



Collins Government Avionics Division

product data sheet

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

The 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.



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KEY FEATURES

- Lightweight — under 11 lb 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
- 2 preset emergency channels
- Easy retrofit; uses existing control wiring in most cases
- Internal QEC, connector-strapped; airframe wiring sets QEC
- Meets RTCA MOPS and FAA TSO
- DO-160 rated for hard mounting in helicopters and fixed wing aircraft
- High reliability; predicted MTBF is 5100 hours for the system
- Enhanced maintenance: hinged chassis for easy access to modules for fast fault isolation; compatible with existing ADF test equipment

OPERATING FEATURES

The 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 (on the available -002 version of the Receiver).

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 interface provided in the -002 version of the Receiver. A TAKE COMMAND switch is also provided for installations using dual controls with a single receiver.

The analog version of the Receiver, Collins part number 622-6812-003, is convertible to the -002 version, providing MIL-STD-1553B bus operation, by the addition of a single plug-in module.

SYSTEM SPECIFICATIONS

Modes	Antenna, ADF, Tone, Ident, Test
Frequency range	100 kHz to 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 μ V/M for 6 dB (s+n)/n ADF Mode — 100 μ V/M for 6 dB (s+n)/n
Signal threshold	10 μ V/M nominal
Spurious response	80 dB below desired
ADF bearing accuracy	$\pm 3^\circ$ from 100 μ V/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)

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MIL-STD-1553B 12 bits plus sign: range
±180°, LSB 0.044°

Bearing speed NMT 7 sec for 175° move-
ment 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 in (80.05 mm) width,
5.04 in (128.01 mm) height,
12.00 in (304.8 mm) depth

Control 5.75 in (146.05 mm) width,
2.26 in (57.35 mm) height,
3.50 in (88.9 mm) depth

Mount 3.36 in (85.3 mm) width,
1.30 in (33.0 mm) height,
13.0 in (330.2 mm) depth

Single antenna 8.60 in (218.4 mm) width,
1.75 in (44.42 mm) height,
16.60 in (421.6 mm) length

Dual antenna 10.62 in (269.79 mm) width,
1.10 in (28.0 mm) height,
23.81 in (604.7 mm) length

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

Receiver FAA TSO: C41c, and DO-
142, DO-160A environmen-
tal category/A2E1/B/DV/
XXXXXXA/EZ/A/EZ/A
(Equivalent to MIL-E-5400,
Class II)

Temperature/
altitude -55 to +71 °C/sea level to
70,000 ft

Humidity 95%, 10 day cycle
(Severe Humidity Environ-
ment — Level 1)

Vibration Sine — Per DO-160A CAT
V: 0.40 in DA 5 to 10 Hz;
2.0 g pk, 10 to 200 Hz

Random — per DO-160A
CAT D, 8.9 gRMS

Qualified for fixed wing
turbo jet engine: Any fuse-
lage location, nacelle,
engine pylon, empennage,
wheel well, or wing

Helicopters: Any fuselage
location

Shock Solid mount — 6 g opera-
tional; 15 g non-operating
(shock duration 11 millisec-
onds all cases)

Control

Control FAA TSO; C41C, DO-142,
DO-160A Environmental
Categories/A2E1/B/AP/
XXXXXXAZAZA (Equivalent
to MIL-E-5400, Class II)

Temperature/
altitude -55 to +71 °C/sea level to
70,000 ft

Humidity 95%, 10 day (Severe
Humidity Environment —
Level 1)

Vibration Sine — Per DO-160A
CAT P: 0.2 in DA 5 to
17 Hz; 3 g pk 17 to 37 Hz;
0.75 g pk 37 to 70 Hz; 0.5
g pk 70 to 100 Hz

Random — per DO-160A
CAT A, 0.32 gRMS

Qualified for instrument
panels and consoles in heli-
copters and turbojet aircraft

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Shock..... Same as receiver

Shock..... Same as receiver

Antenna

Antenna..... FAA TSO, C41C, DO-142,
DO-138 Environmental Cat-
egories/AJ/B/JN/
AAAEWXXXX

Vibration..... 0.02 in DA 5 to 1000 Hz,
3 g maximum

0.10 in DA 5 to 55 Hz,
1.5 g maximum

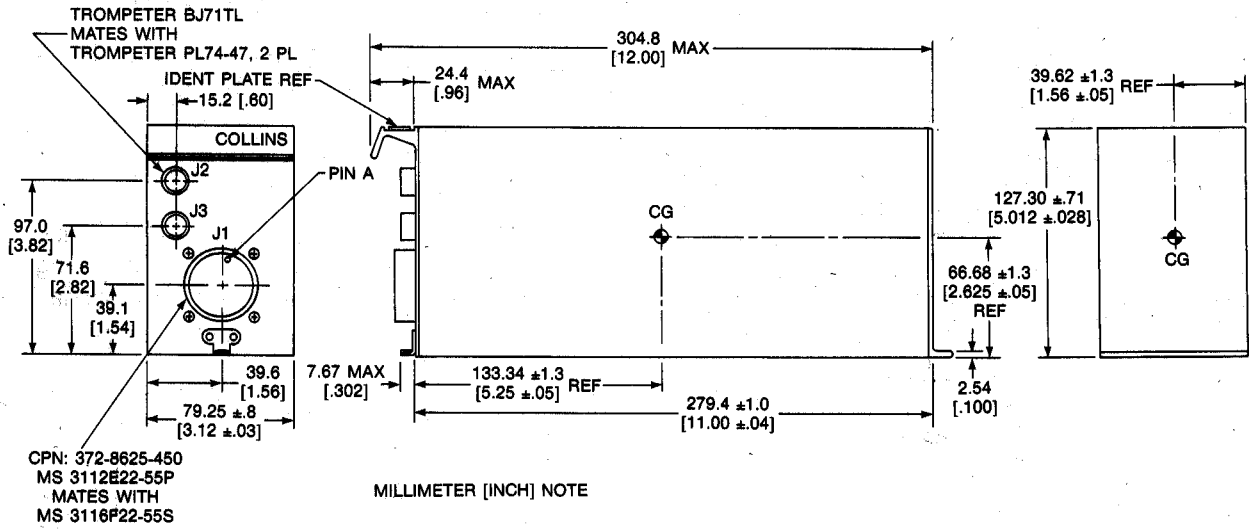
Temperature/
altitude..... -65 to +71 °C/sea level to
60,000 ft

(Qualified for all fuselage
locations in rotary wing air-
craft and turbo engine fixed
wing aircraft)

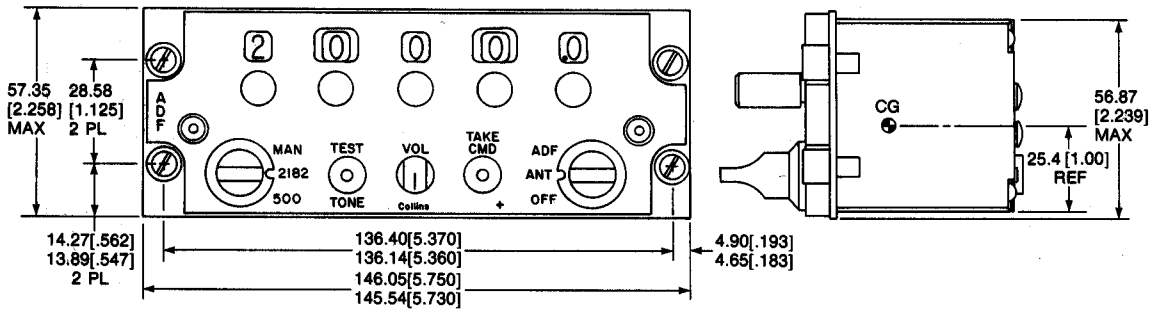
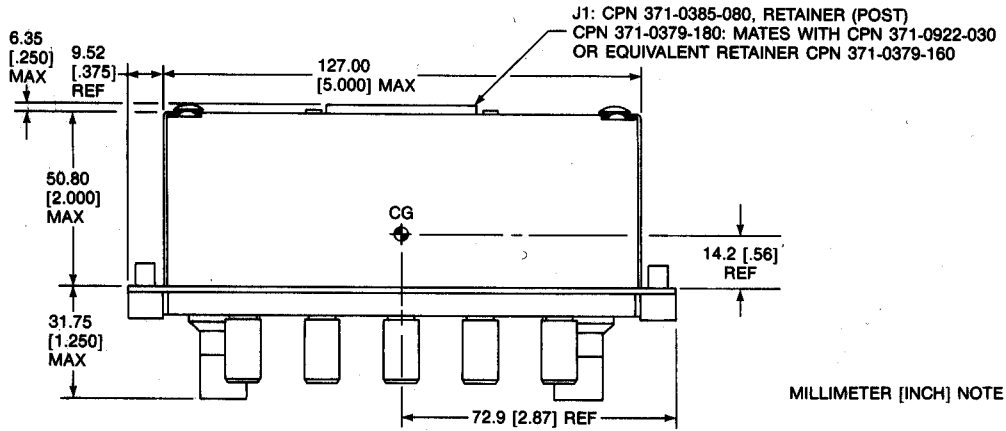
Humidity..... 95%, 10 day, (Severe
Humidity Environment)

Specifications subject to change without notice.

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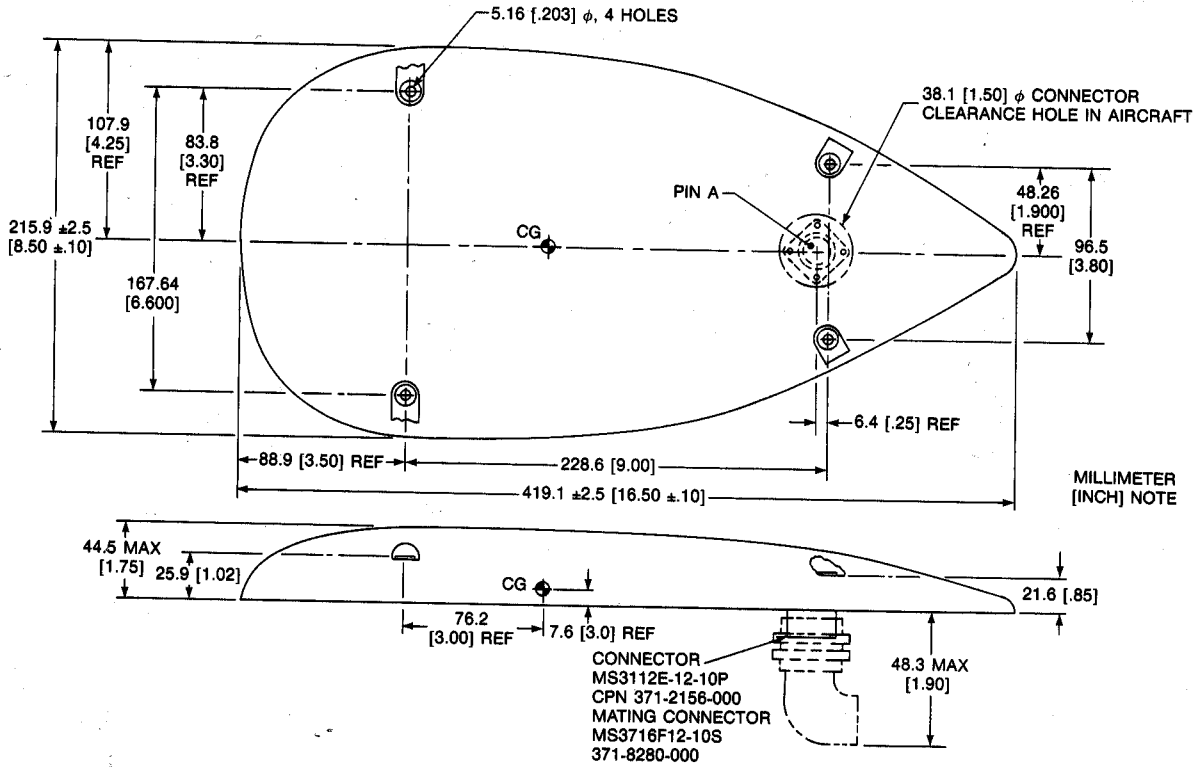


RADIO RECEIVER

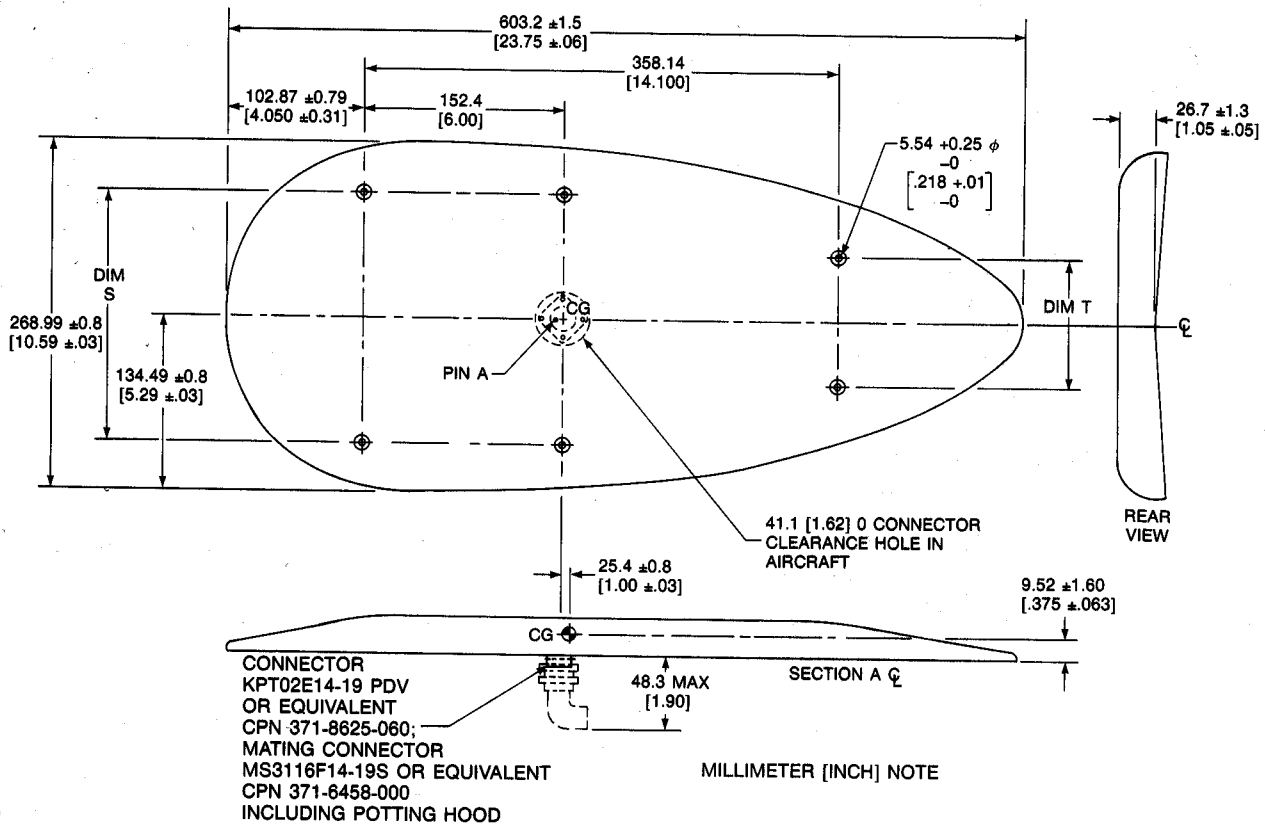


CONTROL

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SINGLE ANTENNA

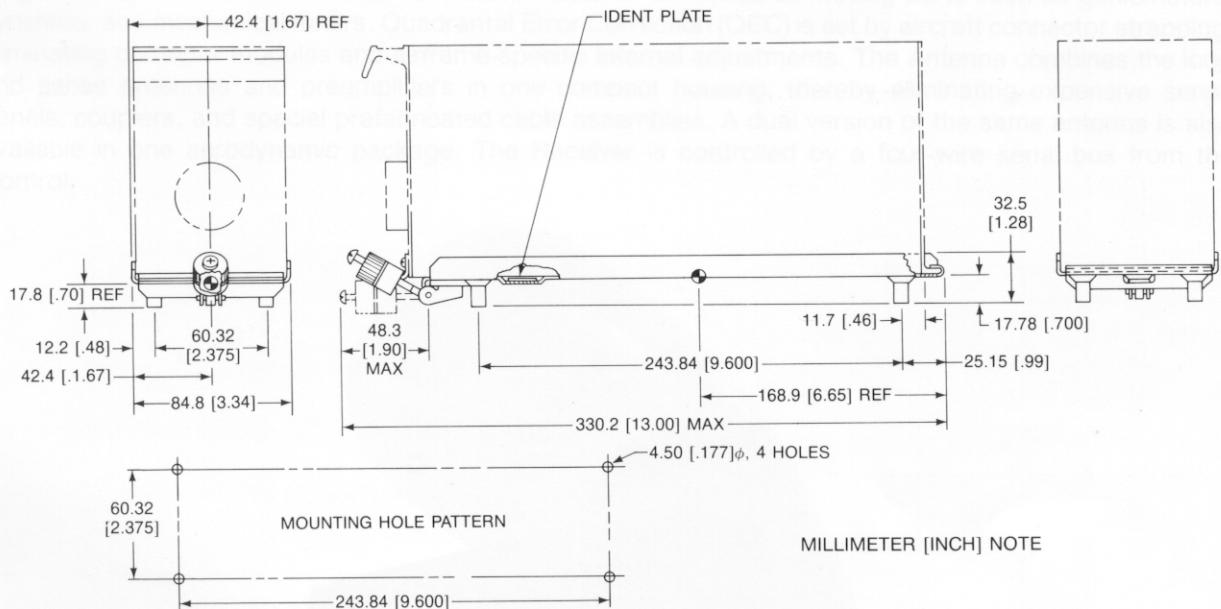


DUAL ANTENNA

AN/ARN-149(V) low-frequency automatic direction finder

The AN/ARN-149(V) system consists of the following components:

Nomenclature	Collins Part No	Description
R-2383/ARN-149(V)2	622-6812-003	Receiver (field upgradable to 1553B)
R-2382/ARN-149(V)1	622-6812-002	Receiver with 1553B
MT-6583/ARN-149(V)1	622-7210-001	Receiver mount
C-11927/ARN-149(V)2	622-6813-001	Control, 28 V white
AS-3933/ARN-149(V)1	622-6820-001	Antenna, single
AS-3934/ARN-149(V)2	622-6820-002	Antenna, dual
MS3116F2-55S	371-6510-000	Receiver mating connector
Cannon DB 255	371-0131-000	Control mating connector
Cannon DB 20962	371-0185-000	Control mating connector hood
Cannon DB 51221-1	371-0379-160	Control mating connector
MS3116F12-10S	371-8280-000	Antenna mating connector



MOUNT



Rockwell International

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Cedar Rapids, Iowa 52498