

## **AIRMEN FLIGHT LEADER PRACTICAL TEST GUIDE**

Applicant must lead a four ship formation.

The check pilot will ride with the applicant in the lead aircraft.

A "standards of performance" guide need not be complex or burdensome, only objective, with minimum standards of performance based on the concept of quality airmanship attainable by a reasonably well qualified Warbird pilot. The "S.O.P." guide for each level of formation pilot; i.e., wing, lead, or check, incorporates a simplified grading system. Competence is described three ways — QUALIFIED, CONDITIONALLY QUALIFIED, and UNQUALIFIED.

A check pilot may be able to use the following guidelines to determine a formation pilot applicant's level of competence and grade accordingly. Each task has a range of grades. An evaluation of "unqualified" in any flight phase while airborne, including takeoff or landing, will cause a "down" for the flight, and the applicant should be required to obtain further training. If the applicant downs a second time, this failure should trigger a consultation with the individual who recommended the applicant.

The qualification format will be the T-34 Association "Wingman Qualification Report" for a wing patch and the T-34 Association "Flight Leader Qualification" for lead patch. These two guides are excellent and generic. There is enough subject latitude in each guide so as to allow a check pilot grading discretion. The check pilot must ride with the applicant for the check ride. See addendum for single place aircraft exception. All formation flight check ride candidates must have received and logged formation flight training in order to qualify for a formation flight check ride. In addition, an approved Airmen lead or check pilot must endorse and recommend the applicant for the check ride.

Any training by an Airmen, Wingman, Lead, or Check, pilot who states the training was in accordance with the T-34 Association Flight Manual/Darton International Formation Flying Video, syllabus and curriculum.

Military formation flight training proof

### **EVALUATION GRADING BASIC GUIDELINE**

#### **QUALIFIED:**

Applicant demonstrates thorough, comprehensive knowledge, and performs all required maneuvers without prompting or counsel. Applicant flies aircraft smoothly and coordinated, without exceeding aircraft or engine limits. All maneuvers required are performed with precision and a degree of finesse. The successful and safe outcome of any maneuver is never in doubt.

#### **CONDITIONALLY QUALIFIED:**

NOTE: The check ride is only graded Satisfactory or Unsatisfactory.

Applicant demonstrates adequate knowledge and performs maneuvers required. Performance of maneuvers is within allowable tolerances, but improvement in smoothness and precise aircraft control is recommended. Applicant safely applies principles of formation flight and qualifies for wingman patch. Additional training and practice are required to reach the QUALIFIED level.

#### **UNQUALIFIED:**

Applicant's knowledge and performance of maneuvers is not adequate. Applicant's planning is deficient and aircraft control is rough. Occasionally some aircraft or engine limits are exceeded. Applicant's demonstrated capability does not meet minimum standards for issuance of formation pilot "wing" credentials.

## ORAL PHASE

### OBJECTIVE #1

Applicant should demonstrate knowledge and understanding of all airborne hand and aircraft signals.

Run-up, Climb  
Frequency changes, Descent  
Number signals, Fuel state inquiry  
Head nod, inflight Emergency  
Wingman cross, Can't hear  
Element cross, Can't transmit  
Break-up and rejoin, Lead change  
Gear and flap cycling, Stack up  
Power addition & reduction, Stack down  
Level off, #4 to slot

### QUALIFIED:

Applicant knows all airborne hand and aircraft signals and when they are used in formation flight.

### CONDITIONALLY QUALIFIED:

Applicant knows most or all of the signals with some prompting. Applicant's description of airborne signals does not exhibit full understanding without discussion and review during the oral test.

### UNQUALIFIED:

Applicant does not know all the airborne hand and aircraft signals without prompting or open book reference. Applicant confuses or inverts the meaning of two or more signals during test.

### OBJECTIVE #2

Demonstrates understanding of the mechanics and safety factors for the following formation procedures. and applicant is able to explain the basic concepts of formation flight:

- 1 • Standard formation configurations: trail, echelon, fingertip, enroute, diamond.
- 2 • Cross-unders, rejoins, aircraft configuration changes.
- 3 • Break-up and rejoin, radius of turn cut-off/overshoot energy management.
- 4 • Turns in fingertip, echelon, trail, enroute, terminal maneuvering.
- 5 • Lead change, emergency signals, HEFOE system.
- 6 • 360° overhead approach, brakes, intervals, section landings, wave-off.
- 7 • Taxi-in, shut-down procedures.
- 8 • Radio discipline: check-in, frequency changes, traffic calls.
- 9 • Emergency abort on take-off.
- 10 • In-flight emergency procedures.
- 11 • Section go-around procedures (rejected landing)

### QUALIFIED:

Applicant understands the process and mechanics of all formation flight conditions. Applicant is able to discuss and explain the dynamics of the different formations, the correct methods of aircraft control to assure safety, and is able to describe proper wingman and leader techniques for formation changes. Applicant understands flight discipline and wingman and leader's responsibility to the integrity of the flight.

### CONDITIONALLY QUALIFIED:

Applicant understands the mechanics of the different maneuvers but needs prompting to understand the safety aspects of each flight condition. Also, the applicant does not exhibit full and comprehensive knowledge of different methods of aircraft control to maintain or change position in formation relative to other flight members. Applicant understands flight discipline and wingman's responsibility to the integrity of the flight.

### UNQUALIFIED:

Applicant is unable to describe basic formation flight mechanics and concepts without prompting. Applicant is unable to describe the dynamics of each formation flight condition and does not exhibit knowledge concerning the safety basic of each formation or configuration change.

## **BRIEFING PHASE**

### **OBJECTIVE #3**

Organize and brief a flight or mission of four aircraft. The check pilot will ride in the lead aircraft with the flight leader candidate. The flight should include all the elements and maneuvers contained in the T-34 Association, "Wingman Qualification Report," plus formation take-offs and landings (optional, see Airmen policy) in addition to overhead approaches.

#### **QUALIFIED:**

Applicant properly plans the flight with an orderly and efficient sequence of maneuvers which take into account local conditions and traffic. Applicant takes into account the qualifications and relative abilities of his/her wingmen and checks their credentials. The briefing is well organized, concise, and clear, and the applicant is clearly in charge. All the elements contained in the T-34 Association "Formation Briefing" form are covered. Emergency procedures are briefed. All flight members clearly understand the briefing and all elements are consistent with standardized Airmen policy and procedures.

#### **CONDITIONALLY QUALIFIED:**

Applicant properly plans the flight but the sequence of maneuvers is not the most efficient, resulting in wasted time and dead space between maneuvers. Several items contained in the T-34 "Formation Briefing" form are omitted. Flight position assignments are not consistent with the wingmen's abilities. The briefing, while generally professional, leaves some unanswered questions and doubt in the minds of the wingmen as to what is to occur. Leadership ability is demonstrated, but is somewhat short of inspiring total confidence. All elements consistent with standardized Airmen policy and procedures.

#### **UNQUALIFIED:**

Applicant lacks planning and organization in the structuring of the sequence of flight maneuvers. Applicant does not take into consideration local conditions and traffic. Applicant does not take into account the qualifications and abilities of his/her wingmen. The briefing is not concise and clear and leaves many unanswered questions. The context and content of the briefing does not suggest strong leadership ability and the applicant is not clearly in charge. Numerous items from the T-34 Association "Formation Briefing" form are omitted and emergency procedures are not discussed. The briefing elements, procedures, hand signals, etc., are not standardized in accordance with Airmen policy and procedures.

### **OBJECTIVE #4**

Start time, start, taxi, run-up, radio communications, standard signals, and procedures.

#### **QUALIFIED:**

Applicant has pre-flighted applicant's aircraft, strapped in, obtained the ATIS or airport information as appropriate, and is ready to start engines at the time applicant briefed. The radio check-in is precise and positive communications are established with all flight members. Any delays or problems are handled in a deliberate manner; and, by applicant's radio communications and hand signals, there is no doubt that applicant is in command of the flight. Applicant taxis at a moderate speed that requires neither excessive power nor brakes, that is appropriate for the prevailing conditions, and that is easily followed by applicant's wingmen. All ATC communications are concise and all communication directions are obeyed. The flight is properly positioned in the run-up area and the lead has allowed adequate space for all aircraft. All hand signals are precisely executed and clearly seen and acknowledged by all flight members. Sufficient time is given to allow all wingmen to perform their run-up checks.

#### **CONDITIONALLY QUALIFIED:**

Applicant rushes the aircraft pre-flight, but is strapped in, has the appropriate airport information, and is ready to start engines at the time briefed. The radio check-in is not precise, and applicant misses the fact that one, or more, flight members have not checked in. Applicant displays indecision when a wingman communicates that applicant has a problem and might be delayed. Applicant is not clearly in charge of the problem. Applicant's taxi speed varies and requires modest power changes and brake applications by the wingmen to maintain position. An ATC radio transmission is missed. Applicant takes position in the run-up area in a manner that makes it difficult for the wingmen to align themselves with the wind and clearly see applicant. Hand signals are correct but not precise. The run-up is hurried and the wingmen are made to feel rushed.

#### **UNQUALIFIED:**

Applicant performs an unsafe or incomplete pre-flight on applicant's aircraft. Applicant is not ready to start the aircraft at the time briefed. The radio check-in is non-standard: wingmen miss calls or are on the wrong

frequency, and applicant allows the flight to proceed without positively establishing communications with all flight members.

Applicant is not decisive when a problem arises, is led rather than leads, and is controlled by events. Applicant's taxi speed varies excessively, is inappropriate for the prevailing conditions, and requires excessive power and brakes for applicant's wingmen to maintain position.

Applicant misses critical ATC communications, causes a traffic conflict or other unsafe condition.

Applicant positions the aircraft in the run-up area with total disregard for the positioning of applicant's wingmen, forcing them to overlap wings or to direct their prop blast in an inappropriate direction, or applicant does not allow them to align themselves with the wind. Hand signals are not correct, precisely given, or visible to all flight members. Applicant does not pay attention to their acknowledgments or notice that some wingmen have missed applicant's signals. Insufficient time is allowed for the run-up, and the wingmen are rushed or their pre-flight checks are incomplete.

#### OBJECTIVE #5

Section take-off, element rejoin after takeoff.

#### QUALIFIED:

The flight leader applicant ensures that all wingmen are ready for take-off and that all flight members are on the proper radio frequency. Applicant's radio communications are clear and concise, and applicant complies with all ATC instructions and clearances. Many ATC facilities are unfamiliar with formation operation. The applicant makes his intentions clear to the ATC facility. Applicant is constantly alert for other conflicting traffic; as in all phases of flight, applicant is the eyes of the formation. Applicant is clearly in command of the flight and the situation. At uncontrolled fields, applicant complies with all local rules, maintains communications on the appropriate CTAF frequency, and is alert to all local traffic. Applicant aligns on the runway on the downwind or far side in calm wind and ensures that the wingmen are properly positioned on the runway. Applicant uses standard hand signals and receives the proper acknowledgment from the wingman. The spool up signal is given, the engine run up to the briefed power setting, and the brakes released on the head nod. Power is applied smoothly but briskly to the lead takeoff power setting, which gives a sufficient power advantage to the wingman. Directional control is precise. Rotation is smooth and precise to the take-off attitude, and the aircraft is allowed to "fly-off" the runway. The gear-up (and flap up) signal is clearly given only when the flight leader has determined that the wingman is safely airborne. When at a safe altitude and airspeed, applicant gives the signal for a power reduction to the wingman, and power is smoothly reduced to the standard climb power setting. A further reduction is taken by the flight leader to give his wingman and the following element a power advantage. Briefed climb speed is precisely established. When the second element is airborne, the flight leader begins a turn to effect the rejoin. Applicant's wingman is briefed to be positioned on the inside of the turn. The aircraft is maintained in a constant bank, at a constant airspeed, and flown smoothly, while the element effects its rejoin on the outside of the turn. The leader is always alert for traffic and sensitive to the power requirements and other needs of his wingmen. After the flight has rejoined and has cleared the local traffic area, a frequency change is executed to the briefed enroute frequency.

#### CONDITIONALLY QUALIFIED:

The flight leader applicant ensures that all wingmen are ready for takeoff and that all flight members are on the proper radio frequency. Applicant complies with all ATC instructions and clearances, but may miss an occasional radio call or not be totally correct or concise in communication. Occasional misunderstandings may occur between the flight members or the ATC facility. Applicant is alert for traffic, but the high work loads imposed by the demands of leading a flight may cause some distractions and inattention. While clearly in command, applicant may not inspire total confidence from the wingmen. At uncontrolled fields, applicant complies with all local "course rules" and maintains communications on the appropriate CTAF frequency. Applicant aligns his aircraft on the runway on the downwind or far side, and ensures that applicant's wingmen are properly positioned on the runway. Applicant uses standard hand signals, but they may not be totally clear or visible to all flight members, and applicant does not notice that not all wingmen have acknowledged. Spool-up and brake release signals are correct, but power application is either too fast or too slow; however, a proper power advantage is afforded to the wingman. Directional control is acceptable. Rotation is smooth but is either too fast or too slow, making it more difficult for the wingman to precisely match applicant's rotation rate, but applicant does allow the aircraft to "fly-off" the runway. The gear-up (and flap-up) signal is clearly given only when the flight leader has determined that the wingman is safely airborne. The wingman is able to maintain proper position throughout the take-off and climb-out but must work harder to do so, and good station keeping requires more control and throttle inputs.

Power is reduced to the standard climb power setting, and adequate power allowance is given to the wingmen when a safe altitude and airspeed have been reached. Briefed climb and rejoin speed is maintained within +/- 10 KIAS, and, if the speed deviates by more than this, applicant communicates this to the flight.

When the second element is airborne, applicant begins turn to effect the rejoin; applicant has the flight in the proper configuration with the wingman on the inside of the turn.

The turn rate is either too great or too shallow, which in turn causes the rejoining element to go acute and maneuver excessively, or, by being too shallow, unnecessarily delays the rejoin. While alert to traffic, applicant may not be totally cognizant of the needs of the wingmen, and applicant's techniques make it more difficult for them to execute a smooth or timely rejoin. After the flight has rejoined and has cleared the local traffic area, a frequency change is made to the briefed frequency.

**UNQUALIFIED:**

The flight leader applicant rushes the wingmen and all are not ready or on the proper (same) frequency when the flight leader takes the active runway. Applicant's radio communications are not clear and concise. Significant doubt exists between flight members or with ATC as to applicant's intentions. Applicant is not clearly the leader or in command of the flight and is hesitant, imprecise, or non-standard in hand signals, communications or actions. Applicant consistently misses ATC or inter-flight communications. Applicant does not comply with all ATC instructions or clearances, causes unsafe conditions to develop, and is not alert to other traffic. At uncontrolled fields, applicant does not comply with local "course rules," and causes a conflict with other traffic. Applicant does not monitor the proper CTAF frequency or make the appropriate radio calls in the blind. Other aircraft in the pattern have to alter their flight path, even though they have the right of way, to avoid applicant's flight. Applicant's runway alignment for the flight is non-standard. Applicant does not take the downwind side of the runway. Applicant crowds the wingman and does not line up well on applicant's side of the runway. Applicant spools up to either a higher or lower power setting than briefed prior to brake release, causing an immediate power miss-match at brake release and requiring an excessive power change by the wingman. Applicant does not give a brake release signal and immediately leaves the wingman behind. Applicant does not give the wingman a sufficient power advantage, or uses using the wingman to use excessive brakes or power reduction to maintain position. Applicant rotates abruptly at too low a speed forcing the aircraft into the air before it is ready to fly, or at too high a speed causing the aircraft to skip along the runway because it is forcibly being held down. In either case, the wingman has difficulty in executing a satisfactory section take-off. The gear retraction (and flap, if appropriate) is initiated without a signal, at too low an altitude, or the flight leader does not ensure that the wingman is safely airborne. The power reduction to climb power is abrupt and to a non-standard setting; applicant does not give the wingmen a sufficient power margin; the reduction is initiated at too low an altitude, at too slow an airspeed, or too late, possibly exceeding engine take-off power limitations. Briefed standard climb speed is not maintained for the rejoin, and the flight is not notified of speed changes in excess of 10 KIAS. The turn for the rejoin is initiated too soon, forcing the rejoining element to go acute and maneuver excessively; the lead's wingman is positioned incorrectly on the outside of the turn; the lead does not maintain a steady target for the rejoining element because he does not fly smoothly, varies airspeed, attitude, or bank angle. The flight leader does not maintain situational awareness, is unaware of airspace limitations, and does not scan for other traffic. The flight leader applicant is unaware of or insensitive to the power requirements and other needs of the wingmen and does not notice that they are out of position due to factors leader controls. Applicant changes to the enroute frequency before the flight has cleared the local traffic area.

**OBJECTIVE #6**

General airmanship and lead flight control techniques, including smooth and deliberate manipulation of flight controls, constant roll rates into and out of turns. Power management, formation configuration changes, aircraft configuration changes, climbs, and descents.

**QUALIFIED:**

The flight leader applicant is obviously in command at all times. The sequence of maneuvers flown is as briefed, logical, and consistent with power and airspace limitations. Situational awareness is maintained at all times. Local "course rules" are followed and all ATC communications and airspace restrictions are complied with. No unsafe condition is allowed to develop that might threaten the safety of the flight. The flight leader is constantly scanning for traffic and is aware of the position and needs of the wingmen at all times. The flight leader is aware of the skill levels of the wingmen and flies in a manner consistent with their level of proficiency. All control inputs are smooth and concise and at a constant rate.

Power changes are made smoothly, kept to a minimum, and the wingmen are always afforded a comfortable power margin. The flight leader never uses maximum take-off, climb, or cruise power. The flight leader never reduces power to idle, or to a setting that is too low that it would not allow all wingmen to carry some increment of power above idle, in order to provide differential speed control. No power setting by the flight leader will cause a wingman to exceed the operating limitations of wingman's powerplant. No maneuver flown by the flight leader will cause a wingman to exceed the operational limitations of the wingman's aircraft.

Standard hand signals are utilized throughout, clearly given, and acknowledgments noted. Radio procedures are standard, and all wingmen are always on the same frequency and checked in properly. When radio or formation signals are given, sufficient time is allowed for the wingmen to relay the signal and to accomplish the formation, configuration, or frequency change. In all required maneuvers, the wingmen are able to easily maintain proper formation position with smooth control and throttle inputs.

**CONDITIONALLY QUALIFIED:**

The flight leader applicant is obviously in command but may display some indecision; however, the wingmen never lose confidence in applicant's ability to lead. The sequence of maneuvers flown is as briefed, but they are not in the most logical or efficient sequence. Situational awareness is good and no FARs or ATC clearances are violated. Local rules are followed, but a better choice of area or altitudes could have been chosen to better take into consideration traffic, terrain, availability of emergency fields, forced landing sites, etc. An altitude flown could have been selected for smoother air to make the workload easier on the wingmen. A good look-out is maintained for traffic at all times, but some traffic is missed. No unsafe situation is allowed to develop. The level of proficiency applicant requires of the wingmen is not always commensurate with their level of skill. All control inputs are well coordinated but could be smoother and more precise. Roll rates are reasonably constant. Power changes, while made smoothly, sometimes do not give the wingmen the necessary power advantage to easily maintain position without approaching power limits, either maximum or minimum. No power setting is used which would cause a conscientious wingman to exceed engine limitations. No maneuver is flown which would cause the wingmen to exceed their aircraft's limitations. Standard hand signals are used throughout, but might be rushed or not visible to all wingmen. The wingmen might feel rushed and the flight leader does not wait for the acknowledgment of wingman's signals. Radio procedures are standard, and frequency changes properly accomplished. If a wingman misses the frequency change, the flight leader accounts for this and does not proceed until he has re-established contact. Formation, configuration, or frequency changes are accomplished in a standard manner. However, there might be some hesitation, the maneuver might be rushed, or the wingmen not in the best position to accomplish the desired maneuver. Better planning would aid in the execution of the maneuver or configuration change. Throughout all required maneuvers, the wingmen are able to maintain good formation position with modest control inputs and modest throttle changes. While some out of position occurrences might develop, they are easily corrected by the wingmen.

**UNQUALIFIED:**

The flight leader applicant is not always in command. Applicant lacks command or leadership presence, leads by committee, and allows events to dictate the course and conduct of the flight. Applicant's lack of leadership is manifested in indecisiveness, poor communications, and lack of planning, thus fostering doubt and uncertainty among the wingmen. The sequence of maneuvers flown is not as briefed, is poorly planned, and is not in a logical sequence. There is dead space between maneuvers and poor use is made of altitude and airspace. Situational awareness is not maintained at all times, and the flight is allowed to fly out of the designated area, possibly unknowingly penetrating some controlled airspace. Local "course rules" are not followed; ATC or FAR violations occur. An alert watch for traffic is not maintained, and unsafe conditions are allowed to develop - unnoticed. The flight leader ignores the proficiency level of the wingmen, and flies maneuvers that exceed their capabilities; applicant does not notice when they are not in position and proceed with maneuvers for which the flight is not ready or is not in a position to accomplish. Control inputs are abrupt and roll rates are

not constant. Throttle inputs are rapid, allow no power margin for the wingmen, and cause the wingmen to exceed their engine limitations or to abuse their engines. The flight leader applicant's maneuvers cause the wingmen to exceed their aircraft's limitations. The wingmen have difficulty in station keeping and constant and sometimes aggressive control and power inputs are required.

Hand signals are not standard, not precise, not visible to all flight members, are given too rapidly, and acknowledgments go unnoticed, cause doubt among the wingmen as to what is to be accomplished. Radio procedures are non-standard, ATC and inter-flight communications are missed or misunderstood, frequency changes are rushed resulting in wingmen being lost in the exchange and not accounted for -- confusion, doubt and uncertainty reign. When formation or configuration changes are attempted, the flight is poorly positioned or out of position, signals are not clear, and there is a general lack of planning. Non-standard position changes or formations result.

#### OBJECTIVE #7

To evaluate the flight leader applicant's ability to smoothly lead advanced training maneuvers: in trail, lazy eights, break-ups, and rejoins.

#### QUALIFIED:

The flight leader applicant properly signals the flight into trail, into extended trail, and selects maneuvers that are appropriate to each formation. When trail formation is signaled, the flight leader applicant executes a turn to aid the wingmen in gaining separation to fall back into the trail position. Lead waits until the #4 wingman radios that "in position" before beginning any maneuvers. The flight leader sets a comfortable power setting, which allows the wingmen an ample power margin, and once that is established, makes no further power changes.

In close trail, the flight leader applicant has briefed the flight to maintain their positions by varying power.

In extended trail, lead expects them to maintain their relative fore and aft position by the proper use of "cut-off." Changes in pitch and roll are accomplished smoothly and precisely at constant rates, and the wingmen have no problem in maintaining position; to do so requires minimal control or throttle inputs. No aircraft or engine limitations are exceeded in the performance of any maneuver. Pitch and roll inputs are increased gradually in a lazy eight type maneuver up to 45 degrees of bank and +/- 20 degrees of pitch. The intensity of the maneuver is gradually increased in concert with the wingmen's performance. The flight leader is at all times aware of the position and performance of the wingmen. The trail formation is terminated by the leader signaling for a rejoin. Leader rolls into a turn, which indicates that wingman #2 is to join on the inside of that turn. Break-ups and rejoins are accomplished in accordance with standard practice. Signals are clearly given and there is no doubt by the wingmen as to what is to be accomplished. The flight leader maintains precise airplane control and provides a steady target at a constant, moderate bank angle throughout the rejoin. Air speed is maintained, and any change greater than 10 KIAS is communicated to the flight. The wingmen are able to effect smooth, fast, and precise rejoins. Situational awareness is maintained at all times and the flight leader is always scanning for traffic. When positioning the flight for in-trail and rejoin maneuvers, the flight leader is constantly aware of the sun angle and wherever possible avoids positioning the flight so that safe visibility is compromised. No unsafe condition is allowed to develop and any exercise is terminated if safety is compromised. The flight leader is obviously in command and in control of the flight and all maneuvers, and the wingmen respond accordingly without hesitation. The flight is conducted as briefed.

#### CONDITIONALLY QUALIFIED:

The flight leader applicant properly signals the flight into trail, into extended trail, and selects maneuvers that are appropriate to each formation. The planning, timing, positioning, and execution of maneuvers are good but could be improved. Better use could be made of the altitude, airspeed, and airspace. The flight in trail and during rejoins is sometimes positioned where the sun angle poses as visibility problem, which could have been avoided. Good situational awareness is maintained and the flight leader is alert for conflicting traffic. The flight is generally conducted as briefed, but some deviations do occur. The flight is conducted safely and no engine or aircraft limitations are exceeded. No maneuver causes the wingmen to abuse their engines. Some unnecessary power changes are made by the flight leader which cause more power changes by the wingmen than desired. An adequate power margin for the wingmen is established, but good technique and careful observation of the performance of the wingmen should have indicated to the flight leader that the wingmen needed a greater power margin. All control inputs are smooth, but rates of change in pitch and roll are not constant, making it more difficult for the wingmen to follow. The wingmen are able to maintain relatively good position in

all maneuvers but at times do require moderate inputs to the controls and throttle. The wingmen's performance is not monitored as closely as it could be, and the increase in intensity of the in trail, lazy eight maneuver is not in concert with the wingmen's performance. Flight and hand signals are executed correctly, but are rushed, not always visible to all the wingmen, and result in momentary confusion which is corrected by the flight leader.

The break-up and rejoin is accomplished in accordance with standard practice. Airspeed or airplane control is not as precise as it could be, and the bank angle is either too steep or too shallow, which either results in the flight members tending to go acute, or taking too long to rejoin. The wingmen are able to effect a safe rejoin, but it could have been accomplished with more speed and precision. Good leadership is demonstrated, but the execution of some maneuvers indicates some lack of experience. The wingmen respond to the flight leader in a positive manner and follow instructions.

#### UNQUALIFIED:

The flight leader applicant does not conduct the flight as briefed. Applicant selects maneuvers that are inappropriate for the selected trail formation or are inconsistent with the wingmen's abilities. The planning, timing, positioning, and execution of maneuvers are not satisfactory. Applicant has poor situational awareness. Applicant is not alert to other traffic in the area. Unsafe conditions are allowed to develop and are uncorrected or unnoticed. The flight leader repeatedly positions the flight so that an unnecessary and unsafe restriction to visibility that could have been avoided by better planning. Lack of planning results in poor utilization of altitude, airspeed, and airspace. Unnecessary time is wasted positioning the flight for successive maneuvers. The flight is led in a manner which causes engine or aircraft limitations to be exceeded. FARs or ATC restrictions are violated. In order to maintain position in formation, the wingmen must abuse their engines. The lead is not considerate of the wingmen, and ignores or is unaware when they are out of position. The lead does not ensure that they are in position or ready before executing a maneuver. Aircraft and hand signals are non-standard or poorly executed, acknowledgments are ignored. An adequate power margin is not established for the wingmen and power changes from maximum to minimum are required to maintain position. The flight leader makes unnecessary power changes during trail and rejoin maneuvers. Control inputs are abrupt, rapid, non-precise, and control application rates vary. The wingmen are unable to maintain good and safe formation. Large and aggressive control and throttle inputs are required. There is excessive relative motion within the flight that is not induced by turbulence. During trail maneuvers, too rapid course reversals and imprecise, abrupt flight control movements make it extremely difficult for the wingmen to track, and thus no useful training is accomplished. The flight becomes unnecessarily spread out. During rejoins, the airspeed and altitude control is not precise, the rejoin speed is not as briefed, and the change is not communicated to the flight. The flight leader's bank angle is excessively steep or shallow. At best, the shallow bank results in an excessive time to rejoin. The steep bank causes the wingmen to go acute during the rejoins and some dangerous overshoots result. The wingmen are not able to execute a smooth, safe, and timely rejoin. Lack of leadership, discipline, and understanding of flight dynamics is evident. The flight leader's lack of good aircraft control makes it difficult for the wingmen to follow.

#### OBJECTIVE #8

To demonstrate flight entry into an airport traffic pattern under ATC, including compliance with all instructions, and maneuvering the flight for: (a) 360 degree overhead break, and (b) formation landings (optional for tailwheel airplanes)

#### QUALIFIED:

Situational awareness and good planning, well in advance, is the quality that best typifies a good flight leader in this very critical phase of flight. The lead obtains the ATIS, or the airport advisory information at an uncontrolled field, well in advance of his flight's arrival; he carefully briefs the flight on the type of approach and pattern to be flown, including any special instructions. There is no doubt among the wingmen as to his intentions for the type of approach, direction of traffic, etc. The arrival into the airport traffic area is well planned to avoid excessive maneuvering, and well coordinated with the appropriate ATC facility, or with local traffic on the CTAF at uncontrolled fields. The lead respects local rules and traffic, avoids conflicts, and respects the right of way of other aircraft. He is alert to the fact that some ATC facilities and many pilots at uncontrolled fields are unfamiliar with 360 degree overhead approaches and formation arrivals. Adequate time and distance are allowed for frequency changes, formation position changes, and for descent and approach checks to be performed by the wingmen. The flight is not rushed; hand signals are standard and clearly given; acknowledgments are received.

The lead is very alert for traffic, and has briefed the wingmen to fly loose enough so that they, too, can scan for traffic.

(a) 360 degree overhead approach, single ship landing. Qualified. Intentions are clearly communicated to ATC, local traffic (CTAF), and all flight members. The flight is maintained in fingertip formation until on initial approach to preserve maneuverability. The arrival into initial approach is well planned, with minimum maneuvering; the flight is moved to echelon with sufficient time allowed to smoothly accomplish the maneuver and to allow the wingmen to become stabilized; no turns are made into the echelon.

The "break" signal is given with the timing interval appropriate to local conditions and the wingmen's abilities. Airspeed is stable, control inputs are smooth, and the wingmen are afforded an ample power advantage; no power changes are made throughout the approach. The break is made over the approach end of the runway, the approach is flown aggressively, and the lead does not configure his aircraft too soon, or slow down too rapidly, to allow his wingmen to gain spacing. The approach is a 360 degree turning pattern.

Touchdown is "on the numbers" in the touchdown zone on the downwind side of the runway, the lead stays on his side, rolls to the end, and clears on his side, or crosses to exit at the end, only when cleared by the aircraft behind. Lead clears the runway and allows the wingmen to form up with him before he taxis to parking.

(b) Formation, section landings, if appropriate, (tricycle gear airplanes, optional for conventional gear). Qualified. The planning and arrival are carried out with the same care as above, and the same elements are graded. In addition, the lead briefs the flight on how they will separate into two flights of two, for the section landings. The lead considers all factors, including runway suitability in length and width for a section landing. The final approach is of sufficient length so that the flight can be well stabilized at the appropriate approach speed, and not be rushed. The wingman is positioned on the upwind side, and ample time is allowed, once established on a straight in final, for the flight to be configured in the landing configuration. The lead always gives the wingman an ample power margin, and never approaches a low power setting that would result in an underboost setting by the wingman. The lead is cognizant of the wingman's correct position for a section landing (wingman is stacked level and forward). Lead also ensures that the wingman is in the proper landing configuration. Signals are clearly given and sufficient time is allowed for the wingman to accomplish each configuration change. A normal glide path is flown, airplane control is smooth and stable, power changes are minimized, and touchdown is accomplished in the touchdown zone. The lead touches down with a slight amount of power and never goes to idle power which might cause the wingman to overshoot the leader. (wingman should touchdown slightly ahead of the leader). The lead lands well on his side of the runway so as not to crowd the wingman, maintains good directional control, and smoothly decelerates with only moderate braking. The wingman needs only small control and power inputs to maintain a stable position throughout the approach and landing; workload was never high and wingman was never rushed.

#### CONDITIONALLY QUALIFIED:

The descent and approach to the airport is adequately planned. The lead obtains the ATIS, or airport advisory information, at an uncontrolled field in advance of his flight's arrival; lead briefs the flight on the type of approach and pattern to be flown, including any special instructions. Lead's intentions are understood by the wingmen. The arrival into the airport traffic area requires some excessive maneuvering that better planning could have avoided; his communications with the ATC facility or with local traffic on the CTAF causes some confusion or unnecessary communications. He complies with local course rules but could be more alert to other traffic. His approach is somewhat rushed, and more time could have been allowed for frequency changes, formation position changes, and for descent and approach checks to be performed by the wingmen. He allows his wingmen to fly too close so that they are not able to scan for traffic conflicts. Hand signals are standard, some acknowledgments are missed, and some minor confusion exists.

(a) 360 degree approach, single ship landing. Conditionally Qualified. Good communications are maintained between the lead, ATC, or the CTAF and local traffic, and within the flight. The arrival into initial approach requires some unnecessary maneuvering that better planning could have avoided. The initial is too short and the formation change to echelon is rushed, as are the hand signals for the brake interval and break. Airspeed and control response is good, but moderate control and power inputs are required by the wingmen to maintain good position; they are working harder than they would like.

The break is delayed past the approach end of the runway because the flight was rushed and not ready. After the break, the lead slows and configure more rapidly than necessary, and extends his downwind past abeam the touchdown point, making it more difficult for the wingmen to obtain spacing. Lead's pattern is larger than necessary, but he lands in the touchdown zone on the downwind side of the runway, stays on his side, uses moderate braking, rolls to the end of the runway, and clears on his side.

(b) Formation, section landings, if appropriate. (tricycle gear airplanes required, optional for conventional gear). Conditionally qualified. The planning and arrival are reasonably well executed, but there is some confusion among the wingmen on how and when the flight is to be divided into elements. There is some unnecessary maneuvering in the terminal area. The lead selects a runway suitable for section landings.

The final approach is too short and the wingman has to rush to be stabilized; but is positioned on the upwind side by lead; less time than would be desired is allowed on final to configure the flight for landing. The lead gives the wingman an

adequate power margin but does make small and frequent power changes, and at times the wingman finds himself near idle, to prevent an overshoot. The wingman is occasionally out of position and stacks too low; lead is slow to correct this. Signals are standard but rushed, airplane control is good but could be smoother; too many small control and power inputs are made by the lead in an attempt to fly a very precise final approach.

The lead lands at idle power, which causes the wingman to overshoot slightly; he lands well on his side of the runway, maintains good directional control, and uses moderate braking. The wingman needs frequent and sometimes moderate control and power inputs to maintain a good formation position. The wingman's workload is occasionally moderate and all times he is rushed.

**UNQUALIFIED:**

Situational awareness and good planning are conspicuously lacking. The ATIS, or airport advisory information for an uncontrolled field, is either not obtained, not relayed to the flight members, or not received in a timely manner. Confusion and doubt prevail among the wingmen as to the flight leader's intentions. The arrival into the airport traffic area is poorly planned; there is excessive maneuvering at low altitudes to position the flight for the approach; the arrival is not well coordinated with the appropriate ATC facility. Missed communications result, and ATC instructions are not followed. Flight leader applicant does not coordinate with local traffic on the CTAF at uncontrolled fields, and traffic conflicts are created with local traffic that may be unfamiliar with formation arrivals. Applicant does not respect local course rules or the right of way of other aircraft. Applicant is not alert to other traffic and allow the wingmen to fly too close, as in parade formation; as a result, they are unable to scan for traffic. There is insufficient time and distance allowed for frequency changes, formation position changes, and for descent and approach checks to be performed by the wingmen. The flight is rushed, hand signals are non-standard and not clearly given, and acknowledgments are ignored.

(a) 360 degree overhead approach, single ship landing. Unqualified. The lead does not clearly communicate his intentions to ATC, local traffic (CTAF), and all flight members. The flight is positioned into echelon prior to arrival on initial approach, and flight maneuverability is compromised; turns are made into the echelon. The arrival is poorly planned, and the position change to echelon is rushed. Airspeed is not stable, the lead is not smooth, and numerous and excessive power changes are made; lead reduces power to idle, and an adequate power margin is not maintained for the wingmen. As a result, the wingmen either do not have enough power, or they are unable to prevent overshooting lead. The wingmen have to abuse their engines in an attempt to maintain formation. The break signal is rushed, and the break interval is inappropriate for the prevailing conditions. The break is either made too soon or too late. After the break, the lead immediately reduces power to idle and configures for landing. Lead extends his downwind unnecessarily, making it difficult for the wingmen to obtain safe spacing. The resultant traffic pattern is too large. The lead flies his final approach at the minimum approach speed, and his touchdown is too long and not in the touchdown zone. Lead lands on the upwind side of the runway, crowds the centerline, and either applies maximum braking to make an early turn-off, or rolls to the end of the runway and crosses to the other side without clearing behind him. After lead clears the runway, he taxis to parking without waiting for the wingmen to join with him.

(b) Formation, section landings, if appropriate. (tricycle gear airplanes required) (optional for tail wheel airplanes).

Unqualified. The planning and arrival are poor, and there is doubt and confusion among the wingmen as to how the flight will be split into elements and the recovery accomplished. There is excessive maneuvering at low altitude in the terminal area, and the lead is not alert to traffic. The runway lead selects is not suitable, or at best only marginally adequate for section landings. The final approach is too short; the airspeed flown by lead is unstable, and too slow to be comfortable for the wingman; lead positions the wingman on the downwind side. The approach is rushed, as are the non-standard signals to establish the airplanes in the landing configuration. Acknowledgments are ignored, and lead does not check that his wingman is indeed in the proper landing configuration. The wingman has insufficient time to properly stabilize in position; he stacks too far aft and too low, and this critical positioning error is undetected, unnoticed, or uncorrected by lead. The lead's control inputs are rough and excessive, as are his throttle inputs. To maintain his glide path he frequently reduces power to idle, forcing his wingman into dangerous overshoots. The wingman must use excessive control and throttle movements in a failed attempt to maintain proper position.

The lead flares abruptly and chops his power to idle while still in flight, which causes his wingman to fly past him. He lands too short, putting his wingman dangerously close to the runway threshold, or too long, wasting excessive runway. The lead crowds the centerline and does not maintain good directional control; he uses excessive braking. The wingman's workload is at times excessive and usually moderate, and he is always made to feel rushed. He is very glad to be safely on the ground!

## OBJECTIVE #9

To properly debrief a four ship formation flight.

## QUALIFIED:

The lead conducts the flight debriefing in a timely and constructive manner in a location that is free from distractions. He is clearly in charge and obviously the leader. He does not brief, lead, or debrief by committee. The flight was clearly a positive learning and training exercise, and only constructive criticism is offered. He freely takes comments and questions from his wingmen, and nothing in his demeanor discourages or intimidates his wingmen from doing so. He is a good teacher / instructor. Mistakes are explained and corrective actions suggested. He is tolerant of the opinions of others; however, when a difference of opinion arises, after careful consideration, it is his decision, fairly reached, that prevails - formation flying is not a democracy. The flight is debriefed in a concise and logical manner from start to finish. Non-standard items are emphasized, and unsafe actions properly understood and covered. Because the lead paid attention to, and was cognizant of, his wingmen's actions in flight, he is able to give meaningful comments. His knowledge of formation dynamics, and his skills as an instructor, allow him to correctly analyze the maneuvers flown, and to offer useful information to his wingmen. The leader has an obligation to deal with, and to recommend additional training, decertification, or disciplinary action for, any pilot in his flight (and for whom he is responsible) whose actions, formation skills, or lack of discipline present a potential safety of flight problem. The flight members profit by the debriefing; it is a learning experience, all their questions are satisfactorily answered, all conflicts are resolved, all elements of the flight are understood; it is a positive experience for the wingmen and they consider the debriefing as time well spent.

## CONDITIONALLY QUALIFIED:

The lead conducts the debriefing in a reasonably timely manner, but does allow distractions to intrude. While in charge, he allows himself to be interrupted and does not control the flow of the debriefing. He uses the flight as a positive learning experience, but tends to be too critical of his wingmen in a manner that discourages their participation. Lead's lack of instructing experience manifests itself in how he deals with others in a learning environment. He tends to debrief by committee. When a difference of opinion or a question of formation procedure arises, it is resolved by committee. The flight is debriefed in an orderly manner, from start to finish. Some non-standard items are missed, but when in doubt the lead refers to the appropriate standardized formation materials, manuals, and video. All unsafe actions that occurred in flight are debriefed. Because he was not aware, as he should have been, of his wingmen's actions in flight, he is unable to give as meaningful comments as he might have. His inexperience as a flight leader or as an instructor makes it more difficult for him to analyze the maneuvers flown and to be able to offer more useful information to his wingmen. He is a good leader but, in his eagerness "to be liked," he is hesitant to deal properly with members of his flight who need additional training, lack discipline or formation skills, or who present a potential safety of flight problem. It is difficult for him to criticize members of his flight, who may be his friends. He confuses being a good guy with being a good leader. The flight members do learn from the debriefing, but the flight time would be better spent, if the debriefing highlighted useful information. The flight members leave the debriefing not realizing that their flight performance could have been better, and that they could have learned more if properly debriefed.

## UNQUALIFIED:

The debriefing is not conducted in a timely manner. The lead allows numerous distractions to intrude. Not all flight members are present, he does not have their attention, and the location selected is not conducive to a meaningful debriefing. He is clearly not in charge, not a leader, and debriefs by committee.

He is not a good teacher and has no experience as an instructor. He is intolerant of questions or the opinions of others. He is never wrong and never admits a mistake. When confronted with a non-standard procedure, he never refers to the standardized materials, manuals, or video. The flight is not debriefed in an orderly manner and it is difficult for the wingmen to follow. Safety of flight items are not debriefed. Because he was, in general, totally unaware of his wingmen's actions in flight, he is unable to render any meaningful comments. He berates his wingmen for their poor performance in flight, fully failing to realize that their substandard flying was due almost entirely to his lack of skills as a flight lead.

He has no real knowledge of formation dynamics and his lack of skill as an instructor or leader prevents him from communicating this important information to his wingmen in a useful manner. He feels no responsibility to deal properly with members of his flight who need additional training, lack discipline or formation skills, or who present a potential safety of flight problem.