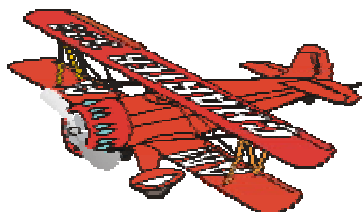


NEWSLETTER OF THE CHARLES RIVER RADIO CONTROLLERS, INC



CRRC FLIGHT-LOG

<http://www.charlesriverrc.org/>

AMA Charter 339

January 2001

Volume 38 Number 1

PRESIDENT

Tom Bauer
781-235-7344
tbauer@wellesley.edu

VICE-PRESIDENT

Jose Bruzual
617-527-1469
jebnet@mediaone.net

MEMBERSHIP SECRETARY

Dick Williamson
978-443-8549
williamson@ll.mit.edu

RECORDING SECRETARY

Chris Larsen
617-287-2721
clarsen@lynx.neu.edu

TREASURER

Miner Crary
978-443-8209
minerc@aol.com

NEWSLETTER EDITOR

Jan Kansky
978-371-2485
kansky@ll.mit.edu

RAFFLE CHAIRMAN

Pete Young ex-officio
617-484-0640
pwyoung@ix.netcom.com

WEBMASTER

Joel Foner
508-653-3560
jfoner@fonerassoc.com

NEXT CLUB MEETING:

Speaker/Topic: "Workshop Night"

Tool Tips and Techniques
January 17, 2001
7:30 PM

VERIZON

(See map on last page)

Raffle Prizes:

**Sig Somethin' Extra Model Gas
Powered Airplane Kit**

**DAW Somethin' Extra Electric
Powered Airplane Kit**

Gallon of Fuel

NEXT BOARD OF DIRECTORS MEETING:

The next directors meeting will be at the Sudbury Library Tuesday, January 24th at 7:30 PM. These meetings are traditionally held the Tuesday following the general meeting. All members and guests are invited to attend.

PRESIDENT'S COLUMN:

-Tom Bauer

Happy New Year everyone! I am honored to be serving the club this year as President. I would like to thank all the out-going officers for their work and dedication to the club. Special thanks to Pete Young as President and Dick Williamson as membership secretary. Dick has volunteered to do this job once again and we should all give him special thanks. We had a turn out of about 50 folks for the Holiday party. I enjoyed it very much, the company was great, the food was good, and the entertainment by "In the Moment" was excellent. Thanks again to everyone who contributed to make this possible. I am looking forward to this year's party.

This year Jan Kansky is taking over as the newsletter editor. If you have any ideas for articles or pictures please send them along to him. Thanks to Kenny Antonellis for his work on the newsletter this last year. Thanks also to Bob Scott for all his effort at getting monthly entertainment. This year Jose Bruzual is

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taking over this job. If you have a friend, or know of someone who would be willing to give a talk for our monthly meeting, drop him a line.

Flying continues at Davis field when the weather permits. I like to fly electrics in the cold still air of early morning. A pair of thin leather dress gloves works well to keep your hands warm, but allows you to feel all the buttons on your transmitter.

At this months board meeting we will be deciding upon events for the year. If you have any ideas, or would like to volunteer, let us know.

I was away in Mazatlan for the Holidays so I wasn't able to make the Frozen Finger Fun Fly. Sounds like the weather was not the best for this event. Mexico was warm and it was fun watching the frigate birds and pelicans thermal out over the ocean. If you have never seen this it is truly amazing. They fly just like a bunch of model (or full-scale) gliders. As soon as one finds a thermal, all the others come a flocking. I wish I had a small plane with me that I could have flown.

That's all for now, I hope everyone has a wonderful and uneventful flying year.

Tom Bauer

MEDFIELD KEYS:

As you may know, the lock is changed every year at the Medfield flying field. To secure your new key either: 1) Bring your old key to the next meeting for exchange. 2) Stop by Alex's R/C hobby shop for exchange (don't forget your membership card.) or 3) Send a SASE with your old key to Ken Antonellis, 14 Winslow Road, Natick,

MA 01760. If you do not have a key to exchange, there is a \$5.00 fee.

TREASURER'S REPORT:

REPORT DATE 12/30/00

STARTING BALANCE

Checking (after #1148)	\$1,699.08
Savings	\$4,398.70
Cash	\$25.00
Total Starting	\$6,122.78

INCOME

Auction	\$629.00
Raffle	\$114.00
Holiday Party	\$595.00
Interest	\$23.22
Total Income	\$1,361.22

EXPENSES

Holiday Party

#1149 Merrit Graphics	\$66.15
#1155 Marlboro CC	\$1,062.00
#1156 Debra Foner	\$175.00
#1157 Pete Young	\$113.38

Annual Filing

#1150 Comm Of Mass	\$15.00
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Raffle

#1151 Bill Dimpfl	\$82.44
#1154 Pete Young	\$164.61
#1161 Bob Scott	\$44.95

Newsletter

#1152 Ken Antonellis	\$135.00
#1158 Ken Antonellis	\$128.48

Winch Batteries

#1153 Dave Walter	\$196.54
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Miscellaneous

#1159 Fritz Bien	\$30.00
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Bank Fees

\$9.00

Total Expenses

\$2,222.55

ENDING BALANCE

Checking (after #1161)	\$814.53
Savings	\$4,421.92
Cash	\$25.00

Total Ending

\$5,261.45

Signature *Miner Crary*

MEMBERSHIP RENEWAL:

Don't forget to renew your CRRC membership! Please use the form enclosed in this newsletter, or talk to Dick Williamson at the next club meet-

ing. Renew before March 1st for \$5 off!

CRRC BUILDING AND FLIGHT INSTRUCTORS:

Below is our list of qualified and willing instructors. Power planes are flown at the Bill Martin Flying Field in Medfield. Sailplanes and Electrics can be flown at the Davis Farm Field on Rte 177 in Sudbury and at Callahan State Park in Framingham. See our web-site <http://www.charlesriverrc.org> for directions to the flying fields. If you have any questions about the construction of your airplane, or want to have an experienced pilot pre-flight check your airplane before heading to the flying field then call any of the building instructors.

POWER

Jon Leehey (Chief)	Wayland	508-358-5721
Bob Scott	Roslindale	617-323-6600
Pete Young	Belmont	617-484-0648
Ruane Crummett	Wayland	508-655-2234
Larry Copeland	E. Walpole	508-668-0448
Fritz Bien	Concord	508-369-1720
Neil Kaufman	Sudbury	978-443-9647

SOARING

Dick Williamson	Sudbury	978-443-8549
Ken Antonellis	Natick	508-653-4513
Fritz Bien	Concord	978-369-1720
Dave Walter	Hudson	978-562-5400
Tom Bauer	Wellesley	781-235-7344
Bruce Schneider	Hudson	978-562-9900
John Nilsson	Clinton	508-368-7136
Pete Young	Belmont	617-484-0640
Joel Foner	Natick	508-653-3560
Lincoln Ross	Waltham	781-891-0332

BUILDING

Pete Young	Belmont	617-484-0640
John Weigel	Natick	508-655-2138
Fritz Bien	Concord	978-369-1720
Dick Williamson	Sudbury	978-443-8549
Tom Bauer	Wellesley	781-235-7344
Joel Foner	Natick	508-653-3560

ELECTRICS

Tom Bauer	Wellesley	781-235-7344
Fritz Bien	Concord	978-369-1720
Dick Williamson	Sudbury	978-443-8549
Bruce Schneider	Hudson	978-562-9900
Dave Walter	Hudson	978-562-5400
Pete Young	Belmont	617-484-0640
Lincoln Ross	Waltham	781-891-0332

HELICOPTERS

Joel Foner	Natick	508-653-3560
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CRRC EMAIL LIST:

-Dave Walter

There are two ways you can join the

CRRC eGroup:

1. Send email to walter@To-pLayer.com requesting email membership. Be sure to indicate the email address you want the mail delivered to.

2. Go to the CRRC club web page at www.charlesriverrc.org, click on CRRC Email List, enter your email address in the text box, and click the button.

After signing up, you will get a welcome message from eGroups.com. Just reply to the message to accept your membership, and you're in! You should begin to get group email messages immediately. When you reply to a message from the CRRC eGroup, your reply is sent to everyone in the group, not just the original sender of the message.

This is set up as a private eGroup. That means only registered members can receive email, post messages, and access the web features. You can tell your friend about it, but if your friend isn't a club member, he or she won't be given access to the eGroup. If you're interested in an email list with wider distribution, check out the links section of the main CRRC web page.

SEEN AT THE FIELD:

DAVIS FIELD

January 1st, 2001 marked the second annual CRRC "Frozen-Finger Fun Fly". The weather cooperated by dumping 6 inches of snow on the ground and cooling down to near freezing, despite being very sunny with only a light breeze from the west, perfect frozen-finger weather. The turn out was impressive considering the weather and the fact that Fritz Bien, the contest director, scheduled Pilot Registration for 9am sharp the day after new year's eve.

In uncharacteristic fashion, Jose Bruzual was the first to arrive. He had just completed his new Zagi 400 the night before and was proud that he finished by 11:30pm, unlike his usual all-night push to complete an airplane the day before a contest. He arrived early to perform a pre-flight check and concluded: "Ready to race.". Many other flyers showed up including, Jeff Hainline, Chris Larsen, Fritz Bien, Don Black, Jan Kansky, Bruce Schneider, Eddie Ellis, Derik Veliz, Dick Williamson, and Miner Crary. Ken Antonellis was our race official and plenty of spectators were on hand including Gina, Laurie, Dave Walter, Les Gerhardt, Gene Rozea, Joel Foner, Mark Drela, Bob Doppler and others (sorry my memory is failing me at this young age).

Fritz specifically wanted to start the first race at 10:01 am because that would put the start time at 10:01 on 01/01/01. Lots of ones and zeros. (Fritz: We really should have showed up at 1 am to make it 01:01 01/01/01. -Ed) But unfortunately, because many were unprepared we had to postpone the first race until 10:10 am. It's a good thing that we made that deadline because the next opportunity to race would not have been until October 1st, 2001 at 1:01 am, or 01:01 10/01/01!

The first two events were pylon races, followed by an all up last down event, and then a few more pylon races. It is not really fair to call them pylon races because it was more of a combat free-for-all with the pylons merely "suggestions" for places to turn as Joel Foner put it. Typical heats had 7 or 8 Zagi 400s and 400xs as well as a few FMA Razors and Eddie's Custom blue foam Zagi 400 look-alike with a special custom race airfoil.

In the end the pylon races came

down to pilot skill and equipment preparation. Out of the 9 or 10 planes that launched at the beginning of the heat, maybe half completed the heat in the air. Many planes hit the snow due to pilot error, sagging batteries in the cold weather, combat kills, hitting the pylon, attempts to get one more flight out of a blown out Zagi 400 prop hub only to have it fall off 10 seconds after launch, etc... It was hard to declare a winner because all the Zagi 400s were finished with nearly identical trim schemes, making identification of an individual winner impossible. Surprisingly, no crashes were reported due to the nearly identical trim schemes.

The all-up-last-down round was won by Don Black using the new 400x power package for his Zagi. I think we may see some custom high capacity designs for future Zagi 400 all-up-last down events. Watch out Don!

Bruce Schneider demonstrated his "EPP Ski" that he used to perform ROG takeoffs and touch and go passes. Somebody was joking that they would offer a kit of the ski for \$50, (It's really just a block of foam.) There was just enough thrust coming from the direct drive Speed 400 electric motor to get the Zagi into the air after a bumpy takeoff run.

Overall the event was a great success! Thanks to Fritz for organizing the event, and for Jose for his custom made pylons designed specifically for the Zagi 400 event. Pictures of the event are posted on our web site at www.charlesriverrc.org on the PICTURES page.

Some of the guys apparently didn't get enough frozen finger fun-flying on January 1st. A core contingent made the trip out to Davis field for flying on Sunday, January 7th. Fritz reported that The

weather was great and the wind was low, the lift was "interesting". Jose reported that the most memorable event of the day was a spectacular midair collision between Don Black's electric and Helmut Lelke's sailplane. Reportedly, both planes suffered considerable damage.

MEDFIELD

The same snow that made the Frozen-Finger-Fun-Fly so much fun put a damper on Flying activities at Medfield due to the access road being snowed in. Pete Young managed to get a few flights in before the snow hit. Here are his comments:

Seeing as the weather predicts are somewhat dismal for Saturday afternoon and Sunday, I went flying today with my son (visiting from California) at Medfield. Weather was calm enough to fly the Dragonfly e-slow flyer and we also flew my Easy 2 ARF gasser. Flying was good and we used my radio glove (insulated hand bag). Afterwards we walked the frozen swamp (beside the access road) for about 1/2 hour looking for downed airplanes. The swamp was well frozen but if anyone tries this, they should not do it alone – it was possible to find thin ice here and there, which we did. But we didn't find any airplanes – if there, they may be under the ice. Lots of animal tracks also. Happy New Year to all! –Pete

INDOOR FLYING

Thanks to Bruce Schneider for organizing another great session of indoor flying on January 6th at Lincoln-Sudbury High School. The snow that fell the night before cut into the attendance somewhat, but it was worth cleaning off the car to see the RC action.

Eddie Ellis brought his LiteStick

which must have had plenty of thrust because on one pass the motor pulled itself off the fuselage. Eddie landed with the motor dangling from the nose, held in place only by the wires from the speed controller!

Mike Cormier's LiteStick served as the tug plane for Jan Kansky's indoor sailplane. The two planes were able to take flight tied to one another, but the pilots were not up to the task of maintaining tension on the tow line within the tight confines of the gym. The best flight had two somewhat acceptable turns followed by a release half way up to the ceiling of the gym. It's still a work in progress.

Several Pico indoor helicopters were flying, and several of the owners had interesting discussions with Joel Foner comparing the Pico to larger RC Helicopters.

IFOs, rubber powered free-flight aircraft, and Eddie's RC car rounded out the entertainment.

CRRC IN THE NEWS:

CRRC is getting more and more press in the modeling magazines lately, mainly because we have many outstanding, active members of the modeling community!

This last month, Mark Drela's 2 meter Allegro-Lite sailplane design was featured in Mike Garton's soaring column in Model Aviation magazine (Feb 2001, page 101). The topic of the column was new designs for RES, or Rudder-Elevator-Spoiler soaring competition. The article pointed out details of Mark's design such as the airfoil sections to address the issue of covering sag, the spar testing to ensure full zoom-launch capability, and the careful weight

budget and aerodynamic design that make the aircraft a top flight contender. Congratulations to Mark!

SERVO SPECTACULAR: SERVOS, SERVOS, SERVOS!

On the 18th of December I posted the following quiz question to the CRRC email list:

First, please tell me how many servos you own as of December 18th, 2000? Quiz Question: How many servos will it take to be the number one servo owner in CRRC?

I received a total of 32 emails over the course of the next day or two! I can only imagine the hours of lost productivity that I should be blamed for. Sorry! I think the basic conclusion everyone came to is that they had many more servos than the initially thought they had!

Here are the responses for number of servos owned : 3, 4, 4, 11, 14, 19, 24, 25, 27, 29, 31, 34, 40, 49, 50, 75, 132, 213

People basically concluded that the real name of the quiz question should have been "Guess how many servos Fritz has?" Nobody even came close. The highest guess was Don Black at 142, however officially, the quiz question winner is, guess who, Fritz Bien, who after all knew in advance what the answer was. Congratulations Fritz, 213!

Because Fritz should know a thing or two about servos after owning and using so many different types, I asked him what servos he was buying now for his indoor, hlg, sailplanes, and power planes. Here is his response:

My latest favorite servos are the Multiplex mcv2 servos. I have 2 in my

Psycho LX. They have fantastic holding power and great resolution. I wish I had more of these for the Mantis I'm building, but instead I probably will just settle on the box of Futaba S133s that I have. The servo that looks interesting is the wing servo that they sell for \$75.

In the wings I have 4 blue Volz Wing Max servos. These are very good in power and resolution, but have a nagging temperature drift problem. I haven't sent them back to Michael Volz for repair as yet. He says its due to a bad capacitor that has to be changed.

In my Ultra sport I have 5 Futaba 9101s which have great centering and stability, but they're too big for most of the modern sailplanes that don't give much room. These were the premium servos that followed the previous premium servos, the Futaba 121s. I have those in my Klemm L25. I also have 1 9201 which I bought for ailerons before I changed to have one servo in each wing.

I have the following micro-servos: 4-Cannon Ultras, which are terrible in centering and have uneven resolution and no power. They were the first to weigh less than 8 g., and I had to wait 18 months for them. They were outdated in 6 months when the FMA S80s came in.

I have 4 S80s. They were great except that their shafts sometimes slipped and the servo would change centering. A drop of CA was used to cure this problem. I needed more servos for my micro-planes, so I got the Hobby Shack CS21s. These were equivalent to the S90, which were replacing the S80s.

I was flying in the front yard and wanted to have the ultimate, so in addition to the Garret receiver, I got 3 Wes-Tech 2.4 g servos. These went into my Piper Cub as well as my Chiribiri.

I have a few dozen S48 and S148s from the radios that I got over the years which were cheaper to get the system than to just get a transmitter and receiver. These are in my combat and junk planes. -Fritz

DEEP CYCLE BATTERY CARE AND MAINTENANCE

-Fritz Bien

Since I've talked several of the regular flyers into getting deep-cycle batteries, I thought it would be nice to help them learn to take care of their investments. This is a series of articles taken directly from the Trojan battery web site: www.trojanbattery.com. I'll start with watering:

Watering:

Flooded batteries need water. More importantly, watering must be done at the right time and in the right amount or else the battery's performance and longevity suffers. Water should always be added after fully charging the battery. Prior to charging, there should be enough water to cover the plates. If the battery has been discharged (partially or fully), the water level should also be above the plates. Keeping the water at the correct level after a full charge will prevent having to worry about the water level at a different state of charge.

Depending on the local climate, charging methods, application, etc. Trojan recommends that batteries be checked once a month until you get a feel for how thirsty your batteries are.

Important things to remember:

1. Do not let the plates get exposed to air. This will damage (corrode) the plates.

2. Do not fill the water level in the filling well to the cap. This most likely will cause the battery to overflow acid, consequently losing capacity and causing a corrosive mess.

3. Do not use water with a high mineral content. Use distilled or deionized water only.

CAUTION: The electrolyte is a solution of acid and water so skin contact should be avoided.

1. Step by step watering procedure:
2. Open the vent caps and look inside the fill wells.
3. Check electrolyte level; the minimum level is at the top of the plates.
4. If necessary add just enough water to cover the plates at this time.
5. Put batteries on a complete charge before adding any additional water (refer to the Charging section).
6. Once charging is completed, open the vent caps and look inside the fill wells.
7. Add water until the electrolyte level is 1/8" below the bottom of the fill well.
8. A piece of rubber can be used safely as a dipstick to help determine this level.
9. Clean, replace, and tighten all vent caps.

WARNING: Never add acid to a battery.

GUIDED TOUR OF CRRCsim

—Mark Drela

The CRRCsim Project was kicked off when Jan Kinsky announced on the CRRC Email List that he was working on porting a freeware flight simulator out of NASA Langley to run on his home computer. He was looking for a means to generate the aero data for any arbitrary airplane to plug into the simulator. Coincidentally, I had the means to generate such aero data and was looking for a simulator to plug it into... A flurry of email code exchanges between me and Jan followed. The initial CRRCsim version was announced by Jan shortly thereafter.

During the quick development, I discovered that the "guts" of the Langley simulator code which computed the aerodynamic forces had serious limitations. It assumed that the aircraft didn't deviate very much from a single cruise speed, and performed only benign maneuvers. If these restrictions were violated, the computed forces would be seriously in error, and unrealistic flight behavior might result. I completely replaced the Langley code with new code which does not have such restrictions. Even relatively violent maneuvers can now be simulated with reasonable accuracy.

The writeup below gives a brief overview of flight simulator basics. The features specific to CRRCsim are then described at the end.

Simulators 101

All flight simulators use the same basic approach to keep track of the aircraft. At any instant in time, the simulated aircraft has some location and some orientation. These are defined by

six numbers: the aircraft's x, y, z coordinates (3 numbers), and by its heading, elevation, and roll angles (3 more numbers).

These six quantities are used by the graphics routines of the simulator to display the aircraft at that instant. As the quantities change in time at some fast rate, the airplane's position and orientation changes, so that it appears to fly — just like in a movie.

The main problem for the simulator program is to rapidly calculate the correct sequence of the six quantities, according to the airplane's properties and the pilot's control inputs. The more accurate this calculation is, the more realistic the plane's flight behavior appears.

Updating all six quantities requires calculation of the forces and moments (torques) on the aircraft. Some, like gravity forces or gyroscopic moments, are easy to compute. They only require knowledge of the mass and inertias of the aircraft, which are specified by the user. Other forces, like thrust, are set directly by the pilot himself. The remaining forces and moments are aerodynamic in origin, and are the most difficult to compute.

CRRCsim simulator

CRRCsim computes aerodynamic forces and moments from data generated by a "Vortex Lattice" program AVL, which in turn takes its input from a geometric definition of the aircraft. The geometric definition consists of chords, dihedral, twists, airfoils, control surfaces, etc. which are specified by the user. AVL is in effect a numerical wind tunnel which simulates the airflow over the specified configuration and computes the force and moment data. For exam-

ple, it computes the Coefficient of Lift (CL) versus angle-of-attack curve which might otherwise be measured in a wind tunnel. AVL actually computes about 20 such curves — 3 forces and 3 moments, versus 2 flow angles (angle-of-attack and sideslip angle), and 3 rotation rates (roll, pitch, yaw rates), in appropriate combinations.

The AVL simulation accounts for most of the important aerodynamic phenomena which might be present, e.g. the wing downwash effects on the stab, roll moment due to sideslip angle, adverse yaw moment of ailerons, etc. Other customizable simulators on the market must use more crude estimates for these effects, since their simple geometry input does not allow specification of the necessary geometry details needed for high-fidelity calculations.

Although AVL's aerodynamic force and moment results are valid for any airspeed, its accuracy starts to degrade if the angle of attack or sideslip angles exceed about ± 20 degrees from straight ahead. This is due to flow separation, stall, etc. which AVL does not model. Flow separation occurs quite infrequently even during violent flight maneuvers, but it's essential that the computed forces remain at least reasonable for any flow angle. In a tail slide, for example, the angle of attack is about 180 degrees! If the resulting computed moments completely unreasonable, then the tailslide recovery will not be realistic.

For maximum accuracy, CRRCsim itself estimates separation-caused drag forces and moments, and adds them to what AVL's output predicts. The overall result is very realistic behavior of the aircraft in any flight situation.



THE CHARLES RIVER RADIO CONTROLLERS, INC

AMA Charter 339

2001 MEMBERSHIP APPLICATION

Name _____ AMA No _____

Street _____ Birth Date (AMA reqmnt) _____

Town _____ State _____ Zip _____ Tel. () _____ - _____

e-mail _____

To receive membership card and field pass, bring this application to a club meeting, or mail with a **copy of your current AMA LICENSE**, appropriate dues, and a **SELF ADDRESSED STAMPED ENVELOPE** to:

Dick Williamson /Secretary CRRC
P.O. Box 398
Lincoln, MA 01773
Telephone (978) 443-8549
email: williamson@ll.mit.edu

I WOULD LIKE TO PARTICIPATE IN:

- ☐ CONTESTS ☐ FUNFLYS
☐ I DO NOT want my address to appear in the club phone book

	New Members	Renewals
OPEN Member	\$30.00	\$35.00
SENIOR member (if age 60 before July 1)	\$20.00	\$25.00
JUNIOR member (under 19 on July 1)	\$15.00	\$20.00
Full-time STUDENT	\$15.00	\$20.00
Family member addtl to OPEN membership	\$15.00	\$20.00
		Deduct \$5 if paid before Mar 1

I'M INTERESTED IN THE FOLLOWING:

- ☐ TRAINERS/SPORT PLANES ☐ ELECTRICS ☐ HELICOPTERS
☐ GLIDERS ☐ PATTERN ☐ RACING
☐ SCALE/SEMI-SCALE/QTR SCALE ☐ DUCTED FANS ☐ SEA/FLOAT-PLANES
☐ OTHER (specify) _____

FREQUENCY DATABASE

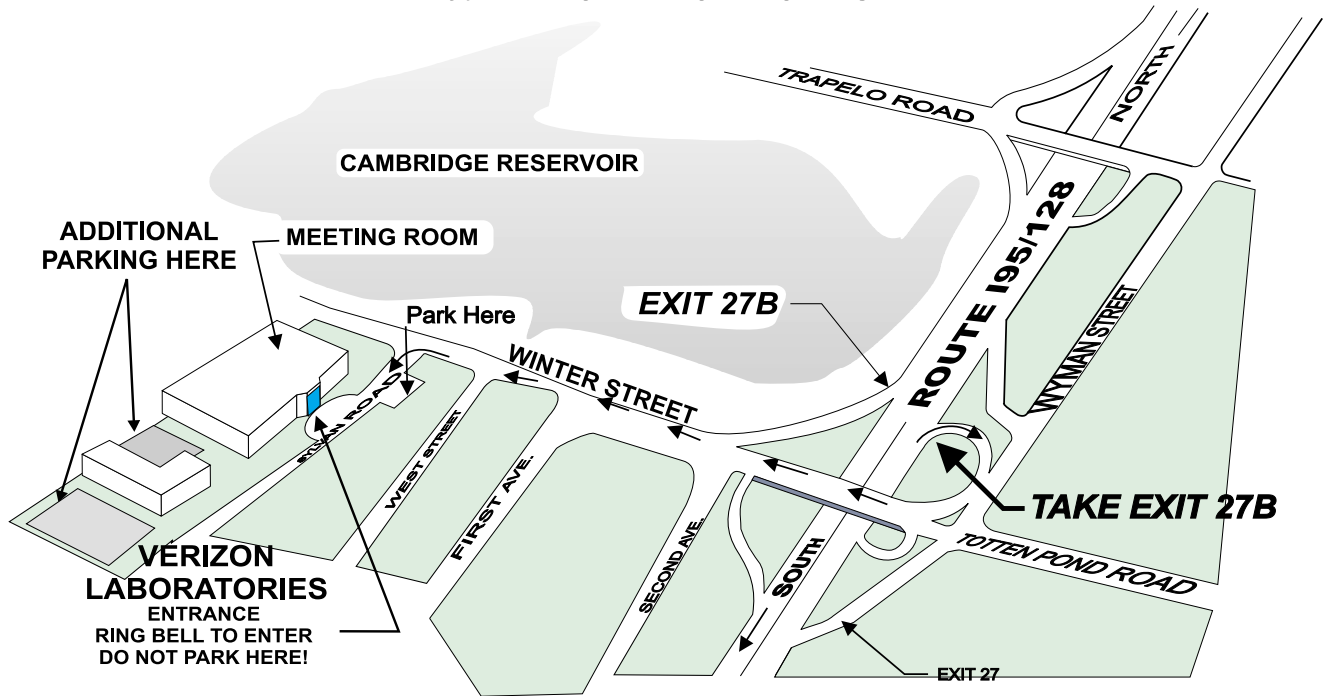
This database is made to help you select future radios that have the fewest conflicts with ones used by others at the flying field. Put the number of transmitters that you own for each frequency. **ADD D IF IT IS YOUR PRIMARY FREQUENCY AT Davis Farm, and M if it is your primary at Medfield.**

11 _____ 16 _____ * 21 X 26 _____ 31 _____ 36 _____ 41 _____ 46 _____ 51 _____ 56 _____
12 _____ 17 _____ 22 _____ 27 _____ 32 _____ 37 _____ 42 _____ 47 _____ 52 _____ 57 _____
13 _____ 18 _____ 23 _____ 28 _____ 33 _____ 38 _____ 43 _____ 48 _____ 53 _____ 58 _____
14 _____ 19 _____ 24 _____ 29 _____ 34 _____ 39 _____ 44 _____ 49 _____ 54 _____ 59 _____
15 _____ * 20 X 25 _____ 30 _____ 35 _____ 40 _____ 45 _____ 50 _____ 55 _____ 60 _____

*These channels cannot be used at CRRC fields due to the close proximity to TV Channel 4. HAM LICENSE CHANNELS: license will be checked at the field!

01 _____ 02 _____ 03 _____ 04 _____ 05 _____ 06 _____ 07 _____ 08 _____ 09 _____ 10 _____
53.1 _____ 53.2 _____ 53.3 _____ 53.4 _____ 53.5 _____ 53.6 _____ 53.7 _____
53.8 _____

LOCATION OF MONTHLY MEETING
FOR THE CHARLES RIVER RADIO CONTROLLERS
at VERIZON LABORATORIES



JAN KANSKY
159 ELSINORE ST #2
CONCORD, MA 01742