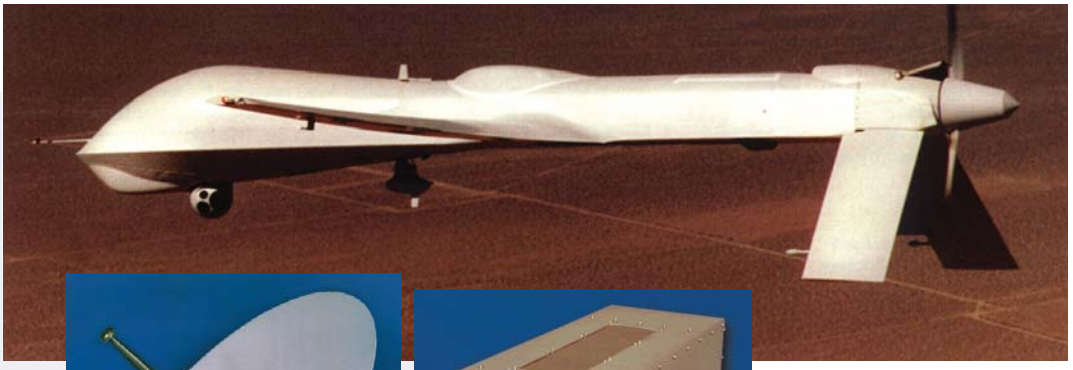
communications
Communication Systems-West

Ku-band SATCOM Data Link (KuSDL) Predator (MAE-UAV)

Reconnaissance System(Block 1 Upgrade in Process, circa 2001)

SATCOM Airborne Terminals

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 (VQ compressed) to the exploitation facilities.



PRODUCT DESCRIPTION

The Predator (MAE-UAV) 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., including TBD reserve capacity
- Return: 2#T1(3200 Kb/sec.) composite TLM and imagery or T1 (1600 Kb/sec.)

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SPECIFICATIONS

Ku-band SATCOM Data Link (KuSDL)

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: 14.0 ➔ 4.5 GHz
- Return: Rx: 10.95 ➔ 2.75 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: 14.0 ➔ 14.5 GHz

Transmit Power
- 50 Watts

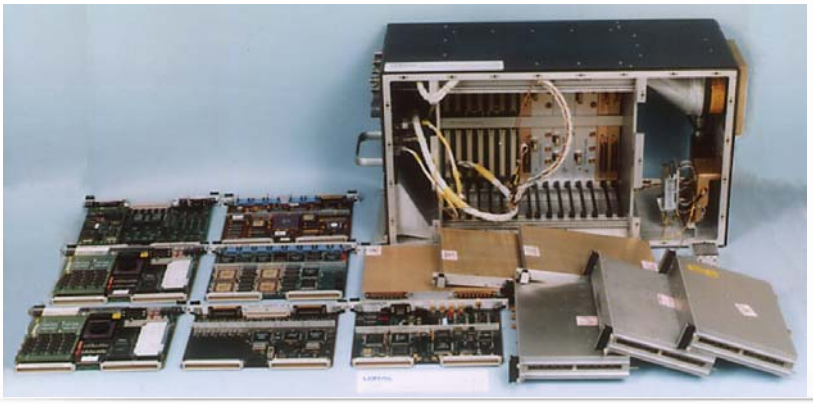
Approximate aperture
- 0.76 m. diameter (30")

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 radio



For further information on Predator contact:

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