communications

Surface Common Data Link Products

Common Data Link - Navy (CDL-N)

AN/USQ-123(V) Multi-Function Shipboard Data Link Terminal Supporting Reconnaissance/Surveillance Missions

PRODUCT DESCRIPTION

Common Data Link-Shipboard Terminal (CDL-N), AN/USQ-123(V), is the multi-function shipboard data link terminal installed aboard aircraft carriers and other amphibious craft to support reconnaissance/surveillance missions. CDL-N is an automated communications node that acquires data linked signals from airborne reconnaissance vehicles (manned or unmanned) and distributes the received signals to the appropriate shipboard intelligence user for processing/exploitation. Once signals are acquired, CDL-N automatically tracks the aircraft-to-ship signal through two one-meter dish antennas located fore and aft.

From its location in the ship's detection and track room, CDL-N receives data over the Airborne Common Data Link from sensors providing digital imagery, signal intelligence (SIGINT), infrared (IR) and radar. It supports the Advanced Tactical Airborne Reconnaissance System (ATARS) and Battle Group Passive Horizon Extension System (BGPHES) used by a Carrier Battle Group (CVBG). These missions provide a CVBG with complete surveillance reconnaissance coverage within a 300 nautical mile radius.

ATARS is a multi-sensor reconnaissance package carried by the F/A-18 aircraft. The sensor package consists of medium- and wide-field electro-optical sensors and an IR sensor. The Airborne Common Data Link transmits imagery from the F/A-18 to the carrier through the CDL-N to the Joint Services Image Processing System-Navy (JSIPS-N) at the rate of 137 megabits per second (Mb/s).

The BGPHES is a passive electronic surveillance measures (ESM) system carried by an ES-3A aircraft. The Airborne Common Data Link transmits ESM sensor data through the CDL-N to the BGPHES Surface Terminal at the rate of 10.71 Mb/s.

As CDL-N operates at X and Ku bands and at multiple data rates (i.e. 10.71, 137, and 274 Mb/s), it is capable of supporting missions and platforms equipped with compatible airborne data links. Aerial platforms in the conceptual or development stages that will be compatible with CDL-N, include the Maritime UAV, the Endurance UAV systems, and the SH-60R LAMPS BK II helicopter. These have imagery, SIGINT and radar sensor packages, and transmit data at 10.71, 137, to 274 Mb/s to CDL-N. CDL-N handles one full duplex ATARS or BGPHES data link at a time, however can be expanded to two independent full duplex links supporting simultaneous missions. **(continued on back)**

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SPECIFICATIONS
CDL-N

OPERATIONAL CONCEPT

Each user is connected to the CDL-N via a data interface and multiplexer/demultiplexer called the Link Controller. The Link Controller converts the single bit stream from the airborne platform into the data and status channels unique to each user. The Link Controller also “muxes” the command channels together for the transmission to the airborne platform. COMSEC devices are contained in the Link Controller.

The CDL-N operator is located in the ship’s detection and track room. The operator, on command from the user, initiates the initial link connection. Thereafter, the data link tracking is automatic and data link functioning is transparent to the users. With a complete built-in-test capability, the system performs its own self-check and, under CDL-N operator supervision, will perform a self diagnostic analysis.

AN/USQ-123(V) TECHNICAL CHARACTERISTICS

- Frequency: X and Ku-bands
- Uplink rate: 200 Kb/s
- Downlink rates:
  - 10.71 Mb/s
  - 137 Mb/s
  - 274 Mb/s
- Modulation
  - Uplink BPSK
  - Downlink O-QPSK
- Bit error rate: $1x10^{-8}$ without encryption
- Forward error correction coding
- Variable-depth data interleaving
- Jam resistance: Direct Sequence Spread Spectrum Command Link at 200 Kb/s
- Control, status and data interfaces for encryption devices
- Command channels (with encryption)
  - Executive functions
  - Voice — CVSD
  - 10 prime mission channels
- Return channels
  - Low rate (10.71 Mb/s)
  - High rate (274/137 Mb/s)
  - Voice (CVSD)
  - Up to 25 user mission channels
- On-line fault indication
  - Single drawer 90 percent
  - Two drawer 95 percent
  - Three drawer 97 percent
- Expandable to four independent and simultaneous full duplex links

OPERATIONAL CONCEPT

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The CDL-N is equipped with the necessary command channels that provide all executive functions, voice communication (CVSD - Continuous Variable Slope Delta modulation), and 10 user channels for prime mission equipment. The CDL-N can interface to two different types of COMSEC equipment. Other security features include jam resistance offered by a Direct Sequence Spread Spectrum Command Link that operates at 200 Kilobits per second (Kb/s). To complement the command channel capabilities, CDL-N provides up to 25 return link channels with individual rates of 50 Kb/s to 42 Mb/s.

In CDL-N, the operator establishes link configuration, performs mission monitoring and does maintenance and diagnostics via software control.

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For further information on CDL-N contact:

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