

# MICHIGAN AIR RALLY

## RULES AND REGULATIONS

### I. ENTRY REQUIREMENTS

#### **A. PILOTS:** Must possess and carry with them their own

1. Airman's certificate, Sport Pilot or higher.
  - Student Pilot certificate holders must be accompanied by an appropriately-rated CFI, and the CFI will be the Pilot in Command.
  - Recreational Pilot certificate holders must be accompanied by a CFI or a Private Pilot or higher, who will function as Pilot in Command.
  - Sport Pilot certificate holders must have any required endorsements for the airspace to be used, typically Class D, and the aircraft flown.
2. Current FAA Medical Certificate, as required by the FARs, for the type of license held by the Pilot in Command. No pilot or medical certificate is required for co-pilots and passengers.

Note: Pilots are responsible for operating within the limitations of their type of pilot license and aircraft limitations in accordance with all applicable FARs.

#### **B. AIRCRAFT**

1. Allowable aircraft include Light-Sport, normal, utility, or experimental category (as defined by the FAA) civil aircraft powered by reciprocating engines with a minimum range of 300 miles plus fuel reserve as required by the FAR's.
2. In compliance with the FAR's, all participating aircraft must have a current airworthiness certificate; including either an annual maintenance inspection or a 100-hour inspection, whichever is appropriate. Any aircraft or pilot found to be in violation of this or any other FAR, will be subject to disqualification.
3. All aircraft not falling in the above categories will be given special attention by the committee. The committee will notify the pilot at the close of registration as to the acceptance of these aircraft in the race.

#### **C. AVIONICS EQUIPMENT – TRADITIONAL (ANALOG) CLASS**

1. The minimum required avionics equipment is an operable Mode C transponder, and an operable two-way communications radio.
2. Use of VOR and ADF is permitted in the Traditional Class.
3. The use of any type (installed or portable) of digital fuel flow meters, fuel computers, fuel totalizers, GPS, LORAN, DME and moving map displays are prohibited during the race. Prohibited instruments installed in the aircraft will be covered and temporarily disabled for the rally, along with any other equipment the rally committee feels would give the user an unfair competitive advantage. Pilots are encouraged to provide their own covering of prohibited instruments. At aircraft impound, the committee will use the smallest possible amount of wax sealant to provide verification that the covers remain in place for the duration of the rally. Tampering with, or removal of, the committee-affixed disabling covering, or the use of prohibited portable devices, during the course of the race is grounds for disqualification.

## **D. AVIONICS EQUIPMENT – DIGITAL CLASS**

1. The minimum required avionics equipment is an operable Mode C transponder, and an operable two-way communications radio.
2. The use of VOR, ADF, GPS, LORAN, DME, and moving map displays is permitted. Such equipment may be either permanently installed in the aircraft, or a portable device, such as a hand-held GPS receiver, a mobile phone or tablet computer with internal or external GPS capability.
3. The use of digital fuel flow meters, fuel computers, and fuel totalizers is permitted.

Note: The Digital Class allows (but does not require) the use of all digital navigation and fuel equipment. The scoring rules for this class apply regardless of whether the equipment is installed in the aircraft; use of portable devices requires entry in the Digital Class. The time and fuel multipliers will be applied even if no digital fuel instrumentation is installed if the entry is registered in the Digital Class.

Note: The use of a portable Attitude Heading and Reference System (AHRS) that displays GPS data requires entry in the Digital Class, unless the GPS-derived data can be covered or disabled on the display.

## **E. SELECTION OF ENTRY CLASS**

Each entrant must specify in which of the Classes they will compete on Thursday at aircraft impound prior to receiving the materials that specify the race course. Once the race materials have been received by an entrant, the class of entry may not be altered.

## **II. REGISTRATION**

**A. ENTRY:** The following forms must be completed, signed, and accompanied by all necessary fees before race assignment is made:

- a) Entry application
- b) Pilot and passenger liability waivers
- c) Aircraft insurance declaration

Aircraft will be registered and impounded on Friday and depart Muskegon on Saturday morning, making a mandatory fuel stop at Harbor Springs, passing multiple checkpoints, and terminating back at the Muskegon Airport.

REGISTRATION FOR FLIGHT CLOSES AT 10AM EDT ON FRIDAY

**B. ASSIGNMENTS:** Early applications will be acknowledged upon receipt. Flight assignments will be verified in writing immediately after the close of registration.

**C. RACE NUMBER:** Each aircraft will be assigned a race number upon acceptance of the pilot's application. The pilot will be responsible for having that number affixed to the following locations prior to registering the aircraft at impound :

- a) both sides of the vertical tail or aft portion of the fuselage, and
- b) on the lower outboard surface of both wings.

The affixed *numbers must be in sharply contrasting colors* when compared to the basic paint design and registration number on your aircraft, with minimum dimensions of 20 inches minimum height and width. Using a four-inch wide stroke, make simple, basic block numerals.

No protest regarding mistaken identity will be honored if your race number does not comply with the above requirements regarding size, color and application.

**D. IMPOUND:** Starts at 10:00 EDT on Friday. All aircraft must be parked in their assigned race spot at the Muskegon County Airport no later than 5 EDT Friday.

Each aircraft to be flown in the rally will be inspected for prohibited navigation and fuel instrumentation. Any instruments installed in the aircraft that are prohibited for the class of entry must be covered so that they may not be utilized during the rally. The Rally Committee will use a small amount of wax (or similar) sealant so that the coverings may be inspected to prove that they have not been removed or tampered with prior to the termination of the race.

Each person acting as Pilot In Command (PIC) for the rally is required to present the following documentation to complete the impound process:

- Pilot's certificate
- Current medical certificate - as required by class of license of the Pilot In Command
- Proof of currency (meaning BFR or other information such as new rating) to act as PIC

Each entrant must specify in which of the Classes they will compete at aircraft impound prior to receiving the materials that specify the race course. Once the race materials have been received by an entrant, the class of entry may not be altered.

Refueling, or "topping off" fuel tanks, is not permitted on Saturday morning prior to launch without express approval from rally officials.

The committee has the right to inspect all aircraft from impound until the posting of the race results at the terminus of the event.

Rally materials specifying the procedures, mandatory checkpoints and timing points will not be provided to entrants until after the impound process is complete.

### **III. FUELING**

**A. Supervision.** Fueling will be performed or supervised by the pilot at all points.

**UNDER PENALTY OF DISQUALIFICATION, NO FUELING MAY BE DONE AT ETHIER THE INTERMEDIATE OR ENDING RALLY AIRPPORTS UNLESS UNDER THE OBSERVATION OF A RALLY OFFICIAL.**

**B. Fuel Level.** The pilot will determine the proper level of fuel added to his aircraft by visual reference. No fuel measurement devices other than a simple non-calibrated fuel dipstick with a single fuel-level mark, may be used unless special permission has been given by the race committee as a result of potentially unsafe weight and balance conditions, or an irregular configuration of the filler neck. Use of dip sticks or measuring tubes with multiple graduations is not permitted.

No fuel tanks may be partially filled at any time, either at the beginning or the end of the rally, unless the fuel level is even with 1) a built in marker in the tank or 2) the marked level on the dipstick. Otherwise, all tanks will be either full or empty at the beginning of the race, and after completion of refueling all tanks on the aircraft must be in the starting configuration. An official at Muskegon will inspect all aircraft and note on the fuel log that the tanks are either full, empty or even with the reduced fueling "tabs" or other factory-installed marks or a non-calibrated dip stick as described above. A copy of this log will be given to the pilot, and this form must be presented to the appropriate fueling officials before your airplane can be refueled in Muskegon or Harbor Springs.

**C. Fueling Process.** The pilot may position the aircraft as desired for fueling provided it is not moved from the parking space. All fueling areas will be on hard surfaced ramps. Before and during re-fueling, the pump meter must be covered until such time that the pilot is satisfied the level of the fuel in the tank is correct. When the pilot so states, the meter will be uncovered and the quantity pumped recorded. Be absolutely sure that your fuel level is correct before you notify the official to uncover the meter. **No further fueling will be permitted.** This rule applies to both the intermediate and ending airports.

**D. Fueling at the intermediate airport is mandatory.** Fueling will be supervised by the pilot. After refueling, the pilot will signal the rally official that he/she is ready to start the engine. The rally official will then signal the pilot when he/she can start their aircraft engine. To save fuel you will not be signaled to start engines until you can proceed directly to the run-up area.

Maximum allowable time from engine shutdown to engine start at Harbor Springs will be ONE HOUR. This is required due to the FSS Flight Plan filed on your behalf by the Rally Committee. In the event of mechanical problems or other difficulties which are deemed reasonable by a committee official, additional time will be allowed. Please be advised that any extra time on the ground at Harbor Springs may cause you to go "overdue" on your flight plan on file with FSS.

**E. Once impound of the aircraft is completed at Muskegon, including refueling, further refueling, or "topping off" fuel tanks, is not permitted (on the day of the Rally) prior to launch without express approval from and supervision by Rally officials.** Authorized Rally officials include the Rally Chair, Rally Scorer, Statistician, or the Rally Starter.

#### **IV. SCORING**

The Rally course is designed and flown in two legs. Each leg includes a starting point, mandatory checkpoints, an airborne timing point and an ending airport. The checkpoints are identified by answering multiple-choice questions. The course is different each year. The course is designed by a designated Rally Committee member and is not revealed to any participant until the briefing on the day before the Rally is flown.

Prior to departure, each entrant must complete the estimates portion of the scoring sheet. This includes time and fuel estimates for each leg. Time estimates are in hours, minutes and seconds. Fuel estimates are in US gallons and tenths. Each leg of the Rally is scored separately.

All competing aircraft start with a score of zero points. Penalty points are then assessed for the following areas of interest:

## 1. Timing

- a. Traditional Class: Time errors accumulate at the rate of one penalty point for each second off pre-flight estimate.
- b. Digital Class: Time errors accumulate at the rate of three penalty points for each second off pre-flight estimate.
- c. Each leg is scored separately, and the cumulative raw time error is totaled in the final scoring calculations. An early time error on one flight leg does not get canceled out by a late time error on the other leg.

## 2. Fuel

- a. All Classes: Fuel errors are scored based on a percentage error of actual fuel used vs. preflight estimated fuel required for each leg. Penalty points are assigned whether the aircraft uses more or less fuel than estimated for each flight leg. For using more or less fuel than preflight estimate, three penalty points are assigned for each one tenth of one percent (0.1%) difference, as determined by "difference from estimate" divided by "preflight estimate". Each leg is scored separately, and the cumulative fuel error is totaled in the final scoring calculations. An underestimate fuel error on one flight leg does not get canceled out by over-estimate fuel error on the other leg. This fuel percentage scoring method accomplishes two criteria: (1) it places a priority on fuel management; fuel is scored more heavily than time errors and (2) larger-engine, high-fuel-burn aircraft can compete fairly with smaller-engined, highly-efficient aircraft. Fuel scoring formula:

$$3 * (1000 * (\text{gallons estimated fuel} - \text{gallons actual fuel}) / \text{gallons estimated fuel}.$$

- b. The result will be rounded to the nearest whole point.
- c. Digital Class: The fuel score for each leg as computed above, is multiplied by 2. This multiplier is applied to all entrants in the Digital Class regardless of equipment installed.

## 3. Other Penalties

- a. 100 penalty points will be assessed for any aircraft not ready for engine start at Muskegon. The penalty may be waived at the discretion of the committee if the delay is due to a mechanical problem with the aircraft.
- b. Penalty points (250 for each checkpoint) will be assessed for failure to pass and identify any mandatory checkpoints designated on each flight leg.
- c. 300 penalty points will be assessed if the aircraft is seen orbiting or circling, for any reason, within sight of either timing line.
- d. Penalty points may be assessed at the discretion of the committee for offenses such as: airspace violations, illegible race numbers or flight practices resulting in hazards to other aircraft.

#### 4. Total Score.

Time, fuel, and penalty points for each leg will be added, with the lowest total points being considered the winner. Time will be calculated from the visual take-off signal at Muskegon (rally starting point)(explained in the pilot's handbook) to the airborne timing point near Harbor Springs, and from the takeoff signal at Harbor Springs to the airborne timing point near Muskegon (rally end point).

No "time off" will be given by the tower. Every pilot is responsible for recording their own time off. Pilots are advised to consider taxi time to all points plus fuel consumed between passing the airborne timing point and landing.

After passing the final timing point in the Muskegon area (rally end point), aircraft are expected to reach Muskegon Airport at a speed of at least 50% of their cruising speed from Harbor Springs to the final timing point. Speeds of less than 50% are subject to penalty.

**Mandatory Checkpoints.** The purpose of the mandatory checkpoints is to insure pilots fly the same approximate route. The checkpoint answers are not meant to deceive participants and in most instances can be easily answered by passing overhead without the need for circling. However, in the event a race aircraft cannot positively identify the correct answer, circling to the left is permitted. Caution should be employed when in the vicinity of any check point. In the event that a crew is unable to identify any answer which may be correct, write down everything you observe at the check point. If the Air Rally scorers can be determined from your written response that you were over the correct checkpoint, credit will be awarded.

**Scoring Ties** - In the event of a tie score between two or more aircraft, the lowest fuel error for the first leg will break the tie. Should a tie still exist, the lowest fuel error for the second leg will be used. Should a tie still exist the most accurate first leg time estimate shall break the tie.

**Scoring Example** - An entrant declares the following pre-flight estimates for each flight leg:

- **Estimates:**
  - Leg 1- 2hr 00min 00sec and 18.0 gallons fuel.
  - Leg 2- 2hr 15min 00sec and 20.0 gallons fuel.
- **Actual Performance:**
  - The actual en-route times and fuel burn for this hypothetical example were:
    - Leg 1 - 01:59:30 with 17.5 gallons, and
    - Leg 2 - 02:16:00 with 20.5 gallons.
  - One mandatory checkpoint was missed on the second leg.
- **Time Scoring:**
  - Traditional Class:
    - Leg 1 is 30 seconds early for 30 points
    - Leg 2 is 60 seconds late for 60 points
  - Digital Class:
    - Leg 1 is 30 seconds early for  $(3*30) = 90$  points
    - Leg 2 is 60 seconds late for  $(3*60) = 180$  points

## **Fuel Scoring:**

- Traditional:
  - Leg 1 is 0.5 gallons (2.8%) over-estimate error, worth 83 points.
  - Leg 2 is 0.5 gallons (2.5%) under-estimate error, worth 75 points.
- Digital:
  - Leg 1 is 0.5 gallons (2.8%) over-estimate error, worth  $(2*83) = 166$  points.
  - Leg 2 is 0.5 gallons (2.5%) under-estimate error, worth  $(2*75) = 150$  points.

## • **Checkpoints:**

One mandatory checkpoint missed on second leg is 250 point

## • **Leg Scores:**

- Traditional Class:
  - Total Leg 1 (30 for time) + (83 for fuel) ) = 113 points
  - Total Leg 2 (60 for time) + (75 for fuel) + (250 for missed mandatory checkpoint) = 385 points
- Digital Class:
  - Total Leg 1 (90 for time) + (166 for fuel) ) = 256 points
  - Total Leg 2 (180 for time) + (150 for fuel) + (250 for missed mandatory checkpoint) = 580 points

## • **Final Score:**

- Total Cumulative Score for a Traditional Class (113+385) entrant: 498 points
- Total Cumulative Score for a Digital Class (256+580) entrant: 836 points

All aircraft scores are then ranked in order of penalty points accumulated.

## **V. COMMITTEE POLICY**

**A. APPLICATION:** Entry application, along with all required waivers and fees must be mailed to the committee on or before the close of registration - please refer to the information packet for dates, addresses and fees. The committee reserves the right to close registration before the date shown if a "sold out" situation should develop regarding lodging, facilities, etc.

**B. WITHDRAWAL:** The Committee has found it necessary to institute a withdrawal fee, which will be charged to all applicants who withdraw after a certain date. This has been necessitated by the fact that in order for the committee to provide the many services on rally weekend, we have had to commit in advance financially in many instances based on an anticipated number of contestants. Only by working in this manner can we run this rally at a minimum. Naturally, the closer to rally day that a cancellation is made, the more difficult it is to withdraw arrangements which have been made on your behalf.

**C. TAKEOFF CONDITIONS:** The rally is conducted in VFR conditions. Should weather conditions force cancellation of the rally, refunds will be made on a pro-rated basis after a final accounting of expenses. Launch of the first aircraft is scheduled for 0900 EDT, weather permitting. In the event of IFR conditions, departure will be delayed until the rally committee determines VFR flight is possible. Departure time for each aircraft must allow sufficient time to enable arrival back to the Muskegon (final destination) airport by 1900 EDT.

**D. RULE CONCURRENCE AND VIOLATION:** Remittance of entry fees with a completed and signed application constitutes total acceptance of all Michigan Air Rally Rules and Regulations and no protest regarding the appropriateness of these rules will be honored.

It is required that all pilots will fly their aircraft and plan their flight in accordance with any and all applicable FARs and the rules of the rally, which includes proper documentation of the aircraft and licensing of the pilot, as required by the FAA and the FCC.

Any violation of the regulations mentioned may be considered grounds for disqualification and forfeiture of entry fees.

**E. AUTHORITY:** In the event of any doubt as to the meaning or interpretation of any of the rules and regulations, a decision of the committee is final. In the event of extenuating circumstances, the committee may interpret rules liberally in the case of a specific contestant, providing an unfair advantage is not thereby granted. It is not the position of the committee to disqualify any contestant on the basis of trivialities or technicalities which do not have a direct bearing on the outcome of the rally, provided they do not involve a willful violation of the rules and regulations.

**F. RESPONSIBILITY:** All participants and guests in the Michigan Air Rally are responsible for any and all charges incurred by them as individuals at any point in the rally unless specifically advised by the committee. For example, all hotel rooms and other costs in Muskegon are the responsibility of the individuals. All guests are expected to check out of the hotel and pay any and all additional charges accrued to their room(s).

## **VI. PROTESTS AND GROUNDS FOR DISQUALIFICATION**

### **A. PROTEST RULES**

1. All protests involving contestants other than the protesting pilot must be in writing, and must be submitted to the committee within one hour of the arrival of the last rally plane in Muskegon (rally end point). The race scorers and responsible committee members meet Saturday night to consider problems observed during the rally, protests filed, and other issues. A response to the filed protest will be provided prior to the awards party on Saturday. The decision of the Rally Committee is final and there is no appeal.
2. All protests involving the scoring of the rally must be in writing, and be submitted to the committee by the Monday following the race. The committee and scorers meet in September to debrief the rally, and scoring protests are considered at that time. The results of the protest review will be provided in writing in a reasonable time. The decision of the Rally Committee is final and there is no avenue for appeal.

## **B. GROUNDS FOR DISQUALIFICATION AND FORFEITURE OF ALL FEES**

1. Rally numbers that are unreadable over timing points may be cause for disqualification *because if you cannot be identified, you cannot be timed*. Although the timing crews make every effort to positively identify your aircraft prior to arrival overhead the timing line, "NO RECORDED TIME" is automatic disqualification.
2. Failure of fuel tank configuration to correspond after fueling at Muskegon (rally start point), Harbor Springs or the addition of fuel to tanks reported empty at Muskegon (rally end point).
3. Any change to, or modification of aircraft, or deviation from good pilot practices and techniques which may be considered by the committee as purposeful violation of the spirit of fair play.
4. Tampering with digital fuel flow device covering.
5. Tampering with navigational devices covering, or any other covering which has been affixed by race officials at impound.
6. Failure to cross the timing lines.
7. Any known violation of FAA Regulations.
8. Refueling without truck meters covered and/or without the presence of Rally Fueling Officials.

IN THE EVENT THE RALLY MUST BE CANCELED DUE TO CONDITONS BEYOND OUR CONTROL, YOUR FEE WILL BE REFUNDED ON A PRO-RATED BASIS UP TO 30 DAYS PRIOR TO THE RACE.

**SECTIONAL CHARTS REQUIRED** You may use equivalent coverage WAC charts if desired. (No charts will be available at the registration desk.)

- Chicago Sectional
- Green Bay Sectional
- Lake Huron Sectional
- Detroit Sectional
- CF18 WAC Chart (optional)