

CM-300/350 (V2) Series Software-Defined Radios

VHF/UHF Ground-to-Air Radios



Voice over IP (VoIP), compliant to EUROCAE ED-137

Front panel display and keypad

Embedded co-site filter

Passively cooled; no fan required

< 6 second boot time

Multiple keying and squelch options

Ultra high Mean Time Between Failure (MTBF)

Overview

General Dynamics' CM-300/350 (V2) radios are the latest additions to the General Dynamics family of Ground-to-Air radios. Based on FAA NEXCOM Segment 2 requirements, the radios provide reliable, clear and uninterrupted communications to improve the safety of flight in the National Air Space (NAS).

CM-300/350 (V2) software-defined radios are digital, Voice over Internet Protocol (VoIP)-capable, and provide advanced, network-ready ground-to-air communications. The rack-mounted transmitter and receiver systems are specifically designed to meet the dynamics mission requirements of air traffic control centers, commercial airports, military air stations and range installations.

Multimode Functionality in one Software Defined Radio

The General Dynamics VHF and UHF Digital Radios deliver more modes and a broader frequency range in a rack mount, passively cooled chassis. Advanced modes, legacy AM voice interoperability, and VoIP facilitate current and future voice and data requirements.

Key Features

- (SNMPv3) with Ethernet
- VHF: 112 - 150 MHz, 8.33 KHz and 25KHz channel spacing
- UHF: 225 - 399.975 MHz, 25 kHz channel spacing
- Low Power Transmitter 2-12 Watts with co-site filter, 2-15 Watts without filter
- High Power Transmitter 12-35 Watts with co-site filter, 12-50 Watts without filter
- Remote control and maintenance capability with SNMP and built-in test
- 100% usable receive channels

CM-300/350 (V2) Series Digital Radios

Typical Performance Parameters:

VHF/UHF General Data

- **Frequency Range:**
 - VHF: 112 – 150 MHz
 - UHF: 225 – 399.975 MHz
- **Frequency Stability:**
 - ≤ 1 ppm
- **Channel Spacing:**
 - VHF: 25 kHz, 8.33 kHz
 - UHF: 25 kHz
- **Modulation:**
 - VHF: A3E (Voice)
 - UHF: A3E (Voice)
- **Power Supply:**
 - DC power supply:
 - 24 V DC nominal (21.6 – 28.8 V)
 - UHF high power only, (28 V DC nominal (+/- 10%))
 - AC power supply:
 - 85-256 V, 50-60 Hz
 - Automatic switchover AC-to-DC
- **Temperature:**
 - Operating: -10°C to $+50^{\circ}\text{C}$
 - Relative humidity: 90% at 40°C (non-condensing)
 - Storage: -40°C to $+70^{\circ}\text{C}$
- **Data Interface:**
 - Ethernet
- **Maintenance:**
 - Local: Ethernet, IPV4
 - Remote: Ethernet IPV4 DHCP
 - Comprehensive: BIT, software upload
 - Setup functions: available on front panel keypad/display
 - Internal Measurements: Internal voltages, audio levels, Tx output power, FWD power, REV power, VSWR, Rx AGC voltage, Temperature
 - Maintenance Data Terminal/Human Machine Interface
- **Standards:**
 - ICAO SARPS
 - ETSI EN 300 676: VHF AM
 - ETSI EN 302 617: UHF AM
 - EUROCAE ED-137A: VoIP
 - FAA-E-3014: VHF/UHF AM
- **VHF FCC Cert. IDs:**
 - MIJCM300V2 - CM-300 (V2) VDT
 - MIJCM350V2 - CM-350 (V2) VDT

VHF/UHF Receiver Data

- **Mechanical Characteristics:**
 - Width: 19 in
 - Overall depth: 18.5 in
 - Height: 1.75 in, 1U
 - Weight: approximately 11 lbs
- **Power Consumption (receiving):**
 - 24V DC: 500 mA typical
 - 230V AC: 180 mA typical
 - 115V AC: 270 mA typical
- **Sensitivity:**
 - A3E (with cavity filter): < -102 dBm (SINAD ≥ 10 dB, 1 kHz 30%)
- **Distortion (1 kHz, 30%):** $\leq 2\%$
- **AF Bandwidth:**
 - A3E AM Voice at 25 kHz channel spacing:
 - $> 300 - 3000$ Hz
 - A3E AM Voice at 8.33 kHz channel spacing:
 - $> 350 - 2500$ Hz
- **AF Noise (-13 dBm, 1 kHz, 90%):**
 - > 40 dB
- **Effective Bandwidth @6dB:**
 - In 25 kHz: $> \pm 9.0$ kHz
 - In 8.33 kHz: $> \pm 3.5$ kHz
- **Adjacent Channel Rejection:**
 - VHF: ≥ 60 dB
 - UHF: ≥ 60 dB
- **Spurious Response:** ≥ 70 dB
- **3rd Order Intermodulation (SINAD 12 dB, 100 kHz and 200 kHz):** ≥ 70 dB
- **Desensitization:** ≥ 80 dB
- **Cross Modulation:** ≥ 70 dB
- **AGC Response (A3E Voice):**
 - Dynamic range: 100 dB (Variation ≤ 3 dB)
 - Attack time: < 30 ms
 - Release time: < 50 ms
- **Audio Line Output:**
 - Adjustable from -25 to $+20$ dBm in 0.2 dB steps
 - Impedance: 600 ohms
- **Squelch:**
 - Carrier, Audio SNR
 - Independently selectable
 - Independently adjustable thresholds

VHF/UHF Transmitter Data

- **Mechanical Characteristics:**
 - Width: 19 in
 - Overall depth: 17 in
 - Height: 5.2 in, 3U
 - Weight: approx. 35 lbs
- **Power Consumption (50W AM – 1kHz 90%):**
 - 24V DC: 14 A typical
 - 230 VAC: 2.2 A typical
 - 115 VAC: 3.9 A typical
- **RF Output Power:**
 - Low Power Transmitter 2-12 Watts with co-site filter, 2-15 Watts without filter
 - High Power Transmitter 12-35 Watts with co-site filter, 12-50 without filter
- **VSWR:**
 - Up to a VSWR of 3:1 without power reduction
- **Protections:**
 - Power reduction on overheating, low voltage and high VSWR
- **AM Voice (A3E):**
 - Modulation rate: adjustable from 0 to 100%
 - Distortion $< 5\%$ ($m=90\%$)
 - Line input level: -25 to $+20$ dBm
 - Line input impedance: 600 ohms
- **AM Responses:**
 - A3E AM Voice at 25 kHz channel spacing:
 - > -3 dB 300 – 3000 Hz
 - A3E AM Voice at 8.33 kHz channel spacing:
 - > -3 dB 350 – 2500 Hz
- **Duty Cycle**
 - VHF Low and High Power Transmitters 100%
 - UHF Low Power Transmitter 100% Duty Cycle
 - UHF High Power Transmitter 50% Duty Cycle
- **Tx Time Out:**
 - Adjustable from 5 sec to 5 min
 - Can be disabled for continuous transmit
- **Multiple Keying Options:**
 - Variable voltage
 - Ground key
- **Spectral Purity:**
 - Harmonics: < -80 dBc (< -65 dBm in L1 and L5 GPS bands w/ optional co-site filter installed)
 - Out of band spurious: < -90 dBc
 - Noise at 1% of Fo: < -150 dBc/Hz
- **Adjacent Channel Power:**
 - AM 8.33 and 25 kHz: < -50 dBc
- **Embedded Antenna Transfer Relay (ATR)**
 - User configurable
 - Main/standby or transceiver configurations

GENERAL DYNAMICS

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