# OMFC Fliteline

The Newsletter of the
Oakville Model Flying Club
February 2001

## O.M.F.C. WINGS PROGRAM GRADUATES

Photo Bert Armstrong

The above members were present at the January meeting to receive their "Wings". Left to Right. John Schipper. Richard Els, Bart Panchenko, Alex Strzalkowski, Ian Windsor, Ian Thompson, Martin Visentin, Brian Anderson

(After viewing the above picture and checking with the C.F.I. and the other Instructors, the following has come to light: Believe it or not, **Ian Windsor and Ian Thompson**, both received their "Wings" this year. Congratulations "Evil" and "Good" Ian. Please accept my apology for missing both of you in the January Fliteline) Editor

## MARCH MEETING

Now is your chance to get the straight goods on batteries. The guest speaker for the March meeting will by Mr. Chris Thompson. Chris will be discussing batteries and in particular Sanyo batteries. (His employer). I would hope that we get a good turn out for this meeting. Batteries and battery power is all that keeps us in the air and if it fails we all know the consequences. Are Nicads the best battery for us to use in our airborne packs or should we be looking at the "Lead Acid" or Lithium batteries. How safe are the Lithium's. (At one time lithium batteries were considered very explosive and caution had to be exercised around them. What's new in the battery industry. The nicads that we are using today are the button cells for the late 1950's. Is "memory" an urban myth or is it a real problem in our sport/hobby. These are just a few of the questions that could be put to our guest. Feel free to ask them and any other question dealing with batteries.

# OMFC 2000/2001 Executive

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## TORONTO WEST SWAP MEET

The Oakville Model Flying Club hosted the third annual Toronto West Swap Meet on Sunday, February 4th. This meet has been growing over the past few years and continued to grow this year. For the first time, we attracted dealers, specifically "The Battery Boys " of Mississauga (www.interlog.com/~adias) and Gold Scallop.

A total of 21 tables were occupied by vendors, and we had more than a 100 guests looking for items to purchase. The hall was opened by 8:00 AM to allow the vendors time to set up the tables, and we had to open the hall to the public by 8:45 AM instead of 9:00 AM, due to crowding in the entrance. The tables had a wide assortment of goods for sale, and many guests were spied leaving the hall with their arms full and sly grins on their faces.

By late morning most of the deals had been snapped up and the number of guests entering was dropping off, so we closed the swap meet down at lunch, folded up the tables , and I went back home to bed. We had a very successful day. Our swap meet is growing rapidly and developing a good reputation. Next year should be even better.

Eric Genzer

# *OMFC Dates for 2001 Season*

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|---|---|---|
| March | 5, 2001 | Regular Meeting 7:30 PM, Unit 13, 785 Pacific Rd, Oakville |
| April | 2, 2001 | Regular Meeting 7:30 PM, Unit 13, 785 Pacific Rd., Oakville |
| May | 4,5,6, 2001 | Toronto Aviation Show, (Willem Sikma) Downsview Airport |
| | 7, 2001 | OMFC Beauty Contest 7:30 PM, Unit 13, 785 Pacific Rd., Oakville |
| | 26, 2001 | OMFC Electric Fun Fly, (John McNicol) North Field |
| June | 9/10, 2001 | OMFC Scale Aerobatics (Bob Hudson), South Field |
| | 24, 2001 | OMFC Air Show (DanMorgan), North Field |

# METALS FOR MODELERS

Roy Vaillancourt

## ALUMINUM

One of the most abundant metallic elements, aluminum is also one of the most versatile engineering and construction materials available today. Its wide range of alloys can satisfy many diverse requirements, including high strength, light weight, good corrosion and tarnish resistance, and good electrical and thermal conductivity. And aluminum's attractive silvery luster makes it easy on the eye.

Although pure aluminum has a relatively high melting point — 1200 degrees Fahrenheit — most of its alloys can be easily fabricated, machined and joined. Aluminum is available cast, forged or wrought, such as in plates, bars or rods. It is non-toxic and can be attractively finished by many common methods including painting and anodization — a chemical etching process. The three alloys most commonly used for modeling are 2024-T4, 5052-H32 and 6061-T6.

**2024 - T4**

T4 is a well known aluminum-copper alloy that has been heat treated in solution and then naturally aged to a stable condition. It is available in sheet, strip, plate, block, rod and tube form. A very rigid metal, it is easily machined. Its mechanical properties include high strength and excellent resistance to fatigue under tensile or compressive loads. However, because it doesn't bend easily under load, it is not easily formed by bending, as in a brake. In fact, T4 fractures readily at the bend line and is likely to crack at stress concentration points under vibration. Although it is not good for engine mounts it is commonly used to make pistons and connecting rods in engines, pivot blocks, scissors or air cylinders on retracts. It should not be used to make bending brackets of any type.

**5052 - H32**

A strain-hardened and stabilized aluminum-manganese alloy, H32 has moderate to high strength properties but is not heat treatable. However, it exhibits good welding and brazing characteristics with a high resistance to corrosion. Most commonly supplied in sheet metal form, it is generally not available in thickness over 3/16 of an inch. H32 is excellent for bending into brackets and similar hardware. When bending, keep the internal radius of the bend equal to 1.5 times the thickness of the material or greater.

**6061-T6**

T6 is an aluminum –silicon-magnesium alloy that has been heat-treated in solution and artificially aged. Of all the aluminum alloys, T6 machines the best and has excellent brazing and welding qualities. It demonstrates very high resistance to cracking under stress and is easily formed by bending or pressure. A medium strength alloy with high corrosion resistance, it is used in many heavy-duty structures such as engine mounts and landing gear components.

For machining aluminum, the best cutting agent and lubricant is kerosene. Next best is a light machine oil like Marvel Mystery Oil, but even candle wax can be used without difficulty.

One thing to remember when finishing aluminum is that for the common man getting paint to stick to it is very tough. Not because we can't paint right, it's because our finishing method does not agree with what aluminum wants to see. Aluminum naturally forms a thin surface layer of oxidation. (This is that black stuff you get on your hands when handling untreated aluminum.) This layer forms rapidly on fresh cut material and prevents the rest of the material underneath from oxidizing or corroding. Even if the part looks shinny, this layer may have already formed. This is why aluminum is considered very corrosion resistant. However, this very same layer is what makes it very hard for paint to stick. Well some of you may say, "I'll out smart this material and use some epoxy paint". Truth is, no matter what paint you use if the surface isn't prepared right the paint will peal right off.

The best way to prepare aluminum is to dip the part in a chromic acid etching bath just prior to priming. This bath removes all oxidation and applies a thin protective top layer that adheres to the aluminum and accepts any paints very well. Painting should begin as soon as possible after the part is dried off but it is possible to wait up to 24 hours, without too much harm. Once the primer is on all other painting can proceed at a normal rate. Well most of us don't have a chromic acid bath at home so how do we handle this problem.? The best way is to sand the entire part with 320 or 400 wet-dry sandpaper used wet. Dry the part off by use of a heat gun or forced air. Wash right away with Acetone or thinners compatible with the paint you will be using. Again dry off and commence applying primer. Once the primer is on you can relax. If you had to stop anywhere in the process before you got primer on the part you'll have to start all over with the sand paper etc.

## LEAD

Probably the second most used metal used by modelers. When was the last time you built a nose heavy plane? Lead is most commonly used by modelers as ballast. This bluish-gray metallic element is very dense with a specific gravity of 11.35. This means it is very heavy for a given volume. Lead is a soft, malleable and ductile material. Its melting point is quite low at 625 degrees F. Lead is also useful for generating electric current in electrochemical applications such as batteries. It can be readily and inexpensively fabricated into many forms. It is used as an additive to some metals to make them easier to machine and it is also a major alloy in most solders. Lead is sometimes added to "plain" bearings to aid in lubrication and ease of fabrication

## COPPER

Probably the first metal to be smelted form its ore. Copper is a very useful material that has a number of desirable properties. It resists corrosion, provides outstanding electrical and thermal conductivity, and has good ductility. While its strength-to-weight ratio is relatively low, Copper is considered a heavy metal. Pure Copper melts at 1981 degrees F. It can be polished to a high luster. It is non-magnetic and combines well with other metals to form a wide variety of useful alloys. It is easy to fabricate and can be either hot or cold worked to increase its strength. What this means is that as you bend Copper, if you were to bend the same area back and forth repeatedly the material actually gets stronger at the bend. The down side is that as the strength and stiffness goes up so does its stress cracking probability. So the trick here is to know just when to stop working it before you start to fatigue it. For most of our uses today there are two basic forms of Copper.

### C110

This is 99.9 percent pure Copper. It can be bent, riveted, drilled, milled, filed, soldered, brazed and welded to most any configuration. Most common use is electrical connections and ground straps etc.

### C112

A harder version of the C110 that can also be easily brazed and soldered. It is harder than the C110 so it may require annealing prior to bending and/or shaping. Annealing is a softening process that is accomplished by heating the part to a burgundy red colour and letting it cool naturally. The annealing process can be applied Or it may be done locally (only to certain areas).

Like aluminum, Copper also likes Kerosene as a cutting agent when machining it. Also like aluminum, Copper forms a thin oxidation layer that helps it become very corrosion resistant. This oxidation layer, however, does not form as fast as aluminum's so painting Copper is not as big a chore. The do-it-at-home modeler should follow similar techniques as used on aluminum when it comes to painting Copper.

## BRASS

Brass is really an alloy of 70 percent Copper and 30 percent Zinc. Brass is an excellent metal for cold working and shares many of the same properties of Copper but Brass is stronger. Increasing the Zinc content increases strength and ductility. Brass can also be annealed the same was Copper is. Brass is considered a "self lubricating" metal and very rarely requires a lubricant in either machining or in use. Brass sometimes had Lead added to aid in machining and forming. There are many special alloys

### C260

Known as "cartridge brass" C260 has a high Zinc content that gives it optimum strength and ductility yet still retains the high formability of Copper. It has excellent cold workability and is used extensively in the automotive field. It is also the most common form of Brass used for plumbing goods, builder's hardware, and ammunition.

### C330

Most widely used for the fabrication of tubing. A low Lead content of .5 percent gives this alloy good machineability and excellent cold working properties. It can be fabricated by forming, bending, machining, piercing and punching. It can also be brazed, soldered and welded similar to Copper. Of all the Brass alloys this is the one that is used most widely for brazing steels and dissimilar metals together.

### C360

Considered a "Leaded" Brass, this allow also has a high Zinc content of up to 37 percent. The inclusion of lead gives this high strength alloy a "free-cutting" quality making it easier to machine. Often called "Leaded Brass" or "Free machining Brass" it finishes well and is the most easily plated, soldered and brazed Brass alloy.