The PAR-E precision approach radar is designed to support the approach and landing control of various aircraft, including the emergency landing due to avionics failure. The radar utilizes an active electronic scanning antenna (AESA) both in the azimuth and the elevation level. The radar meets ICAO recommendations and standards.

**Radar configuration**

The PAR-E radar consists of following basic parts:

- Antenna system (AESA)
- Radar Equipment cabin
- Power supply unit – Diesel generator, UPS unit
- Fire fighting system
- Security electronic system

Philosophy of PAR-E radar design is based on creating modular solution with units as independent as possible. The reason of such resolution consists in creating radar structure, which flexibly adapts customer’s requirements and needs.

**Configuration of the PAR-E radar is characterized with following properties:**

- The radar construction is fully solid state, including the transmitting circuits. Both azimuth and elevation antenna involve digital T/R modules ensuring its high reliability.
- The radar can be transported by standard vehicles for ISO ferry containers.
- PAR-E is fully duplicated radar, including the system of communication with a remote site.
- The MTBCF value is 13,400 hrs minimum. The “Radar Equipment cabin” container includes a cabinet for embedding the spare parts kit, which allows to keep the MTTR parameter below 30 minutes.
- In its basic configuration, the radar is independent from the public supply network; the configuration involves a power station. In case of a stationary site, the radar configuration is complemented with the UPS unit to ensure the radar operation during the short-time supply voltage failure.
- The PAR-E radar system involves the BITE diagnostics to enable fast and accurate identification of a faulty block of the radar system.
### Radar functions

The PAR-E Precision Approach Radar is designed for detection of targets, such as aircraft, ground objects and meteorological formations. The detected information are displayed on workplace screens and radar information are transferred to remote ATC workplaces.

The radar is particularly important in situations when the pilot has limited sight (because of fog, rain, etc.). In this situation, the radar has to provide the approach controller with maximum quality radar display complemented by computer evaluation of speed, deviations from glide path / course line, the distance from the previously approaching aircraft, etc.

The PAR-E radar contains circuits for data transmission to either local or remote controller working stations, GCA-sites (Ground Control Approach). Approach controller consoles can be situated either in the ATM centre, the control tower or in the container.

If requested, it is possible to enhance the PAR-E container configuration with an additional equipment to be able to use the approach controller consoles in container, which can operate as substitute workstation for approach management.

<table>
<thead>
<tr>
<th>PAR-E system parameters</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency band</td>
<td>X-band</td>
</tr>
<tr>
<td>Used principle of electronic scanning</td>
<td>AESA</td>
</tr>
<tr>
<td>Instrumented range</td>
<td>40 km (21.6 NM)</td>
</tr>
<tr>
<td>Instrumented azimuth</td>
<td>-15° to +15°</td>
</tr>
<tr>
<td>Instrumented elevation</td>
<td>-1° to +14°</td>
</tr>
<tr>
<td>Data Refresh Rate</td>
<td>&lt; 1 s</td>
</tr>
<tr>
<td>Azimuth antenna vertical tilt mechanism</td>
<td>-2° to +3° around optimal setting</td>
</tr>
<tr>
<td>Elevation Antenna skew mechanism</td>
<td>-10° to +10° around azimuth scan centreline</td>
</tr>
<tr>
<td>Signal processing type</td>
<td>Adaptive MTD</td>
</tr>
</tbody>
</table>

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