2030 DF
HIGH-RESOLUTION DIRECTION FINDING EQUIPMENT
Moog Inc. is a worldwide designer, manufacturer and integrator of mission critical products and systems. Over the past 60 years, we have developed a reputation for delivering innovative solutions for the most challenging civil, military and marine applications. Moog’s product heritage in navigation and surveillance systems is based on supplying innovative system solutions to civil aviation authorities and military commands worldwide. By the 1980’s, we were supplying complete fixed base, shipboard, mobile and man portable TACAN systems to customers globally.

2030 DF OVERVIEW

Moog’s 2030 Direction Finder (DF) offers reliability, flexibility and superior performance backed by many years of worldwide installation experience. A typical system is comprised of an antenna, receiving and resolving equipment, touch screen numerical vector display (NVD), frequency control equipment, front-end processor (FEP) and a signal distribution facility option. The high resolution 2030 DF provides accurate navigation information using standard VHF or UHF radio systems.

The modular, versatile system design of the 2030 can be easily expanded as requirements change. Technical advantages include extensive BITE facilities, remote control operation with remote indication of fault parameters, remote testing and fault diagnosis.
REMOTE MAINTENANCE MONITORING (RMM)

The 2030 DF has an integrated monitoring and maintenance system which can be displayed on a local PC, remote PC or both. Display screens show operating parameters, overall system status, LRU status, alarm limits, diagnostics and test, amplifier status and transmitter control status.

The 2030 DF features a BITE system which continually monitors and provides alarm indications in the event of module failure, system transfer or shutdown.

ANTENNA COMPATABILITY

The 2030 DF system utilizes the Doppler principles and offers a wide aperture antenna for best error suppression with a medium aperture antenna for use on fair-to-good DF sites and mobile applications. VHF and UHF options are available.

- The 18 dipole wide aperture antenna array enables accurate bearing resolution at poor sites where reflections from hangars, parked aircraft, etc. distort the RF field. The 9 dipole medium aperture antenna array uses frequency shift techniques to ensure bearings are not adversely affected by transmitter frequency drift.
- Combined VHF/UHF options utilize a range from UHF unipole counterpoise with coaxially mounted VHF wide aperture antenna, to wide aperture UHF with medium aperture VHF on a common mast (as used in mobile applications).

AUTO-TRIANGULATION

The auto-triangulation system determines position fixes (latitude and longitude) and range from the bearings of RF transmissions detected by 2030 DF stations. The touch screen numeric vector display (NVD) provides a direct, quick and convenient method of controlling and configuring the 2030 DF.

- Fixes are presented on a graphical display and provide backup to the main radar display
- Scroll or zoom the map display or auto follow known transmissions
- Measure distances on the map, search a database of known map features or interrogate each feature for data such as map coordinates or emergency telephone numbers
- Also operates in replay mode

LOGISTICS SUPPORT

Moog provides global logistics support and technical assistance, including:

- A customer helpline manned 24 hours a day
- Support packages for 15-20 years of the whole operational life of the equipment
- System installation and training
- Site survey and system commissioning
- Safety cases, spares and repairs
## 2030 DF TECHNICAL SPECIFICATIONS

### Frequency Ranges

<table>
<thead>
<tr>
<th>Type</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>VHF</td>
<td>Aeronautical band 117 to 136 MHz</td>
</tr>
<tr>
<td>VHF</td>
<td>Marine band 156 to 162 MHz</td>
</tr>
<tr>
<td>UHF</td>
<td>Aeronautical band 225 to 406 MHz</td>
</tr>
</tbody>
</table>

### Environment – External

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>-40°C to +60°C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>100%</td>
</tr>
<tr>
<td>Wind speed</td>
<td>up to 200 km/hr</td>
</tr>
<tr>
<td>Icing/snow</td>
<td>4 cm ice or 1 m snow</td>
</tr>
</tbody>
</table>

### Environment – Internal

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>0°C to +55°C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>95%</td>
</tr>
</tbody>
</table>

### DF System

- Doppler principle

### DF Channels

- Min 1 - Max 24

### Independent Operators

- Min 1 - Max systems dependent

### Operation Modes

- Local and remote mode

### System Interfaces

- RS232, RS485, modem, Ethernet

### Interface Protocol

- Asynchronous

### Message Format

- ASCII, Hex

### Baud Rates

- Selectable

### AC

- 115/230 VAC UPS optional (approx. 200 VA per operator channel)

### DC

- Option 22 to 30 VDC battery backup

### Displays

#### Antenna Site

- LUI/HMI displaying all active DF channels to 0.1 degree

#### Operator Site

- Digital/Vector indicator
- 1 degree numerical resolution
- 1 degree vector resolution
- Persistence 2 - 8 seconds
- Presentation any 2 of QTE, QDM, QDR, QUJ
- Last bearing recall (store)
- Freeze channel (option)
- Local transmitter inhibit (option)
- Test Oscillator Activation (option)

### Frequency Control

#### Antenna Site

- LUI/HMI

#### Display Site

- Touch screen NVD

### Status Information

- Built-in test equipment
  
- **BITE**

- **Antenna** Dipole failure identification

- **Resolver System** Individual module status

- **Display Equipment** Individual module status

- **Inter Site** Communications status

- **History** System fault log and bearing log

### System Testing

- Automatic/manual test transmission at selected frequency
- Remote calibration on each DF channel

### Test Oscillator

- Optional

### Frequency Range

- 117 MHz - 400 MHz

### Applicable Standards

- R&TTE Directive 1999/5/EC, Article 3.1 (a), Article 3.1 (b) and Article 3.2
- ISO 9001:2000 Plus TickiT
- ISO 9001 for hardware
- ISO 9000-3 for software
- FAA.STD.0.16A

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