

PITTS AEROBATICS

AIRPLANE FLIGHT MANUAL

MODEL S-1T AIRPLANE

SERIAL NO. 1-200 DP

Pitts
S-1T

FAA APPROVED: _____

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FEDERAL AVIATION AGENCY

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LOG OF REVISIONS

REVISION LETTER	PAGES AFFECTED	DESCRIPTION OF CHANGE	APPROVAL AND DATE
A	i, 1 of 10, 10.1 of 10	typo., and placards added	<i>F. E. McGowan</i> Acting Chief, Engineering and Manufacturing Branch Southern Region, FAA Date: October 29, 1976
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SECTION I OPERATING LIMITATIONS

A. <u>Airspeeds:</u>	<u>CAS</u>
Normal operating range (green arc) from stall speed:	64 MPH 56 KNOTS
To maximum normal operating speed:	154 MPH 134 KNOTS
Caution range (yellow arc) from maximum structural cruise speed:	154 MPH 134 KNOTS
To never exceed speed: (red radial)	203 MPH 176 KNOTS

NOTE: DO NOT OPEN CANOPY PAST FIRST NOTCH ABOVE 120 MPH (104 KNOTS)
 FOR ACROBATIC MANEUVER ENTRY SPEEDS, SEE PLACARDS SECTION.

B. Powerplant Limits:

For Lycoming AEIO-360-A1E engine and Hartzell HC-C2YK-4CF/FC7666A-2 propeller. Propeller minimum diameter 72 inches. Propeller maximum diameter is 74 inches.

Propeller Pitch Settings:	High Pitch $28^{\circ} \pm \frac{1}{2}^{\circ}$ Low Pitch $13\frac{1}{2}^{\circ}$
<u>Engine rated power:</u>	200 HP @ 2700 RPM
<u>Minimum fuel grade:</u>	100 Octane
<u>Oil Pressure:</u>	
Minimum (red radial)	25 PSI
Caution range (yellow arc)	from 25 PSI to 60 PSI
Normal range (green arc)	from 60 PSI to 90 PSI

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SECTION 1 OPERATING LIMITATIONS

B. Powerplant Limits (cont'd)

Oil Pressure: (cont'd)

Caution range (yellow arc)	from	90 PSI
	to	100 PSI

Maximum (red radial)		100 PSI
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Oil Temperature:

Maximum (red radial)		245 Deg. F
		118 Deg. C

Normal range (green arc)	from	100 Deg. F
		38 Deg. C
	to	245 Deg. F
		118 Deg. C

Fuel Pressure:

Minimum		0 PSI
---------	--	-------

Normal range (green arc)	from	0 PSI
	to	12 PSI

Maximum (red radial)		12 PSI
----------------------	--	--------

Tachometer:

Recommended idle		650 RPM
------------------	--	---------

Normal range (green arc)	from	500 RPM
	to	2000 RPM
	and from	2350 RPM
	to	2600 RPM

Avoid continuous operation (red arc)	from	2000 RPM
	to	2350 RPM
	and	2600 RPM
	to	2700 RPM

Do Not exceed (red radial)		2700 RPM
Avoid continuous operation (red arc)	above	2600 RPM
in aerobatic and full throttle level flight		

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SECTION I OPERATING LIMITATIONS

C. Weights

Maximum gross weight 1150 LBS.

NOTE: Reference station, FS 0.00 is located
 60.56 inches forward of lower wing leading edge.

Maximum oil	2 U.S. Gals.	15 LBS.
Fuel tank capacity	20 U.S. Gals.	120 LBS.
Baggage, maximum		15 LBS.
Usable fuel, normal flight	19 U.S. Gals.	114 LBS.

(See Section V, "Weight and Balance," for allowable weight and center of gravity combinations and detail loading instructions.)

Weight and Center of Gravity Limits:

Most forward limit:

FS 59.35 (17.53%MAC) at 1115 lbs. or less;

Most forward at maximum gross weight:

FS 60.37 (20.47%MAC) at 1150 lbs.;

Most rearward at maximum gross weight:

FS 61.38 (23.39%MAC) at 1150 lbs.;

Most rearward limit:

FS 62.48 (26.6% MAC) at 970 lbs. or less; with
 straight line variation between points given.

D. Flight Load Factors:

Positive flight, limit	+6.0 G.
Negative flight, limit	-4.67 G.

Maneuvers and entry speeds:

See section IV, "Placards."

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SECTION I OPERATING LIMITATIONS

E. Flight Limitations:

This airplane must be operated as a day VFR airplane only.

Flight into known icing conditions is prohibited.

No acrobatic maneuvers with baggage.

F. Usable Fuel:

Of the 20 U.S. gallon fuel tank capacity, 19 gallons are usable during all normal flight conditions.
Unusable fuel, normal flight: 1 U.S. Gallon.

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SECTION II OPERATING PROCEDURES

A. Normal Procedures:

a. Opening Canopy:

1. To open canopy from outside, pull up on the canopy latch tabs located at the lower front edges of the canopy, and slide the canopy aft.
2. To open canopy from inside, pull aft on cable latch release located at top forward center of canopy.

b. Check Stall Warning System as follows before every flight if aircraft does not have a full electrical system:

1. Reach into cockpit and turn master stall warn switch ON.
2. Walk to stall warn sensor on right wing and deflect vane UP.
3. If horn is clearly audible from wing, system is acceptable for flight. If horn is not clearly audible from wing, replace dry-cell battery before flight.

c. Starting Engine from Cold:

- | | |
|--|----------------|
| 1. Alternate air: | OFF |
| 2. Propeller governor control: | HIGH RPM |
| 3. Fuel selector: | ON |
| 4. Master stall warn switch | ON |
| 5. Mixture control: | FULL RICH |
| 6. Throttle: | OPEN ¼ INCH |
| 7. Auxiliary fuel pump: | PUMP 3 STROKES |
| 8. Pull mixture control to: | IDLE CUT-OFF |
| 9. Switch ignition to: | LEFT MAGNETO |
| 10. Prop engine | |
| 11. When engine starts, push mixture control immediately to: | FULL RICH |
| 12. Switch ignition to: | BOTH MAGNETOS |
| 13. Oil pressure: | INDICATION |

NOTE: Hot idle oil pressure 25 PSI minimum.

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SECTION II OPERATING PROCEDURES

A. Normal Procedures (cont'd):

d. Starting Engine From Hot:

- | | |
|--|-------------------------|
| 1. Alternate air: | OFF |
| 2. Propeller governor control; | HIGH RPM |
| 3. Fuel selector: | ON |
| 4. Master stall warn switch: | ON |
| 5. Mixture control; | FULL RICH |
| 6. Throttle: | HALF OPEN |
| 7. Auxiliary fuel pump: | PUMP 1 STROKE |
| 8. Throttle | OPEN $\frac{1}{4}$ INCH |
| 9. Pull mixture control to: | IDLE CUT-OFF |
| 10. Switch ignition to; | LEFT MAGNETO |
| 11. Prop engine. | |
| 12. When engine starts, push mixture control immediately to: | FULL RICH |
| 13. Switch ignition to: | BOTH MAGNETOS |
| 14. Oil pressure | INDICATION |

e. Ground Running and Warm-Up:

To prevent overheating follow these procedures:

- | | |
|-------------------------------|-----------------|
| 1. Head airplane into wind | |
| 2. Mixture: | FULL RICH |
| 3. Propeller governor control | HIGH RPM |
| 4. Warm-up at approximately: | 1000 - 1200 RPM |

Avoid prolonged idling and do not exceed: 2200 RPM

f. Pre-Takeoff:

- | | |
|---|-----------|
| 1. Warm-up as above. | |
| 2. Oil pressure: | GREEN ARC |
| 3. Oil temperature: | GREEN ARC |
| 4. Mixture control: | FULL RICH |
| 5. Elevator trim: | NEUTRAL |
| 6. Flight controls: | FREE |
| 7. Fuel pressure: | GREEN ARC |
| 8. Set throttle to 1700 RPM and move propeller governor control through full range and return to: | HIGH RPM |

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SECTION II OPERATING PROCEDURES

A. Normal Procedures (cont'd):

f. Pre-Takeoff: (cont'd)

9. Magneto check:
 With propeller set at high RPM set
 throttle at: 2200 RPM

10. Switch magnetos from both to one and
 note drop off, return to both until
 engine regains speed and switch to
 other magneto and note drop-off,
 then return to both.
 Normal drop-off is: 100 RPM
 Maximum drop-off is: 175 RPM
 Difference in drop-off between magnetos is: 50 RPM

g. Landing:

1. Mixture control: FULL RICH
 2. Propeller governor control: HIGH RPM

h. Engine Shut-down:

1. Throttle: CLOSED
 2. Mixture control: IDLE CUT-OFF
 3. Master stall warn switch: OFF
 4. Ignition switch: OFF

i. Acrobatic Flight:

Low altitude acrobatics with less than $\frac{1}{4}$ tank of
 fuel onboard is not recommended.

j. Spin Recovery Procedure:

With aileron neutral, apply full opposite rudder
 briskly, followed by full nose down elevator. When
 spin rotation stops, neutralize rudder and elevator
 and recover to level flight.

NOTE: Aileron held against the spin may delay the
 recovery.

B. Emergency Procedures:

a. In-flight Engine Restart:

1. Pull mixture control to: IDLE CUT-OFF
 2. Establish glide at: 100 MPH IAS

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SECTION II OPERATING PROCEDURES

A. Normal Procedures (cont'd):

a. In-Flight Engine Restart (cont'd):

- | | |
|---|--------------------|
| 3. Fuel selector: | ON |
| 4. Master stall warn switch: | ON |
| 5. Ignition switch: | BOTH MAGNETOS |
| 6. Throttle: | $\frac{1}{4}$ OPEN |
| 7. Propeller governor control: | HIGH RPM |
| 8. Increase airspeed to start propeller
wind-milling, if it has stopped. | |
| 9. Advance mixture control to: | FULL RICH |

b. Freezing of Pitot-Static Head:

In the event of icing of the static orifices on the pitot static head, an alternate source of static pressure is provided. To open the alternate static pressure source, turn the indicated valve on the instrument panel counterclockwise to full open. See placard for altitude error.

c. Best Glide Speed, Engine Out Is: 97 MPH IAS

d. In Case of Emergency Bailout, pull canopy full aft prior to bailing out.

e. NOTE: Stall warning is inoperative with master stall warn switch "OFF"

SECTION III PERFORMANCE INFORMATION

A. Altitude loss during power off stalls: 200 FT

B. Power-off stalling speed versus bank angle, at 1150 lbs. gross weight and forward gross C.G. =

<u>BANK ANGLE</u>	<u>STALLING SPEED</u>	<u>BANK ANGLE</u>	<u>STALLING SPEED</u>
0 ^o	64 MPH CAS	45 ^o	76 MPH CAS
30 ^o	69 MPH CAS	60 ^o	91 MPH CAS

C. Demonstrated flight time, inverted is: 3 MINUTES

D. Demonstrated crosswind velocity is: 20 MPH

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SECTION IV

PLACARDS

The following placards are installed in the airplane:

1. Adjacent to fuel selector handle in cockpit:
 "Fuel Select"
 "19 gals. usable"
 "ON" "OFF"
2. Adjacent to airspeed indicator: "Design maneuver speed 154
 MPH: demonstrated crosswind velocity 20 MPH."
3. On inside of baggage compartment door: "No acrobatics with
 baggage; max. baggage 15 lbs."
4. Adjacent to fuel tank filler neck: "Fuel 100/130 octane.
 19 gals. usable."
5. On instrument panel adjacent to alternate static source valve:
 "Open for alternate static ."
6. On left side of cockpit, adjacent to mixture control: "Pull
 for lean mixture."
7. On right side of cockpit, adjacent to alternate engine inlet
 air control: "Pull for alternate air."
8. On left side of cockpit, adjacent to elevator trim control
 handle: "Nose up; Neutral; Nose down."
9. On throttle quadrant: "Open; Throttle; Closed."
10. On instrument panel: "No Smoking."
11. Adjacent to master stall warn switch: "Master stall warn.;
 Must be on for flight; ON; OFF."
12. Adjacent to propeller governor control on LH side of cockpit:
 "Push for high RPM."
13. On LH side of cockpit fairing, inside in clear view of pilot:
 "This airplane must be operated as an aerobatic category
 airplane in compliance with the operating limitations stated
 in the form of placards markings and manuals. Operations
 limited to day VFR conditions. Flight into known icing
 conditions prohibited."

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SECTION IV

PLACARDS

13. cont'd

"APPROVED MANEUVERS AND RECOMMENDED ENTRY SPEEDS: (MPH)

MANEUVER	INSIDE		OUTSIDE	
	MAX.	MIN.	MAX.	MIN.
LOOP (UP)	180	130	180	130
LOOP (DOWN)	100	70	100	70
SLOW ROLL	180	100	180	100
BARREL ROLL	180	130	180	130
SNAP ROLL	140	90	110	90
HAMMERHEAD	180	130	180	130
LAZY EIGHT	180	140	180	140
CHANDELLE	180	140	180	140
STALLS AND SPINS	(SLOW DECELERATION)			

For spin recover, put ailerons neutral, apply full opposite rudder briskly and then apply nose down elevator."

14. On instrument panel, adjacent to "F" mark on fuel quantity indicator: "19 gals. usable."
15. On LH side of cockpit fairing in clear view of pilot: "No acrobatics with baggage."
16. On top centerline of canopy at forward edge: "Pull aft to open."
17. On right hand forward lower corner of canopy: "Do not open past first notch above 120 MPH IAS."
18. On instrument panel adjacent to alternate static source valve:
 "Altimeter Error,
 Alternate Static On: Airspeed, MPH Error, Ft.
- | | |
|-----|------|
| 80 | -20 |
| 100 | -10 |
| 120 | +60 |
| 140 | +90 |
| 160 | +150 |

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SECTION IV

PLACARDS (cont'd)

21. On outside lower forward corners of canopy bubble (both sides): "To open: Lift tab slide aft (both sides)."