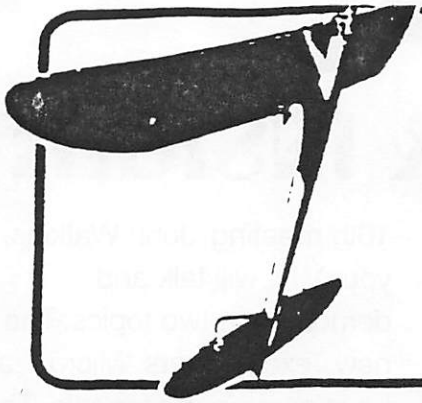


MINNEAPOLIS MODELER

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Established 1937 **Charter # 379**

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Editor..... **Joe Huettl** **(715) 842-9638**

Issue No. 270 **September / October 1999**

Coming Events:

September 10th , 1999

Club meeting @ Air National Guard Museum...7:30 P.M.

September 12th, 1999 **"Fall Meet"** **-AA-** **CD** **Dale Mendenhall** **612-535-2976**

½ A Gas	Mulvihill	Pee Wee 30
A Gas	Coupe d' Hiver	Cat. / H.L. Glider
BCD Gas	P-30	Embryo Endurance
Classic Gas	Junior Event	

September 25th & 26th.

Mid America F.F. Champs, Lawrenceville, Il. See enclosed flyer for details.

October 1st, 1999

Club meeting @ ANG Museum...7:30 P.M.

October 17th, 1999 **"Octoberflug"** **-AA-** **CD** **Dave Braun** **651-457-2264**

½ A Gas	Mulvihill	Cat. / H.L. Glider
A Gas	P-30	Coupe d' Hiver
BCD Gas	Embryo Endurance	.020 Replica~1/4 A Nos Gas
Nos Gas	O.T. Rubber (<'46)	Junior Event

October 31st, 1999 **"Turkey Shoot"** **CD** **Aaron Petersen** **651-224-6136**

Flying starts @ Noon.	Any airplane / power.	Longest string of maxes wins!
	Frozen "Trophy" to winner	

DENNY'S THOUGHTS & INSIGHTS

At this writing, the '99 Nats have just concluded, August 6th, and the guys from the MMAC did well. You'll read the results elsewhere in this issue.

Flight time cards are being used to record flight times as each flight ends. Then after each flight, the time is to be recorded on the main flight sheets at the contest director's area. The time cards are a back-up, not a temporary replacement for the master flight sheets. Each flight MUST be recorded right after its conclusion. It is not acceptable to record multiple flights on the time card and then record them on the master flight sheets. In other words, no sandbagging! The reasons are obvious especially to the other flyers whose times have been recorded properly.

We have had a problem of not enough people to time flights. Remember "time one, fly one" rule. It was brought up at the August club meeting that we could assign members, by choice, who would time for other flyers, for an hour at a stretch.

Couple more points: I'll start with my mistake. We'll not fly in the lee of the trees, even if the winds are light. The gas powered ships can handle the roll of the wind over the trees, but the smaller rubber models or gliders can't.

Next point: The flying site should be cleaned-up after each contest or flying session. Each flyer should police their own area. So cleaning-up after the contest is <u>everybody's</u> job.

Last point, which should have been the first. The contest directors should check with Gary Oakins the Saturday before the contest to find out which area of the sod farm we can fly on. When you go up there to test fly, check in at the office first.

Hank Nystrom of Texas Timers has introduced a new fuel shut-off timer, Micro I, for .020-.049. It's been written-up in the model magazines, so order yours soon!

The July 11 contest was beautiful weather, and it only took 3 moves to end-up where we finally flew from. It wasn't the best spot, but we had a great turn-out. Thanks to Don Monson, CD. Everything went great. The best turn-out in a long time.

The annual "Almost Silent Meet" was held August 15. The winds were 15-25 mph plus. So only 13 brave contestants flew. Then at 2:00 or so it rained. Not our best contest weather. I wasn't able to partake of the flying for I left at 10:00 to attend my granddaughter's second birthday party.

Well that's two blow-outs this year. Tim Johnson came-up with a good idea. MMAC could schedule the contests for Saturdays with Sunday as the alternate day in case of a blow-out on Saturday. As it stands now there is no way to re-schedule. This seems like a good idea and we'll discuss it at the September 10th meeting. That's right, the meeting is <u>after</u> labor day.

Be sure to attend the September 10th meeting. John Watkins, your V.P., will talk and demonstrate two topics: The new Texas Timers "Micro I" and have some parts for sale. The "Blow Pen" with marker for spray painting numbers and designs on tissue, super light even for indoor models.

Class Gas still is the news across the world. There's an article in the new NFFS 1999 Symposium on the British, original version, of <u>SL</u>ow <u>O</u>pen <u>P</u>ower. The interesting thing is that they have limited the engine size to (3.5cc) .21 cu. in. I can't recall if any other country or the U.S. has this limit on engine size, maybe they do and I just missed it.

The NFFS 1999 Symposium is now in the MMAC library and can be checked out at the monthly meetings for a whole month and then returned at the next meeting. I'm also donating a book to the library "Flight of Passage" by Rinker Buck. A true story of brothers, ages 15 and 17 who flew a restored Piper Cub across the continental United States in 1966 without a radio. Very good reading.

See ya at the field,



MMAC MINUTES FOR THE JULY 9th MEETING

The July meeting was called to order at 19:54 by Denny Sussman.
Number in attendance---21
The Secretary's minutes for the June meeting were accepted as published in the Newsletter.
The Treasurers reported was read and accepted.

CORRESPONDENCE;
The Secretary read a letter from the EAA asking us to buy calenders and also a thank you letter from Duane McDonnell for the get well cards. Denny read the letter and the info on Minnesota Model Aero clubs, with their schedule of events.
Don Patterson showed the examples of MMAC posters he made to display in Hobby Shops. These are to create interest for new members. Comments by the members followed. Denny said he had calls for info on contests from as far away as South Dakota. Don Patterson suggested we publish more information for prospective flyers in the newsletter. More about this at future meetings
OLD BUSINESS:
Gary Oakins reported on the results of his and Jack O'Leary's efforts to get Bob Oppegard into the AMA hall Of Fame. Bob will be inducted into the Hall Of Fame at the Muncie Nationals. If he is'nt able to be there, Gary will receive the award for him. For those who do not know about Bob's contribution to the modeling world, its his superior rubber stripper. It is known all over the world in the indoor flying circle.
CONGRATULATION TO YOU BOB OPPEGARD !!!
NEW BUSINESS:
The July contest is all set. The direction of the wind will determine which end of the field we will fly from.
Don Berggren reported that Karl Nitardy is on the mend, and will be back with us soon.
The meeting adjourned at 20:24
The raffle was won by John Hirte. It was several sheets of Jap Tissue.
SHO AND TELL:
Aaron Peterson showed his Micro X Piper- Clipper and his Cessna C-34 which took him 18 total hours to build.
Gary Oakins showed his Nelson powered "C"-711 Pilfered Pearl- Hi Bred Bloomquist Collage.

The club members welcomed a new prospective member. He is

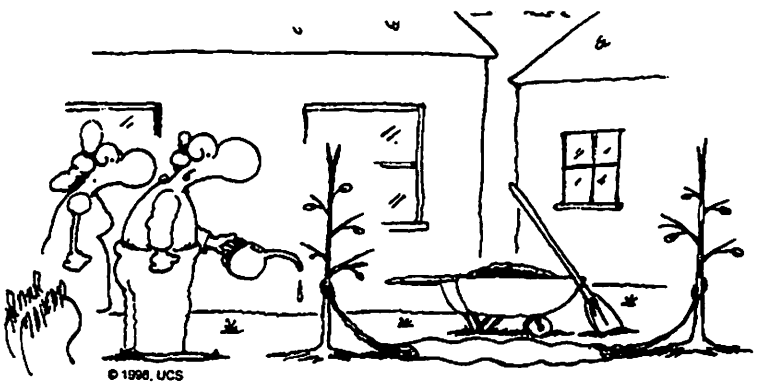
Bill Borgen
22E 22nd St
Apt. 610
Mpls. MN 55404 tel 871-7193



MMAC MINUTES FOR THE AUGUST 6th MEETING

The August meeting was called to order at 20:00 by Denny Sussman.
Number in attendance---12.
The minutes for the July meeting were read and accepted.
The Secretary gavethe Treasurer's report in his absence. It was accepted as read.
CORRESPONDENCE:
The secretary passed the RC flyer on the Park Rapids contest.
The president said he received the new NFFS symposium.
Denny also passed out the flyers to be posted in hobby shops for MMAC interested parties, with tear offs to call members.
OLD BUSINESS:
Denny brought up the problems we had at the last contest. There were people flying at two fields at the same time. It was decided that the contest director, whomever it is, will contact Gary Oakins the night before the contest to get the field location. If Gary is not available, then call Denny Sussman.
Also, check with the field office for permission any time you go test flying.
There was much discussion again on timer cards. Timers are still not posting times after flights. This must be done.
There also were some members who thought the CD's were not exercising enough authority at the meets. The rule is still, fly one-time one.
NEW BUSINESS:
The secretary read excerpts from the August issue of Model Aviation AMA News column. This is in regards to keeping club meetings interesting. He suggested we make a list of topics on building and flying that would be of interest to new and old members alike. There seemed to be a good amount of interest in this. Some members agreed to give talks and we decided they should have a time limit. When we start this, we will make notice of the talk subject and the one giving the talk, for the Newsletter.
The next club meeting will be September 10th.
The meeting adjourned at 20:36
SHOW AND TELL:

Tim Johnson showed his Atwood powered FUBAR and how he used carbon fiber in the construction.
Harold Wachtler showed his Logan Coombs picture of Mister Mulligan and a model of the United States.
John Watkins showed his electric ARF free flight model.
The raffle was won by Jim Ladwig. It was Frank Ziac's 51 year book and a Hannan book of plans.



"It should be ready just in time for retirement."

FROM IAM 1833

Contest Results

Summer Meet

July 11, 1999

1/2A Gas

1st. Gary Oakins	120	95	120	335
2nd. Gene Wolf	78	42	67	187
3rd. Tim Johnson	73	65	31	169
4th. Terry Taylor	53	43	64	160

A Gas

1st. Gary Oakins	120	120	120	360

BCD Gas

1st. Denny Sussman	120	120	120	120	120	600
2nd. Gary Oakins	120	120	120	120	4	484
3rd. Dick Bloomquist	120	120	120	—	—	360

Nostalgia Gas

1st. Sid Jepson	120	120	84	324
2nd. Dick Bloomquist	120	120	—	240
3rd. Tim Johnson	50	52	65	167
4th. Don Spehn	45	—	—	45

Pee Wee 30

1st. Herman Fessler	120	88	90	800
2nd. Terry Taylor	38	—	—	165

Junior Event

1st. Matt Dona	120	108	—	228
2nd. Jacob Dona	68	120	—	188
3rd. Sean Moore	15	45	13	73

Embryo Endurance

1st. Herman Fessler	120	118	89	9 Bonus	336
2nd. Jim Anderson	114	104	58	—	276
3rd. Jim Jorgenson	86	91	86	—	263
4th. Aaron Petersen	62	76	47	9	194
5th. Duane McDonnell	27	31	27	5	90

Coupe d Hiver

1st. Warren Ringlien	120	115	44	279
2nd. Jim Jorgenson	67	87	120	274
3rd. Joe Huettl	120	67	60	247
4th. Herman Fessler	31	62	—	93

Catapult / H.L. Glider

1st. Gordon Dona	60	120	77	257
2nd. Joe Huettl	8	100	56	164
3rd. Jacob Dona	20	74	53	147
4th. Matt Dona	51	22	26	99
5th. Aaron Petersen	30	43	23	96
6th. Duane McDonnell	36	30	28	96
7th. Herman Fessler	33	23	33	89
8th. Dick Diers	30	24	30	84
9th. Warren Ringlien	28	30	25	83
10th. John Hirte	28	24	25	77
11th. Jeff Ringlien	15	13	15	43
12th. Terry Taylor	10	9	3	22
12th. Tim Johnson	12	6	4	22

P-30

1st. Herman Fessler	103	73	120	296
2nd. Aaron Petersen	120	45	120	285
3rd. Joe Huettl	120	63	91	274
4th. Tim Johnson	83	69	68	220
5th. Warren Ringlien	60	84	60	204
6th. John Hirte	37	50	80	167
7th. Don Spehn	48	47	47	142
8th. Pete Owen	93	—	—	93

Mulvihill

1st. Jack O'Leary	120	120	120	104	464
2nd. Gordon Dona	120	120	120	—	360
2nd. Aaron Petersen	120	120	120	—	360
4th. Warren Ringlien	120	111	120	—	351
5th. Jim Jorgenson	94	120	46	—	260
6th. Joe Huettl	120	117	5	—	242
7th. Sid Jepson	120	120	—	—	240

Old Time Rubber

1st. Jack O'Leary	120	120	120	180	540
2nd. Aaron Petersen	120	120	120	103	463
3rd. Sid Jepson	82	120	120	—	322
4th. Herman Fessler	120	71	120	—	311
5th. Joe Huettl	120	49	63	—	232
6th. Jim Anderson	29	55	29	—	113
7th. Pete Owen	50	—	—	—	50

Contest Results

Almost Silent Meet

August 15th, 1999

90 sec. Max

OPEN POWER

1st. Gary Oakins	90	35	—	125

.020 REPLICA / 1/4 A NOS GAS

1st. Gary Oakins	30	62	41	133

NOSTALGIA GAS (SMALL)

1st. Sid Jepson	90	—	—	90

JUNIOR EVENT

1st. David Pederson	82	75	—	157
2nd. Sean Moore	26	27	23	76

CATAPULT / H.L. GLIDER

1st. Herman Fessler	21	33	90	144
2nd. Joe Huettl	45	32	45	122
3rd. Warren Ringlien	18	22	49	89
4th. Tim Johnson	26	25	34	85
5th. Al Nephew	32	22	27	81
6th. Duane McDonnell	14	18	31	63

EMBRYO ENDURANCE

1st. Herman Fessler	90	90	—	9Bonus	189
2nd. Don Berggren	90	—	—	9	99

COUPE D HIVER

1st. Warren Ringlien	90	70	79	239
2nd. Joe Huettl	72	22	—	94

P-30

1st. Joe Huettl	57	90	90	237
2nd. Warren Ringlien	82	57	90	229
3rd. David Pederson	90	50	82	222
4th. Tim Johnson	84	43	—	127
5th. Jim Anderson	32	74	—	106
6th. Herm Fessler	70	—	—	70

1.5X BOSTONIAN

1st. Herm Fessler	64			64
2nd. Jim Anderson	47			47

MULVIHILL

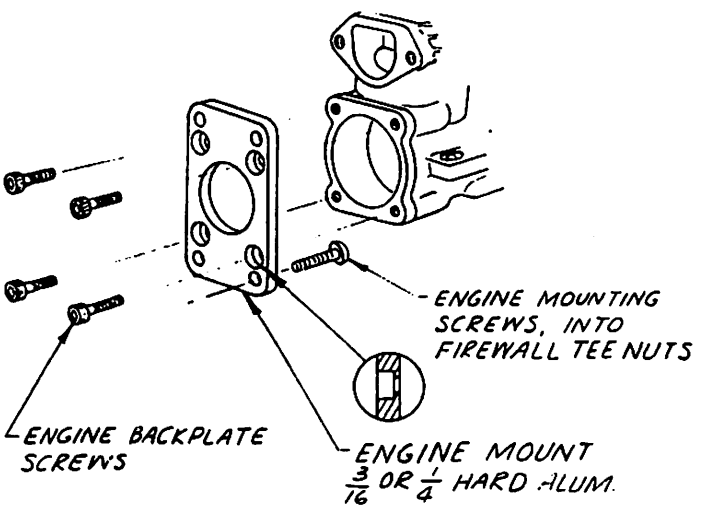
1st. Warren Ringlien	81	90	90	261
2nd. Joe Huettl	90	90	81	261

Piston Power

ENGINE MOUNTS: THE LIGHTWEIGHT CHAMP...Jim O'Reilly

The engine mount system shown in the accompanying sketch is becoming so widely used that its existance can nardly have escaped almost any serious AMA Gas competitor. Nevertheless, it is shown here because it is the lightest possible mount system and can be made with nothing more exotic than an electric drill.

The system can be used on any engine with adequate thread engagement at the backplate screws. I have seen it used on K & B 3.25/3.5 series engines. The use of Allen-head screws intended for high-strength applications is prudent. The setup shown in the sketch assumes that the aircraft firewall is tall and narrow. Obviously, round or square firewalls would use a mount of a different shape than the one shown. The central hole is merely a lightening hole. The only part of the design which presents any difficulty at all are the four counter-bored holes for the backplate screw heads. The aluminum plate needs to be thick enough so that the counterbores can be deep enough to contain all of the screw heads and there must be an adequate amount of material remaining on the forward face under the screw heads to avoid fatiguing out. With careful workmanship on these holes the mount should be capable of being made from .188 inch aluminum alloy. The alloy used should be a hardened alloy.



J O'Reilly 3-27 BC

Nats '99

Perfect weather...lots of lift...airplanes filling the sky...new friends...old friends...good food...good drinks...lots of beautiful women...all but the latter of these describes the 1999 edition of the National Aeromodeling Championships held, once again, at our site in Muncie, Indiana. MMAC had a fairly large contingent in attendance and some picked up a little hardware to boot! As seems to be the case for these past two years, (can't say for sure regarding last year as I didn't attend)contest management was top notch with Phil Sullivan as the "Head Honcho" and Jim O'Reilly as the "Assistant Honcho". There were also lots of other "little itty-bitty honchos" as well, of which Gary Oakins, Jack O'Leary and yours truly each donated a day to work at processing and/or score keeping. Personally, this was my most enjoyable day as I got to meet many people I'd only read about in the modeling press. Neat!

Oh, yeah, I almost forgot to mention...we moved twice during the day due to wind variations and I got the dubious honor of being the official porta-potty driver. This is an overgrown riding lawn mower with a porta-potty mounted on the bed of a small trailer. We forgot to check the outhouse on the first move and literally caught some poor unsuspecting woman with her pants down. A few screams was all it took to bring the rig to a halt but I have a sneaking suspicion that that woman didn't set foot in one of those things for the rest of the week! OOPS!

Highlights and lowlights: Jack O'Leary loses his Mulvihill w/ transmitter in Dawn Unlimited...never to be seen again === Gary Oakins destroys his new bunter...a line comes off the timer prematurely === Jack loses his Moffett in the soy beans...finds it, I think, but it's to late to fly again === Warren and Andy Ringlien both lose Mulvis... I find Warren's but they can't find Andy's === I lose my good Coupe w/ transmitter ... believed to be at the bottom of a 5000 acre reservoir === Bob Oppegard wins a Special Award at the NFFS banquet in honor of his world renowned rubber stripper === Jack O'Leary places 28th in Moffett, 11th in Large Rubber Stick and receives a 5th place plaque in Dawn Unlimited === Warren Ringlien places 26th in Mulvihill, 27th in P-30, 16th in Coupe and 28th in Catapult Glider === Bob Hinrichs (our Madison, Wi. connection) places 26th in Mulvihill and 25th in ½ A Gas === Bob Kumferman (our Milwaukee connection) places 22nd in P-30, 10th in Pee Wee 30, receives a 2nd place plaque in A Electric and wins a 1st place plaque in B Electric === Bill Rogers places 40th in Catapult Glider === Dick Bloomquist places 10th in ½ A Gas, 9th in C Gas, 12th in D Gas, 27th in B Nos Gas and takes home a 3rd place plaque in Super D === Gary Oakins places 18th in ½ A Gas, 17th in A Gas, 17th in B Gas and 16th in .020 Replica === Sid Jepson places 17th in .020 Replica, takes home a 2nd place plaque in ABC Cabin and wins a 1st place plaque in ABC Pylon === Joe Huettl places 24th in Coupe, 11th in H.L.. Glider and takes home a 6th place plaque in P-30 === Clyde White times and picks air.

Greg Hinrichs (son of member, Bob) placed well in a number of events as did Andy Ringlien (son of member, Warren).

All in all not too bad a show from the men (boys?) from MMAC! Congratulations to all who flew and a personal and heartfelt "thanks" to those who helped me.

P.S. Let's do it again next year and take even more MMAC members along. It's a heck of a show!!!

MID-AMERICA F. F. CHAMPS !

MID-AMERICA AIR CENTER

LAWRENCEVILLE, IL . AMA Sanctioned — Sponsored by Tri County Aero
September 25 & 26, 1999 — Saturday 9:00 AM-5:30 PM
Practice/testing, Friday — Sunday 9:00 AM-4:30 PM
ENTRY FEE $10 1ST EVENT–$3 ALL OTHERS JUNIORS $2 PER EVENT

SATURDAY

A Gas
B Gas
Mulvihill
HLG
1/2 A Nostalgia
O.T. Rubber Stick
Coupe
Hand Held Catapult Glider
Pre 50 Wakefield
1/2 A Texaco

SUNDAY

1/2 A Gas
C/D Gas
P-30 Rubber
Wakefield
A1/A2 Glider
ABCD Nostalgia
O.T. Gas (combined)
.020 Replica
Moffett Rubber

Wakefield-3 minute maxes, NO rounds

PASS THIS INFORMATION AROUND TO YOUR FRIENDS– BUD

EARLY CONTACTS:

CD BUD BROWN F/F
RR #4, BOX 51
LAWRENCEVILLE, ILL. 62439
618-943-2076

PAT ENGLISH F/F
823 BROADWAY
VINCENNES, IN. 47591
812-882-3649

Jim Newman

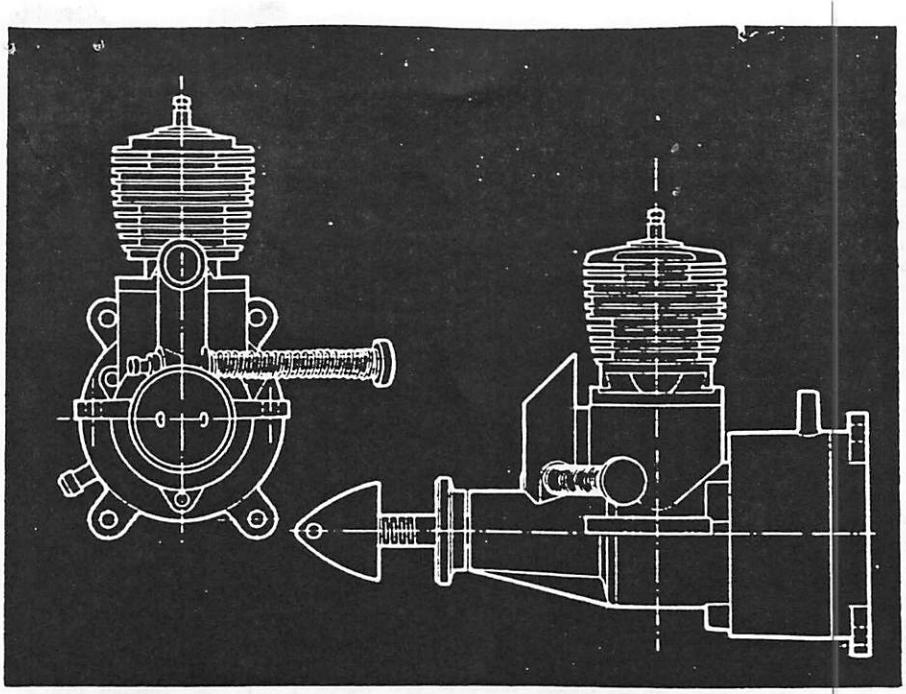
Engine Review

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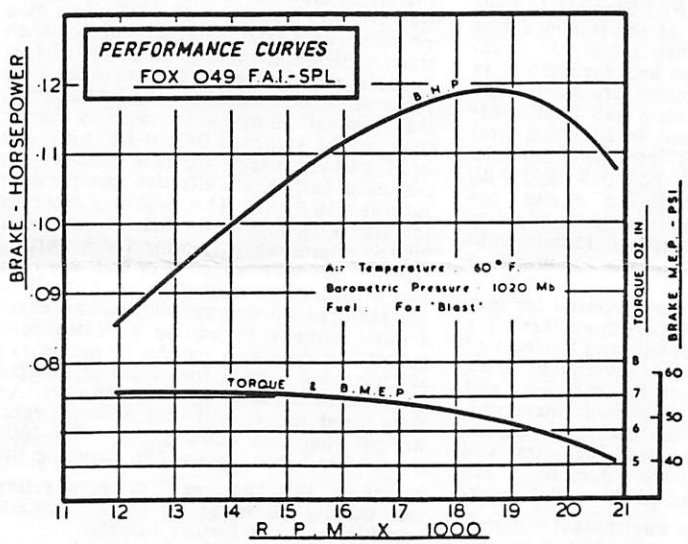
Fox .049 FAI Special

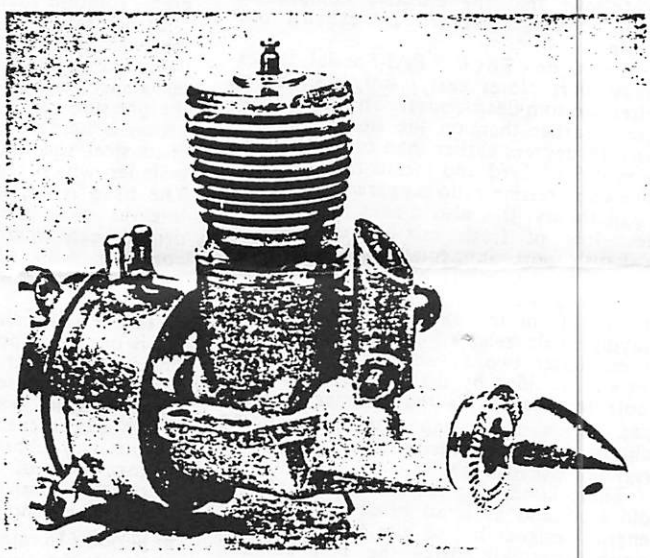
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By P. G. F. CHINN



MUCH MODIFIED CONTEST VERSION OF POPULAR FOX .049 FAI-SPECIAL REVEALS IMPRESSIVELY BOOSTED PERFORMANCE AND EXTREMELY INTERESTING PORTING CHANGES.



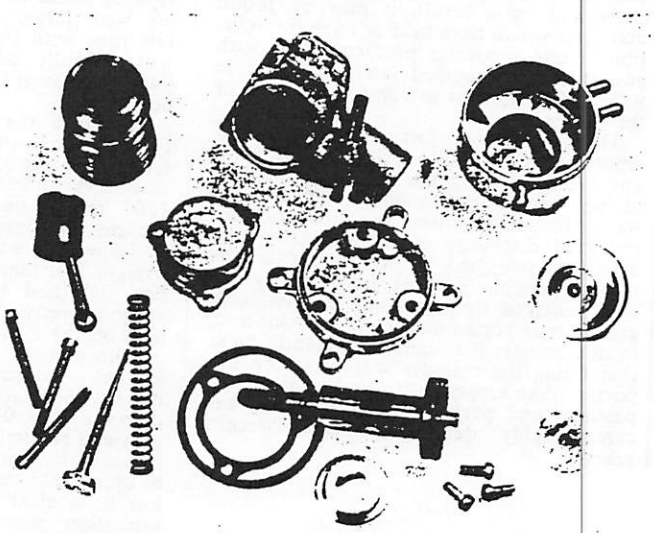


Shown here with optional tank mount, FAI Special is easily identified by larger bearing housing and intake, also new tapered exhaust ports.

► We have remarked before that, in the ½A class, American motors lead the world in performance. This is underlined by the new Fox 049 "FAI-Special" which, by our rating, qualifies among the top two or three contest 049's, on a power output basis.

Outwardly, the FAI-Special version does not, at first sight, look very much different from the standard Fox 049. A machined aluminum spinner-nut decorates the front end and the casting has a matt, instead of polished, finish. However, a closer look reveals a larger diameter intake tube, differently shaped exhaust ports and a much bigger main bearing housing with side webs omitted. The modifications do not stop here either. Dismantling the FAI-Special and comparing it with previous models, we find that it has a new crankshaft, new cylinder and revised porting throughout. In fact, the really significant changes are, in our view, in the porting. Here, by way of explanation, we would like to digress for a moment.

We were asked recently why we do not regularly quote compression-ratios in these Engine Reviews. There are a number of reasons for this. Firstly, to calculate compression-ratio, one must measure the volume of the combustion space at top-dead-center. This (*Continued on page* 52)



Parts of FAI Special. Engine features new crankcase, large diameter shaft, optional tank mount, also new cylinder with special dual bypass.

9

Engine Review

(*Continued from page* 24)

can rarely be done accurately in a small engine by geometrical calculations derived from actual physical measurements and the more common method is to determine the volume of the combustion chamber with the aid of a burette or pipette and a suitable fluid. However, even this becomes tricky when one gets down to ½A sizes, especially as with the wide use of one-piece glowheads in such engines, an alternative must be found to the usual practice of introducing the fluid via the plug hole. Secondly, even assuming that one evolves a practical method, standard to all engines, of accurately determining combustion chamber volume, the nominal compression-ratio, based on the relationship of the total volume of the cylinder (as swept by the piston) plus the (unswept) combustion space volume and divided by the combustion chamber volume, does *not*, in fact, give us a true picture.

The fly in the ointment—and this applies to all two-cycle engines with piston controlled ports—is that, since compression can only begin when the cylinder is sealed, *effective* compression-ratio is related only to the actual swept volume of the cylinder *above the top of the exhaust port*. Moreover, since the swept volume above the exhaust port, relative to the nominal swept volume, varies according to the location of the exhaust port between TDC and BDC, it follows that the effective compression ratio is also influenced by exhaust port timing.

On the new Fox 049 FAI-Special, the exhaust port closes early: only 58 degrees after bottom-dead-center. This is 12 degrees earlier than on the stock 1964 049 and 18 degrees earlier than on the original Fox 049 of 1962 and means that the effective compression ratio is appreciably higher.

In theory, this also means that there is less loss of fresh mixture through the exhaust port immediately before it is closed by the raising piston and that, during the power stroke, more energy is extracted from the expanding gases by delaying their release. On the other hand, these latter two advantages are, to some extent, nullified by the reduced time available for scavenging the cylinder of burnt gas, which may mean that the incoming charge is more heavily adulterated with residual exhaust gas.

These conflicting factors are, of course, old stuff and as is so often the case, an engine designer has to aim for an exhaust timing that will strike the best balance. However, it is equally true that, as i.c. engine design develops, emphasis tends to shift from one part of the engine to another and, as a result, it may be found that rules which have held good in the solution of one particular problem, may, with advantage, be modified later, to blend in with a development in some other part of the engine.

There has been just such a shift of emphasis in regard to exhaust port areas and timing. During the early development of high performance model engines, much was made of the need for free and unrestricted discharge of exhaust gases and designers struggled to accommodate the biggest possible exhaust port area along with generous timing. Many engines were grossly over-ported on the exhaust side and, in due course, it became abundantly clear that filling the cylinder was far more important than emptying it. Intake valves and passages and ports have, as a result, became highly developed during recent years.

As we remarked earlier, the significant changes made to the Fox FAI are in these departments. Firstly, gas enters the engine via an appreciably larger carburetor intake tube (its actual cross-sectional area being approximately 60 percent bigger than that of the standard 049) and through a very much larger crankshaft. This latter has a 5/16 in.dia. journal (instead of ¼ in. dia.) which accommodates a large rectangular valve port (approximately 100 percent greater area) and a 13/64 in. bore intake passage (69 percent more cross-sectional area). Rotary-valve timing (measured) is 54 deg. ABDC to 41 deg. ATDC.

From the crankcase, gas reaches the cylinder through two internal bypass flutes which total about three times the cross-sectional area of the standard engine's single bypass. These flutes extend well up between the exhaust ports to give a bypass period of 108 degrees which, although less than the bypass duration of the stock engine, reduces exhaust lead when the ports open, to only 4 degrees. To accommodate these wider bypass flutes, between the two opposed exhaust ports, the latter are now tapered in width from top to bottom. The lower one-third of the port height is ineffective as exhaust area, serving instead as a sub-piston supplementary air intake port, when the piston skirt clears the bottom edge of the port, for 28 degrees of crank rotation each side of TDC.

Structurally, the FAI-Special follows the basic specification of the standard Fox 049. The crankshaft has a crescent counterbalance, is hardened and runs direct in the pressure-cast aluminum crankcase. The piston is hardened, with a ball joint hardened steel rod and runs in a leaded steel cylinder which screws into the crankcase. The head is the stock Fox 049 type with integral glow filament. The engine has drilled beam mounting lugs but is supplied complete with an optional radial tank-mount of substantial diecast aluminum construction.

Two FAI Specials were received for test. As is our usual practice, both engines were checked out after break-in and the best of the two was used for subsequent tests. These engines were stock specimens and had not been specially selected: there was, in fact, an appreciable difference in the performance of the two examples still amounting to over 1000 r.p.m. on a 5x4 prop at the conclusion of the initial break-in period (15 minutes intermittent running) although the slower engine began to pick up with further running. Of course, the Fox 049 does not, in any case, call for the type of break-in that we normally associate with larger lapped-piston motors. A few runs with the needle set slightly rich will normally be sufficient to enable the 049 to be given its head, straight off, without risk.

We tried the FAI-Special on various fuels. It ran well on all of them, ranging from a straight 3 to 1 methanol-castor mix, to Fox "Blast." On a 6 x 3 Tornado, it was 1500 rpm faster using "Blast" than on straight methanol-castor. Nevertheless, the FAI-Special was more powerful on straight fuel than the standard 1964 model Fox 049 had been on "Missile-Mist"—which is pretty good. For our dynamometer tests on the FAI-Special, we chose "Blast."

Immediately noticeable was the substantially improved torque developed by the FAI-Special—about 15 percent higher than the stock 049. About one-third of this gain can be attributed to the greater power liberated by the use of high-nitro "Blast" as opposed to medium nitro "Missile Mist", but it is clear that the improvement in aspiration gained from the use of bigger intake and bypass passages has been responsible for the major part of the FAI-Special's greater performance.

By contrast, the bhp peaking speed (in the 18,500/19000 rpm bracket, where the excellent output of nearly 0.12 bhp was developed) was no higher than before and it seems reasonable to suppose that this is a product of the more conservative timing of the new engine. It means that, while the FAI Special will turn any size prop faster than the standard 049, it may be advantageous to use a slightly bigger size. This much is, in fact, suggested in the instruction leaflet issued with the engine. On our tests, the FAI Special was 27 percent more powerful than the standard 049 at 18,000 rpm and 26 percent better at 16,000 rpm. However, at 20,000 the improvement had dropped to 21.5 percent and at 21,000 to 19 percent.

For ultimate contest performance, therefore, it seems logical to aim for an in-flight maximum rpm of 19,000, or just over, which will allow the engine to accelerate rapidly up to its peak, but not too far beyond. A 6x3 Top-Flite nylon (17,400—18,300 rpm according to age, etc of the prop) would seem to be the smallest practical free-flight size. A 6x3½ (if available) or a fast 6x4 may be preferable with some models.

We encountered one slight spot of starting bother with both test model FAI-Specials during break-in. This was a tendency for the engine to oscillate, i.e. for it to fire too far advanced, causing the prop merely to flip back and forth as the piston was arrested just short of TDC. This is a phenomenon sometimes encountered when starting diesels if there is an excess of fuel in the combustion chamber combined with too much compression. On the FAI-Special, the nominal compression ratio is higher than on the standard 049; it has only one head gasket instead of two and, as we discussed earlier, its effective compression ratio is also higher. This probably accounts for the tendency to oscillate if one is a bit too liberal when priming for a start.

Any user who encounters this problem and who finds he cannot adjust himself to the required starting techniques, can effect a quick remedy by adding an extra head gasket (or even two gaskets if necessary) and/or using a mild fuel, such as straight 3/1 methanol/castor without additives. An extra head gasket will cost 300-400 rpm; straight fuel and extra gasket 1800-2000 rpm. After becoming used to handling the engine in this "de-tuned" state, a return can usually be made to stock "contest" condition without further trouble.

For many years, Fox engines have enjoyed a well-deserved following among contest flyers, especially in the C/L stunt, combat and rat-racing fields. With the FAI-Special, Fox now makes a strong bid to extend this appeal to ½A contest flyers.

Summary of Data

Type: Two-port, two-cycle with opposed exhaust ports and dual bypass. Shaft type rotary-valve intake.
Weight: 1.7 oz. (1.9 oz including tank)
Displacement: 0.04993 cu. in. or 0.818 c.c.
Bore: 0.390 in. Stroke: 0.418 in.
Stroke/Bore Ratio: 1.072:1
Specific Output (as tested on "Blast" fuel): 2.36 bhp"cu. in.
Power/Weight Ratio (as tested on "Blast" fuel). 1.11 bhp/lb.
Price: $9.95
Manufacturing: Fox Manufacturing Company, Station A, Fort Smith, Arkansas.

Builder of the model rule. Do we need it?

Almost everyone has an opinion on this one. What was the reason for the BOTMR in the beginning? It probably came about to keep young and untrained flyers from having their models built by their fathers so that they could have a better chance of winning over their friends with unskilled fathers. Maybe a good idea at that time. Is it still a good idea? Probably not. The enforceability issue is one of the main problems. A contest director never knows whether or not the competitor has built his model. How much of the construction has to be done by the builder? How do you police that? Ninety percent of the models are built from scratch now as opposed to about ten percent many years ago. In RC the BOTMR says that the flyer must build at least as much as in the average kit. The trouble with that is the average kit gets more and more pre-built all the time. Glass fuselage, foam wing, stab and rudder, pre-hinged surfaces, installed retracts, etc. How shall we decide in the future what is or is not acceptable, and who is going to look after it on the contest field? I doubt that very many contest directors would like to have the job. When a modeler decides to quit, or it is decided for him, his models are essentially worthless. Wouldn't it make more sense to give or sell them to someone who has not flown free flight and let them sample the joys of flying free flight. The chance that the neophyte will win with this model is slim at best. As he builds confidence and skill he will become more like the rest of us and win his share. What is the matter with that. If he beats you, it will make you work harder to see that you win instead. What's wrong with that? Nothing. The BOTMR does nothing to further the sport in today's world.

The FAI recently did away with theBOTMR, (it has its detractors for sure) and the result has been generally good for the sport. More flyers flying better models and the competition is very close as a result. It gives competitors a way to be competitive without investing in the necessary inventory of carbon pre-preg, the oven, and learning the technology (which takes a while) to become competitive. This is not to say that you can't do this, but at least you have the choice. Let's face it folks, the act of building a model airplane is not rocket science. It is not difficult to do, and the fact that you choose not to build your own wing or other parts should not make you unworthy of competing with those who do, and you can bet that there are a few modelers out there that will do it, and win more than their share which will result in more flyers moving on to something else.

The question is . . . do we want to have AMA Gas progress into the future with technology, or do we want it to to become another form of Nostalgia with dozens of limitations.AMA Gas should be the "unlimited" event in free flight. For limited classes we have Old Timer, Nostalgia, and FAI power.. AMA Gas is now unlimited except by displacement, but the BOTMR is <u>limiting</u> the technology. If we <u>limit</u> the high performance technology to only those who are willing and capable of doing it, we are seriously <u>limiting</u> the number of potential flyers which is sure to precipitate a further reduction in our numbers. Once the <u>limitations</u> begin, there is no end to it.

If we are going to continue with the BOTMR, we at least need to establish whether or not a set bones made of carbon fiber constitutes a kit or not. (Even if the competitor buys the bones and a fuselage tube and a fuselage front end, he is looking at about 80-100 hrs. to finish the model.) This year's nats saw the beginnings of the complaining and griping about one well-known competitor buying his carbon fiber composite wings. <u>He did not</u>, by the way, and he kicked butt. Which he will continue to do in the future with that model. Is every one of the modelers now involved in AMA Gas willing to build the carbon fiber composite model from scratch? Some would, most would do something else. A few would not buy the pre-built bones, most would! Should we complicate the event by not allowing certain things like high aspect ratio wings, carbon fiber, bunts, auto stuff etc., We already have Nostalgia (as well as SLOP in the future, maybe) that essentially does that.

Baseball players do not make their owa gloves, bats or balls. If they did, do you suppose they would be better players? Very few race car drivers build their own cars. Golfers can buy shafts and heads of their choice and assemble their own clubs from parts available on the open market and most of them don't even do that these days because of the vast array of available equipment. All could, but all don't. 90% of the competitive shooters in America do not build their own equipment, but many of them could if they wanted to and had the equipment to do it. Sports flourish because of the availability of fine equipment that competitors can choose from. Why should we be different? Are we improving our situation or are we limiting it to the status quo of don't know and don't tell.

MMAC Outdoor Point Totals as of 1 Sep 99

1.	H. Fessler	83	16.	D. Diers	12
2.	J. Huettl	75	17.	J. Anderson	10
3.	G. Dona	74	18.	D. McDonnell	10
4.	G. Oakins	65	19.	D. Berggren	8
5.	W. Ringlien	59	20.	J. Hirte	7
6.	A. Petersen	50	21.	H. Liljequist	7
7.	J. O'Leary	30	22.	T. Taylor	5
8.	T. Johnson	28	23.	D. Pederson	5
9.	D. Bloomquist	27	24.	B.Kumferman	3
10.	S. Jepson	22	25.	J. Ringlien	3
11.	J. Dona	19	26.	D. Spehn	3
12.	D. Sussman	19	27.	G. Wolf	3
13.	W. Rogers	18	28.	A. Nephew	2
14.	M. Dona	16	29.	P. Owen	2
15.	J. Jorgensen	15	30.	J. Watkins	1

Junior Event

1.	M. Dona	7
2.	J. Dona	6
3.	D. Pederson	3
4.	S. Moore	2

The Minneapolis Model Aero Club
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Wausau, Wi. 54403

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