AIR TRACTOR, INC.
Olney, Texas

FAA APPROVED

AIRPLANE FLIGHT MANUAL

FOR

AIR TRACTOR MODEL AT-301

RESTRICTED CATEGORY ONLY

THIS DOCUMENT MUST BE CARRIED IN THE
AIRPLANE AT ALL TIMES

Serial No._____

Registration No._____

FAA APPROVED [redacted]

DON P. WATSON, Chief
Engineering & Manufacturing Branch
Federal Aviation Administration
Southwest Region
Fort Worth, Texas

DATE: March 1, 1979

AIR TRACTOR, INC.
Olney, Texas

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AIR TRACTOR MODEL AT-301

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TAKE-OFF [FULL HOPPER LOAD AND SHORT STRIP]

Use same procedure as for normal take-off except as follows:

1. Lower flaps to 10° position (first mark).
2. With a full hopper load apply full power before the brakes are released.
3. After breaking ground do not retract the flaps until at least 100 mph is reached.

CRUISE

Any amount of power up to maximum continuous ratings may be used for cruise. However, avoid low RPM and high manifold pressure settings.

For an empty AT-301 with the pump removed for long ferry flights, an economy cruise setting of 1900 RPM and 23.0 inches will provide an indicated airspeed of approximately 122 mph at 8,000 ft. Fuel consumption at this setting is approximately 28 gallons per hour.

Other power settings that would be acceptable are as follows:

RPM	Manifold Pressure	Indicated Airspeed	Altitude
1900	24.0 inches	123 mph	8,000 ft.
1900	25.0 inches	126 mph	8,000 ft.
2000	26.0 inches	131 mph	8,000 ft.

With the spray pump installed, a reduction in airspeed of approximately 4 mph will be noted. Lower altitudes will also show a lower indicated airspeed for a given power setting.

The R1340 engine on the AT-301 can be leaned at any altitude without detrimental effects due to the lack of a tightly enclosed cowling. Leaning will usually improve engine performance and is recommended except when take-off power is used.

AGRICULTURAL FLYING

Since agricultural flying is extremely varied, it is not practical to recommend operating procedures which in many cases would not fit a particular operation. However the procedures outlined in this section are general and may be followed if they apply.

Survey of field:

1. Before entering the field to be treated, fly around the entire perimeter at least once to firmly establish the location of wires, standpipes, or other obstacles.
2. Determine direction field will be flown and check position of flagmen if used.
3. Check surrounding area on downwind side for possible drift damage.
4. Make note of houses or areas to avoid during turns.

Entering Field:

1. If practical, make first pass into the wind so that two passes will be made before the first downwind turn is required. Avoid making first pass into the sun, however.
2. If obstructions border the field reduce speed slightly and make a high approach. When obstruction is near enough, nose down smoothly to angle which will clear obstruction and apply power to prevent high-speed stall on roundout. Avoid flying just above obstruction height and abruptly pitching over.

Swath [Spraying]:

1. For a full load on a hot day set prop at 2150 RPM and manifold pressure at 30'' or less, depending on how well the aircraft is performing.
2. Spray runs may be made at 130 to 135 mph when the aircraft is heavy, which will provide good penetration as well as adequate speed for pull-ups and turns.
3. As load diminishes, reduce RPM by 50 RPM increments so that as hopper nears empty, RPM is 2,000. From 2,000 to 2150 RPM is the smoothest setting for the AT-301 due to the engine mount design and engine vibration characteristics and therefore this should be the normal working range.
4. Reduce manifold pressure as load diminishes to avoid excessive speed over the crop, which reduces penetration. Spray speeds of 120 to 125 mph are normal as the hopper nears empty.
5. The operator should select a speed which feels comfortable and best fits his particular operation. In gusty air always use 5 to 10 mph more speed.

Pull-Ups:

1. Prior to pull-up apply additional power smoothly.
2. Abrupt pull-ups should be avoided since excessive speed is lost which reduces turn performance.
3. When making pull-ups over wires avoid starting bank too soon.

Turns:

1. The previous training and experience will influence the operator flying the AT-301. All conventional types of turns may be performed in the AT-301.
2. Flaps may be used as a turning aid providing small deflections are used (5 to 8 degrees). The usual method of using flaps is to make the pull-up and initial bank with flaps retracted. As the aircraft is being banked to turn back into the field touch the flap switch briefly and let off a little back pressure on the stick, as the flaps cause a slight pitch up tendency. Continue the turn, and as you line up for your pass, retract the flaps.
3. Make co-ordinated turns. Use the slip indicator as a means of determining whether or not you are carrying bottom rudder. The AT-301 has excellent stall characteristics and if the aircraft is inadvertently placed in an impending stall situation, it is only necessary to relax some back pressure on the stick to make recovery, and little altitude is lost.

APPROACH AND LANDING (NORMAL)

1. Set mixture control FULL RICH
2. Reduce power slightly and move prop control full forward (High RPM).
3. Pull Carb. heat control full on if icing conditions exist.
4. Close throttle and establish glide at 85-90 mph (flaps up) or 75-80 mph (flaps down). These figures for empty aircraft. The engine should be cleared occassionally by opening throttle.
5. During landing roll, steer the aircraft with rudder. Brakes are for stopping or turning off the runway. Avoid heavy braking. The AT-301 is a slow landing aircraft and it is poor pilot technique to land so close to your loading rig that heavy braking is required.

LANDING (CROSS-WIND)

1. Establish proper crab angle to line up with runway.
2. Leave flaps retracted unless strip is very short and cross-wind does not exceed 15 mph.
3. During final stages of flare-out apply necessary rudder to straighten aircraft with runway. In strong crosswinds, it will be necessary to lower the up-wind wing.
4. Touch down should be in tail-low attitude and on up-wind wheel. Allow downwind wheel to touch, then tail wheel.
5. Remain alert during roll-out. Steer with rudder and use brakes only if necessary.

STOPPING THE ENGINE:

1. Idle for at least one minute to cool engine.
2. While engine is idling, place propeller control in HIGH RPM (full forward position). If the aircraft is equipped with a 12D40-211 propeller, run engine smoothly up to 1500 RPM, move the propeller control to LOW RPM (full aft) position and reduce speed to idle RPM for one minute.
3. Move mixture control to FULL LEAN position and when engine cuts, move throttle forward slowly.
4. Continue opening the throttle slowly after the engine starts to cut. When engine stops, turn off ignition switch, battery switch, alternator switch.
5. Set brakes and control lock.

LOADING THE AT-301:

Under the provisions of CAM8.10-4(b) "Maximum capacities should be selected by the applicant and demonstrated in the flight check in accordance with section 8.10-3(e). (1.) These maximum capacities for hoppers or tanks should be listed on placards on or adjacent to the appropriate filler covers."

NIGHT OPERATING PROCEDURES (If Applicable)

1. Instrument and Nav lights - ON
2. FLIGHT LIGHTS - As desired
3. Use extra caution during final approach and landing if airplane does not have a standard landing light system.

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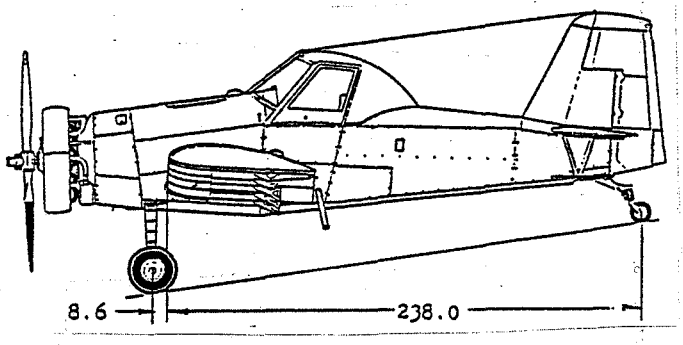
SECTION 5 - WEIGHT AND BALANCE



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LEVELING MEANS: Top of L/H gear leg next to fuselage skin
DATUM: Wing Leading Edge

WEIGHTS

Left main wheel
Right main wheel
Tail wheel

CONDITIONS

Oil (8.0 gallons) (-23.0)
Fuel (None) (+33.0)
Standard Spray System

	FORWARD C. G.			AFT C. G.		
Main Wheels		-8.6			-8.6	
Tail Wheel		238.0			238.0	
Pilot	170	74.0	12,580	170	74.0	12,580
Unusable Fuel	36	33.0	1,188	36	33.0	1,188
Fuel	225	33.0	7,425	720	33.0	23,760
Payload		7.0		--	--	--
	5000		100,438			

Forward C. G. = $\frac{100,438}{5,000}$ = (Limit is 14.0")

Aft C. G. = _____ = (Limit is 23.0")

*Installed on aircraft

EQUIPMENT LIST

Battery	(GE-51)	57 lbs.	(+160.0)
Spreader	(Transland 22356)	115 lbs.	(+26.0)
Speed Ring	(Dwng. 50240)	30 lbs.	(-56.0)
Lighting System	(Dwng. 60004)	4.9 lbs.	(+47.4)
Windshield Washer	(Dwng. 80216)	10 lbs.	(+71.0)
Automatic Flagman	(STC SA265NW)	15 lbs.	(+49.0)
Night Working Lights	(Dwng. 60038)	14.4 lbs.	(+33.0)
38 Extra Nozzles	(Dwng. 80037)	14 lbs.	(+78.0)