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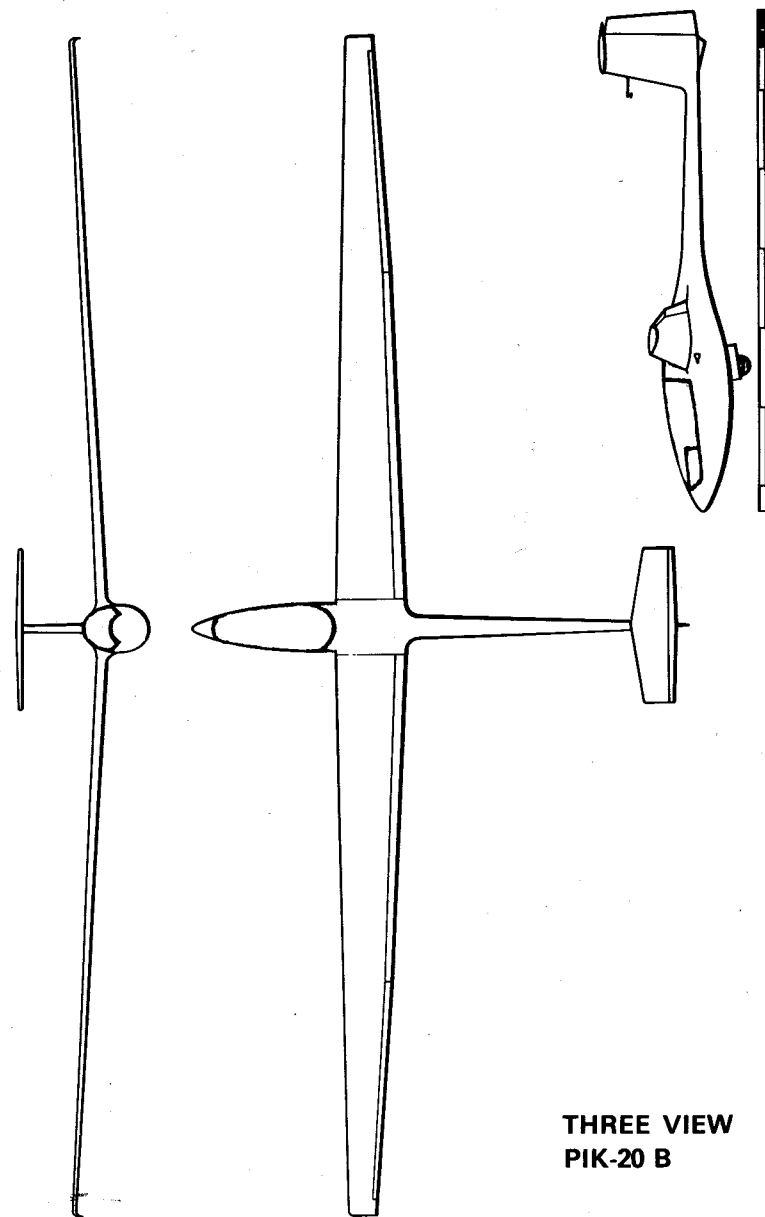
I FLIGHT MANUAL

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Supplement: Weight and Balance Data Sheet



THREE VIEW
PIK-20 B

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1. TECHNICAL DATA

1.1. Main technical data

- Span 15 m (49.2 ft)
- Length 6.43 m (21.10 ft)
- Height 1.34 m (4.40 ft)

1.2. Wing

- Wing area 10.0 m² (107.5 sqft)
- Aspect ratio 22.5
- Dihedral angle 3°
- Sweep-back angle (quarterchord line) 0°
- Angle of incidence 1°
- Root chord 0.90 m (2.95 ft)
- Mean chord 0.65 m (2.13 ft)
- Tip chord 0.36 m (1.18 ft)
- Mean aerodynamic chord (MAC) 0.70 m (2.30 ft)
- Root profile FX 67-K-170
- Tip profile FX 67-K-150
- Aileron area 2 x 0.24 m² (2 x 2.61 sqft)
- Aileron movements Up 21° – 24° ± 2°
Down 17° – 21° ± 2°
- Flaps-airbrakes area 2 x 0.55 m² (2 x 5.99 sqft)
- Flaps-airbrakes movements Up 8° ± 1°
Down 80° + 10° – 5°
- Ailerons move with flaps Up 8° ± 1°
Down 8° ± 1°

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1.3. Horizontal stabilizer and elevator

- Area 1.00 m² (10.76 sqft)
- Span 2.0 m (6.56 ft)
- Aspect ratio 4.0
- Angle of incidence – 2°
- Profile FX 71-L-150/20
- Elevator movements Up and down 20° ± 1°

1.4. Vertical stabilizer and rudder

- Area 1.02 m² (10.98 sqft)
- Profile FX 71-L-150/30
- Rudder movements Right and left 27° ± 2°

1.5. Fuselage

- Height 0.86 m (2.62 ft)
- Width 0.60 m (1.97 ft)
- Main wheel 5.00-5
- Tail wheel 200 x 50 mm (7.87 x 1.96 in)

1.6. Weights and loads

- Empty weight about 240 kg (529 lbs)
- Gross weight 450 kg (992 lbs)
- Maximum water ballast 140 kg (309 lbs)
- Wing loading 32 . . . 45 kg/m²
(6.55 . . . 9.21 lbs/sqft)

2. SAILPLANE DESCRIPTION

2.1. General description

The PIK-20 is designed according to OSTIV — Airworthiness Requirements For Sailplanes 1971, single seat Standard Class Sailplane for training and limited acrobatics (Utility Category).

The whole sailplane is made of epoxy resin laminates. The shoulder configuration wing and the control surfaces are of rigid sandwich structure, PVC-foam between epoxy laminates.

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The fuselage is made of epoxy laminates stiffened with eight ribs and by the cockpit with a double bottom.

The retractable main landing wheel is equipped with brake.

The tail wheel is located under the vertical stabilizer in a housing.

The trailing-edge flaps-airbrakes may be used for three purposes:

1. To improve performance while thermalling and gliding.
2. At all speeds as air brakes except for more than 45° (see Air-speed Limits).
3. During landing as landing flaps.

The "T"-configuration tail unit has conventional elevator and rudder surfaces.

2.2. Flight control and flap system

The primary flight control surfaces (ailerons, elevator and rudder) are controlled by a conventional control stick and rudder pedal arrangement.

The elevator trim is controlled by a green knob located on the left side console. It is connected to the elevator control system by a spring.

The trailing-edge flaps blue control wheel is located to the left of the pilot's seat. The wheel provides detent positions for all values between -8° and 80° of flap deflection.

The wheel also moves the aileron neutral position between angles -8° ... +8°, this means that the ailerons follow the flaps to +8° and then the connection opens. This is done by means of a slide under the flap drive rack under the wheel. The slide is connected to the differential lever of the aileron drive mechanism, where geared segments move.

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2.3. Landing gear system

The retractable main landing gear is operated by means of a grey lever located on the right side of the cockpit. In the forward position the gear is down — rear position the gear is up. Remember to put the handle in the forward position before landing.

The wheel brake handle is attached to the control stick.

2.4. Other controls

The yellow tow coupling release knob is located on the lower left side of the instrument panel. The tow coupling hook is located below the fuselage in front of the landing gear.

The canopy is hinged to the right side of the cockpit and can be opened by pulling the red knob on the left side of the cockpit. Jettising in an emergency occurs by pulling the abovementioned knob together with the red jettisoning knob on the right side of the cockpit and lifting the cockpit. The grey coloured pedal adjustment knob is located in front of the control stick on the right, below the instrument panel.

Adjustment of the seat back occurs by loosening four screws located on the lower part of the seat back.

The water ballast draining knob is located on the right side of the cockpit. The forward position is open — the rear position closed.

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3. LIMITATIONS

3.1. Airspeed limits (I.A.S.)

Never exceed (V_{NE})	262 km/h 163 mph 142 kts
Gusty conditions (V_B)	242 km/h 150 mph 131 kts
Maneuvering (V_A)	185 km/h 115 mph 100 kts
On aero tow (V_T)	185 km/h 115 mph 100 kts
On winch tow (V_W)	125 km/h 77 mph 67 kts
Flaps-airbrakes deflected, — 45° or less	262 km/h 163 mph 142 kts
Flaps-airbrakes deflected, — more than 45°	200 km/h 124 mph 108 kts
All acrobatic maneuvers must be accomplished with speeds less than (See 4.1.3 and 5.7)	185 km/h 115 mph 100 kts

3.2. Flight load factors

- Maximum positive + 5.3
- Maximum negative - 2.65
- Maximum positive
flaps-airbrakes deflected more than 45° + 4.0

3.3. Operating limits

- VFR day (See Service Manual, part 6 for equipment)
- Cloud flying, provided that the following instruments installed: Airspeed indicator, altimeter, compass, turn and slip indicator, variometer.
- Approved acrobatics:
Looping, stall turn, steep turn, lazy eight, chandelle and spin.
- During acrobatic maneuvers the flaps-airbrakes must not be deflected more than 45°.
- No snapped figures approved.
- Accelerometer mandatory for acrobatics.
- Acrobatic maneuvers with water ballast are prohibited.

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3.4. Weight and C.G. limits

- Empty Weight about 240 kg (529 lbs)
- Maximum gross weight 450 kg (990 lbs)
- Maximum water ballast 140 kg (309 lbs)
- Pilot and parachute 55 ... 110 kg (120 ... 240 lbs)
- C.G. limits aft datum minimum 2.085 m (82.08 ins)
maximum 2.225 m (87.59 ins)
(20 ... 40 % MAC)

Datum: Vertical plane 1.90 m (= 74.80 ins) forward of wing leading edge at wing root rib.
Leveling means: Slope of rear top surface of fuselage 1000:28.

3.5. Rated load in aero and winch tow 500 kg (1100 lbs)

4. MARKINGS

4.1. Placards

4.1.1. In full view of the pilot

Maximum airspeed	
In calm weather (V_{NE})	262 km/h 163 mph 142 kts
In turbulent weather (V_B)	242 km/h 150 mph 131 kts
Maneuvering (V_A)	185 km/h 115 mph 100 kts
On aero tow (V_T)	185 km/h 115 mph 100 kts
On winch tow (V_W)	125 km/h 77 mph 67 kts
Flaps-airbrakes deflected 45° or less	262 km/h 163 mph 142 kts
Flaps-airbrakes deflected more than 45°	200 km/h 124 mph 108 kts

Weights

Gross weight 450 kg including water ballast.

If the pilot's weight with the parachute is below 75 kg ballast weights must be installed in the nose (see Flight Manual and Weight and Balance Data Sheet).

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4.1.2. In full view of the pilot

Preflight check

- Tail dolly removed
- Parachute secured
- Seat and pedals adjusted
- Safety belts secured
- Canopy locked
- Altimeter set
- Flaps-airbrakes in take-off position (8° up)
- Trim set for take-off
- Tow rope coupled on
- Controls free

Before landing

- Water ballast drained
- Landing gear down
- Flaps as desired

4.1.3. In full view of the pilot

Operating limitations

- This sailplane must be operated in compliance with the operating limitations as stated in the form of markings, placards and in the Flight Manual.
- Cloud flying is only permitted when the following instruments are installed: Airspeed indicator, altimeter, magnetic compass, turn and slip indicator and variometer.
- Approved acrobatic maneuvers, maximum entry speeds and maximum load factors:

Maneuver	Maximum entry speed
Steep turn	185 km/h 115 mph 100 kts
Looping	185 km/h 115 mph 100 kts
Lazy eight	185 km/h 115 mph 100 kts
Chandelle	185 km/h 115 mph 100 kts
Stall turn	185 km/h 115 mph 100 kts
Spin	Use slow deceleration
Stall (Except Whip Stalls)	Use slow deceleration
Maximum load factors	+ 5.3 – 2.65
Maximum positive load factor, flaps-airbrakes deflected more than 45°	+ 4.0
Acrobatic maneuvers prohibited with flaps-airbrakes deflected more than 45°.	

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All acrobatic maneuvers including spins must be accomplished in accordance with the approved PIK-20 Flight Manual.
Accelerometer must be installed.

- Night flying prohibited.

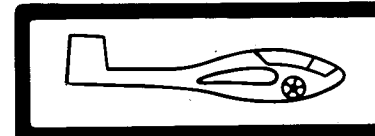
4.2. Symbols of the Controls



Tow release *YELLOW*



Canopy Lock and Jettison Control
RED



Landing Gear up



Landing Gear down



Trim control – Nose down
GREEN



Trim control – Nose up
GREEN

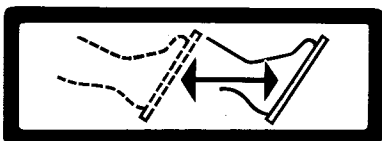


Flaps-airbrakes
BLUE

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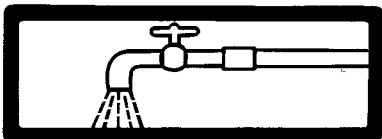
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Pedal adjustment



Cabin ventilation



Water ballast

- 4.3. Other markings
- Adjacent to tow coupling **RATED LOAD** 500 kg (1100 lbs)
 - Above the main wheel 2.5 Aty (35 psi)
 - Above the tail wheel 2.0 Aty (28 psi)
 - Adjacent to static pressure entry on fuselage skin **STATIC PRESSURE KEEP CLEAR**
 - Adjacent to oxygen control valve (if installed) **DURATION TABLE**
 - On fuselage nose (inside) **BALLAST**

4.4. Flight Instrument Markings

4.4.1. Air Speed Indicator

- Maximum;

Red radial	262 km/h	163 mph	142 kts
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- Caution range;

Yellow arc	242 ... 262 km/h	150...163 mph	131...142 kts
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- Normal range;

Green arc	74 ... 242 km/h	46...150 mph	40...131 kts
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- Flap operating range;

White arc	74...200 km/h	46...124 mph	40 – 108 kts
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4.4.2. Accelerometer

- Maximum positive; Red radial + 5.3
- Maximum negative; Red radial – 2.65

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5. NORMAL PROCEDURES

- 5.1. Preflight inspection
- Tail dolly removed
 - Barograph on (if installed)
 - Loading and ballast checked
 - Parachute secured
 - Seat and pedals adjusted
 - Safety belts secured
 - Canopy locked
 - Altimeter set
 - Flaps-airbrakes in take-off position (8° up)
 - Trim set for take-off
 - Tow rope coupled on
 - Controls free
- 5.2. Take-off on winch launch
- Trim in front position with mean C.G.
 - Flaps-airbrakes max 5° down
 - Recommended airspeed

110 ... 125 km/h	68 ... 77 mph	59 ... 67 kts
------------------	---------------	---------------
 - Maximum airspeed 125 km/h 77 mph 67 kts
 - During climb after 100 m (300 ft) altitude flaps-airbrakes can be taken 15° down
- Note: If flaps-airbrakes are deflected more than 5° the airplane takes off too rapidly and controllability decreases.
- 5.3. Take-off on aerotow
- Trim in neutral position with mean C.G.
 - Recommended airspeed

120 ... 130 km/h	75 ... 81 mph	65 ... 70 kts
------------------	---------------	---------------
 - Maximum airspeed 185 km/h 115 mph 100 kts

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5.4. Flight

- At a safe altitude retract landing gear
- At weight 320 ... 450 kg (705 lbs ... 990 lbs)
- Gliding speed 90 ... 105 km/h 56 ... 64 mph 49 ... 57 kts
- Best lift/drag ratio 39.5 ... 42,0
- Minimum sink rate at 73 ... 89 km/h = 0.58 ... 0.69 m/s
(114 ... 126 ft/min)

Stall speed flaps-airbrakes,

- down 10° 67 ... 81 km/h 42 ... 49 mph 36 ... 44 kts
- Stall speed flaps-airbrakes
- down 90° 60 ... 72 km/h 37 ... 44 mph 32 ... 39 kts
- In stall the nose drops smoothly without natural warning: inadvertent spins don't occur.

Note: At speeds over 185 km/h (115 mph, 100 kts) full control movements are not acceptable. As the speed is increased to V_{NE} from V_A the control movement shall be decreased to 1/3 of maximum movement. The elevator control force is low and that is why it must be used carefully to avoid excessive g-loads.

5.5. Landing

- Water ballast drained
- Landing gear extended
- Approach speed about 90 km/h (56 mph, 49 kts)
- Flaps-airbrakes down as desired, in the final down 60—90°. Before touchdown the flaps-airbrakes can be retracted to shorten the ground roll.
- On the ground wheel brake as desired.

Note: To avoid confusion it is recommended to keep the flaps-airbrakes handle on the upper sector, by using full rotations.

5.6. Cloud flying

- IFR instruments on and monitored
- Air speed within green range
- At air speed exceeding 200 km/h (124 mph, 108 kts) extend flaps-airbrakes
- Observe icing

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5.7. Acrobatics

During acrobatic maneuvers the flaps-airbrakes must not be deflected more than 45°.

Following acrobatic maneuvers are approved with entry speeds listed below:

Maneuver	Recommended entry speed		
Steep turn	120 km/h	75 mph	65 kts
Looping	185 km/h	115 mph	100 kts
Stall turn	170 km/h	106 mph	92 kts
Lazy eight	170 km/h	106 mph	92 kts
Chandelle	185 km/h	115 mph	100 kts
Spin	Use slow deceleration		
Stall (except Whip Stalls)	Use slow deceleration		

Note: Max. entry speed for steep turn, looping, stall turn, lazy eight and chandelle is 185 km/h, 115 mph, 100 kts.

During acrobatic maneuvers monitor accelerometer.

The spin is possible at all C. of G. positions: however in the forward C. of G. position the sailplane enters spin with very great difficulty. The start of the spin is conventional for sailplanes: Pull control stick fully back and at the same time apply rudder control to the desired direction, then apply full aileron to the same direction. Without aileron control the spin stops after one or two turns. The spin stops by neutralizing the controls. The spin recovers rapidly by applying full rudder opposite to the direction of rotation. Do not push the control stick forward of the neutral position so as to avoid an extreme speed increase.

Drain the water ballast before acrobatic maneuvers.

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6. WEIGHT AND BALANCE

The following information will enable you to fly your PIK-20 within the prescribed weight and center of gravity limitations. To calculate the weight and balance for your PIK-20, use the Sample Problem, Loading Graph and Center of Gravity Moment Envelope as follows:

Take the licensed Empty Weight and Moment/1000 from the Weight and Balance Data Sheet (in Service Manual), and write them down in the proper columns. Add all additional weights and their corresponding moments/1000 (using the Loading Graph) of items to be carried on the flight. Plot the total weight and moment on the Center of Gravity Moment Envelope and if the intersection point is within the envelope, the loading is acceptable. If necessary use ballast in the nose (Usually if the pilot's weight with the parachute is below 75 kg/165 lbs ballast weights must be installed).

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SAMPLE LOADING PROBLEM	SAMPLE SAILPLANE		YOUR SAILPLANE	
	Weight (lbs)	Moment (lb-ins/1000)	Weight (lbs)	Moment (lb-ins/1000)
1. Licensed Empty Weight x)	545	52.3		
2. Pilot and parachute	187	10.8		
3. Water ballast	132	11.1		
4. Ballast in the nose				
5. Equipment xx)				
TOTAL WEIGHT AND MOMENT	864	74.2		

In this sample case the point (864 lbs. at 74.2 lb.-ins./1000) falls within the Center of Gravity Envelope and the loading is acceptable.

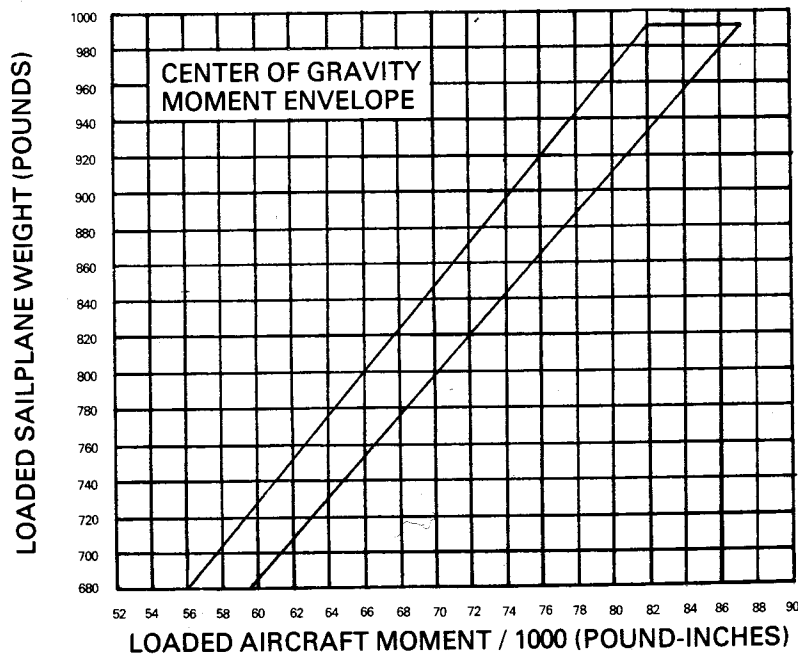
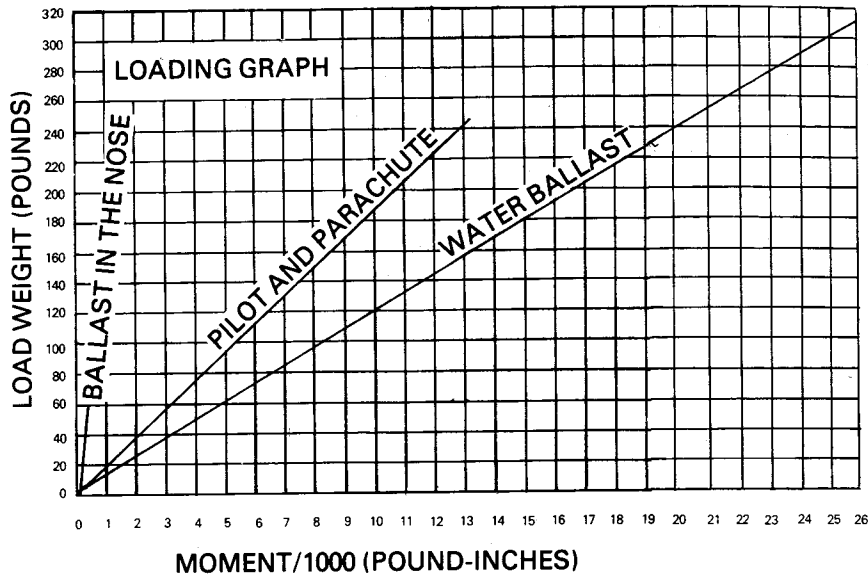
x) See the Weight and Balance Data Sheet

xx) See the weights, arms and moments of the removable equipments at the end of the Service Manual.

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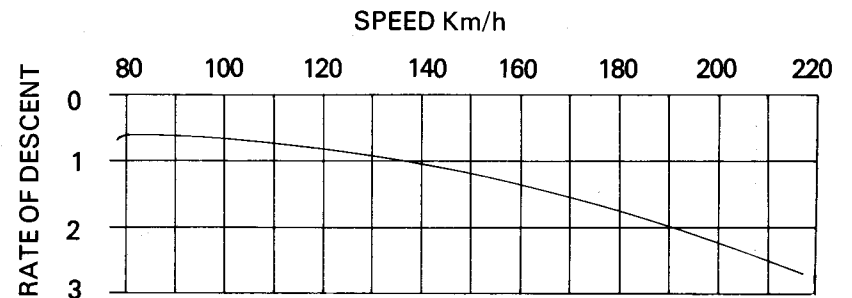
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7. PERFORMANCE

At sea level	Weight 320 kg (705 lbs)	Weight 450 kg (992 lbs)
– Stall speed (flaps down 10°)	67 km/h 42 mph 36 kts	81 km/h 49 mph 44 kts
– Stall speed (flaps down 90°)	60 km/h 37 mph 32 kts	72 km/h 44 mph 39 kts
– minimum rate of descent at speed	0.58 m/s 114 fpm	0.63 m/s 133 fpm
– Maximum gliding ratio at speed	73 km/h 45 mph 40 kts	89 km/h 54 mph 48 kts
	90 km/h 56 mph 49 kts	105 km/h 64 mph 57 kts



m/s PERFORMANCE AT WEIGHT 450 kg (992 lbs)

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8. SPECIAL FLIGHT CONDITIONS AND EMERGENCY PROCEDURES
 - 8.1. Flying in the rain and icing conditions
Raindrops, ice or frost on the sailplane's surfaces will considerably reduce its performance: Stall speed increases 5 to 10 percent and also rate of descent is greater than normal. This must be taken into consideration in particular during approach and landing.
 - 8.2. Flying at high altitude
If you fly above 3500 m (11000 ft) altitude use oxygen.
 - 8.3. Landing on uneven or soft ground
Landing on uneven or soft ground may be done with the landing gear extended or retracted depending on circumstances. Usually the sailplane is not damaged by landing on grass with the landing gear retracted.
 - 8.4. Jettisoning of the canopy
To jettison the canopy pull the red locking control and the red knob on the right hand side of the cockpit and lift the canopy.

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II SERVICE MANUAL

1. ASSEMBLY AND DISASSEMBLY

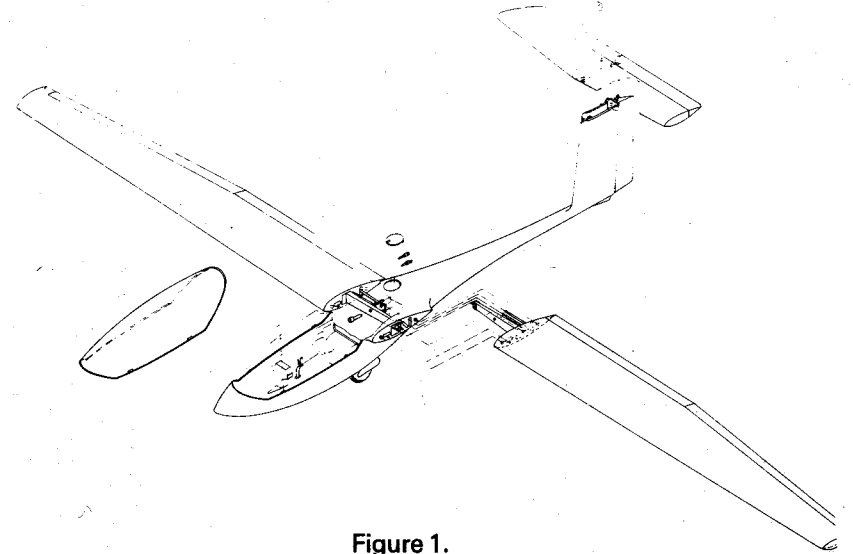


Figure 1.

1.1. Preparation

Three or even two persons can easily assemble and disassemble the PIK-20. Before assembly remove the canopy and prepare the required tools, clean clothes, grease of mineral or synthetic basis, the wing assembly tool and a bit of steel wire for pulling out the locking pin of the horizontal stabilizer. Clean and grease all fitting surfaces, bolts, pins and control system connectors.

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1.2. Wing assembly (Figure 2)

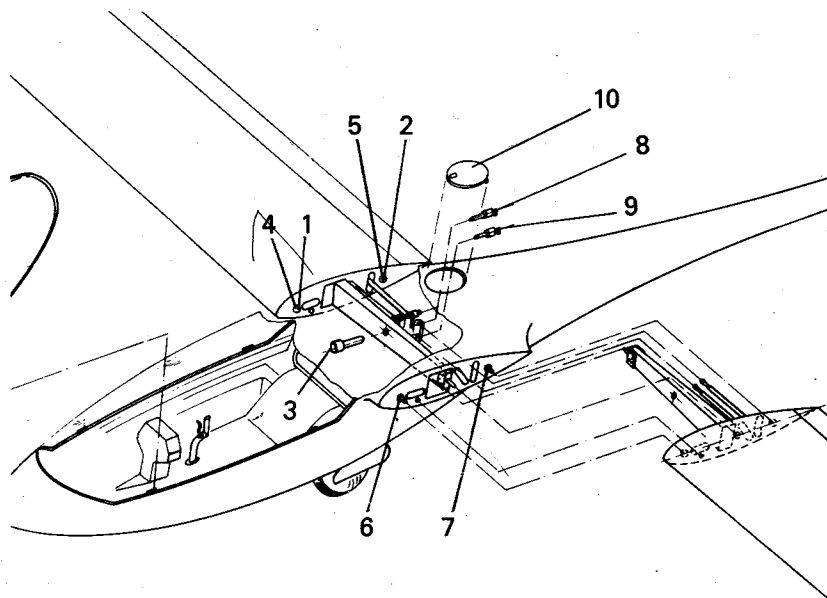


Figure 2

- Insert the right-hand wing ensuring that the fuselage bevel pins (1) and (2) are in the seats (4) and (5).
- Insert the left-hand wing in the same way and watch that the bevel pins (6) and (7) go correctly into their seats. Draw the wings together with the wing assembly tool and install the main wing pin and secure it using a Fokker-pin. It is necessary to upload the wing tips when using the assembly tool.
- Connect aileron and flap control rods by installation of pip-pins (8) and (9). Close the inspection opening (10) on the top of the fuselage.

1.3. Empennage assembly (Figure 3)

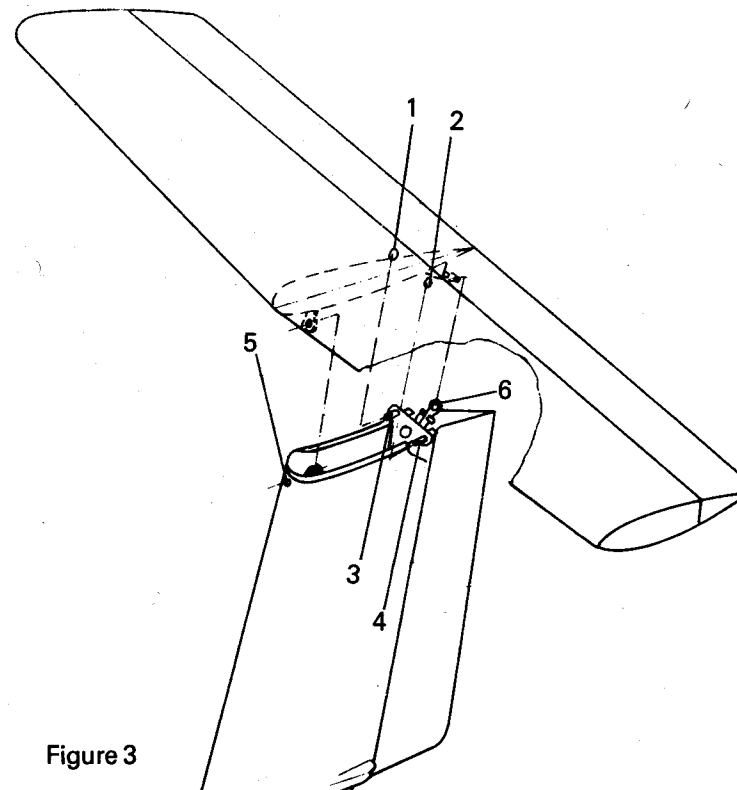


Figure 3

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- Insert the horizontal stabilizer by lifting the leading edge up a little and by pushing the ball bearings (1) and (2) on to the pins (3) and (4) on the vertical stabilizer.
- Pull out the locking pin (5) with a tool (steel pin) and push the leading edge into place. Remove the tool and push the locking pin in. Ensure that the safety spring is engaged and secure the pin using a Fokker-pin.
- Deflect the elevator upwards and connect elevator control rod (6) and secure it using a Fokker-pin.

1.4. Disassembly

- The wings are removed in the reverse sequence to assembly. Reinstall all attachment bolts and control rod connection bolts in their holes and secure them.
- Remove the horizontal stabilizer in the reverse sequence to assembly.

2. PREFLIGHT CHECK

Following sailplane rigging, and before the first flight of the day carry out the following checks:

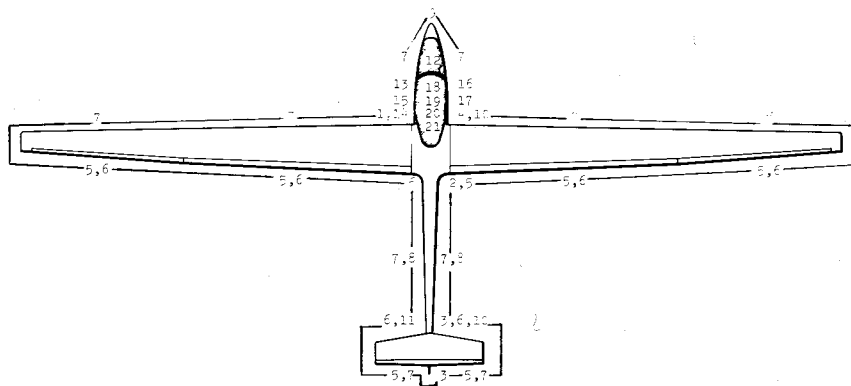


Figure 4

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1. Main wing pin secured.
2. Pip-pins connecting ailerons and flaps-airbrakes secured.
3. Horizontal stabilizer attachment pins correct and locking pin all the way in and secured. Quick release for elevator control rod secured.
4. Tow coupling clean and functioning properly.
5. Ailerons, flaps-airbrakes, elevator and rudder correct, free and full travel.
6. Tapes over control-surface gaps for adherence (if fixed).
7. Wings, fuselage and empennage for damages to the skin, dents or cracks.
8. Static pressure vents free.
9. Pitot tube free.
10. Tyre pressure correct.
11. Tail dolly removed.
12. Ballast properly fastened.
13. Canopy clean and locking mechanism for condition.
14. Water ballast system for condition and proper functioning.
15. No foreign matter or loose particles in the cockpit.
16. Control stick and pedals free and full travel.
17. Flaps-airbrakes full travel.
18. Safety belts for condition.
19. Instruments for condition and correct indication.
20. Trim control for condition.
21. Documents in the sailplane.

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3. TRANSPORTATION OF SAILPLANE

For transportation, the use of the special PIK-20 trailer is recommended. If the sailplane is being transported in another vehicle, the following should be checked:

- Depending on transportation van, the sailplane may be fixed and supported by the following elements: Wing spar root shanks; Bevel pins of the fuselage; Undercarriage wheel (take care of hatch covers) and tail wheel. Besides this wing, fuselage and horizontal stabilizer may be placed in appropriate holding clamps.
- Fix all control surfaces using gust locks.
- Lock aileron and flaps rods and attachments in the wing using cords or rubber belts.
- Take care of that no shifting, jamming or deformation can arise and avoid entry of dirt and water into the sailplane.
- On an open trailer, protect the canopy, the area of the horizontal stabilizer attachment and cover the pitot tube and static pressure vents.
- Ensure that all components cannot be shifted during transportation.

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4. CARE AND MAINTENANCE

The PIK-20 fiberglass sailplane requires minimal maintenance.

4.1. General care

The outside of the sailplane can be kept bright and smooth simply by washing with water and mild soap. Avoid abrasive or harsh detergents. Rinse with clean water and dry with terry-cloth towels or chamois. If you choose to wax your sailplane, use a good automotive-type wax, however, not one containing silicone.

The canopy surface may be cleaned and polished using the conventional plexiglass care products. Never clean with a dry cloth.

Note: Never use gasoline, benzine, alcohol, acetone, carbon tetrachloride, lacquer thinner or glass cleaner to clean plexiglass.

In hot sunshine it is recommended that the sailplane is protected with fabric.

Prior to hangaring, the water drain holes, shown in Figure 5 should be inspected for free outlets and cleaned if necessary.

4.2. Before assembly

Clean and grease points marked "X" in Figure 6.

4.3. Every week

Clean cabin and wheel box e.g. with vacuum cleaner.

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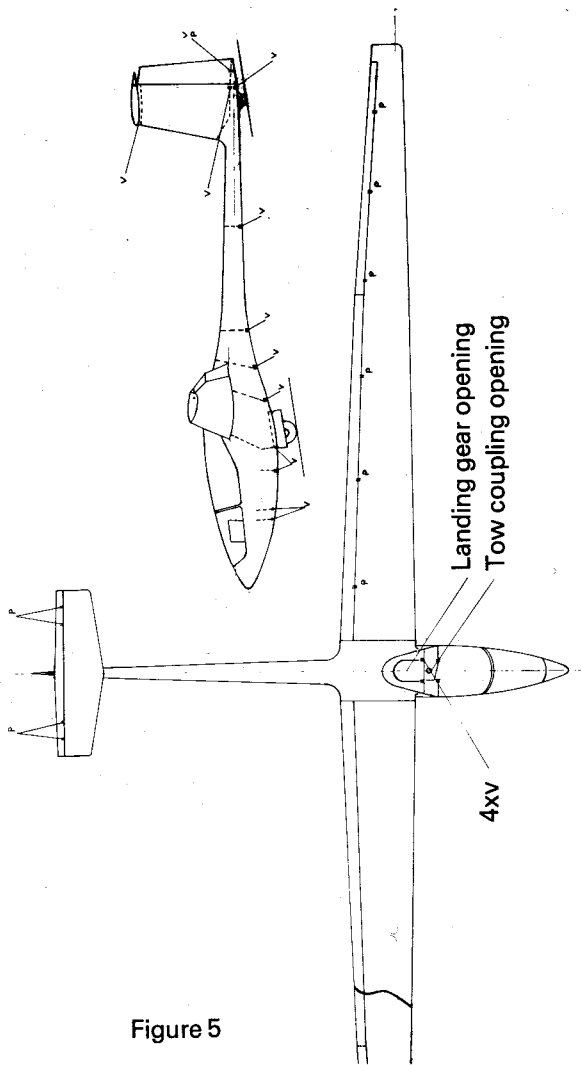


Figure 5

Water drain (v) and pressure relief (p) holes

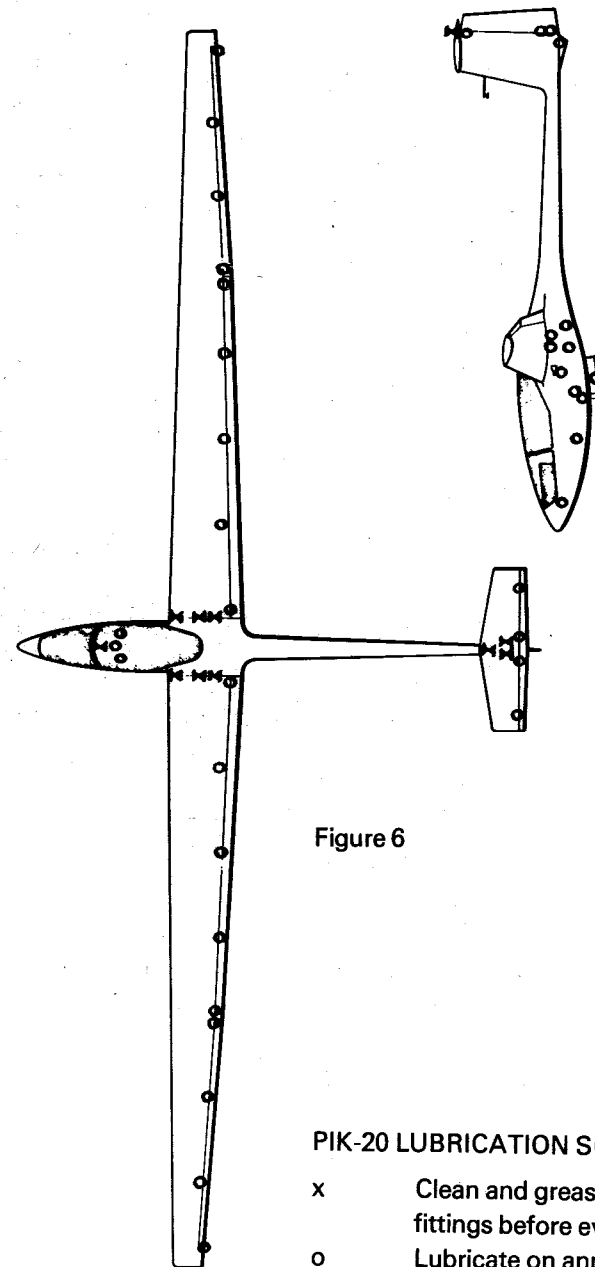


Figure 6

PIK-20 LUBRICATION SCHEME

- x Clean and grease these fittings before every assembly
- o Lubricate on annual inspection

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4.4. Annual inspection

- Inspect, clean and lubricate with oil the bearings and hinges marked "O" in Figure 6.
- Inspect the other bearings and rod endings and, if necessary, protect with lithium-grease.
- Inspect the rudder cables.
- Inspect Bowden control cables of the tow release coupling, wheel brake, pedal adjustment, cabin ventilation and water tanks.
- Inspect and lubricate the tow release coupling(s).
- Inspect landing gear, wheel brake and gear doors.
- Inspect wing attachment points and tightness of attachment.
- Inspect horizontal stabilizer attachment points.
- Inspect and clean the pitot-static system.
- Check control surface deflections.
- Inspect water tanks.
- Inspect and lubricate the flap drive wheel and the differential lever inside the fuselage.

Note: If the sailplane is damaged, the structural repair schemes are given in "Repair Manual".

5. WEIGHING PROCEDURE

5.1. Preparation

- Ensure that all items marked in the sailplane equipment list are installed in their proper location in the sailplane.
- Remove dirt, moisture, foreign items such as rags and tools from the sailplane before weighing.
- Weigh the sailplane inside a closed building to prevent errors in scale readings due to wind.

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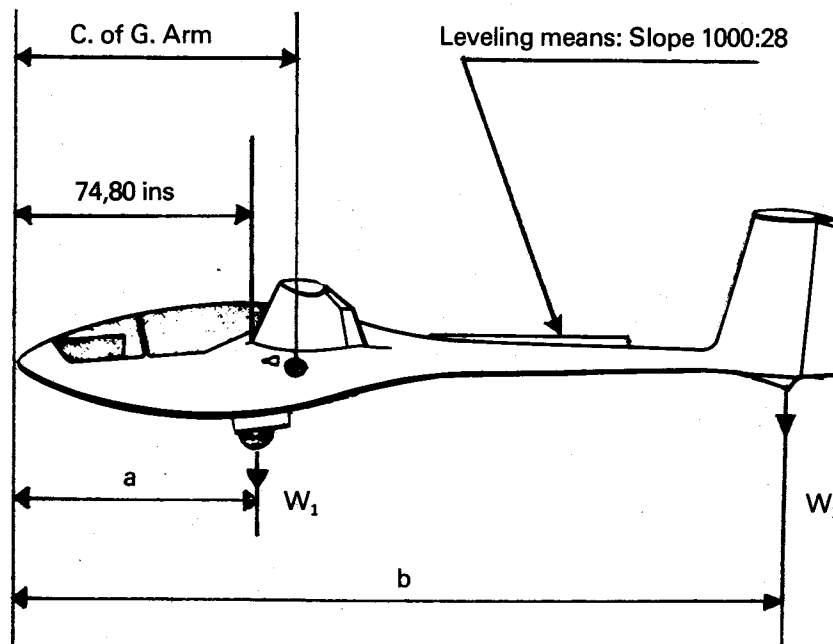
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5.2. Weighing

- Level sailplane (see diagram). Levelling means: Slope of top surface of rear fuselage between stations 140 ins and 180 ins 1000 to 28 tail down.

Datum: Vertical plane 1.90 m (74.80 ins) in front of leading edge of wing root rib.



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— With the airplane level, record the weight shown on each scale. Deduct the tare, if any, from each reading.

Scale Position on Symbol	Scale Reading (lbs)	Tare (lbs)	Net Weight (lbs)
Main wheel (W_1)			
Tail wheel (W_2)			

Empty weight and moment	Net Weight (lbs)	Arm (ins)	Moment (lb.-ins./1000)
W_1		$a = 79.6$	
W_2		$b = 229.2$	
Licensed Empty Weight		C. of G.	

$$C. \text{ of G. } = \frac{W_1 a + W_2 b}{W_1 + W_2}$$

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6. EQUIPMENT

The following list shows equipment items which may be installed in the PIK-20. Items marked "X" are included in the Empty Weight recorded in Weight and Balance Data Sheet.

Item	Part	Weight (lbs)	Arm (ins.)	Moment (lb.-ins./1000)
	I Minimum Equipment (Standard USA)			
	Airspeed indicator Model:			
	Altimeter Model:			
	Compass Model:			
	Safety belts Model:			
	Seat cushion			
	Tow coupling Model:			
	II Optional Equipment			
	Variometer Model:			
	Compensating bottle			

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Item	Part	Weight (lbs)	Arm (ins.)	Moment (lb.-ins./1000)
	Turn and bank indicator Model:			
	Artificial horizon Model:			
	Battery Model:			
	Accelerometer Model:			
	Clock Model:			
	Radio Model:			
	Oxygen Equipment Model:			
	Water Ballast tanks Model:			

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