

# Flight Replicas “Zlin Z-526F”



## For use with Microsoft Flight Simulator X plus Acceleration

Thank you for purchasing this FSX aircraft. Its aim is to give you a precise and detailed feeling for the famous Zlin 526F.

‘Zlin’ takes its name from the capital of the central eastern province of the Czech Republic. The Zlin Aircraft Company ZLINSKA LETECKA Inc. (ZLAS) – was established in 1934 by a businessman J.A. Baťa. Since then the company has had a prolific history of aircraft production, making gliders, light aircraft, helicopters as well as the famous range of classic aerobatic aircraft.

The basic Zlin Z-526, a development of the much earlier Z-26 series first flown in 1946, was originally designed in 1959 as both a basic and aerobatic trainer. As a small example of their outstanding flying qualities for the time, the type won the Lockheed Trophy freestyle aerobatic competition, held in England between 1955 and 1965, three times. In the 1964 competition, Zlins were five of the first seven finishers, including first place.

The 526F version of this package, featuring an improved M-137A engine with turbo and an Avia V503 constant speed propeller, was first introduced in 1968. The design improvements proved to be very successful, for both basic training as well as higher skill level piloting, and became popular for aerobatic competitions (and as a result, the Z-526AFS version was later developed as a single seat version of the Z-526F, and built between 1981 and 1984).

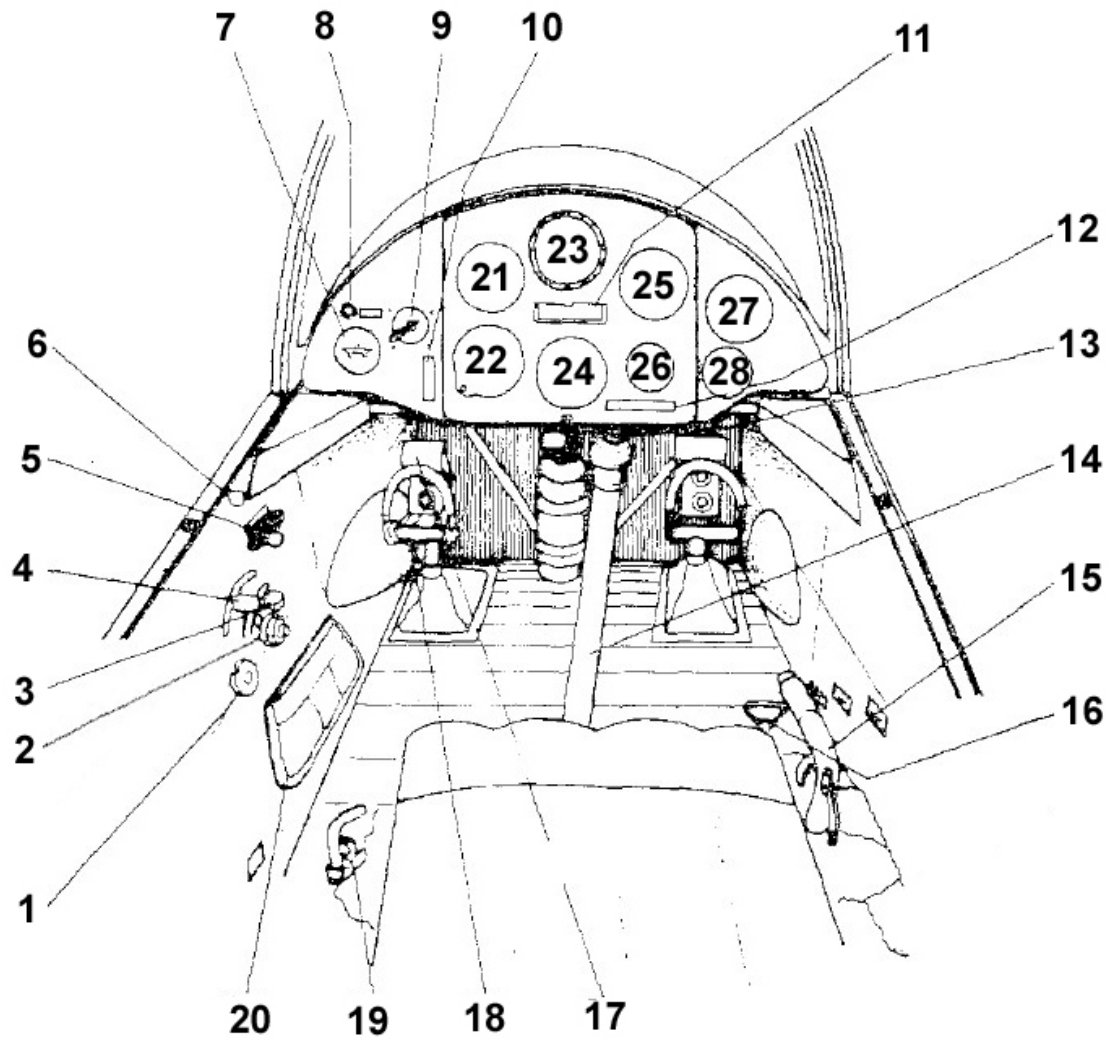
All together 1450 aircraft were built in the Zlin Tréner series, and they were exported into 37 countries.

**WARNING: THIS MANUAL AND FSX MODEL ARE NOT TO BE USED FOR REAL FLIGHT TRAINING PURPOSES**

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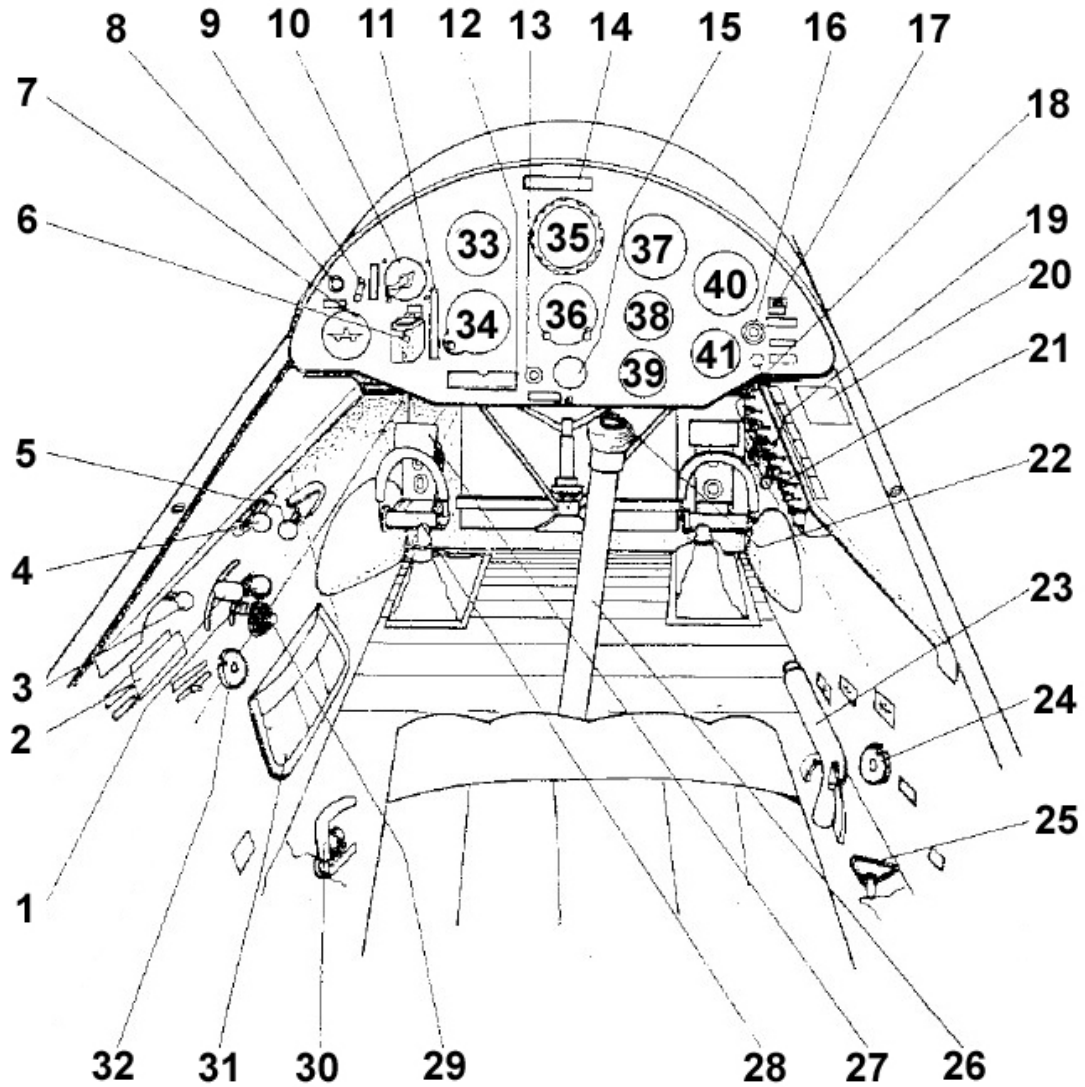
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## FRONT COCKPIT



1. Elevator trim
2. Throttle/mixture control stiffness (inop)
3. Mixture
4. Throttle
5. Fuel tank selector
6. Elevator Canopy eject handle
7. Landing gear position indicator
8. Generator off warning light
9. Magnetos
10. Meters/Feet altitude chart
11. Compass card
12. No Smoking and No Solo placards
13. Radio Buttons (inop)
14. Control Stick
15. Flap lever
16. Seat height adjustment (inop)
17. Brake pedal
18. Rudder pedal
19. Landing gear emergency lever (inop)
20. Storage pouch
21. Airspeed indicator (km/h)
22. Altitude (meters)
23. Compass with course selector ring
24. Turn and slip
25. Vertical speed (m/s)
26. RPM
27. Oil temperature/oil pressure/fuel pressure
28. G meter (with return to zero button)

# REAR COCKPIT



1. Throttle and mixture levers
2. Aerobatic information placards
3. Canopy eject levers
4. Fuel tank selector
5. Fuel pressure hand pump
6. Landing gear (left click for cover; for switch use mouse wheel)
7. Landing gear position indicator
8. Generator off warning light
9. Master switch
10. Magneto switch
11. Meters/feet altitude chart
12. Compass card
13. Over-G light test button
14. VFR only placard
15. Over-G warning light
16. Starter button
17. Pitot heat on light
18. Fire extinguisher knob
19. Engine priming knob
20. Aircraft performance information placard
21. Switches
22. Control stick radio buttons (inop)
23. Flap position lever
24. Rudder trim
25. Seat height adjustment (inop)
26. Control stick
27. Brake pedals
28. Rudder pedals
29. Throttle/mixture stiffness (inop)
30. Landing gear emergency lever (inop)
31. Storage pouch
32. Elevator trim
33. Airspeed (km/h)
34. Altitude (meters)
35. Compass with course selection ring
36. Artificial horizon
37. Vertical speed (m/s)
38. RPM
39. Cylinder head temperature
40. Oil temperature/oil pressure/fuel pressure
41. G-meter (with return to zero button)

## Additional Click Spots Plus radio stack



1. Click spot (large screw) to make pilot disappear
2. Click spot (large screw) to make aerobatic chart holder appear (see image below)
3. Radio stack (controlled via mouse wheel). You may need to zoom in to select frequencies, as the knob is quite small on-screen.

**Canopy roof vents** (top of canopy and windshield) and **side ventilation window** can also be opened.



## Notes on the FSX Model

### Realism Settings

Aircraft realism setting in FSX should be set at maximum.

### Aerobatic Chart

You can create your own aresti chart (or substitute a map, etc.) by using the .psd file found in the aircraft folder “C:\Program Files\Microsoft Games\Microsoft Flight Simulator X\SimObjects\Airplanes\Zlin\_526F\Placard - Aresti Aerobatic Chart”.

### Placards

Cockpit placards are provided in English, German, Czech and Polish. The Czech and Polish are partial only as information wasn't available during development, but does cover the main instrument panels. Placard textures can be modified or even new ones created using the .psd files found in the files in the aircraft folder, for example “C:\Program Files\Microsoft Games\Microsoft Flight Simulator X\SimObjects\Airplanes\Zlin\_526F\Placards – English”



## **Constant Speed Propeller**

All that has to be done when setting rpm is to move the throttle and then, when in a dive or climb, when the rpm would normally change, the blade pitch automatically alters to maintain the set rpm. The stable rpm also increases the efficiency of operation, both in terms of a light workload and improving aircraft performance.

The propeller on the 526F is an Avia V503, running counter-clockwise, and is fully automatic and controlled via hydraulic actuator. This actuator is driven by an airspeed-controlled windmill situated on a spinner ahead of the propeller. The windmill spins independently of the engine and the pilot, depending only on the speed of the aircraft.

We have attempted to illustrate this feature in FSX, which is why the windmill vanes visible from the cockpit will at times move independently.

## **Landing Gear Lights**

These are somewhat different than the typical Western type, in that while the lights are green when the landing gear is down, they remain red for as long as the landing gear is up.

## **Paint Schemes**

Paint schemes are representative only, due to equipment differences on individual aircraft, and as such registration markings are, for the most part, fictional.

## **GPS**

The 526F doesn't normally come equipped with a GPS, but in case you feel like flying further than your local airfield, one has been provided in a 2D window.

## **Radio and Transponder**

Transponder and Radio in the VC are turned on and tuned using the mouse wheel. For ease of use, radios are also provided in a 2D window.

Due to the location of the radio and control stick, it is recommended to set your frequencies before flight if not using the 2D window.

## **Shaking at Idle**

Most small aircraft shake at idle due to propwash buffeting. The Zlin will do this.

## Limitations

### 1. Engine Instruments

1.1. Fuel Gauge: fuel quantity is measured in liters.

1.2. Tachometer:

Normal operating range (Green arc)	500 - 2680
Allowable for 5 minutes (Yellow arc)	2680 - 2750
Maximum for 30 seconds	2860
Maximum RPM (red line)	3025

1.3. Cylinder head temperature indicator measured in degrees Celsius.

Normal (green arc)	140 - 185
Descent (yellow arc)	70 - 140
Climb (yellow arc)	185 - 200
Allowable for 5 minutes (red line)	200

1.4. Oil temperature, fuel pressure, oil pressure (all-on-one gauge)

1.4.1. Oil temperature ° C

Low range (yellow arc)	25 - 40
Normal (green arc)	40 - 80
Descent minimum	40
Climb (yellow arc)	80 - 85
Maximum for 5 minutes (red line)	85

1.4.2. Oil pressure measured in kg/cm<sup>2</sup>

Minimum (red line)	1.2
Normal (green arc)	3.5 - 4
After engine start (yellow arc)	1.2 - 3.5
Maximum (red line)	4.5

1.4.3. Fuel pressure

Minimum (red line)	0.1
Normal (green arc)	0.3 - 0.4
After engine start (yellow arc)	0.1 - 0.3
Short-term growth (yellow arc)	0.4 - 0.5
Maximum (red line)	0.5

## 2. Permitted speeds

### 2.1. Permitted Airspeeds IAS measured in km/h

Maximum (red line)	VNE	305
Normal use (green arc)	VS1 - VNO	110 - 230
Smooth Air Maneuvers (yellow arc)	VNO - VNE	230 - 305
Range with flaps (white arc)	100 - 152	
Max. Speed with flaps extended	VFE	152
Max. Speed for landing gear extend/retract	VLO	140
Max. Speed landing gear extended	VLE	305
Max. Speed Cruise	VNO	230
Max. Speed Design Maneuvering	VA	230
Max. Speed Very Aggressive Maneuvers	VRA	160

### 2.2. Max. Rate of descent during landing

940 kg:	2.44 m / sec.
975 kg:	2.34 m / sec.

### 2.3. Operational Ceiling

Dependant somewhat on trim  
Practical ceiling: 5200 m.

### 2.4. Overload

#### 2.9.1. Aerobatic maneuvers

Flaps retracted, aircraft without additional tanks + 6g, -3g

#### 2.9.2. Normal maneuvers

Flaps retracted +3.5, - 1.5 g

### 2.5. Crew

Aircraft may not be flown solo from front cockpit.

### 2.6. Smoking

No smoking permitted on board.

### 2.7. Temperature

2.7.1. At outside temperatures lower than + 10 ° C the inlet cooling oil tank cover should be closed.

2.7.2. In the case of starting the engine at outside temperatures below + 5 ° C heat the oil tank with hot air.

2.7.3. Working temperature -20 ° C, + 40 ° C.

### 2.8. Other limitations

2.8.1. IFR flight is forbidden unless aircraft suitably modified.

2.8.2. Normal aircraft configuration (no additional tanks):

2.9. Recommended maneuvering speeds (IAS) km/h:

Turn while climbing 200

Turns at 45° angle 180

Turning base 140

Deliberate spins are prohibited.

Aerobatics in aircraft with additional tanks is prohibited.

### 3. Aerobic Flight

3.1. The 526F can perform aerobatic maneuvers with one or two persons on board, in conformity with any aircraft load requirements.

3.2. Inverted flight may be performed for a maximum of 3 minutes.

3.3. Before each aerobatic flight it is necessary to thoroughly prepare the crew and the aircraft on the ground.

3.4. Before the flight, check in the plane for any loose objects.

3.5. Seat belts must be worn.

3.6. Check battery condition.

3.7. A minimum altitude for return to level flight must be selected.

3.8. The aircraft is equipped with an G overload indicator. Exceeding permissible G limits will illuminate the large red light on the rear instrument panel.

3.9. Aerobatic graphs (i.e. aresti) should contain IAS.

3.10. Spins with flaps extended are forbidden.

## **Cockpit Procedures: Flying the aircraft**

### **1. Before entering the aircraft check**

1. All connectors, controls and safety items
2. The amount of fuel
3. The amount of oil
4. Propeller - fault-free rotation
5. Landing gear - air pressure in the tires at 2.2 atm
6. The correct position of the hinge springs on the folding landing gear
7. Shock absorbers - the same deflection of the two shock absorbers
8. Tail wheel tire pressure - 1.5 atm
9. Loose objects in the cabin
10. If a solo flight, that seatbelts in the front seat are fastened
11. Magnetos - rear panel - off "0"

### **2. Upon entering the passenger compartment**

1. Adjust the seat height and secure in place
2. Check the freedom of control movement
3. Trim to neutral
4. Check the brakes - press the brake pedals, having someone outside trying at the same time to move the plane
5. Check for unobstructed canopy eject mechanisms
6. Undercarriage switch – down
7. Switches – all off
8. Master switch – on, and check voltage

### **3. Before starting the engine**

1. Magnetos off
2. Mixture rich
3. These switches on: generator, avionics, radio and starter
4. External power supply - connect to aircraft if such a source is available
5. Fuel tank selector to main

### **4. Starting the engine**

1. Throttle forward to 1/3
2. Prime the engine – 3 or 4 pumps
3. Increase fuel pressure using hand pump – 3 or 4 pumps
4. Check all clear around aircraft
5. Magnetos on
6. Press the starter button
7. External power source disconnected, if used

8. Check the oil pressure – if the pressure indicator does not rise, turn off the engine.

9. Warm up the engine - 800 - 1000 rpm for 1 to 2 minutes - then 1400 rpm. Minimum oil temperature - 25 ° C /.

### **5. Run up**

1. Slowly move throttle up to 2560 rpm (max 30 seconds)
2. Check oil pressure
3. Check fuel pressure
4. Check ignition – apply full throttle, then move magneto switch through 1 and 2 positions. Rpm should not drop more than 50 rpm.
5. Check battery charge
6. Throttle to minimum – 500 – 600 rpm.

### **6. Before taxiing**

1. Switches - all on (navigation lights as needed)
2. Check all trims neutral
3. Check the fuel selector is on the main tank.
4. Check the fuel quantity
4. Check free movement of all controls
8. Check landing gear indicator lights are green
9. Check seat belts fastened
10. Check that canopy is locked
11. Required radio frequencies selected

### **7. Takeoff**

1. Slowly go to full throttle
2. Elevators neutral
3. Aircraft should leave the ground at 90 km/hr
4. Raise undercarriage after 5 meters altitude

### **8. Climb**

1. Climb at 145 km/h, up to 4,000 meters
2. During climb gradually reduce the airspeed by 5 km/h for each 1 km height.
3. Adjust mixture starting at 1500 meters

### **9. Cruise**

1. Engine speed - 2580 rpm  $\pm$  60 rpm
2. Airspeed - 210 km/h in level flight

### **10. Descent**

1. Throttle to minimum
2. Recommended speed (flaps in) 150 km/h.
3. Trim as needed

4. Monitor engine temperatures and use throttle to keep in the green arc as needed.

#### **11. Landing approach**

1. Lower undercarriage at 140 km/h. Check green lights are on
2. Flaps:
  - 1<sup>st</sup> position at 140 km / h
  - 2<sup>nd</sup> position at 130 km / h.
3. Minimum throttle (as needed)

#### **12. Landing**

1. Final approach
  - lined up and stable from 7 m to 0.5 m.
2. Control gently stick back for three-point landing
3. After landing, control stick fully back and brakes as needed

#### **13. After landing**

1. Flaps up
2. Elevator trim to tail heavy

#### **14. Switching off the engine**

1. Cool the engine at speeds of 700 - 800 rpm for 1 - 2 minutes.
2. Throttle fully back
3. Magnetos to off
4. Fuel valve lever to off
5. All switches off

### **Emergencies**

#### **1. Fire**

1. Shut off the fuel supply
2. Full throttle
3. Use fire extinguisher
4. Magnetos off
5. Master switch off
6. Decide to force land or leave the aircraft via parachute

#### **2. Leaving the plane with a parachute**

1. Point the plane towards an area of the ground least occupied.
2. Elevator trim to tail heavy
3. Shut off the fuel supply
4. Magnetos off
5. Master switch off
6. Undo seatbelts

7. Pull canopy eject handles and push canopy up and away
8. Jump out of a plane (in the event of a spin, jump always towards the outside direction of the spin)

### 3. Forced landing

1. Landing gear up
2. Use flaps as needed
3. Magnetos off
4. Shut off the fuel supply
5. Master switch off

### 4. Unexpected stall

1. Control stick forward
2. Go to "full throttle"
3. Center controls
4. As soon as the aircraft reaches a speed of 140 km/h resume normal flying



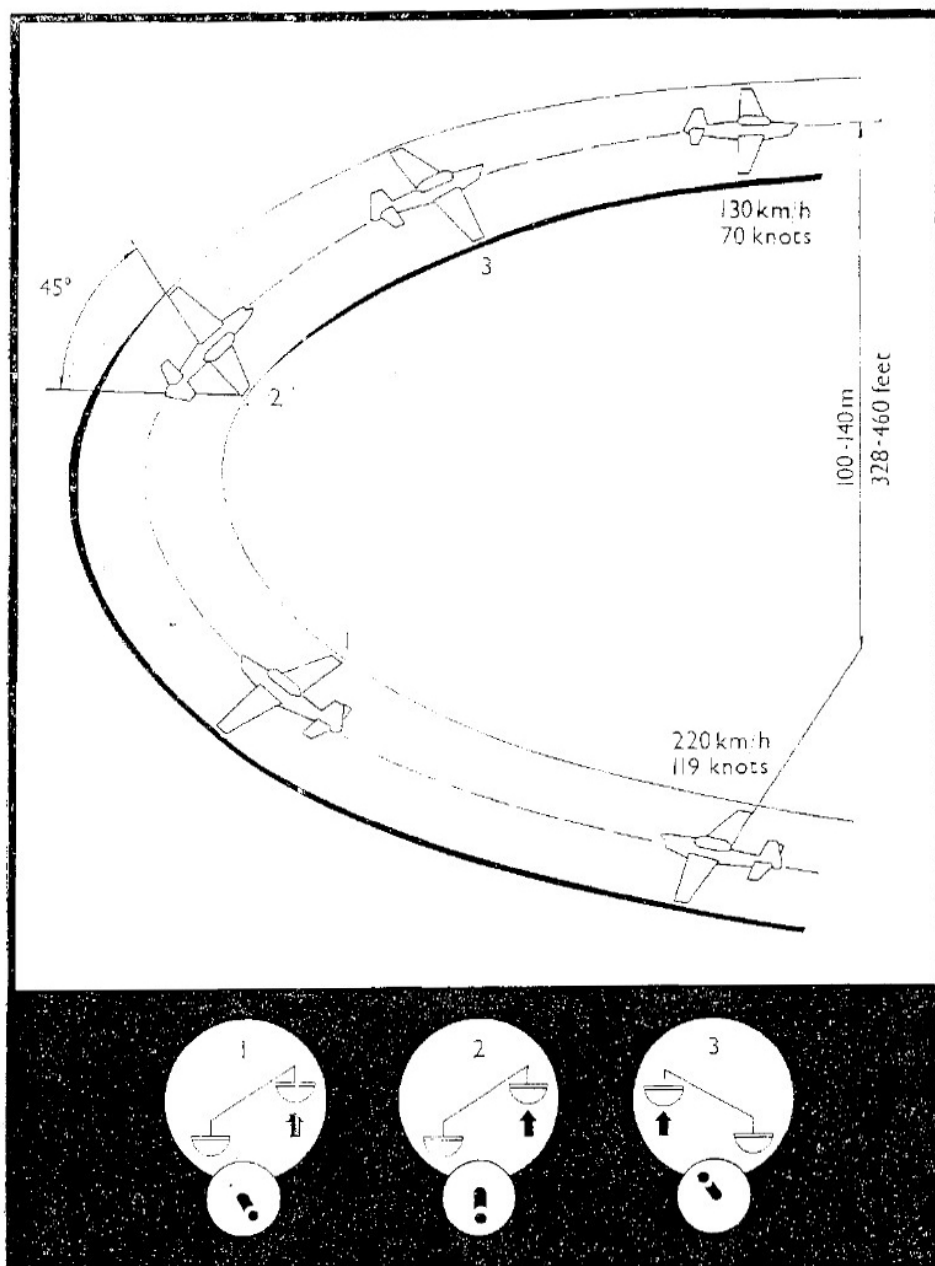


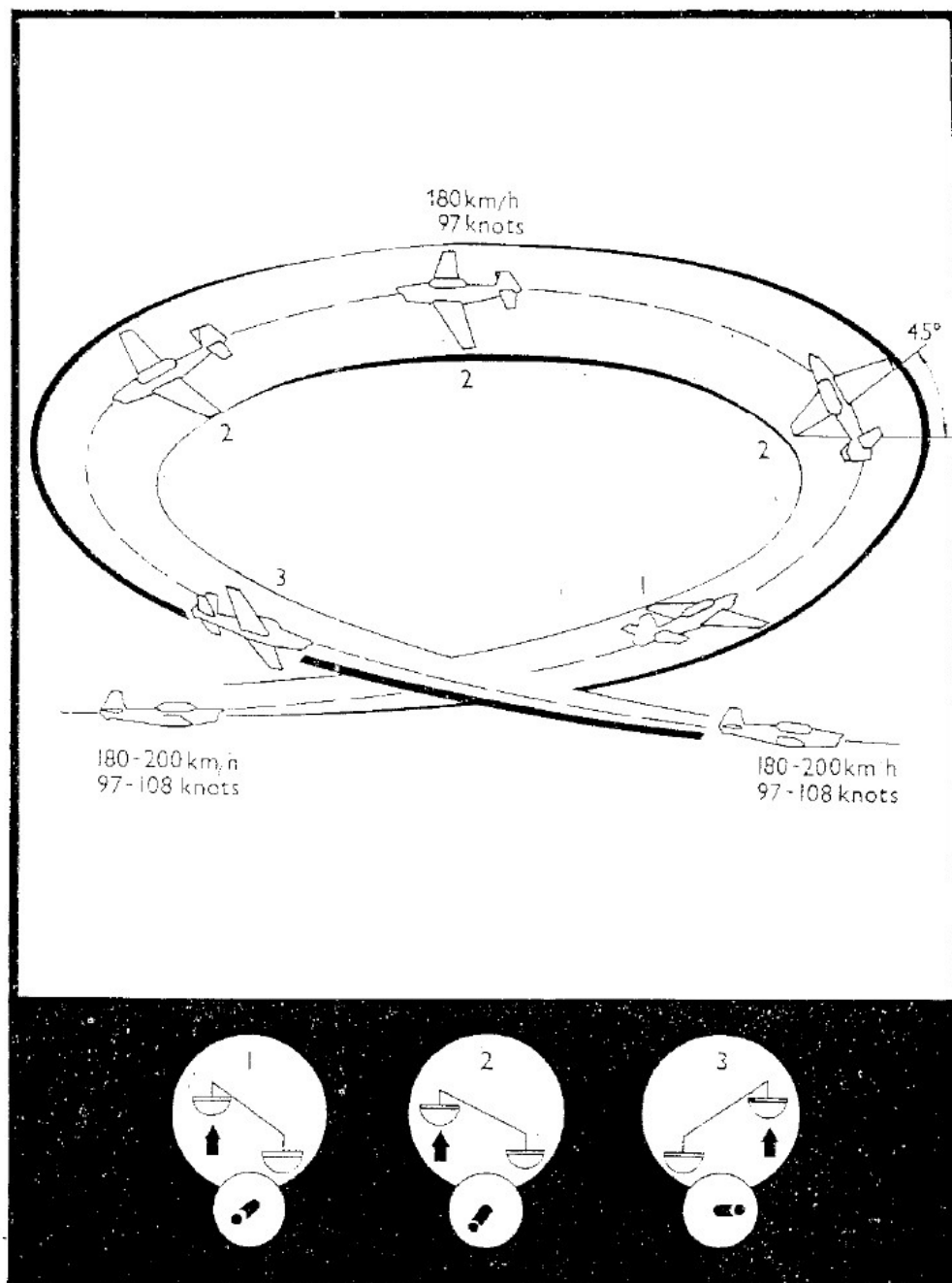
# Aerobatic Maneuvers

Please note that airspeeds and angles are provided. Large circle is rudder pedal position at indicated numbered spots during the maneuver, and smaller circle is stick position.

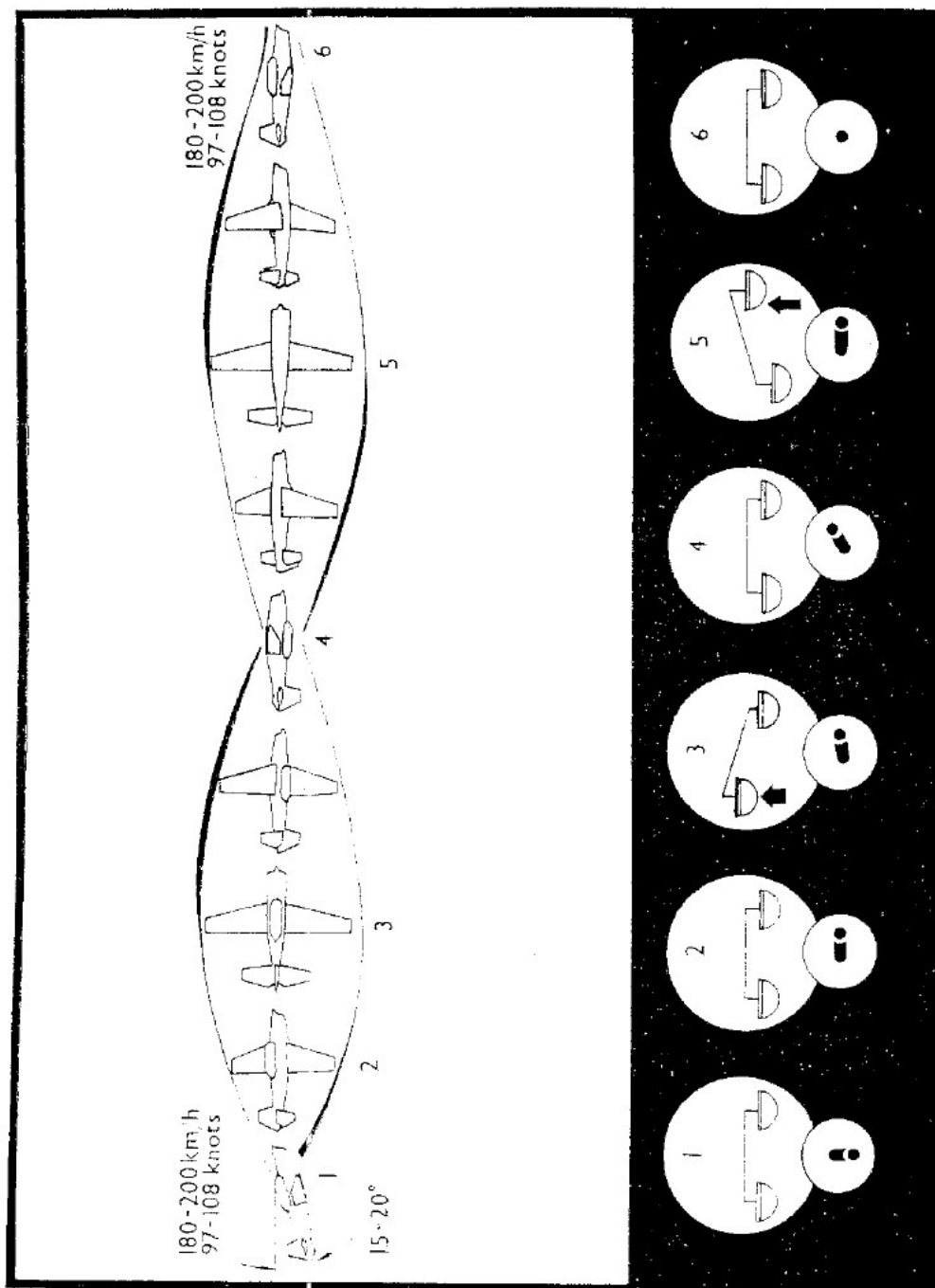
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## TURN

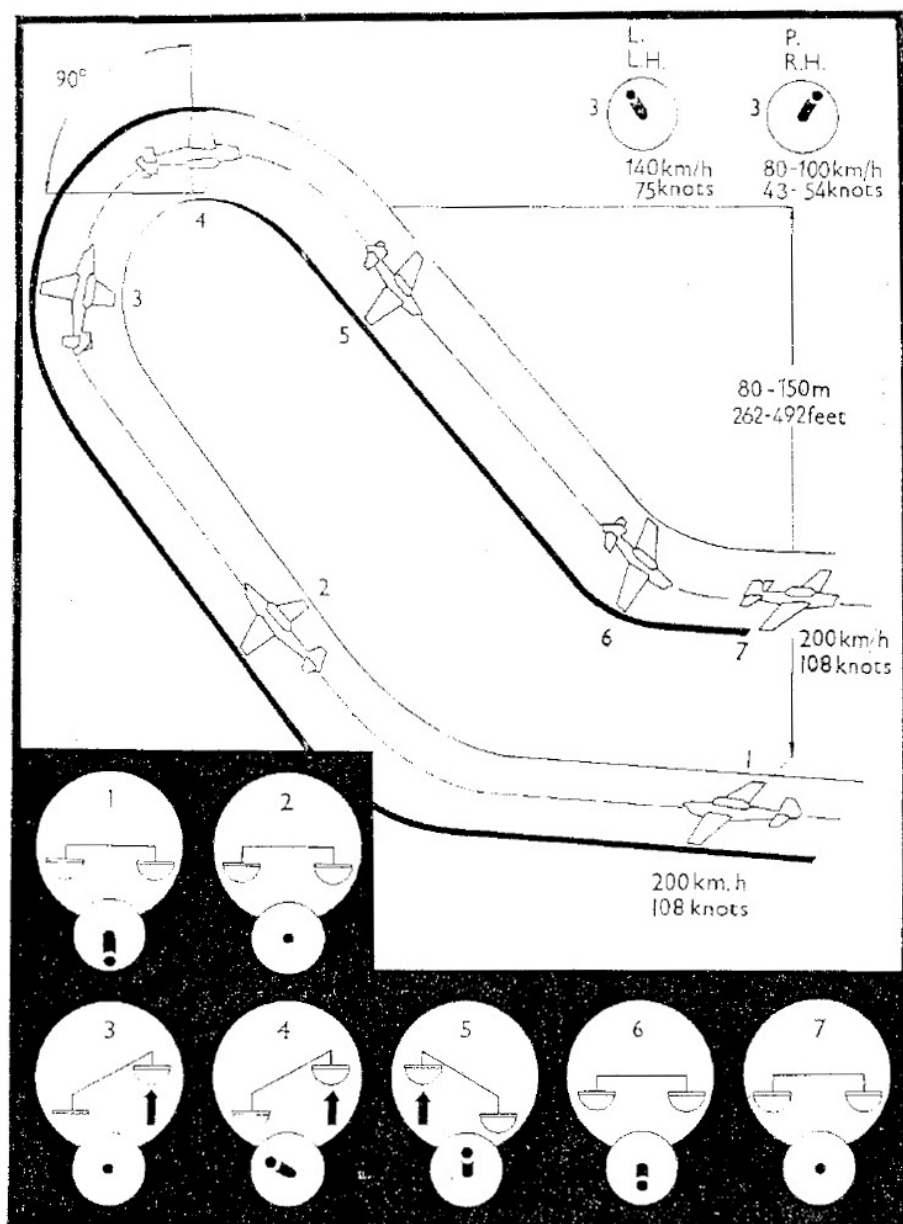


**360° TURN**

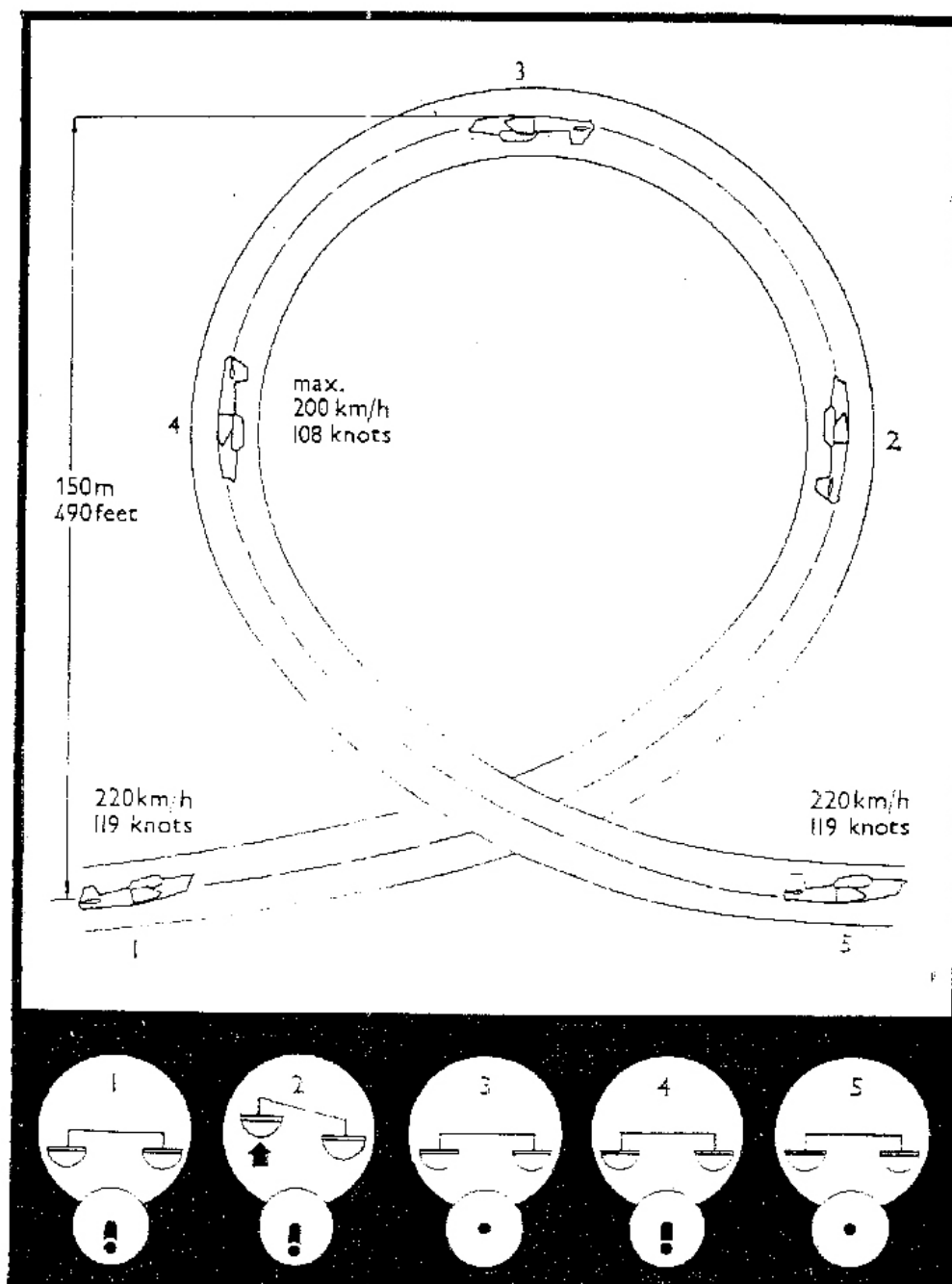
## ROLL



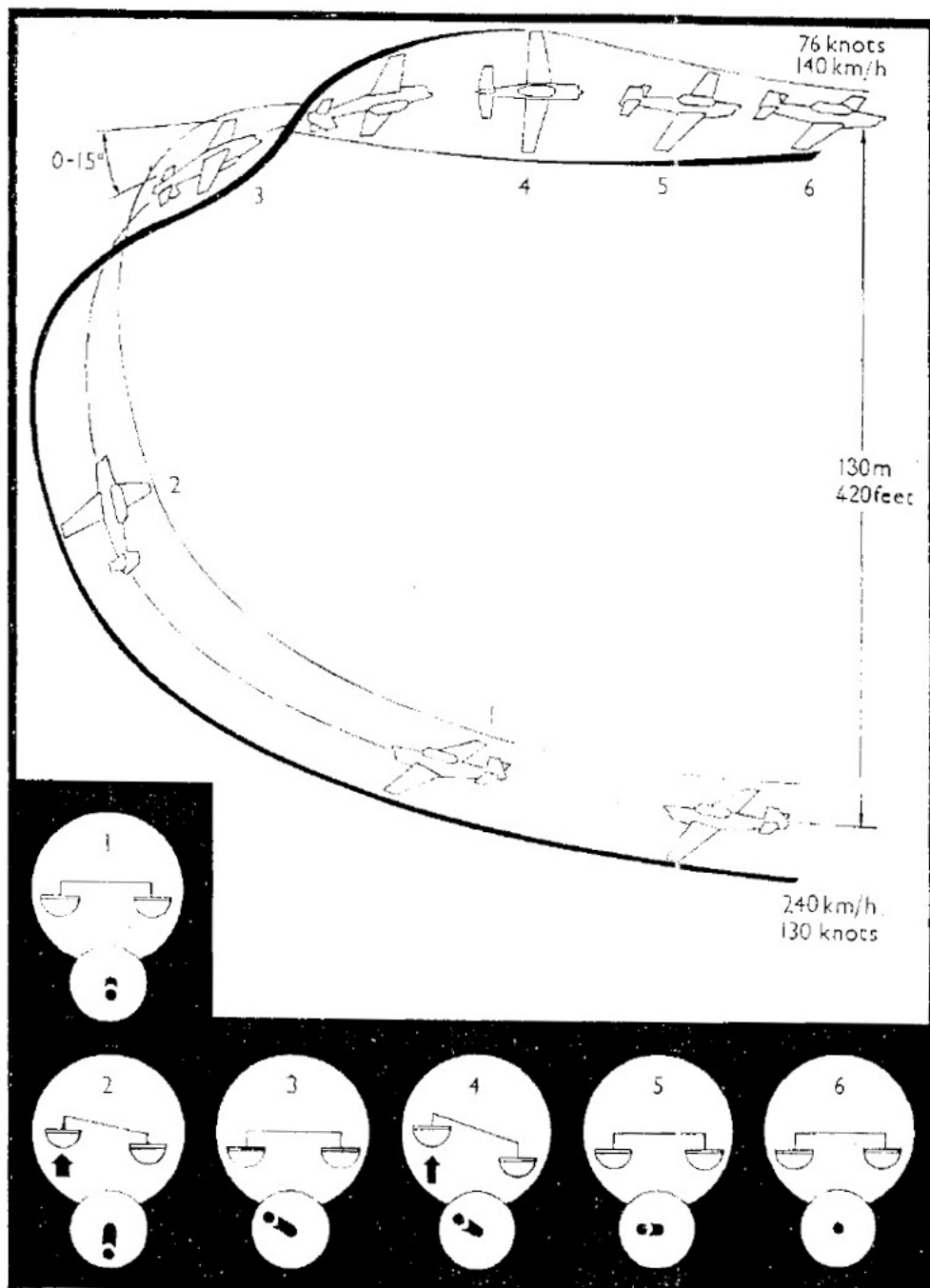
## WING OVER



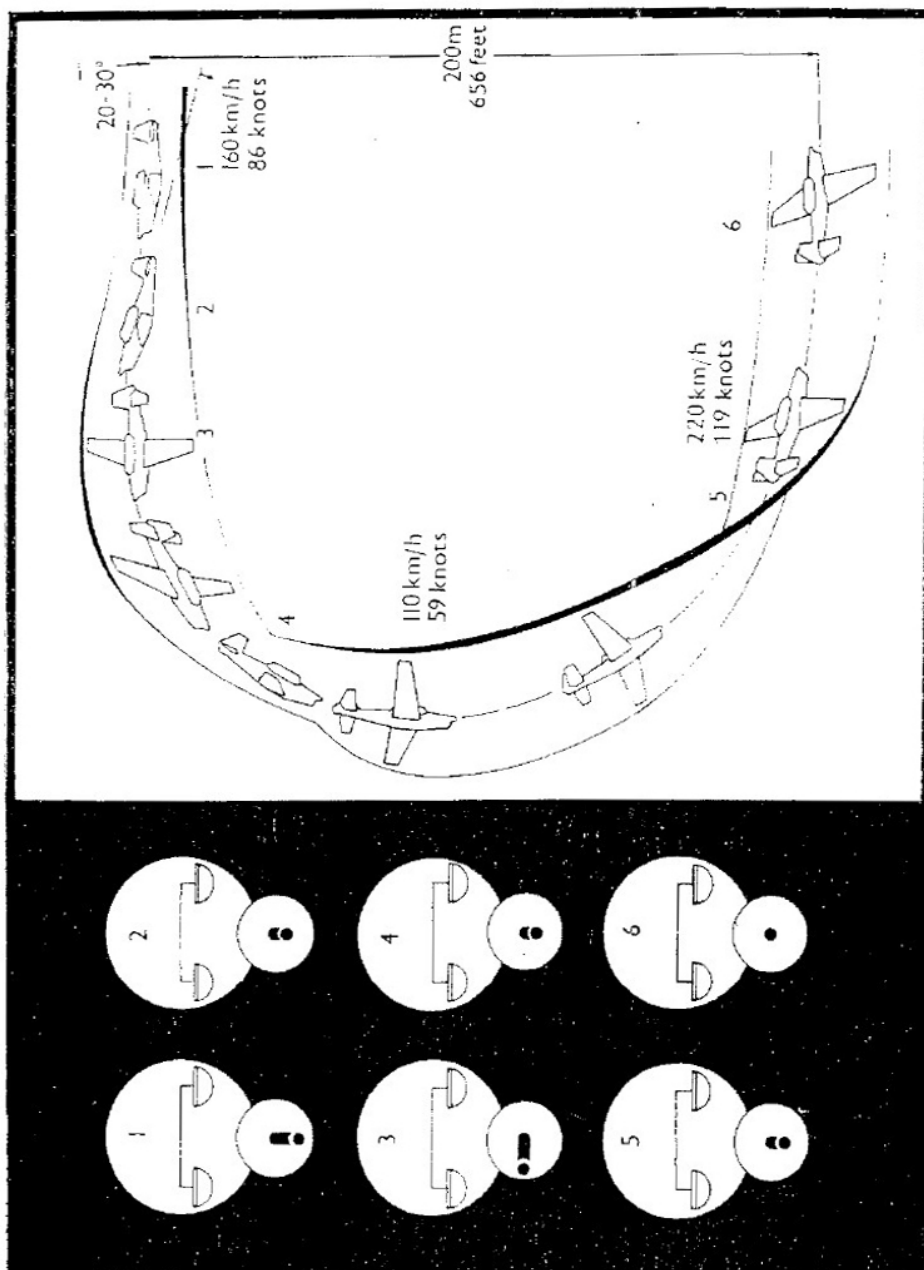
## LOOP



## IMMELMAN

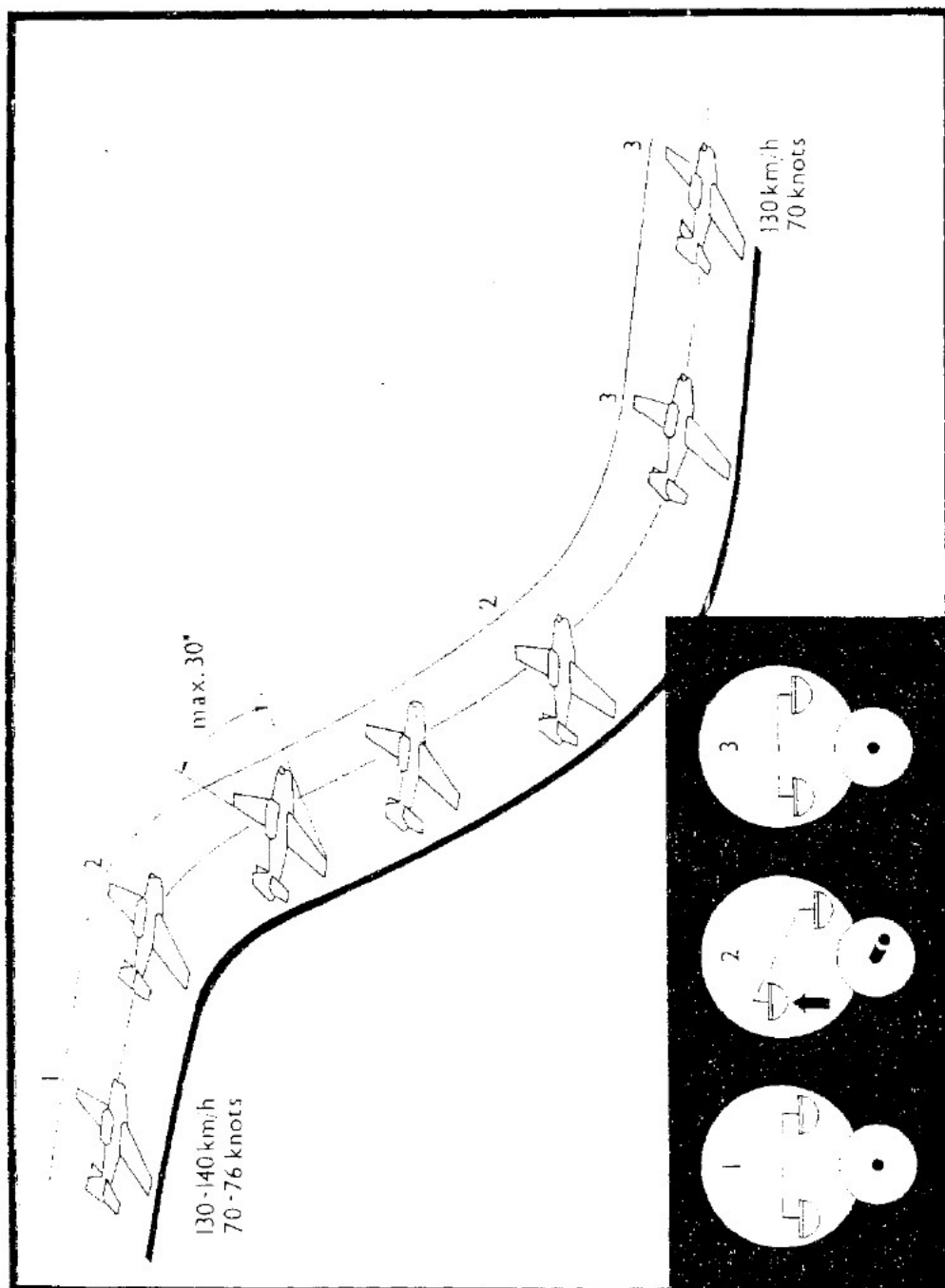


## SPLIT-S

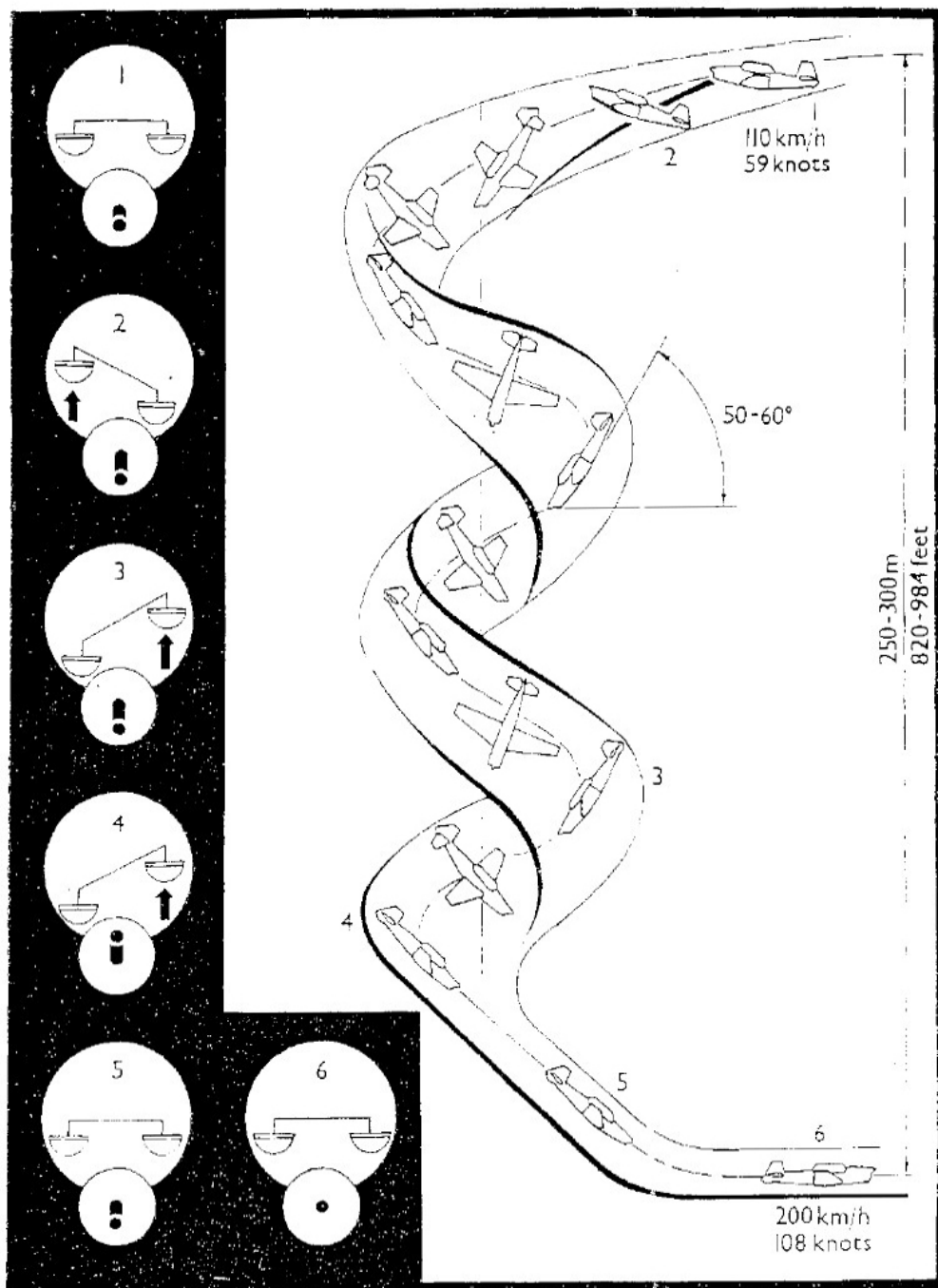




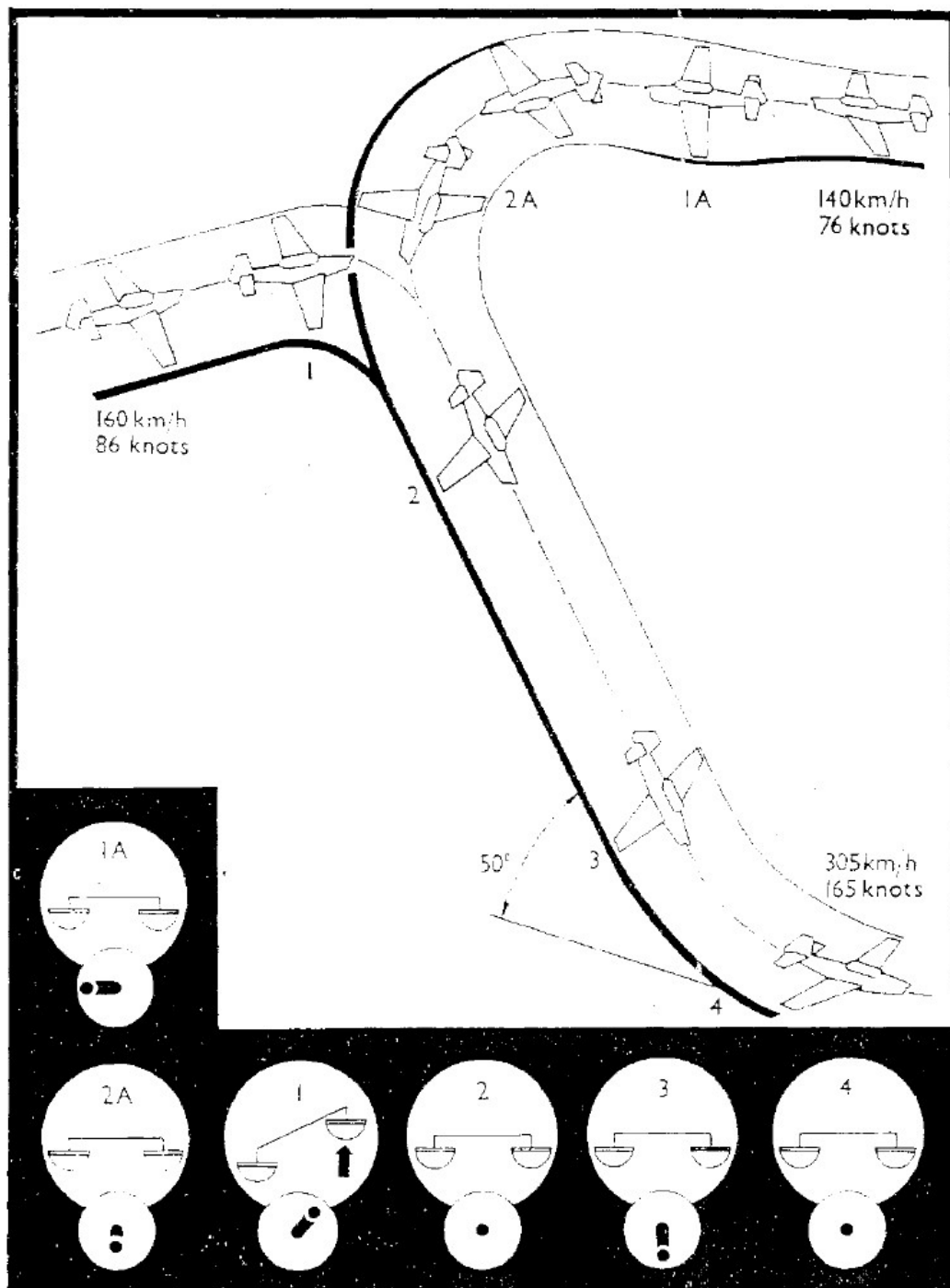
## SIDE SLIP

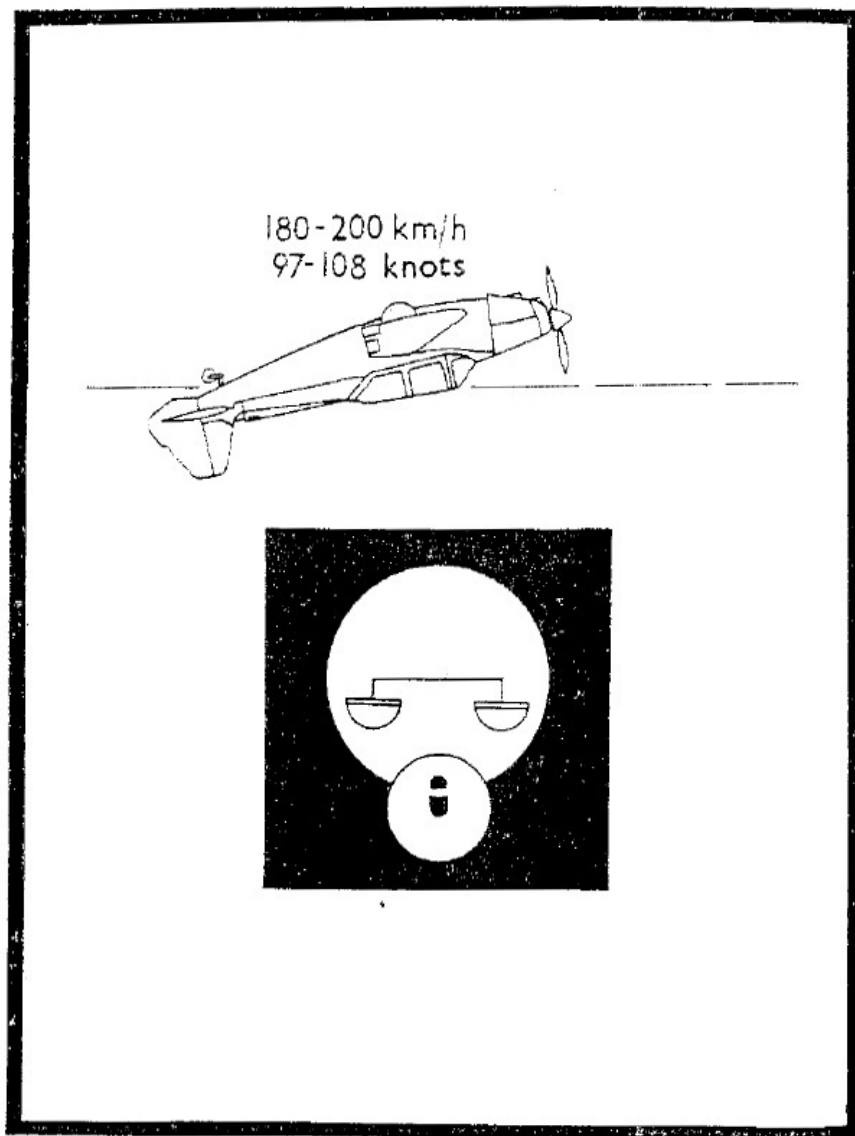


## SPIN

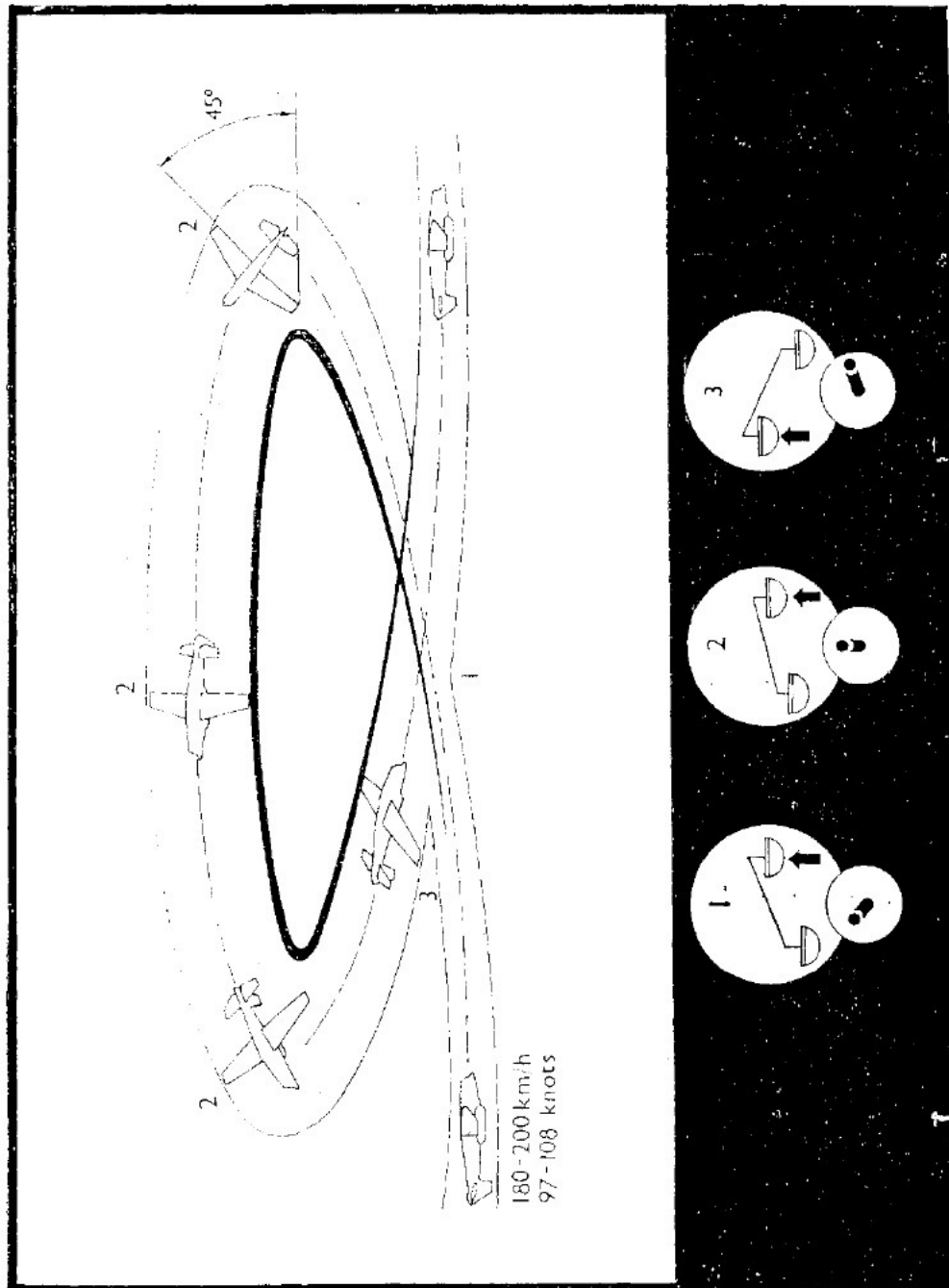


# DIVING TURN



**INVERTED FLIGHT**

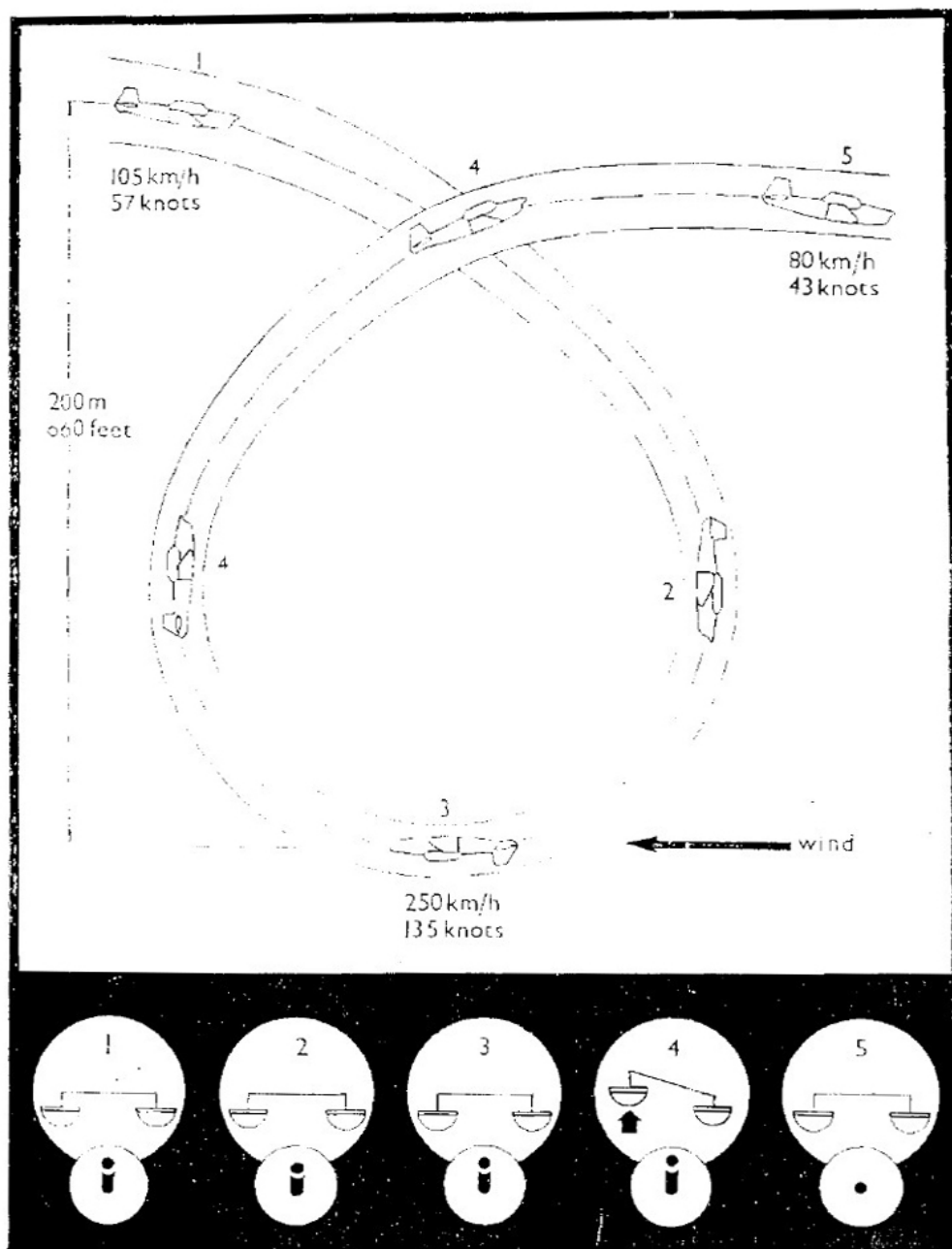
## INVERTED TURN



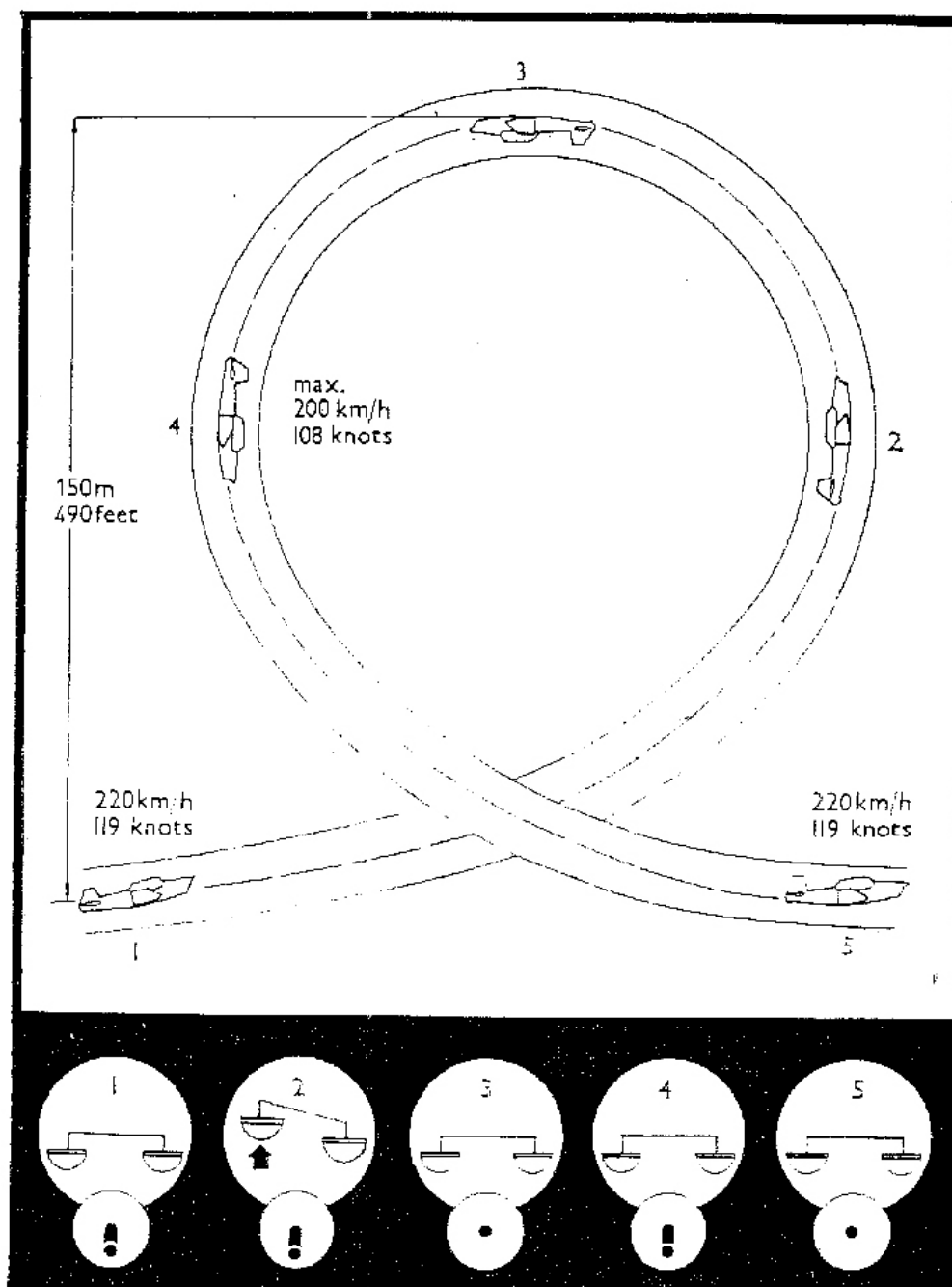
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• when approaching the vertical slowly

## OUTSIDE LOOP



## LOOP





**Thank you:**

- Warwick “Wozza” Carter: Gauge help and debugging; beta testing.
- Tibor Kókai: For generously donating the sound set; beta testing. (You should definitely check out the PWDT Z-142, by Tibor Kókai and Bence Benedek, available in several freeware libraries.)

And the good friend without whose special request I would never have had the pleasure of getting to know this amazing aircraft.

**Support:**

[support@flight-replicas.com](mailto:support@flight-replicas.com)

All requests for support must be accompanied by the following information:

1. Place/website where the aircraft was purchased;
2. Order number;
3. Name used when purchasing; and
4. Date of purchase.

No support will be available without this information.

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