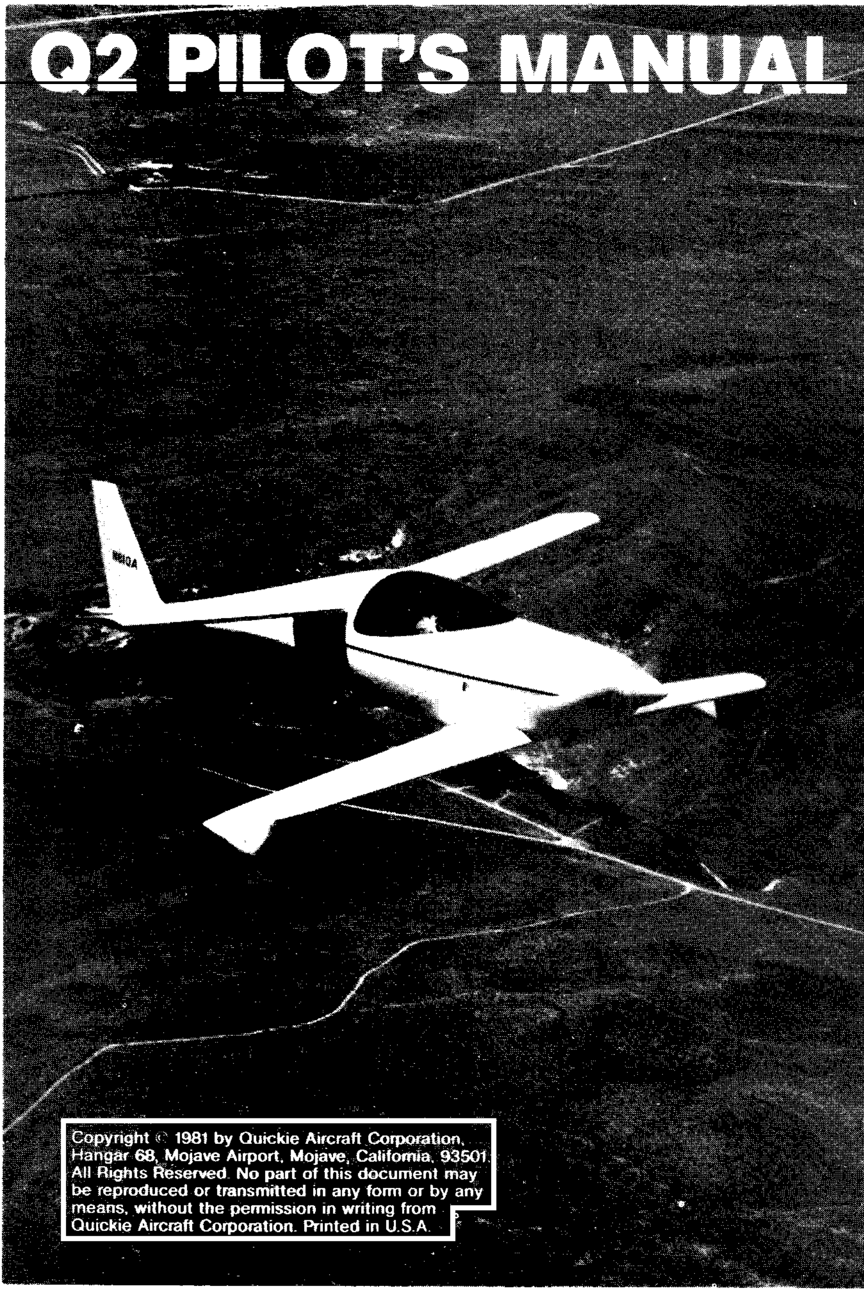
# Q2 PILOT'S MANUAL





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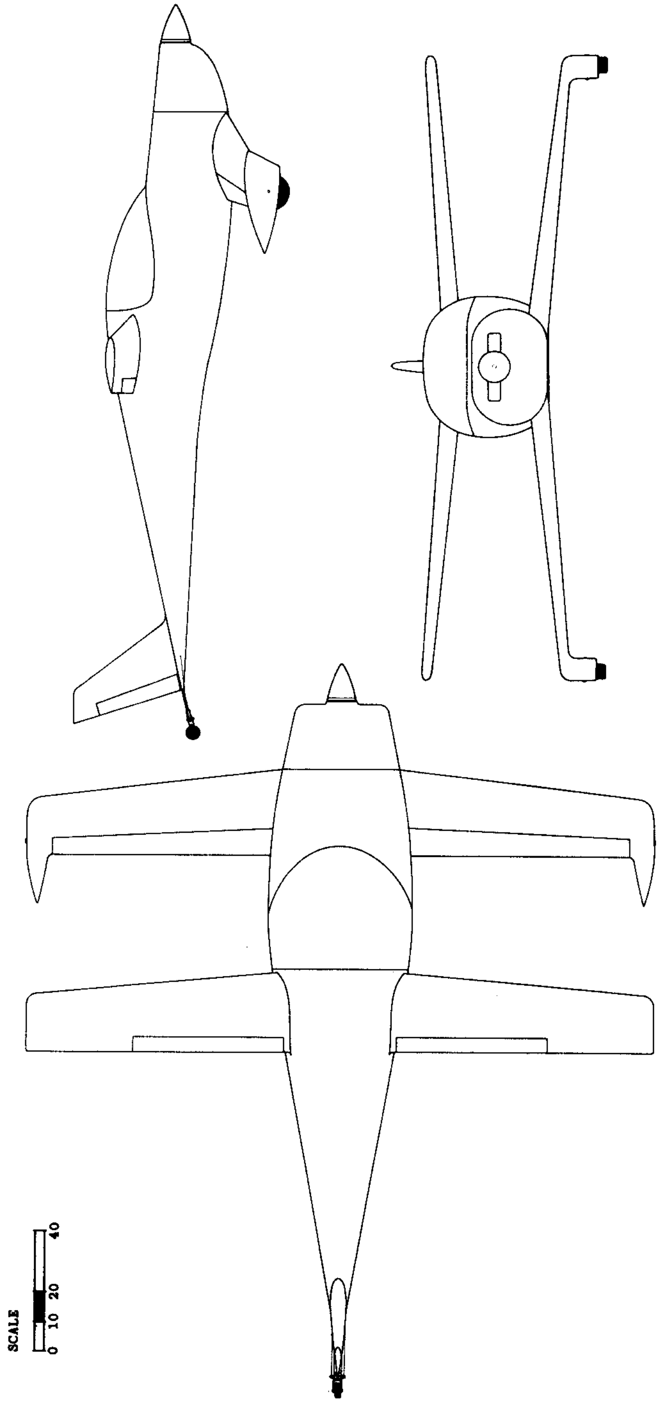
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# DESCRIPTION OF SYSTEMS & STRUCTURES

## DESCRIPTIONS AND INTRODUCTION

The Q2 is a high-performance, homebuilt aircraft. Its compact external size and extremely efficient design results in superb performance and unequalled fuel economy using a relatively low horsepower engine. Inside, it provides comfort for a pilot up to 6' 8" tall and 250 lb, plus passenger and baggage in the roomy compartment behind the seat. Its canard configuration was designed not only for performance, but to provide improved flying qualities and safety as compared to the conventional light plane.

The Q2's high-lift canard (forward wing) is fitted with a plain elevator that controls the aircraft's pitch attitude. The canard also serves as the main landing gear spring since the main gear is mounted on the tips of the canard. This feature results in a remarkable smooth ride as well as outstanding ground stability during taxiing, takeoff, and landing.

Roll capability is provided by ailerons on the inboard portion of the main wing.

Yaw control is provided by a rudder mounted on the vertical fin, and is actuated by conventional rudder pedals.

The pitch and roll capability is provided by a side stick controller in the center console. This feature permits precise control of the Q2 while reducing pilot fatigue and cockpit clutter.

The tailwheel is actuated directly from the rudder pedals providing positive steering at all times while on the ground. Since the tailwheel is not raised on the takeoff roll like other taildraggers, this positive steering is available until the aircraft is airborne, making for very safe takeoff and landing characteristics.

Even though the Q2 has relatively low horsepower, it can outperform many general aviation aircraft while retaining unequalled fuel economy. The maximum speed is 180 m.p.h., and the fuel economy exceeds 60 miles per gallon.

The sandwich composite structure of your Q2 provides some important advantages over conventional metal, wood, or fabric construction. It has been tested to loads far in excess of those required for

FAA certification. Fatigue margins are higher. Contour is maintained under load; the structure does not "oil can", buckle, or distort. It provides excellent insulation and damps noise. It has no hidden joints, no water traps, and is far less susceptible to corrosion. It is easier to inspect, more redundant, and easier to repair. It is not susceptible to thermal stress due to temperature changes. Properly protected from UV, it has an unlimited life.

The engine that powers the Q2 is a reliable Revmaster 2100-DQ aircraft engine. This engine has proven to be a very reliable aircraft powerplant, and features a forged steel crankshaft, dual magneto ignition, mixture control, alternator, and optional electric starter.

## INSTRUMENT PANEL

The instrument panel is mounted to the fuselage.

Sufficient room is provided in the instrument panel for mounting day VFR, night VFR, and full IFR equipment.

## HEATING AND VENTILATION

Fresh air ventilation is provided by a scoop on the forward canopy frame. The flow of air can be controlled by wedging a foam stop into the inlet from inside the cockpit.

The composite aircraft structure has very good insulating properties. This fact, coupled with the "greenhouse effect" of the large canopy as well as the body heat available, should make your Q2 comfortable down to 10 degrees F. If you plan to routinely operate below that temperature, you may wish to rig up a cabin heat muff using the engine exhaust system.

## LANDING GEAR

The main landing gear are suspended from the tips of the canard. The natural flexibility of the canard provides good dampening as well as excellent springing, and results in a very comfortable ride over most surfaces.

The tailwheel is suspended from a specially made S-glass tailspring. The tailwheel is actuated directly from the rudder pedals, resulting in very accurate and positive directional control while taxiing, and during takeoff and landing.

## BAGGAGE COMPARTMENT

A roomy baggage compartment is provided behind the seatback bulkhead. Access is obtained by raising the seat. The baggage limit is 40 pounds. Depending on the pilot, passenger, and fuel to be carried, baggage may have to be limited because of gross weight or center-of-gravity limits.

## FLIGHT CONTROLS

Pitch and roll control is actuated by a side stick controller mounted on the center console. In comparison to conventional wheels or control sticks, the side stick allows more accurate control inputs with less pilot fatigue and less cockpit clutter. Everyone who has flown the Q2 has commented on its desirerability for light aircraft.

The rudder pedals are conventional and mounted to the top of the canard.

The elevators on the canard, and the inboard ailerons on the main wing, are actuated by push-pull torque tubes.

The rudder is actuated by conventional cables.

An in-flight cockpit adjustable pitch trim system is provided. It works by adjusting a small trim wheel which biases two springs in the pitch system to allow the elevator to trim out in the desired position. The trim system is completely independent of the normal pitch control system, thus providing back-up pitch control system in the event of a primary control problem. Also, it should be noted that the primary pitch control system (i.e. the stick) can over-ride any position of the trim system.

Roll trim is provided by a ground adjustable fixed trim tabs on the ailerons.

Yaw trim is also provided by a ground adjustable fixed trim tab on the rudder.

## ENGINE CONTROLS

The push-pull type throttle, located on the left side console, is equipped with a friction lock to prevent creeping (but which can be overridden manually). The carburetor heat control and the mixture control are located in the center of the cockpit, as is the cowl flap control. All three are of the push-pull type.

## BRAKES

The braking system consists of a internally expanding drum brake on each main tire, actuated by a cable that runs along the trailing edge of the canard to individual toe brakes inside the cockpit. This mechanical system is much lighter and less expensive than the more typical hydraulic disc brake system, and yet provides excellent stopping capability for the Q2.

## FUEL SYSTEM

The nominal 15 gallon main fuel tank is located near the aircraft's center of gravity to minimize center of gravity changes with fuel load. A nominal 5 gallon header tank is located just aft of the firewall above the pilot's and passenger's legs. The unusable fuel quantity on the prototype Q2 is less than 1/2 gallon. This number should be determined individually for each aircraft.

The engine is gravity fed from the header tank, with a fuel shutoff valve located on the instrument panel controlling the flow. An electric fuel pump transfers fuel from the main fuel tank to the header tank. The excess is continuously recirculated to the main fuel tank through an overflow tube in the header tank. A backup manual fuel pump is provided in the event of a failure of the electric fuel pump. The header tank alone is capable of over 200 miles of travel.

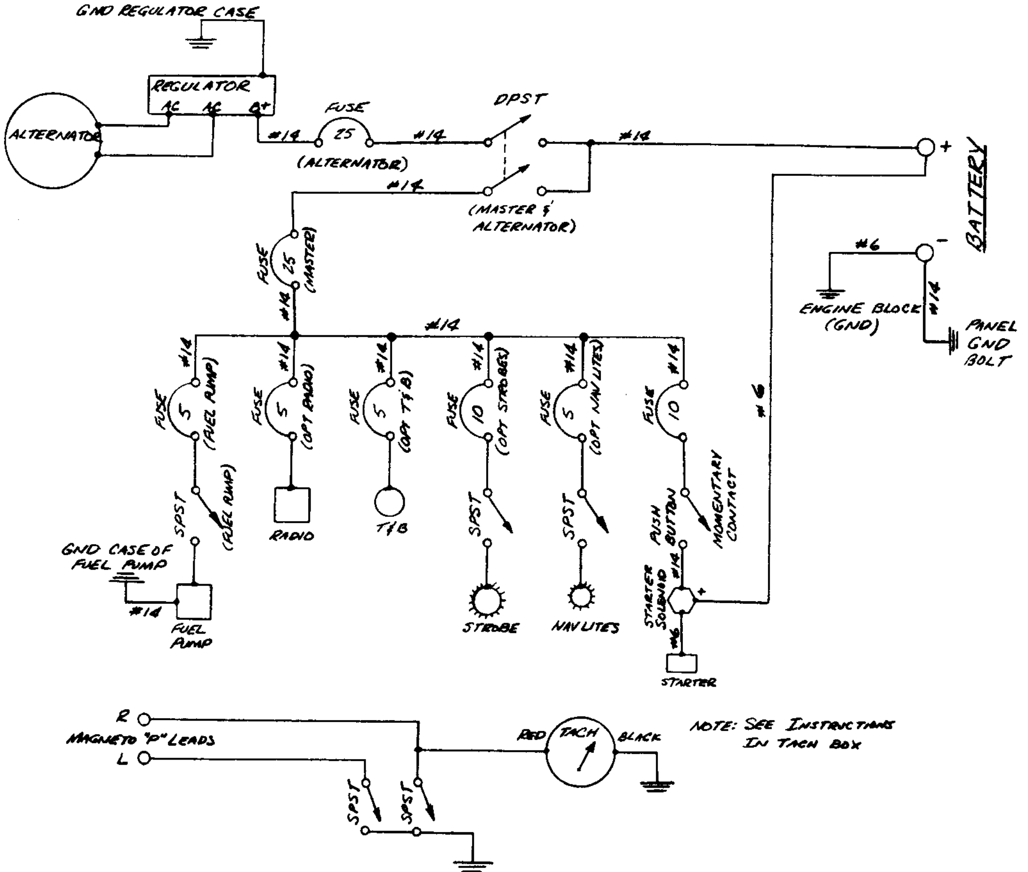
Each fuel tank has a sight guage to measure fuel quantity.

### NOTE

Check the fuel gauge while in level, balanced flight to avoid misreading the fuel quantity indications.

The fuel filler cap is provided on the right upper forward fuselage, accessible from the outside of the aircraft. Only 100 octane Aviation fuel is recommended.

# ELECTRICAL SYSTEM SCHEMATIC



# CHECK LIST & OPERATING INSTRUCTIONS

PREFLIGHT

The aircraft should be given a thorough visual inspection prior to each flight.

1. Open canopy.
2. CHECK: Magneto Switches - OFF.
   Master Switch - OFF.
   Fuel quantity - As required.
3. Drain fuel sample from the sump drain.
4. Check left elevator for freedom of movement.
   Check lateral freeplay (3/32" Max.)
5. Inspect left wheel pant and tire for general condition (wear, cuts, abrasions, and proper inflation).
6. Check left canard surface for damage.
7. Check oil level. It is recommended that you DO NOT OPERATE ENGINE WITH LOW OIL LEVEL.

   CAUTION

   Overfilling the sump may lead to high oil temperature.
8. Check propeller for cracks, nicks, and security.
   Check cowling for damage and security.
   Check air inlets and outlet for obstructions.
9. Check right canard surface for damage.
10. Check pitot tube for obstructions.
11. Inspect right wheel pant and tire for general condition (wear, cuts, abrasions, and proper inflation).
12. Check right elevator for freedom of movement.
    Check lateral freeplay (3/32" Max.).
13. Check canopy for cracks and nicks.
14. Fuel cap secure; vent hole clear.
15. Check right main wing surface for damage.
    Check right aileron for freedom of movement.
    Check lateral freeplay (3/32" Max.)
16. Inspect fuselage for damage.
    Check static port clear.
17. Check vertical fin surface for damage.
    Check rudder for freedom of movement.
    Check rudder vertical freeplay (3/32" Max.)

18. Inspect tailspring for damage.
    Inspect rudder/tailwheel cables and attachments for security and damage.
    Inspect tailwheel and weldments for general condition (wear, cuts, abrasions).
19. Inspect fuselage for damage.
    Check static port clear.
20. Check left main wing surface for damage.
    Check left aileron for freedom of movement.
    Check lateral freeplay (3/32" Max.)

## BEFORE STARTING ENGINE

1. Check all controls for operation.
2. Check toe brakes - ON.
3. Mixture - IDLE CUTOFF.
4. Fuel Valve - ON.

## NORMAL ENGINE START

1. Throttle - Cracked 1/4".
2. Carburetor heat - OFF.
3. Master Switch - ON.
4. Magneto Switches - ON.
5. Mixture - FULL RICH for 3 seconds; then IDLE CUTOFF.
6. Starter Button - PUSH to turnover engine.
7. Mixture - FULL RICH when engine catches.
8. After engine is running; Check to verify oil pressure within 20 seconds.
9. Warm up engine at 1000 RPM.

## FLOODED ENGINE START

1. Master Switch - OFF
2. Magneto Switches - OFF.
3. Mixture - IDLE CUTOFF.
4. Throttle - FULL ON.
5. Aircraft - TIED DOWN and CHOCKED.
6. Turn engine through backwards by hand 10 to 20 revolutions.
7. Mixture - IDLE CUTOFF.
8. Starter Button - PUSH to turnover engine.
9. Mixture - FULL RICH when engine catches.
10. After engine is running: Check to verify oil pressure within 20 seconds.
11. Warm up engine at 1000 RPM.

## BEFORE TAXI

1. Seat belts and shoulder harness': adjusted and buckled.

## TAXI

1. Check tailwheel steering and brakes.
2. Check ammeter.

## BEFORE TAKEOFF

1. Engine instruments: operating properly in the green arc ranges.
   Engine Runup: 1400 RPM; check left and right magnetos;

   100 RPM drop maximum.
2. Carburetor heat - ON: Check for RPM drop, then OFF.
3. Engine: Check idle.
4. Fuel Valve - ON.
5. Mixture - FULL RICH.
6. Fuel quantities - As required.
7. Canopy - Locked; secondary latch in place.
8. Trim - As desired.
9. Carburetor heat - OFF.
10. Controls: Free, with movement in the proper direction and no binding.
11. Altimeter - Set.
12. Radio - ON.
13. Cowl Flap - OPEN.

## TAKEOFF - NORMAL

1. Throttle: Full open.
2. Controls: Hold aft stick, lift off at 65 CAS.
3. Climb speed 75 CAS.

## CLIMB

1. Normal - 100 CAS.
2. Best Rate - 85 CAS at S.L. full throttle.
3. Best Angle - 70 CAS at S.L. full throttle.

## CRUISE

1. Power setting: 2700 to 3200 RPM.
2. Trim - As required.
3. Mixture - Lean to peak RPM.
4. Cowl Flap - As required.

BEFORE LANDING

1. Mixture - Full rich.
2. Carburetor heat - As required.
3. Airspeed: 85 CAS.

LANDING

1. Touchdown tailwheel first.
2. Maintain directional control with the tailwheel steering.
3. Brake, as required, for stopping.

LANDING - OBSTACLE CLEARANCE

1. Airspeed: 70 CAS on final.
2. Touchdown tailwheel first.
3. Maintain directional control with the tailwheel steering.
4. Brake, as required, for stopping.

AFTER LANDING

1. Carburetor heat - OFF, if ON.
2. Cowl Flap - CLOSED.

SHUT-DOWN

1. All electrical equipment - OFF.
2. Mixture - IDLE CUTOFF.
3. Magneto Switches - OFF.
4. Master Switch - OFF.
5. Fuel Valve - OFF.
6. Chock wheels and tie down aircraft.

# OPERATING PROCEDURES

BEFORE STARTING

Before starting, be sure that the engine is properly filled with oil. Revmaster recommends 100 LL or 100/130 octane Aviation gasoline.

STARTING

At normal temperatures, the engine should start with the throttle cracked 1/4".

Problems encountered during starting are almost always caused by flooding.

TAKEOFF

The takeoff sequence in a Q2 is considerably different than that used with other taildraggers.

The Q2 should be allowed to accelerate to liftoff speed in a three-point attitude (i.e. the tailwheel remains on the ground). This allows the pilot to make use of the direct and positive tailwheel steering all the way to liftoff, rather than having to transition to rudder control, as is the case with most taildraggers. When liftoff speed is reached, the aircraft will levitate into the air without any further command from the pilot. The liftoff speed is a function of the elevator position (e.g. the more aft stick that is used, the lower will be the liftoff speed) and c.g. It is recommended that a normal takeoff sequence be to begin the takeoff with the stick somewhere aft of neutral, and go to nearly full aft stick before reaching 50 CAS. The aircraft will lift off at about 65 CAS. Leaving the stick position somewhat forward will cause the aircraft to remain on the ground longer since it will need a higher speed to become airborne. Pushing the stick forward of neutral will cause the tailwheel to lift off the ground before the aircraft is ready to levitate; this results in a longer takeoff run and additional skill required (the aircraft's handling becomes similar to a Cub or Champ). A forward c.g. location will also cause the aircraft's tailwheel to rise prematurely.

You may desire to ammend this sequence when the winds are strong and gusty. In order to leave a larger margin for abrupt gusts right after liftoff, you may wish to not use near full aft stick and, therefore, permit the aircraft to build up more speed before liftoff. Under gusty, turbulent conditions, a liftoff speed of 70-75 CAS is sufficient. However, you should avoid allowing the tail to raise on takeoff (caused by not enough aft stick) unless you are prepared to handle the aircraft like any other taildragger.

Because of the moderate horsepower engine and rather flat ground attitude, torque and P-factor effects are small.

## CLIMB

Best rate-of-climb speed varies from 85 CAS at S.L. to 78 CAS at 10,500 ft. The best angle-of climb is 70 CAS at S.L. and corresponds to the lowest speed obtainable without causing the aircraft to begin the moderate pitch bucking. (See the section on Low Speed Flying Qualities).

Recommended normal climb speed is 100 CAS.

## CRUISE

Recommended maximum normal cruise RPM is 3250 rpm.

Continuous use of carburetor heat during cruising flight decreases engine efficiency, and is not recommended. Use carburetor heat only as necessary. When applying carburetor heat, do so slowly to the full on position at intervals to determine if ice has developed.

## GENERAL FLYING QUALITIES

See the section entitled "Low Speed Flying Qualities" for information on that portion of the operational envelope.

The Q2 has excellent response and control harmony at all speeds. Because of the light weight and low inertia, the response characteristics can be likened to a good handling sports car - both vehicles do exactly what the pilot asks them to.

The control forces on the Q2, while somewhat lighter than say, a Grumman Tiger, are not overly sensitive. The side stick function allows more accurate inputs with less fatigue and less cockpit clutter.

The Q2 has moderate pitch dampening, and is an enjoyable cross-country aircraft.

Flying in visible moisture can result in an increase in stick force and a small change in elevator angle at a given trim speed. When first encountered, this phenomenon can be disconcerting to the pilot because of the increase in stick force. The pitch trim system is effective in conteracting this trim and force change.

Continuous flying in rain may cause erosion of the fixed pitch wood prop.

At high speeds and aft center of gravity locations, a mild 'tucking' of the nose can be noted when the aircraft is allowed to depart in pitch. This tucking will not be noted in normal straight and level flight, and is indicated here for the benefit of pilots intending to explore the outer reaches of the performance envelope.

Since the weight of the Q2 pilot is a significant percentage of the empty weight of the aircraft, the pilot immediately acquires a sense of oneness with the aircraft, unlike what he can find with storebought aircraft. The result is that whether it be for a 15 minute local romp, or a 2 hour cross country, the pilot never tires of flying the aircraft.

## LOW SPEED FLYING QUALITIES

The Q2 possesses outstanding low speed flying qualities. All who have flown the prototype Q2 have agreed that the aircraft is very safe for the low time pilot and that its low speed characteristics are a significant improvement over other aircraft available today.

While flying at minimum speed, the Q2 has no tendency to drop a wing or depart at normal c.g.'s, and yet full roll response remains available from the ailerons and the rudder.

At minimum speed, depending on the throttle position, the aircraft's performance can be varied from a climb of 500 ft/min (full throttle at S.L.) to a descent of 900 ft/min (idle throttle at S.L.).

Minimum speed is characterized by reaching full aft stick and experiencing a mild pitch bucking tendency at mid to aft c.g.

The pitch bucking tendency can be explained thus: The Q2 is designed so that the front wing (canard) will stall (reach its maximum lift) before the main wing does. When the canard reaches its maximum lift, it also limits the aircraft angle of attack that can be reached since the elevators that control the aircraft angle of attack are located on the canard. When the pilot attempts to force the aircraft to a higher angle of attack by holding full aft stick, the canard begins losing lift, causing the nose of the aircraft to pitch down to remain in equilibrium. After the nose has lowered itself a degree or so, if the stick is still being held in the full aft position, the canard will again try to drive the aircraft to a higher angle of attack. The cycle will repeat itself as the canard reaches its peak lift, lowers the aircraft angle about a degree, reaches its peak lift again,etc. At any time during this cycle, the pilot can release some back pressure and the aircraft will stabilize at a higher speed. If the stick position is such that the aircraft is faster than 70 IAS, the pitch bucking will stop.

During flight at minimum speed, since neither the main wing nor the rudder stalls, full aileron effectiveness (inboard on the rear wing) and full rudder effectiveness is available. In addition, full pitch control is available unless the pilot maintains full aft stick, at which point he is artificially reducing his pitch authority by trying to force the aircraft to a higher angle of attack than is possible.

Spin testing was carried out on the Q2 prototype by Peter Lert, an experienced test pilot who also performed the spin testing on the QUICKIE. Using conventional spin entry techniques, Peter was unable to make the Q2 spin. In fact, all that he could induce with crossed controls and full rudder deflection, was a rudder roll and a steep spiral resulting in an airspeed of about 150 IAS after a 360 degree turn. On the basis of his independent testing, we have concluded that the prototype Q2 has very safe low speed flying characteristices and is not susceptible to spinning, even when provoked.

Those of you who have seen the Q2 perform at airshows may have noticed that much of the performance was spent at a sufficient angle of attack to bring about the pitch bucking. All pilots who routinely fly the Q2 prototype do not hestitate to use full aft stick at very low altitudes to obtain maximum performance. Of course, the individual judgement of the pilot must be used to match the situation to the necessary response; the outstanding handling characteristics will not compensate in every situation for poor planning or execution by the pilot.

LANDING

A final approach speed of 85 CAS should be used under normal conditions.

The Q2 should be landed full stall, tailwheel first, even in a crosswind. This is because the very wide gear track provides excellent stability on the rollout, as well as an excellent visual cue as to how high off the ground one is during the flare, or roundout.

The visual cue available from the main gear minimizes any tendency to "drop" the aircraft in. However, until one is comfortable in the aircraft, one should be extra cautious about flaring too high and dropping the aircraft in from 3 feet. This is due to the fact that the pilot in a Q2 sits much closer to the ground than what he is accustomed to any conventional certificated aircraft.

A short field landing should be made with an approach speed of 70 CAS. A speed lower than 70 CAS may cause difficulty in flaring if the roundout is started too high and the pilot attempts to correct it.

Crosswind landings in the Q2 are easy. A conventional "wing low" approach should be used, permitting the upwind main wheel to touch shortly before the tailwheel. The other main gear will lower and touch gently, with no adverse yaw characteristics noticeble during the transition. Once all three wheels are on the ground at less than liftoff speed, the aircraft becomes extremely docile on rollout, and the pilot will have difficulty judging the strength of the crosswind because the aircraft is so stable.

Wheel landings are not recommended initially with the Q2, since the tailwheel first characteristics are so good. If you do choose to land on the main gear first, the response characteristics are similar to wheel-landings in other taildraggers.

As docile as the Q2 is on rollout, however, it is still a taildragger and requires the pilot's attention with the rudder pedals. If one releases the rudder pedals after touchdown, as one might do in a Cherokee, the Q2 will groundloop, probably without damage.

## SLIPS

Slips are very effective. Rapid descents with high sink rates can be obtained through a properly executed slip. It is recommended, however, that slips be practiced at altitude until the pilot is familiar with the aircraft. The recommended slip speed is 90 CAS. Pilots should make themselves familiar with the aircraft at a variety of slip speeds.

## COWL FLAP

The cowl flap is utilized to control engine temperatures within the limits. Opening the cowl flap increases the flow of air through the engine, increasing the cooling. Closing the cowl flap reduces aircraft cooling drag, improving performance. All performing data contained in this manual are based on the cowl flap closed condition, unless otherwise noted.

The cowl flap is also useful for maintaining normal temperatures during prolonged power off descent to prevent thermal shock.

# OPERATING LIMITATIONS

The Q2 is intended for day VFR operation with standard equipment installed. With appropriate optional equipment installed, it would be suitable for day and night VFR and IFR. Operation should be in accordance with all markings, placards, and check lists in this Pilot's Manual. This Pilot's Manual does not reflect night VFR or IFR operating procedures.

## UTILITY CATEGORY OPERATION

The Q2 is intended to be operated in the utility category. The utility category is restricted to airplanes intended for limited acrobatic operation within the flight load factor limitations listed below. The following utility category maneuvers are approved.

1. Any maneuver incident to normal flying.
2. Minimum speed maneuvering with full aft stick.
3. Lazy eights, chandelles, and steep turns.

### MAXIMUMS

| | |
|---|---|
| Gross Weight | 1000 lbs. |
| Maneuvering Speed | 134 MPH CAS |
| Flight Load Factors | +4.4g, -1.76g |

## ACROBATIC LIMITATIONS

| Maneuver | Maximum Entry Speed-CAS |
|---|---|
| Chandelles | 134 MPH |
| Lazy Eights | 134 MPH |
| Steep Turns | 134 MPH |

## AIRSPEED LIMITATIONS

| | |
|---|---|
| Maximum Glide or Dive, Smooth Air (Red Line) | 200 MPH CAS |
| Maneuvering Speed | 134 MPH CAS |
| Caution Range (Yellow Arc) | 146-200 MPH CAS |
| Normal Range (Green Arc) | 64-146 MPH CAS |

## ENGINE INSTRUMENT MARKINGS

| | |
|---|---|
| Oil Temperature Gauge - | |
| Normal Operating Range (Green Arc) | 160-220°F |
| Maximum Allowable | 220°F |
| Oil Pressure Gauge - | |
| Normal Operating Range | 30-60 PSI |
| Maximum Allowable | 60 PSI |
| Cylinder Head Temperature (If Installed) - | |
| Normal Operating Range | 300-450°F |
| Maximum Allowable | 450°F |
| Tachometer - | |
| Normal Operating Range | 2700-3200 RPM |
| Maximum Allowable | 3300 RPM |
| Voltmeter (If Installed) - | |
| Normal Operating Range | 13.5-14.5 V |

## WEIGHT AND BALANCE

The following information defines the weight and center-of-gravity range that has been tested on the Q2 prototype.

A sample loading problem is included to aid you. The empty weight and empty c.g. must be measured for your Q2; Do not use the sample here.

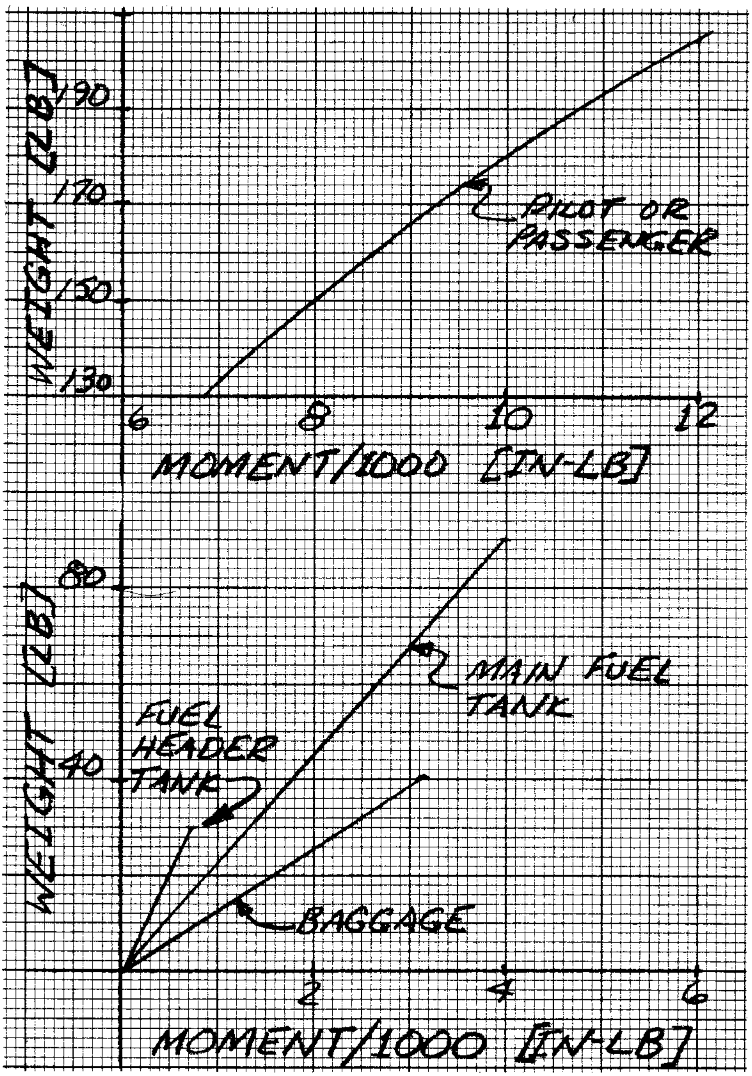
Begin by writing down the most current empty weight and moment arm. Next, using the loading graph provided and knowing the weights of the various loads, you can calculate a total weight and moment for the particular loading. Then,by consulting the center-of gravity envelope chart, you can determine whether the particular loading is within the allowable limits.

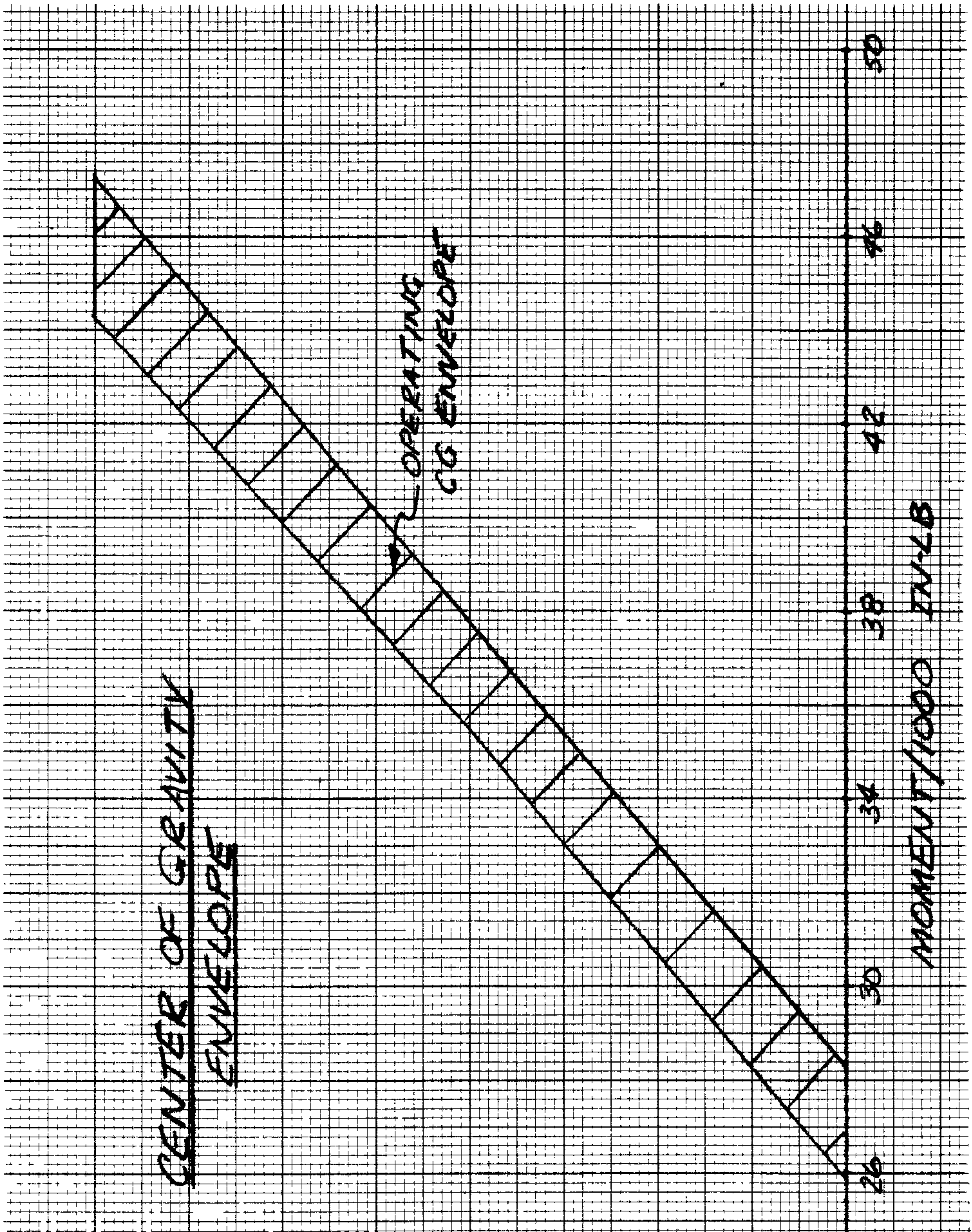
QUICKIE AIRCRAFT CORPORATION recommends that each builder perform a weight and balance measurement using scales with each pilot/passenger/fuel/baggage combination prior to flight. Since the Q2 useful load is greater than the empty weight, small variations in positioning may have sizable effects on c.g. The useful load vs weight and moment chart should be used as a guide only.

# SAMPLE LOADING PROBLEM

| ITEM | WEIGHT (LB) | ARM (IN) | MOMENT (IN-LB) |
|---|---|---|---|
| Empty Weight | 517 | 40.16 | 20762.7 |
| Oil | 5 | 5 | 25.0 |
| Fuel (Header Tank) | 30 | | 720 |
| Fuel (Main Tank) | 60 | | 2680 |
| Pilot | 170 | | 9300 |
| Baggage | 40 | | 3120 |
| TOTAL | 822.0 | | 36607.7 |

Check - Gross Weight vs. Moment Graph; Loading is inside Operating C.G. Envelope




CENTER OF GRAVITY ENVELOPE
OPERATING CG ENVELOPE
MOMENT/1000 IN-LB
26
30
34
38
42
46
50
GROSS WEIGHT [POUNDS]
600
700
800
900
1000

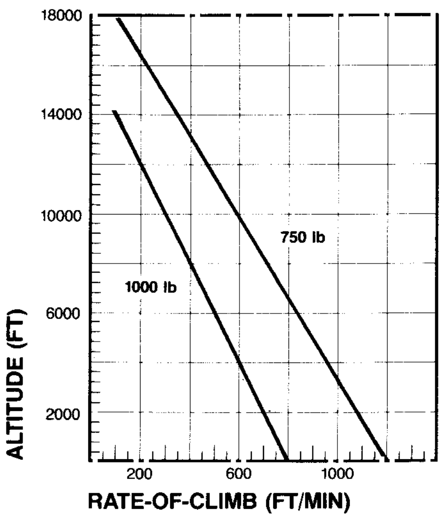
# PERFORMANCE CHARTS

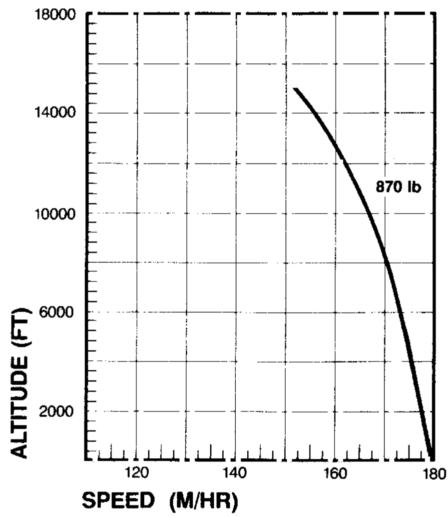
Performance information has been derived from actual flight tests on the Q2 prototype and corrected to standard atmospheric conditions at 1000 pounds maximum gross weight.

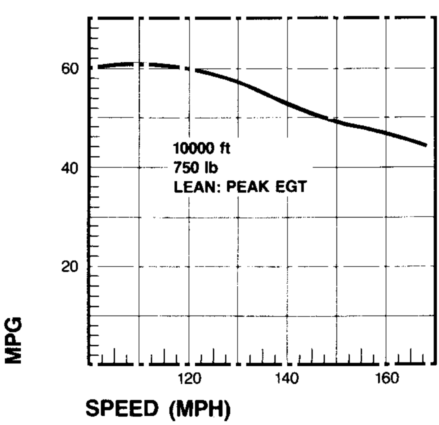
Actual performance will vary from standard due to variations in atmospheric conditions, engine and propeller condition, mixture leaning technique, builder construction procedures, and other variables associated with the particular performance item.

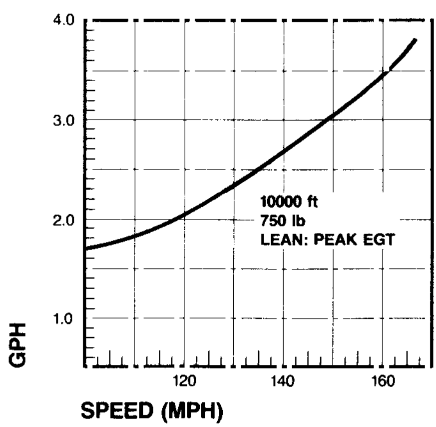
**Gross weight**
1,000 pounds
**Fuel capacity**
20 gallons
**Engine**
Revmaster 2100-DQ
**Horsepower**
64 horsepower @ 3200 rpm
**Top speed**
180 miles/hour
**Fuel economy**
Maximum cruise:
44 miles/gallon
Economy cruise:
60 miles/gallon
**Takeoff distance (Sea Level)**
360 feet (750 pounds)
610 feet (1000 pounds)
**Landing distance (Sea Level)**
720 feet (750 pounds)
790 feet (1000 pounds)
**Rate of climb (Sea Level)**
1200 feet/minute (750 pounds)
800 feet/minute (1000 pounds)
**Ceiling**
19,000 feet (750 pounds)
15,000 feet (1000 pounds)

**Range**
Maximum cruise: 682 miles
with 45 minutes reserve
Economy cruise: 1020 miles
with 45 minutes reserve
**Minimum speed**
61 miles/hour (750 pounds)
64 miles/hour (1000 pounds)


18000
14000
10000
6000
2000
ALTITUDE (FT)
1000 lb
750 lb
200
600
1000
RATE-OF-CLIMB (FT/MIN)


18000
14000
10000
6000
2000
ALTITUDE (FT)
870 lb
120
140
160
180
SPEED (M/HR)


60
40
20
MPG
10000 ft
750 lb
LEAN: PEAK EGT
120
140
160
SPEED (MPH)


4.0
3.0
2.0
1.0
GPH
10000 ft
750 lb
LEAN: PEAK EGT
120
140
160
SPEED (MPH)

# EMERGENCY PROCEDURES

## BRAKE FAILURE

Although brake failure is infrequent in any aircraft, landing without brakes is no problem. If a brake failure is detected, proceed to the nearest airport with adequate runway length to accommodate a landing without brakes. It is recommended, with a single brake failure, that neither brake be utilized during landing and roll-out.

Plan the touchdown near the approach end of the runway. The aircraft nose should be aligned with the runway centerline. Use minimum safe airspeeds for existing conditions. Maintain directional control straight down the runway with the tailwheel steering. Allow the airplane to roll to a stop without the use of brakes. The engine may have to be stopped to reduce the ground roll. Push or tow the aircraft to a facility for repair.

## MINIMIZING THE GROUND ROLL ON LANDING

Under normal conditions, to minimize the landing ground rollout, touchdown at the minimum speed, maintain directional control with the tailwheel, and apply brakes until the tailwheel lifts clear of the ground. A further reduction in ground rollout can be obtained by shutting the engine off using the ignition switch.

If, after accomplishing these items, the remaining space available for stopping is still insufficient, you may elect to intentionally groundloop the aircraft. To do this, apply full rudder and wait patiently; the aircraft will turn in a circle of ever decreasing radius while lowering the speed. After about 180-270 deg. of turn, the aircraft will stop. During flight testing, this maneuver was accomplished without damage to the aircraft. No tendency to tip over was evident. Carefully inspect the entire airframe after a groundloop.

CAUTION: This manuever is not recommended as a normal operation because of the very high loads imposed on the airframe.

## EMERGENCY LOCATOR TRANSMITTER

An ELT should be installed aft of the baggage compartment.

## ICING CONDITIONS

Carburetor ice may be encountered at any time, even with ambient temperatures of 80 F. The first indication of carburetor ice should be a slight drop in engine RPM. Slight engine roughness may or may not accompany this engine RPM drop. If carburetor icing is suspected, the following procedures are suggested:

1. Slowly apply full carburetor heat. Engine roughness may then occur due to an over-rich mixture or water from the melting ice.
2. Continuous engine operation with carburetor heat ON is not recommended due to the decrease in engine efficiency.

Flying in known icing conditions is not only prohibited by FAA regulations, but it is also very foolish. However, should wing icing occur, the following procedures are suggested:

1. Monitor engine RPM for any indication of carburetor ice.
2. Increase airspeed if possible to reduce the angle of attack.
3. Changing altitude or course may alter the rate of accumulation of ice.
4. Remember that ice accumulation increases wing loading, decreases performance, decreases range and increases stall speeds. When landing, plan a slightly higher than normal air speed during landing approach. Guard against the increased stall speed created by the above montioned conditions.

REMEMBER: Flying in icing conditions should be avoided.

## WINDSHIELD OBSCURATION

A windshield obscuration caused by ice or moisture condensation should not be encountered while flying day or night VFR. If it is encountered, open all vents, turn cabin heat ON if installed, and change altitude, if possible, in order to alter the outside air temperature. If part of the windshield is clear, a slip may be used to keep the airport in sight during the approach and landing.

## LOW OIL PRESSURE/ENGINE OVERHEAT

A low oil pressure reading may be caused by malfunction of the indicating system, oil pump failure, or loss of oil. Monitor the oil temperature gauge for a marked increase in temperature. If no temperature change is detected, the failure may be in the oil pressure indicating system. Proceed to the nearest airport, land, check the oil level, and determine the difficulty.

In flight, if the oil pressure indication is low and is confirmed by high oil temperatures, reduce power and proceed to the nearest airport or suitable landing area and land. If possible, notify the nearest ATC radio facility of your difficulty.

CAUTION: Lack of oil pressure will cause the engine to seize, requiring replacement or repair. Do not expect engine to continue operating while inflight.

When operating in high outside air temperature, the oil temperature may approach the red line. This is not detrimental and is not cause for concern unless the oil temperature exceeds the red line on the oil temperature gauge. A reduced power setting will lower the oil temperature; should it exceed the red line in flight, land at an airport and correct the problem.

## INFLIGHT ENGINE FIRES

Inflight engine fires in today's modern aircraft are extremely rare and it should be noted that the presence of smoke does not always mean that a flaming fire exists. As an example, it may be engine oil on the exhaust system. If, in the pilot's judgement, an engine fire exists the following procedures are suggested:

1. Fuel selector - OFF
2. Magneto switches - OFF
3. Establish a maximum safe rate of descent. Increasing speed may blow the fire out.
4. Side slip maneuvers may be used, as necessary, to direct flames away from the cabin area.
5. Select a suitable field for a forced landing.
6. Notify ATC of your location and problem, if possible.
7. Master switch - OFF
8. Complete the forced landing; do not try to restart the engine.

## INFLIGHT ELECTRICAL FIRES

Indication of inflight electrical fires may be wisps of smoke or the smell of hot or burning insulation. Should an electrical fire develop, the following procedures are suggested:

1. Master switch - OFF
2. All Electrical switches - OFF
3. Magneto switches - OFF
4. Cabin air vent (s) - OFF
5. Proceed to nearest suitable airport for landing.

CAUTION: If electrical power is necessary for safety of flight, attempt to isolate the electrical problem and turn that unit off.

## ENGINE ROUGHNESS

If a rough-running engine is encountered, it may be for any one of the following reasons:

1. Lead or oil fouled spark plugs.
2. Incorrect fuel/air mixture.
3. Incorrect use of carburetor heat.

The Revmaster 2100-DQ engine design is very tolerant of a wide range of fuel/air mixture ratios. Some roughness at high altitudes may be encountered if the mixture control is not used to lean the air mixture.

Spark plugs may become oil-fouled during taxiing, prolonged power-off descents, or cruising with an improper fuel-to-air mixutre. The majority of engine roughness encountered is due to fouled spark plugs. This may be eliminated by removing the spark plugs and cleaning them.

Improper use of carburetor heat also may induce engine roughness. Abrupt application of carburetor heat when cruising above 5,000 MSL may result in momentary engine roughness. This condition is caused by warm air being fed into the carburetor. Warm air is less dense and tends to upset the fuel/air ratio, thus causing an overrich mixture condition. Returning the carburetor heat to OFF will tend to correct this condition. It may be necessary, from time to time, to fly with partial carburetor heat. Adjust mixture for smooth operation.

NOTE: Flying with partial carburetor heat is not recommended unless the aircraft has a functioning carburetor air temperature gauge installed.

## ENGINE FAILURE

Engine failures are very rare in modern aircraft. Should an engine failure occur, the basic procedures listed below may be a useful guide:

1. Establish a glide speed of 90 mph.
2. Check wind direction for landing.
3. Pick a suitable landing area and plan an approach.
4. Use the backup squeeze bulb fuel pump in case the fuel pump has failed, and header tank is empty.
   Carburetor Heat - ON
   Magneto Switches - OFF, then ON
   Start Button - ON
5. If the engine does not start promptly, attention should be shifted to the forced landing procedure.
6. Notify ATC of your location and problem, if possible.
7. Fuel Valve - OFF
   Magneto Switches - OFF
   Master Switch - OFF
8. Complete the landing and secure the aircraft. Notify ATC by telephone of your situation and location.

## ELECTRICAL SYSTEM MALFUNCTION

The ammeter will vary depending on the current drain from operating equipment; increasing current requirement will cause an increasing positive ammeter reading.

A negative ammeter indication indicates discharging battery. Check the alternator and regulator for malfunction and control equipment usage.

Maximum alternator charging rate is 20 amp. Do not exceed this value.

The engine will continue to operate normally since it has a dual magneto.

# CARE OF THE AIRCRAFT

COMPOSITE STRUCTURE

The Q2 is painted with a primer that contains a barrier for ultra violet radiation. This, or an equivalent UV barrier, is required to protect the epoxy and foams from deterioration. Do not expose unprotected fiberglass to sunlight for extended periods. Unpainted areas should be retouched. The high surface durability and high safety margins designed into the Q2 make it highly resistant to damage or fatigue. If the structure is damaged, it will show up as a crack in the paint. The strain characteristics of the material are such that it should not fail internally without first failing the paint layer. If damage is apparent due to a crack in the paint or wrinkle in the skin, remove the paint around the crack by sanding, and inspect the glass structure. Do not use enamel or lacquer paint remover. If the glass structure is damaged, it will have a white appearing ridge or notch indicating torn (tension) or crushed (compression) fibers. If there is no glass damage, it will be smooth and transparent when sanded. If there is glass structure damage, repair as shown in Chapter 3 of the Q2 Construction Plans. Delaminations are rare, due to the proper design of joints.(None have occurred on the prototype.) If a delamination occurs (skin trailing edge joints, etc.), spread the joint, sand the surfaces dull, trowel in wet flox, clamp back together, and let cure.

PROPELLER CARE

Since wooden propellers do not have "metal fatique" problems, they are a lot more forgiving of nicks. However, whenever you notice a large nick, you should sand it out and refinish and rebalance the prop.

Waxing the propeller regularly will also help protect the surface.

Flying regularly in rain may erode the leading edge of the propeller.

EXTERIOR CARE

Consult the manufacturer of the paint that you used, or his representative, to determine the best means of maintaining a bright exterior surface.

## CANOPY CARE

It is recommended that you keep the plexiglas in the canopy clean and unscratched. The following procedures are recommended:

1. If large deposits of mud and/or dirt have accumulated on the plexiglas, flush with clean water. Rubbing with your hand is recommended to dislodge excess dirt and mud without scratching the plexiglas.
2. Wash with soap and water. Use a sponge or heavy wadding of a soft cloth. DO NOT rub, as the abrasive action in the dirt and mud residue will cause fine scratches in the surface.
3. Grease and oil spots may be removed with a soft cloth soaked in kerosene.
4. After cleaning, wax the plexiglas surface with a thin coat of hard polish-wax. Buff with a soft cloth.
5. If a severe scratch or marring occurs, jeweler's rouge is recommeded. Follow directions, rub out the scratch, apply wax and buff.

NOTE: Never use benzine, gasoline, alcohol, acetone, carbon tetrachloride, lacquer thinner or glass cleaner to clean plastic. These materials will damage the plastic and may cause severe crazing.

## ENGINE OIL

Check engine oil level on each flight prior to operating the engine. Do not mix brands, nor grades of motor oil. Recommended oil numbers for expected ambient temperatures are:

| Temperature | Grade |
|---|---|
| Below 90°F | SAE 40 |
| Above 90°F | SAE 50 |

Engine oil should be changed every 25 hours.

## BATTERY

The battery recommended for the Q2 when equipped with an electric starter is a 12 volt, 18 amp-hour. It should be serviced in accordance with the manufacturers directions. Only distilled water should be used to replenish the battery.

TIRE SERVICE

The tires should be inspected for wear and cuts and abrasions before each flight.

Tires should be replaced when the remaining tread depth reaches 1/16".

The proper inflation pressure for the main tires is 25 PSI.

BRAKE SERVICE

The brake pads should be inspected every 25 hours of flight, and replaced when the pad thickness is less than 0.030".

ELECTRICAL SYSTEM

Inspect the electrical wiring every 25 hours for chafing or loosening.

RECURRENT MAINTENANCE INSPECTION

Every 100 hours, you should inspect all of the items that are covered in Initial Flight Testing, Section IX.

FUEL REQUIREMENTS

Aviation grade fuel 100/130 or 100 LL is recommended for the Revmaster 2100-DQ engine.

# ENGINE OPERATION

See the manuals supplied by Revmaster Aviation for the Revmaster 2100-DQ engine for information on operation of the Q2 powerplant.

# INITIAL FLIGHT TESTING

## INTRODUCTION

Once the construction of your Q2 is completed, you are ready to prepare your Q2 for flight testing. This task should not be taken lightly, and a thorough, professional approach will assure you of years of trouble-free fun.

The information contained in this section is intended to aid you as you prepare for first flight. It does not replace good common sense on your part. If you are not sure of some phase of preparation, call QUICKIE AIRCRAFT CORPORATION and ask questions. Beware of individuals in your community who profess a great knowledge in this area; they may or may not be competent.

This Chapter is divided into two basic sections:

1. Pilot preparation.
2. Aircraft preparation.

## PILOT PREPARATION

Quite often, while building a homebuilt aircraft, the owner-builder-pilot allows his own pilot proficiency to slip in order to expedite completion of his aircraft. This move is unwise.

We recommend the following steps to prepare oneself for first flight:

1. Ten hours of flying time in the last 3 months.
2. Checkout in at least 3 different types of aircraft shown in the logbook.
3. One hour of takeoff and landings in a taildragger within the preceeding 3 months.
4. A private pilot certificate with no restrictions.
5. <u>Study</u> the Q2 Pilot's Manual thoroughly.
6. <u>A ride</u> in a Q2, if practical.

In addition, the pilot should feel confident in his ability to fly a new aircraft. If he does not, he should check out in different types of aircraft until he feels comfortable, even if it means delegating first flight in his Q2 to a more competent pilot.

The above are suggestions that we believe to be conservative and desirable before the first flight of <u>any</u> homebuilt aircraft.

## AIRCRAFT PREPARATION

Before the initial taxi tests of your Q2 are performed, you must carefully make a complete inspection of the entire aircraft, with particular emphasis on the flight systems. This is similar to what a factory built aircraft goes through before it is delivered to the customer.

The following list can also be used for each annual inspection:

1. Check all fasteners for proper security and safetying.
2. Check control system travels at the surfaces:
   a. Rudder travel $\pm$ 28 degrees.
   b. Aileron travel $\pm$ 25 degrees.
   c. Elevator travel 17° T.E. down; 15° T.E. up.
3. Ailerons should fair into the trailing edge of the wing with the control stick at neutral.
4. Check that canopy sponge seals are in place and that canopy locking handle is adjusted so it must be forced <u>hard up</u> to lock. This is extremely important to eliminate any possibility of it being bumped open in flight. Verify that the secondary canopy latch functions properly.
5. Check elevator and aileron pushrods for proper installation (spacers, washers, bolts, locknuts, etc. installed properly).
6. Check elevator and aileron pushrods for freedom of movement throughout control travel.
7. Check pitch trim for proper function, and freedom of movement.
8. Check elevator and aileron hinge attachments for security.
9. Check elevator and aileron for freedom of movement throughout range without binding or chafing.
10. Check rudder pedals, cables, and attachments for freedom of movement throughout range without binding or chafing.
11. Check brake system for freedom of movement.

12. Check main tire inflation at 25 psi. Recheck 2 days later for leaks. Check axle bolts for function and security.
13. Check tailwheel area for freedom of movement and proper security.
14. Check safetying and security on all actuating mechanism hardware.
15. Check instrumentation: CHT, and Oil Temp with a match or hot water at the probe; check pitot-static system for leaks; check remainder of instrumentation on initial engine run.
16. Check Engine compartment: Propellor bolts for proper torque and safetying; propeller for proper track (within 1/8"); engine mount bolts for security and safety; oil level; throttle, mixture, cowl flap, and carb heat controls for security and proper function; ignition wiring for security and redundancy; and check baffling for tight fit around engine and cowl, otherwise overheating may occur.
17. Check fuel system: fuel cap seals securely and vent system clear; Flow check your fuel system by removing the fuel inlet line to the fuel header tank and verifying that both electric fuel pump and backup squeeze-bulb fuel pump flow a steady stream of fuel. Check fuel shutoff valve for function; and verify a steady flow of fuel to carburetor with fuel selector on. Clean fuel filter after flushing entire system; calibrate fuel gauges by pouring fuel into tanks in increments and marking gauges.
18. Check battery secured and vent line exits bottom of fuselage.

## WEIGHT AND BALANCE

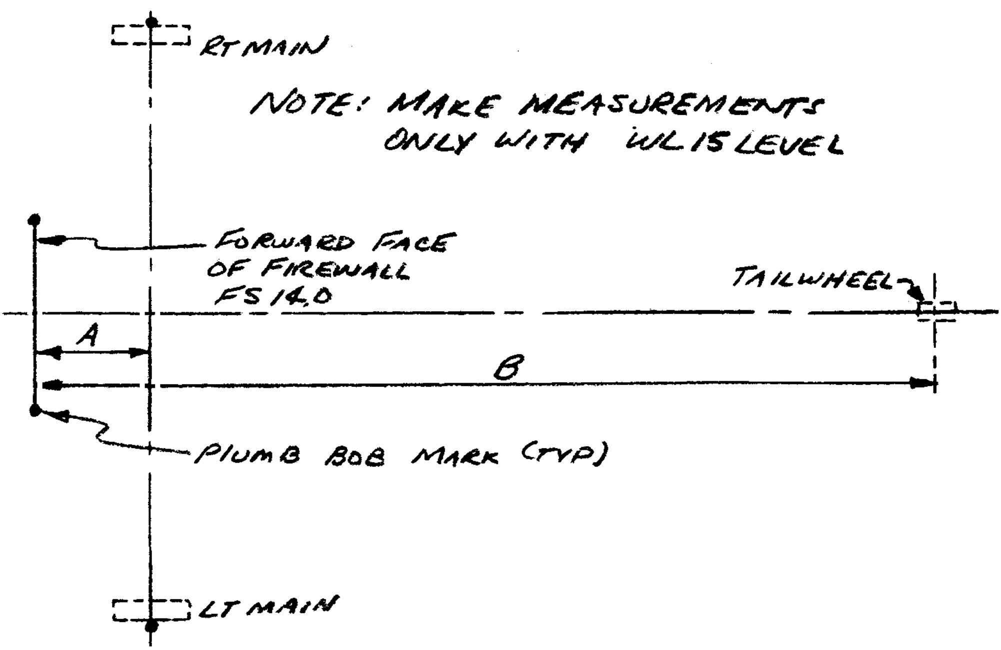
It is extremely important to do an accurate weight and balance on your Q2 to determine <u>your</u> aircraft's c.g. The measurements should be recorded in the aircraft logbook and used for all future c.g. computations. The following procedure is recommended for performing an accurate weight and balance:

EQUIPMENT REQUIRED - 3 Scales (platform type preferred); one level; some chalk; a 12' tape measure; 3 pieces of 1" x 12" lumber to distribute the weight evenly over the scales; and miscellaneous wood to set the tailwheel scale on at the proper vertical height. Calibrate the scales by weighing a known object.

STEP 1 - Position the aircraft on the scales with the WL15 line level. Record the scale readings with the aircraft only (i.e. no fuel, pilot, no baggage).

STEP 2 - With the aircraft off of the scales, but still level, use your plumb bob to locate on the floor the centerlines of the main gear axles and the tailwheel. Also mark the location of each forward face of the firewall on the floor using the plumb bob.

STEP 3 - Make the measurements shown below:



To get the moment arm (fuselage station) of the main gear add distance A to 14.0 (it should be about STA 39.5); To get the moment arm of the tailwheel, add distance B to 14.0 (it should be about STA 210.4).

STEP 4 - Make a tabulation along the lines of the following:

| ITEM | GROSS WT | TARE | NET | ARM | MOMENT |
|---|---|---|---|---|---|
| L Main | 260.5 lb | -1.0 lb | 259.5 lb | 39.5 in | 10250.25in-lb |
| R Main | 257.5 lb | -2.0 lb | 255.5 lb | 39.5 in | 10092.25in-lb |
| Tailwheel | 3.0 lb | -1.0 lb | 2.0 lb | 210.4 in | 420.8 in-lb |
| Total | | | 517 lb | 40.16 in | 20763.3 in-lb |

Divide the total moment by the total new weight to obtain the empty c.g. - 40.16 in.

STEP 5 - Now you can perform some sample weight and balance calculations using the sample problem and curves in the Q2 Pilot's Manual. To be absolutely accurate, it would be a good idea to do another weight and balance with pilot in the aircraft since pilot location in cockpit will effect his moment and aircraft c.g. location. You should placard the maximum and minimum pilot weights allowable from your calculations on the instrument panel.

## FLIGHT TESTING YOUR Q2

After having spent many months building your Q2, you are going to be in a big hurry to fly it. This is a mistake. Flight testing any new aircraft must be approached cautiously.

Read over the first parts of this section. Is everything checked and completed? Now think carefully; what else can you think of that you should do to get ready for first flight? Spend days or weeks, literally, thinking about that question. Do not do any engine runs or taxi tests until you are sure that the aircraft is ready to fly. Many taxi tests end up with an unexpected first flight; don't be caught unprepared. Do not fly your Q2 unless all flight and engine instruments included with the basic kit are operating normally. Observe all RPM and temperature limits in this Pilot's Manuel.

Especially, do not fly or even taxi your Q2 until an accurate weight and balance in the flight configuration is known and checked against the Pilot's Manual limitations.

GROUND TESTS - Run the engine in for at least 5 hours at various speeds, and with the cowling on. Watch all engine instruments for any signs of problems. Do not exceed 400 deg CHT. Frequently take the cowling off and carefully inspect the engine compartment for loose bolts, excessive vibration, or leaks. After the 5 hour runin, do a very careful inspection of everything in the engine compartment. Remember, don't rush. When you button up the cowling for the last time, be able to say to yourself that the aircraft is ready for first flight.

BASIC TAXI TESTS - Now you are ready to taxi the aircraft around on the ground for a little bit to get accustomed to the cockpit environment. Don't stop until you feel completely at home with the aircraft's very low speed characteristics; make sharp turns, apply brakes, listen for the sounds of the engine and aircraft.

TAXI TEST - Taxi tests can be divided up into two regimes; low speed (under 30 mph) and high speed (over 30 mph). Spend at least 30 minutes in the low speed area getting used to the sound and feel of the aircraft. Always be prepared for a liftoff and first flight if it should accidentally occur. Now park the Q2 for a day to think about everything that you have learned. Do not do the high speed taxi tests until you have had this 1 day cooling off period.

HIGH SPEED TAXI AND LIFTOFFS - Do these procedures in a basic aircraft like a Cessna 150 before doing them in your Q2. Find an airport with the following conditions today:

1. Weather; wind calm, or straight down the runway and smooth, and no turbulence aloft (check with another aircraft).
2. Runway; smooth, at least 4500 feet long and preferably over 6000 ft. long.

Check the aircraft to verify that you have about 5 gallons of fuel. Check yourself to make sure that you are <u>not</u> tired, or too exited. There is always tomorrow.

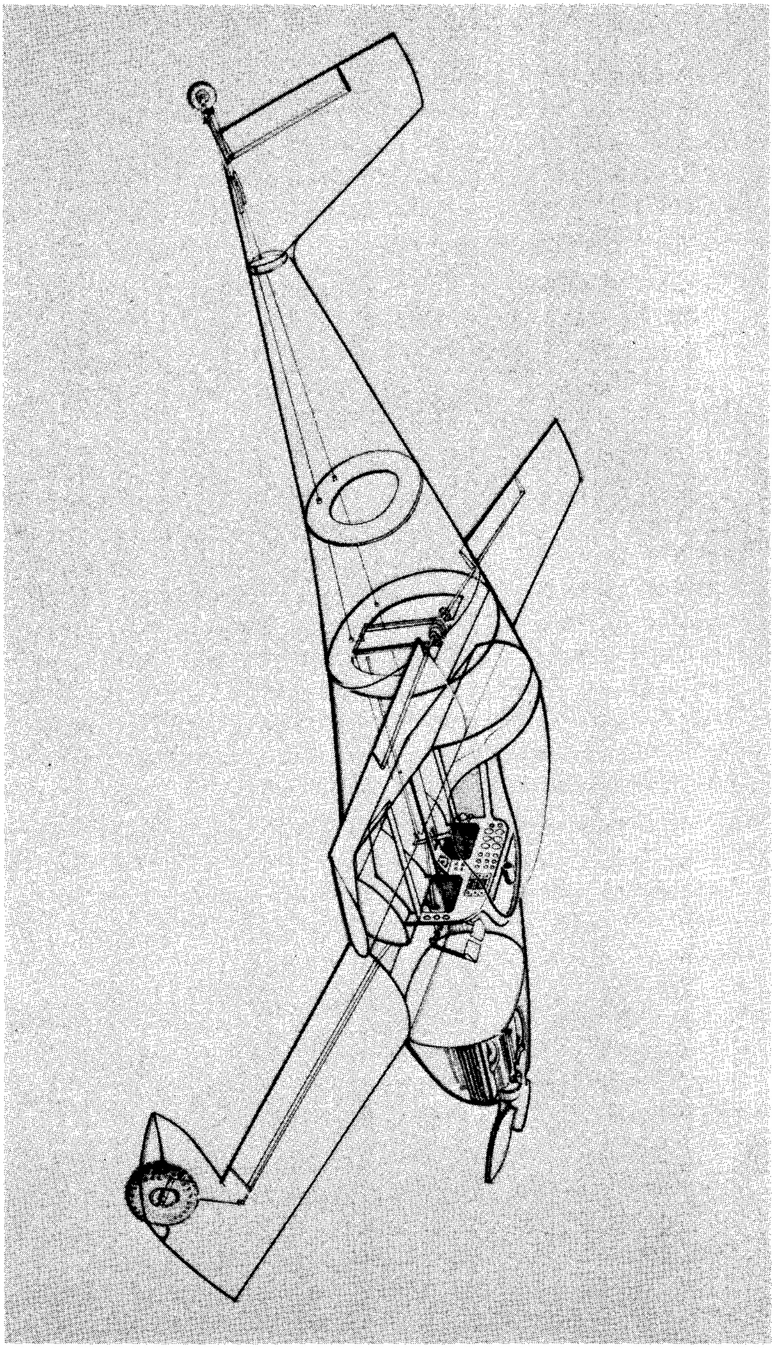
Perform high speed taxi tests at increasing speeds (i.e. 35 mph, 40 mph 45 mph, and 50 mph). Repeat until you feel absolutely comfortable. Perform the tests by accelerating to the aim speed, bringing power smoothly to idle and decelerating to a stop.

Evaluate whether your airport has sufficient room to make a runway flight (i.e. liftoff, fly straight and level for about 5 seconds, and land). If it does, you may want to do this to feel out the aircraft.

<u>FIRST FLIGHT</u> - The first flight is just a short step up from the runway flight. The main items to look for are proper operation and function of all controls, and proper indications on all engine related instruments. The first flight should be only 15-20 minutes long; long enough to feel comfortable in the aircraft for landing, but not so long that you feel obliged to "ring" the aircraft out. After first flight, every part of the aircraft should be checked carefully to determine any problem areas.

On landing the Q2, one should touch down tailwheel first with full aft stick. On takeoff, the tailwheel should <u>not</u> lift off before the main gear if full aft stick is used. If either or both of these statements is not true for your Q2, contact Quickie Aircraft Corporation for help. A <u>small</u> adjustment of aileron rigging is needed. These comments apply to mid-aft c.g. locations. At forward c.g. takeoffs the tailwheel may lift off first.

<u>THE FLIGHT TEST PROGRAM</u> - In subsequent flights, concentrate on learning more about the aircraft, and getting accustommed to flying it. Expand the operational envelope slowly (e.g. don't dive it to redline speed on the second flight, and don't operate in 50 knot winds right away). Remember, there is no substitute for good judgement. Call QUICKIE AIRCRAFT CORPORATION if you have any questions.



BEFORE STARTING ENGINE

1. Check all controls for operation.
2. Check toe brakes - ON.
3. Mixture - IDLE CUTOFF.
4. Fuel Valve - ON.

NORMAL ENGINE START

1. Throttle - Cracked 1/4".
2. Carburetor heat - OFF.
3. Master Switch - ON.
4. Magneto Switches - ON.
5. Mixture - FULL RICH for 3 seconds; then IDLE CUTOFF.
6. Starter Button - PUSH to turnover engine.
7. Mixture - FULL RICH when engine catches.
8. After engine is running; Check to verify oil pressure within 20 seconds.
9. Warm up engine at 1000 RPM.

BEFORE TAXI

1. Seat belts and shoulder harness': adjusted and buckled.

TAXI

1. Check tailwheel steering and brake.
2. Check ammeter.

BEFORE TAKEOFF

1. Engine instruments: operating properly in the arc ranges. Engine Runup: 1400 RPM: check left and right magnetos: 100 RPM drop maximum.
2. Carburetor heat - ON: Check for RPM drop, then OFF.
3. Engine: Check idle.
4. Fuel Valve - ON.
5. Mixture - FULL RICH.
6. Fuel quantities - As required.
7. Canopy - Locked; secondary latch in place.
8. Trim - As desired.
9. Carburetor heat - OFF.
10. Controls: Free, with movement in the proper direction and no binding.
11. Altimeter - Set.
12. Radio - ON.
13. Cowl Flap - OPEN.

TAKEOFF - NORMAL

1. Throttle: Full open.
2. Controls: Hold aft stick lift off at 65 CAS.
3. Climb speed 75 CAS.

CLIMB

1. Normal - 100 CAS
2. Best Rate - 85 CAS at S.L. full throttle.
3. Best Angle - 70 CAS at S.L. full throttle.

CRUISE

1. Power setting: 2700 to 3200 RPM.
2. Trim - As required.
3. Mixture - Lean to peak RPM.
4. Cowl Flap - As required.

BEFORE LANDING

1. Mixture - Full rich.
2. Carburetor heat - As required.
3. Airspeed: 85 CAS.

LANDING

1. Touchdown tailwheel first.
2. Maintain directional control with the tailwheel steering.
3. Brake, as required, for stopping.

AFTER LANDING

1. Carburetor heat - OFF, if ON.
2. Cowl Flap - CLOSED.

SHUT-DOWN

1. All electrical equipment - OFF.
2. Mixture - IDLE CUTOFF.
3. Magneto Switches - OFF.
4. Master Switch - OFF.
5. Fuel Valve - OFF.
6. Chock wheels and tie down aircraft.