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

VHF/UHF Ground-to-Air Radios

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
- 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)

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## 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°C  
  Relative humidity: 90% at 40°C (non-condensing)  
  Storage: –40°C to +70°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 ACG 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  
  MIJCM300V2 - CM-300 (V2) VDT  
  MIJCM350V2 - CM-350 (V2) VDT
- **VHF FCC Cert. IDs:**  MUJCM300V2 - CM-300 (V2) VDT  
  MUJCM350V2 - 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%)
- **AF Bandwidth:**  A3E AM Voice at 25 kHz channel spacing:  > 300 – 3000 Hz  
  A3E AM Voice at 8.33 kHz channel spacing:  > 300 – 2500 Hz
- **AF Noise (–13 dBm, 1 kHz, 90%):**  > 40 dB
- **Effective Bandwidth @6dB:**  In 25 kHz: > +/– 9.0 kHz  
  In 8.33 kHz: > +/– 3.5 kHz
- **Adjacent Channel Rejection:**  ≥ 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
- **Out of band spurious:**  < –90 dBc
- **Harmonics:**  < –80 dBc
- **Carrier to谐波比:**  > –3 dB 350 – 2500 Hz
- **Spurious Response:**  ≥ 70 dB
- **Effective Bandwidth @6dB:**  In 25 kHz: > +/– 9.0 kHz  
  In 8.33 kHz: > +/– 3.5 kHz
- **Adjacent Channel Rejection:**  ≥ 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
- **Out of band spurious:**  < –90 dBc
- **Harmonics:**  < –80 dBc
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  Impedance: 600 ohms
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  Independently selectable  
  Independently adjustable thresholds
- **Out of band spurious:**  < –90 dBc
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- **Carrier to谐波比:**  > –3 dB 350 – 2500 Hz
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  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
- **Protection:**  Power reduction on overheating, low voltage and high VSWR
- **AM Voice (A3E):**  Modulation rate: adjustable from 0 to 100%  
  Distortion <5% (m=90%)
- **Audio Line Input:**  –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
- **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
  - < –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

### CM-300/350 (V2) Series Digital Radios

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