



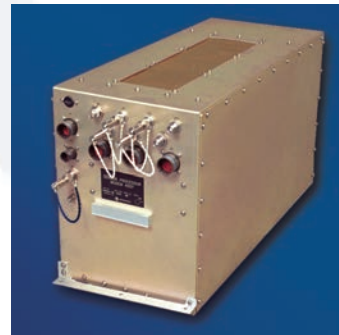
communications

Communication Systems-West

Ku-band SATCOM Data Link (KuSDL) Predator

Reconnaissance System

The KuSDL utilizes commercial, geostationary satellites to effect full duplex SATCOM linking the Predator UAV to a remote control exploitation complex. The command link provides real-time control and data while the return link transfers real-time EO, IR or SAR motion video to the exploitation facilities.



SATCOM Airborne Terminals

PRODUCT DESCRIPTION

The Predator Reconnaissance Communications System (w. ATC Radio) will include:

- I) Predator UAV, fully equipped with sensors and ATC Radio and KuSDL, and LOS data link (within UAV operating range of launching and maintenance facilities).
- II) Transponder lease(s) on appropriately positioned commercial, Ku-band

geosynchronous satellites. Lease, revenue arrangements and spot beam locations all established long before mission initiation.

- III) In-theater exploitation and control complex, including transportable satellite earth terminal (IESS -208, Type E2) with full duplex Ku-band receive and transmit capability. Complex would include exploitation capability and full connectivity to in-theater voice communications complex. Remote pilot (GCS) accomplishes ATC with authorities near flight-path via data links and onboard AN/ARC-210 radio.

COMMON PARAMETERS TO ALL TERMINALS

Channel Format

- Forward: SS-QPSK; FEC (rate 1/2):1024 sym. intlv. depth (8.000 Mchip/sec. spread)
- Return: O-QPSK; FEC concatenated RS(247, 231); Intlv. 8 RS words; Conv. (1/2, 7)

Channel Bandwidth Req.

- Forward: Spread Spectrum command within 9 MHz allocation
- Return: Coded telemetry/ imagery within 5 MHz allocation

Information Rate

- Forward: 200 Kb/sec.
- Return: 2T1(3200 Kb/sec.) composite TLM and imagery or T1 (1600 Kb/sec.)

Cleared by DoD/OSR for Public Release under 95-S-3560/L on 3 October 1995

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SPECIFICATIONS

Ku-band SATCOM Data Link (KuSDL) Predator

GROUND TERMINAL

Function

- Mission control and exploitation

“Owner”

- Theater commander JFTC Control Description
- Local operators w/radio communications cmd

Controller(s)

- Theater commander via radio communications

EIRP

- Forward: <67dBW
- Return: N/A

G/T

- Forward: N/A
- Return: 30-31 dB/°K

Carrier Frequency

- (125 KHz tuning in UAV term.)
- Forward: Tx: 13.75 → 14.50 GHz
- Return: Rx: 10.95 → 12.75 GHz

Transmit Power

- 125 Watts

Approximate aperture

- 5.5 m to 6.2 m

Signal Format

- Command: RS-422 I/F, custom
- Telemetry: RS-422 I/F, custom
- Video (EO/IR): NTSC, analog
- Synthetic Aperture Radar (SAR): RS-422 I/F, 5 Mb/s par.

Microwave Sensing

- Display, exploitation console and data base

Optional Sensing

- Display, exploitation console and data base

Air Traffic Control

- Remote pilot

SATELLITE TERMINAL

Function

- Bent-pipe relay

“Owner”

- Commercial agency e.g. INTELSAT, PANAMSAT

Control Description

- Radio remote: special channels from CC

Controller(s)

- Commercial agency

EIRP

- Forward: ≈ 31 dBW
- Return: ≈ 23 dBW

G/T

- Forward: 4.5 dBW
- Return: 4.5 dBW

Carrier Frequency

- Lease within terminal range

Transmit Power

- 35-50 Watts

Approximate aperture

- Existing, Sat. dependent

Signal Format

- Amplify and translate

Microwave Sensing

- n/a

Optional Sensing

- n/a

Air Traffic Control

- n/a

UAV TERMINAL

Function

- Low-level earth resources collection

“Owner”

- Theater commander JFTC

Control Description

- Radio remote: direct or via satellite relay

Controller(s)

- Theater commander: Launch or Mission

EIRP

- Forward: N/A
- Return: <55.5 dBW

G/T

- Forward: 12 dB/K
- Return: N/A

Carrier Frequency

- (125 KHz tuning in UAV term.)
- Forward: Rx: 10.95 → 12.75 GHz
- Return: Tx: 13.75 → 14.50 GHz

Transmit Power

- 50 Watts

Approximate aperture

- 0.76 m diameter (30")

Signal Format

- Command: RS-422 I/F, custom
- Telemetry: RS-422 I/F, custom
- Video (EO/IR): NTSC, analog
- Synthetic Aperture Radar (SAR): RS-422 I/F, 5 Mb/s par.

Microwave Sensing

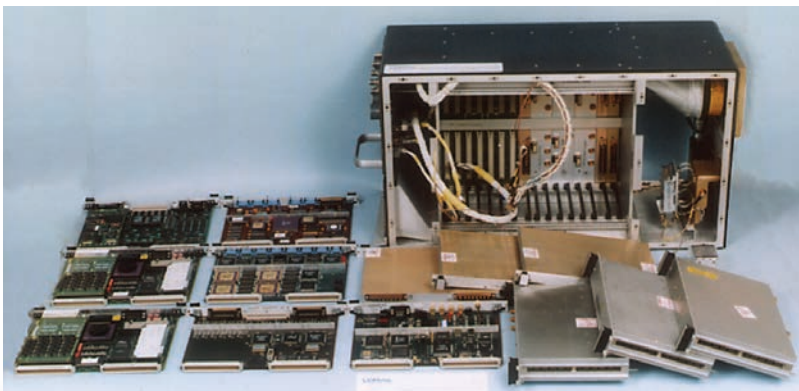
- WEC/Synthetic Aperture Radar (SAR) @ 16.4 GHz

Optional Sensing

- Versatron “Skyball” EO/IR - Analog video

Air Traffic Control

- AN/ARC-210 radi



For further information on Ku-band SATCOM Data Link contact:

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