AN/ARN-149(V) Low-Frequency Automatic Direction Finder

Porvides enhanced navigation for military aircraft around the world.

The Rockwell Collins AN/ARN-149(V) is the first low-frequency automatic direction finder to provide an internal, field-upgradable MIL-STD-1553B digital multiplex bus capability. This system, consisting of a receiver, control, antenna and mount, provides a low-frequency automatic direction finding function in a lightweight, easily installed set. The all solid-state receiver eliminates all moving parts such as goniometers, synchros and mechanical tuners. Quadrantal Error Correction (QEC) is set by aircraft connector strapping, eliminating corrector modules and airframe-specific internal adjustments. The antenna combines the loop and sense antennas and preamplifiers in one compact housing, thereby eliminating expensive sense panels, couplers and special prefabricated cable assemblies. A dual version of the same antenna is also available in one aerodynamic package. The receiver is controlled by a four-wire serial bus from the control.

KEY FEATURES

- Lightweight – under 11 lbs for complete system
- Synthesized digital tuning
- Internal, field-upgradable, MIL-STD-1553B compatibility (input and output functions) with retention of analog interface
- 100 to 2199.5 kHz frequency coverage in 500 Hz steps; positive digital selection
- Integrated sense-loop antenna, dual antenna available for dual installations
- Dual identification tone filter enhances Morse tones for positive aural identification even with noisy reception conditions
- Coherent detection for improved adjacent channel rejection
- Two preset emergency channels
- Easy retrofit; uses existing control wiring in most cases
- Internal QEC, connector-strapped; airframe wiring sets QEC
- Meets RTCA MOPS
- DO-160 rated for hard mounting in helicopters and fixed wing aircraft
- High reliability; predicted MTBF is 4,900 hours
- Enhanced maintenance; hinged chassis for easy access to modules for fast fault isolation; compatible with existing ADF test equipment
- Design refresh 2011

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OPERATING FEATURES

The Rockwell Collins AN/ARN-149(V) LF ADF system provides automatic pointing to low and medium frequency non-directional beacons (NDB), standard broadcast stations and emergency stations on frequencies of 500 and 2182 kHz. The frequency is selected in 500 Hz increments on the control, or via the MIL-STD-1553B data bus.

The receiver processes the signals received from the integrated dual loop and sense antenna and provides bearing information to a standard radio magnetic indicator (RMI) via the 3-wire synchro interface and to either a cockpit display unit (CDU) or an aircraft navigation system computer via the MIL-STD-1553B bus interface. An aural output provides station identification, weather reporting and AM broadcast audio.

The control provides a wide selection of features for the receiver including ON/OFF, antenna mode, ADF mode, emergency presets, frequency selection, tone for keyed CW stations, volume control and test initiation. All of these features except for the ON/OFF and preset emergency frequency selections are controllable via the MIL-STD-1553B bus. A TAKE COMMAND switch is also provided for installations using dual controls with a single receiver.

SYSTEM SPECIFICATIONS

Modes	Antenna, ADF, Tone, Ident, Test
Frequency range	100-2199.5 kHz with 500 Hz channel spacing
Frequency capture	±250 Hz
Frequency stability	0.003%
Frequency control	Serial (4-wire) or MIL-STD-1553B dual multiplex bus
Receiver sensitivity	Antenna mode – 70 µV/M for 6 dB (s+n)/n ADF mode – 100 µV/M for 6 dB (s+n)/n
Signal threshold	10 µV/M nominal
Suprious response	80 dB below desired
ADF bearing accuracy	±3° from 100 µV/M to 0.5 V/M
Audio output	Internally adjustable. Factory set for 100 mW, 600- or 150-ohm load
Bearing output	3-wire synchro (11.8 V, 26 V ac 400 Hz excitation)
MIL-STD-1553B	12 bits plus sign: range ±180°, LSB 0.044°
Bearing speed	NMT 7 sec for 175° movement with 180° antenna rotation
Power requirements	27.5 V dc, 0.6 A max with 1553B; 26 V ac, 400 Hz, 0.5 A max (3 RMI loads)
Size	
Receiver	3.15 x 5.04 x 12.00 in (80.05 x 128.01 x 304.8 mm) W x H x D
Control	5.75 x 2.26 x 3.50 in (146.05 x 57.35 x 88.9 mm) W x H x D
Mount	3.36 x 1.30 x 13.00 in (85.3 x 33.0 x 330.2 mm) W x H x D
Single antenna	8.60 x 1.75 x 16.60 in (218.4 x 44.42 x 421.6 mm) W x H x D
Dual antenna	10.62 x 1.10 x 23.81 in (269.79 x 28.0 x 604.7 mm) W x H x D
Weight	
Receiver	5.5 lb (2.5 kg) with MIL-STD-1553B 4.7 lb (2.2 kg) without MIL-STD-1553B
Control	1.6 lb (0.7 kg)
Mount	0.35 lb (0.16 kg)
Single antenna	3.1 lb (1.4 kg)
Dual antenna	5.1 lb (2.32 kg)
Qualification	
Receiver	C41c and DO-142, DO-160A environmental category/ A2E1/B/DV/XXXXXXA/EZ/A/EZ/A (equivalent to MIL-E-5400, Class II)
Temperature/altitude	-55 - +71°C/sea level to 70,000 ft
Humidity	95%, 10 day cycle (severe humidity environment – Level 1)
Vibration	Sine – per DO-160A CAT V: 0.40 in DA 5-10 Hz; 2.0 g pk, 10-200 Hz Random – per DO-160A CT D, 8.9 gRMS Qualified for fixed wing turbo jet engine: any fuselage location, nacelle, engine pylon, empennage, wheel well or wing Helicopoters: any fuselage location
Shock	Solid mount – g operational; 15 g non-operating (shock duration 11 milliseconds all cases))

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

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Rockwell Collins delivers smart communication and aviation electronic solutions to customers worldwide. Backed by a global network of service and support, we stand committed to putting technology and practical innovation to work for you whenever and wherever you need us. In this way, working together, we build trust. Every day.

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