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**

Radar PAR-E 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 solution is based on creating modular unit with as high mutual independence as possible. The reason of such resolution consists in creating radar structure, which flexibly meets customer’s requirements and needs.

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

- It is fully solid state radar including transmitting circuits. Each azimuth and elevation antenna involves digital T/R modules ensuring its high reliability.
- The radar can be transported by standard conveyances for ISO containers ferry.
- PAR-E is fully duplicated radar, including the system of communication with a remote site.
- The MTBF value is 13,400 hrs minimum. The “Radar Equipment cabin” container installation comprises a cabinet for the spare parts kit embedding, which enables the MTTR parameter maintaining on the value of 30 minutes maximum.
- In its basic configuration, the radar is independent on the public supply network; the configuration involves a power station. In case of a stationary site, the radar configuration can be complemented with the UPS unit ensuring the radar operation at the supply voltage short-time failure.
• The PAR-E radar system involves the BITE diagnostics enabling fast and exact identification of a faulty block from the radar system.

Radar functions
PAR-E Precision Approach Radar is designed for targets detection, i.e. aircraft, ground objects and meteorological formations and displaying information detected on monitors of workplaces, and radar information transfer to remote ATC workplaces.

The radar is particularly important in situations when the pilot has limited outlook (because of fog, rain, etc.). In such situation, the radar has to provide an approach controller with as high radar display quality as possible, complemented with computer evaluation of speed, deviations from glide path / course line, the distance from the aircraft which appears sooner on descent axis, etc.

Radar PAR-E contains circuits for data transmission to either local or remote controllers working stations, GCA-sites (Ground Control Approach). Approach controller consoles could be placed either in an ATM centre, a control tower or in a container.

In case of customer’s requirement it is possible to fit the container PAR-E with additional equipment so as to be able to use the approach controller consoles, which will be placed in container PAR-E, as reserve workstation for controller of PAR radar.

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**PAR-E system parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</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 centerline</td>
<td>-10° to +10° around azimuth scan</td>
</tr>
<tr>
<td>Signal processing type</td>
<td>Adaptive MTD</td>
</tr>
</tbody>
</table>

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