THE VALLEYFLYER





PHOTO BY DICK SONHEIM

MODEL OF THE MONTH winner Herb Boyer looks overwhelmed by the mass of expensive flying equipment around him while keeping a firm grip on his seven pound PT-17 constructed from a Sterling kit purchased at the November Valley Flyers auction. This proves that some of the auction purchases do get built and don't just get resold at the next auction. The PT-17 is powered by an OS Max 80, is covered with Coverite and painted with varethane. Special features include a cockpit edge made from the vinyl beading off an old auto seat. From left to right about Herb are show and tellers: James Wang with his Heli-Baby, Chuck Smith with a Comet X-200, Gideon Kotler with his F-4 Phantom, Linda Smith with a F-104, our usual photographer Mike Stecker with his Super Chipmonk, John Pahlow with his RCM Trainer and Tom Cone with his P-51 (no, the tail wheel doesn't retract.)

May 77-

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VICE PRES: JOHN ELGIN

SECRETARY: BERT SMITH

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The Show and Tell at the last meeting was really great. We had a wide variety of interesting airplanes and different finishing methods that certainly gives one all kinds of new ideas. Of course, if I could use monokote like John Pahlow, I would never paint again. Oh well, back to reality! One comment though about the show and tell, I hope the people who have a partially built airplane or a clever gadget will also bring these to the meeting. Also, if any of our members have a specialty or a presentation on a "how-to" please don't be bashful.

Now to a more mundane subject. The club needs a newsletter editor or an assistant newsletter editor. In the past the President, George Finch, and Gary MvPike have been doing this job. However, Gary's business makes it no longer possible for him to continue helping which leaves George as both editor and president of the club. The newsletter editor job is not especially difficult. I write this column and George Finch writes "Finches Flack" every month. Other articles, pictures and contest reports are provided to the editor as well as contest schedules, advertisements, etc. The editor lays these out and has them reproduced at a local printer such as Sir Speedy or Instant Press. Finally, he puts on the address labels and stamps and mails them.

This whole operation takes a few hours a month. I am afraid that unless we get a volunteer to either be editor or as a last resort to help George, we may not be able to continue to have a newsletter. The funny part is that it we don't continue to have a newsletter, the people who cry out the most are the ones who volunteer to help the least.

If anyone can help, please let either myself or George Finch know. Also, the newsletter editor attends board meetings and receives free membership in the club.

JOHN ELGIN

FINCH'S FLAK

This month Rod Taylor is presenting a representative from Kraft Systems, Inc. who will discuss the latest offerings from our friends in Vista. This is all to happen starting at 8:00 P.M., Tuesday, May 10th, so come early to get a good seat.

This month the raffle and new products report will be provided by Chuck Smith of:
Chuck showed off a new line of pulse jet powered wonders at the April meeting which were not included in the Model of the Month competition but are in the front cover picture anyhow. The last I heard they were in Chuck's Northridge store for you to dream and drool over. I own two pulse jets but finally gave up on them because of their noise. Chuck says the new German jets are somewhat muffled.

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Well, the good old NMPRA has again exhibited its traditional "we'll do what we want" attitude and scheduled a Formula I contest on the same day as our Formula 500 contest was scheduled, this after moving Bakersfield so we had to change the Formula 500 training day. The net result is 3 Formula I contests in four weekends with only 22 May being left open. Since there are a lot of flyers that fly both Formula 500 and Formula I, it is unlikely that we will have a reasonable turnout even if we cancel the training day and hold the contest the 22nd. Most of our "experts" are going to be so numb trying to keep ready to race, that they won't be able to help out for the training day anyhow. At this writing the board meeting has been postponed for a week but I think the only solution is to cancel both the race and the training day until August where we will have an open date if we cancel our August Formula I

Originally NMPRA asked us to hold two or three races, all on what I considered was less than desirable dates. The first was too early and lost more money than any other contest we have ever held except for the speed trials the year we bought the equipment. The one I propose cancelling is too close to the NATS, is not the last point race of the season and is not needed by the NMPRA now. I might add, that we have lost 10 1/2 serious NMPRA racers in the last year leaving only Larry, Laird and Scott as our only very competitive members. The 1/2 comes from one member who only joined because he needed an FCC license for the Valley Flyers race. I can count 15 Valley Flyers who fly or have a plane and plan to fly Formula I, so I think it's proper we do sponsor Formula I contests. I just think it's too bad that NMPRA, including its officers particularly, keep sticking our nose in it, so to speak. Enough soap box. When I started as Editor, I sort of made a pact with myself to write and print information rather than editorials, letting Bob or John do most of the bitching.

There has been a proposal that the July meeting return to a week night fun fly format at the field with the last events being night flying events. Comments will be solicited at the May meeting.

We need a volunteer for Christmas party chairman. Len Katz has done it for years and like the editor could use some relief.

It is now time for all members to get nasty at the Basin. park directors are relatively ineffective. Before you give a non-Valley Flyer a hand, make them produce a FCC license and an AMA card or proof of insurance. Otherwise you are more likely to find youself in legal troubles should the helpee cream someone with his airplane. Also, if someone is breaking the rules, get together and inform him en masse. If a delegation confronts the offender, he is much more likely to take an apologetic attitude. There have been some high flying, some over the pits flying, and some unsafe aircraft episodes lately that shouldn't happen again!

The metal cals of the Valley Flyers logo are available again at \$.50 a piece. See me. This months puzzle is easy so give it a try. The answer is in some obscure place in the Flyer.

PUZZLE OF THE MONTH:

August 20-21

August 27-28

Recent archaeological records have shown that the first remote control model airplane flyer was a Greek by the name of Ridiculitious. He flew a glider powered by a trained pigeon whom he could control with various vocal commands. Ridiculitious was born on July 4th, 30 BC. He died on July 4 30 AD because of an unfortunate accident involving his first attempt at a man-carrying pigeon-powered airplane which ended in failure when some unthinking spectator dropped a bag of birdseed on the ground causing Ridiculitious to be thrashed to death. How old was Ridiculitious when he died?

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May 7-8
                      MACS Trade Show
   May 14-15
                      Pattern and Sport Scale, Pioneers
                      1/2 A Standoff Scale, Mile Square
   May 15
   May 15
                      Biplane, R/C Bees (Site to be announced)
   May 21-22 14-15
                      Formula I, Bakersfield
   May 29
                      Formula 500, Valley Flyers, Sepulveda Basin Formula I, San Luis Chispe
   May 28-29-30
                      Pattern, Fresno R/C, Madera
   May 28-29
                      1/4 Midget, Mexicali, Mexico
   June 4-5
                      Formula I, Santa Clara (Tentative)
   June 5
                      1/2 A Pylon, Valencia Valley
                      Pattern, Pomona Valley MAC, Cucamonga
1/4 Midget, Valley Flyers, Sepulveda Basin
Formula 500, SGVRCL, Whittier Narrows
   June 11-12
June 12
   June 26
                      Masters R/C Aerobatics Team Selection, Springfield, Ohio
   June 25-26
   June 29-July 4
                     R/C Aerobatics World Championships, Springfield Ohio
   July 2-3
                      Sport Scale, OCRC/Scale Squadron, Mile Square
                     Formula I, SGVRCL/BIRDs, Whittier Narrows
Pattern and Sport Scale (Scale 10th only) Valley Flyers, Sepulveda Basin
   July 2-3
>> July 9-10
                     Formula I, San Diego area (Site to be announced)
  July 16-17
  July 24
                      1/2 A Pylon, Simi Valley
  July 23-24
                      Invitational Fun Fly, OCRC, Mile Square
                     Formula 500, Pomona Valley MAC, Cucamonga
  July 31
  AUGUST 6-14
                     NATIONAL MODEL AIRPLANE CHAMPIONSHIPS, MARCH AFB, RIVERSIDE, CALIFORNIA
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Formula I, Valley Flyers, Sepulveda Basin ?

Air Circus, SGVRCL, Whittier Narrows

	* * * T H E	VAL	LEYFLYERS	* * *	
1	* * * T H E ADAMS, ROBERT ADAMS, H. E. AFFLECK, ANDRE" AKINS, TOM ALTMAN, WALTER BAER, JOE BARBER, THOMAS V. BARKER, FRANKLIN BECKER, MARTIN BIRENBAUM, SHELDON R. BLESSING, RONALD E.		27361 SIERRA HIGHW	01750	(805)252-9630
2	ADAMS, H. E.		2234 CLOVERFIELD B	71.000	(803)232-7630
3	AFFLECK, ANDRE"		12832 WOODLEY AVE.	90405	(213)399-160
14.	AKINS, TOM		GRANADA HILLS, CA. 245 S. REND ST. #3	91344	(213)360-3220
5	ALTMAN, WALTER		LOS ANGELES, CA. 1219 BARRY AVE.	90057	(213)384-7696
6	BAER, JOE		WEST L. A. 2758 MOTOR AVE.	90025	()
7	BARBER, THOMAS V.		LOS ANGELES 7546 BALBOA	90064	(213)839-6628
8	BARKER, FRANKLIN		VAN NUYS, CA. 17350 CHASE ST.	91406	()
9	BECKER, MARTIN		NORTHRIDGE, CA. 10360 HASKELL	91234	(213)987-2416
1.0	BIPENBALM, SHELTION R.		GRANADA HILLS, CA.	91202	(213)361-1498
11	DIEGGING PONALD F		CANOGA PARK, CA.	91304	(213)346-9924
12	BRIDI, JOE		NORTHRIDGE, CA. 23625 PINEFOREST L	91325	(213)345-0482
			HARBOR CITY, CA. 4801 DUNSMORE	90710	(213)326-5013
13	BROOKS, ALLAN		LA CRESCENTA, CA.	91214	(213)249-4767
14	CLARKE, VINCENT S.		7840 WOODMAN #278 PANORAMA CITY, CA.	91402	(213)780-2665
15	CLEM, RON		13001 ROSE AVE. LOS ANGELES, CA.	90066	(213)398-686
16	COLEMAN, BOB		18325 VANOWEN #48 RESEDA, CA.	91335	(213)342-7537
17	CONE; TOM		17430 TROSA ST. GRANADA HILLS, CA.	91344	(213)363-0578
18	COPLAN, MAURICE		17757 TRAMONTO DR. PACIFIC PALISADES	90272	(213)454-4251
19	DANIELSON, JOHN		4761 ROSEBANK DR. LA CANADA, CA.	91011	(213)248-0131
20	DAVIDSON, JACK A.		10121 LANGMUIR AVE SUNLAND, CA.	91.040	(213)353-2084
21	DAVIDSON, JAMES G.		10121 LANGMUIR AVE SUNLAND, CA.	91040	(213)353-2084
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23	DEAN, DOUG		850 WHITSETT AVE.	91607	(213)769-4039
24	DEYO, PATRICK		8545 RUDNIK AVE.	91304	(213)344-4211
25	DI LEO, TONY		532 N. CROFT #4	90048	(213) 458-5300
26	DIMAIO, COLLIN		526 AVONDALE AVE.	90049	(213)395-7894
27	COPLAN, MAURICE DANIELSON, JOHN DAVIDSON, JACK A. DAVIDSON, JAMES G. DE BOURBON, SYBIL DEAN, DOUG DEYO, PATRICK DI LEO, TONY DIMAIO, COLLIN DIMAIO, FRED DORTCH JR., NATHANIEL S.		526 AVONDALE AVE.	OUUIO	/213/3/5 7070
28	DORTCH JR., NATHANIEL S. EDELBERG, BOB EDZANT, BARRY		2952 LASALLE AVE.	00040	(213/3/3-10/6
29	EDELBERG, BOB		16262 ARMSTEAD	01744	(213/302-0/12
30	EDZANT, BARRY		4958 BILMOOR AVE.	71344	(213)360-3300
31	EDZANT, JACK		6922 HOLLYWOOD BLV HOLLYWOOD, CA.	91356	(213)881-2191
32	ELGIN, STEPHEN		HOLLYWOOD, CA. 20812 VOSE ST.	90028	(213)466-7581
33	ELGIN, JOHN S.		CANOGA PARK, CA. 20812 VOSE ST.	91306	(213)883-8059
34	ELGIN, STEPHEN ELGIN, JOHN S. EVETT, COLBY		CANOGA PARK, CA. * 1636 OCEAN PARK BL	91306	(213)883-8059
35	EYMAN, ROBERT E.		SANTA MONICA, CA. 11920 WOODBINE ST.	90405	(213)396-0280
36	P*** A 1 2** P*** A 1 2** A 1		LUS ANGELES, LA.	90066	
A. 1.	FARISH, GARY		CANOGA PARK, CA. 13938 HAMLIN STREE	91306	C) - ES PELOT
38			VAN NUYS, CA.		(213)787-1174
39					(213)459-1577
			SANTA MONCA, CA.	90403	(213)829-1482

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40	CADUED DALE C	3910 MINERVA LOS ANGELES, CA.	90066	(213)397-1170
41	GARNER, DALE 5.	TUJUNGA	91042	(213)353-3312
42	GURDUN, STAN	SEPULVEDA, CA.	91345	(213)892-0402
শ্ব	GARGES, DAVE GARNER, DALE S. GORDON, STAN GROVE, BILL HAGER, RICHARD A. HALVORSEN, BOB HAUTZENROEDER, RICHARD D. HEMINGWAY, DAN HOTELLING, ED	TUJUNGA, CA.	91042	(213)353-0801
44	HAGER, RICHARD A.	SEPULVEDA, CA.	91343	(213)894-3425
45	HALVORSEN, BOB	7519 WISH AVE. VAN NUYS, CA.	91406	(213)342-6331
46	HAUTZENROEDER, RICHARD D.	6551 DESOTO AV #15 CANOGA PARK, CA.	91303	(213)887-0951
47	HEMINGWAY, DAN	3823 ANDERSON ST.	91214	(213)248-0961
48	HOTELLING, ED	3180 GOLDENSPUR DR	93010	(805)482-7547
49	HAUTZENROEDER, RICHARD D. HEMINGWAY, DAN HOTELLING, ED HOWELL, ARLIN HOYER, H. C. IGO, VINCENT R. INKSTER, ELWOOD M.	9010 TOBIAS #154	91402	(213)894-8764
50	HOYER, H. C.	9932 JOVITA AVE.	01711	(213)349-0928
51	IGO, VINCENT R.	1333 BROCTON #3	71311	
52	INKSTER, ELWOOD M.	WEST L.A., CA. 3730 INGLEWOOD BLV	90025	(213)478-2721
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58	KOLODZIEJ, RICHARD J.	4650 KESTER AV#115 SHERMAN OAKS, CA.	91403	(213)986-5420
59	KOTLER, GIDEON	12744 ARCHWOOD ST. N. HOLLYWOOD, CA.	91606	(213)763-3207
60	LACOUR JR., GEORGE	206 39TH ST. CHATSWORTH, CA.	91311	(213)341-8957
61.	KOLODZIEJ, RICHARD J. KOTLER, GIDEON LACOUR JR., GEORGE LAULOM, LARRY LEE, CLARENCE LEE, JACK	6907 WHITEOAK ST.	91335	(213)342-5225
62	LEE, CLARENCE	7215 FOOTHILL BLVD	91012	(213)352-3766
63	LEE, JACK	7215 FOOTHILL BLVD	71012	/047/7557744
64	LEE, JACK LEVINE, EARLE LLOYD, MARSHALL B. MACLANE, ANTHONY R.	1180 REXFORD AVE.	71042	(213/332-3700
65	LLOYD, MARSHALL B.	PASADENA, CA. 3333 BAGLEY AVE #2	91107	(213)351-9268
66	MACLANE, ANTHONY R.	LOS ANGELES, CA. 19640 CHASE ST.	90034	(213)838-5721
67		NORTHRIDGE, CA. 17730-2 DEVONSHIRE		(213)349-9590
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69	MATTEGON GARY F	STUDIO CITY, CA.	91604	(213)985-1707
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70	MMITHEWS) HMNIAN OF	BURBANK, CA.		(213)845-4747
71		LUS ANGELES, CA.	90025	(213)474-0745
72	McPIKE, JEANNINE	VAN NUYS, CA.	91401	(213)787-5220
73	McPIKE, GARY	13915 CALIFA ST. VAN NUYS, CA.	91401	(213)787-5220
74	MOSKOFF, ABE	H911 HASKELL AVE.	91436	(213)986-6204
75	MCPIKE, GARY MOSKOFF, ABE OWENS, LAIRD	6469 DAY ST. TUJUNGA) CA.	91042	(213)353-8691
76	HWENS JK., K.L.(BUB)	6469 DAY ST. TUJUNGA, CA.		(213)353-8691
77	PACKARD, REED E.	2918÷ W. MAGNOLIA BURBANK, CA.		(213)842-7139
78	PAHLOW, JOHN L.	13214 INGRES AVE.		(213)363-4419
79	PALMER, BOB	GRANADA HILL, CA. 9161 MOREHART AVE.		(213)767-6734
		ARLETA, CA.	71331	(210/10/20/04

80	PANEK, MIKE	17835 HIGWATHA		£. 0
81	PELTIER, ROGER	GRANADA HILLS, CA.	91344	(213)360-3371
82	Ph (*** 5. 5. 5. 9** 5. 5.2** *** *** *** *** *** *** *** *** ***	NEWHALL, CA.	91321	. (805)255-7 76
83	PETERSON, C. W.	MISSION HILLS, CA. 13755 VENTURA BL#5	91345	5 (213)365-307
84	PFLOMM, GEORGE V.	SHERMAN DAKS	91423	(213)783-0160
85	PERMINGTON, PAUL W. PETERSON, C. W. PFLOMM, GEORGE V. PONTELLE, MIKE	ENCINO, CA. 14729 HUSTON ST.	91316	(213)987-2172
86	RAMBO, NATE	SHERMAN DAKS, CA.	91403	(213)981-3333
87	PONTELLE, MIKE RAMBO, NATE REBANAL, FLORANTE R.	CAMARILLO, CA.	93010	(805)482-3702
88	REED, HOWARD D.	CULVER CITY, CA. 18719 COVELLO ST.	90230	(213)398-6656
89	REBANAL, FLORANTE R. REED, HOWARD D. REPLOGLE, JAY M. RICE, HOWARD D. ROSEN, RALPH B. ROSS, JAY WILLIAM	RESEDA, CA. 13939 BURTON ST.	91335	(213)343-6901
90	RICE, HOWARD D.	PANORAMA CITY, CA. 16321 GLENHILL	91402	(213)787-8591
91	ROSEN, RALPH B.	SEPULVEDA, CA.	91343	(213)894-1329
92	ROSS. JAY WILLIAM	BEVERLY HILLS, CA.	90210	(213)826-5525
93	RUBIN, GREG	BEVERLY HILLS, CA. 5860 DALCOM AVE. RESEDA, CA. 10036 SUNNYBRAE AV	91335	(213)343-8771
94	SCHNEIDER, ART	CHATSWORTH, CA.	91311	(213)341-6584
95	ROSS, JAY WILLIAM RUBIN, GREG SCHNEIDER, ART SIMPSON, WILLIAM D.	AGOURA, CA.	86184	(213)889-3349
96		Lurno Arkhro: CM:	70274	()-
97	SMITH, CHUCK	LOS ANGELES, CA.	90008	(213)291-4916
98	SMITH, ROBERT M. SMITH, CHUCK SMITH, BERT A. SONHEIM, RICHARD SPORNY, RICHARD STECKER, MIKE STEIN, ROBERT D. STOKELY, HANK STONE, DAVID R.	7024 BECKFORD AVE. RESEDA, CA.	91355	(213)363-1642
99	SONHETM. RICHARD	NORTHRIDGE, CA.	91324	(213)886-1072
100	SPORNY, RICHARD	GLENDALE, CA. 17840 CHASE ST.	91201	(213)245-8433
101	STECKER, MIKE	NORTHRIDGE, CA.	91324	(213)885-0738
102	STEIN, PORERT D	LOS ANGELES, CA.	90024	(213)472-3111
103	STOVELY HAND	17436 MANTECA ST. VAN NUYS, CA.	91406	(213)343-6096
104	CTOME DAYIN D	LA CRESENTA, CA.	91204	(213)248-0961
105	STONE, DAVID R. SWIFT, TOM	CANOGA PARK, CA.	91303	(213)887-7837
106	TAVAREZ, SAL	SUN VALLEY, CA.	91352	(213)767-9911
103	TAYLOR, ROD	ENCINO, CA.	91316	(213)344-2314
108	VERONICO, ARMAND	VAN NUTS, CA.	91406	(213)344-2962
L 0 9	WAH, GARY	12620 PRESNELL ST. LOS ANGELES, CA.	90066	(213)822-6373
110	WANG, JAMES	10122 BALBOA BLVD. GRANADA HILLS, CA.	91344	(213)363-3323
111	WATSON JR., LARRY	600 ENDRINO PLACE BEVERLY HILLS, CA.	90210	()
	WEAVED. LADDY	15040 PARTHENIA ST SEPULVEDA, CA.	91343	(213)894-1982
.13	WEAVER, LARRY	WOODLAND HILLS, CA	91367	(213)883-1535
14	HTI SON. PTCHAPT	SYLMAR, CA.	91342	(213)367-1464
15	ZARFI. DON	SUN VALLEY, CA.	91352	(213)767-0561
2. 4.	WEAVER, LARRY WIGHAM, CURBY WILSON, RICHARD ZABEL, DON	TUJUNGA, CA.	91042	(213)248-1625
× .				

A recent article published by Lockheed (1) caught my attention. I thought, "Now that's just what I have been preaching to my kid". Excerpts from the article are quoted here to show that basic aerodynamic laws are valid for modern jet transports and for models as well.

Most of us are constantly trying to get just a little more speed out of our R/C models whether we fly a sport-job, a pattern ship, or a racer. Drag can be easily overcome in a sport plane; just put in a larger engine. Drag of a pattern plane can't be corrected so easily because engine displacement is limited. Lot's of development money is being spent to increase the power output of the 60's. Schnerule porting, Perry Directional Porting, fuel pumps, and the use of higher nitro fuel are examples.

In the case of Formula I racers it's a bit more tricky to reduce drag because just about everything is limited by rules.

One law of aerodynamics says that for a given speed, thrust is proportional to weight multiplied by drag divided by lift. Reducing weight will require less thrust for a given speed, thus allowing the excess thrust to be available to increase speed. However, the rules limit the minimum weight, but keep as close to the minimum weight as possible. Drag is the other variable on which we can work to increase

The following pertinent information has been extracted from the article (1) may give you some food for thought. "Much effort has been expended to reduce the drag on the L-1011 by careful design of the wing and fuselage shapes. The success of this effort can be seen by noting that, at Mach 0.85 and 35,000 feet, the drag on the L-1011 is equal to the drag on a 45 inch diameter cylinder the same length as the L-1011 wing span. This phenomenon exists because the sharp drag rise of a cylinder starts at a low Mach number compared to a high Mach number for a streamlined shape. Any unstreamlined protuberance or surface irregularity on the streamlined shape, will cause relatively high irag at the higher (cruise) Mach numbers.

*For example: The tailskid, which is a 4 inch diameter cylinder 22 inches long, will cost an airline 31,530 US gallons per year per airplane in excess fuel consumed if allowed to remain extended during oruise flight. In Suly 1976 dollars, this is over \$9,580 per year (based on 30.4¢ per gallon of jet fuel in the Los Angeles area).

"ELEMENTS OF SKIN FRICTION DRAG - Skin friction drag is the scrubbing action of air over the exterior aircraft skin, associated fasteners, gaps and panel mismatches. It represents about 50 % of the total drag in high speed cruise flight and is proportional to the surface area affected, the density of the air and the local air velocity squared.

"Figure 1 shows some typical skin surface irregularities that contribute to total drag. Figure 1

Typical Skin

Irregularities

FASTENER

GAP

NEGATIVE

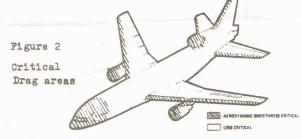
MISMATCH

MISMATCH

MISMATCH

MISMATCH

To aircraft parts having the greatest forward facing curvature, the condition of the forward surfaces of the wing, fuselage, nacelles and tail are the most critical from the standpoint of friction drag (Fig 2).

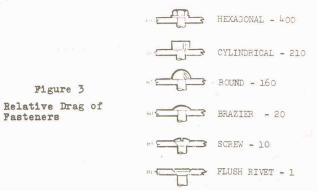


"BOUNDRY LAYER - A recognition of the boundary layer is pertinent to any discussion of skin friction. The boundary layer is a region of retarded airflow near the surface of a body moving in the air. On an airplane, the thickness of this boundary layer will vary from fractions of an inch at the front surface to many inches at the rear." vary

"Because drag is proportional to the air velocity squared, it is obvious that a fastener or skin irregularity in a boundary layer will produce less drag than a protrusion out of a boundary layer.

"Aircraft skin irregularities can alter the boundary layer, converting it from a thin, smooth (laminar) flow to a thick, turbulent one. Turbulent flow reduces the lifting efficiency of the airfoils and increases drag. High fasteners or other skin irregularities closer than about 15% of wing chord length from the leading edge will cause the local flow conditions to become turbulent.

"RELATIVE DRAG OF FASTENERS - Flush-type fasteners are required on most of the surface of high performance aircraft where fasteners are used. However, if use of another type of fastener is necessary, drag relationships may be of value in making a choice. Figure 3 shows a comparison of the relative drag of various fasteners with respect to a flush rivet.



"RELATIVE DRAG OF SHEET METAL JOINTS, MISMATCH AND SURFACE WAVINESS - A square-edged sheet metal lap joint (or a mismatch of panel and door edge) that faces the airflow (step up), has about twice the relative drag as one with a negative step (step down). On sheet metal lap joints, the use of feathered or rounded edges facing the wind reduces the drag markedly.

"Figure 4 indicates relative drag values of various surface masmatches. Note: If the lip of the lap joint in (c) were open, the re ative drag would be 60 instead of 40, emphasizing the need for secure joints.

	AIRFLOW	AIRFLOW
	(a) 70	(5) 70
	(b) 51 5	(1) 51
Figure 4	(c) 40	1/ 22
Relative Drag of	(d) 13	(k) 7
Sheet Metal Joints	(e) 41	(1) 22
	(t) 24	(m) 24
	(g) 1	(n) 1

"Dented, warped and wavy surfaces can become a prob-lem from a total drag standpoint. As the surface irregularity height increases, the drag rises very rapidly ..

"RELATIVE DRAG OF SURFACE FINISHES - The condition of sheet metal and painted external surface finishes affect drag appreciably. For flight at Mach 0.85 and 35,000 feet altitude, any paint or other grain size greater than 0.6 mil results in a calculable increase in drag. Roughness or grain size is measured in mils (0.001 inch). Some comparative values follow:

Type of surface	Roughness in Grain Size(Mils)		
Aircraft type sheet metal Optimum paint sprayed Aircraft mass production paint Camouflage on matte black Incorrectly sprayed paint	0.1 0.2 0.5 to 1.0 1.0 to 2.0		
(possibly in a dust environment) Industrial air particulates (dust)	0.8 to 1.2		

"If an 8 mil roughness exists over the fuselage top and vertical fin of an L-1011, the added drag would increase the fuel flow required to fly at Mach 0.85 by about 85 pounds per hour or 15,850 US gallons per year for just one aircraft. 15,850 US gallons of additional jet fuel costs over \$4,800."

It must be reiterated that the above quoted article was published in the context of the L-1011 TriStar cruising at Mach 0.85 at 35,000 feet. Relationships and quantitative values are not directly applicable to models. It does highlight the types of things we can do to reduce drag on models. Here are some of the things that come to mind.

Seal the gaps between removeable parts such as cheek cowl, wings, pants and hatches.
 Mount switches and cherger receptacles inside out of the airstream, especially wing fillets.
 Painted stripes on the wing and fuselage should run parallel to the airflow. The slight step up caused by masking tape increases drag, especially during highspeed turns. Loss of laminar flow and boundary layer separation (also known as a high speed stall) can also occur.

If spanwise paint stripes are desired, paint the leading edge last to produce a step down which is only half the drag of a step up.

(4) Minimize gaps on the ailerons, rudder and elevators. Tape seals are helpful, especially if no step ups are created by the tape.

(5) Wing bolts, wheel axle screws and cowl fasteners should be of the flush type. Tape over screw access holes.

(6) Smoothout those dints in the leading edges. That goes for the prop, too, which can be nicked by small gravel or grains of sand. A Formula I movin' out will have the prop tips traveling at Mach 0.85.

(7) Rubout the painted surfaces and apply wax. Olean off exhaust residue after each flight.

I can't guarantee you will win, but you will go fast:

Reference (1) TriStar Service Digest, October-December 1976. Reprinted with permission of the copyright owner, Lockheed Aircraft Corporation.

FREQUENCY CONTROL AND THE COLOR CODE SYSTEM

Years ago we had only one R/C channel available to us (believe it or not). Gradually our hobby expanded and we were initially granted six channels on the 27 MHZ band. It became immediately apparent that some simple type of frequency designation was needed. At the suggestion of the R/C flyers the AMA adopted a color coded flag system based on the RETMA Color Code System used on electronic components resistors, capacitors, etc.). For example: BROWN is one, RED is two, ORANGE is three, etc.. Applying this to the 27 MHZ channels, the first R/C channel (26.995 MHZ) was designated BROWN, and so on. To distinguish the Six Meter flyers from 27 MHZ a second flag (color BLACK) was added. For example: the first spot frequency on Six Meters (53.1 MHZ) would have two flags, BLACK and BROWN. And finally when the 72 to 75 MHZ frequencies were added another second flag (color WHITE) was added. These flags are suppose to be actually ribbons of approximately 1" width and 16" length. Most R/C manufacturers supply the appropriate flag(s) with all their assembled or kit transmitters. The flags are attached to the top of the transmitting antenna and alternately act as a good wind direction indicator. Make sure your flag colors are vivid. Don't use a fading RED which could easily be mistaken for the color ORANGE.

AMA FREQUENCY FLAG COLORS

27 MHZ BAND

Frequency	Color
26.995 MHZ	BROWN
27.045	RED
27.095	ORANGE
27.145	YELLOW
27.195	GREEN
27.225 *	BLUE

50 to 54 MHZ (Six Meters)

Frequency	Color
53.100 MHZ	BLACK & BROWN
53.200	BLACK & RED
53.300	BLACK & ORANGE
53.400	BLACK & YELLOW
53.500	BLACK & GREEN

72 to 75 MHZ BAND

Frequer	1cy	Color		
72.08 N	1HZ**	WHITE & BROWN		
72.16		WHITE & BLUE		
72.24	**	WHITE & RED		
72.32		WHITE & VIOLET		
72.40	**	WHITE & ORANGE		
72.96		WHITE & YELLOW		
75 64	* *	WHITE & CREEN		

27.225 MHZ is not recommended for R/C use. The four frequencies indicated by (**) are for model aircraft use only.

The remaining 72 to 75 MHZ frequencies must be shared with other R/C activities, such as R/C racing cars, boats, etc.

In addition to these frequencies the AMA established two experimental "channels" on Six Meters for the exclusive use of super regenerative receiving equipment. The "channels" are as follows:

Frequency	
51.20 MHZ 52.04	

BLACK & LIGHT BLUF BLACK & VIOLET

THE VALLEY FLYER

George W. Finch 18127 Wakecrest Dr. Malibu, Calif. 90265

In general this type of equipment is no longer used.

In addition to the frequency flags, most R/C flyers now use some type of control system to prevent accidental (same channel) interference. Remember, if a fellow modeler is flying on the BROWN flag (26.995) MHZ) and you turn on your transmitter on the same frequency, it is more than likely that his model will crash. This type of modeler to modeler interference is the one we can control if some simple procedures are followed. At most flying fields, local R/C clubs use a "Frequency Clip Board" A colored clothes pin (one for each channel color) is arranged on a display board. To operate your transmitter (FOR ANY PURPOSE) (flying or testing), you must first obtain the colored clothes pin matching your frequency color and clip it to your transmitting antenna. If you follow this practice exactly and without exception, you can rest easy while flying. In some active areas the transmitters are actually impounded by a club or field representative who permits only one transmitter, on a given channel, to operate at a time (this technique is almost always employed at an R/C contest).

When flying for the first time or in a new area, check with the local flyers and find out what specific frequency controls are being used. Remember, always consider the next guy as well. Just owning an R/C system and being licensed, does not mean you can simply fly whenever you want. Wait your turn if you must, but don't get careless and cause the destruction of another modelers pride and joy.

FCC COMPLIANCE DECALS AND LOGGING REQUIREMENTS

72 to 7€ MHZ----All assembled transmitters above 30 MHZ on the Citizens Radio Service Bands will come with a compliance decal which certifies that "This transmitter complies with FCC Rules and Regulations, Part 95, as of the date of manufacture, Station Class C". Then it lists the model number and the address of the manufacturer. On kit transmitters usually a small compliance decal is supplied. Make sure you affix this to the transmitter case. Without it you could receive an FCC violation and as a minimum not be allowed to enter a sanctioned R/C contest. No logging procedures are required for operating on either the 27 or 72 to 75 MHZ bands.

53 MHZ (Six Meters) ----- Effective January 15, 1973, Section 97.99, Special Provisions, "Stations Used Only for Radio Control of Remote Model Crafts and Vehicles", was amended to substantially delete a good deal of the normal "HAM" logging procedures. To comply with this new procedure you must have affixed to your transmitter case a "Transmitter Identification Card" (FCC Form 452-C) or a plate made of a durable substance indicates the restrict the restric of a durable substance indicating the station call sign and the licensee's name and address. Station identification, by Morse Code, is no longer required. Station logs need not indicate the times of commencing and terminating each transmission (each flight) or series of transmissions. In other words, all you need is a simple log which indicates that on a given date you operated R/C, without the need for specifics such as the number and duration of each flight. This new simplified logging procedure was obtained through the efforts of the AMA Frequency

> Bob Aberle, W2QPP (AMA 8409) Member, Academy of Model Aeronautics Frequency Committee

> > NUYS

