# PEAK CHARGE

*Newsletter of the Silent Electric Flyers of San Diego*



Club meetings are held on the third Tuesday of each month at the Serra Mesa Recreation Center, 9020 Village Glen Drive, San Diego, at 7:15 pm. Full membership is open to all Academy of Model Aeronautics (AMA) members. Next meeting: Tuesday, February 15th, 1994. Next Fun-fly: 8:30 am, Saturday, February 19th at Dusty Rhodes Park, SW corner of I-8 and Nimitz Blvd.


Volume IV, Number 2, February 1994


## PRESIDENT'S COMMENTS

By Steve Manganelli

**Attention 1993 Members**: It is now February 1994 and if you haven't sent your 1994 renewal dues to Chuck Grim, this will probably be your last newsletter! Mid-year renewal dues are the same as now, so you might as well send Chuck Grim your $10 so as not to miss any of our escapades! If you are consciously deciding no longer to participate in our activities then I personally bid you farewell and best of luck in all (especially E-power modeling) your endeavors.

**New Keeper of the Club Trainer**: Phil Moore has graciously accepted custodianship of the club trainer which was delivered at January's funfly. Any member or prospective member wanting a get acquainted flight should get in contact with Phil whose phone number appears on the front page of the newsletter. I know Phil will try his best to make it ambulatory at Club Funflys.

**NEW Newsletter Editor (?)**: Congratulations to our new *Peak Charge* editor, *Model Builder* columnist and our old editor, Roger Jaffe. Roger informed me that his primary time constraint is evening meetings rather than editorial chores. He will edit the newsletter from all contributions received by the first of the month, and will be sending a camera ready original to Jerry Berman for printing and mailing. Thank You Roger!

**NEW Secretary**: Thank you Steve Belknap, for taking on the task of recording our meeting minutes. It's a great job and we know you'll love it! Steve also stole the show at January's funfly bringing a huge Telemaster, electrified with a geared Cobalt 40 on 18 cells. Apparently Steve's fine flyer was found completely intact in a dumpster! Steve will now need to acquire a new charger as charging 6 cells at a time really slows down the program.

**Aircraft Data Acquisition System**: We learned from January's meeting (see minutes appearing elsewhere) that Steve Neu's computerized dynamometer measures all relevant parameters defining an electric motor's performance. Measurement of current, voltage, torque, and RPM, lead to graphs of efficiency, current, and power vs torque. Once you know the characteristics of a motor at a specific input voltage, you can put a propeller on it, measure the RPM and infer the other properties from the above graphs. There is just one problem: the RPM on the ground is not necessarily the same in the air! Many factors affect the difference between static (ground) and airborne RPM including the aerodynamic cleanliness of the model, the flight profile flown, the attitude of the model during the power on, etc. For gliders or old-timers where the motor is primarily used for climbing at high angles of attack, static RPM will be close to that in the air. For a Aerobatic Model, the expected level flight RPM will be somewhat less than static and vary substantially during the maneuvering sequence.

Now enter the data acquisition system. The airborne data acquisition system as manufactured/sold by Robbe Modelsport GmBH consists of a receiver sized data storage device, a 5-cell battery pack, and up to 5 analog and digital sensors. The available sensors from Robbe measure current, voltage, altitude, airspeed, and RPM. The current and voltage sensors require integration within the electric power system, the airspeed sensor requires a pitot tube, and the RPM sensor we surmise is a photocell pointed at the spinning prop, sensing light interruptions. The altitude sensor is in effect a sensitive barometer which is calibrated for ground altitude pressure before each day's flying. The software then allows entry of an offset to define the actual altitude of your flying site.

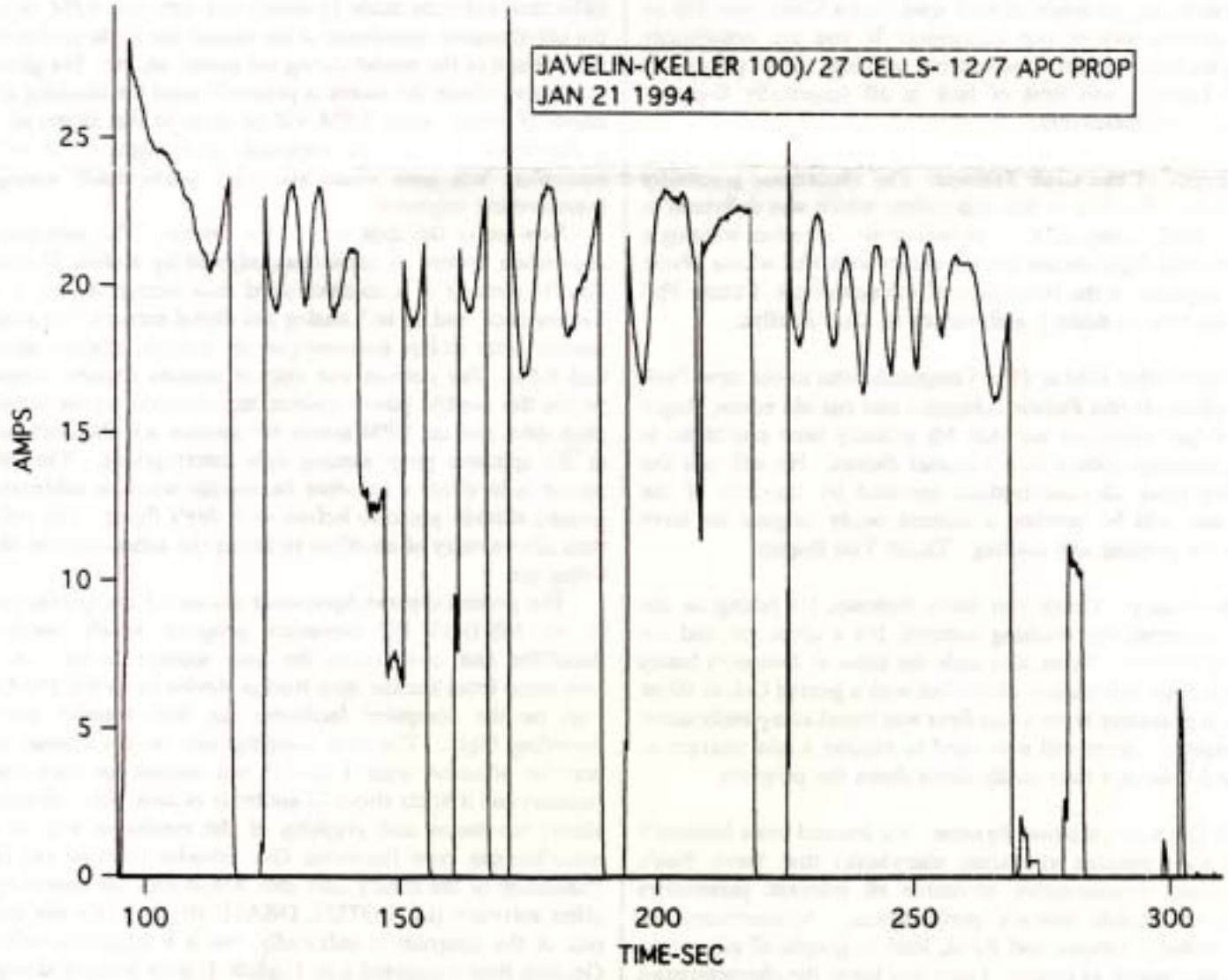
The ground support equipment portion of the system consists of an MS-DOS PC computer program which manipulates data/files and interrogates the data storage device. A cable connected from the the data storage device to an RS-232/Comm Port on the computer facilitates the data transfer after the recording flight. The data sampling rate on the storage device may be adjusted from 1 to 125 per second for each channel (sensor) and it holds about 32 kilobytes of data. The software also allows tabulation and graphing of the results as well as some housekeeping type functions. Our favorite function (so far) is translation of the binary data into ASCII files for importing into other software (i.e. LOTUS, DBASE III, etc.). It's not that the rest of the program is unfriendly, but it is originally written in German then translated into English. It goes without saying that technical jargon is very hard to translate!

We had surprisingly little trouble getting the system to work, even though we gave ourselves a few extra obstacles. Though the program was written for a DOS computer, we managed to make it work on a Macintosh by using a DOS emulation program. Not only did it slow the interrogation process down, but necessitated making a special Macintosh interconnecting cable. We then translated the binary files to ASCII, then immediately into Macintosh format for manipulation using the same program as the dynamometer (Igor).

The flight documenting the first sucessful test was made with only the current sensor functioning and is shown as Figure 1. The Javelin is an ARF sport/pattern model converted to Electric using 27 1000 mAh cells, and old Keller 100. Time 85 seconds to 115 seconds is the takeoff followed by a shallow climb and turn to downwind, followed by a vertical climb to a stall turn (motor off at the top). The next 3 bumps (up to 140 seconds are 3 loops, probably at full throttle. There is another sequence of 5 loops near the end and we think the "points" are stall turns. We learned that though the static current is near 28+ amps, the prop "unloads" in the air to between 18 and 23 amps, a substantial reduction and a handy fact to know if you are trying to optimize your model's power system. Stay tuned for additional tests using more sensors.

**Postscript**: Drag out your March 1994 *Model Aviation* (You renewed your AMA, right?) and turn to page 100. Bob Kopski's "Radio Control Electrics" column shows a graph similar to Figure 1 but of a different model and collected in real time using telemetry from the model to the ground. The actual data though looks very different! Reading the text of the article, Bob took off his Revolt! then flew level using as little power as possible to cruise in level flight. Steve in contrast, took off then did a free style pattern! As can be seen from Bob's graph, peak power is 450 watts yet his bird can maintain flight at 100 watts or less. Taking a swag at Figure 1, Steve's takoff power is about 850 watts and average power during the maneuvering sequence is about 630 watts. Do you want to optimize your setup for 22% of peak (Bob) or 74% of peak (Steve)? Your personal flying style as well as the airplane must be considered when selecting an optimum power system.

**Next Months Program** Next month's program will feature Steve Neu demonstrating the on-board data acquisition system.



# FROM THE EDITOR

Well, here I am again. Actually, the biggest part of this job is getting the newsletter printed, folded, stapled, labelled, stamped and in the mail and I certainly appreciate Jerry Berman's offer to continue this work. Thanks alot!!

Last year we only had two Steve's as club officers -- this year we have three! It confuses my writing, especially when preparing the minutes for the newsletter. Here's my solution: from now on, Steve Manganelli will be known as Our Fearless Leader, Steve Neu will be known as The Dyno Man and Steve Belknap will be known as The Keeper of the Records. Chuck, unfortunately will not have a nickname and will continue to be called Chuck. Just kidding -- I'll just use Steve M, Steve N, and Steve B -- and of course Chuck!.

On a more serious note, I received a flyer from Superior Aircraft Materials advertising their business in the Los Angeles area and letting their customers know of the recent change in ownership. Now owned by Ernie Weinberg, Superior Aircraft Materials promises to live up to the high standard of quality that the Taibi's maintained. Through April 1994, they are offering a 20% club discount on group orders over $250.00. Please bring your orders to the next club meeting and if there's enough interest we can make a club order. Their catalog is in this issue of *Peak Charge*.

Thank you for your confidence in allowing me to be your newsletter editor once again. As always, I am always interested in your ideas and articles, so please feel free to put your thoughts on paper and send them to or call me at work at 463-4455.

# MINUTES OF THE JANUARY 18th MEETING

The meeting was called to order at 7:18 pm by President Steve Manganelli

1. **Guests / New Members**: Fred Clark was a guest

2. There is now a conflict with another group which uses the meeting room before us and the meetings will be at 7:15 pm.

3. **Mission Bay Park Flying Site**: Steve discussed the site with the city -- they have a new plan which involves pumping the water in the sewer and then immediately breaking the berm, thus connecting the cove to the bay. Needless to say this necessitates new permits which will keep us out of the flying site until about June.

4. **Treasurer's Report**: This is late and will be given at next month's meeting.

5. **Club Trainer**: Phil Moore has agreed to take care of the Club Trainer Airplane and bring it to the club fun-flys.

6. There was a discussion of what was new in electric modeling that was shown at the IMS show in Pasadena.

7. Most of the items ordered from Astro Flight are in and delivered to members however we are still waiting for a few items.

8. **Program**: Steve Neu demonstrated his new dynamometer which uses a Macintosh PC for data collection and automated graphing.

9. Steve Belknap volunteered and was elected to be our new secretary.

10. Roger Jaffe has again agreed to become our newsletter editor. Jerry Berman will still publish and mail the newsletter.

11. **Raffle**:
    a. Jerry Garrison won a discount certificate from New Creatons R/C
    b. LD Coy won a bag of Sig balsa blocks.
    c. Chuck Grim won a 1965 vintage Sterling royal Coachman kit which was donated by Steve Manganelli.
    d. Chuck then auctioned the kit off to the highest bidder with the proceeds going to the highest bidder. John Day was the winning bidder at $10.

12. **Displays**:
    a. Harold Reed showed his 035 powered Strato Streak. It used five 800 mAh cells and weighs 27.5 ounces.
    b. Phil Moore showed the Tyco Jetstream Twin that he got on sale at Pic & Save for $29 complete with radio. The deal of the century!

**NEXT FUN-FLY - SATURDAY, FEBRUARY 19, 1994 - 8:30 AM**
**DUSTY RHODES PARK**
**SW CORNER OF I-8 AND NIMITZ BLVD**
**SAN DIEGO**

**NEXT MEETING - TUESDAY, FEBRUARY 15, 1994 - 7:15 PM**
**SERRA MESA RECREATION CENTER**
**9020 VILLAGE GLEN DRIVE**
**SAN DIEGO**

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