

Joint Liaison Formation Committee (JLFC)



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Operations Manual

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Operations Manual

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Joint Liaison Formation Committee (JLFC)



Policy

Overview

The Joint Liaison Formation Committee and the FAST Committee are products of perceived need within the warbird community to standardize and increase the safety of formation flying. Warbirds have flown formation for years, but, with the passage of time, military trained pilots retired from flying and non-military pilots began flying warbirds. They began a learning process for flying formation that was at times haphazard and occasionally outright dangerous. Further, each of the various warbird organizations created a series of communication signals that were incomprehensible to someone outside that organization--differences based on the military service where the leaders learned formation. Finally, there were significant differences on the proper position to fly and how best to get there.

At the Warbird Operators Conference held in Galveston in 1993, a historic event occurred; various warbird organizations (CAF, NATA, T-34 Association, W of A, and CHAA) agreed to investigate a common program for formation flying. The same problems faced by these organizations were also being faced by the liaison groups. In March the next year, 1994, representatives of several liaison organizations attended the Warbird Operators Conference and as a result the Joint Liaison Formation Committee was formed in July, 1994 at Keokuk, Iowa. It was comprised of persons very interested and skilled in formation flying. The participating organizations were the Warbirds of America, The International Liaison Pilots and Aircraft Association, The International Bird Dog Association and The Canadian Bushhawks Liaison Squadron.

The committee investigated the information available and came to realize, as the FAST committee had done a year earlier, that there were good manuals available that could serve as the common standard. The JLFC adopted the T-34 Association Formation Manual and further supplemented it with The Canadian Bushhawks Liaison Squadron Formation Manual. Further, the Darton Video, "Formation Flying - The Art" was available that used the same procedures. These adopted materials were presented to the Board of Directors at the Warbirds of America Conference at Oshkosh in August, 1994 and approved. The Joint Liaison Formation Committee met and set up a permanent committee charged with preparing the manuals and implementing the standards for liaison formation flight. A smaller Standardization Committee created the manuals and forms needed. A mission statement was prepared to serve as a focus for the committee. The JLFC closely followed the principals already set up by the trainer FAST committee. The JLFC agreed to create and maintain a depository of records.

The JLFC was invited in March, 1995 at the Warbird Operators Conference in Midland, TX to attend and participate as an observer at the FAST Committee executive meetings. Later that year, the JLFC Operations Manual was approved by FAST and the JLFC was invited to join FAST as the Liaison Division. This offer was voted on and approved by the members of the JLFC and in August, 1997, the JLFC accepted the FAST Committee's offer. The JLFC assumed the same status as a FAST Signatory group and has two votes on the FAST Board of Directors.

Subsequently the Light Trainer (Stearman) group was accepted into the JLFC. Because of "brand recognition" of the name, the organization would still be known as the JLFC.

Mission Statement



The mission for the JLFC is "to encourage and enforce SAFETY, STANDARDIZATION and PROFICIENCY in liaison and light trainer formation flying". The JLFC is to approve rules for formation flight, change rules as appropriate and approve methods of issuing approval for pilots to participate in formation flights. This committee qualifies formation aviators using the T-34 and Canadian Bush-hawks formation manuals, the Darton video and the JLFC performance standards.



Basic Rules

A number of basic rules will be observed.

1. The committee sets up standards and tests to show compliance. All individuals and organizations accept the JLFC approvals. Thus, an applicant belonging to one organization is approved by all the organizations with no further safety rides needed. This does not eliminate the responsibility of the individuals or leaders to assure actual ability, compliance and currency.
 2. There are several methods to show compliance with standards:
 - A. If a pilot ceases being in compliance, the pilot could be decertified.
 - B. While tests indicate a knowledge/skill level at the time of the tests, a lead pilot has the responsibility for determining current ability.
 - C. There is an appeal process that allows a decertified pilot a full hearing and opportunity to show compliance with standards.
 3. A lead pilot and a safety pilot have an absolute right to determine who is flown in a given flight.
 4. The standards used are the T-34 Manual, the Canadian Bushhawks Liaison Squadron Formation Manual, the Darton Video and the Practical Flight Safety Guides as approved by the JLFC.
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Requirements

In order to participate in JLFC formation flight, a pilot must be able to comply with the formations requirements. There are three levels, wingman, lead and safety pilot. The wingman level is available to anyone who qualifies. The lead level will be determined by need for lead pilots as well as ability. The safety pilot level will be determined by need by the JLFC and will be based on the highest standards of experience and geographical needs. The number of safety pilots will be kept to a minimum in order to allow the greatest level of standardization.

1. Wingman Level Qualifications (to take the safety ride).

- Private Pilot
- 200 hours total time
- Current 3rd class medical
- Flight test recommendation by a current lead or safety pilot.
- Member of the JLFC.
- Pass the safety ride.

2. Lead Pilot Level Qualifications (to take the safety ride)

- Commercial Pilot or equivalent (desired)
- 500 hours total time
- Current 3rd Class Medical
- 75 hours logged formation flight
- 1 year as JLFC wingman
- 15 hours and a minimum of 10 flights in a 4 ship formatio.. (or 2 ship if testing for 2 ship lead)

- Safety ride recommendation by current lead or safety pilot
- Member of the JLFC.
- Pass the safety ride

3. Safety Pilot Level Qualifications (to take the safety ride)

In addition to possessing the requirements, the JLFC must have determined there exists a need for additional safety pilots. A safety pilot level is not to be considered an additional rating, rather it is an agreement to help develop the art of formation flying.

- Commercial Pilot plus one of the following ratings:
 - FAA Examiner
 - Military Check Pilot, current or former
 - Airline Check Pilot, current or former
 - CFI, current
- Current 3rd Class Medical
- 2000 hours minimum flight time
- 100 hours minimum formation flight time
- 500 hours logged warbird/liaison time
- Minimum 5 years formation flying, at least 3 years as a leader
- Member of the JLFC
- Recommended by two other JLFC Safety pilots
- Commitment to volunteer and serve the formation flying community
- Agree and sign that the safety pilot will adhere to all JLFC policies including observing policy for safety rides.
- Pass the safety ride

Safety Rides

The requirements are usually the minimum needed for the safety ride. If an applicant for a level does not meet the minimum requirements for a safety ride, the standardization committee may consider a partial waiver. Thus, there are two methods of satisfying the requirements. For ease of use, the Administrative Review Process will be used. The applicant and sponsoring safety pilot, prior to the safety ride, will call the chairman of the standardization committee with the request. The chairman will confer with at least two other members of the committee before granting or denying the request.

In all safety rides, the safety pilot will ride with the applicant. There will be no external observed safety rides except in the case of a single place aircraft. In that case, the requirements as written in the wingman flight guide for "Single Seat, Single Control" check rides will be used. It is anticipated the applicant will demonstrate a basic ability in a dual control aircraft prior to using the single seat, single control safety ride.

In the event a person is unusually well qualified, and can obtain recommendations from three safety pilots, a formation approval may be granted by the standardization committee after discussion and consideration. This does not eliminate the standardization safety ride, rather it allows unusually qualified candidates a faster route to the approval.

Currency

Formation flight is an art that deteriorates with disuse. Thus, there is a requirement for currency in formation flight.

WINGMAN: A wingman can be granted currency by flying formation one time with a current lead and the lead pilot filing an activity report each year with the JLFC records chairman. If there are no activity reports filed within a year, the wingman's currency will expire at the end of the calendar year. In the following year, the currency may be renewed with a practice formation flight (not an airshow flight) and a proper report filed. If, after two years there are no currency reports filed, the wingman will need to take a safety ride with a safety pilot to renew the currency.

LEAD: Lead pilot recurrency will consist of leading a flight with either a lead or safety pilot flying in formation. The safety or lead pilot will submit a report indicating currency. If there are no activity reports filed within the year, the currency will expire at the end of the calendar year. In the following year, the currency may be renewed with a practice formation flight (not an airshow flight) and a proper report filed. If after two years there are no currency reports filed, the lead pilot will need to take a safety ride with a safety pilot to renew the lead currency. If, during the time, the lead pilot has flown formation as a wingman and the report was filed, the pilot will be approved for wing position currency.

SAFETY PILOT: Safety pilots can only be recertified by other safety pilots or by attendance at a safety pilot standardization meeting. The safety pilots are strongly encouraged to also have the formation reports filed to maintain currency certification. The recertification of safety pilots will not be automatic, rather, sufficient inquiry will be made by the JLFC Standardization Committee to determine the activity level, degree of standardization, performance, ability, judgement and attitude of the safety pilot. If the JLFC Standardization Committee determines a safety pilot should not be recertified, the denied safety pilot will have the right to appeal the decision to a panel of 3 safety pilots, 1 selected by the JLFC Standardization Committee, 1 selected by the denied safety pilot and the 2 pilots thus selected choose a 3rd panel member. The decision of the panel will be final.

There will be a standardization meeting at least once a year for safety pilots. All safety pilots are strongly encouraged to attend so formation safety will be enhanced. The standardization meeting will generally concern itself with assuring that safety pilots are adhering to the flight manuals and the video. It will also provide a discussion arena for improving safety rides, problem solving and helping safety pilots with any instruction problems. A safety pilot may be recertified by another safety pilot observing a safety ride as given by the applicant. It is recommended the safety pilot doing the recertification of another safety pilot be one of the designated standardization committee members.

A safety pilot is expected to act on any unsafe performance by formation pilots. The action can include teaching, counseling, rechecks or decertification.

Appeals

In the event a pilot is decertified and wishes to appeal the decision, the appeal process is to notify the JLFC chairman of the desire to appeal. The chairman will appoint one safety pilot not involved with the decertification, the pilot will appoint one safety pilot not involved with the decertification and the two safety pilots will select a third safety pilot not involved with the decertification. The three pilots will determine the information necessary to make a decision. The decision of the safety pilot panel may be appealed to the standardization committee whose decision is final.

Organization Approvals

In the event an organization wishes to become a sponsor of the JLFC, the following conditions should be met.

A. The organization should fly military type aircraft as opposed to civilian type aircraft (C-172's, Piper's, Bonanza's, etc.) The organization should have a defined need for formation with a reasonable number of aircraft and members. An organization with only a few aircraft or a small number of members is encouraged to join with an existing member organization.

B. The committee will investigate the organization and its adherence to the standards of the JLFC as is needed.

C. Upon tentative approval of the organization, the committee will extend an invitation for the organization to designate two representatives to come as guests to the next JLFC meeting. The JLFC will retain the right of approval of the guests. The representatives of an organization should be superior aviators with a record of diplomatic skills.

D. After attending one or more JLFC meetings as a guest, the committee may invite the organization to full membership.

E. Until full membership is granted, the guest will have full discussion privileges, but not have a vote.

F. There will need to be at least one safety pilot identified by the organization. The safety pilot will need to have a safety ride by a member of the JLFC who is also a safety pilot. The safety pilot(s) identified will need to meet the qualifications as listed and be approved by the JLFC. The safety ride will be given upon acceptance of the member organization into the JLFC organization.

G. The organization will need to designate two persons to represent the organization on the JLFC. One of the persons should probably be the safety pilot designee. The JLFC will retain the right of approval of the representatives.

H. The organization should show a commitment to the program by creating or having an established formation training and checking program. This would include having training available as well as safety rides and purchase of the video and manuals.

I. The safety pilot designee(s) should plan on attending the standardization meetings once a year.

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Appendix A

AGREEMENT FOR FORMATION FLIGHTS

We have considered the requirements for formation flying in military type aircraft and agree to support the following policy.

A. We will use the Canadian Bushhawk Liaison Squadron formation manual and T-34 formation manual along with the Darton video. This will in no way override or replace the current FAR's governing formation flight.

B. The JLFC will maintain a national registry of JLFC formation rated pilots. This will include issuing a registration card showing the applicant has met the minimum standards for formation flight. The reverse of the card will carry a disclaimer.

The cost of the administration will be borne by the individual in the form of a \$15.00 annual fee made payable to the JLFC. If the applicant desires other evidence of formation qualification (such as patches), the applicant may purchase these items from the JLFC records chairman.

C. The registration card will be valid for one year and will have an expiration date. Renewal will be accomplished on the basis of a lead qualified pilot submitting a report to the JLFC records chairman relating a successful formation flight by the applicant(s). In the event a lead report is not submitted within a year, the pilot will have one more year to obtain a lead report. The second year lead report should be from a practice flight, not an air show flight. After a second year of no formation reports, the pilot will need to have a safety ride by a safety pilot.

D. The qualifications of an applicant will be judged on the basis of JUDGEMENT, PERFORMANCE, ABILITY, and ATTITUDE. The following will be the basis of consideration.

1. Wingman Applicants. An applicant will need the recommendation of a lead or safety qualified pilot from a JLFC or any FAST signatory. It is suggested that there be at least two documented flights with at least one two ship formation and one four ship formation. The safety ride must be conducted by a JLFC Safety Pilot.

2. Lead Applicants. An applicant will need the recommendation of a lead or safety pilot from a JLFC or any FAST signatory. It is required the lead applicant have at least one year experience as a wingman pilot. The safety ride must be conducted by a JLFC Safety Pilot.

3. Safety Pilot Applicants. An applicant will need to have the recommendation of two safety pilots and the approval will be based on a great many factors including geography, need for safety pilots, experience as a CFI or other instructing/checking type experience, judgement, attitude and other factors.

E. The formation approval will be a general approval and is not airplane specific. It will be usable in liaison or light trainer military type aircraft only. The pilot must be current and qualified in the aircraft before flying formation. The lead pilot may conduct such inquiries as is necessary to determine the qualifications.

F. Decertification of a pilot. If no lead report is filed within a year, the person is decertified. In order to become recertified, the person must satisfactorily complete a practice formation flight with an appropriate lead pilot within the second year. A person can be given a safety ride at any time by request of the committee or by a safety pilot. If a safety pilot finds a reason for decertification, the report should be sent to the JLFC chairman for a decision. The decision could include but not be limited to: another safety ride with a different safety pilot, additional training or other means of evaluation. The evaluatee would have the right to request another safety ride. The evaluation would be on the basis of performance, judgement, ability and attitude.

G. Membership in a sponsoring organization as a requirement to fly a show will be left to the discretion of that organization.

H. The JLFC will be composed of elected representatives including a Chairman, Vice Chairman, Secretary/Treasurer and Standardization Chairman. They will decide the policy and conduct the evaluations as needed by paragraph F. It is anticipated the JLFC will meet once a year or more often if needed.

I. The JLFC Chairman will annually appoint a standardization committee. The standardization committee should consist of no fewer than five of the most highly experienced JLFC pilots. Additionally, the JLFC Chairman will be a voting member of the standardization committee.

J. The JLFC Chairman will annually appoint regional operations officers for East, Central, West and South areas. The Operations officers will be responsible for all JLFC clinics and ground schools held within their respective areas.

K. The JLFC Chairman will annually appoint a Keokuk formation clinic registration chairman. Regional operations officers holding other clinics may request the assistance of the Keokuk registration chairman.

L. The JLFC Chairman will annually appoint a Public Information Officer. The PIO may in turn appoint such membership help as needed in the following areas:

1. Creation and maintenance of a JLFC Media List, with names and addresses of appropriate aviation publications and editors.
 2. Writing and distributing of JLFC news releases to the media list.
 3. Appointment of official photographer.
 4. Editing and publishing of the JLFC "Wingman" publication on a periodical basis.
 5. All press releases and publications are subject to the JLFC chairman's approval.
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POLICY REGARDING WINGMEN

The wingman is the primary person of the formation program. As such, it is up to the formation pilot to maintain currency and to strive for improvement. The primary thrust of the program is to maintain a high level of safety and then to improve. Accordingly, if a person observes an unsafe action, the act should be reported to the lead, or a safety pilot. While the safety ride indicates an acceptable level of performance, the wingman should remember the safety ride is the MINIMUM level of performance.

Minimum equipment for formation training or safety rides includes dual controls, headset VHF radio and interphone. Hand held radios are not acceptable unless they may be used hands free with a PTT switch, headsets and interphone capable.

ATTITUDE ATTITUDE ATTITUDE

The spirit of the wingman has been captured by the following list of attributes. The list was taken from a Korean War combat squadron ready room. It has been adapted to civilian use by deleting the direct combat references. The new wingman should use this as a departure point for learning about formation.

- *I'm a new guy and I don't know enough to be anything else.*
- *I go where my leader goes.*
- *I do what my leader does.*
- *I do what I'm told to do.*
- *When the going gets tough, I move in a little closer and press on.*
- *If my leader gets into trouble, I stick with him.*
- *I watch him and try to learn from him because someday I want to be a leader.*
- *I expect my leader to be experienced and capable.*
- *I expect him to go to the right place.*
- *I expect him to do the right thing.*
- *I expect him to let me know what I'm supposed to do.*
- *When the going gets tough, I expect him to take care of me.*
- *When it's time to break, I expect him to break.*
- *If I'm in trouble, I expect him to stick with me.*
- *I expect him to teach me because I must learn to lead.*
- *I'm going to be the best possible wingman I can and some day, with help, I'm going to be the best possible leader.*

Appendix C

POLICY REGARDING LEAD PILOTS

The two primary defenses we have for maintaining safety in the formation program are safety pilots and lead pilots. Safety pilots can help with orientation and make sure pilots are safe at the time of the test, but lead pilots are the real day to day key to safety.

The lead pilot has the duty and responsibility to assure safe completion of the flight intact. Toward that end, the lead needs to be assured of a number of items.

1. The planned mission (flight) is safe and all the members of the flight are in agreement. As examples, if the flight is only VFR, will there be areas that will become IFR and thus will necessitate filing for the flight? Does the flight require low level flying and are all members acquainted with procedures for lower level formation flights? This does not mean the lead pilot is simply a committee chairman, rather, the lead pilot must lead, but knowing the abilities and weaknesses of the wingmen. Formation flight is not based on committee approval, rather, it is based on leadership of the lead pilot.

2. All members of the flight are qualified for the planned mission. As examples, if the flight requires IFR, are all the members current, qualified and the planes appropriately equipped? If the flight is a formation, are all the members qualified for formation? Are they current in the plane? Are they current for formation in the specific plane? If the lead has any questions about the proposed wing pilots, the lead's responsibility is to make whatever inquiries are necessary, including a two ship practice formation, check of credentials, check of logs, etc. to assure wingmen are in fact fully qualified. This means the lead is not simply required to accept someone that has an airplane and a formation card. The lead must check each person. If an unknown person shows up, the lead does not need to accept that person in the formation flight until the lead is satisfied of that person's ability, attitude, performance and judgement.

3. Is the proposed flight properly briefed? This would include making sure every person in the flight understands the mission, what is expected of each pilot and what actions need to be taken. It should include all items listed in the formation manuals in briefing sections, but, in addition, the lead needs to be assured the wing pilots know and understand the information.

4. During flight, the lead must constantly evaluate wing pilots and make corrections based on observations. This would include planning maneuvers so the least skilled wingman can satisfactorily complete the flight. It would also include making judgements necessary to assure safety of the flight, including canceling, diverting to an alternate, etc.

5. Following flight, the lead should gather all wingmen and do a thorough debrief. This should include any suggestions to wingmen and also to the lead for a better job of leading. It is considered good form to give positive evaluations as well as negative evaluations to each wingman. Following the flight the lead should file a formation report.

6. Minimum equipment for formation training or safety rides includes dual controls, headset VHF radio and interphone. Hand held radios are not acceptable unless they may be used hands free with a PTT switch, headsets and interphone capable.

Appendix D

POLICY FOR SAFETY PILOTS

The JLFC Safety pilot is the cornerstone of the JLFC formation program and this program is built on a foundation of Safety and Standardization.

Safety pilots should be formation pilots of the highest standards, experience, qualifications and skills who are committed to the JLFC program. They should have a strong background in flight instruction/checking, formation and the operation of warbird type aircraft.

They are selected on the basis of their qualifications and geographical need by the JLFC. In interest of standardization, the number of safety pilots will be kept to an absolute minimum, and the certification of new safety pilots based solely on need. The process is initiated by the JLFC which determines the needs for additional safety pilots to cover a specific geographical area. The JLFC then has its safety pilots recommend a candidate for the position, determines if the candidate is qualified and interested in serving and then administers a standardization safety ride. The safety ride will be administered by any member of the Standardization Committee or its designated representative. The JLFC will be very much involved in the process, since there may be other organizations' check pilots in the area. Under those circumstances, there would not be a need for an additional safety pilot.

The position of safety pilot is not to be considered an additional "merit badge" that a formation pilot aspires to after becoming a flight lead. It is also not an honorary position that is bestowed on formation pilots.

The safety pilot must sign a statement that he will conduct all check rides in accordance with JLFC guidelines. Furthermore he must have in his possession all the current JLFC materials to include the T-34 Formation Flight Manual, the Canadian Bushhawks Liaison Squadron Formation Manual, the Darton Formation video, "Formation Flying - The Art", the JLFC Safety, Leader, and Wingman flight test guides and all JLFC policy guides, safety ride forms, etc.

The safety ride will be primarily a safety and standardization type test. In this concept, the ride should include observation of flight in a formation, as a flight leader and then in the capacity of giving a safety ride.

The safety pilot may be called upon to give rides in a variety of aircraft and for a variety of organizations. This is considered to be part of the process of improving safety and ability to fly formation. A safety pilot who wishes to give safety rides to only the members of one organization may be decertified as a safety pilot because that attitude is not in the spirit of the JLFC program of formation flight. This is not to require a safety pilot to accept a safety ride with a person that is unknown or a type of aircraft that the safety pilot is uncomfortable flying. The safety pilot may decline to accept the safety ride for any reason.

Minimum equipment for formation training or safety rides includes dual controls, headset VHF radio and interphone. Hand held radios are not acceptable unless they may be used hands free with a PTT switch, headsets and interphone capable.

Appendix E

PROCEDURES AND PAPERWORK

The procedures for arranging, taking and giving a safety ride are relatively simple. There are only a few steps in the process.

1. Generally speaking, the person giving the training cannot give the safety ride. This is accepted practice used by the military as well as the airlines. This is also the policy of the JLFC. Under special circumstances, however, the JLFC may approve a waiver prior to the flight being conducted using the *administrative review process* as outlined in item 7 below.

2. Determine if all the requirements have been met. If so, the safety ride can proceed at the convenience of the safety pilot and the applicant. If all the requirements have not been met, and the lead/safety pilot feels the applicant is qualified, the applicant can request before the safety ride, a waiver of some of the requirements by the *administrative review process* as outlined in item 7 below.

3. The safety pilot will use the JLFC Flight Evaluation Form with the recommendation signed by a lead or safety pilot prior to conducting the safety ride. The release/hold harmless clause will be signed by the applicant prior to conducting any flight training. The applicant and the safety pilot can then perform the safety ride. If the safety ride is unsuccessful, the safety pilot will note the areas needing work and mail the Flight Evaluation Form to the JLFC Records Chairman. If the safety ride is successful, the safety pilot will enter his/her Control Number as evidence of a successful safety ride and the applicant will be responsible for mailing the completed Flight Evaluation Form along with the \$15.00 administration fee to the JLFC Records Chairman. It is recommended that the applicant keep a photo copy of the form in case of loss or destruction.

4. At the time of this writing, the JLFC Records Chairman is Tom Gordon, 3210 S. County Road 23, Loveland, CO 80537.

5. The currency reports (JLFC Activity Report) are to be sent to the same person as the flight evaluation forms, see item #3.

6. The Flight Evaluation Forms and currency reports (JLFC Activity Report) will be used by the JLFC to maintain records and may be disposed of at the discretion of the records chairman. The Release/Hold Harmless Agreements should be kept on file and maintained by the records chairman. These agreements should be on file for each wingman, lead or safety card issued.

7. *Administrative Review Process.* This allows a partial waiving of the requirements upon the recommendation of a safety or lead pilot. Before the safety ride, the recommending safety or lead pilot must call the chairman of the standardization committee who will confer with at least two other members of the committee to determine the need or advisability of waiving the requirements. Upon approval of waiver, the safety ride may be performed. The decision making process may include determining whether the applicant has additional ratings, how much the applicant is flying each year, the type of time the applicant has (whether it is all in warbirds or other types of time), what profession the applicant has and other items that need to be investigated.

7. Decertification due to non-currency. A pilot may be decertified by non-

currency. This means the pilot has not participated in any formation flights for one calendar year. In the first year after currency is lost, a lead pilot may recertify a wingman with a successful practice flight. After two years, the wingman must take a safety ride with a safety pilot. A lead pilot may regain currency in the second year by successfully leading a practice flight with another current lead or safety pilot in the flight observing the lead pilot. After the second year, the lead pilot must take a safety ride with a safety pilot. A safety pilot may be decertified by non-performance of safety rides or non-currency of flights. After safety pilot decertification, the pilot must have a safety ride with a current safety pilot.

Decertification may include pilot incapacitation due to medical deficiency, substance abuse or an unsafe attitude. Any JLFC pilot may request a decertification of another pilot for an unsafe act(s). If a safety pilot observes an unsafe act, the safety pilot is authorized to immediately decertify the pilot. A pilot that is decertified due to an unsafe act has an appeal process to follow.

A. If a safety pilot decertifies a pilot, the safety pilot may require an immediate safety ride. If the safety ride is refused or not successfully completed, the pilot is decertified.

B. If the safety ride is not successful, the decertified pilot may request another safety pilot for an additional safety ride. If the second safety ride is successful, the first and second safety pilots will confer and come to a mutual agreement. If they are unsuccessful in reaching an agreement, or if the decertified pilot does not agree with the findings, the chairman of the JLFC must be notified to convene an appeal committee.

C. The appeal committee will consist of three safety pilots, one appointed by the chairman, one appointed by the decertified pilot and the two safety pilots will select a third safety pilot. None of the appeal committee are to be involved with the original action or secondary safety ride. The three pilots are to represent a cross-section of the membership. The appeal committee will investigate as necessary and render a decision. The decision may be appealed to the standardization committee whose decision is final.

D. The safety pilots or the appeal committee or the standardization committee have the discretion to reinstate the pilot in a different level than before, have remedial training and then a safety ride, permanent decertification or recertification in the same level as before or other remedies as may be appropriate.

8. Decertification due to unsafe act. A pilot may be decertified for an unsafe act. This is defined as a deviation from safe procedures as it relates to aviation safety. It usually will relate to formation safety, but may also include general aviation safety.

Appendix F

POLICY NOTES

1. All applicants must attend a JLFC sanctioned ground school and pass the JLFC Formation exam with at least a 90% score before beginning flight training. This includes pilots previously qualified by other FAST signatories.
2. Each applicant should possess a copy of the Bushhawk Formation Manual, the T-34 Formation Manual and the JLFC Operations Manual -- all available at cost from the JLFC Records or Registration Chairmen,
3. Any JLFC Safety Pilot or Lead (or FAST Check Pilot or Lead) may recommend an applicant for a Safety Ride per Appendix A of this manual. But a different JLFC Safety Pilot must give the ride. Likewise, any JLFC Safety Pilot or Lead may recommend an applicant for a FAST check ride. This tried and true policy of separate training and checking is in use by both the military and airlines. It is not a question of mistrusting the instructor, but rather of keeping the process clean and unquestionably above board. It precludes any favoritism or appearance thereof.
4. FAST forms are not acceptable. Using JLFC forms allows us to stand alone if necessary and maintain our own data base. JLFC forms suitable for copying are found in the "Forms" section of this Operations Manual.
5. Safety Pilots never charge for their services, but may at their discretion charge for travel expenses where extreme distances are involved. That expense should be assumed by the applicant.
6. If a lead or Safety Pilot passes an applicant on to another instructor, the gaining instructor will not fly with the applicant until he/she has conferred with the previous instructor.
7. Applicants are ordinarily expected to pay gas expense for their dedicated Leads during training flights. Exception: When all aircraft contain applicants. Dedicated leads are more desirable because applicants get to fly wing for the entire training period.
8. All Safety Rides will be conducted with only JLFC qualified Safety Pilots, Leads or Wingmen (other than the applicant) in the formation flight. Under no circumstances will non formation qualified pilots be part of a Safety Ride flight.
9. Any Safety Pilot who puts on a clinic elsewhere should have attended the JLFC Keokuk Clinic within the last year. Although not mandatory, this assures all pilots to be informed of JLFC standardization compliance.
10. Annual card renewal (January) is \$15, obtained by mailing a check to the Records Chairman made out to the JLFC and accompanied by a JLFC Activity Report (if none previously submitted during year). \$5 of this renewal fee goes to FAST for the stickers and \$10 goes to JLFC to cover administration cost.
11. Other formation pilots certified by FAST are not considered qualified by JLFC. FAST allows no reciprocity with the JLFC and JLFC none with FAST. Our JLFC pilots are considered by FAST to be qualified to fly only L-Birds/Light Trainers in wavered airspace. This creates confusion and frustration for our pilots who are both JLFC and FAST qualified, but for the foreseeable future they must

maintain dual qualification and currency.

12. Training of groups other than military L-Birds or Light Trainers: FAST has mandated (1999) that no FAST stickers will be issued to groups flying other than military type aircraft. This does not preclude JLFC from offering help to such groups, but does preclude issue of JLFC cards with FAST stickers. In line with our stated purpose of saving lives through encouraging safety, standardization and proficiency, JLFC will continue to offer aid to these groups as our finite resources allow and within the following guidelines. The goal being to train and check only a few core individuals, allowing groups to create their own programs and apply for FAA approval, just as JLFC did some years ago. Successful applicants may also purchase JLFC patches.

A. Groups other than L-Bird and Light Trainers will be encouraged to receive any training or checking by volunteer JLFC Leads or Safety Pilots at the groups' geographical locations, not at JLFC Clinics. All expenses of lodging, travel and meals will be paid by the requesting groups. Training and checking of such groups, at JLFC clinics or elsewhere, will be in like performance aircraft. Suitability of like aircraft types will be at the discretion of participating JLFC pilots after consultation with the JLFC Standardization Committee. All aircraft must meet JLFC equipment standards (ie: dual controls and VHF radio with microphone head sets -- no hand operated hand helds).

B. Some "Other" groups may train at JLFC clinics on a highly restricted basis. The Registration Chairman will assign priority to military type L-Bird and Light Trainers. Any other types or group registrations will be held by the Registration Chairman and accepted only if training slots still exist thirty days before the event. Even then they will be instructed that they may be bumped until one week prior by L-Bird or Light Trainer applicants. Those bumped will be sent full refunds. Other groups must arrive at the clinic with at least two aircraft of similar performance and configuration and be responsible for their own coordination of such arrangements. Only one non-JLFC group will be accepted per clinic, on a first come, first serve basis.....unless the Registration Chairman determines that a surplus of Leads and Safety Pilots will exist at the clinic. JLFC will give training and safety rides to a maximum of two of the group's most qualified pilots or a one time safety ride, but no training, for up to four of their elsewhere qualified pilots. In any case, all applicants will attend the JLFC ground school and satisfactorily demonstrate pre-study of JLFC formation procedures from the T-34 and Bushhawk manuals before proceeding to flight training or checking.

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Joint Liaison Formation
Committee
(JLFC)



**Two Ship
Formation Flight Syllabus**
Three Periods

Joint Liaison Formation Committee Flight Syllabus

Period 1 - Two ship basic formation

Review: (.5 Hrs.)

- Signals: hand, aircraft.
- Emergency procedures: Inflight emergencies -HEFOE, abort on takeoff, lead change.
- Radio discipline: check in, frequency numbers, frequency changes, non-briefed frequency changes, traffic calls.
- Standard formation configurations: Fingertip/echelon, trail, enroute.
- Cross unders, break-up and rejoins, radius of turn cut-off, over shoot energy management.
- Turns in fingertip/echelon, trail, enroute.
- Terminal procedures: maneuvering, 360° overhead break, line astern, downwind break, intervals, wave off.
- Taxi in, shut down procedures.

Flight brief: (.5 Hrs.) Use briefing card

- Flight call sign; "Dawg Flight"
- Departure taxi route, runway, intersection or full length takeoff
- Weather (departure and destination stations): current, forecast, winds, altimeter setting, field elevations.
- Frequencies (departure and destination stations): ATIS, ground, tower, enroute, assignment of frequency numbers.
- Times: start, taxi, takeoff, rendezvous, practice area, other.
- Enroute: altitude, airspeed, RPM.
- Weather flight separation: altitudes, rendezvous location, orbit pattern, altitude, direction and airspeed.
- Bingo fuel, fuel management, nearby airfields.
- Landing: destination traffic pattern altitude and direction, arrival procedures.
- Runway turnoff, taxi in, shutdown.

Flight: (1.5 Hrs.)

- Start, check in, taxi, takeoff.
- Rendezvous/join up.
- Straight and level practice: Basic position/station keeping.
- Cross unders, trail position, enroute position.
- Turns: 360°, 180°, 90° (into and away), fingertip and trail position.
- Straight climbs and descents: fingertip and trail position.
- Climbing turns and descents: fingertip and trail positions.
- Landing preparation: pre landing checks, landing lights.
- Pattern entry: downwind break (four seconds).
- Landing: alternate sides of runway, runway turn off.
- Taxi in, shut down.
- Debrief.

Joint Liaison Formation Committee Flight Syllabus

Period 2 - Two ship basic formation

Review: (.3 Hrs.)

- Previous flight: hand and aircraft signals, emergency procedures, radio discipline, basic formation positions and procedures, terminal procedures, landing, taxi in and shut down procedures.
- Break-up and rejoin.
- Radius of turn, overshoot energy management.
- 360° overhead break, alternate side of runway landing, wave off.
- Questions and answers.

Flight brief: (.2 Hrs.) Use briefing card

- Flight call sign; "Potato Flight"
- Departure taxi route, runway, intersection or full length takeoff.
- Weather (departure and destination stations): current, forecast, winds, altimeter setting, field elevations.
- Frequencies (departure and destination stations): ATIS, ground, tower, enroute, assignment of frequency numbers.
- Times: start, taxi, takeoff, rendezvous, practice area, other.
- Enroute: altitude, airspeed, RPM.
- Weather flight separation: altitudes, rendezvous location, orbit pattern, altitude, direction and airspeed.
- Bingo fuel, fuel management, nearby airfields.
- Landing: destination traffic pattern altitude and direction, arrival procedures.
- Runway turnoff, taxi in, shutdown.

Flight: (1.5 Hrs.)

- Start, check in, taxi, takeoff.
- Rendezvous/join up.
- Straight and level practice: Basic position/station keeping.
- Cross unders, trail position, enroute position.
- Turns: climbing and descending, fingertip and trail position.
- Break-up and rejoins.
- Loose tail chase.
- Landing preparation: pre landing checks, landing lights.
- Pattern entry: 360° overhead break (three seconds).
- Landing: alternate sides of runway, runway turn off.
- Taxi in, shut down.
- Debrief.

Joint Liaison Formation Committee Flight Syllabus

Period 3 - Two ship basic formation

Review: (.3 Hrs.)

- As necessary all two ship procedures.
- Questions and answers.

Flight brief: (.2 Hrs.) Use briefing card

- Flight call sign; "Bushhawk Flight".
- Departure taxi route, runway, intersection or full length takeoff
- Weather (departure and destination stations): current, forecast, winds, altimeter setting, field elevations.
- Frequencies (departure and destination stations): A.TIS, ground, tower, enroute, assignment of frequency numbers.
- Times: start, taxi, takeoff, rendezvous, practice area, other.
- Enroute: altitude, airspeed, RPM.
- Weather flight separation: altitudes, rendezvous location, orbit pattern, altitude; direction and airspeed.
- Bingo fuel, fuel management, nearby airfields.
- Landing: destination traffic pattern altitude and direction, arrival procedures.
- Runway turnoff, taxi in, shutdown.

Flight: (1.5 Hrs.) Training or check as necessary.

- Start, check in, taxi, takeoff.
- Rendezvous/join up.
- Basic position/station keeping.
- Cross unders, trail position, enroute position.
- Turns and climbs, fingertip and trail position.
- Tail chase/ lazy eights.
- Landing preparation: pre landing checks..
- Pattern entry: downwind (four seconds) or 360° overhead (three seconds) break as appropriate.
- Landing, runway turn off.
- Taxi in, shut down.
- Debrief.

Joint Liaison Formation
Committee
(JLFC)



**Four Ship
Formation Flight Syllabus**
Three Periods

Joint Liaison Formation Committee Flight Syllabus

Period 1 - Four ship basic formation

Review: (.5 Hrs.)

- Signals: hand, aircraft.
- Emergency procedures: Inflight emergencies -HEFOE, abort on takeoff, lead change.
- Radio discipline: check in, frequency numbers, frequency changes, non-briefed frequency changes, traffic calls.
- Standard formation configurations: Fingertip/echelon, trail, enroute.
- Section cross unders, break-up and rejoins, radius of turn cut-off, over shoot energy management. #4 positions and problems.
- Turns in fingertip/echelon, trail, enroute. Smoothness of section lead.
- Terminal procedures: maneuvering, 360° overhead break, line astern, downwind break, intervals, wave off.
- Taxi in, shut down procedures.

Flight brief: (.5 Hrs.) Use briefing card

- Flight call sign; "Dawg Flight"
- Departure taxi route, runway, intersection or full length takeoff
- Weather (departure and destination stations): current, forecast, winds, altimeter setting, field elevations.
- Frequencies (departure and destination stations): ATIS, ground, tower, enroute, assignment of frequency numbers.
- Times: start, taxi, takeoff, rendezvous, practice area, other.
- Enroute: altitude, airspeed, RPM.
- Weather flight separation: altitudes, rendezvous location, orbit pattern, altitude, direction and airspeed.
- Bingo fuel, fuel management, nearby airfields.
- Landing: destination traffic pattern altitude and direction, arrival procedures.
- Runway turnoff, taxi in, shutdown.

Flight: (1.5 Hrs.)

- Start, check in, taxi, takeoff (single ship).
- Rendezvous/join up by section.
- Straight and level practice: Basic position/station keeping by section.
- Cross unders, trail position, enroute position.
- Turns: 360°, 180°, 90° (into and away), fingertip and trail position.
- Straight climbs and descents: fingertip and trail position.
- Climbing turns and descents: fingertip and trail positions.
- Landing preparation: pre landing checks, landing lights.
- Pattern entry: Position section, downwind break (four seconds).
- Landing: alternate sides of runway, runway turn off.
- Taxi in, shut down.
- Debrief.

Joint Liaison Formation Committee Flight Syllabus

Period 2 - Four ship basic formation

Review: (.3 Hrs.)

- Previous flight: hand and aircraft signals, emergency procedures, radio discipline, basic formation positions and procedures, terminal procedures, landing, taxi in and shut down procedures.
- Break-up and rejoin by section.
- Radius of turn, overshoot energy management.
- 360° overhead break, alternate side of runway landing, wave off.
- Questions and answers.

Flight brief: (.2 Hrs.) Use briefing card

- Flight call sign; "Potato Flight"
- Departure taxi route, runway, intersection or full length takeoff.
- Weather (departure and destination stations): current, forecast, winds, altimeter setting, field elevations.
- Frequencies (departure and destination stations): ATIS, ground, tower, enroute, assignment of frequency numbers.
- Times: start, taxi, takeoff, rendezvous, practice area, other.
- Enroute: altitude, airspeed, RPM.
- Weather flight separation: altitudes, rendezvous location, orbit pattern, altitude, direction and airspeed.
- Bingo fuel, fuel management, nearby airfields.
- Landing: destination traffic pattern altitude and direction, arrival procedures.
- Runway turnoff, taxi in, shutdown.

Flight: (1.5 Hrs.)

- Start, check in, taxi, takeoff.
- Rendezvous/join up by section.
- Straight and level practice: Basic position/station keeping by section.
- Cross unders, trail position, enroute position.
- Turns: climbing and descending, fingertip and trail position.
- Break-up and rejoins by section.
- Loose tail chase.
- Landing preparation: pre landing checks, landing lights.
- Pattern entry: Position section, 360° overhead break (four seconds).
- Landing: alternate sides of runway, runway turn off.
- Taxi in, shut down.
- Debrief.

Joint Liaison Formation Committee Flight Syllabus

Period 3 - Four ship basic formation

Review: (.3 Hrs.)

- As necessary all two ship procedures.
- Questions and answers.

Flight brief: (.2 Hrs.) Use briefing card

- Flight call sign; "Bushhawk Flight".
- Departure taxi route, runway, intersection or full length takeoff
- Weather (departure and destination stations): current, forecast, winds, altimeter setting, field elevations.
- Frequencies (departure and destination stations): ATIS, ground, tower, enroute, assignment of frequency numbers.
- Times: start, taxi, takeoff, rendezvous, practice area, other.
- Enroute: altitude, airspeed, RPM.
- Weather flight separation: altitudes, rendezvous location, orbit pattern, altitude, direction and airspeed.
- Bingo fuel, fuel management, nearby airfields.
- Landing: destination traffic pattern altitude and direction, arrival procedures.
- Runway turnoff, taxi in, shutdown.

Flight: (1.5 Hrs.) Training or check as necessary.

- Start, check in, taxi, takeoff.
- Rendezvous/join up by section.
- Basic position/station keeping by section.
- Cross unders, trail position, enroute position.
- Turns and climbs, fingertip and trail position.
- Tail chase/ lazy eights.
- Landing preparation: pre landing checks..
- Pattern entry: Position section on downwind, interval turning base (four seconds) or 360° overheadbreak (four seconds) or as appropriate.
- Landing, runway turn off.
- Taxi in, shut down.
- Debrief.

Joint Liaison Formation
Committee
(JLFC)



**Wingman
Practical Test Guide**

Foreword

In aviation, each rating, certificate or flying privilege requires the pilot or applicant to demonstrate his/her knowledge and skills in performance measures against a minimum standard. Each module of performance or individual task usually is demonstrated by a "level of accomplishment".

Each task and the associated level of accomplishment is a criteria by which an evaluator is able to judge and measure an individual's depth of knowledge and his/her ability to perform to minimum standard.

In all instances where aviation knowledge and skill are required, the individual must have, at some time past, taken a "check ride" to demonstrate competence. A check ride or flight test is the aviation community's way of providing for an evaluation of an individual's total knowledge and the ability to maneuver an aircraft precisely according to demands of the rating. Regardless of the rating or certificate, the process is the same.

The flight test process is always the same. A minimum standard of performance is established, and an applicant is required to demonstrate the necessary knowledge and skill necessary to meet the minimum. However, no one is perfect, therefore each module or task usually will incorporate tolerances in levels of performance. While we are all familiar with the average stated standards of heading $\pm 10^\circ$, ± 100 ft altitude for general flying, no such criteria has been developed for the civilian evaluation process to judge the quality of formation flying on an individual task basis, objectively!!!

The Joint Liaison Formation Committee has officially set up the Formation Standardization Committee and adopted the Canadian Bushhawk Liaison Squadron "Formation Flight Syllabus" as approved by the Warbirds of America's Board of Directors in August, 1994. The Formation Standardization Committee along with the F.A.S.T. Committee, by definition and intent, are promoting a standard. Both the organizations have officially adopted the curriculum of the T-34 Association "Formation Flight Manual" and Darton International's "Formation Flying, The Art" video. The syllabus of each curriculum is dedicated to the basics of formation flight. Each of these training aids, the manuals and the video, is integral to the process of safe formation flight, the manuals for describing the standards, and the video for teaching and visually demonstrating the process.

However, neither the manuals nor the video have standardized or codified the evaluative process. Concomitant with the Formation Standardization Committee and the F.A.S.T. Committee's goals of standardization in formation flight as it relates to all of the U.S. Warbird community, we are establishing a flight test process which incorporates a criteria for evaluation. This criteria has been developed for each maneuver and is organized as an objective flight test guide to be used by each formation safety pilot.

The current evaluative process as specified by the T-34 Association manual provides for formation pilot certification by "... performance and maneuvers to a (level) acceptable to the check pilot". This objectivity is desirable in a small organization where like aircraft are all being flown. Merging liaison and light trainer organizations in the process of formation flight demands more structure. The primary emphasis of new structure is a standardization of safety pilots from all organizations through the use of a "standard of performance" manual or flight test guide for formation pilot wingmen and leaders.

A "standard of performance" manual 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 pilot. Basic airman qualification will include:

- Private pilot, minimum (preferably commercial)
- 200 hours total time
- Current third class medical with limited waivers (specify)
- Flight test recommended by a currently qualified lead or safety pilot

Partial waiving of these standards will be considered only by the Formation Standardization Committee in accordance with the appeal process.

The "s.o.p." guide for each level of formation pilot; i.e., wing, lead or safety, incorporates a simplified grading system. We are adopting a system of judging competency as either QUALIFIED or UNQUALIFIED.

Further defined, a safety pilot may be able to use the following guidelines to determine a formation pilot applicant's level of competency and grade accordingly. An evaluation of "unqualified" in any flight phase while airborne, including takeoff and 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, the failure should trigger a consultation with the individual who recommended the applicant.

The qualification format will be the Canadian Bushhawk Liaison Squadron "Wingman Responsibilities" and the T-34 Association "Wingman Qualification Report" for a wing card and the Canadian Bushhawk Liaison Squadron "Flight Leader Responsibilities" and the T-34 Association "Flight Leader Qualification" for lead card. These guides are excellent and generic. There is enough subject latitude in each guide so as to allow a check pilot grading discretion. This guide has been approved by the Joint Liaison Formation Committee, Warbirds of America and F.A.S.T..

The safety pilot must ride with the applicant for the check ride. In event of a single place aircraft, see the addendum for exceptions.

All formation flight safety ride candidates must have received and logged formation flight training from one of the following sources to qualify for a formation flight safety ride. In addition any approved JLFC or F.A.S.T. lead or safety/check pilot must endorse and recommend the applicant for the check ride. The safety ride must be conducted by a JLFC Safety pilot.

- A. Liaison & Light Trainer Formation Flight Training Program.
- B. Military flight training.
- C. Confederate Air Force Traron formation training.

E. Any other formation training program certified by a JLFC safety pilot who states the training was in accordance with the Canadian Bushhawk Liaison Squadron Formation Flight Manual and T-34 Association Flight Manual/Darton International Formation Flying Video, syllabus and curriculum.

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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.

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 standard for issuance of formation pilot "wingman" credentials.

STANDARDS GRADING FORM

Phase 1 - Oral

Objective 1

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

- Run-up
- Frequency changes
- Number signals
- Head nod
- Wingman cross
- Element cross
- Break-up and rejoin
- Gear and flap cycling
- Power additions and reductions
- Level off
- Climb
- Descent
- Fuel state inquiry
- Inflight emergency
- Can't hear
- Can't transmit
- Lead change
- Stack up
- Stack down
- #4 in slot

QUALIFIED:

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

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. Additionally, applicant is able to explain the basic concepts of formation flight.

- Standard formation configurations: trail, echelon, fingertip, enroute, diamond.
- Cross unders, rejoins, aircraft configuration changes(*).
- Break-up and rejoin, radius of turn cut-off, overshoot energy management.
- Turns in fingertip, echelon, trail, enroute, terminal maneuvering.
- Lead change, emergency signals, HEFOE system.
- 360° overhead approach, breaks, intervals, section landings(*), wave off.
- Emergency abort on takeoff.
- Inflight emergency procedures.
- Section(*) go around procedures (wave off).

(*) See Addendum

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 method of aircraft control to assure safety and is able to describe proper wingman techniques for formation changes. 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 basics of each formation and configuration change.

Standards Grading Form

Phase 2 - Flight

Objective 3

Start time, start, taxi, response to signals.

QUALIFIED:

Applicant properly plans pre flight, is strapped in and ready at start time. Applicant concentrates on leader and complies with start, radio check in and taxi signals. Applicant configures aircraft as leader turns into proper ground taxi position, and maintains taxi position without excessive use of power or brakes.

UNQUALIFIED:

Applicant is generally not prepared at pre brief start time. Applicant does not accomplish start in flight number sequence or uses excessive time. Applicant misses signals, taxi position is incorrect, and/or uses excessive power and brakes to maintain position.

Objective 4

Radio discipline: check in, frequency change.

QUALIFIED:

Applicant has recorded all pre brief frequencies in proper order of use. Applicant anticipates radio calls from lead and responds "crisply" with flight position number on all commands. Applicant checks off and on all assigned channels, and frequency changes are made timely so as not to disrupt flight number sequential check in. If applicant aircraft is NORDO, he is able to precisely and effectively communicate his situation to his leader by use of hand signals, including recognition of all numerical digits.

UNQUALIFIED:

Applicant is aware of all pre brief procedures but uses them out of sequence. Applicant misses two or more radio check ins or selects incorrect frequency and delays flight. Applicant does not respond to hand signals from his leader or misunderstands numerical digit instructions. Applicant's general awareness concerning radio discipline is not at a level consistent with what is required for safe formation flight.

Objective 5

Run up, check list and standard procedures.

QUALIFIED:

Applicant taxis into proper parade position in sequence, space permitting and smoothly stops with no wing overlap. Applicant complies with lead run up signal and performs run up and pre takeoff checks in timely manner. Upon completion of checks, applicant configures his ship for safe takeoff without missing any check list items, selects proper transponder code (standby), and acknowledges ready with thumbs up to his leader. Thumbs up signal must be in sequence only when all flight members are ready.

UNQUALIFIED:

Applicant lines up in pad with wing tip overlap and/or angular mismatch with lead. Applicant does not concentrate and misses run up signal, causing flight delay. Applicant rushes run up and pre takeoff check list, squawks active and prematurely passes thumbs up to lead without checking down line formation members. Applicant's concentration and discipline are lacking and may cause flight safety hazard.

Objective 6

Section takeoff(*): position and power management.

QUALIFIED:

Applicant uses proper spacing and taxis into correct wing position for section takeoff(*). At brake hold, applicant acknowledges run up signal, checks instruments, then concentrates on leader. At leader head nod commencing takeoff roll, applicant smoothly adds power and maintains position during takeoff roll. While maintaining position during acceleration, applicant does not use excessive power adjustments, is smooth on all controls and rotates to liftoff with his leader. After liftoff, applicant maintains position on the wing and properly complies with gear up and power adjustment signals from his leader. Throughout the maneuver, the applicant performs smoothly without over control of excessive relative motion.

UNQUALIFIED:

Applicant is hesitant about proper position for section takeoff and needs prompting. Applicant complies with run up signal and, at head nod commencing takeoff, becomes sucked or acute. Applicant's response is excessive power control which does not correct position error. Aircraft control is not smooth, and applicant's position at liftoff is not consistent with procedures. Applicant either remains acute or sucked after takeoff, necessitating large power changes. Parade position is attained after takeoff only by asking lead for course modification to establish cutoff.

(*) See Addendum

Objective 7

Station keeping, climbing turns 90° and 180°, level off and power reduction.

QUALIFIED:

Applicant exhibits precise aircraft control, resulting in little or no relative motion. Applicant's maneuvering and his power control are timely, with no erratic throttle control. Vertical and horizontal positions are stable while in either fingertip or echelon turns. Applicant is able to smoothly and precisely maneuver his aircraft, assuring proper station keeping position. Applicant's smoothness enhances the ability of "3" or "4" to maintain relative position. Applicant monitors engine performance and systems periodically to assure compliance within aircraft limitations. Applicant stays alert and aware while consistently maintaining concentration and discipline assuring the integrity of the flight.

UNQUALIFIED:

Applicant exhibits poor level of concentration, which manifests itself by rough aircraft control. Station keeping is erratic and not predictable. Power usage is excessive, with M/P or RPM excursions. Applicant routinely goes acute of gets sucked and/or does not maintain wing tip clearance. Applicant fails to monitor aircraft systems periodically and is behind the airplane. Applicant's aircraft control is uncoordinated and not definitive. Applicant's attitude is good, but his skills and performance in formation flight may pose a safety hazard.

Objective 8

Cross unders: power management smoothness, proper nose/tail clearance.

QUALIFIED:

Applicants use of power and primary flight controls is smooth, coordinated and predictable. Cross unders are performed using the correct technique with power, stepdown, nose to tail clearance and prompt power usage. Applicant understands and acknowledges lead signals. Cross unders are at the correct rate and station keeping after cross under is in the correct position.

UNQUALIFIED:

Applicant repeatedly fails to cross under safely. Applicant typically removes excess power and becomes sucked or removes too little power and cross under is performed with insufficient nose to tail clearance. Applicant also uses incorrect heading change when commencing cross under, causing crossing speed to be too fast or too slow.

AEW



Objective 9

Break up and rejoin: signal recognition, proper interval, radio call, cut off angle, 45° line, overshoot energy management.

QUALIFIED:

Applicant understands and is able to describe the mechanics and geometry of radius of turn and energy management with respect to break ups and rejoins. Applicant responds correctly and acknowledges lead breakup command. When the maneuver begins, applicant breaks at the command interval and turns into trail with lead on the horizon at approximately 1000 - 1200 feet astern. Applicant demonstrates radius of turn principal in break up phase so as not to overrun or lag in trail on lead. When lead signals rejoin and commences maneuver, applicant demonstrates understanding of maneuver by slight power application to gain approximately a 5-10 kt speed advantage over lead and simultaneously turns with leader at a rate that places him inside lead's radius on a 45° bearing line. From this point, applicant demonstrates his understanding of the maneuver by adjusting bank and/or intercept track to arrive at a wing station keeping position in no more than 180° of turn. Applicant uses power as required when within 2-4 plane lengths of the lead but does not substitute power usage for proper cutoff, or exceed engine limits during power changes.

In the event of an impending overshoot, the applicant uses proper underrun procedure and does not position himself on the outside of the leader's turn, vertically, any higher than an echelon wing position. Applicant demonstrates, during overshoot, proper use of clear air space outside leader's radius of turn and reserves enough energy to effect the rejoin by turning back inside of leader's turn without becoming sucked. Applicant exhibits no tendency to go wing up, lose sight of his leader and is always smooth and predictable on the controls.

UNQUALIFIED:

Applicant has difficulty understanding and describing the geometry necessary to be applied in the rejoin process. Applicant requires tutoring and/or graphic descriptions, including drawings, to perceive the rejoin process. While in flight, applicant has difficulty maintaining correct spacing during break up and in trail phase of the maneuver. When the rejoin is commenced by lead, the applicant either uses too little or too much angle of bank and positions himself on an incorrect bearing line. When on a sucked bearing line, the applicant does not perceive the angle necessary to affect the rejoin and attempts to use excessive power to overcome the sucked condition. When the applicant establishes a bearing line which is acute, once again he attempts to use power to manage the closure rate as opposed to establishing the correct intercept line. When the closure rate becomes excessive, the applicant has a tendency to go belly up or lose sight of his leader. Alternately, in an overshoot condition, the applicant uses excessive aircraft heading change, and in doing so is positioned so great a distance from the lead that he blows the possibility of reintercepting the lead's radius of turn. With counsel and demonstration, the applicant is still not able to perceive the correct sight picture and effect a safe rejoin.

Objective 10

Landing gear(*) and flap recycling, turns in "dirty" configuration, power and position management, signal recognition, energy management.

QUALIFIED:

From a position of station keeping, lead will signal the wingman applicant to extend the landing gear(*) and flaps. The applicant promptly recognizes the configuration changes signaled by the leader and acknowledges them with a head nod. When the leader is ready to execute the configuration change, he signals the wingman applicant with a head nod, and the applicant promptly effects the configuration change. During the configuration change, the applicant controls his aircraft so as to maintain precise station keeping position, especially pitch changes about the lateral axis. During the configuration changes, the applicant modulates the power smoothly, as required, to maintain his relative fore and aft position.

While in the dirty configuration, the applicant maintains precise station keeping position, as in cruise flight. The applicant acknowledges and complies with power changes initiated by the lead while in the dirty configuration and maintains his position. Reconfiguring the flight from a dirty configuration to a clean configuration, the applicant acknowledges and complies with lead signals, adding power, retracting the gear and retracting the flaps while maintaining precise station keeping position.

UNQUALIFIED:

The wingman applicant receives and acknowledges the leader's command for configuration changes. When the leader executes the configuration change, the applicant's position changes substantially and he either becomes acute, sucked or goes wide. Additionally, he does not match pitch changes about the leader's lateral axis and overcompensates with large power modulations. When the wingman's aircraft is configured for landing, he is able to move into a station keeping position but over controls and does not trim his aircraft properly. When leader commences aircraft cleanup and reacceleration, the applicant once again breaks formation by not precisely matching the leader's attitude and power changes.

(*) See Addendum

Objective 11

Aircraft recognition signals: yaw, porpoise, wing rock.

QUALIFIED:

The wingman applicant, on receiving the yaw signal from the leader's aircraft, properly makes a coordinated small heading change and power reduction so as to move out to cruise formation flight position. Applicant recognizes proper cruise formation as being slightly stepped down from leader but slightly forward of the normal station keeping on an approximate 40° bearing line. The applicant, upon receiving the leader's aircraft porpoise signal, awaits the leader's slight turn and takes additional step-down and slightly reduces power to assume the close trail position. When stable in the close trail position, the wingman calls, "Two's in," or as the flight position number dictates. The wingman applicant, upon receiving the leader's wing rock signal, promptly proceeds from whatever formation position he is in to the standard station keeping position on the inside of the leader's turn. If the position change is from cruise formation, the applicant adds the appropriate amount of power and makes a slight heading change to "move up the line" and establish a normal station keeping position.

UNQUALIFIED:

The applicant misunderstands and/or does not acknowledge the lead aircraft yaw, porpoise or wing rock signals. Applicant misinterprets signals and performs the wrong position change. Applicant's concentration is not adequate and requires radio communication from the leader to perform position change. When in close trail or cruise formation, applicant does not understand wing rock signal and does not comply with leader's instructions: or, applicant understands wing rock signal, but aircraft control and energy management in the rejoin to station keeping necessitates large power manipulations or utilizing the under run procedure.

Objective 12

Lazy eights left and right and 45° bank plus or minus 20° pitch(*).

QUALIFIED:

The applicant maintains precise station keeping position and understands and appreciates the acceleration and deceleration effects with respect to the lazy eight (*) maneuvering. Applicant uses power with anticipation, smoothness and well within engine limits. As required, applicant advances the propeller control to a higher rpm so as not to exceed engine limits in engines which are supercharged. On the inside and outside of the turns, applicant's position does not change fore and aft as a result of acceleration and deceleration effects in the maneuvering. In the event that the leader positions the wingman in extended trail for the lazy eight maneuvering, the applicant sets a fixed power setting and maintains position, using appropriate vertical and horizontal cut off so as not to exceed spacing variations in excess of two plane lengths.

UNQUALIFIED:

Applicant is unable to maintain station keeping position precisely during maneuver. During inside turns, applicant continually goes to wing overlap and/or acute. During outside turns, applicant gets sucked and then overcontrols with power in an attempt to regain position. Applicant is rough on the controls, not coordinated and on occasion there is a potential for a safety hazard. The applicant, in extended trail maneuvering, cannot master the process of cut off to maintain nose to tail position. The applicant continually overcontrols with the throttle and, in combination with attempting to use cut-off, exceeds the recommended 60° maneuvering cone specified for extended trail flight.

(* See Addendum

Objective 13

Terminal maneuvers: overhead approach, break and landing or section landing(*).

QUALIFIED:

Applicant maintains precise station keeping position during echelon formation on initial approach to the airport. Applicant acknowledges lead's break up interval and times his break precisely to the interval and takes proper spacing, turning from the initial approach to down wind. Applicant maintains precise in trail position on the leader at the same altitude, configures his airplane for landing, and precisely flies the pattern to land on the appropriate side of the runway in accordance with his flight number position. Applicant touches down on the runway with spacing in accordance with the break up interval and/or that spacing set by flight member number 2.

During section landing(*), wingman applicant exhibits precise station keeping skills during that period of time that the leader has commanded the flight to configure their airplanes for landing. On final approach, applicant maintains the appropriate acute stack level position, with approximately 20 feet of wing tip spacing. When on 500 foot straight-away or short final applicant increases wing tip spacing, not to exceed 25 feet, and aligns his aircraft on his side of the runway. Applicant continues precise station keeping position of acute and stack level over the threshold and flares with his leader to touchdown. During flare, touchdown and roll out, applicant uses appropriate power so as not to get sucked or move ahead of his leader.

UNQUALIFIED:

Applicant exhibits poor station keeping capabilities, lack of confidence and lack of concentration, especially in the terminal area while approaching the airport. Applicant attempts to fly too close to his leader or encounters reasonably severe difficulty in maintaining a safe station keeping position. Applicant acknowledges lead's break up signal and interval but does not comply with the interval. Applicant's flight position after the break is not precise and the pattern is sloppy. Applicant ignores or misjudges his landing position on the runway and lands on the wrong side of the runway or on the center line against local course rules.

In preparation for section landing(*), wingman applicant is unable to maintain precise station keeping position during the process of reconfiguring the aircraft for landing. After configuration, as commanded by the lead, wingman applicant goes acute, wide or gets sucked to an extent that power modulation within engine limits will not allow for reattaining appropriate section landing station keeping position. Applicant exhibits lack of confidence, lack of concentration and flight capability to maintain precise section landing station keeping position, and may pose a flight hazard. Applicant is unaware of the safety hazard involved with radical position changes during a section landing approach and uses poor judgment in evaluating options such as wave off

(*): See Addendum.

Runway clearing, taxi in, shutdown and debriefing.

QUALIFIED:

Applicant clears runway in accordance with standard formation safety rules. Applicant rolls to the end, or as briefed, and clears at the last taxiway and turns into trail on his leader with pre briefed spacing. Applicant configures his aircraft as the leader's and maintains appropriate nose to tail clearance during taxi in. Applicant turns into the ramp space in flight number sequence, with the appropriate fuselage line up and spacing. Applicant shuts aircraft down in accordance with the command cut signal from the leader and the execution head nod. During debriefing, applicant is attentive and, when the case arises, accepts constructive criticism with appreciation and understanding. Applicant demonstrates maturity and objectivity and appreciates his responsibility to maintain the integrity of the flight.

UNQUALIFIED:

Applicant fails to exit the runway as briefed and/or possibly causes a ground conflict with other flight members on the landing roll out. Applicant turns to taxi behind leader but does not configure his aircraft as the leader. Applicant uses excessive power and/or brakes during the taxi in portion and does not maintain consistent spacing between his aircraft and his leader. Upon reaching the ramp, the applicant ignores or misunderstands the leader's shut down command and is either premature or late in shutting his aircraft down. Applicant's post flight aircraft securing is incomplete. During debriefing, applicant does not accept criticism well, makes excuses for errors in flight performance, and exhibits immature emotions. Applicant does not realize the importance of his responsibility in maintaining the integrity of the flight.

ADDENDUM

To accommodate the greatest number of potentially qualified Liaison, Light Trainer and Warbird operators for the purpose of formation safety rides, the following modifications to the standards of performance Flight Test Guide are incorporated.

Safety pilot's options (Include/Exclude as appropriate for type of aircraft)

1. Formation take off and landings in tailwheel aircraft.
2. Lazy eights in fingertip or echelon.
3. Type specific hand and aircraft signals, if standard for the aircraft type or operating entity, such as a museum. However, this DOES NOT preclude adoption and use of ALL standard signals, hand and aircraft, as described in the T-34 Association Formation Flight Manual. Use and understanding of hand and aircraft signals is a mandatory requirement to pass a formation flight safety ride.
4. Airborne configuration changes.

SINGLE SEAT SINGLE CONTROL CHECK RIDES

To accommodate single seat aircraft, a safety ride may be performed by use of a "chase aircraft". The applicant must meet all the conditions for formation flight, and must meet F.A.R. regulations for pilot in command. For purposes of this safety ride, a qualified lead must be in charge of the section. All flight member aircraft must be capable of two way radio communications, using permanently installed aircraft radios. The JLFC safety pilot must be rated in the chase aircraft and be flying pilot in command.

The flight must be conducted in accordance with the JLFC Formation Flight Practical Test Guide, excepting as noted herein or when type specific operations prohibit a maneuver or configuration.

A thorough briefing must be given prior to any safety ride, and extreme caution must be observed when performing flight safety rides using dissimilar aircraft.

Joint Liaison Formation
Committee
(JLFC)



**Flight Leader
Practical Test Guide**

Foreword

In aviation, each rating, certificate or flying privilege requires the pilot or applicant to demonstrate his/her knowledge and skills in performance measures against a minimum standard. Each module of performance or individual task usually is demonstrated by a "level of accomplishment".

Each task and the associated level of accomplishment is a criteria by which an evaluator is able to judge and measure an individual's depth of knowledge and his/her ability to perform to minimum standard.

In all instances where aviation knowledge and skill are required, the individual must have, at some time past, taken a "check ride" to demonstrate competence. A check ride or flight test is the aviation community's way of providing for an evaluation of an individual's total knowledge and the ability to maneuver an aircraft precisely according to demands of the rating. Regardless of the rating or certificate, the process is the same.

The flight test process is always the same. A minimum standard of performance is established, and an applicant is required to demonstrate the necessary knowledge and skill necessary to meet the minimum. However, no one is perfect, therefore each module or task usually will incorporate tolerances in levels of performance. While we are all familiar with the average stated standards of heading +/-10°, +/-100 ft altitude for general flying, no such criteria has been developed for the civilian evaluation process to judge the quality of formation flying on an individual task basis, objectively!!!

The Joint Liaison Formation Committee has officially set up the Formation Standardization Committee and adopted the Canadian Bushhawk Liaison Squadron "Formation Flight Syllabus" as approved by the Warbirds of America's Board of Directors in August, 1994. The Formation Standardization Committee along with the Formation and Safety Team (F.A.S.T.), by definition and intent, are promoting a standard. Both the organizations have officially adopted the curriculum of the T-34 Association "Formation Flight Manual" and Darton International's "Formation Flying, The Art" video. The syllabus of each curriculum is dedicated to the basics of formation flight. Each of these training aids, the manuals and the video, is integral to the process of safe formation flight, the manuals for describing the standards, and the video for teaching and visually demonstrating the process.

However, neither the manuals nor the video have standardized or codified the evaluative process. Concomitant with the Formation Standardization Committee and the Formation and Safety Team's (F.A.S.T.) goals of standardization in formation flight as it relates to all of the U.S. Warbird community, we are establishing a flight test process which incorporates a criteria for evaluation. This criteria has been developed for each maneuver and is organized as an objective flight test guide to be used by each formation safety pilot.

The current evaluative process as specified by the T-34 Association manual provides for formation pilot certification by "... performance and maneuvers to a (level) acceptable to the check pilot". This objectivity is desirable in a small organization where like aircraft are all being flown. Merging all Liaison and Light Trainer organizations in the process of formation flight demands more structure. The primary emphasis of new structure is a standardization of safety pilots from all organizations through the use of a "standard of performance" manual or flight test

guide for formation pilot wingmen and leaders.

It is recognized that the flight leader is the cornerstone of the JLFC formation program. Therefore, the selection, training, recommendation and evaluation of new flight leaders should be held to the highest standards. Furthermore, standardization is the key to having a successful national formation program, and every attempt must be made to ensure that standard practices are followed in the selection, training and evaluating of flight leader candidates.

GENERAL RESPONSIBILITIES

Under the JLFC program, the flight leader is responsible for the safe conduct of all formation flights under his/her control. He/she is responsible for the selection of the wingmen to fly in his/her flight. This implies that the flight leader is familiar with the wingmen's qualification and experience level with respect to the mission to be accomplished, whether it be a local training flight or a demanding air show. The flight leader is charged with verifying his/her wingmen's credentials (license, medical, JLFC wingman qualification and currency) as well as their condition to fly and their currency and competency in type.

The JLFC program qualifies all formation pilots to one set of standards, irrespective of the aircraft in which the pilot performs the safety ride. It is then incumbent upon the flight leader to determine if the wingman is qualified and current to fly in the flight leader's flight, in what might be a different type aircraft. Airshow promoters must rely heavily on the individual flight leaders to select only properly qualified pilots to fly in their shows, again demonstrating the importance of well qualified, responsible flight leaders.

TRAINING

For the national formation program to succeed and continue, it is critical that there be a system to both train new formation pilots and to provide for maintaining the proficiency of all formation pilots. The flight leader must provide this function.

While not required, it is desirable that a flight leader have a background in flight training, such as a CFI, military flight lead, air carrier flight instructor, or a civil or military check airman. Flight leader applicant is responsible for providing additional training as required, for recommending decertification of wingmen if necessary and for recommending wingmen and flight leader applicants for flight safety rides.

RECORDS

The flight leader is responsible for maintaining and reporting to the appropriate JLFC organization the currency records for the wingmen with whom applicant has flown and deems current and proficient via the Formation Activity Report. As previously noted and as contained in the Policy Manual, currency is for one calendar year renewable for an additional year.

QUALIFICATIONS

- Commercial pilot or equivalent(desired). CFI, military or air carrier flight instructor is highly recommended.
- 500 hours total time.
- Current third class medical with limited waivers (specify).
- 75 hours logged in formation flight.
- Fully qualified and experienced as a JLFC Wingman for at least one year.
- 15 hours and a minimum of ten flights in four ship formation (or two ship if testing for two ship flight leader).
- Safety ride recommendation by a current qualified JLFC Flight Leader or Safety Pilot.
- Applicant must lead a four or two ship, depending on rating sought. Wingmen in flight must hold at least JLFC Wingman qualification.
- Member of the JLFC.
- Pass the safety ride.

LEADERSHIP

Leadership ability is the most important quality that must be evaluated in each candidate for the JLFC Flight Leader test. It is to this standard that all maneuvers and briefings will be evaluated. To qualify for a flight leader, it is not enough to be a good wingman (although it certainly helps) or a good pilot. The applicant must possess those qualities which communicate to his/her wingmen that applicant is both qualified and proficient in a flight leader position as well as in all the piloting skills necessary for the aircraft type being flown and the mission of the flight. The flight leader must be able to demonstrate that applicant is not only in charge and responsible, but that applicant is also an individual the wingmen are confident and comfortable in following and from whom they will readily obey directions and orders.

Decisions made by a flight leader can literally involve life or death. Decisions that affect the safety of a flight of multiple aircraft must be made rapidly and be based on a sound foundation of aeronautical experience and knowledge. To this end, the JLFC requirements for a flight leader have been made noticeably more stringent. To safely lead a formation of aircraft for which one is totally responsible implies above average knowledge of the aircraft, its systems and performance limitations; the airspace and ATC environment; the wingmen and their limitations and qualifications; all formation hand signals and procedures; and the situational awareness and operational techniques that a good leader must possess to smoothly and safely lead a flight.

In the execution of all required maneuvers, the flight leader will be judged by the performance of his/her wingmen.

The true test of a flight leader is the application of leadership techniques and the ability to fly the aircraft in a manner which can easily and safely be followed by his/her wingmen. The bottom line is that the selection of flight leader candidates is the cornerstone of the JLFC program. It is not an honorary position and the candidates should represent the most knowledgeable, best qualified and, most importantly, the best leaders. The litmus test that each safety pilot must apply to each candidate is: "Would I be willing to fly on this pilot's wing and be led by him/her under all conditions of flight?"

The "s.o.p." guide for each level of formation pilot; i.e., wing, lead or safety, incorporates a simplified grading system. We are adopting a system of judging competency as either QUALIFIED or UNQUALIFIED.

Further defined, a safety pilot may be able to use the following guidelines to determine a formation pilot applicant's level of competency and grade accordingly. An evaluation of "unqualified" in any briefing or debriefing, ground or flight phase will cause a "down" for the flight, and the applicant should be required to obtain further training. Applicants will be given credit for those portions of the safety ride successfully completed.

The qualification format will be the Canadian Bushhawk Liaison Squadron "Wingman Responsibilities" and the T-34 Association "Wingman Qualification Report" for a wingman card and the Canadian Bushhawk Liaison Squadron "Flight Leader Responsibilities" and the T-34 Association "Flight Leader Qualification" for a flight leader card. These guides are excellent and generic. There is enough subject latitude in each guide so as to allow a safety pilot grading discretion. This guide has been approved by the Joint Liaison Formation Committee (JLFC).

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.

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 standard for issuance of formation pilot "leader" credentials.

STANDARDS GRADING FORM

Phase 1 - Oral

Note: This oral phase shall be accomplished for flight leader candidates even though it was accomplished as part of their wingman test. This is to insure absolute standardization in all signals, procedures and maneuvers among all flight leaders.

In addition, the applicant shall have complete knowledge and understanding of the flight leader responsibilities, as set forth in the Foreword to this Practical Test Guide and in the Policy Manual.

REQUIRED MATERIALS

To be an effective flight leader and instructor and to ensure safety and standardization, all flight leaders should have in their possession the following materials:

- "Formation Flight Manual", T-34 Association
- "Canadian Bushhawk Liaison Squadron Formation Flight Manual"
- "Formation Flying - The Art", Darton Int'l Video (recommended)
- J.L.F.C. Formation Wingman Practical Flight Test Guide
- J.L.F.C. Formation Flight Leader Practical Flight Test Guide
- J.L.F.C. Formation Flight Activity Forms

Objective 1

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

- Run-up
- Frequency changes
- Number signals
- Head nod
- Wingman cross
- Element cross
- Break-up and rejoin
- Gear and flap cycling
- Power additions and reductions
- Level off
- Climb
- Descent
- Fuel state inquiry
- Inflight emergency
- Can't hear
- Can't transmit
- Lead change
- Stack up
- Stack down
- #4 in slot

QUALIFIED:

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

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. Additionally, applicant is able to explain the basic concepts of formation flight.
- Standard formation configurations: trail, echelon, fingertip, enroute, diamond.
- Cross unders, rejoins, aircraft configuration changes(*).
- Break-up and rejoin, radius of turn cut-off, overshoot energy management.
- Turns in fingertip, echelon, trail, enroute, terminal maneuvering.
- Lead change, emergency signals, HEFOE system.
- 360° overhead approach, breaks, intervals, section landings(*), wave off.
- Taxi-in, shutdown procedures
- Radio discipline: check in, frequency changes, traffic calls.
- Emergency abort on takeoff.
- Inflight emergency procedures.
- Section(*) go around procedures (wave off).

(*) If applicable to aircraft type.

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 method of aircraft control to assure safety and is able to describe proper wingman techniques for formation changes. 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 basics of each formation and configuration change.

STANDARDS GRADING FORM

PHASE 2 - BRIEFING

Objective 3

Organize and brief a flight or mission of four aircraft (or two aircraft if testing for two ship lead). The safety pilot will ride in the lead aircraft with the flight leader candidate. All flight members will be at least J.L.F.C. Wingman qualified. The flight should include all the elements and maneuvers contained in the T-34 Association, "Flight Leader Qualifications" and the Canadian Bushhawk Liaison Squadron "Flight Leader Responsibilities", plus formation take-offs and landings (*) in addition to overhead approaches.

(*) If applicable to aircraft type.

QUALIFIED:

Applicant properly planned 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 the leader and in charge. All the elements contained in the T-34 Association, and the Canadian Bushhawks Liaison Squadron's, "Formation Briefing" form are covered. Emergency procedures are briefed. All flight members clearly understand the briefing and all elements are consistent with standardized J.L.F.C. 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 tone 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 and the Canadian Bushhawk Liaison Squadron "Formation Briefing" form are omitted and emergency procedures are not discussed. The briefing elements, hand signals, etc., are not standardized in accordance with J.L.F.C. policy and procedures.

STANDARDS GRADING FORM

Phase 3 - Flight

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 ATIS and 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. Applicant complies with all ATC communications.

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.

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, leads by consensus and committee, is lead 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 conditions.

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 acknowledgements 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 takeoff(*), element rejoin after takeoff.

(*) If applicable to aircraft type

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's radio communications are clear and concise and applicant complies with all ATC instructions and clearances. Since many ATC facilities are unfamiliar with formation operation, applicant makes his intentions clear to the ATC facility. Applicant is constantly alert for other conflicting traffic; and 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 "course rules", maintains communications on the appropriate CTAF frequency and is alert to all local traffic.

Applicant aligns on the runway on the downwind or the 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 acknowledgement from the wingmen. 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 briefed power setting, which gives a sufficient power advantage to the wingmen. Directional control is precise. Rotation is smooth and precise to the takeoff attitude and the aircraft is allowed to "fly off" the runway. The gear up (and flap, if appropriate) signal is clearly given only when the flight leader has determined that the wingman is safely airborne. As in all phases of this test, the flight leader applicant will be judged by the performance of his wingmen.

When at a safe altitude and airspeed, applicant gives the signal for a power reduction to the wingmen 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 positioned on the inside of the turn - a cross under might be necessary to accomplish this. 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.

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 or 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 the 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 a 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 too little power, needlessly extending the takeoff roll and causing the wingman to use excessive brakes or power reduction to maintain position. Applicant rotates abruptly at too low a speed or at too high a speed, either forcing the aircraft into the air before it is ready to fly or causing the aircraft to skip along the runway because it is being forcibly being held down. In either case, the wingman has difficulty in executing a satisfactory section takeoff. As in all phases of this test, the flight leader applicant will be judged by the performance of the wingmen.

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 takeoff 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, altitude 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.

(*) If applicable to aircraft type.

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 takeoff, 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 used throughout, clearly given and acknowledgements 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 signals and to accomplish the formation, configuration or frequency change. As in all phases of this test, the flight leader will be judged by the performance of the wingmen. Throughout all required maneuvers, the wingmen are able to easily maintain proper formation position with smooth control and throttle inputs.

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 logical sequence. There is dead space between maneuvers and poor use is made of airspace and altitude. 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 proceeds with maneuvers for which the flight is not ready or is not in 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 aircrafts' 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 acknowledgements go unnoticed, cause doubt among the wingmen as to what is to be accomplished. Radio procedures are non standard, ATC and interflight 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. As in all phases of this test, the flight leader applicant will be judged by the performance of the wingmen.

Objective 7

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

(*) If applicable to aircraft type

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 aide the wingmen in gaining separation to fall back into the trail position. Lead waits until the #4 wingman radios that he is "in position" before beginning any maneuvers. The flight leader sets a comfortable power setting, which allows the wingmen a comfortable 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 and power 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° of bank and +/- 20° 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 the turn. The flight leader radios airspeed for the rejoin if it is different than briefed. Break-up 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. Airspeed is maintained at the briefed speed and any changes greater than 10 KIAS are 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 whenever possible avoids positioning the flight so that safe visibility 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.

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 the maneuvers are not satisfactory. Airspace boundaries are exceeded and 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 the sun angle creates 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 lead in a manner which causes engine or aircraft limitations to be exceeded. FAR's or ATC restrictions are violated. 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 and acknowledgements are ignored. An inadequate 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 (none should be required) 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° overhead break and (b) formation landings (*)

(*) If applicable to aircraft type

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 appropriate ATC facilities or with local traffic on the CTAF at uncontrolled airfields. The lead respects local course 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° overhead approaches and formation arrivals. Adequate time and distances 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; acknowledgements are received. The lead is very alert for traffic and has briefed the wingmen to fly "loose" enough that they, too, can scan for traffic; this is not an airshow parade formation and you are not alone in the sky.

(a) 360° overhead approach; single ship landing.

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 wingmen are afforded an ample power advantage; minimum (none are preferred) 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° turning pattern, the downwind is not extended past abeam the touchdown point, traffic permitting. (Note: if there was traffic in the pattern, the break should have been extended upwind so that the base turn could be commenced abeam the touchdown point and not crowd the aircraft ahead.)

Touchdown is "on the numbers" in the touchdown zone on the downwind side of the runway, (in the case where runway length is not a factor the lead lands as far down the runway as possible in order to avoid turbulence caused by "prop wash" to his wingmen), the lead stays on his side, rolls to the end, or as

briefed, and clears on his side or crosses to exit, only when cleared by the aircraft behind. Lead marshalls clear of the runway and allows the wingmen to form up with him before he taxis to parking.

(b) Formation, section landings, if appropriate.

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 section landings, usually 30% to 50% greater than required for single ship landings.

The final approach is of sufficient length so that the flight can be sufficiently 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 or idle power setting by the wingman. The lead is cognizant of the wingman's position; i.e., that wingman is stacked level and forward; and if not correct, adjusts it. Lead also insures that the wingman is in the proper landing configuration (gear, flaps and etc.). 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. Properly executed, the wingman would touchdown slightly before 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.

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 allows 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 acknowledgements are ignored.

(a) 360° overhead approach, single ship landing.

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 do not have enough power or they are unable to prevent overshooting lead. The wingmen have to abuse their engines by overboosting or underboosting 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 turnoff 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 marshal with him.

(b) Formation section landings, if appropriate.

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 wingmen; lead positions the wingmen on the downwind side. The approach is rushed as are the non-standard signals to establish the airplanes in the landing configuration. Acknowledgements 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 of 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 covered and understood. 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 skill 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. They would willingly fly with this leader again.

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. His comments seem to be limited to, "Well, it was a pretty good flight, I don't have any comments, do you guys have any questions, if not let's get to the bar!"

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, his response is, "That's the way we do it around here." When in doubt he never refers to the standardization 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 were not noticed in flight, so, therefore, they 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 sub-standard flying was due almost entirely to his lack of skills as a flight lead. He has

no real knowledge of formation dynamics; or if he does, his lack of skill as an instructor or leader prevents him from communicating this important information to his wingmen in a useful manner.

Lacking in leadership skills, 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.

The flight members do not profit from this debriefing, no questions are answered, conflicts are left unresolved, it is a waste of time, confusion and doubt exists as to many of the elements of the flight ...but the wingmen do learn one thing - that they will never fly with this lead again!

**Joint Liaison Formation
Committee
(JLFC)**



**Safety Pilot
Practical Test Guide**

Foreword

The safety pilot practical test guide is organized differently from the other guides in that the subjects required are much further ranging and there is a need for determining judgement and critical analysis.

The JLFC safety pilot is the cornerstone of the JFC formation program and this program is built on the foundation of safety and standardization.

Safety pilots should be formation pilots of the highest standards, experience, qualifications and skills who are committed to safety in formation flights and to the JLFC program. They should have a strong background in flight instruction, formation and operation of warbird type aircraft.

They are selected on the basis of their qualification and on geographical need. The JLFC is responsible for their selection.

In the interest of standardization, the number of safety pilots should be kept to an absolute minimum and the certification of new safety pilots should be based solely on need. The process should be initiated by the JLFC if it determines there is a need for additional safety pilots to cover a specific geographical area. The JLFC has the safety pilots recommend a candidate for the position, determines if the candidate is qualified and interested in serving and then administers a safety and standardization review ride.

The position of safety pilot is NOT to be considered an additional "merit badge" that a formation lead pilot aspires to after becoming a flight lead. It is also NOT an honorary position that is bestowed on formation pilots.

The prospective JLFC Safety Pilot must sign a statement that the safety review will be conducted in accordance with the JLFC Guidelines. Furthermore, the candidate must possess all the current JLFC materials, to include: The Canadian Bushhawk Liaison Squadron Formation Flight Manual, the T-34 Formation Flight Manual, the JLFC Safety, Leader and Wingman practical test guides, the JLFC policy guide, safety review and formation activity report forms. The Darton video, "Formation Flying - The Art" is also recommended.

Once the need for an additional safety pilot has been identified by the JLFC and a pilot has been selected who meets the requirements, the candidate is given a safety review by a member of the standardization committee or its designated representative.

The candidate safety pilot should be observed if possible in a formation flight as wingman, as flight leader and most importantly in the capacity of a safety pilot giving a safety review. The sole purpose of this ride is to insure SAFETY and STANDARDIZATION and that the candidate understands all the aspects of the JLFC program including the administrative details, safety review forms, formation activity reports and the like. Due to the subject matter being reviewed (judgement, critical analysis, communications ability, etc.), there are no specific maneuvers required or graded.

The requirements for a safety pilot are higher than for the formation pilot since they will literally determine the success or failure of the entire program. In addition to being able to fly very well, he/she needs to possess very good critical analysis skills to help determine the abilities of the candidates for the other ratings.

Safety pilots are strongly requested to file activity reports to maintain currency, both for the safety pilot and for the other pilots in the formation.

It cannot be emphasized too strongly that the safety pilot is the cornerstone of the entire JLFC program. As such, the safety pilot must be of the highest caliber and must maintain a high regard for safety, adherence to the standards and service to the entire formation flying community.

PILOT CREDENTIALS

- Commercial pilot and one of the following is desired:
 - FAA Examiner or Designee
 - Military Check Pilot, current or former
 - Airline Check Pilot, current or former
 - CFI, current
- Current 3rd Class Medical
- 2000 hours total flight time
- 100 hours minimum formation flight time
- 500 logged warbird/liaison flight time, all types
- Minimum of 5 years of formation experience, of which 3 is as a leader.
- Member of the JLFC
- Recommendation of 2 other safety pilots
- Commitment to volunteer and serve the formation flying community
- Must adhere to all the JLFC policy and sign that all safety rides will be in accordance to the JLFC guidelines
- Take and pass a safety ride

TO MAINTAIN THE SAFETY PILOT STATUS:

- Must give at least one safety review every two years
and/or
- Give 5 hours of formation dual annually (and report the dual given)
and/or
- Be observed by another safety pilot while performing a safety review
and/or
- Lead a four ship at three airshows a year
or
- Must attend one safety pilot standardization meeting every two years
or
- Be recommended and approved to continue as a safety pilot by the JLFC

PARTIAL WAIVER OF SOME OF THE STANDARDS

Prior to the safety review, the applicant will contact the chairman of the standardization committee with the request for the waiver. The chairman will confer with at least two other members of the committee before granting or denying the request.

DECERTIFICATION

A safety pilot may be decertified for violations of safety, non-adherence to the JLFC standards or by the standardization committee. In the event a safety pilot is decertified, the pilot has the following appeal process. First, notify the Chairman

of the JFC of the desire to appeal, the Chairman will then appoint 2 safety pilots, the safety pilot appealing will appoint 2 other safety pilots and these four appointed safety pilots will select a 5th safety pilot. The panel of 5 safety pilots will determine and examine the information necessary to reach a decision. The decision of the safety pilot panel may be appealed to the standardization committee, whose decision is final.

Joint Liaison Formation Committee (JLFC)



Forms

The forms that follow in this section are not for use in everyday operation, but for duplicating only. The fold out forms are designed so that they may be duplicated on any print copy machine on standard 8 1/2" X 11" copy paper. The single page forms are for reference as to how they should be assembled, formatted and cut (if necessary). I hope this method is helpful in ease of use and providing as many forms as you may need.



Joint Liaison Formation Committee

Wingman Qualification Report

Date: _____

Name: _____ Phone No. (____) _____

Address: _____ Aircraft type: _____

Location: _____ Aircraft no.: _____ Flight duration: _____

Document Check	S	U	Flight Phase	S	U
License/Medical			Start time, taxi, response to signals		
Log Book: 200 total hours			Radio discipline: check-in, frequency changes		
Required Materials			Run-up: check list and standard procedures		
Oral Phase (Briefing)	S	U			
Standard Hand Signals: Run-up, frequency changes, number signals, head nod, wingman cross, element cross, break-up and rejoin, gear and flap cycling, power addition and reduction, level-off, climb, descent, fuel state inquiry, inflight emergency, can't hear, can't transmit, lead change, stack up, stack down, #4 in slot.			Section takeoff: position and power management(*)		
			Climbing turns: 90° and 180°, level off and power reduction		
			Cross unders: power management, smoothness, proper nose/tail clearance		
Standard formation configurations: trail, echelon, fingertip, enroute, diamond			Break-up and rejoin: signal recognition, proper interval, radio call, cut-off angle, 45° line, overshoot energy management		
Cross unders, rejoins, aircraft configuration changes			Landing gear and flap cycling, turns in dirty configuration, power and position management, signal recognition		
Break-up and rejoin, radius of turn cut-off, overshoot energy management			Aircraft recognition signals: yaw, porpoise, wing rock		
Turns in fingertip, echelon, trail, terminal maneuvering			Lazy eights left and right and 45° bank plus or minus 20° pitch (*)		
Lead change, emergency signals, HE-FOE system			Terminal maneuvers: Overhead approach, break and landing or section landing(*)		
360° overhead approach, break, intervals, section landing (*)			Runway clearing, taxi-in, shutdown, and debriefing		
Taxi-in, shut down procedures					
Radio discipline: check-in, frequency changes, traffic calls			(*) May not be appropriate for aircraft; at safety pilot's discretion.		

Flight Evaluation:

Card issued (Date): _____ No _____ (Check One): Two Ship _____ Four Ship _____

Further training and recheck: _____ Safety Pilot's Number: _____

Pilot

Signature: _____

RECOMMENDATION FOR A CHECK RIDE



as Wingman _____ as Flight Leader _____



Date: _____

I have observed _____ in _____ formation flight(s) in position 1 ____, 2 ____, 3 ____, 4 ____ and find him/her qualified to fly formation. The formation flight has been in _____ (type of aircraft). I recommend the safety ride be performed.

Flight Leader/Safety Pilot Number _____

RELEASE/HOLD HARMLESS AGREEMENT

Date: _____

The Undersigned Holder/Applicant of/for the Wingman ____, Leader ____, Safety Pilot ____ Formation Qualification Card hereby acknowledges and attests that he/she is an active member of the J.L.F.C.. As an active member of the J.L.F.C., I hereby agree to be familiar with, and abide by, the Guidelines, Rules and Regulations established by the J.L.F.C. . I further acknowledge and understand that the Guidelines, Rules and Regulations of the J.L.F.C. have been established to provide the Holder/Applicant of/for this card with the minimum information necessary to understand the procedures and signals of formation flying, and further I acknowledge and understand that it is my sole responsibility to keep fully informed, current and aware of all information available from whatever source concerning formation flight. The undersigned recognizes and agrees that no representations or warranties have been made to him/her which are inconsistent with any of the procedures, signals and policies as set forth within the Formation Flight Manuals, (all editions) published by the Canadian Bushhawks Liaison Squadron, the T-34 Association, Inc. or the Darton International, Inc. video, "Formation Flying - The Art". Further, I hereby acknowledge that this Formation Card/Evaluation does not waive my obligation to abide by the applicable local, state and Federal rules and regulations. I further recognize that formation flight training and formation flying is inherently dangerous wherein there is a possibility of death or injury, and in consideration of my acceptance of this Formation Qualification Card/Evaluation, issued by the J.L.F.C., I, for myself, my heirs, executor, administrators and assigns do hereby release and forever discharge this Organization, its members, employees, suppliers, agents or representatives of and from any and all claims, demands, losses or injuries incurred or sustained by me as a result of instruction, training, attending, participating in, practicing for and traveling to and from activities involving formation flights. Further, I agree to accept any and all financial obligations incurred as a result of medical assistance, hospitalization and related expenses which may arise out of participation, attendance, practicing for, traveling to and from or because of engaging in formation flights, organized and sanctioned by any named entity or individual herein..

Printed Name of Applicant: _____

Address: _____

Phone Number: (____) _____

Signature of Applicant: _____



Joint Liaison Formation Committee

Flight Leader Qualification Report

Date: _____

Name: _____ Phone No. (____) _____

Address: _____ Aircraft type: _____

Location: _____ Aircraft no.: _____ Flight duration: _____

Document Check	<input checked="" type="checkbox"/>	Oral, Briefing and Flight Test Phase	S	U
License				
Current Medical		Oral		
Log Book: 500 total hours total time 25 hours formation		Flight Briefing		
JLFC Wingman - minimum of one year		Ground start time, taxi, run-up		
Recommended for a check ride by a current Leader or Safety Pilot		Radio communications, standard signals and procedures		
Required Materials: Canadian Bush-hawks Liaison Squadron Formation Manual, T-34 Formation Manual, JLFC Wing or Lead Flight Test Guide, have viewed Darion video: "Formation Flying - The Art", JLFC Formation Activity Reports		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, climbs and descents.		
Flight Evaluation: Card issued (Date): _____ No _____ (Check One): Two Ship _____ Four Ship _____ Further training and recheck: _____ Safety Pilot's Number: _____		Advanced training maneuvers: in trail, lazy eights(*), break-ups and rejoins. Traffic pattern: 360° overhead breaks, approaches and formation landings(*).		
Comments:		Debriefing		

(*) May not be appropriate for aircraft: at safety pilot's discretion.

Pilot
Signature: _____

RECOMMENDATION FOR A CHECK RIDE



as Wingman _____ as Flight Leader _____



Date: _____

I have observed _____ in _____ formation flight(s) in position 1 _____, 2 _____, 3 _____, 4 _____ and find him/her qualified to fly formation. The formation flight has been in _____ (type of aircraft). I recommend the safety ride be performed.

Flight Leader/Safety Pilot Number _____

RELEASE/HOLD HARMLESS AGREEMENT

Date: _____

The Undersigned Holder/Applicant of/for the Wingman _____, Leader _____, Safety Pilot _____ Formation Qualification Card hereby acknowledges and attests that he/she is an active member of the J.L.F.C.. As an active member of the J.L.F.C., I hereby agree to be familiar with, and abide by, the Guidelines, Rules and Regulations established by the J.L.F.C.. I further acknowledge and understand that the Guidelines, Rules and Regulations of the J.L.F.C. have been established to provide the Holder/Applicant of/for this card with the minimum information necessary to understand the procedures and signals of formation flying, and further I acknowledge and understand that it is my sole responsibility to keep fully informed, current and aware of all information available from whatever source concerning formation flight. The undersigned recognizes and agrees that no representations or warranties have been made to him/her which are inconsistent with any of the procedures, signals and policies as set forth within the Formation Flight Manuals, (all editions) published by the Canadian Bushhawks Liaison Squadron, the T-34 Association, Inc. or the Darton International, Inc. video, "Formation Flying - The Art". Further, I hereby acknowledge that this Formation Card/Evaluation does not waive my obligation to abide by the applicable local, state and Federal rules and regulations. I further recognize that formation flight training and formation flying is inherently dangerous wherein there is a possibility of death or injury, and in consideration of my acceptance of this Formation Qualification Card/Evaluation, issued by the J.L.F.C., I, for myself, my heirs, executor, administrators and assigns do hereby release and forever discharge this Organization, its members, employees, suppliers, agents or representatives of and from any and all claims, demands, losses or injuries incurred or sustained by me as a result of instruction, training, attending, participating in, practicing for and traveling to and from activities involving formation flights. Further, I agree to accept any and all financial obligations incurred as a result of medical assistance, hospitalization and related expenses which may arise out of participation, attendance, practicing for, traveling to and from or because of engaging in formation flights, organized and sanctioned by any named entity or individual herein..

Printed Name of Applicant: _____

Address: _____

Phone Number: (____) _____

Signature of Applicant: _____



Joint Liaison Formation Committee Activity Report



Date _____ Aircraft Type _____ Number in Flight _____

Type of Activity (check One):

Safety Review Practice Training Cross-country Airshow

Flight Members

Print Name	JLFC Formation Card No	Signature
#1 Leader		
#2 Wingman		
#3 Section Leader		
#4 Wingman		

Safety Pilots/Flight Leaders Present		JLFC Formation Card No	Position Flown
Print Name			

Total Flight Time _____ Landings _____ T.O. _____

For currency Reporting Requirements for reissue of Formation Card every year see the Safety Pilot or Flight Leader Practical Test Guides of the JLFC Policy Manual as appropriate.

MAIL TO: Tom Gordon, JLFC Records Chairman, 3210 S. County Rd. 23, Loveland, CO 80537



Joint Liaison Formation Committee Activity Report



Date _____ Aircraft Type _____ Number in Flight _____

Type of Activity (check One):

Safety Review Practice Training Cross-country Airshow

Flight Members

Print Name	JLFC Formation Card No	Signature
#1 Leader		
#2 Wingman		
#3 Section Leader		
#4 Wingman		

Safety Pilots/Flight Leaders Present		JLFC Formation Card No	Position Flown
Print Name			

Total Flight Time _____ Landings _____ T.O. _____

For currency Reporting Requirements for reissue of Formation Card every year see the Safety Pilot or Flight Leader Practical Test Guides of the JLFC Policy Manual as appropriate.

MAIL TO: Tom Gordon, JLFC Records Chairman, 3210 S. County Rd. 23, Loveland, CO 80537

Joint Liaison Formation Committee



Flight Briefing



Flight Call Sign: _____

Departure Runway: _____ Taxi Route: _____

Weather: Winds: _____ Altimeter: _____

Alternate & Weather: _____

Positions: Lead _____ #2 _____

#3 _____ #4 _____

Frequencies:

Departure: ATIS () _____ Ground () _____

Tower () _____ Depart Con () _____

Enroute () _____ Air Show () _____

Arrival: ATIS () _____ Apch Con () _____

Tower () _____ Ground () _____

Time Hack: Start: _____ Takeoff: _____

Rendezvous: _____ Other: _____

Overhead (parade display): _____

Enroute: Altitude: _____ Airspeed/RPM: _____

Rendezvous: Point: _____ Orbit Alt/Speed _____

Landing: Pattern: _____ Altitude: _____

Formation: _____ Pitchout Interval: _____

Airspeeds: _____

Planned Maneuver Sequence: _____

Bingo Fuel: _____ Notes: _____

Joint Liaison Formation Committee



Flight Briefing



Flight Call Sign: _____

Departure Runway: _____ Taxi Route: _____

Weather: Winds: _____ Altimeter: _____

Alternate & Weather: _____

Positions: Lead _____ #2 _____
#3 _____ #4 _____

Frequencies:

Departure: ATIS () _____ Ground () _____
Tower () _____ Depart Con () _____
Enroute () _____ Air Show () _____

Arrival: ATIS () _____ Apch Con () _____
Tower () _____ Ground () _____

Time Hack: Start: _____ Takeoff: _____
Rendezvous: _____ Other: _____
Overhead (parade display): _____

Enroute: Altitude: _____ Airspeed/RPM: _____

Rendezvous: Point: _____ Orbit Alt/Speed _____

Landing: Pattern: _____ Altitude: _____
Formation: _____ Pitchout Interval: _____
Airspeeds: _____

Planned Maneuver Sequence: _____

Bingo Fuel: _____ Notes: _____

J.L.F.C. Operations Manual Change Suggestions

1. Provide background for suggested change(s) and include attachments if necessary.
2. Provide your name, address, phone number and date.
3. Route via mail to:

Records Chairman
c/o Tom Gordon
3210 South County Road 23
Loveland, CO 80537

Manual Section(s): _____

Page(s): _____

Proposed Change(s): _____

Reference Data: _____

Manual Section(s): _____

Page(s): _____

Proposed Change(s): _____

Reference Data: _____

NOTES