

FORMATION FLYING IN THE NORTH AMERICAN T-6

Success in formation flying depends on the interest and enthusiasm of the leader and his wingmen. Wingmen must have confidence in their leader, and the leader must be able to rely on his wingmen.

The leader is your safety pilot. He plans ahead, allowing plenty of room for maneuvers. It's his job to spot other airplanes and keep the formation clear of other traffic. He never flies too close to obstacles. The leader usually flies at slightly reduced throttle, thus giving his wingmen a margin of power to use in keeping up with the formation. A good leader demands precision flying and second-by-second teamwork. That is the only way he can train an able team.

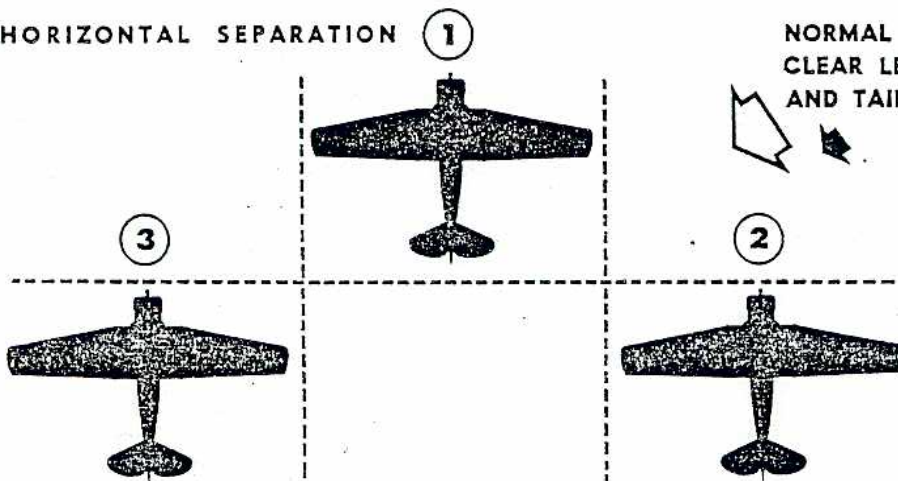
Follow the leader smoothly and promptly.

GENERAL RULES FOR WINGMEN

1. Keep your eyes on the leader. Bank with him, turn with him, stick with him.
2. Maintain distance sideways from the leader by using coordinated corrections.
3. Anticipate throttle adjustments. If you use full throttle to catch up, don't leave it on until you are back in position. If you do, you'll go shooting by the leader. Before the leader starts to turn, increase your throttle if you are on the outside of the turn; decrease throttle if you are on the inside of the turn.

Positions in Formation

HORIZONTAL SEPARATION



VERTICAL SEPARATION



crease throttle if you are on the inside of the turn. Be sure to allow for the lag in acceleration and the effects of momentum.

4. Keep making small corrections constantly in order to hold the right position. It's a lot easier to make several slight adjustments than to regain your position after definitely falling behind or veering to one side.

5. The important thing is steady, accurate flying rather than too close a formation.

COMMON ERRORS

Getting out of position: dropping below lead airplane, getting too far out, too close, or too far behind.

Using too much throttle adjustment.

Flying in position with one wing down.

Correcting too much, with dangerous results.

Not watching the lead airplane closely enough.

Not keeping your head out of the cockpit when adjusting auxiliary controls.

Not changing position properly.

Not knowing signals.

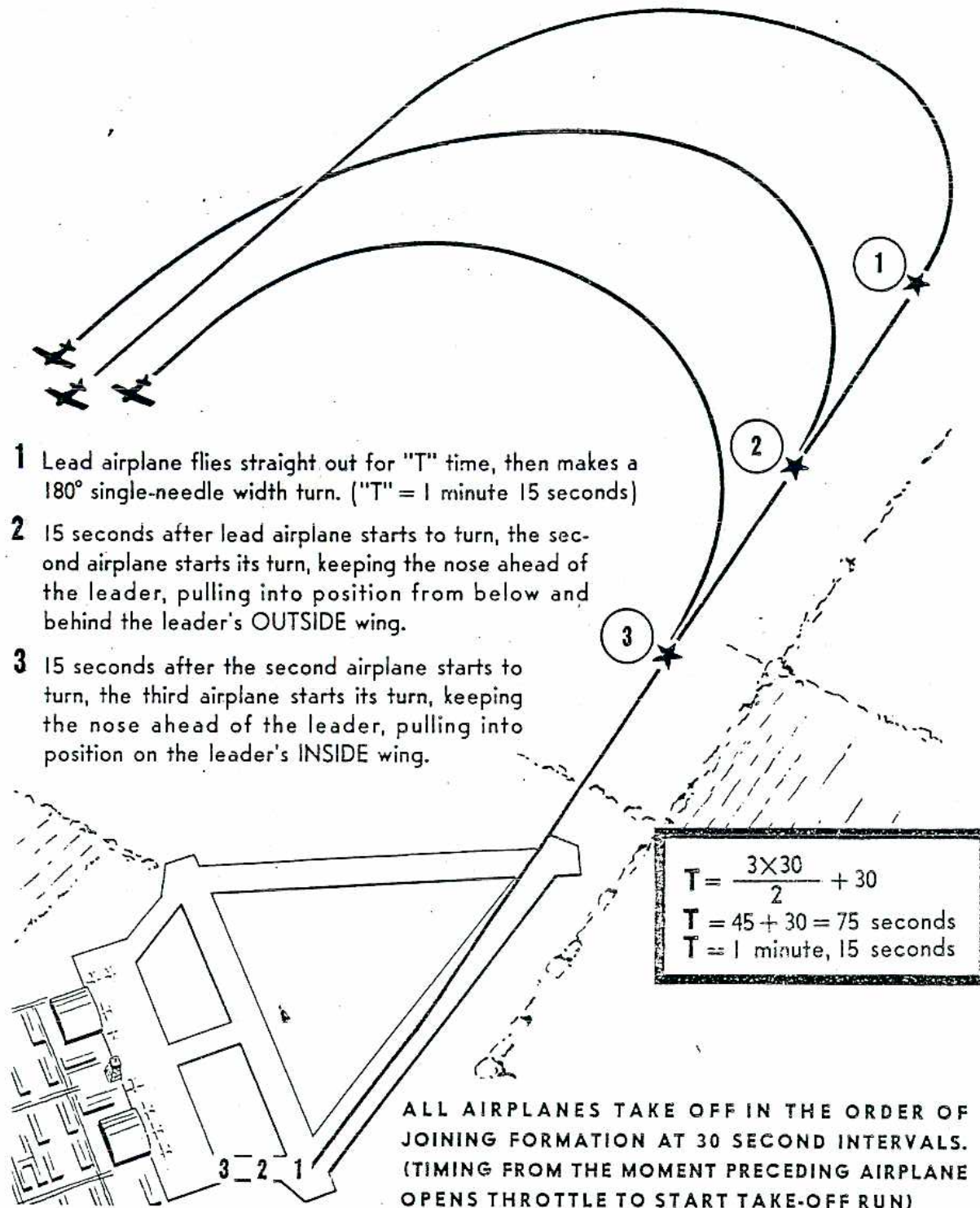
Not dropping down on the inside of a turn, or not taking the high position on the outside of a turn. Dropping out on turns.

Taxiing too close in formation, or too far out. Jamming on brakes too hard. Not being able to control airplane.

Reacting too slowly.

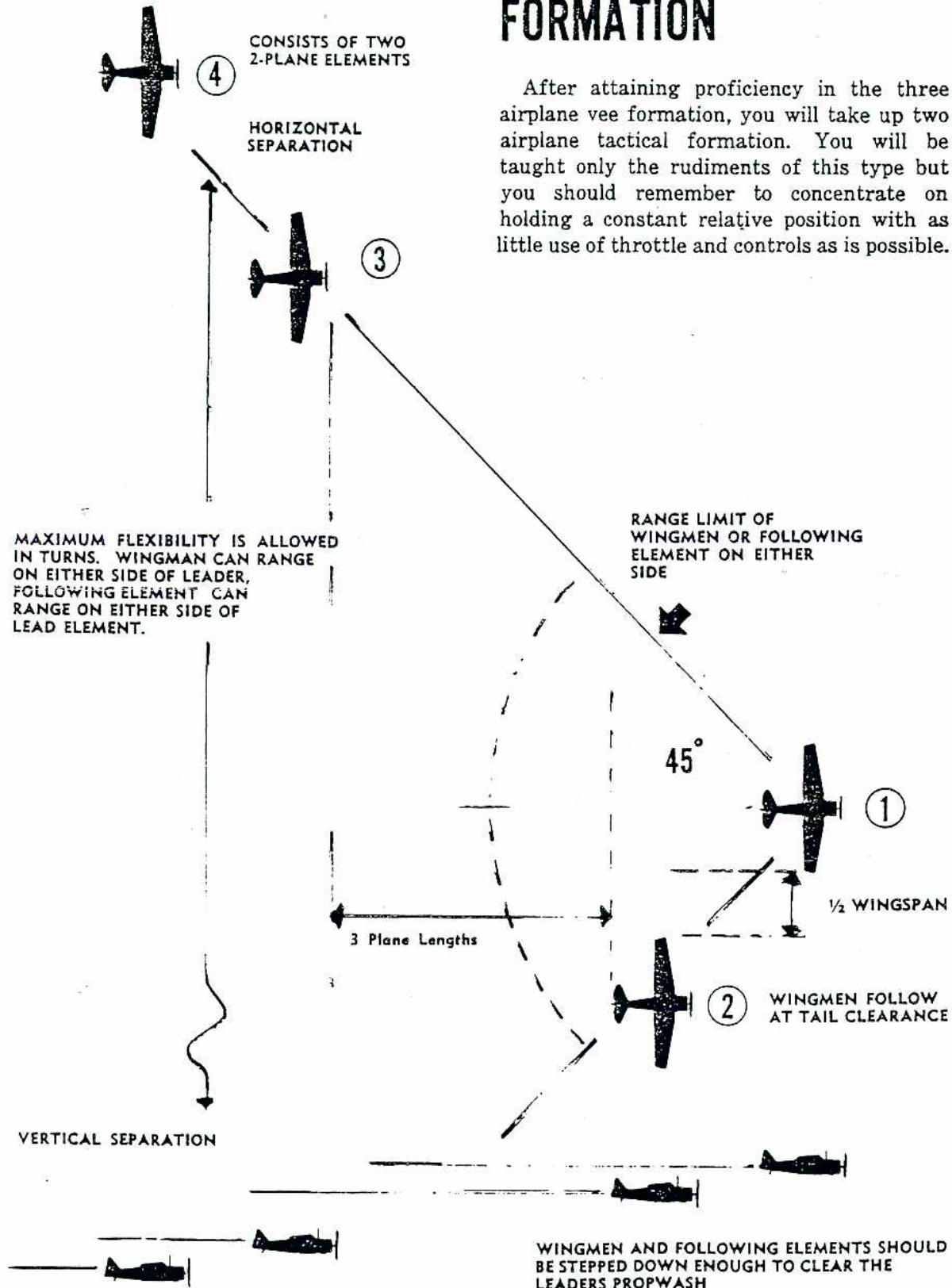
JOINING FORMATION FROM INDIVIDUAL TAKE-OFFS

Individual take-offs may also be made. The airplanes join the formation after making the first turn. The take-offs and the turns after them are timed.



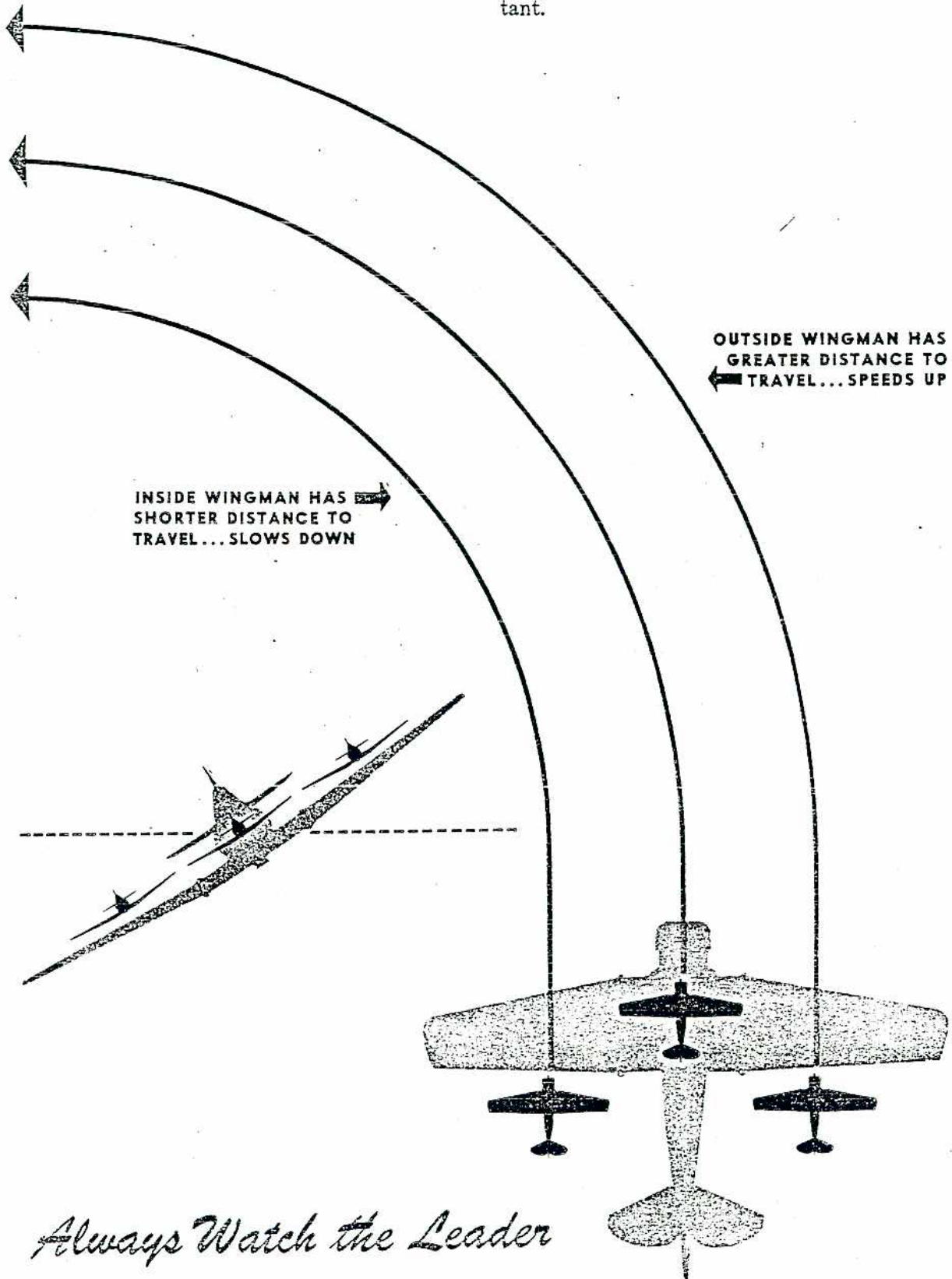
TWO-AIRCRAFT FORMATION

After attaining proficiency in the three airplane vee formation, you will take up two airplane tactical formation. You will be taught only the rudiments of this type but you should remember to concentrate on holding a constant relative position with as little use of throttle and controls as is possible.



URNS IN FORMATION

Again the leader does the looking around.
Be prepared for what is coming. Try to
read your leader's mind. Timing is all-impor-
tant.



Always Watch the Leader

NORTH AMERICAN TRAINER ASSOCIATION
Formation Qualification Report

T-6 Flight Profile

ACTION:	HAND SIGNAL:
Run-up to 2000 RPM	Index finger and arm extended vertically, circular motion
Take-off in Sections (brake release at forward end of nod)	Head nod forward (distinct movement)
Join-up F.T. Right (Leader continues to circle until all A/C in position)	None
F.T. Right to F.T. Left	
A. Lead signals #2 impending Section move, then signals Section Lead #3 to move his flight to left echelon, #3 passes signal to #4	Double pump of arm, fist clenched (#2 1st, #3 2nd)
B. #3 moves his Section to #2's left wing	None
C. Lead signals #2 to move from left wing of Lead to right wing of Lead, #2 passes signal to #3	Extend arm, fist clenched
D. Section Lead moves out 1/2 spacing minimum to allow clearance for #2, after #2 clears Leader, #3 moves into position on Leader	None
F.T. Left to Diamond	
A. Lead signals Section Lead to move #4 into slot position	Left arm up, fingers extended, then clench fist with thumb pointed aft, motion aft
B. Section Lead (#3) nods acknowledgment to Lead and then signals #4	Left arm up, fingers extended, then clench fist with thumb pointed aft, motion aft
C. #4 moves into position in slot	None
D. Section Lead signals Leader #4 is in position	Thumbs up signal

Diamond to F.T. Left

A. Lead signals #4 to return to left wing of Section Lead	Rocks wings (Dutch roll, 3 or 4 times, 10 deg. max)
B. #4 moves to his previous position on left wing of #3	None
F.T. Left to Right Echelon	
A. Lead signals #2 impending Section move, then signals #3 to move his flight to right echelon, #3 passes signal to #4	Double arm pump, fist clenched (#2 1st, then #3 2nd)
B. Section Lead moves his Section to #2's right wing and #4 moves to #3's right wing after #3 passes Leader center line	None
Break-up and Rejoin	
A. Lead signals break-up (Lead watches to see all members of flight receives signals)	Arm up, index finger extended with circular motion, followed by number of fingers to indicate break interval in seconds
B. Lead breaks (60 deg. bank, 180 deg. of turn) #2 Breaks at interval #3 Breaks at interval #4 Breaks at interval	Kiss-off or salute
C. Lead rolls out, 180 deg. from original heading	None
D. Last man in calls on R/T	None
E. Lead signals Re-join	Lead rocks wing 15 deg. left and right several times, then continues in a 20 deg. left turn for join-up
F. #2 always joins on the inside of the turn #3 and #4 join on the outside of the turn (all rejoins are to a finger tip formation)	None

F.T. Right to Trail

A. Lead signals

Lead gently porpoises his A/C 3 times (A/C should not change altitude)

B. Section Lead #3 moves out

None

C. #2 Moves back and slides in

None

D. #3 moves back and slides in

None

E. #4 moves back and slides in

None

Trail to F.T. Left (Right turn)

A. Lead signals reform

Lead rocks wing 15 Deg. L & R Twice, then 20 Deg turn to right

B. #2 always joins on inside of the turn #3 and #4 join on the outside of the turn

None

F.T. Left to Right echelon

A. Lead signals #2 impending Section move, then signals Section Lead, #3 to move his flight to right echelon, #3 passes signal to #4

Double arm pump, fist clenched (#2 1st then #3)

B. Section Lead moves his Section to #2's right wing and #4 moves to #3's right wing after #3 passes leader center line

None

Break for Landing

A. Lead signals break-up (Lead watches to see all members of the flight receive signal, #2 and #3 continue to signal break until nod from lead)

Arm up, index finger extended with circular motion, followed by number of fingers to indicate break interval in seconds

B. Lead breaks, 60 deg. of bank, level turn

Kiss-off Salute

#2 breaks at interval
#3 breaks at interval
#4 breaks at interval
(each A/C at the break reacquires the previous one to maintain separation)

C. Lead rolls out 180 deg. from original heading and establish pattern

D. #2 rolls out and establishes spacing, #3 and #4 follow spacing set by #2

Left/Right Runway Discipline (Runway Width Permitting)

A. Leader lands on downwind side of runway

B. The rest of the flight stagger their landings accordingly

C. Do not stop on the runway, roll to the end at a safe speed consistent with maintaining visual contact with the A/C ahead at all time

D. Leader to use radio for spacing checks

Crossing the runway center line except at the end is an automatic disqualification

Criteria for flight test

A. Smooth application of aerodynamic controls

B. Smooth application of power controls

C. Rough handling of A/C can be disqualifying

D. Improper movement of A/C is an automatic disqualification

E. Successful outcome of the flight shall never be in doubt by the Check Pilot

TAKE - OFF

SIGNALS - FINGER RAISED, CIRCULAR MOTION = RUN UP TO 15"
(ELEMENT TO) HEAD SNAPPED FORWARD ⇒ RELEASE BRAKES, APPLY POWER.



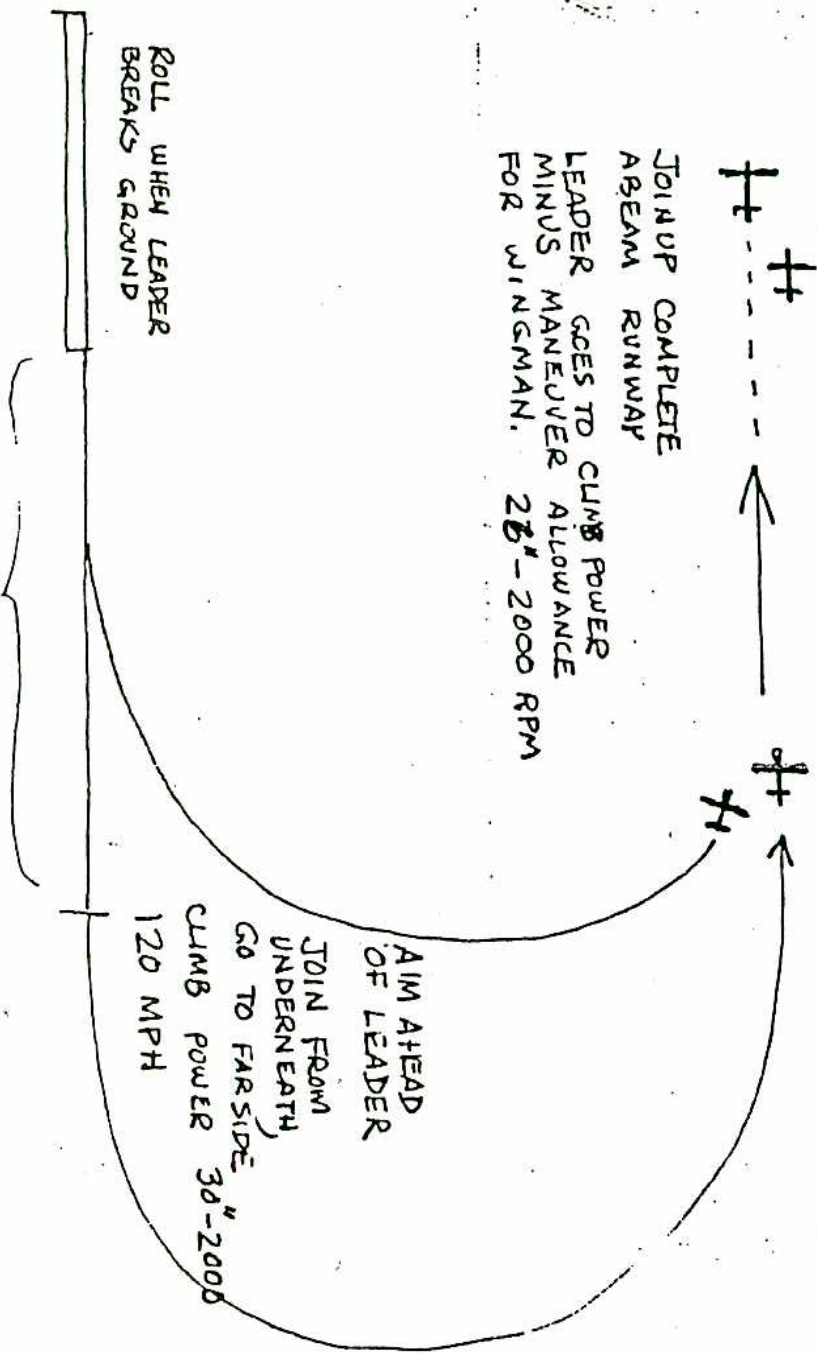
- LEAD LINES UP DOWNWIND SIDE SO HIS PROPWASH WILL AFFECT WINGMAN LESS
- LEADER'S POWER LIMITED TO 33" - 2250 RPM (IF ELEMENT TO)
- BOTH ACFT RUN UP TO 15" PRIOR TO BRAKE RELEASE, LEAD APPLIES DOWNED VERY CAREFULLY
- WIND
- KEEP TO YOUR OWN HALF OF THE RUNWAY.
- RETRACT GEAR ON LEADERS SIGNAL (HEAD SNAPPED FORWARD) (IF ELEMENT TO)

JOIN-UP

JOINUP COMPLETE
AREAM RUNWAY
LEADER GOES TO CLIMB POWER
MINUS MANEUVER ALLOWANCE
FOR WINGMAN. 28"-2000 RPM

ROLL WHEN LEADER
BREAKS GROUND

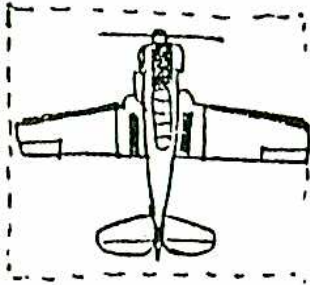
1 MILL



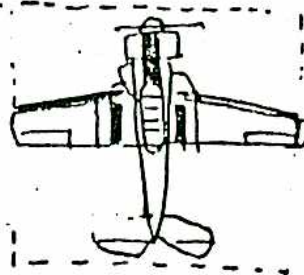
AIM AHEAD
OF LEADER
JOIN FROM
UNDERNEATH,
GO TO FAR SIDE
CLIMB POWER 30"-2000
120 MPH

20° BANK
REDUCED
POWER
24"-2000 RPM
105 MPH

BASIC POSITION
TWO-SHIP ELEMENT



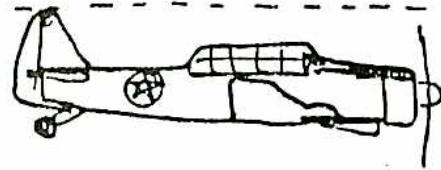
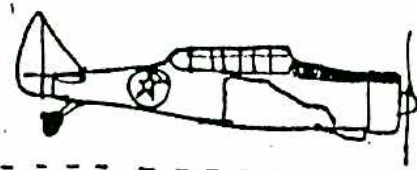
- 1. 45° BACK - STACKED DOWN
- 2. WINGTIP CLEARANCE
- 3. NOSE-TAIL CLEARANCE



DO NOT VIOLATE
THE OTHER FELLOW'S
AIRSPACE BOX.

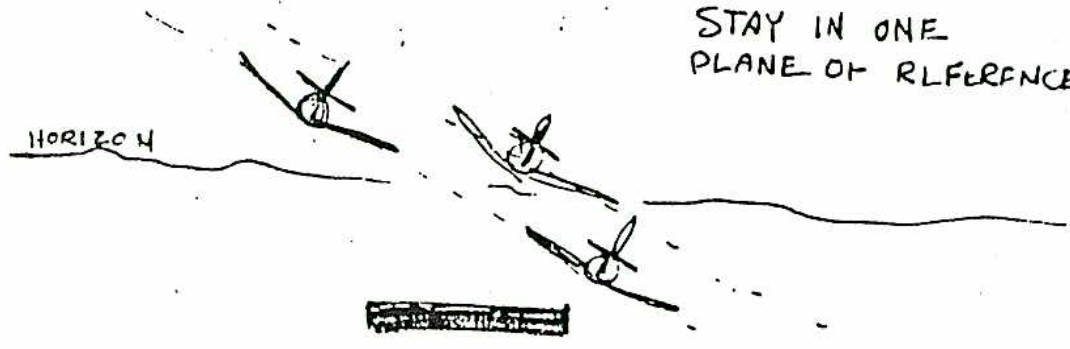
TOP VIEW

RUDDER - BELLY
CLEARANCE



SIDE VIEW

STAY IN ONE
PLANE OF REFERENCE

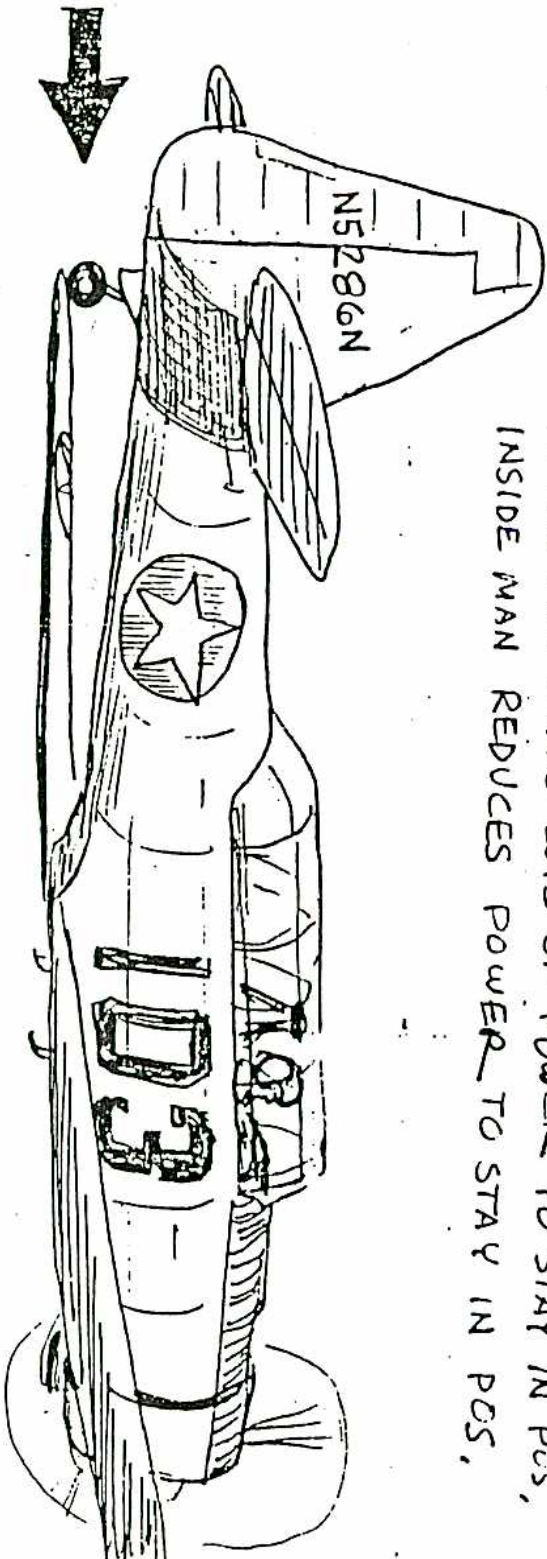


"V" FORMATION

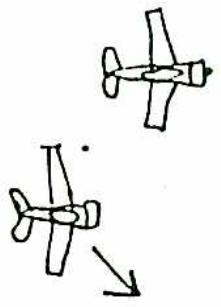
BASIC POSITION VISUAL REFERENCE

KEEP THIS REFERENCE AT ALL TIMES, BOTH IN LEVEL FLIGHT AND IN TURNS.

OUTSIDE MAN NEEDS LOTS OF POWER TO STAY IN POS, INSIDE MAN REDUCES POWER TO STAY IN POS.



PLACE TAIL WHEEL ON TIP OF FAR WING (T-6 ONLY)



LINE ABREAST POSITION

NO TURNS!
EXCEPT VERY GENTLE
SLOW BANKS.
STAY IN ONE PLANE.



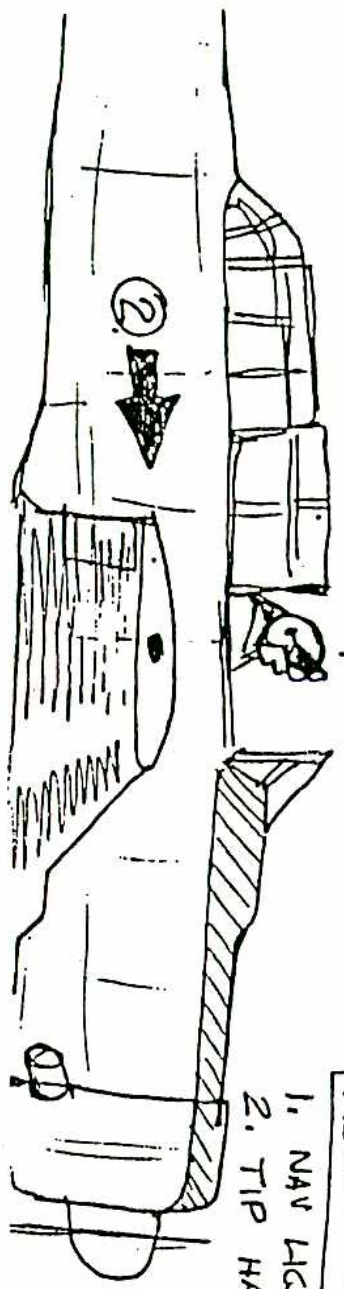
STEP 1

ON LEADERS RADIO
COMMAND, MOVE OUT
- WITH RUDDER, MOVE
AHEAD WITH POWER,
MOVE UP LEVEL.



STEP 2

MAINTAIN ONE WING PANEL BETWEEN
WING TIPS.

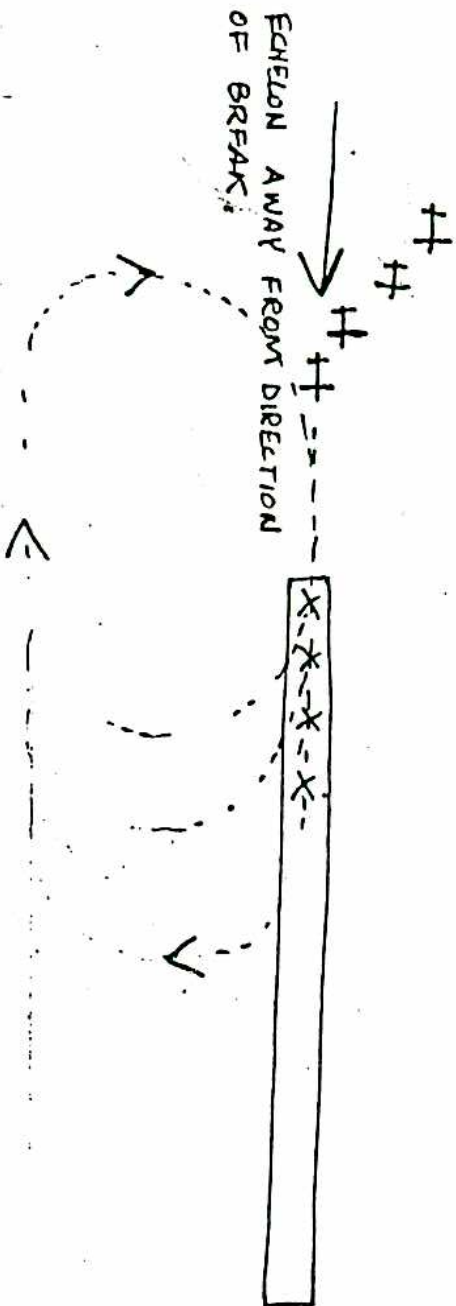


VISUAL REFERENCES

1. NAV LIGHT UNDER PILOT
2. TIP HALF WAY UP FUSELAGE

PITCH OUT
(BREAK)

DONE ONLY FROM ECHELON



USE 60° BANK, APPLY ALERON CONTROL SHARPLY. WHEN 60° BANK ESTABLISHED, PULL!
(BANK AND RANK TECHNIQUE),

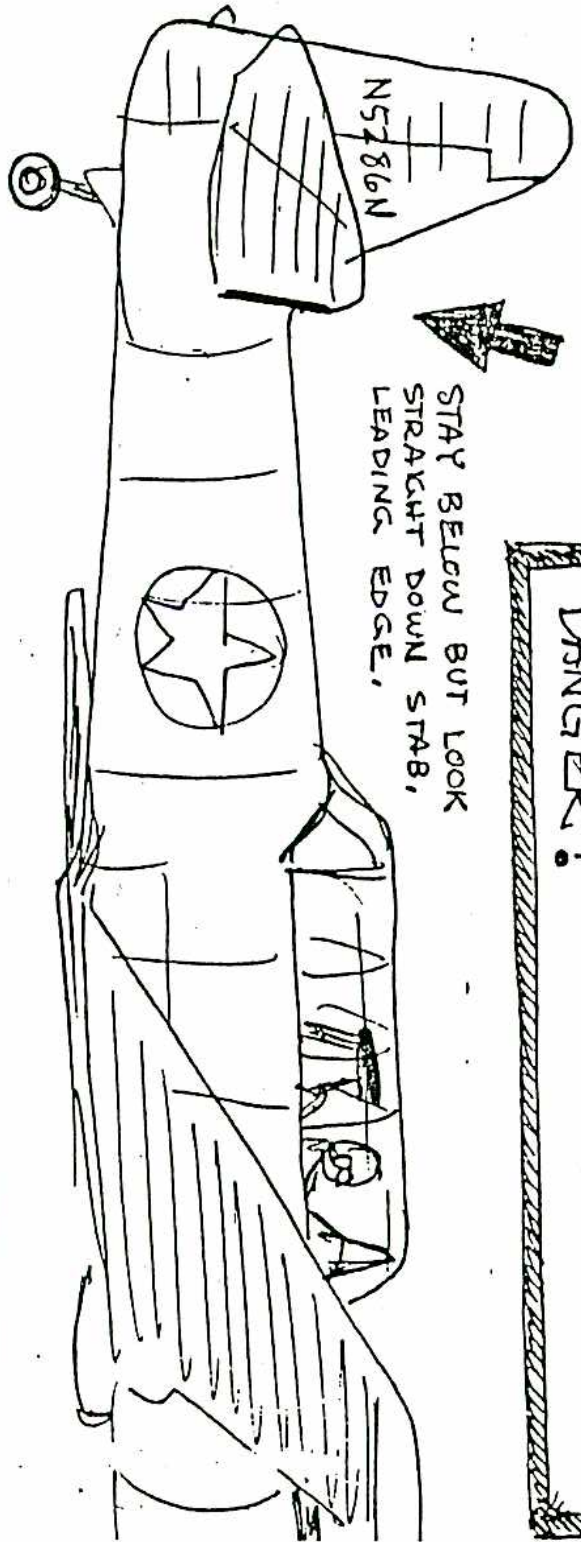
FLY A FULL 180° . AT 60° BANK, ROLL WINGS LEVEL, DROP GEAR, KEEP MAN AHEAD DIRECTLY ON HORIZON. FLY SHORT DOWNWIND, REDUCING POWER. DROP 30° FLAP TURNING BASE, KEEP DESCENT STEEP, INTERVAL AT 10 SEC, LAND (WHEEL LANDING ONLY) ON OPPOSITE SIDE FROM MAN AHEAD, LAND AT LEAST $\frac{1}{3}$ DOWN THE RUNWAY. NO BRAKES.

SKYTYPER V-FORMATION BASIC VISUAL REFERENCE

(ALSO USED FOR DIAMOND FORMATION TO GIVE SLOT MAN SPACE TO MOVE FORWARD TO TIGHT POSITION.)

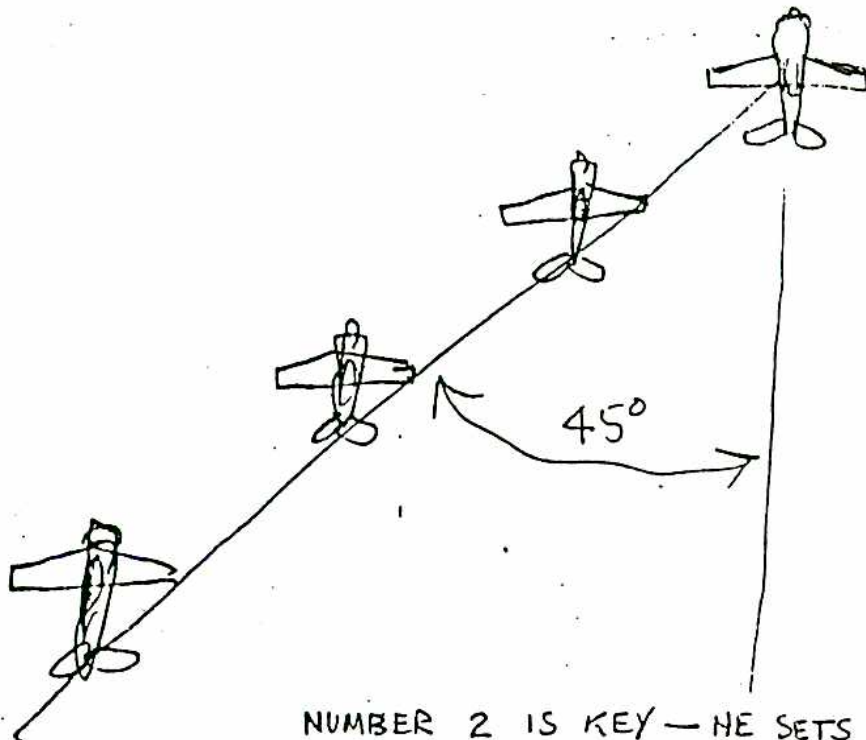
CAUTION! NORMAL NOSE-TO-TAIL CLEARANCE NOT PROVIDED. **DANGER!**

STAY BELOW BUT LOOK STRAIGHT DOWN STAB, LEADING EDGE.

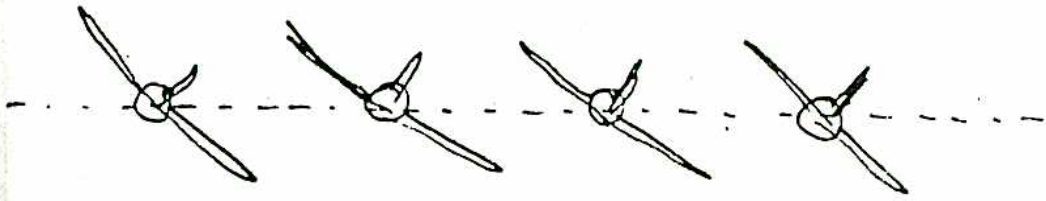


USE ONLY AFTER PROFICIENT IN "NORMAL" V-FORMATION

ECHELON



NUMBER 2 IS KEY — HE SETS LINE DOWN AND AWAY, ALL PILOTS LINE UP HEADS TO ESTABLISH POSITION.

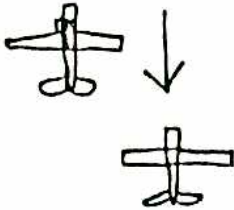


KEEP LEVEL IN TURNS
(LEVEL TO HORIZON)

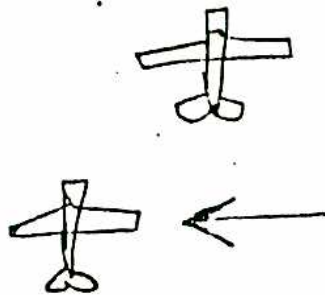
NO TURNS INTO ECHELON SIDE!

CROSSUNDER

3-PART PROCEDURE: FALL BACK, CROSS, MOVE UP,
SIGNAL - LEADER ROCKS WINGS SHARPLY.



STEP 1 - WINGMAN MOVES BACK 15'
THEN STOPS, REDUCE POWER
ONLY SLIGHTLY TO MOVE BACK.

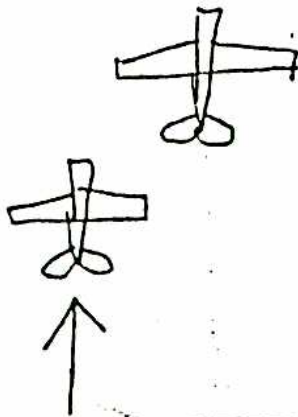


STEP 2

WINGMAN CROSSES BELOW
LEADER'S WASH, THEN STOPS,
USE RUDDER, KEEP LEVEL
WITH LEADER.

STEP 3

WINGMAN MOVES
AHEAD - USES
VISUAL TAILWHEEL
ON WING TIP REF.
CONSIDERABLE
POWER REQUIRED.



DONT ENTER LEADER'S WASH!
STOP BETWEEN EACH STEP!