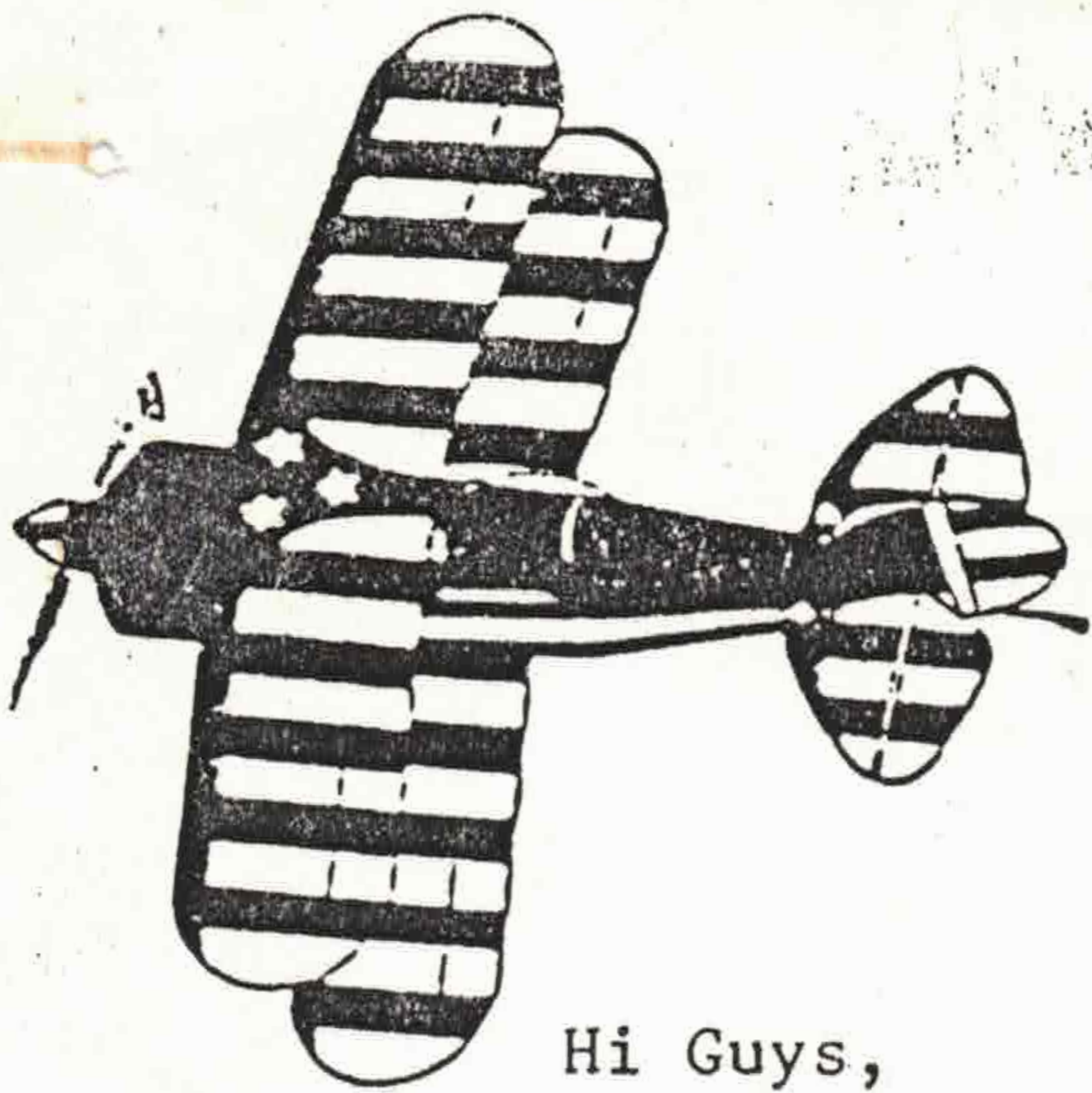


IMAAU Sport Aerobatics



February 15, 1989

Hi Guys,

I received the enclosed TOC data from Phil Kraft the other day and made copies for our regional executives (you).

Please pass on the information to our members, at least those who may be interested in the competition for a place in the 1989-90 TOC.

Our 1989 champion will be invited to the 1990 TOC and will need to begin making plans this year just in case. If our Nats winner already has an invitation, we will elect to send our number two placer.

Please make suggestions for improving our image and competitions. I know you all have some good ideas knocking around so let's hear from you. Pictures and articles would also be appreciated.

If you plan on sending an article or comments to a magazine, it might be wise to send me a copy for verification and edit as two heads are usually better than one.

1990 TOURNAMENT OF CHAMPIONS OFFICIAL RULES

INTRODUCTION:

Since its inception in 1974, the Las Vegas Tournament of Champions, sponsored by Circus Circus Hotels, has become the premier event for Radio Controlled Aerobatic model aircraft. Trends established by this event have greatly influenced the overall sport of Radio Control. Aircraft flown in this competition closely simulate their full scale counter part. Although as dictated by experience, full scale Aerobatic competition rules will not be strictly adhered to, the catalog that will be used in developing the sequences to be flown at the 1990 T.O.C. will be the 1989 version of the catalog as developed by the FEDERATION AERONAUTIQUE INTERNATIONALE (FAI). Sequences to be flown in the 1990 T.O.C. will be announced the summer of 1989. Prospective contestants may write the Circus Circus Hotel to obtain prints of these sequences.

SELECTION OF CONTESTANTS

The competition is open to 20 contestants. Ten contestants plus one alternate will be selected from the United States and ten contestants plus one alternate will be selected internationally.

Five U.S.A. contestants will be invited based on their individual combined placement in both the 1989 U.S.A. National Masters Radio Control Pattern Event and the 1989 U.S.A. F3A Team selection Finals. In both events contestants were awarded points to fifteenth place. In the case of equal point scores, the contestant placing highest at the U.S.A. Nationals will be selected.

Five U.S.A. contestants and one alternate will be selected at the discretion of the contest management.

Five international contestants and one alternate will be

invited at the discretion of the of the contest management. The balance of five will be invited according to their placement at the 1990 F.A.I. World Radio Control Aerobatic Championships.

CONTESTANTS AND ALTERNATES INVITAION ACCEPTANCE DEADLINE

Contestants and alternates must notify the contest director of their acceptance of their invitation to participate prior to January 15, 1990. If for any reason, a contestant cannot attend, the alternate of his category (U.S.A. or international) will replace that contestant and a new alternate will be selected and invited.

After January 15, 1990, if a contestant withdraws from the competition, he will be replaced by the alternate of his category. If a second contestant withdraws, the remaining alternate will replace that contestant regardless of category. In the event of further withdrawals, contestants will not be replaced.

Alternates must arrive in Las Vegas at the Circus Circus Hotel no later than Sunday, November 4, 1990. They must be prepared to compete with their aircraft ready for processing (Monday, November 5, 1990).

The alternate's appearance award of \$2700 is in addition to any prize money he may win should he be required to replace one of the contestants after Tuesday, November 6, 1990.

AIRCRAFT SPECIFICATIONS

A. Type of Aircraft:
Model aircraft shall be a replica of an actual full size aircraft designed for aerobatic maneuvers. Suitable military aircraft will also be acceptable. It is the responsibility of the contesant to document both the aerobatic capability and proof of scale of the full size aircraft chosen. Contestants must provide three-view scale drawings of both the original aircraft they have selected and their version of this

aircraft. Deviations from scale should be noted to aid contest officials in processing. Contestants will be provided with three-view drawings of representative aircraft with the desired location of dimensions to be checked noted. Drawings and other documentation should be sent to the contest director no later than May 15, 1990. Aircraft specifications submitted prior to May 15, 1990, may be changed at any time before the contest upon approval of the contest director. Aircraft will be weighed and specifications carefully checked Monday, Tuesday, and Wednesday (November, 5, 6, and 7) 8 a.m. - 6 p.m. Lots will be drawn to schedule contestant's aircraft processing.

B. Deviation from scale

a. The outline dimensions of the model as viewed from the top and side shall be within a 10% deviation from scale.

b. The scale of the model will be determined by the model's wingspan (top wing for biplanes) as compared to the full size aircraft.

c. The general contours and shapes of the model shall be similar to the full size aircraft.

d. The model's airfoils need not be similar to the full size aircraft.

e. The control surface hinge locations and type can be different on the model as compared to the full size aircraft.

f. Additional controls and flight control surfaces cannot be used on the model unless the full scale aircraft had such control or control surfaces.

g. Any type of radio control equipment and control levers or switches can be used

C. ENGINE

Maximum engine displacement shall be 4 1/2 cubic inches (75cc).

D. WEIGHT

Maximum weight ready to fly less fuel shall be 22 pounds (10 kg).

E WING AREA

Minimum wing area for monoplanes shall be 1100 square inches (7097 square centimeters) and for biplanes 1500 square inches (9678 square centimeters)

F. COCKPIT

The model shall contain a realistic pilot and instrument panel of appropriate size.

CONTESTANTS AND OFFICIALS SHOULD CLEARLY UNDERSTAND THAT THE RULES ARE INTENDED TO INSURE AN AIRCRAFT WHICH CLOSELY RESEMBLES ITS FULL SCALE COUNTERPART.

ANY MODEL THAT DOES NOT MEET THE INTENT OF THE RULES OR AIRCRAFT SPECIFICATIONS SHALL BE DISQUALIFIED AND NOT ALLOWED TO COMPETE.

BIPLANES

Flight scores of contestants flying biplanes shall be increased by a factor of 2 %.

JURY

A three man jury will rule upon any disputes and will be the final authority. The jury will consist of a representative of the sponsors, the contest director, and the chief judge.

JUDGES

A minimum of ten judges will be used, with two groups of five judges (Group A and Group B) judging the qualifying rounds and all judges judging the final rounds. During the

qualifying, the judges will be rotated so as to obtain as equal a contestant exposure as possible. Alternate judges will be used if necessary to maintain a staff of ten judges. The judges will be recognized international judges from airomodeling and full scale aerobatic judging. An orientation flight by a non-competitor will be made prior to any starting of new round with new judges.

HELPERS

Contestants are allowed one helper during each of their contest performances.

TIME LIMIT

The contestant must have his engine started and commence his flight within three minutes after his time has started. If he fails to commence within the first three minutes and is so informed by the timer, he must immediately clear the area for the next contestant. No engine restarts are allowed after the aircraft leaves the ground on take-off. Restarting is permitted within the first three minutes. Once the competitor has been given permission to start his engine and turn on his transmitter, he may delay no longer than one minute before attempting to start his engine.

There is no time limit for the aerobatic sequences except as noted:

- a. After takeoff, the contestant is permitted to make one flyby in the direction of flight he has chosen. After this fly-by he must position his aircraft to enter the aerobatic zone or "box" without delay so as to start his performance before the judges.

UTILIZATION OF AIRSPACE AND FREQUENCIES

Only one flight will be flown at a time during the competition. A suitable frequency identifier pin will be used to control use of frequencies.

NUMBER OF ATTEMPTS

Each competitor is entitled to one attempt for each official flight. An attempt can be repeated at the jury's discretion only when, for any unforeseen reason outside the control of the competitor, the aircraft fails to make a start. Radio malfunction or inability to start an engine are not to be considered as reasons for a second attempt of an official flight. There is an official flight when an attempt is made, whatever the result.

SAFETY

Considerations of safety for spectators, contest personnel and other contestants are of the utmost importance to this event. Dangerous flying of any sort, or poor sportsmanship of any kind, shall be grounds for disqualification of any contestant involved.

SCORING SYSTEM AND MANEUVER SELECTION

With the exception of the Three Minute Free Program,

Program,

maneuver selection for all programs will be compiled from the 1989 FAI Aerobatic Catalog.

JUDGES FLIGHT SCORING

Judges will score each maneuver from 1 to 10 points. 1/2 points may be used at the judges' discretion. All judges' scores will be counted. Contestants' scores will be the composite of the judges' total scores multiplied by the applicable "K" factors. Scores will not be calculated by any type of averaging or weighting formula.

The "K" factor is a difficulty coefficient assigned to each flight maneuver as specified by the FAI AEROBATIC CATALOG. (not applicable to the 3 Minute Free Program)

FLIGHT PROGRAMS

Contestants will be required to perform the following

programs:

1. Known Compulsory Programs, #1, and #2.
2. Unknown Compulsory Programs #1, #2, #3, and #4.
3. Three Minute Free Program. (This event is not part of the main contest and contestants will compete for a seperate award.)

1. For qualifying, Known compulsory Programs #1 and #2 will be flown twice. For the finals, Known compulsory programs #1 and #2 will also be flown twice.

2. For qualifying, Unknown Compulsory Programs #1 and #2 will be flown twice. For the Finals, Unknown Compulsory programs #3 and #4 will be flown twice.

KNOWN COMPULSORY PROGRAMS.

This program will be composed of figures (14 to 18 each) flown in normal and inverted flight, performed consecutively and and continuously, observing the prescribed sequence of the figures.

In preparing the Known sequences, the TOC contest management will use the 1989 FAI Aerobatic Catalog as a basis.

UNKNOWN COMPULSORY PROGRAMS.

The contest management will use the same general criteria in preparing the sequences for this event as are used for the Known Compulsory Program except that the degree of difficulty may be slightly lower for the event.

The program will be given to the contestants at a special meeting the evening before the day of the event. The chief judge and the contest director will be available at the meeting to help contestants with any questions that may arise regarding the Unknown Compulsory Program. Practice of these programs is not permitted, and any contestant found guilty of such of such practice will be disqualified for the entire contest.

THREE MINUTE FREE PROGRAM

Distinct from the rest of the contest, this event, time permitting, will be flown by all contestants. Anything goes as far as maneuver selection is concerned and the FAI catalog need not apply. A written or verble description of the flight need not be furnished to the judges. The contestants may use music or other special effects to enhance his performance. Direction of entry into or exit from the aerobatic zone is optional and entry may be made in any attitude. However, the flight must be planned to ensure safety of all concerned. a contstant will be downgraded for excessivelly low flying. An approximate low altitude limit is 10 meters.

This is a show-off event which should be fun for both contestants and spectators.

There are four criteria used in judging as follows:

- a. Originality
- b. Versitility
- c. Harmony and Rhythm
- d. Execution

Each criterion is scored a maximum possible 60 "K". Therefore, the maximum score for the event is 240 "K" per judge or 1200 "K" total for five judges

The time limit for this event is three minutes plus or minus five seconds. Flight time starts when the aircraft leaves the ground and terminates when the aircraft touches down within the 100 feet diameter circle. The contestant's total score will be reduced by 30 points for each scond that his flight time exceeds the allotted three minutes plus or minus five seconds. Landings outside the 100 foot circle will result in a 100 point deduction from the contestants total score.

The Three Minute Program will be flown Thursday, Friday, and Saturday as the last event of the day. Five of the top scoring competitors will fly off Sunday after the Finals Competition is concluded. Note that the Three Minute Free Competition is separate from the rest of the TOC. Qualifying competitors need not have qualified for the TOC finals.

However, contestants qualified for the TOC finals may also have qualified for the finals for the Three Minute Free Programs.

POSITIONING COEFFICIENTS: (NOT APPLICABLE TO THE THREE MINUTE FREE PROGRAM)

A difficulty coefficient (K) will apply to all flights.

AEROBATIC ZONE:

This Zone is defined horizontally by a 60 degree angle each side of the pilot as he faces 90 degrees to the runway. Vertically, an angle of 60 degrees from the pilot's position defines the upper boundary to the zone (see diagram).

Direction of flight shall be parallel to the runway and in the direction selected by the contestant.

METEOROLOGICAL CONDITIONS:

The maximum wind should not exceed 20 knots. The ceiling should be such that a contestant can climb to maximum altitude. However, the chief judge may deviate from these weather requirements after meetingg with the contestants in which at least a 2/3 majority agrees to continue the contest. However, safety shall be the primary consideration of the chief judge. A competitor is entitled to discontinue his flight if meteorological conditions deteriorate during any portion of his flight. In such a case, the competitor, immediately after landing, must report his reasons to the chief judge who will inform the judges. If the judges accept the reasons for interrupting the flight, it will be repeated from the beginning.

MEETING SCHEDULE

Tuesday, November 6, 1990. There will be a 7: P.M. meeting in

the Hospitality Suit (room 1410) for all contestants, judges, and contest personnel. This will be an informal get-together to discuss all facets of the contest

Wednesday, November 7, 1990, 9:00. A.M. There will be a meeting for all judges and the chief judge, Dr. Jim Edwards. The location will be announced. At 1:00 P.M., all judges will meet at the contest site for a practice judging session.

Thursday, November 8, 1990. After flying competition is finished for the day, The Unknown Compulsory #1 will be given to all contestants and judges. The details of the program will be discussed at this time.

Friday, November 9, 1990. After the end of the days competition, The Unknown Compulsory Program #2 will be given to contestants and judges. The program will be discussed at this time.

Saturday, November 10, 1990. After the competition is finished for the day, the Unknown Compulsory Programs #3 and #4 will be given to the judges and the five finals contestants. The programs may be discussed at this time.

IMPORTANT NOTICE

After the Unknown Compulsory Program #1 is given to the contestants Thursday, no further practice flying is allowed at any location. Contestants may request permission from the chief judge for short flights to check aircraft trim or engine performance. Such flights may be flown only at the contest site before or after the days' official flying. Also, flying is to be observed at all times by a contest official to ensure adherence to the rules.

CONTESTANTS NUMBER ASSIGNMENT

Contestants will draw a number from one to twenty at the meeting Tuesday, November 6, 1990. These numbers will then be assigned to each contestant for the duration of the contest.

COMPETITION SCHEDULE

Weather permitting, there will be four official days of flying. Only completed rounds will be scored. If for any reason, flying must be postponed, the jury will adjust the flying schedule to best suit the circumstances. Programs completed will determine contestant placement. Decision of the jury will be final.

Unless otherwise specified by the contest director, competition flying will commence at 9:00 AM each day of the contest. The demonstration flight for the judges will be flown daily at 8:45 AM. Judges and all contest personnel are requested to be at the flying site by 8:30 AM

The flight order will be as follows:

DAY (1990)	PROGRAM TO BE FLOWN	CONTESTANTS STARTING ORDER	
Wednesday, nov.7	Official Practice Day	JUDGES GROUP	
Thursday, Nov 8	Known #1 Qualifying	1	A
" "	Known #2 Qualifying	4	B
" "	Three Minute Free	1	A
Friday, Nov.9	Unknown #1 Qualifying	8	B
" "	Known #1 Qualifying	12	A
" "	Three Minute Free	10	B
Saturday, Nov.10	Unknown #2 Qualifying	16	A
" "	Known #2 Qualifying	20	B
" "	Three Minute Free	15	A + B

FINALS

Sunday, Nov. 11	Unknown #3	?	A and B
" "	Known #1	?	A and B
" "	Unknown #4	?	A and B
" "	Known #2	?	A and B
" "	Three Minute Free	?	A and B
" "	Three Minute Free	?	A and B

FINISH ORDER

The top individual scores from each completed qualifying program will be added together for each contestant, and the five top scoring contestants will be eligible for the finals. The top individual flight scores for the completed finals rounds will be totaled to determine the winners.

THREE MINUTE FREE

Each contestants best performance out of his two flights will determine the winner.

BEST MODEL AIRCRAFT AWARD

In order to be eligible fo this award, aircraft must have been flown in at least three rounds of the competition. Back up aircraft not flown in the competiton are not eligible for this award.

Judging of the aircraft will be based 1/3 on general appearance, 1/3 on workmanship, and 1/3 on realism.

ADDITIONS

1. Allowable engine displacement to be increased to 4 1/2 cubic inches (750 cc) to allow for a broader selection of engines.
2. The "effective silencer" rule is to be dropped. From a practical standpoint, is very difficult to enforce and unnecessary for this event.
3. The biplane handicap will be lowered to 2 %. This small handicap may be necessary to compensate the biplane entrants for the extra work and difficulty in preparing these aircraft for the event.
4. The method of entering the aerobatic "zone" has been re-written and the direction of flight is now at the option of the pilot, not the chief judge.
5. The programs will be designed using the 1989 F.A.I. catalog.
6. The Free Program will be dropped and a second Known Compulsory added.

With the high number of free styles being flown, it is very difficult for the spectators to compare the performances of one pilots to another. By having all pilots fly the same maneuvers in each round, the event should be more interesting for the spectators. Also, the work load of the officials will be greatly reduced.

7. Flight programs will be prepared using 14 to 18 maneuvers of a high degree of difficulty. These programs will take less time to perform therefore reducing the time constraints and allowing greater freedom in selecting and scheduling demonstration performances.

8. The Three Minute Free Program will be a seperate event. It too will be speeded up by counting flight time from take-off to touch-down.

9. The starting order of contestants will be changed for each round to give as equal as possible exposure to the judges.

Copies to:

Bill Bennett
Jim Edwards
Steve Nelson
Betty Stream
Wolfgang Matt
Don Lowe
Mel Larson
Glen Carter
Hanno Pretner
Tony Frackowiak