TOSHIBA

NAVAIDS SYSTEMS

DVOR

Doppler VHF Omni-directional Radio Range

- Toshiba's DVOR is designed based on the advanced technology.
- Toshiba's DVOR has more than a 60-year-history with a huge supply record of installations in domestic and worldwide airports.
- Toshiba's DVOR is continuing to contribute to the improvement in air traffic safety throughout the world.

Key Product Features

System

- Dual transmitters, monitors and power supplies
- Ergonomic design
- Color touch panel for local control
- Extensive BITE for fault isolation
- Front accessible plug - in modules for easy exchange
- Local and remote setup and control through a user-friendly PC program
- Flexible PC interface: local area network, serial link and modem link
- Optional battery backup with dual battery banks
- Recording operation events and equipment conditions
- Master and slave operation with associated DME (Distance Measuring Equipment)
- Support for SNMP

Transmitter

- Digital signal generation
- Separate carrier and sideband amplifiers
- Up to 100 W output power

Monitor

- Advanced digital design for high stability and accuracy
- Automatic continuous integrity testing
- Monitor and control by digital hardware
- Optional bearing monitor with two additional field antennas

Antenna System

- 1 carrier antenna and 48 sideband antennas
- VSWR monitoring on all antenna outputs
- Signal distribution unit consists of plug-in modules in main rack
- Optional separate signal distribution rack for mountaintop use

DVOR

GENERAL CHARACTERISTICS

Type	Double Side Band
Output Power	25 to 100 W, Adjustable
Bearing Accuracy	±0.5 degrees
Spurious Attenuation	More than 60 dBc
DC Input Power	+40 to +56 VDC (battery nominal 48 V)
Power Consumptions	2.0 kVA (Normal operation)

ENVIRONMENTAL CONDITIONS

Ambient Temperature (Except COTS)	-10 to +55 °C (Indoor Equipment)
	-50 to +70 °C (Outdoor Equipment)
Relative Humidity (Except COTS)	Maximum 95 %RH (up to +35 °C), Maximum 60 %RH (up to +55 °C) (Indoor Equipment)
Wind Speed	Maximum 60 m per second (survival, standard)
	Maximum 90 m per second (survival, option)
Ice Load	Maximum 5 cm (survival)

CARRIER SIGNAL CHARACTERISTICS

Frequency Range	108 -118 MHz
Frequency Stability	±0.001 %
Channel Spacing	50 kHz

Remote Control and Monitoring System

Remote operation control and equipment status monitoring of DVOR

Remote Control & Monitoring System (RCMS)

- RCMS is capable of monitoring and displayed the operating status of VOR interfaced.
- RCMS displays monitored/measured data sent from VOR on the window in a systematic expression.
- Control and Monitoring: ON/OFF of equipment, Switching of dual configuration equipment, Monitoring of equipment status
- Windows OS based PC Application (Interface : RS232C or Ethernet)

Remote Control & Status Unit (RC Unit)

- RC Unit performs monitoring and control of the VOR via landline between site and monitor room.
- Monitoring functions: Transmitter ON/OFF status, Total monitor alarm status, AC commercial power failure, Battery voltage alarm, Remote Control line alarm, Buzzer stop status, Power ON/OFF status, Others
- Control functions: Transmitter ON/OFF, Buzzer stop, Power ON/OFF, Others

VOR Status Unit (NAV Panel)

- NAV Panel indicates the operating status of the VOR equipment.
- Function: Operation / failure indication, Alarm for failure and shut down, Alarm silence control

MODULATION COMPONENTS

Sub-carrier Center Frequency	9960 Hz ±0.01 %
Reference Signal Frequency	30 Hz ±0.01 %
Reference Signal Modulation Depth	30 ±2 %
FM Deviation Ratio	16 ±1
Variable Signal Frequency	30 Hz ±0.01 %
Variable Signal Modulation Depth	30 ±2 %
ID tone Frequency	1,020 Hz ±0.01 %
ID tone Modulation Depth	4 to 20 %, Adjustable (without voice), Maximum 10 % (with voice)
Voice Modulation Depth	Maximum 30 %

FIELD MONITOR LIMIT

Bearing Error	±1 degree, Adjustable (Tolerance +0, -0.2 degrees)
Carrier Level	±3 dB, Adjustable (Tolerance ±0.1 dB)
AM Modulation Depth at 30 Hz	±15 %, Adjustable (Tolerance ±0.1 %)
AM Modulation Depth at 9960 Hz	±15 %, Adjustable (Tolerance ±0.1 %)
ID Modulation Depth	±50 %, Adjustable (Tolerance ±1 %)
No ID Period	10 to 120 seconds, Adjustable (Tolerance ±1 second)
ID Code	Mismatching
FM Deviation	±1, Adjustable (Tolerance ±0.1)

ANTENNA SYSTEM

Antenna Radome design permits coaxial mounting of the DME antenna on top of the Radome above the VOR carrier antenna.

Antenna Elements	48 + 1 Alford loop antennas
Field Monitor Antenna	1 Yagi antenna (edge type is optional)
Counterpoise	More than 30m in diameter

APPLICABLE STANDARDS

ICAO Annex 10
EUROCAE ED-52
ISO 9001
RE DIRECTIVE 2014/53/EU

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TD-18047 as of March, 2019