FLIGHT MANUAL

P92 Echo CLASSIC Deluxe

MANUFACTURER : *COSTRUZIONI AERONAUTICHE* ***TECNAM*** S.r.l.

AIRCRAFT TYPE : ***P92 CLASSIC deluxe.***

SERIAL NUMBER :.....

MANUFACTURING DATE :.....

TECNAM P92 Echo Classic Deluxe
CHECKLIST

General Information

Wing span	9.4 m
Wing chord	1.4 m
Wing loading	34.2 kg/m2
Overall length	6.5 m
Overall width	1.1 m
Overall height	2.5 m
Stabilator span	2.9 m
Vertical tail span	1.23 m
Main gear tire Air Trac	5.00-5
Nose gear tire Sava	4.00-6
Maximum takeoff:	450 kg
Standard empty weight	289kg
MAX Full Cross wind	15 Kts - 28 Km/h

Fuel - Oil - Coolant

Fuel grade	Min RON 90 EN 228 Regular EN 228 Premium EN 228 Premium plus AVGAS 100 LL
Fuel tanks	2 x 45 litres = 90 litres
Oil Capacity	Max. 3.0 liters – min. 2.0 litres
Coolant	See “Rotax Operator’s Manual”

Speeds

White arc - Vso	71 – 110 Km/h IAS
Green arc - Vfe	110 – 200 Km/h IAS
Yellow arc	200 – 260 Km/h IAS
Red line - Vne	260 Km/h IAS

Temperatures - Pressures

Max CHT	150° C
Normal CHT	75° - 150° C
Min - Max Oil temperature	50° - 140° C
Oil normal operating temp.	90° - 110° C
Minimum Oil Pressure	0.8 Bar
Normal Oil Pressure	2.0 - 5.0 Bar

A. PREFLIGHT INSPECTION

CABIN INSPECTION

Weight and balance	Check if within limits
Safety belts used to lock controls	Free
Flight controls	Unhindered movement of control
Parking brake	Engage
Master switch	On
Check generator switch	is illuminated and ammeter is operational
Flaps control	activate control to full extension checking end travel and instrument indication.
Trim control	activate control to full scale checking end travel and instrument indication
Master switch	OFF
Fuel level	Check level on the basis of flight plan

EXTERNAL INSPECTION

A) Left side tank cap	Check proper fastening
B) Left fuel tank blow-out plug	Check for obstructions
C) Remove Pitot protection cap	Check pitot is unobstructed
D) Leading edge and wing skin	Check integrity
E) Left aileron	Check integrity and unhindered movement
F) Left flap and hinges	Check integrity
G) Check left side main gear	Tire inflation (1.6 bar), condition and alignment; check fuselage skin condition.
H) Horizontal tail and tab	Check integrity and unhindered movement
I) Vertical tail and rudder	Check integrity and unhindered movement
L) Check right side main gear	Tire pressure (1.6 bar), condition and alignment; check fuselage skin condition.

EXTERNAL INSPECTION - continued

M) Right flap and hinges ---------- Check integrity
N) Right aileron ---------- Check integrity and unhindered movement
O) Leading edge and wing skin ---------- Check integrity
P) Check right side tank ---------- Cap is fastened and blow-out plug is unobstructed
Q) Check right side static vent ---------- Is unobstructed, do not blow inside vents
R) Check integrity of nose gear ---------- Tire inflation (1.0 bar) and condition; check condition of rubber shock absorbers
S) Propeller and spinner condition ----- Check for nicks and fastening

T) Open engine cowling and perform the following checklist :

I. Check no foreign objects are present

II. Check the cooling circuit for losses from tubing, check coolant reservoir level, insure radiator honeycomb cooling fins are unobstructed.

III. Check lubrication circuit for losses from tubing, check oil reservoir level, in-sure radiator honeycomb cooling fins are unobstructed

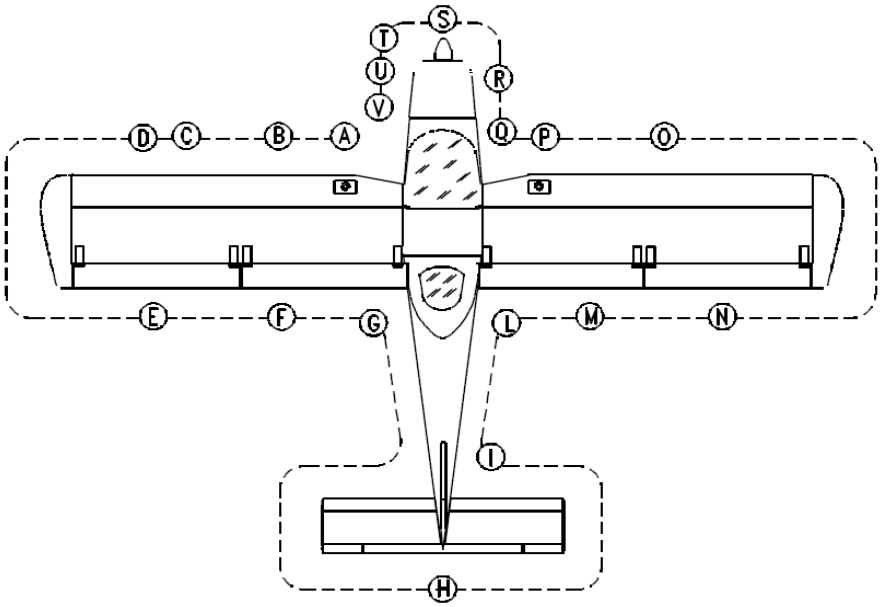
IV. Open both fuel taps, inspect fuel circuit for losses from tubing, check integrity of fireproof protection braids, drain circuit using a container to collect fuel activating the specific drainage tap located on the firewall, shut fuel taps. Check for absence of water or other contaminants.

V. Check integrity of silent-blocks.

VI. Check firmness and integrity of air intake system, check externally that ram air intake is unobstructed.

VII. Check that all parts are secure or safetied.

U) Close engine cowling.
V) Check left side static port ---------- Is unobstructed
Z) Tow bar and chocks ---------- Removed



B. CHECKLISTS

BEFORE ENGINE START

I. Flight planning, fuel consumption, refueling.
II. Aircraft loading and related inspections
III. Seat and safety belts ---------- Adjusted
IV. Doors secured ---------- Secured
V. Parking brake ON. ---------- ON

ENGINE START

I. Master switch ---------- ON
II. Both fuel taps ---------- OPEN (ON)
III. Engine throttle ---------- IDLE
IV. Choke ---------- As Needed
V. Magnetos switch ---------- ON
VI. Prop area ---------- CLEAR
VII. Ignition key ---------- Set to START
VIII. Engine RPM ---------- 2000 - 2500 RPM
IX. Choke ---------- OFF
X. Check engine instruments
XI. Check oil pressure ---------- RISING

BEFORE TAXING

I. Radio and utilities ---------- ON
II. Altimeter ---------- SET
III. Navigation lights ---------- As REQUIRED

TAXING

I. Brakes ---------- Check operation
II. Flight instruments ---------- Check operation

HOLDING - RUN-UP

I. Parking brake ---------- ON
II.a Navigation lights ---------- ON
II.b Strobe light ---------- ON
II.c Landing Light ---------- ON
II.d Optional equipment ---------- ON
III. Check engine parameters ---------- Oil temperature 50-110°C
Cylinder Heads Temp 75-150°C
Oil Pressure 2.0-5.0 Bar
IV. Check ammeter ---------- Insure alternator is charging
V. Engine's rpm at 4000 RPM ---------- Test magnetos
VI. Visual check of fuel indicators
VII. Flaps ---------- SET 15° (Take-Off)
VIII. Stick ---------- Free Movement
IX. Trim ---------- Set to ZERO Trim
X. Seatbelts ---------- Fastened
XI. Doors ---------- Secured

TAKEOFF AND CLIMB

I. Control Tower ---------- Clearance
II. Check for clear final
III. Parking brake ---------- OFF
IV. Carburetor heat ---------- OFF
V. Taxi to line-up
VI. Rotation and takeoff
VII. Slight braking ---------- to stop wheel spinning
VIII. Flaps ---------- Retracted
IX. Landing light ---------- OFF
XI. Establish climb rate

CRUISE

I. Reach cruising altitude
II. Set power and engine rpm's for cruise.
III. Check engine parameters ---------- Oil temperature 90° - 110° C
Temp. cylinder heads < 135° C
Oil pressure 2.0 – 5.0 bar
IV. Carburetor heat as needed

Compensate unpredicted asymmetrical fuel consumption between left and right fuel tanks by shutting off appropriate fuel tap located inside cabin

LANDING

I. Landing Light ---------- ON
II. Check runway final ---------- Establish descent, approach to final
III. Extend flaps gradually ---------- Maximum deflection of 35°.
IV. Optimal touchdown ---------- 70 Km/h
V. Land and Vacate
VI. Flaps ---------- 0° (UP)
VII. Landing Light ---------- OFF
VIII. Taxi to Apron
IX. Parking brake ---------- ON
X. Navigation Lights ---------- OFF
XI. Strobes ---------- OFF

ENGINE SHUT DOWN

I. Keep engine running ---------- 3000 RPM for about two minutes in order to reduce latent heat.
II. Turn off all electrical utilities
III.a Set magnetos ---------- OFF
III.b Set Master Switch ---------- OFF
IV. Fuel taps ---------- OFF
V. Insert hood over pitot tube on left side wing strut

C. EMERGENCY PROCEDURES

ENGINE FAILURE DURING TAKEOFF RUN

1. Throttle ---------- Idle (fully out)
2. Brakes ---------- Apply as needed
3. Magnetos ---------- OFF
4. Flaps ---------- Retract
5. Master switch ---------- OFF
6. Fuel shutoff valves ---------- OFF

ENGINE FAILURE IMMEDIATELY AFTER TAKEOFF

1. Locate landing area
2. Throttle ---------- Idle (fully out)
3. Fuel shutoff valves ---------- OFF
4. Magnetos ---------- OFF
5. Flaps ---------- As Needed
6. Master switch ---------- OFF
7. Land with wings level

EMERGENCY LANDING WITHOUT ENGINE POWER

1. Set glide speed to optimal value of 110 Km/h
2. Select area most suitable for emergency landing, possibly upwind
3. Fuel shutoff valves: OFF ---------- OFF
4. Magnetos: OFF ---------- OFF
5. Tighten safety belts, release door safety lock and unlatch doors
6. Flaps: as needed ---------- As Needed
7. Ready to land, Master switch -------- OFF

POWER-ON FORCED LANDING

1. Adjust descent slope
2. Extend flaps as needed
3. Select area suitable for emergency landing
4. Tighten safety belts, release door safety lock and unlatch doors
5. Before touchdown: fuel shutoff valves OFF
6. Flaps ---------- Extended
7. After touchdown ---------- Magnetos OFF, Master switch OFF

D. SMOKE AND FIRE

ENGINE FIRE WHILE PARKED OR DURING TAKEOFF

1. Fuel shutoff valves ---------- OFF
2. Abort takeoff if possible
3. If engine is running let it use up remaining fuel in carburetors
4. Magnetos and Master switch -------- OFF
5. Warn bystanders to clear the area as fast as possible

6. Without removing the engine cowling use a CO2 or a powder fire extinguisher to put out flames directing spray towards cowling's air intakes

ENGINE COMPARTMENT FIRE IN FLIGHT

1. Fuel shutoff valves ---------- OFF
2. Throttle ---------- Fully Inward (Full Throttle)
3. Magnetos ---------- OFF
4. Do not try airstarting engine
5. Extend flaps ---------- As Needed
6. Carry out forced landing emergency procedure
7. Master switch ---------- OFF

CABIN FIRE DURING FLIGHT

1. Master switch ---------- OFF
2. Door vents ---------- OPEN
3. Extinguish fire with on-board fire extinguisher (if available) directing spray towards flame base
4. Land as soon as possible

DO NOT USE WATER to put out fire and do not open engine cowling until absolutely certain fire is extinguished. In case an appropriate fire extinguisher is not handy, still keeping engine cowling closed, it is possible to use a woolen blanket, sand or dirt to try smothering the fire.

RECOVERY FROM UNINTENTIONAL SPIN

1. Adjust throttle to minimum (full outward position)
2. Activate rudder bar by pushing foot opposite spin direction
3. Push control stick full forward and keep in position until spin is halted
4. Center rudder bar
5. Gradually recover flight attitude avoiding to exceed VNE
6. Readjust throttle to restore engine power

STALL SPEEDS

Bank 0°

Flaps 0° ---------- 74 Km/h
Flaps 15° ---------- 69 Km/h
Flaps 35° ---------- 64 Km/h

Bank 30°

Flaps 0° ---------- 78 Km/h
Flaps 15° ---------- 76 Km/h
Flaps 35° ---------- 69Km/h

Bank 45°

Flaps 0° ---------- 84 Km/h
Flaps 15° ---------- 79Km/h
Flaps 35° ---------- 76 Km/h

Bank 60°

Flaps 0° ---------- 101 Km/h
Flaps 15° ---------- 97 Km/h
Flaps 35° ---------- 91 Km/h

TRUE AIRSPEEDS

		Cruising regime					
Engine speed [rpm]		4000	4200	4500	4800	5000	5200
Altitude [ft ISA]	0 IAS [km/h]	144	152	164	176	184	192
	2000 IAS [km/h]	136	144	156	168	176	184
	4000 IAS [km/h]	127	135	147	160	168	177
	6000 IAS [km/h]	118	126	139	152	161	169
	8000 IAS [km/h]	109	118	131	144	153	161

Caution: If a circuit breaker pops out it may only be reset once. Never attempt to hold the circuit breaker in (could cause an electrical fire).

GROUND ANCHORAGE (OPTIONAL)

1. Head the airplane into the wind if possible.
2. Retract the flaps.
3. Chock the wheels.
4. Lock the control stick using safety belts.
5. Secure tie-down ropes to the wing tie-down rings and to the tail ring at approximately 45-degree angles to the ground, in longitudinal direction