety Tip - Better Than Push Rods - Cheaper 40 Power - Quiet Flight International - Brushless - Trends - Lost Foam Technique (Brushless/Trends/Lost Foam are on disk as seperate articles)

It consists of a high intensity LED, mounted on the aircraft at some conspicuous place and an piezo-electric transducer, located inside where it can be made audible without being irritating. Either indicator may be eliminated from the unit without affecting operation. A blinking LED provides inexpensive circuitry that causes the high intensity LED to blink and the piezo transducer to beep.

The total weight of unit is about 1.5g, not including its wiring. It may be wired directly to the Rx switch, connected to an unused Rx servo port or to the BEC output. Its average current drain is approximately 3.5mA. The three parts are available from Radio Shack at a total cost of less than \$6.



L1-blinking LED, #276-030 or -036

L2-high intensity LED, #276-066

P1-Peizo buzzer, #273-074

PULL/PULL CABLES

John Rimmer

from the November 1994 issue

DEAF NOTES

edited by Frank Korman

In case you haven't heard, **Spectra** has got to be the best way to control your tail feathers as it is the lightest, strongest, most positive, and smoothest of all servo to elevator and rudder

connections. Spectra is a non-stretch bullet-proof-vest fiber that is sold under the name "spider wire" where fishing gear is sold. It is slippery, small in diameter, and STRONG. A CA'd square not secures it well. I have used small pieces of Teflon for turns of more than 90 degrees. The neatest thing about this is the decrease in weight The cable or push rod system you replace may weigh up to two ounces. This will require as much as 4 ounces to be removed from the nose. That adds up to as much as 6 ounces total decrease in weight. With all this you might think it is difficult to install or requires maintenance - not true. I find it quicker to install than any other type of tail feather control and in more than a year have had not one problem. I find it much more positive than any type of cable or pushrod.

Installation could not be simpler. Finish the plane including covering or painting before installing the pull-pull cables. You can use two 1/2 A control horns on the rudder and elevator, but I use 1/32 plywood, or thin glass/epoxy circuit board. Cut a slot through the control surface at the appropriate place and use thick CA to hold the horn in place. Since full servo travel is usually 60 degrees most control surfaces should move about 30 degrees each way. I like to make the holes in the control surface horns about double the distance between the holes in the servo arm.

Tie the spider wire to the control horn with a square knot leaving some slack for

movement and secure the knot with CA. You can also use thin CA to firm up the spider wire to make it easier to poke through the holes. It is a nice touch, but not necessary, to insert plastic tubing in the fuselage where the spider wire will enter going to the servo. Carefully route the spider wires through the fuselage to the servo, taking care not to twist them creating additional drag.

Using your X-acto knife remove the sharp edge on both sides of the servo arm or wheel made by the holes; push the spider wires up through these holes and wrap them once around the screw holding the arm to the servo. I like to use a little thin CA on the spider wire that will go around the screw to prevent any possibility of slippage and loss of tension. Later you may simply loosen the set screw on the servo arm and adjust the cables for better control surface neutralization.

That is the complete picture. Don't be worried about slack in the cables because the leverage of the system seems to almost eliminate control surface sloppiness you might think would result.

Good luck with your flights and have fun soaring!

[John is a longtime top notch sailplane pilot who has become enthusiastic about E-power designing his own planes, and experimenting with various power combinations. He was the only F5B pilot to show up at the Lubbock NATS. It was there he clued me in about, and gave me some spider wire. Hence this article. His address is: 2308 Rosebud, Victoria, TX. 77901 Ph: (512) 575-8680]



An Alternative "40" Size Motor

from Herminio Perez
from WATTS CURRENT
Newsletter of the Westmoreland Electric
Soaring Society, Inc.
editor: Rich Simpson

While rummaging at a Home Depot, I saw a display for the new DeWalt cordless drills and screwdrivers. They are using a new custom motor, designed for efficiency and high torque. It is rated 220w continuous, with batteries from 9.6 to 14.4 volts. The motor is a little larger than a Mabuchi 700 (with a thicker can), with an added brush holder assembly (like the fancy 540 motors), replaceable brushes, two ball bearings and a built in cooling fan.

These drills are new on the market, so I had to order a motor from the factory, \$36, and definitely worth it, matches and exceeds the performance of a geared Astro 40. It needs a 5mm prop adapter and some decoupling caps. The brushes are big and made of silver-graphite, they cost \$7. Its a high RPM motor on 18 cells, probably would use a 9x6 at 15,000 rpm.

Call 1-800-DEWALT for the nearest part dealer, the part number is 798491-08...the dash number is for the winds, 08 for 12 cells, none for 8 cells and something else for 10 cells. The good news... the DeWalt motor definitely out performs a geared Astro 40 on 18 cells. Bob finally made the 3:1 belt drive and tried it on: 6400 rpm with a 13x12 (cutdown MA 15x12) at 30 amps, the Astro with the same prop and battery setup does 5900 rpm at also 30 amps. When the Dewalt is throt-

tled down to 5900, the current is only 25 amps. This motor is loafing at that power level.

Bob took it flying in his Kadet, the motor IS more powerful than the Astro, and barely gets warm after 12 minutes of mild aerobatics. This particular Kadet is about 8.5 lbs. Previously, he has flown it with the Astro gear box and an APC prop, much faster than he likes to fly.

**Reported in Quiet Flight
International by Ian Handley
as seen at the Militky Cup,
Pfaffikon, Switzerland**

Variable Pitch Prop - This uses a system similar to that used to change the pitch on helicopters. It is used for 10 cell and Open when it is powered by a Robbe 744/5. The pitch is programmable through an MC 20 transmitter. At launch the pitch is great and it reduces throughout the climb to keep the revs high, enabling the model to maintain speed in the vertical climb. The 7 second climb gives a gradual change from pitch 1 to pitch 2, when you nose over for the course and accelerate on the motor the pitch is set coarse for maximum acceleration. An extra servo is required to control the unit.

**Speaking of Quiet Flight**

International - I believe that I mentioned this new British magazine before, but maybe you missed it. If you want to subscribe contact Fulco Inc, 30 Broad Street, Denville, New Jersey 07834. I don't have a price U.S. or phone to give you, but this would make a great addition to your electric info. Check it out for great articles like how a brushless motor works or European trends.