

# FLIGHT MANUAL EXTRA EA 230

Version 3.2 Aug. 2007



**N9750N**

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**SECTION 1: GENERAL INFORMATION**

Registration:	N9750N
Type:	Extra EA 230
Serial No.:	84/05/003
Manufacturing year:	1984
Manufacturer:	Walter Extra, Koeln, West Germany
G Rating:	+10g / -10g
Engine:	Lycoming AO360 230HP
Propeller:	Mühlbauer 4 Blade variable Carbon Spinner
Roll Rate:	With bigger Ailerons 270 deg./sec.

The EA 230 is approved for aerobatics.

During take-off, flight and landing the aircraft reacts as any other aerobatic approved tail-dragger.

Only pilots with sufficient experience on tail-draggers should fly the EA230.

The aircraft reacts normally during stalling and spinning.

The airplane has to be handled with special care on ground, taking the highly specialized construction materials into account.

The aircraft is designed to resist very high g-forces. It has to be indicated that the full use of this capacity may exceed the physical loading capacity of the pilot, as this depends on the individual constitution. Special care has therefore to be taken during flights with high g-forces.

Operation during day and VFR conditions only.  
No flights in icing conditions permitted.

During aerobatics no luggage permitted.

**Description and dimensions:**

Span:	7.40 m
Length:	5.82 m
Height:	1.73 m
Airfoil:	MA 15 S (root) MA 12 S (tip)
Angle of Incident:	Wing      0 deg. Stabilizer 0 deg.
Controls:	All controls 26 deg. symmetrical
Engine:	Lycoming AEIO – 360 230 hp
Starterbattery:	12V
Fuel:	Avgas 100LL (100 Octane)
Oil:	for -17° to +21° C outside air temperature AeroShell 80W for -16° to +32° C outside air temperature AeroShell 100W

**Airspeed limitations:**

		<i>kts</i>	<i>km/h</i>
Normal flight range (green)	vs	40	72
	to vno	139	250
Caution range (yellow)	vno	139	250
	to vne	222	400
Maximum speed (red line)	vne	222	400

**Recommended entry speeds for approved maneuvers:**

			<i>kts</i>	<i>km/h</i>
Looping:	positive	above	105	190
	negative	above	105	190
Roll:	positive	above	83	150
	negative	above	83	150
Snap roll:	horizontal	max.	111	200
	vertical down	max.	88	160
	45 deg. down	max.	100	180
	45 deg. up	max.	122	220
	vertical up	max.	128	230

positive and negative are the same speeds



**Bail out with parachute**

1. Headset disconnect
2. Canopy open and eject
3. Seatbelts open
4. Stand up on the seat and push stick with one foot forwards.
5. Open parachute when free from airplane.

Loss of elevator control      steer with pitch trim

Loss of aileron control      steer with rudder,  
only flat curves.

Loss of rudder control      steer with aileron,  
hold direction with  
brakes after  
touch-down.

In all cases described above you should select a long and wide landing area and the throttle should be handled very carefully.

Flair out carefully and touch down in flat angle.

If a hard landing can not be avoided:

Fuel selector	off
Ignition	off

**SECTION 4: NORMAL OPERATION PROCEDURES**

Outside Check      check

**Engine Start:**

1. Fuel selector      on
2. Mixer      rich
3. Throttle      full open
4. Wobble pump      cold      3-5 strokes  
                                 warm      2-3 strokes
5. Mixer      lean
6. Throttle      1 cm open
7. Start Engine      turn ignition key
8. Mixer      smoothly rich, when engine fires
9. Oil pressure      check

**IMPORTANT!**

**let engine running until temperature is in the green arc before run up**

**Run up**

1. All engine instruments      green arc
2. Mixer      rich
3. Prop control      high rpm
4. Throttle      1800 rpm
5. Magneto check max. diff.      100 rpm
6. Prop control      pull 3 times
7. Engine idle      check

**Check before Take-off**

- |                           |               |
|---------------------------|---------------|
| 1. All engine instruments | green, normal |
| 2. All flight instruments | set and check |
| 3. Trim                   | Neutral       |
| 4. Controls               | free and easy |
| 5. Tail wheel             | lock          |
| 6. Time                   | check         |

**Normal Take off**

- |             |                        |
|-------------|------------------------|
| 1. Throttle | full power             |
| 2. Elevator | neutral (to lift tail) |
| 3. RPM      | check rising           |
| 4. Speed    | check rising           |
| 5. Rotate   | 55 kts (100km/h)       |

**Short field take-off**

- |                   |                     |
|-------------------|---------------------|
| 1. Throttle       | full open           |
| 2. Elevator       | slightly pulled     |
| 3. Take-off       | 40 kts (72 km/h)    |
| 4. Climb attitude | 50 deg. climb angle |

**Climb**

- |                 |                    |
|-----------------|--------------------|
| 1. Accelerate   | 83 kts (150 km/h)  |
| 2. Throttle     | below 25" manifold |
| 3. Prop Control | below 2500 rpm     |

**Cruising**

- |                 |                           |
|-----------------|---------------------------|
| 1. Trim         | as required               |
| 2. Throttle     | below 25" manifold        |
| 3. Prop control | below 2500rpm             |
| 4. Mixer        | as required lean with EGT |

**Landing**

- |                        |                   |
|------------------------|-------------------|
| 1. Mixer               | rich              |
| 2. Prop Control        | high rpm          |
| 3. Speed (short final) | 77 kts (140 km/h) |
| 4. Speed (touch-down)  | 70 kts (126 km/h) |
| 5. Touch-down          | 3 point landing   |
| 6. Tail wheel          | unlock            |

Touch down speed is slightly higher than the minimal speed, the landing gear does not allow maximal angle of attack.

The demonstrated crosswind component is max. 20 kts (10m/s)

Landing distance over a 15m obstacle with no wind at MSL is min 180m. Ground roll distance is min. 80m. (No addition for none optimal landing technique)

**Engine shut off**

- |                           |            |
|---------------------------|------------|
| 1. Engine                 | idle       |
| 2. Electrical instruments | off        |
| 3. Mixer                  | off (pull) |
| 4. Ignition               | off        |
| 5. Circuit Breakers       | out        |

**SECTION 5: PERFORMANCE**

**Take off:**

Over 15m obstacle at MSL no wind: 250 m

**Landing:**

Over 15m obstacle at MSL no wind: 180 m

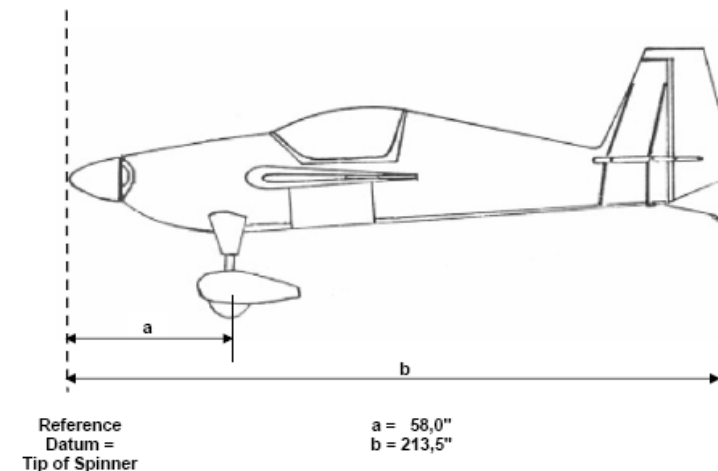
Ground roll at MSL no wind: 80 m

**Climb:**

Best rate of climb: 42.7 m/sec

Climb speed (Vy): 150 km/h

**SECTION 6: WEIGHT AND BALANCE**



**Standard Empty Weight: 1008.23 lbs / 457.32 kg**

Airplane including unusable fuel (0,5 Gal) and full engine oil (6 qts / 11 lbs)

Center of Gravity at 65.86"

**Maximum take-off Weight: 1322.77 lbs / 600.00kg**

Possible payload 314.54lbs / 142.68kg (for example pilot 82kg and 85l Fuel)

**SECTION 7: EQUIPMENT****Communication and Transponder**

- 1 Becker VHF COM RT 3209
- 1 Becker VHF COM Control Unit CU 5209
- 1 Becker ATC XPDR ATC 3401
- 1 Becker ATC XPDR Control Unit ATC 5401
- 1 Alt Encoder Terra 3000

**Instruments**

- 1 Tachometer Jet Electronics 3300
- 1 Thommen Altimeter (-300 to 6000 m)
- 1 Dual Fuel flow/Manifold press
- 1 EGT
- 1 CHT
- 1 Westberg Dual Volt / Ammeter
- 2 Wultrad G-Meter
- 1 Magnetic Compass
- 1 Flight Time Counter