

# **Central Indiana Soaring Society**

## **Tow Pilot Manual**

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# **Tow Pilot Manual**

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# 1. Introduction

## 1. Purpose

The intent of this manual is to provide standardized operating procedures for tow plane operation at Central Indiana Soaring Society (CISS). These procedures represent the safest, most practical methods of operation based upon club experience, manufacturer's data, sport standards, and the best available information. If a situation arises for which these procedures are inadequate or do not apply, the pilot's best judgment should prevail.

## 2. Mission Objective

Operation of CISS tow planes will be conducted with three goals in mind. In order of importance, they are:

- A. To conduct the operation as safely as possible;
- B. To provide the glider pilot with the best service possible; and
- C. To accomplish this mission as economically as possible.

At no time must safety be sacrificed to advance another objective. Safety must always be first in priority, and shall be paramount in the conduct of all operations.

## 3. Jurisdiction

- A. This manual has been prepared using information from a variety of sources. If a conflict is found between material in this manual and other sources, the following sources shall be considered controlling:
  - 1) Federal Aviation Regulations;
  - 2) Manufacturers' Manuals; and
  - 3) CISS Operations Manual.
- B. This manual is issued in addition to the CISS Operations Manual. Tow Pilots must be familiar with the policies and procedures set forth in the CISS Operations Manual, in addition to the policies and procedures contained within this manual.

## 4. Document Control

Maintenance of the Tow Pilot Manual is the responsibility of the Chief Tow Pilot. Your comments and suggestions are welcome. If you have any suggestions to improve the procedures outlined in this manual, please provide them to the Chief Tow Pilot or to the CISS Board of Directors.

## 2. Pilot Qualification and Responsibility

### 1. FAR Experience and Instruction Requirements

Tow Pilots are required to meet the FAR Experience and Instructions required by FAR §61.69. This FAR is reprinted below; however, if the FAR is revised, the current FAR is controlling.

#### **§ 61.69 Glider and unpowered ultralight vehicle towing: Experience and training requirements.**

- (a) No person may act as pilot in command for towing a glider or unpowered ultralight vehicle unless that person—
- (1) Holds at least a private pilot certificate with a category rating for powered aircraft;
  - (2) Has logged at least 100 hours of pilot-in-command time in the aircraft category, class and type, if required, that the pilot is using to tow a glider or unpowered ultralight vehicle;
  - (3) Has a logbook endorsement from an authorized instructor who certifies that the person has received ground and flight training in gliders or unpowered ultralight vehicles and is proficient in—
    - (i) The techniques and procedures essential to the safe towing of gliders or unpowered ultralight vehicles, including airspeed limitations;
    - (ii) Emergency procedures;
    - (iii) Signals used; and
    - (iv) Maximum angles of bank.
  - (4) Except as provided in paragraph (b) of this section, has logged at least three flights as the sole manipulator of the controls of an aircraft towing a glider or unpowered ultralight vehicle simulating towing flight procedures while accompanied by a pilot who meets the requirements of paragraphs (c) and (d) of this section;
  - (5) Except as provided in paragraph (b) of this section, has received a logbook endorsement from the pilot, described in paragraph (a)(4) of this section, certifying that the person has accomplished at least 3 flights in an aircraft while towing a glider or unpowered ultralight vehicle, or while simulating towing flight procedures; and
  - (6) Within the preceding 12 months has—
    - (i) Made at least three actual or simulated tows of a glider or unpowered ultralight vehicle while accompanied by a qualified pilot who meets the requirements of this section; or
    - (ii) Made at least three flights as pilot in command of a glider or unpowered ultralight vehicle towed by an aircraft.
- (b) Any person who, before May 17, 1967, has made and logged 10 or more flights as pilot in command of an aircraft towing a glider or unpowered ultralight vehicle in accordance with a certificate of waiver need not comply with paragraphs (a)(4) and (a)(5) of this section.
- (c) The pilot, described in paragraph (a)(4) of this section, who endorses the logbook of a person seeking

towing privileges must have—

- (1) Met the requirements of this section prior to endorsing the logbook of the person seeking towing privileges; and
  - (2) Logged at least 10 flights as pilot in command of an aircraft while towing a glider or unpowered ultralight vehicle.
- (d) If the pilot described in paragraph (a)(4) of this section holds only a private pilot certificate, then that pilot must have—
- (1) Logged at least 100 hours of pilot-in-command time in airplanes, or 200 hours of pilot-in-command time in a combination of powered and other-than-powered aircraft; and
  - (2) Performed and logged at least three flights within the 12 calendar months preceding the month that pilot accompanies or endorses the logbook of a person seeking towing privileges—
    - (i) In an aircraft while towing a glider or unpowered ultralight vehicle accompanied by another pilot who meets the requirements of this section; or
    - (ii) As pilot in command of a glider or unpowered ultralight vehicle being towed by another aircraft.

[Doc. No. FAA–2001–11133, 69 FR 44866, July 27, 2004]

## 2. FARs

All FARs must be followed. Pay particular attention to:

- A. The tailwheel airplane logbook endorsement required by FAR §61.31, unless the pilot has logged flight time as pilot in command of tailwheel airplanes prior to April 15, 1991.
- B. The flight review requirements of FAR §61.56.
- C. While acting as Tow Pilot, a pilot must have in his physical possession or readily accessible in the aircraft:
  - 1) A current pilot certificate issued to him under FAR §61.
  - 2) A current medical certificate issued to him under FAR §67
  - 3) A government issued photo ID. FAR §61.3

## 3. CISS Requirements

In addition to the experience and instruction requirements of FAR §61.69, CISS requires the following:

- A. The pilot must meet the experience requirements of the open pilot

warranty of our insurance policy, or be listed as a named pilot in the policy.

- B. Satisfactory completion of a checkout by the Chief Tow Pilot or his designee.

#### 4. Tow Pilot Checkout

Checkout of a Tow Pilot will consist of the following:

- A. A review of the pilot's experience to ensure compliance with the FARs and CISS experience requirements outlined above.
- B. Ground instruction regarding techniques and procedures essential to the safe towing of gliders, including airspeed limitations, emergency procedures, signals used, and maximum angles of bank, in addition to familiarization with the CISS towing procedures outlined in this manual.
- C. A minimum of 3 dual tows as sole manipulator of the controls under the supervision of the Chief Tow Pilot or his designate. These tows may be actual or simulated. This requirement may be waived at the discretion of the Board of Directors, or the Chief Tow Pilot for a pilot that is current and qualified to tow gliders as a result of tow experience acquired elsewhere.
- D. A logbook endorsement certifying that he has received ground and flight instruction in gliders and is familiar with the techniques and procedures essential to the safe towing of gliders, including airspeed limitations, emergency procedures, signals used, and maximum angles of bank.

#### 5. Pilot In Command Authority

- A. The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft. (FAR §91.3)
- B. While a glider is under tow, the Tow Pilot is directly responsible for, and is the final authority as to, the towing operation.
- C. The Tow Pilot, as pilot in command, must ensure compliance with all other FARs applicable to glider towing operations.

#### 6. Tow Plane Use Limitations

- A. Unless otherwise authorized by the Board of Directors, the use of club tow planes is limited to the following:
  - 1) Tow operations
  - 2) Flights supporting tow operations
  - 3) Flights related to tow plane maintenance
  - 4) Aero retrieves

- 5) Search operations
  - 6) Proficiency flying by tow pilots
    - i. Tow pilots may use the tow plane for up to thirty minutes at the beginning of the season if needed for proficiency without charge to the pilot.
    - ii. Tow pilots may rent the tow planes for additional flying. The time will be billed to the tow pilot's account at the hourly rate established by the Board of Directors. Rental of the tow planes must be coordinated to not interfere with normal CISS operations. The planes must not be used for any commercial purposes without formal prior approval by the Board of Directors.
- B. Towing operations from any field other than CISS must be coordinated in advance and approved by the Board of Directors. This does not apply to Aerotow Retrieves performed in accordance with this manual.

### **3. Preflight**

#### 1. Aircraft Status Board

Prior to acceptance of the aircraft, the Tow Pilot shall review the Aircraft Status Board in the tow plane hangar. Pay particular attention to the scheduled oil change posted. Review of the Aircraft Status Board will help the Tow Pilot determine if the aircraft is flyable, and what open write-ups are present that may affect his flights.

#### 2. Preflight

- A. Call FSS prior to the first flight for a weather briefing. Get updates as needed.
- B. The Tow Pilot shall conduct a thorough origination preflight prior to the first flight of the day or following aircraft maintenance. During the course of the towing day, it is recommended that the Tow Pilot make at least an abbreviated walk-around following any personal breaks, refueling, or Tow Pilot changes. Refer to the appendices of this manual, or to the aircraft flight manual, for aircraft-specific preflight procedures.
- C. Check the operation of the tow rope release mechanism prior to the first tow of the day.

#### 3. Fueling Procedures

- A. A grounding wire shall be connected to the aircraft prior to the start of fueling, and shall remain in place until fueling is complete.
- B. Some air space (about 1”) is to be left in the top of the tank after fueling to prevent fuel overflow due to heat expansion.
- C. Following fueling, ensure the fuel cap(s) are securely fastened before flight.
- D. It is recommended that the oil level be checked when adding fuel. Note that an accurate reading cannot be taken until a few minutes after shutdown. Fill to 10 qts.
- E. Log the gallons of fuel added on the Fuel Log Sheet.

4. Engine Starting

- A. Do not start the tow plane engine if the tail of the aircraft is oriented towards a hangar, unsecured gliders, personnel, or anything else that may be damaged or injured by the resulting prop blast.
- B. Hand propping to start the engine is prohibited.

5. Run-ups

- A. Prior to the first flight of each day, or following aircraft maintenance, a run-up shall be conducted in accordance with the appendices of this manual, or the aircraft flight manual. The engine should be allowed to warm up before advancing power for the run-up. On some aircraft the oil temperature might not rise into the green arc. However, if the engine has been running for 5-6 minutes a run-up is permissible.
- B. Do not conduct the run-up near the takeoff line. Doing so can result in dangerous prop blast to aircraft or personnel, or can result in a noise level that interferes with preflight preparations on the flight line.
- C. One flight around the traffic pattern is authorized prior to the first tow of the day for each tow plane. On the first flight, call Anderson Tower to let them know glider operations have started at Alexandria.

6. Field Conditions

The tow pilot has the authority and responsibility to independently suspend flying when the tow pilot considers the conditions hazardous. NOTE: The Crew Chief and the duty instructor pilot are likewise authorized to independently terminate operations should they perceive unsafe conditions.

7. Tow Pilot Changes

Tow Pilot changes will not be conducted while the tow plane engine is running. Leaving the cockpit while the engine is running is prohibited.

8. Taxiing Over Tow Ropes

Taxiing over a tow rope creates a risk of the rope being picked up by, and fouled around, the propeller. For this reason, taxiing over tow ropes should be avoided.

## 4. Takeoff

1. Ground Signals

CISS Tow Signals (see Chapter 9: Communications) shall be used during launch operations. In addition, radio communications on the appropriate airport frequency whenever possible to increase good communication and operational safety.

2. Fuel Status

Prior to each takeoff, the Tow Pilot shall verify that sufficient fuel remains to complete the tow, including the 30 minute day VFR fuel reserve required by FAR §91.151.

3. Distance Available

The Tow Pilot and the glider pilot are both responsible for ensuring that sufficient distance is available for takeoff and obstacle clearance. Consider the slope, wind, temperature, and length of the grass in planning the takeoff.

4. Normal Takeoff Procedure

- A. The Tow Pilot shall position the aircraft in front of the glider, leaving sufficient slack for ease of hookup. Use extreme caution when approaching the front of the glider where the ground crew is operating to prevent propeller injury. Minimum power shall be used to minimize risk of prop blast to aircraft and personnel.
- B. After receiving the “Take Up Slack” signal, the Tow Pilot will remove all slack from the tow rope. The majority of the slack may be taken out before the glider wings are leveled, but care must be taken not to tension the tow rope before the glider pilot signals that he is ready.

- C. The Tow Pilot may begin takeoff roll upon seeing the “Begin Takeoff” signal from the Wing Runner (or radio communication from the glider.)
- D. The Tow Pilot will remain alert at all times for the “Hold/Stop” signal from the ground crew. Even if the Tow Pilot has received the “Begin Takeoff” signal via radio, he will continue to watch the Wing Runner for, and will respond to, further signals.
- E. The Tow Pilot, Glider Pilot and Wing Runner are jointly responsible for ensuring that the pattern is clear of landing aircraft prior to takeoff, including verification that the departure path is clear of aircraft landing downwind.

5. Unassisted Takeoff Procedure

This procedure shall be used when no ground crew is available to assist in launch operations.

- A. The Tow Pilot shall position the aircraft in front of the glider, leaving sufficient slack for ease of hookup, and shall shut down the tow plane engine if required to leave the tow plane.
- B. The Tow Pilot shall retrieve the tow rope, and hook up the glider when the glider pilot is ready (pre-takeoff checks completed). The rope shall not be connected until the glider pilot is ready for takeoff. In the case of a two-seat glider, one of the glider pilots may accomplish this.
- C. The Tow Pilot shall gently take out slack until the rope is taut.
- D. When the glider pilot is ready, he will give the “Begin Takeoff” rudder waggle signal or use radio communication.
- E. The Tow Pilot may begin takeoff roll upon seeing the canopy closed and the “Begin Takeoff” signal from the glider pilot, or, if radio communications have been established, when the glider pilot advises the Tow Pilot to begin takeoff.
- F. The Tow Pilot and Glider Pilot are jointly responsible for ensuring that the pattern is clear of landing aircraft prior to takeoff, including verification that the departure path is clear of aircraft landing downwind.
- G. Radio communications will be used to the fullest extent possible to increase the safety of this procedure.

## **5. Tow and Release**

1. Flight Path

- A. Safety is the most important consideration in a tow.
  - B. Whenever possible, when a crosswind is present, allow the aircraft to drift to the downwind side of the extended centerline. This will allow the glider pilot to make an upwind turn onto final approach in the event of premature termination of the tow.
  - C. Unless otherwise specified by the glider pilot, the flight path should be planned to keep the glider upwind of the airport and within easy gliding range of the airport.
  - D. Strength of the wind and performance of the glider should be considered when adjusting the flight path. When the wind is strong, the tow will be conducted in a straighter line upwind and release will occur farther from the airport. When the wind is light, position the glider so that it is upwind and no farther than two miles laterally per thousand feet towed.
  - E. Be a good neighbor. The flight path should be adjusted to avoid flying over homes or other noise-sensitive areas.
  - F. Ensure that the flight path will provide compliance with all VFR cloud clearance and visibility minima.
  - G. As the tow plane / glider combination is less maneuverable than the individual aircraft would be, maintain a good scan for traffic and plan early to avoid potential conflicts.
  - H. Avoid towing into low or dazzling sun or glare.
  - I. If thermals exist, try to reach release altitude in or near a thermal so the glider may release in lift. Thermal locations noted during previous tows can be useful. If possible, approach the thermal from the left so that the glider will fly into the thermal after releasing and turning right.
  - J. When possible, plan the flight path to allow an expeditious return to the airport using the proper descent profile for engine cooling, planning for proper sequencing with other aircraft already established in the traffic pattern.
2. Towing Speed
- A. Towing airspeed will be adjusted based upon the type of glider and the glider's use of water ballast. The recommended speed for most of our operations is 75 mph.
  - B. Tow Pilots should note any special towing airspeed and release altitude requests from the glider pilot and honor these requests to the fullest extent possible. If unclear on the units used (mph vs. knots), or if the requested speed cannot be maintained, clarify the request before taking off.
  - C. On tow, speed should be maintained as steadily as possible. This is best accomplished by maintaining a constant pitch attitude, and not by chasing

the airspeed indicator.

3. Angle of Bank

During the tow, a normal bank angle of about 15 to 20 degrees should be used. 30 degrees is the maximum bank recommended during normal towing operations. Increased angles of bank beyond these limits should only be used with experienced pilots and only after the pilots have briefed the anticipated increase in bank angles. Turns should be entered and recovered from gently, and should not be made unnecessarily. Note that instructors may desire extra turns for student practice.

4. Thermalling on Tow

Circling in thermals on tow is permissible only when the thermal is relatively strong and of large diameter, and when the Tow Pilot has prior agreement with the glider pilot. As turn radius is larger during tow and vertical component of lift is reduced in a turn, it is not economical to attempt to circle in a weak or narrow thermal. Also, pilots with less experience may encounter difficulty when the Tow Pilot decides to attempt to circle in a thermal. If either the thermal strength and diameter or the glider pilot's experience level is in doubt, do not circle in thermals during the tow.

5. Air Signals

CISS Tow Signals (see Chapter 9: Communications) shall be used during glider towing operations. In addition, radio communications on the aircraft frequency shall be used whenever possible to increase good communication and operational safety. The Tow Pilot shall maintain vigilance for any signals from the glider pilot.

6. Normal Release

After positive verification of the tow rope has release, as the glider pilot initiates a climbing turn to the right, the Tow Pilot shall initiate a descending turn to the left. Turn and descent entry shall not be made abruptly, as damage can occur if the tow rope has not released properly.

7. Boxing the Wake

The glider pilot should normally indicate prior to launch when he intends to practice boxing the wake. This maneuver will normally commence at, and not below, 1,000' AGL. The Tow Pilot should adjust the flight path to allow straight flight during this maneuver to the fullest extent possible. If the maneuver is to be accomplished more than one time, the Tow Pilot should make any required turns between maneuvers.

## 8. Cross-Country Towing

Determine the glider's maximum aerotow speed before departure. Make level-off and power adjustments gradually. Descents while towing cross-country will also be gradual, so plan ahead to ensure cloud clearance requirements can be met. The tow positions to be used (high vs. low) shall be briefed beforehand so both pilots will know what to expect during the tow. Both pilots shall have all necessary cross-country information and supplies, e.g. maps, water.

# 6. Approach and Landing

## 1. Letdown Procedure

- A. A safe, efficient, and expeditious return to the airport is the goal. An ideal descent would allow the tow plane to enter the pattern on downwind leg from straight flight, without having either to perform a spiral descent to lose altitude or to add power to make the airport.
- B. In addition, descent must be done in a manner that will result in the least risk of engine wear due to shock cooling or overspeed. The descent profile we are adopting is:

At release, reduce power to 2100 rpm for 30 seconds while flying no faster than 100 mph (probably not descending.) Then reduce power to 1700 rpm for 30 seconds at 100 mph, then other speed and power settings may be used.

*This procedure came from Tom Knauff who has used Pawnees for years in a commercial glider towing operation. He expects 4000 hours between overhauls.*

## 2. Vigilance

Although the watch for conflicting traffic must be maintained throughout the flight, it may be most important upon return to the airport and entry to the traffic pattern. Maintain a heightened traffic awareness level during this phase of flight. Be especially vigilant for gliders that may be close to entering the traffic pattern.

## 3. Traffic Pattern

Use normal traffic pattern with left turns.

4. Right of Way

Plan ahead before pattern entry to allow safe and efficient sequencing with other glider and tow plane traffic. If safe sequencing of the tow plane with gliders in the pattern is ever in doubt, yield right of way (by going around if necessary) and re-sequence into the traffic pattern when safe.

5. Rope Clearance

The rope will hang considerably lower than the tow plane's altitude. Cross the airport boundary, and any surrounding obstacles (fence, road, etc.) at an altitude that will ensure safe clearance of the tow rope to any person or obstacle on the ground. Check periodically with the Crew Chief for feedback on whether the rope is clearing the road with sufficient height. Be aware a cross wind will cause the rope to trail slightly to the side of the aircraft path.

6. Landing Direction

Landings should generally be made in the normal takeoff direction. It is the responsibility of the pilot landing against the normal takeoff direction to ensure that his aircraft does not conflict with any other aircraft taking off, in the pattern, or landing.

7. Go-Around / Balked Landing

If a go-around is performed, remember the tow rope trailing behind the tow plane. Consider any obstacles along the flight path. Expedite the climb until satisfactory clearance is assured.

## **7. Postflight**

1. Fueling

Prior to returning the tow plane to the hangar at the end of the towing day, fill the tow plane with fuel as outlined in the Preflight section.

2. Logging of Discrepancies

Ensure that all discrepancies encountered during the towing day are noted on the Status Board. Also, alert the Chief of Maintenance of any discrepancy that should be addressed prior to the next scheduled routine maintenance. In the event of a write-up that grounds the aircraft, the Chief of Maintenance should be notified, and a note left in the airplane.

## **8. Emergency / Abnormal Operations**

### **1. Emergency Communication**

When an emergency or abnormal situation occurs, radio communications on the airport frequency shall be used whenever possible to alert all personnel to the nature of the situation and to coordinate appropriate responses as necessary. CISS Tow Signals shall also be used as appropriate.

### **2. Premature Termination of a Tow**

When there is a premature release, either due to training or an abnormal procedure, the tow pilot will announce the condition on the airport frequency. (e.g. “Rope break at 200 feet. Glider landing east.”) If the tow rope breaks any time after the initial take off roll, the tow pilot should continue the take off to provide more options to the glider.

### **3. Airbrakes / Spoilers Extended**

Upon noting that the glider’s airbrakes / spoilers are extended, either before takeoff or during tow, the Tow Pilot shall use the “rudder waggle” signal to inform the glider pilot that the glider’s airbrakes / spoilers are not stowed. If the glider pilot has informed the Tow Pilot of his intention to begin takeoff roll with airbrakes / spoilers out, this is not required; however, after takeoff the airbrakes / spoilers should be stowed, and the glider pilot should be alerted if they are not. Unless the glider pilot stows the airbrakes / spoilers, remain in the vicinity of the airport to allow the glider pilot to return to the airport for an immediate landing. Be aware that the glider pilot might not be able to retract the airbrakes.

### **4. Aborted Takeoff**

If a takeoff is aborted, the tow plane should use minimum braking to prevent the glider from over-running the tow plane. The Tow Pilot shall maneuver the tow plane to the left, allowing the glider to overshoot to the right if necessary. Note that this is accomplished in the same direction as a normal release.

### **5. Release of Tow Rope from Tow Plane**

If the safety or controllability of the tow plane is ever in doubt, do not hesitate to pull the emergency release immediately. Even if an inexperienced glider pilot is, as a result of being ditched, faced with landing in a strange field, he may well do

better on his own than trying to cope with a confused situation involving two aircraft.

6. Glider Release Failure

Unless the glider pilot advises otherwise, when an aerotow continues to 1,000' above the normal release altitude, the Tow Pilot will proceed as if the glider pilot has signaled that he is unable to release the tow rope. If possible, confirm that a release failure has occurred via radio before initiating this procedure.

- A. Use caution as the tow rope may inadvertently release at any time. Remain within gliding distance of the field if possible.
- B. The glider pilot will advise the Tow Pilot that a release failure has occurred either by radio or by moving to the left side of the tow plane and rocking the glider's wings.
- C. The Tow Pilot will acknowledge by radio or by rocking his wings, then will continue the climb and will position the glider over the airport.
- D. When over the airport, the Tow Pilot will release the tow plane end of the rope.
- E. If the Tow Pilot cannot release the glider, the Double Release Failure procedure shall be applied.

7. Double Release Failure

- A. Use caution as the tow rope may inadvertently release at any time. Remain within gliding distance of the field if possible.
- B. If the Tow Pilot is unable to release a glider which is unable to release, the Tow Pilot will advise the glider pilot that the tow plane release mechanism has failed by radio or by yawing (fishtailing) the tow plane.
- C. The glider pilot will acknowledge the Tow Pilot by fully opening the airbrakes / spoilers and thereafter keeping them open throughout the descent and landing.
- D. The Tow Pilot will then begin to descend.
- E. Once established in the descent, the glider pilot will move into the low tow position.
- F. The Tow Pilot will make a pattern so that the landing by the tow plane will occur at approximately the midpoint of the field. Consider obstacle clearance requirements of the glider in the low-tow position and the shallow approach angle used. The pattern will have to be flown very wide with gradual turns and descents.

- G. Once in the pattern, neither the Tow Pilot nor the glider is to attempt to release the tow rope. In most wind conditions, the rate/angle of descent of the tow plane and glider mean that, in the latter stages of the pattern, the glider may be out of gliding distance of the field.
  - H. After touchdown the Tow Pilot will allow the tow plane to come to a gradual stop, and may start a gentle turn to the left if necessary. The glider pilot shall keep clear to the right of the tow plane after landing.
  - I. In the event of a go-around, the glider pilot will slowly close the airbrakes / spoilers, then will resume the high tow position once the climb has been established. The Tow Pilot shall climb back to altitude and shall signal the start of a new approach by yawing (fishtailing) the tow plane.
  - J. When possible, both visual and radio communications will be used. Neither pilot should assume that the radio is operational or that communications have been understood. For all critical radio communications, the commands or instructions should be repeated as part of the acknowledgment.
8. Aerotow Retrieves
- A. The Crew Chief is the only person who may authorize an aerotow retrieve; however, the responsibility for determining the safety of an aerotow retrieve rests with the Tow Pilot.
  - B. The retrieve will be carried out only when the Crew Chief determines that it will not interfere with normal towing schedules, and when it is certain that the retrieve will be completed before sunset.
  - C. Report the Hobbs time to the Crew Chief for billing.

## **9. Communications**

- 1. Standard signals
  - A. Standard SSA signals should be used.
- 2. Radio Communications
  - A. To improve communications and enhance safety, radio communications shall be used to the fullest extent possible.
  - B. The following frequencies are used at CISS:
    - 122.8 MHz – CTAF at Alexandria

126.0 MHz – Anderson Tower

For more information see AIM 4-1-11 (b) 1

3. Transponder Usage (FAR 91.215)

If installed and operative, the Tow Pilot shall operate the transponder, including Mode C equipment if installed, on VFR code 1200 or as assigned by ATC. Transponders are not currently installed in CISS tow planes.

4. Reporting Adverse Conditions

The Tow Pilot is in an excellent situation to monitor changes in weather and field conditions. Alert the daily Director of Operations of any conditions that will affect operations, such as approaching weather.

5. Debriefing of Instructors

The Tow Pilot is able to monitor the performance of student pilots during the tow. Discussing student performance with the student's instructor can improve training quality through feedback.

# Appendix A: Piper Pawnee

1. Operation

A. Preflight

- 1) Cockpit
  - Cockpit Switches ..... OFF
  - Fuel Selector .....ON
  - Elevator Trim .....Neutral
  - Flaps ..... Extend

- 2) Exterior
  - Fuel Tank .....Verify Fuel Level Visually
  - Right Aileron & Flap Hinges ..... Inspect
  - Right Nav Light ..... Inspect
  - Stall Warning Vane..... Inspect
  - Right Wing/ Strut..... Inspect
  - Right Landing Gear / Tire / Brake ..... Inspect
  - Right Cowl Area ..... Inspect
  - Right Cowl Fasteners ..... Verify Secure
  - Propeller ..... Inspect
  - Alternator Belt ..... Inspect
  - Air Filter..... Inspect
  - Oil Level ..... Check

NOTE: Observe oil quantity limitations and recommendations  
(See Limitations Section below)

- Left Cowl Area..... Inspect
- Left Cowl Fasteners ..... Verify Secure
- Fuel Strainer..... Drain / Test
- Left Landing Gear / Tire / Brake..... Inspect
- Left Wing / Strut ..... Inspect
- Pitot Tube..... Uncover / Inspect
- Left Nav Light..... Inspect
- Left Aileron & Flap Hinges ..... Inspect
- Beacon..... Inspect
- Fuselage & Tail Surfaces ..... Inspect
- Elevator & Rudder Hinge Bolts ..... Inspect
- Tail Wheel / Springs / Tow Hook ..... Inspect
- Tail Position Light ..... Inspect
- Windshield / Windows.....Inspect / Clean

B. Before Starting Engine

- Seat Belt / Shoulder Harness..... Fasten
- Seat.....Adjust / Lock

Brakes ..... Test / Set  
 Fuel Selector .....ON  
 Trim Tab ..... Test / Set for Takeoff  
 Flaps .....Test  
 Altimeter ..... Set  
 Cockpit Switches ..... Off  
 Circuit Breakers ..... Check  
 Primer..... Close / Lock

C. Starting Engine  
 Master Switch .....ON  
 Mixture..... Rich  
 Carb Heat .....Cold  
 Area..... Clear  
 Magneto Switches ..... LEFT ONLY  
 Starter .....Engage  
 NOTE: Observe starter duty cycle limitations  
 (See Limitations Section below)  
 Magneto Switches ..... BOTH ON  
 Oil Pressure .....Verify Rising  
 Warmup (if required) .....800-1000 RPM

D. Run-up  
 Brakes ..... Test / Set  
 Controls..... Free / Correct  
 Instruments..... Set / Checked  
 Primer..... Closed / Locked  
 Throttle..... 1800 RPM  
 Magneto Check ..... 125 RPM Max Drop, 50 Max Difference  
 Carb Heat Check .....Note Drop  
 Throttle.....800-1000 RPM

E. Before Takeoff  
 Flaps .....Up  
 Carb Heat .....Cold  
 Trim..... Set for Takeoff  
 Fuel Selector .....ON  
 Fuel Quantity.....Sufficient  
 Mixture.....Rich  
 Instruments.....Checked

F. Recommended Towing Airspeeds  
 The recommended towing speeds for the Pawnee (IAS) is 75 mph. The

glider pilot may request other speeds.

G. Descent Profile

To prevent rapid cooling of the engine, use the following procedure:

At release, reduce power to 2100 rpm for 30 seconds while flying no faster than 100 mph (probably not descending.) Then reduce power to 1700 rpm for 30 seconds at 100 mph, then other speed and power settings may be used.

H. Before Landing

Mixture..... Rich  
 Carb Heat ..... Cold or As Required  
 Flaps ..... As Required

2. Limitations

A. No acrobatic maneuvers, including spins, are approved.

B. Operations with the window open in flight are prohibited.

C. The stall warning system is inoperative with the master switch off.

D. Airspeed Limitations

Never Exceed Speed ( $V_{NE}$ ) ..... 156 mph  
 Maximum Structural Cruise Speed ( $V_{NO}$ ) ..... 124 mph  
 Maneuvering Speed ( $V_A$ ) ..... 120 mph  
 Maximum Flaps Extended Speed ( $V_{FE}$ )..... 109 mph

E. Engine Limitations

| Configuration                 | Max RPM | Oil Press (psi) | Oil Temp (°F) | CHT (°C)     |
|-------------------------------|---------|-----------------|---------------|--------------|
| Within 30 sec of engine start |         | Visible Rise    |               |              |
| Warmup                        | 1000    | min 25          |               | Visible Rise |
| Magneto Check                 | 1800    | 60-85           | min 40        |              |
| Normal Operation              | 2575    | 60-85           | 120-245       |              |

F. Fuel Limitations / Recommendations

Type ..... 80/87 min.  
 Recommended Minimum Fuel for Takeoff .....10 gal.

G. Oil Limitations / Recommendations

Type .....

Substitution or mixing is not allowed.

|                                      |       |
|--------------------------------------|-------|
| Minimum in Normal Operations.....    | 9 qt  |
| Minimum in Hot Weather.....          | 10 qt |
| Recommended Maximum Fill Level ..... | 11 qt |
| Maximum.....                         | 12 qt |

H. Starter Duty Cycle Limitations

- 1) Do not crank the starter for more than 10 seconds.
- 2) If the engine fails to start, wait 20 seconds for cooling before each subsequent start attempt.
- 3) After 6 start attempts, wait 30 minutes for cooling before making another start attempt.