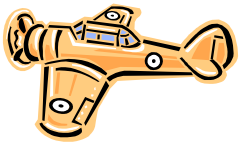
News Letter



August 2002

Website http://www.users.bigpond.com/natlighting/qmac.htm

President	Fred Lambert	62973206
Secretary/Treasurer	John Frost	62380788
Safety Officer	Max Dumbrell	62382239
Committee Members	Thomas Kelly	62271324
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Newsletter Editor	Stuart Barber	62559655

Welcome to the August 2002 newsletter.
The Large Model day held on the June long weekend was a cold and windy affair but still some pilots braved the elements and committed flight, results are as follows:

First Place Scale Civilian
Max Dumbrell-Druine Turbulent

Second Place Scale Civilian
Peter Van Den Waterbeemd-CAP 21

First Place Sports
Fred Lambert-Ultra Sport

Second Place Sports
John Daws-Phaeton

QMAC Committee Meeting.
28th May

QMAC committee meeting was held on the 28th May at Tom's house

Main items resulting from the meeting are:

- Increase in club fees will only be the amount increased by the ACTAA.
- Some new members with only 10KHz spacing from odd frequencies.
- ACTAA now have a events organiser (Murray Scott). This will help to stop local club event clashes.
- Club response to MAAA Part 101 regarding MAAA reluctance to relax inspection requirements for models 7kg-25kg.
- Tom to provide more raisin toast.

What's on?

ACTAA AGM
7th August

Millennium Cup Glider Competition
18th August

Family Day – Club Field
25th August

QMAC AGM – Club Field
6th October

Please visit the QMAC website for any late changes to events.

Toilet.

Those who braved the Large Model day in June would have luckily found the toilets finished and in full working order. Well done to those involved, it has improved our facilities no end and makes our club events just a little more comfortable.

Field Markings.

The landing strip has now been marked out using painted copper logs, this has made it a lot easier for landing approaches as the strip is now highlighted. The pits area has also been marked out and the taxiing line is now more apparent.

Email.

I have been receiving a few non delivery messages, so if you have changed or know of someone who has , please forward me the details.

Methanol.

The club is again looking at purchasing a 205-litre drum of methanol, if you are interested please let Fred or me know. Price is yet to be finalised due to freight costs.

Thanks to Murray Scott for the following article on Jets over Sydney 2002

Jets over Sydney 2002 (Nowra)

Jets Over Sydney 2002 (Nowra) was organised over 3 days on the Queen's birthday holiday weekend, Friday through Sunday, leaving the holiday Monday for interstate visitors, homeward travel. With visitors from all Australian mainland states bar the Northern Territory entering this year, the travel consideration is much appreciated. Two internationally recognised jet modellers also attended, a flyer from Thailand who was the principal organiser of the recent World Jet Masters in Thailand, Piyasin Changtrakul, from Chang Mai, Northern Thailand, and David Gladwin, noted model jet journalist, formerly of the UK, and now resident in Australia.

Jets Over Sydney is jointly organised by "The Shoalhaven Model Flying Club" and the "Jet Flyers Association NSW".

Friday is principally a set up day for both the organisers and flyers. Saturday is the best day for visitors; Tom and Peter Drury were seen amongst the visitors as was Max Rixon, who are all BMAC members.

ACT was represented by Garret McDonald, and Peter Hamilton, both from the Canberra Club, Garret flying his turbine powered Mick Reeves "Super Reaper", and Peter a Kyosho ducted fan "F86" and our own BMAC member Geoff Woodward flying his usually very exciting routine with a helicopter, during the lunch break demonstrations.

Weather was great for Friday, reasonable for Saturday, and poor for Sunday, in spite of the weather plenty of flying took place on all days, two models suffered damage due to the extreme turbulence, one on take off the other on landing.

On Saturday the judging for scale and sports models was carried out, as well as an award for technical achievement. Target speed was contested on Saturday and Sunday the object was to fly past the Radar gun at exactly 100mph on Saturday and 130 mph on Sunday. Quite fierce competition ensued on both days with Rick Davies from Adelaide taking first and second place with 99.9mph and 100.2mph. Local Shoalhaven Club member Mike Beverly winning on Sunday with 129.9mph, John Forrest from Sydney Jet Flyers came second after 22 passes of the Radar in one flight.

This proved to one too many as he ran out of fuel and landed on the large dam that borders the flight line, with no apparent ill affects to the model.

A trend obvious at this year's event was the growing popularity of smaller turbines of approximately 5kg thrust. These smaller turbines apart from being cheaper to buy, they are suitable for retrofitting to many existing 90 size ducted fan models. Turbine engines for the first time in Australia were in equal numbers to their ducted fan counterparts.

Saturday's photo call saw 34 models presented, 17 of them being turbine powered.

If you have a fascination for jets, mark the Queens birthday

long weekend June 2003 for a trip to Nowra.

Murray Scott

Members Please !!!!!

Please ensure when you lock the gate, remember to put our lock thru the farmers lock.

Ha Ha Ha Ha Ha

A woman stopped by unannounced at her recently married son's house.
She rang the doorbell and walked in. She was shocked to see her daughter-in-law lying on the couch, totally naked. soft music was playing; the aroma of perfume filled the room.
"What are you doing?" she asked.
"I'm waiting for my husband to come home from work," the daughter-in-law said.
"But you're naked!" the mother-in-law exclaimed.
"This is my love dress," the daughter-in-law explained.
"Love dress? But you're naked!"
"My husband loves me to wear this dress," she explained. "It excites him no end. Every time he sees me in this dress, he instantly becomes romantic and ravages me for hours on end. He can't get enough of me."

The mother-in-law left. When she got home, she undressed, showered, put on
Her best perfume, dimmed the lights, put on a romantic CD and laid on the couch waiting for her husband to arrive.

Finally, her husband came home. He walked in and saw her laying there so provocatively.

"What are you doing?" he asked.

"This is my love dress" she whispered, sensually.

"Needs ironing," he said.

MODEL AERONAUTICAL ASSOCIATION OF AUSTRALIA INC.
MEMBER OF THE AUSTRALIAN SPORT AVIATION CONFEDERATION
ABN 64 819 095 900

Date: 24 June 2002
From: Ivan Chiselett/Federal Secretary
To: All M.A.A.A. Clubs and Affiliate Members
Subject: 2002/2003 Fee Increase - Insurance Cost Escalation

Dear Member,

As you would be aware there is a crisis within the insurance industry at present, in particular with third party type policies, and many organisations have been unable to obtain affordable cover. This has again affected the MAAA but, due to our track record over many years, not quite as severely as for some other organisations.

As advised in the M.A.A.A. Newsletter No. 1, 2002, the M.A.A.A. was not able to obtain a final quotation for the insurance at the time of the Council Conference in February. The "quotes" given at the time were only indications and the insurance companies advised that these prices could change before the policy starting date of July 1. Even so the prices quoted at this time were considerably higher that those for the previous year.

Council included an insurance contingency amount of $20,000 in the budget and hoped this would cover the situation. It stated that the fee might have to be adjusted in the event that this amount was inadequate. This resulted in our provisional senior fee, for example, rising by $10. This was all for the additional insurance budget compared to the original HIH quote for 2001/2002 on which last year's fees were based.

The M.A.A.A. has been monitoring the situation and were verbally advised at the end of April that at that stage no further increase was expected. It was therefore a significant surprise when, after pressing the Broker for a final quote since 1st June, the final quotation arrived on 21st June. This was for a total amount of $276,083.55, excluding GST. This represented an increase of 101% over the actual insurance payment for 2001/2002. More seriously, the insurance quote is $114,882.37 (excluding GST) above the budgeted amount even allowing for $20,000 from the contingency fund.

The M.A.A.A. has a policy of only dealing with AAA rated underwriters to minimise a risk of the HIH problem being repeated. The Broker advised he contacted four other underwriters to obtained competitive quotes. They responded that they could not improve on the quotation that we have or that they were not prepared to quote.

The M.A.A.A. Executive immediately called an emergency Council meeting to discuss the situation. The Council met by tele-conference on Sunday June 23 and considered that the M.A.A.A. could not absorb this massive increase in cost. It was reluctantly agreed that full amount would have to be passed onto the membership.

The M.A.A.A. insurance quotation is based on a membership of 9300 members. Therefore, the addition amount is $12.35 per member to which GST has to be added. On this basis the amount would be $13.59 per member.

The M.A.A.A. Council decided that, to cover the increase insurance costs, all membership fees should be increase by $13.50 from the provisional amount set at the 2002 Council Conference.

Therefore, the total M.A.A.A. fees for the year 2002/03 are Seniors & Pensioners $63.50 and Juniors $33.50.

Many members will have paid their fees already based on the provisional amount. It is regretted that they will now have to pay the additional amount. Their State Association and Club will advise how this is to be managed. In order to allow time for this process anyone who paid the provisional annual fee prior to being advised of the change will have until the 31st August 2002 to pay the $13.50 before being considered unfinancial and hence not covered by MAAA Membership benefits, including insurance. Any moneys paid in advance for membership that is not taken up will be refunded.

One important change to the insurance policy is that there is "no cover for activities outside the normal activities of the Association, State and Territory Associations and affiliated Clubs unless specifically declared (for example, displays at shopping centres, sporting events etc.)". This is only a requirement for advice and there is no expectation of additional cost.

This means that if your club is planning a display of any kind or an activity out the normal, you must advise your State Secretary, at least 14days prior to the event, who will then advise the M.A.A.A. Please do not leave it to the last minute, as we all need time to ensure that the appropriate people are advised. The M.A.A.A. Public Display procedure will also cover this.

The Council appreciates that the insurance cover afforded our members is an extremely important aspect of our membership and this cover must be maintained for our members. Indeed, in today's environment, anyone flying a model aircraft anywhere without adequate insurance is taking a severe risk on his or her financial future.

The Council is disappointed that it has had to make this large fee increase to our Members but unfortunately it is out of our control. This fee increase is exclusively a result of insurance cost which, whilst high, is not as severe as many other similar organisations have had to endure. Nevertheless, Council agreed that the M.A.A.A. should write to the appropriate Government authorities expressing our concern at these massive insurance costs, which threatens the existence of Associations like ours.

Yours Sincerely
(Ivan Chiselett)

ABC's ABOUT GLOW FUEL

Fact (A) - It's quite likely that no other single facet of modeling generates as many myths, misconceptions, misunderstandings, errors (and more than a few lies), or as much outlandish goofiness as model fuel, one of our absolutely necessary, non-optional items for powered flight.

Fact (B) - Of all the above, the one fact that rouses the most questions - and without doubt the most wrong answers - is the ongoing nonsense about the amount of oil required in model fuel.

Myth: Model Glow Fuel must contain XX% oil to operate properly, perform well and protect the engine.

Fact: There is no such fixed number or at least not a valid one.

Why not? Think about it: In order for this to be true, all oils used in model fuel - all of them - would have to be identical in every characteristic. Does anyone honestly believe they are? I doubt it.

While lubricants compounded for full-size engines - automotive, recreational vehicle or aircraft - are rarely, if ever, suitable for use in model engines (for many reasons), nevertheless, there are a number of base lubricants that are available for our highly specialized use. However, most of these must be modified slightly or extensively by the use of a variety of additives and modifiers.

While Klotz model oils are perhaps the most well-known to the average user, and are quite good, they are by no means the only lubricants available to model fuel blenders, and there are currently a number in use. Each has its own "personality" - its own set of technical specifications and characteristics.

At this point, we should point out that we• re speaking of the so-called "synthetic oils" popularly used in modern model fuels. Castor oil, the oil of choice, and, indeed, the only suitable model engine oil for many years, is more of a common and known factor. Assuming a good grade, if a fuel uses only castor as its lubricant, then we could give you a fixed percentage, at least for the various engine groups and types. However, few model fuels intended for R/C use today contain only castor oil as the lubricant. For the purposes of this discussion, we will only deal with fuels containing either straight synthetics, or a blend of castor and synthetics.

So, what does all that mean?

Let's draw a little picture here: Suppose at some point in your life, you become concerned about living a long and healthy life, so you decide to consult a doctor for advice as to how to accomplish this. When you come to the subject of food, you say, "Well, tell me, Doctor, if I wanna still be healthy and virile at 90, how do I eat?" The good doctor replies, "M'boy, if you will eat two pounds of food a day, you'll be fine!"

My guess is your response would be something like, "well, what kind of food, Doc? After all, no two are exactly alike, is that two pounds of lettuce or two pounds of pork chops?" If he replied, "It doesn't matter. Just as long as you eat that two pounds every day, you'll probably outlive your kids." My bet is that you'd run, not walk, out of that quack's office!

Why, then do we blindly follow someone's Word From On High when they say (in words engraved on stone tablets), Thou shalt use no fuel that does not contain XX% oil." It makes absolutely no sense to me, nor do I think it will to you, if you just stop to think about it. All foods are different; so are oils.

If that's true, why do the instructions with my engine specify a fixed percentage of oil? Simple - to protect themselves. All engine manufacturers have been burned (figuratively and literally) in recent years by "bargain priced" fuels containing either inferior oils, or insufficient amounts of oils. Every one that I've talked to will admit off the record that they know that fuels containing good oils won't need as much as their instructions say. But they also say they know they have no control over that, so they are going to print a high number, in hopes that amount of even a cheap oil will be sufficient. Frequently, it isn't.

So why not just put a lot of oil - at least 20% or more - in fuel and not worry about it? A lot of reasons, all good ones. For example:

Too much oil - any more than is necessary - makes the engine run really crappy. Think about it: methanol burns; oil doesn't - or at least it shouldn't. (Some do, but that will be dealt with in another installment.) Common sense would tell us that the less oil (nonburnable) we can safely use (to an irreducible minimum point, of course), the more methanol (burnable) we will have in our combustion chamber. More burnable ingredients = more power. One well-known magazine writer, with more than 50 years engine experience, tells me that in his experience, for every 1% oil removed from model fuel, the effect is about the same as adding 1% nitromethane. And it costs a lot less! By the same logic, the less oil we use (to the predetermined minimum, of course), the less the oil is going to be dousing the glow plug element, and we should be able to

achieve a lower, smoother idle. Next to nitromethane, oil is the most expensive ingredient in model fuel. By not using an unnecessary amount of oil, especially if it's just to satisfy some Great Guru's edict, the manufacturer can keep the cost of the fuel down, which puts a smile on all modelers' faces. Remember that even an additional 25 cents in manufacturing cost translates to an additional dollar or more at the retail level. So, what is the right amount?

It all depends on, what kind of oils, in what combinations, with what additives, etc. And for what use? Sport airplanes, Racing, Helicopters, Boats, Cars, Ducted Fan? What size engines? (As engine size increases, they need progressively less oil. Why? Simple mathematics. Surface area of the combustion chamber increases at about half the rate as the displacement increases.) Most people know that the big T.O.C. and Unlimited racing engines use oil in the 4% to 5% range.

Ducted fan and helicopter engines typically need more oil, 4-strokers less. It might be surprising to most airplane flyers to know that top competition model car engines use fuel with oil contents in the single digits, even though they are turning in the 40,000 - 50,000 rpm range, and have no fan in front to cool them! As matter of fact, they will hardly run on regular airplane fuel. Before we get started on the subject heading, I• d like to offer a couple more thoughts on last month• s subject, "What’s the Oil Content?" - thoughts that have been remembered since writing the original column:

Many modelers who have been involved in the hobby for a long time, including those who have been away for years and recently returned, are very stubbornly remembering when model fuel just about had to contain something in the order of 25% oil - usually all-castor - and have a hard time dealing with the idea that virtually no one runs that much any more in modern engines.

The operative word here, of course, is "modern." The metallurgy in today's engines barely resembles that of a generation ago. The end result, as far as model engines are concerned, is that the engines today simply don't require as much lubricant - not nearly as much. I will be quick to add that those running antique engines in Old Timer events should certainly continue to use the old-time formulas - no doubt about it.

In addition to vastly improved metallurgy, we must remember than manufacturing techniques barely resemble those from years ago, in many ways. Modern CNC machinery has made it possible to routinely and cheaply make 1 or 1 million parts all exactly alike.

Those of you who have come along in later years may be shocked to know that up until the advent of this new technology, every piston was hand fitted to every liner. There was no such thing as simply machining 1,000 pistons and 1,000 sleeves, picking one from each batch and having them fit.

The belief in those days that some engines of the same size and make were markedly hotter than others was no doubt true. We've read that in those days, a .29 for example, might vary from as low as an actual .26 to a .32 - some 23% more displacement! More closely controlled tolerances have resulted in the ability to use much different fuels than a generation ago.

The second thought on the subject of total oil content came from reading the operating instructions included with a new imported 4-stroke engine - the DAMO FS 218 twin. It recommends a fuel containing 94% methanol, 5% nitro and 1% Castor Oil! Clearly, this reinforces my point that "there ain't no such thing as a fixed percentage of oil content." Now, on to this month's subject:

Before we depart the subject of oil in model fuel, let• s talk about a point that's argued vehemently all over the land - Which kind of oil is better - synthetic or castor?

Each side has its very strong proponents, and each side is right, to a point. "Old-timers" tend to still favor an all-castor fuel, or at least one containing a liberal amount of castor oil. Modelers who have come to the hobby in the last 15 or 20 years have a strong affection to synthetic oils, or at least want their fuel to have mostly synthetics. Let's take a look at both types statistically:

SYNTHETIC OILS

Strong Points Weak Points

Good Lubricity (It's "slick") Most tend to cause corrosion if adequate inhibitors aren't added.

Little to no carbon or vanish buildup inside Burns off surfaces at about 100 degrees lower temperatures than castor oil

Leave less oily mess on models Many types and qualities, making it hard to choose the best one

Available in a variety of viscosities Expensive - good ones cost almost twice as much as castor oil, increasing the cost of the fuel.

Totally soluble in nitromethane When used as the sole lubricant, a greater quantity is required, which increases the cost of the fuel.

CASTOR OIL

Great Lubricity Tends to cause carbon and varnish buildup in engine if cheap grade and/or too much is used. Reduces the amount required, resulting in more power and better idle. Messier on model than synthetics Will tolerate internal temperatures about 100 degrees higher than any synthetic Somewhat sensitive to extremely cold temperatures - mild separation in solution, residue on model becomes almost "buttery" in consistency.
Almost 50% cheaper than good synthetics -
reduces cost of fuel. Insoluble in nitromethane. In solutions above 40% - 50% nitro, will separate unless some sort of co-solvent is used.
Great natural rust and corrosion inhibitor Generally available in only one viscosity
I'd like to insert here that there is a "Chicken Little& The Sky Is Falling" rumor making the rounds of the Internet these days that the manufacturers of castor oil have recently changed their methods of making the product, and the castor oil we are getting now is either wholly or partially incompatible with methanol.
I have talked at some length with the "Head Techie" of one of the largest castor oil importers in the U.S., and I want to go on record as saying that, according to the best information I can find, This is total B.S. The Head Techie actually laughed out loud when I told him what was going around. He said, "You know, there isn't much we do to the stuff. We press the oil out, filter it, grade it and package it. As far as I know, nothing has changed." It apparently started with one of the fuel manufacturers. For what reason, I have no idea, unless it's to help them promote their proprietary synthetics. (Incidentally, I have read a response on the net from SIG, agreeing with the fact that it's nonsense.)
So, there you have it. "You pays your money and takes your choice." Actually, it's a little better than that, and the obvious answer is - use a combination of the two, in proportions that will come nearest to enjoying the benefits of each, while minimizing the adverse characteristics.
A few years back, the modeling community was in a "synthetic oil frenzy," and the swing was toward all-synthetic fuels. Happily - at least in this writer's opinion, we've seen a very noticeable swing back toward the center, with the majority seeming to prefer a synthetic/castor blend. We think this makes sense, and many years experience proves it.
The most frequent comment I hear from lovers of all-synthetic fuels is, "Brand XX leaves a lot less oil on my model." My response to that is, "Doesn't that bother you? If you don't see much oil on your model after flying, that tells you one of two things - or both: Either there wasn't enough oil in there in the first place, or the oil is burning off with the methanol. Neither is good. There's no way oil can burn off and properly lubricate at the same time." This is usually met with a puzzled look, then one of the light dawning, having just realized something they never thought of before.
Oil residue in model engines is a natural as barking is to a dog. We have to learn to live with it.
As an aside, not long back a friend sent me a copy of an article published in a European model magazine. In one part, the writer stated, "The Americans are the only ones rich enough and dumb enough to use synthetic oils." Perhaps overstated just a bit, but it has some validity.
There a couple of types of engines that do require an all-castor fuel, or at least one with a considerably higher castor content than most others. One would be the Fox ringed iron piston type, and the other would be the small Cox engines, because of their rather unique ball-and-socket connecting rod-to-piston design.
Pattern flyers traditionally prefer an all-synthetic fuel, for a couple of reasons, I think. One is the fact that pattern flyers practice a lot - hour after hour after hour. That much use, plus the tuned pipe setup that is almost universal with them probably, tends to cause a greater problem with varnish and carbon buildup than in sport types. (At the risk of bombarded, I also think it's largely a state of mind. "Joe Champion uses all-synthetic, so that's what I'm going to use.")
The other area where we have seen all-synthetic fuels gain in popularity in recent years has been with model helicopters, probably for the same reasons. Also, the trend toward 30% nitro fuel for serious competition has led to using a lower viscosity lubricant, and, as shown in the comparison charts above, this necessarily dictates using synthetics.
Nitromethane…..everybody knows it’s there, but few, it seems, really know much about it. Although most seem to know - at least vaguely - that’s its primary purpose is to add power, we still get an occasional call or letter asking, "Why do you use it in model fuel?" At best, there is much misinformation regarding this somewhat exotic ingredient. Let’s see what we can do to clear some of it up.
Nitromethane is just one of a family of chemicals called "nitroparaffins." Others are nitroethane and 1-nitropropane and 2-nitropropane. Nitroethane can be used successfully in small quantities. (Top fuel drag racers, which generally run on straight nitromethane, sometimes add a little in hot, humid weather to prevent

detonation.) At one time, nitroethane was only about half as expensive as nitromethane, but its cost now is so nearly the same, using it to lower cost is hardly worth the trouble. Neither of the nitropropanes will work in model engine fuel. Incidentally, nitromethane is made of propane, in case you didn't know (and I'll bet you didn't).

Yes, NITRO = POWER! But….there are conditions and contingencies. First of all, it doesn't add power because it's such a "hot" chemical. Not at all. This may come as a surprise to most readers, but the methanol (methyl alcohol) in the fuel is by far the most flammable ingredient….nearly twice as flammable as nitromethane. As a matter of fact, if nitro were only 4 degrees less flammable, it wouldn't even have to carry the red diamond "flammable" label!

In actuality, nitromethane must be heated to 96 degrees F. before it will begin to emit enough vapors that they can be ignited by some sort of spark or flame! (I demonstrated this not long ago to a friend by repeatedly putting a flaming match out in a cap full of nitro. I might add that he insisted on standing about 20 feet away during the demonstration.)

So….how does it add power? We all know (I think) that although we think of the liquid part substance we put in fuel tanks (in our automobiles or model airplanes) as the fuel, in truth, there is another "fuel," without which the liquid part would be useless. Remember what it is? Right….just plain old air (in reality, the oxygen in the air).

Every internal combustion engine mixes air and another fuel of some sort….in our case, a liquid…glow fuel. The purpose of the carburetor is to meter those two ingredients in just the right proportions, and every individual engine has a requirement for a specific proportion of liquid fuel and air. Try to push in too much liquid without enough air, and the engine won't run at all. That's the purpose of the turbocharger on full-size engines….to cram in a lot more air than a simple carburetor or fuel injection system can handle.

Now…..suppose we were to find a way to run more liquid through our model engines without increasing the air supply? That would add power, wouldn't it? Well, guess what….we can! An internal combustion engine can burn more than 2 ½ times as much nitromethane to a given volume of air than it can methanol. Voila! More Power! That's how it works, and it ain't all that complicated. Nor do we have to spend a lot of time thinking about it in the course of a normal day's sport flying.

However, there are some factors we do need to consider. As a practical matter, virtually all our everyday sport flying can be done on model fuel containing from 5% to 15% nitromethane. If you're flying something like a trainer or a Cub or similar model, there's probably no reason why 5% won't work perfectly well. Need a little more power? Move up to 10% or 15%. In most of our sport engines today, I really wouldn't recommend going any higher than that. It probably won't hurt anything, but it won't do you much good, either.

We sell more 15% fuel than any other single blend, and for good reason. Most of the popular engines on the market today are built to run on something very near that blend. Typically, European engines will successfully run on lower nitro blends, because they are built to do so. Why? In Europe, nitro can cost between $150 to $200 a gallon! Reason enough?

Nitro does more than just add power. It also helps achieve a lower, more reliable idle. One good rule of thumb for checking to see if a particular engine needs a higher nitro blend is to start the engine, let it warm up for a few seconds, set throttle to full idle and remove the glow driver. If it drops rpm, move up to a 5% higher nitro blend. If there is no discernible drop, you should be fine right where you are.

One of the most popular misconceptions is that by adding substantial nitro, the user will immediately achieve a huge power jump. Just ain't so. Most will be surprised to learn that in the 5% - 25% nitro range, you will probably only see an rpm increase of about 100 rpm static (sitting on the ground or on a test stand) for each 5% nitro increase. In the air, it will unload and achieve a greater increase, and it will probably idle better, too.

My pet rule is this: If you have a model that's doing well, but just isn't quite "there" powerwise, go up 5% in nitro. If that doesn't do it, you need a bigger engine, not more nitro!

Most of our popular sport engines in use today aren't set up to run on much more than 15% or 20% nitro. Increasing the nitro has the effect of increasing the compression ratio, and each specific engine has an optimum compression level. Exceed it and performance will probably suffer, not gain, and the engine will become much less "user friendly."

High performance racing engines, for example, are tuned entirely differently….compression ratio, intake and exhaust timing etc….and are usually intended to run on much higher nitro blends. One exception, of course, are racing engines used in certain international and world competition (FAI). By the rules, these engines are

not allowed to use any nitro at all, and they go just as fast as those that run on 60 or 65%! The first question that comes to mind, then, is, "Why aren't all engines designed to run on no nitro, so we can all save a lot of money?" Ask any of the world-class competitors. Those engines are a serious bitch to tune and run, and are definitely not user-friendly! In fact, they are well beyond the skill levels of most average flyers. There's a price to everything.

Another statement we read or hear frequently is that nitromethane is acidic and causes corrosion in engines. It isn't acidic, and the manufacturers say it doesn't happen…..can't happen. However, at least one noted engine expert and magazine writer insists that it does. Flip a coin. (I once asked Dave Shadel, 3-time World Pylon Champion, and a fellow who works on more high performance engines than anyone I know, how frequently he encounters rust in engines that have been using high nitro blends. His answer? "Never.")

Why does nitro cost so much? While I have no clue as to the cost of manufacturing, other than it takes a multi-million dollar investment in a large refinery to produce it, there is one pretty good reason: There is only one manufacturer of nitromethane in the Western Hemisphere. Figure it out for yourself.

Also (and this will come as a big surprise), our hobby industry only consumes about 5% of all the nitromethane produced; and full-size auto racing about another 5% or so. This means we have no "clout" whatever, and simply must pay the asking price. Where does the rest of it go? Industry. It's used for a variety of things - a solvent for certain plastics, insecticides, explosives (yes, it was an ingredient in the Oklahoma City bombing) and I'm told it's an ingredient in Tagamet, a well-known prescription ulcer medication (no wonder that stuff is so expensive!). Please note that while nitromethane is an ingredient in making some explosives, under normal use, it in itself, is not exploseve. (Remember….the guy used fertilizer, too.)

Hardly a month passes that someone doesn't call to ask, "I hear more nitro will make my engine run cooler. Is that true?" Nope. The higher the nitro content, the higher the operating temperature. Fortunately, in most of our sport engines, the difference in operating temps between 5% and 10% is negligible, and there are lot of other factors (proper lubrication, etc.), that are much more important.

Finally, remember in the beginning of this, we said that nitro adds power because we can burn more of it than we can methanol, for a given volume of air? This also means that the higher the nitro content of the fuel, the less "mileage" (or flying time) we will get. In a typical .40 size engine using 15% nitro, we can usually get a minute to a minute and a half flying time for every ounce of fuel. The Formula 1 guys are lucky to get 2 minutes out of an 8 oz. tank!

What's the practical side of this? If you go to a higher nitro blend, be sure to open your needle valve a few clicks and reset before you go flying. Otherwise, you'll be too lean, and could hurt your engine. Conversely, if you drop to a lower nitro blend, you'll have to crank 'er in a little.

Well, what do you think? Is there really a difference, or is this merely a big hype by the fuel manufacturers to sell more products? Let's see a show of hands…..ah, yes…about evenly divided. Well, let's explore the facts.

Fact: Most 4-stroke model fuels contain less oil than comparable 2-stroke fuels.

The most common response to this is, "But 4-stroke engines have more moving parts….they should need more oil, not less!" Well, that sounds reasonable, but it doesn't stand up under close examination. The number of moving parts has nothing to do with it. What is important? Think about it.

Fact: With rare exceptions, 4-stroke engines run at substantially slower rpms than a comparable 2-stroke engine…most in the under-10,000 rpm range vs. 12,000, 13,000 or more for a typical 2-stroke of the same size. They are engineered to deliver maximum power at slower rpms, with bigger props. What does this have to do with it? One of the main factors used in determining the proper oil content of fuel is heat. To use the well-worn term, it doesn't take a rocket scientist to figure out that the more slowly an engine turns, the less heat it generates from friction. If you don't believe that, rub your palms together slowly, then as fast as you can.

So….lower rpms = less heat = less need for oil.

Fact: 4-stroke engines only fire every other stroke, vs. every stroke by a 2-stroke engine. Firing, or combustion, burns fuel, which creates heat. Logically, it may be deduced that if there is fire in the chamber only every other stroke, the engine has time to cool off a bit between combustion cycles. Let's take that a little further: Using a hypothetical 4-stroke engine turning 10,000 rpm = 5,000 combustion cycles per minute, vs. a hypothetical 2-stroker turning 13,000 rpm…with the same number of combustion cycles per minute….the gap widens. The 2-stroker has 160% more combustion cycles than the 4-stroker. Even though this is partially offset by the fact that at least some 4-strokers have a higher exhaust gas temperature, the message is clear: 4-strokers remain cooler, and need less oil.

Fact: Oil doesn't burn (or shouldn't) - methanol does. Using a little logic, we arrive at the conclusion that a properly made 4-stroke fuel will deliver better performance than a 2-stroke fuel in the same engine.
Why? Remember…the 4-stroker is only firing every other stroke. This results in the plug element wanting to cool down between strokes, resulting in a "colder" plug. Excess or unnecessary oil, constantly dousing the element, is going to make it more difficult to achieve a slow, smooth idle. Those who contend that, "Well, using too much oil can't hurt anything" are wrong. In addition to causing undue friction in the engine, keeping the metal parts from properly mating, etc., too much oil in 4-stroke fuel is constantly trying to cool a plug element that is already having problems. Sort of like pouring a bucket of cold water on a poor guy who is already shivering.
Again, since oil doesn't burn, it's doing nothing to help us develop power….it simply lubricates and goes right out the exhaust and all over everything. However, suppose we don't put unnecessary oil in the fuel, and replace it with methanol, which does burn. Well, what do you know…greater top end power! Hey, I think we're on to something here! Remove unnecessary oil from 4-stroke fuel, and we get a "twofer" - two benefits for the price of one….a slower, more reliable idle plus greater top end power!
Conclusion: For reasons that should be clear above, a properly blended 4-stroke fuel should deliver better all-around performance in a 4-stroke engine than a regular 2-stroke fuel in the same engine.
While it's not going to actually harm anything to run 2-stroke fuel in a 4-stroke engine, never, ever run 4-stroke fuel in a 2-stroke engine. It's not going to have enough oil. Now, for those of you will say that you have done it with no problems, I'll agree…..if you have a real good ear and keep the needle valve "fat" (rich), it will probably work just fine…but the official word is DON'T! It reduces your margin of error unacceptably.
Finally: Because engine manufacturers have been burned in recent years by some fuel makers' attempt to lower the cost of their products by using either too little oil or a cheap grade, most manufacturers today are recommending that you run a 2-stroke fuel only in their 4-stroke engines, or will specify what would seem to be an abnormally high oil content (and it probably is). Who could blame them? Since they know they have no control over the oil used in someone else's fuel, they're just trying to cover their fannies. So would I.
Note: I believe it's commonly known that the manufacturers of YS engines…among the most powerful 4-stroke engines available….mandate that only fuels containing oil contents in the normal 2-stroke range be used. Their engines are unique, and the manufacturer's recommendations should be followed, although, as with anything, there are exceptions.
Nitromethane…..everybody knows it's there, but few, it seems, really know much about it. Although most seem to know - at least vaguely - that's its primary purpose is to add power, we still get an occasional call or letter asking, "Why do you use it in model fuel?" At best, there is much misinformation regarding this somewhat exotic ingredient. Let's see what we can do to clear some of it up.
During the Q&A part of countless "Dog & Pony Shows" at hobby clubs all over the U.S., one of the frequently asked questions is, "What's the shelf life of fuel?" The answer if both simple and easy: Properly stored, model engine fuel will last almost indefinitely. So….what constitutes "properly stored"? Let's take a look.
Contrary to many things you might have read or heard, just about the only thing that adversely affects model fuel is the absorption of moisture from the air. Keep the air away from it, and your fuel will likely be potent longer than you are! Methanol - the major ingredient in model fuel - is hygroscopic. This means it's virtually 100% soluble in water, and absorbs moisture from the air like a vacuum cleaner sucking up dirt.
Most modelers have no idea how rapidly this can - and does - happen, and tend to be rather skeptical about the idea. Let me paint a picture for you: Almost everyone has spilled a little fuel on the top of their fuel can in their flight box. If so, you've no doubt noticed that the shallow film of raw fuel takes on a cloudy, milky look. What you are seeing is the methanol sucking moisture right out of the air. Since the quantity of fuel is thin with a lot of surface area, the absorption is rapid, the water won't mix with the oil and the fuel turns cloudy. Just remember how quickly this happens…..almost immediately….and it might give you an idea of just how quickly your fuel can be ruined if you leave the cap off, allow a vent tube to remain open, etc.
The wide surface area relative to the quantity of the fuel exposed is disproportionate, of course, to leaving the cap off the fuel jug, but I think you get the idea. In a humid condition such as exists in parts of the U.S., it doesn't take very long at all to adversely affect your fuel. And it doesn't take a large opening….a cross-threaded cap, a small vent line, etc. is all that's needed to do the damage.
The solution is simple, of course….just keep it tightly sealed. And yet, sometimes that's not enough. Most of us have seen small droplets condensed inside our fuel jugs after it's become partially empty. This is the result

of condensation of moisture as the air trapped inside the jug cools. Until about a year ago, there was little we could do about this, but there is now a method to take care of this problem. Since it's not the purpose of this column to commercially promote our own products, those interested are invited to contact the writer at the e-mail address above, and we'll be happy to tell you about the product that will solve the problem.

For the reasons above, it's our opinion that it is rarely a good idea to buy model fuel in 55 gallon drums. Unless all the fuel is poured up the first time the drum is opened, a substantial volume of air is trapped inside the drum each time it's opened. Steel containers of any kind warm and cool much more readily and rapidly than plastic, and condensation is much more evident in this type container. The result is that the last portion of the drum of fuel is quite likely to be contaminated with moisture, sometimes to the point of being unusable.

There is another downside to buying fuel in drums, especially if more than one person is using it. With no control over the type container the fuel is dispensed into….perhaps not bearing sufficient or proper warnings, etc., the liability is incredibly high if an accident of any sort should occur. Model clubs considering this type of fuel purchase for their members should be particularly aware of the potential liability….which is huge!

While it's true that the UV in sunlight (or in fluorescent lights, for that matter) will cause pure nitromethane to deteriorate over time, it's our experience that once the nitro is in solution and substantially diluted, the deteriorative effect is relatively minor.

To test this, some years ago we put a gallon of 10% fuel out in direct sunlight (in sunny Southern California) for a month. At the end of that time, we tested that fuel in an engine vs. fresh product and could see no difference. While it certainly won't hurt anything to store fuel away from direct sunlight, etc., it's our personal opinion that the adverse effect of sunlight on fuel under normal operating conditions is too little to worry about.