COLLINS GLU and GNLU

Digital and Analog Multi-Mode Receivers

STATE-OF-THE-ART MMR GLOBAL LANDING SYSTEM.

Flexible, high integrity navigation and landing system. Over 8000 in the fleet today supporting over 100 customers.

The Collins family of Multi-Mode Receivers (MMR) provides precision navigation and autoland capabilities for both analog and digital aircraft. Collins MMRs provide the aircraft operators with all-weather navigation and landing capabilities (ILS/VOR/MLS/GPS/GLS/FMS). This permits the operator to select the operational capability required today while maintaining the flexibility to meet tomorrow's demands.

Inherent in the Collins MMR design is a fully monitored "high integrity" position, velocity and time. This monitored design is unique in the industry and permits development of satellite-based applications requiring 10^{-9} integrity.

Industry Firsts. Collins certified the first fully integrated, precision approach navigation and landing system using global positioning system (GPS) with local area augmentation systems (LAAS) GLS CAT I in October 2000.

In September 2000, Collins delivered the first air transport category MMRs with CAT I MLS for integration in air transport class aircraft.

KEY USER BENEFITS

- Meets all known requirements for HIRF/lightning and FM immunity
- MMRs are backwards compatible with existing navigation and landing systems; in-production aircraft require OEM SB
- Exceeds ARINC 743A requirements
- Compatible with Airbus, Boeing, Douglas and Fokker BITE requirements
- Growth items include monitored output, GNSS landing system (GLS) CAT IIIB, microwave landing system (MLS) CAT IIIB, space-based and land-based augmentations, L1, L5, Galileo and P-lites (if required)
- ARINC 615 data loadable
- GNSS and SUSP software designed to meet DO-178B Level A Flight Critical requirements
- GNSS position, velocity and time-out designed to achieve 10^{-8} and 10^{-9} integration using a monitoring technique to support "high integrity" applications
- Primary position, velocity and time reference for the aircraft
- Digital MMR is certified and delivered in Boeing (B737/747/757/767/777/BBJ, MD-10 and MD-11) and Airbus (A319/320/321/330/340/A300-600/A310)
- Analog MMR certification: B727/737 DC9, MD82/83/87 A300, RJ-100, 75, 85

Rockwell Collins

SPECIFICATIONS*

General	DO-192/195/160D, DO-208, DO-229, EUROCAE ED-46 and ED-47A
Reference documents	ARINC 604, ARINC 600, ARINC 755, ARINC 756 and ARINC 710

CHARACTERISTICS

Size	3 or 4 MCU per ARINC 600
Weight	8.5 lb (3.85 kg) — 14.5 lb (6.58 kg)
Power	115 V ac, 400 Hz (GLU) 28 V dc (GNLU)

CERTIFICATION

Design compliance	TSO: C36e, C34e, (A2 D2)-YBA(BCL) E1XXXXXZEAEZYZLXX, C129B1/C1

ENVIRONMENTAL

Temperature range	Operating: -40 ºC to +70 ºC Ground survival: +85 ºC

ILS PERFORMANCE SPECIFICATIONS

LOC cross-modulation	<0.00465 DDM change
AGC	GS ±0.009 DDM, -76 to -33 dBm
LOC inter-modulation	<0.00465 DDM change, $2N_1$ (dBm) + N_2 (dBm) +72 dBm <0 107.7 to 108.0 MHz
Spurious response	800 dB (LOC)
Monitored conditions	Modulation drops 30%, SMO loses lock, instrumentation error >0.0065 DDM (GS), tuning word repetition rate and power supply voltages
Frequency	LOC 108.10 to 117.95 MHz GS 329.15 to 335.0 MHz
Channel spacing	LOC 50 kHz GS 150 kHz
Navigation outputs	Serial digital per ARINC 429
Output accuracy (-55 ºC to +70 ºC)	Centered signal: GS0.009DDM and LOC0.0046DDM Standard deviation: GS 0.009DDM and LOC 0.009 DDM
Output long-term stability	GS 0.001 DDM and LOC 0.001 DDM
Output word data rate	20/second
Output data resolution	GS: 0.0002 DDM

RECEIVER

Sensitivity	LOC -96 dBm for 6 dB (s+n)/n and valid status GS -89 dBm for valid status
Selectivity	LOC 6 dB ±12 kHz minimum, 60 dB ±31.0 kHz maximum, GS 6 dB ± 21.0 kHz minimum and 60 dB kHz maximum
Audio output gain	Adjustment from 5 to 40 mV into a 200 to 600-ohm load with -73 dBm rf modulated 30% with 1 kHz
Audio output impedance	<25 ohms

GPS PERFORMANCE

ADDITIONAL SPECIFICATIONS

Frequency	1575.42 MHz (L1) C/A code transmissions
Channels	12 channels, all-in-view tracking
Accuracy	95% normal maneuvers (w/o SA, HDOP = 1.5, VDOP = 2.0)
Horizontal velocity	1.5 meters/second
Horizontal position	23 meters (4.5 meters DGPS)
Vertical velocity	1.1 meters/second
Time	100 nanoseconds
Dynamics	800 kts ground speed 0.6 g horizontal acceleration 0.5 g vertical acceleration 3m/s^3 jerk
Time to first fix	75 seconds max w/valid initialization 10 minutes max w/o valid initialization

RECEIVER SENSITIVITY

Acquisition	-121 dBm
Tracking	-125 dBm

ENVIRONMENTAL

Altitude	30 meters (4.5 meters DGPS)

MLS PERFORMANCE

ADDITIONAL SPECIFICATIONS

Channels	200, per ICAO Annex 10
Dynamic range	-20 to -106 dbm

Accuracy per axis	Azimuth	Elevation
PFE	0.017º	0.017º
CMN	0.015º	0.010º
Resolution	0.010º	0.010º

Antenna	3 (2 passive, 1 continuous active)
Datalink legend	C-Band (optional)

***SUBJECT TO CHANGE WITHOUT NOTICE**

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523-0780662-10111J 2M-ATS-8/02