STRUCTURE and CONFIGURATION OF THE HELICOPTER
Approach

- Distinctive Designs.
- Description of the different parts and their fundamental use.
APPROACH

STRUCTURE and CONFIGURATION
The Structure or cell (airframe) in a conventional single rotor helicopter is composed of:

- fuselage,
- landing gear,
- tailboom, and
- cowlings and main transmission.
- Other examples.
Casualty
Evacuation
- 6 litters
- 5 crew

Troop
Transport
- 15-20 troop
  seats
- 2 crew

Search and
Rescue
- 10 rescues
- 2 crew
Utility/Offshore Oil Cabin Configuration

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger door width</td>
<td>37.5&quot;</td>
</tr>
<tr>
<td>Passenger door height</td>
<td>52.0&quot;</td>
</tr>
</tbody>
</table>
GENERAL STRUCTURE
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GENERAL STRUCTURE
MD 600N

- Engine Particle Separator
- Static Mast Rotor Support
- Crashworthy A-Frame Truss with integral crew seats
- Six-Blade Fully Articulated Main Rotor
- Outstanding Outward Visibility
- Analog and Digital Flight Instruments
- Simple Mechanical Controls
- Reversible Cabin Seating
- Double Opening Cabin Doors

- NOTAR® Anti-Torque System
- 600 shp Drive System
- Allison C250-C47 808 shp Turbine Engine with FADEC
- Flat Cargo Floor
- 115-Gallon Crash-Resistant Fuel System
- Eight-Place Seating Capacity

STRUCTURE and CONFIGURATION
Fuselage:

- **Fuselage:**
  - PASSENGER COMPARTMENT
  - CREW COMPARTMENT
  - NOSE SECTION
  - FORWARD SECTION
  - INTERMEDIATE SECTION

STRUCTURE and CONFIGURATION
Fuselage. Forward section
Fuselage. Forward section

STRUCTURE and CONFIGURATION
Fuselage. Forward Section
Fuselage. Intermediate section

- Usually a semimonocoque structure.
  - Plataform for the engine.
  - Bays for equipment and baggage.
Fuselage

- Other examples

1. Engine cowling
2. Passenger-cargo door
3. Passenger step
4. Landing gear
5. Crew door
6. Windshield wiper
7. Nose compartment window
8. Upper hinged nose door
9. Lower hinged nose door
10. Windshield
11. Crew seat
12. Roof window
13. Transmission cowling
Fuselage
- EC-135.
- EC-135.
• EC-135.
Transmission frame
There are different systems to minimise the vibrations produced by the main rotor.
Tail boom

STRUCTURE and CONFIGURATION

- Tail rotor gear box fairing
- Vertical fin
- Strobe
- Position light
- End plate
- Aluminum cover
- Horizontal stabilizer
- Tail skid
- Tailboom
- Leading edge slat
- Synchronized elevator
- Position light
Tail boom

1. Vertical fin door
2. Intermediate gearbox cover
3. Aerodynamically actuated elevator
4. Tail rotor driveshaft cover
5. Baggage compartment door
6. Tailboom
7. Lower fin fairing
8. Tail skid
Tail boom

STRUCTURE and CONFIGURATION
Tail boom

- EC 135 and Tiger.
Tail boom

STRUCTURE and CONFIGURATION
Reference Lines

- **Reference axes (3)**
  - Corresponding to the Cartesian axes X, Y and Z.

- **Aim:**
  - To locate with precision any point on the helicopter

- **Definitions:**
  - **FS or STA**, fuselage stations, planes perpendicular to the X axis.
  - **WL (water lines)**, planes parallel to xy plane.
  - **BL (Butt lines)**, planes parallel to the “plane of symmetry” of the vehicle.
Figure 1-20. Fuselage Stations, Waterlines, and Buttlines (Sheet 2 of 2)
Figure 1-20. Fuselage Stations, Waterlines, and Bottlenecks (Sheet 1 of 2)
Vertical Stabilizer

- Back sweep design.
- RC layout.
- Curvature of the airfoil
- Tail skid.
- Other configurations.
VERTICAL STABILIZER

STRUCTURE and CONFIGURATION
Vertical stabilizer
VERTICAL STABILIZER

STRUCTURE and CONFIGURATION
Horizontal Stabilizer

STRUCTURE and CONFIGURATION
Horizontal Stabilizer
Horizontal Stabilizer

COUGAR

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LANDING GEAR
LANDING GEAR

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Bibliography