RED RADIALS

FORMATION

STANDARD OPERATING PROCEDURES

General

The following details the Standard Operating Procedures (SOPs) to be used by pilots participating in Red Radials (RR) formation activities.

These operations include:

- Close Formation,
- Combat,
- Long Line Astern and
- Tactical Formation (TACFORM).

This document only covers general procedures and close formation.

While the main aircraft types operating in RR formations are radial engine powered Yak and Nanchang aircraft, other types may be involved.
As a result, these procedures detail both generic and aircraft type specific procedures.

Formation leads need to consider, and brief, all issues associated with mixed type operations.

Throughout this document speeds are expressed in KPH(*Knots)* IAS.

Background information is included in Italics.

These SOPs are based on the RR Formation Procedures and Techniques manual. It should be referred to for more detailed information.

CLOSE FORMATION

Formation Stations

The close formation stations are:

Echelon, and
Line Astern.

For Yak/Chang aircraft, the correct formation position is achieved by aligning the following points:

Echelon Position

Vertical Alignment
Prop hub and aircraft centreline on horizon.

Lateral Alignment
Inside corner of the aileron in line with the cowl space.

Longitudinal Alignment
Forward tip of stabiliser aligned with the fin join reference.

If other aircraft types are participating in RR formations, the references must be agreed during the pre-flight phase.

There must be no wing overlap in the Echelon position.

Familiarity with these stations can be best achieved by standing next to an aircraft on the ground, and reviewing the echelon alignment points.

Line Astern.

The Line Astern position aims to achieve a spacing of one aircraft length.

Vertical Alignment
Rudder just out of “prop wash”.

Lateral Alignment
Directly astern the lead aircraft

Longitudinal Alignment
10 metres separation prop to rudder trailing edge.

FORMATION OPERATIONS

*The default standard procedure is indicated by **. Other options should be briefed specifically.*

Engine Start

Formation members complete their aircraft walk-around and then stand in front of their aircraft, or in a position where they can be seen by the lead. Once all members are ready, a thumbs up signal will be passed by the lead. *In dispersed situations, a time can be nominated in lieu of this routine.*

Formation members will then complete their pre-start checks and follow the procedure nominated during briefing:

** Radio:

1. Wait for the lead to check-in the formation on the briefed frequency.
2. After this, the lead will call “start”.

Nocom (as briefed):

1. Indicate ready to start with a “thumbs up” in view of the lead.
2. Lead will initiate the start using the appropriate hand signal.

or,

1. Start as soon as individual pre-start checks are complete.

or,

1. Start at the designated time.

Complete a standard start (and run-up, if briefed) and then wait for the leader to initiate a pre-taxi radio check-in on the briefed frequency.

If at the pre-start/pre-taxi radio check-in you are not ready to start/taxi, respond as per your formation position with the expected delay. Once subsequently able to proceed, call “ready” or give the lead a “thumbs up”

Taxying

Aircraft should taxi in order on the centreline, 30m apart.
Leads need to allow the wingman sufficient time to get into position when leaving the apron, then taxi at normal speed.
If there is the risk of FOD/ dust on the taxiway, extend aircraft spacing to 100m (as briefed).
On wide taxiways aircraft should stagger alternatively either side of the centreline.

The general tendency is to taxi too far apart (30m appears quite close).
Be aware that tailwheel aircraft will need to zigzag while taxying, for visibility over the nose.

Run-up

Where possible, line-up with fuselages parallel and heads aligned then:

** 1. perform an individual run-up check.
or (if briefed),
1. carry out a run-up together when commanded by the lead.

When checks complete and ready for departure indicate with a “thumbs up”. For formations greater than two aircraft, this is to be accomplished via a reverse order thumbs up from formation members. *That is, the last aircraft in the formation signals ready first. The next pilot indicates ready when he/she sees that signal and is also set for take-off. This continues down the line in turn until, finally, number two indicates ready to the lead.*

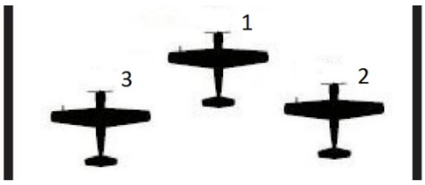
Runway Line-up.

Pair 2-Ship (22m Minimum Runway Width (MRW))

The leader will line up on the centre of the far side of the runway, wind permitting.
If the crosswind is greater than 5kts, the lead should take the downwind side.

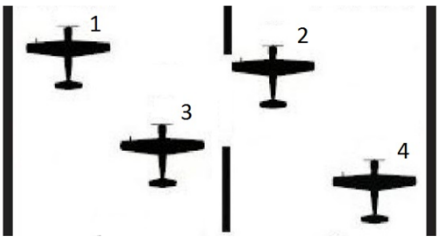
The wingman then lines up in the centre of his side of the runway, forward of the extended echelon line (*gives a “head start”).*

Vic 3-Ship (32m MRW)



The leader lines up on the centreline. Number 2 takes the right side and 3 the left. Both forward of the extended echelon line, with sufficient lateral spacing to ensure no wing overlap.

Battle 4, 3/4-Ship (22m MRW)



The two elements line up in a staggered pattern, with element leads on one side of the runway and wingmen the other. Wingmen again line up on the extended echelon line. The lead of the second element allows sufficient longitudinal spacing to ensure nose to tail separation. Wingtip overlap is permitted between pairs, to allow for runway width.

If there are only 3 aircraft, the first two aircraft take the centreline of their half. Number three lines up on the centreline.

Take-Off

The two basic formation departures are:

** Echelon Pair/Vic or,
Stream

Echelon take-offs are only permitted with the same type of aircraft (*e.g., Yak52/Yak52, Super Chang/Super Chang, Yak52TD/Yak52TD.*)

Echelon Take-off (2/3-Ship)

After lining up, the following visual signals will be used to conduct an echelon take-off:

1. The wingman will signal ready for departure with a “thumbs up”,
2. Leads will initiate increasing power to the appropriate setting (*70% Yak/Chang*) with the “run-up” hand signal.
3. Wingmen indicate ready for take-off by looking directly at the lead and giving a small head nod when he/she looks at them,
4. Lead will indicate commencement of the take-off with an exaggerated head nod. *The brakes release point is when the lead’s chin touches his/her chest*.

Lead should initially set Static MAP *(SL/760, 2000'/680). Gives the wingmen a power margin.*

Battle 4

A Battle 4 take-off is a combination of two element echelon take-offs with a suitable time interval. The spacing between elements should be at least 10 seconds.

Stream Take-off

Stream take-offs are to be flown when conditions could make a close formation take-off hazardous. *For example: strong crosswind, wet/short/narrow runway, high density altitude or FOD on the runway*.

Line up is carried out as for a standard echelon formation take-off.
When ready to commence the take-off, the lead will look across to the wingmen. They will indicate they are ready for take-off with a “thumbs up”.

The leader will not give a signal to ‘Run-Up’. Instead, they will look back to the front and then, without a head nod, release brakes and carry out an individual take-off using normal power. Wingmen will then commence their take-off after the briefed interval.
Stream take-offs should be carried out at 5 to 10sec intervals (as briefed).

In dusty/FOD conditions, or for operational reasons, a rolling stream take-off can be briefed or called on taxi out. In this procedure, each aircraft enters the runway in turn and commences their take-off without stopping on the runway.

Runway Abort.

Should the need arise for an abort during an echelon take-off, the aborting aircraft calls “STOPPING” on the radio and commences braking. The serviceable aircraft continues the take-off.
Stay on your side of the runway (*the centreline is a brick wall).*
During a stream take-off, aircraft behind an aborting aircraft will also stop.

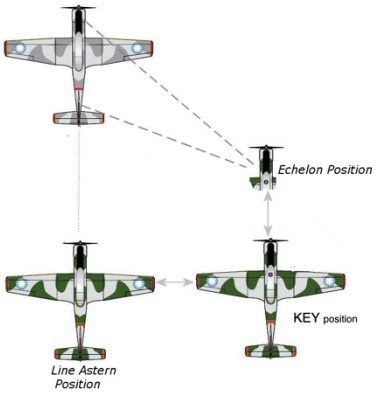
Stream Join-up

Lead should thoroughly brief the geometry of the join up following a stream take-off. Careful consideration should be given to the direction of turn with regard to departure track, operating area, terrain and cloud base.
Lead will climb straight ahead to at least 500 ft AGL before turning and set a reduced climb power. Then, level off at the pre-briefed height and maintain 185-200(*100-110)* IAS.
Do not rush the rejoin. Keep the aircraft/element ahead of you in sight and stay out of their way. Join the formation after they are in position.

Station Changing. *Cross Under (and behind)*

All changes from echelon are made through the line astern position.

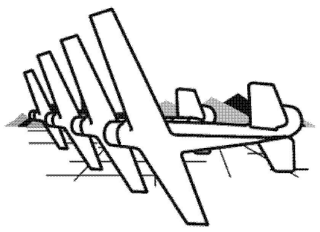
Wingmen should pass close to the KEY position during the transition from one position to another.



The leader may initiate changes by radio or visual signal. The wingman will acknowledge by immediately complying with the instruction.
A wingman may request a station change by radio. Movement should not commence until cleared by the leader (*radio or visual*).
The last aircraft in line astern should call “IN” when established in position.

Belly Turns

A belly turn is only to be used during turns away from wingmen in echelon.

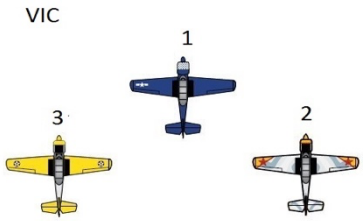


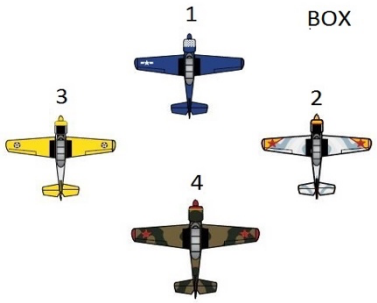
3 - 4 Aircraft Formations

Formations of 3 or more aircraft use combinations of the echelon and line astern positions.

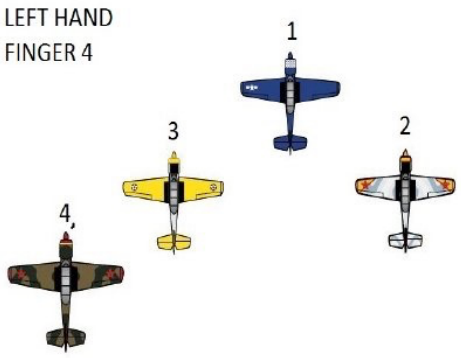
In echelon, pilots of aircraft further out than immediately "on lead's wing" should be able to see him/her. This allows them to include lead in some of their scan, which can moderate some of the formation movement. To help with this, the number 2 echelon aircraft should sit slightly lower than the normal position.

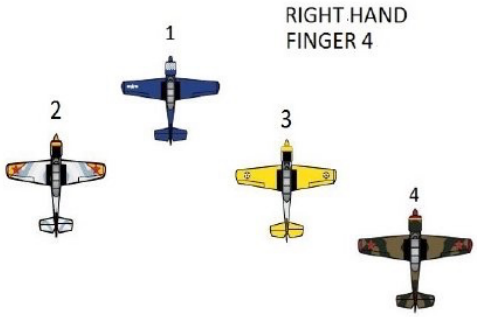
Standard Formations





Note : "Reverse Vic" and "Reverse Box" have 2 and 3 on the opposite side.



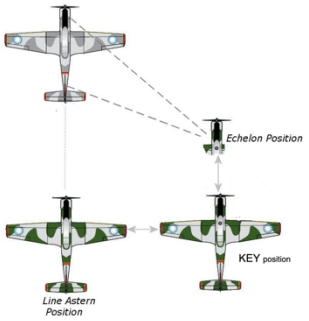


Changes in formation symmetry (e.g., Vic → reverse Vic) should be performed by initially calling the formation into line astern.
If the formation is in BOX, the appropriate FINGER 4 positions should be achieved before further formation changes.

Rejoining

Rejoins are used to allow aircraft to get into position after a loss of contact situation, following a stream take-off and to join elements in large formations.

The aim point for a rejoin is the KEY position of the aircraft most on the inside of the turn.
Pass through this point with low or no closure. From there follow the techniques (and pace) of a normal station change, to get into the required position.

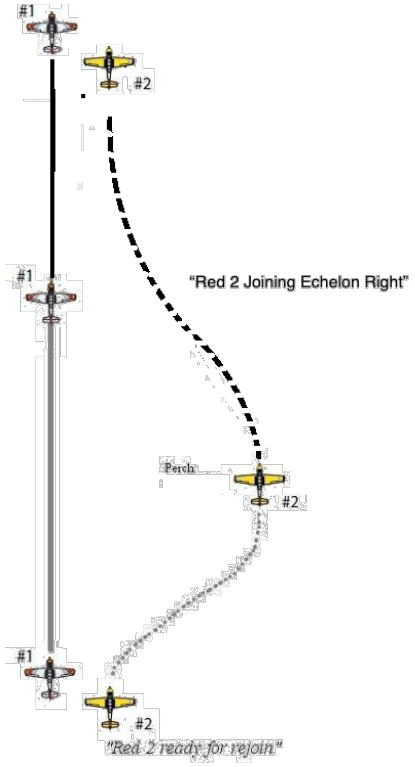


All overshoots from rejoins must be below and behind the aircraft ahead.
Never lose sight of the aircraft ahead!

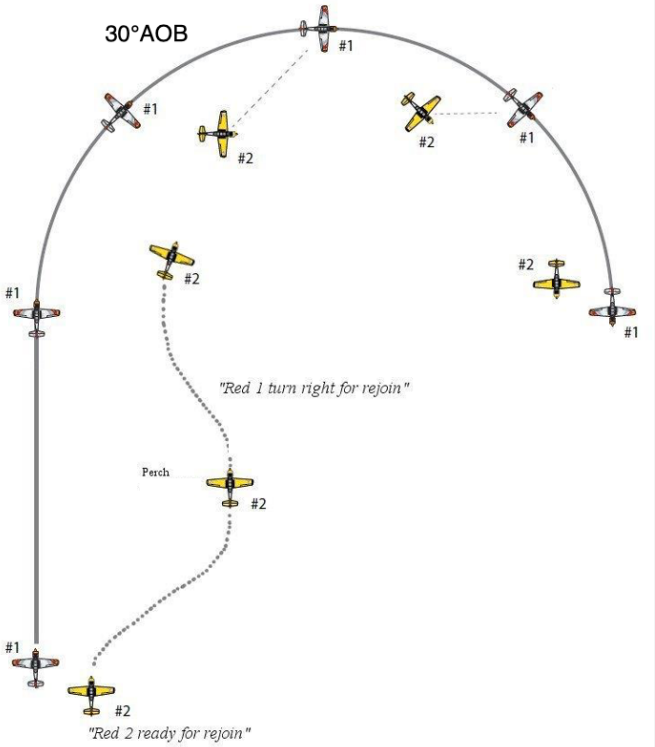
Practise Rejoins

** **2-Ship** practise rejoins (turning and straight) can be performed using the **"perch method**". They are a training exercise and, therefore, the wing aircraft sets the pace (initiation, lateral separation, start of turn and angle of bank). Lead is responsible for lookout, area maintenance and traffic monitoring.

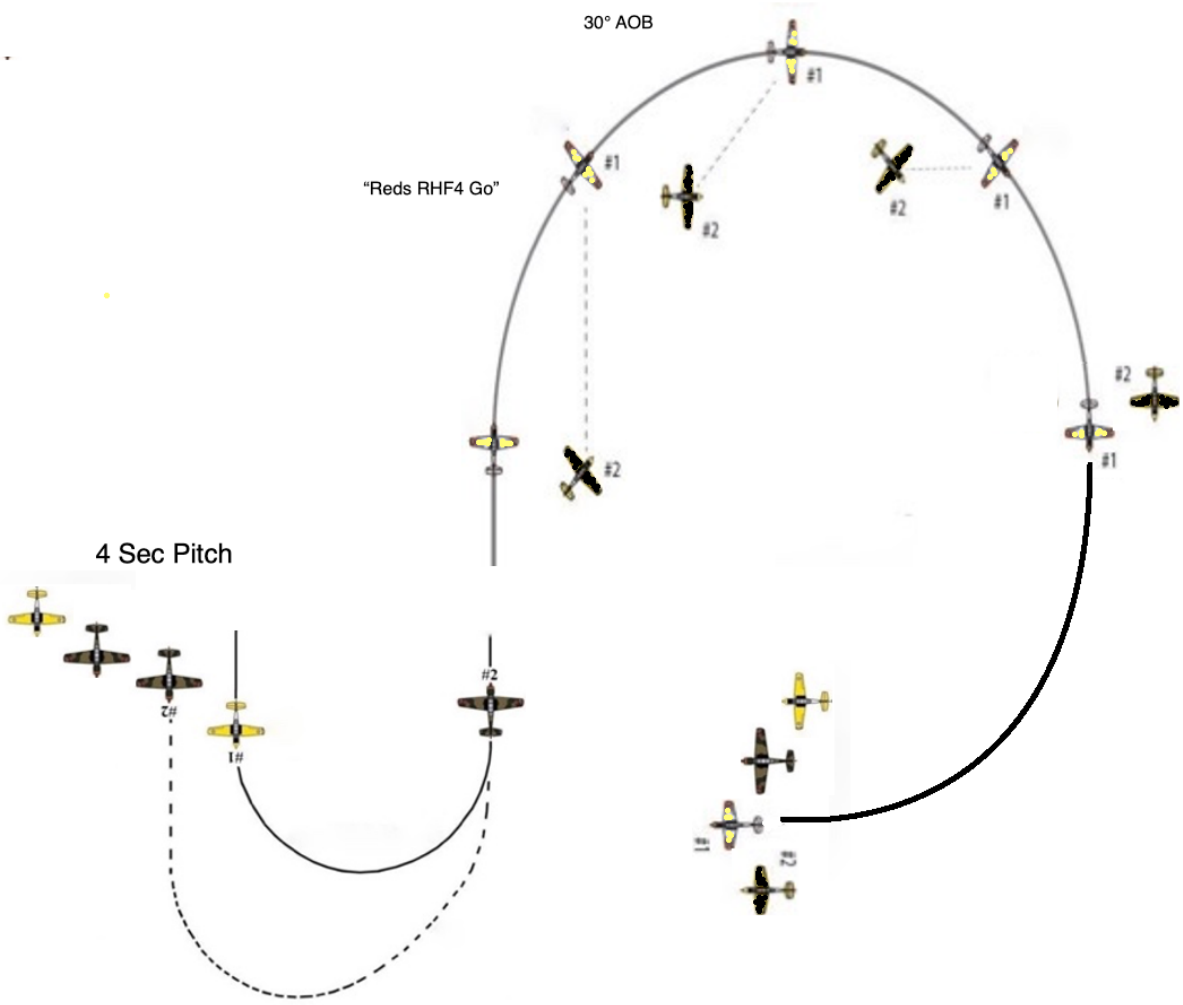
Straight Rejoin



Turning Rejoin



3/4 Ship practise rejoin exercises (turning only) use the "**pitchout method**". In this case lead sets the pace.



Lead Changes

The formation leader may change the lead at any time for either exercise purposes or due to an aircraft unserviceability.
Element aircraft and deputy leads should be ready to take the lead and continue operations at any time.

Formation lead changes should only be undertaken in VMC conditions and well clear of other aircraft. A lead change implies the changing of responsibilities for each aircraft captain.
A lead change may be initiated from any formation station whilst in level flight. The aircraft taking the lead should pass at least one wingspan laterally abeam the lead. Only a moderate overtake is required.

Only “take the lead” after passing abeam the lead aircraft.

There is no renumbering of the formation after an airborne lead change.

Responsibility rests with the formation member relinquishing the lead to properly brief the new lead on any airspace restrictions or air traffic control requirements.

Return to Base (RTB)

Returns to Base are performed by:

**1. Initial and Pitch
2. Join via crosswind or downwind.
3. Pairs approach.

Initial and Pitch.

The formation tracks via an Initial Point (IP) to the airfield. The IP should be at least 2nm downwind on the dead side of the extended active runway centreline. *This allows for formation station changes and traffic assessment/location.*

Formations arrive over the airfield on the dead side of the landing runway.

Each aircraft then joins the circuit, via crosswind, by pitching from echelon at the briefed interval.

Minimum pitch interval is 4 seconds.

GAIN AND DO NOT LOSE SIGHT OF THE AIRCRAFT AHEAD!

During the pitch and downwind, wingmen adjust to maintain the leader's altitude and track until lead's base turn.

Enter the base turn no later than when the aircraft ahead is in your right 2 or left 10 o'clock position. *This will ensure that you turn at the same point as the aircraft ahead and that aircraft spacing remains constant.*

The ideal distance between aircraft is 600m on base, facilitating a minimum landing separation of 500m on the runway.

Fly a standard base turn and finals. *The aircraft ahead should, at all times, be at the same distance in-front and below your level as at the initial base turn.*

In addition to your normal final checks, make a conscious note of the spacing between you and the aircraft ahead. Approaching the flare, the aircraft ahead should have passed the 1000ft markers. If not, it is unlikely that the minimum required landing separation will be maintained and an overshoot will be required.

All landings are to be made on the centre line.

Once under control, check that the brakes work, and then move your aircraft to the exit side of the runway. *This allows a following aircraft, with a brake failure, to pass in what is called the "Hot Lane" (the non-exit side of the runway, unless specifically briefed otherwise). If the hot lane is required, the aircraft should call "Vodka 2 Hot Lane, Hot Lane".*

Should an aircraft go-around for any reason, that aircraft then rejoins for landing as an individual aircraft. It is no longer deemed to be part of the landing formation.

Join via Crosswind or Downwind

To achieve the required downwind separation when joining the circuit, the lead will instruct the formation to “take spacing”.

Allow sufficient time/distance for wingmen to use moderate power reductions and manoeuvring to gain the required separation.

Once on downwind, the procedures are the same as an initial and pitch.

Pairs Approaches

Pairs approaches are envisaged to be used to bring home a wingman who needs assistance (e.g., a pitot static issue).

They are to be conducted via an extended final segment.

Once the wingman is in a position where he/she can reasonably be expected to continue for a safe landing, the leading aircraft should advise him/her to continue for a landing. The leading aircraft should then perform a go-around.

Practise pairs approaches can be conducted to either:

1. The lead advises the wingman to continue for a landing. The lead then performs an individual missed approach after wing acknowledges and the wingman continues for a landing or,
2. Both aircraft go-around in formation and join the circuit by taking spacing turning crosswind. After that, procedures as per pitch out.

After Landing

At non-controlled airfields, the last aircraft to vacant the active runway should advise any traffic that the formation is “clear”.
For aerodromes with a Ground Frequency, aircraft automatically change to it vacating the runway. They then check-in with their callsign only.

Normally aircraft will taxy to their parking positions and shutdown individually.
If desired, a formation shutdown can be briefed. This is performed by initially calling for a “run-up” followed by “cut”. *Appropriate hand signals may also be used.*

Formation Considerations

Fuel

The following fuel remaining amounts are to be nominated during the pre-flight briefing:

1. **'Joker'.** Fuel sufficient to permit continued operations to a logical cessation point, followed by a return to landing at a nominated base. *It is used to designate a low fuel state that is above the bingo value. You might think of it as a "prepare to stop mission" advisory.*

2. '**Bingo**'. Fuel sufficient to permit a return to landing at a nominated base with reserves intact. *When an aircraft calls "Bingo", the exercise is to be terminated and a return to base initiated immediately.*

Wingmen advise the lead as soon as the nominated amount is remaining in their tanks.
The amounts can be nominated in minutes or quantities remaining.

Transponder Usage

Only one aircraft in the formation is to squawk a required transponder code. Normally this would be the lead. Where a lead aircraft does not have a serviceable transponder, another formation aircraft will be delegated squawk responsibilities. After a lead change, the new formation lead should take over transponder responsibilies, if possible. Other aircraft in the formation should only squawk standby.

Engine Handling

Radial engines require careful handling, particularly at high rpm settings. If you find yourself at a low throttle setting, needing a lot more immediate thrust to remain in position; 'ease it on'. Rapid increases in throttle may exceed the CSU's capabilities, resulting in an engine/prop overspeed. Whilst pilots should anticipate changes, an out of position situation and smooth recovery is preferable to poor engine handling.

Limitations

The maximum operation limits to be used in RR formations are:

Angle of bank (AOB)	60°
Pitch	+/- 30°

The wingmen's experience level may require lower manoeuvre values.

Knock It Off

A "Knock It Off (KIO)" can be called by any member of a formation who observes or perceives a safety issue affecting the continuation of the exercise. Everyone stops manoeuvring. The lead will ascertain the reason for the KIO and organise a rejoin if appropriate. While there is the discretion to resume the mission, as a general rule an RTB is the safest course of action. The issues can then be discussed and resolved on the ground.

AIRMANSHIP

The golden rules**;**

DO NOT LOSE SIGHT. If you do, CALL IT.

4 AVOIDS 3, 3 AVOIDS 2, 2 AVOIDS1.

Leadership

It takes considerable experience in formation flying to achieve a full understanding of the fundamentals of leadership. Remember that the leader is responsible for the whole formation and must observe the following:

a) Ensure a clear unambiguous and complete briefing,
b) Maintain a vigilant lookout at all times; they are the eyes of the formation,
c) Be aware of the fuel state of all members of the formation and make calculations on the lowest reading,
d) Be responsible for formation navigation,
e) Position and manoeuvre the formation to minimise glare from the sun and other distractions. This is sometimes unavoidable and the wingman may adjust their position slightly to use the leader's aircraft as a shield when looking into the sun,
f) At all times avoid maximum/minimum power settings and flying close to the aircraft limits.
g) Be smooth, accurate and predictable in all flying; make roll and pitch rates constant.
h) Have a thorough knowledge of the aircraft and emergency procedures and so be able to give advice to other members of the formation,
i) Make correct, clear, concise radio calls and hand signals at all times,
j) Regularly look at the wingman to ensure ops normal (and that they are still there!).
k) Prepare for the lead change by carrying out your own aircraft checks and perform a good lookout. Ensure you are not about to enter cloud or are not approaching the airspace boundary. Brief any operating or ATC restrictions before handing over to your wingman.

On the Wing

a) Should a dangerous situation develop, do not press on; bug out,
b) Follow laid down procedures. For example, during rejoins, ensure that you have vertical separation with the leader up to the point of achieving similar speed.
c) Provide mutual support; be prepared (at any time) to provide assistance to other members in the formation, and
d) Be prepared to take over the lead at any time.

Clock code traffic calls may be made by any member of the formation,

RADIOS

Good standard radio procedures not only sound professional, they cut down on confusion. Multiple formations can be in the area at the same time, possibly departing and recovering at similar times. Concise and predictable R/T is vital to prevent saturating the frequency.

A thorough knowledge of R/T calls can provide the pilot extra "brain space" for the most important task - flying the aircraft.

Correct, confident and concise delivery and response indicates to others, inside and outside of the formation, that the pilot has prepared and is "in control".

So, use the standard radio calls listed in Annex A!

Frequency Changes

There are a number of different radio installations in the various aircraft, some in not particularly good positions for changing frequency in formation. Leads can help in this regard by:

- Keeping the number of changes to a minimum,
- Limiting changes to stable or more relaxed situations (straight with everyone in position, combat formations, etc.),
- Allowing plenty of time before needing to be on a new frequency and before checking-in after calling the change.

Wingmen can also assist by being familiar with their radio location and having some idea of the number of “clicks” needed to make the change. Pre-set frequencies if you have that capability.

Callsign Changes

If the lead (or new lead) determines that it is absolutely necessary (e.g., aircraft unserviceable on the ground) to renumber or change the callsign of the formation, he will transmit the changes of position including any change to deputy lead responsibilities. The lead will then initiate a radio check as per a formation check-in.

Relative Position

When calling relative position use;
Left/Right, Clock code, Relative vertical position, and Range

(e.g., “Left, 10 o'clock, low, 1 mile”)

Standard Terms

“Visual”	I have visual contact with my lead/wingman/other element
“Blind”	I don't have visual contact with my lead/wingman/other element
“Tally”	I can see the non-formation aircraft.
“No Joy”	I cannot see the non-formation aircraft.
“Revs”	A request for a thrust reduction.
“Power UP”	A request for a thrust increase.
“Terminate”	Used to cease the manoeuvring of all aircraft in a specific flight when learning objectives are achieved or are not achievable. Terminate is used when safety of flight is not a factor.
“Knock It Off”	Used to cease the manoeuvring of all aircraft when safety of flight is a factor or doubt or confusion exists.

Base Call

There is a higher workload during formation recovery and circuits. Always include “3 greens” in your base call, after checking **all** gear indications. The 3 greens base call allows other formation members to provide mutual support should the 3 green call not be heard.

Some general points:

- Always preface the transmission, whether initiated by you or in reply, with the formation callsign (except on check-in). Multiple formations need to know if the transmission was for them.
- Many warbird aircraft radios have poor transmit and/or reception characteristics. To avoid "Clipping" transmissions (especially the formation identifier), allow a short time between pressing transmit and speaking. Many older radios need time to "catch up".
- Concise and predictable R/T makes it easier for other pilots to understand calls. A slower than normal rate of speech may occupy less time overall, if the transmission doesn't need to be made twice.

VISUAL SIGNALS

Visual signals, both hand and aircraft movement, are an efficient means of communication within formations. This is particularly so in circumstances where there is a lot of RT traffic or an aircraft in the formation has a communication issue.

All RR formation participants are required to be familiar with the visual signals, including those used in an emergency.

While they are ultimately a supplement to the radio, their use is strongly is encouraged. Whenever possible, use hand signals in the first instance.

Having said that, leads should consider the experience of the formation members when deciding on the level of visual signal usage.

If a member of the formation does not react to a visual signal, use the radio.

Leads should look at their wingman when using hand signals to ensure that the wingman has seen and understood the visual signal. Wingmen should acknowledge visual signals with a small head nod and/or start the required response.

Hand/Head Signals

The hand/head signals that are expected knowledge in Red Radial formation operations are listed below**:**

Exaggerated Head Nod
Engine Start/Run up
Ready for Take-off
Start of Take-off roll
Change Sides
Line Astern Go
Long Line Astern Go

Loosen Formation
Pitch Out

Cannot Transmit
Cannot Receive
Lead Change
System Failures HEFOE

Frequency Change **

** In Red Radial operations, not normally used to initiate a frequency change. (Can be used, as required, to get a formation member on to the correct frequency, e.g after a missed change)

They are illustrated in Annex B.

Aircraft Signals

The following lead aircraft movements can be used to signal the requirement to join up in these formation positions:

Wing “Waggle”
“Porpoise”

Gentle Yaw

Echelon Right, Vic or LHF4
Line Astern

Battle/Spread

Annex A STANDARD RADIO CALLS

The following is a summary of SOP R/T calls to be used in RR formations. It is not a "guide".

Situation	Transmission	Response	Further Response	Note
Right/Left as appropriate.				
Start				
Formation Check in	*'Red, check'*	*'Red 2, 3, 4'*		
Large Formation Check in	*'Vodka Red Check'*	*'Vodka 2, 3, 4. Red 1, 2, 3'*		
Start	*'Red Start'*	Start Engine		
Taxi	*'Cowra Traffic, Reds, 3Yaks/Nanchangs/Warbirds Taxiing R/W etc.... '*			Don't detail each individual aircraft type if different.
Frequency Change				
When radio frequency change required.	*'Red Push 121.8 (or Stud x)'*	Change Frequency		
then	*'Red 1'*	*"2, 3, 4"*		
Take-Off				
One Aircraft Aborts	*'Red 2 stopping'*	*'Red 1'*		
Lead Needs to Stop the Formation T/O	*'Reds STOP, STOP, STOP."*		All Aircraft Stop	
Power Change Request				
Wingman Has Insufficient Thrust to Keep Up	*'Red 2, Revs'*	*'Red 1'*	Lead reduces Thrust (Once only)	Can be used during Take-off.
Wingman Needs More Thrust set by Lead	*'Red 2, power up'*	*'Red 1"*	Lead Increases Thrust	Can be used during Take-off.

Station Changes

	'Red Echelon Right Go'	Wingman Manoeuvres		
	'Red Line Astern Go'	Wingman Manoeuvres	*"Red 4 In" (or last Wingman in)*	
	'Red Line Abreast Go'	Wingman Manoeuvres		
	'Red Vic Go'	Wingmen Manoeuvre		
	'Red LH Finger 4 Go'	Wingmen Manoeuvre		
	'Red Spread Go'	Wingman Manoeuvres		2 Aircraft
	'Red Battle Go'	Wingmen Manoeuvre		3-4 Aircraft
	'Red, Combat Go'	Wingman Manoeuvres	*"Red 2 In"*	
	'Red Arrowhead Heavy Right Go'	Wingmen Manoeuvre	*"Red 4 In"*	
	'Red, Long Line Astern Go.'	Wingman Manoeuvres	*"Red 4 In"*	

Formation Management

Lead Change	*'Red 2, Take the lead.'*	*"Red 2", then "Red 2 passing Left/Right taking the lead."*	*"Red 1 Visual"*	Do Not Renumber
Terminate	*"Red 2, terminate"*	*"Red 1, terminate" "Red 3, terminate"*		
Calling Position	*"Red 2. Red 1, right 4 o'clock, slightly low, 600 metres"*			Position relative the aircraft being called.

TACForm

No "Go" required in directing the turns etc)

In Place 180	*'Red In Place Right'*			
In Place	*'Red In Place 90(*) Right'*			*Or number of degrees req'd
Check Turn	*'Red Check 20(*) Right'*			*Or number of degrees req'd
Cross Turn	*'Red Cross Turn'*			
Delay Turn	*'Red 90(*) Right'*			*Or number of degrees req'd
Weave	*'Red Weave'*			

Rejoins

Practice Rejoin	*'Red 2 ready for rejoin'*	1 clears the turn, then thumbs up	Wingman Manoeuvres	
	'Red 1 turn Right for rejoin'	Red 1 turns		For turning rejoin
	'Red 2 rejoining echelon Right'			Straight rejoins.
	'Reds RHF4 Go"	*Red1 begins turn*	Wingmen Manoeuvre	Pitch out method
Unsafe Rejoin	*'Red 2 bugging-out.'*	*'Red 1'*		
	'Red 3 BUG-OUT NOW.'	*'Red 3'*	Red 3 Bugs out	

Safety Items

Knock It Off	*'Red 3, knock-it-off, knock it off''*	*"Red 1, knock it off" "Red 2, knock it off" "Red 4, knock it off"*		
Break Out	*"Red 2, breaking out, climbing to 4500 feet."*	*"Red 1"*		
Lost Sight	*'Red 2 Blind'*	*'Red 1"*		

Fuel State

	"Merlin Fuel Check"	*"Merlin 2, 80ltrs"*		
Mission Minimum	*"Merlin 2, Joker"*	*"Merlin 1 Joker"*		
Safe RTB Minimum	*"Merlin 2, Bingo"*	*"Merlin 1 Bingo"*		

RTB

CTAF Call	*'Cowra Traffic, Red, 3 Warbirds, 5 miles South, 2500, tracking for right initial 33'*			
Initial	*'Cowra Traffic, Red, Right Initial RW 33'*			
Approaching the airfield, if pitch out inappropriate	*'Red Take spacing'*	Wingmen Manoeuvre		
Overhead pitching out	*'Cowra Traffic, Red Crosswind R/W 33"*			
Base	*'Cowra Traffic Red 1 Base R/W 33, 3 greens, Full Stop'*	*'Red 2 Base 3 greens'*	*'Red 3 Base 3 greens'*	
Landing Stable	*'Red 4 Stable'*			Last aircraft
Pairs Approach, when wing able to land.	*'Red 2, Continue for landing"*	'*Red 2'*	Red 1 does an overshoot	Red 2 lands
Pairs Approach, both overshoot.	*"Red Going Around'*	Both aircraft overshoot.	Join circuit.	
Landing Not Stable	*'Red 2 HOT LANE'*			
Last Aircraft Vacates R/W	*'Red runway vacated'*			Last aircraft

Annex B

ESSENTIAL HANDSIGNALS

Engine Start/Run up

Extend arm over head and make a circular motion with the hand with index finger pointing upward.

Exaggerated Head Nod

Used by the lead as an executive to initiate the sequence commanded by the hand signal.

Frequency Change

Tap you ear with fingers extended. Extend fingers vertically for the digits 1 through 5, horizontally for 6 through 9.

Hand is pulled down out of sight between digits.

Signal 0 with a clenched fist.

Change to Pre Briefed Frequency

Tap ear with your index finger then indicate the Stud/Tac number required . e.g 2 fingers to switch to Stud/Tac 2

Lead Change

The flight lead will point to the deputy lead and then point straight ahead, indicating, "Take the lead" the deputy lead will acknowledge with a head nod, push the power up and, when passing line abreast with Lead , tap the top of his head with an open palm and then point directly ahead indicating "I have the lead".

Gear Down

Clenched fist chain pulling motion up down head nod to execute

Flaps Up/Down

Thumbs and fingers together open and closing head nod to execute

Line Astern Go

Thumb pointed to rear.

Long Line Astern Go

Fist with thumb extended smartly Forward/aft

Cannot Transmit

Point to mic, then thumbs down

Cannot Receive

Point to ear, then thumbs down.

Loosen Formation

Open hand pushing wingman out. Can also be used to allow wingmen to deploy to a pre briefed position

Change Sides

Used to move elements from one side to the other. Lead points to the wingman then using a sweeping motion over the head points to the other side of the formation.

Pitch Out

Lead waves wingmen good bye.

Hand open fingers extended.

Wave hand forward and aft.

System Failures HEFOE

Hold clenched fist to forehead
Then hold fingers up to indicate system system failed/degraded.
1 Finger Hyd/Pneumatic

2 Fingers Electrics

3 Fingers Fuel

4 Fingers Oxy

5 Fingers Engine