Communications System Overview

Viking 400 UAS flights are controlled using the Expeditionary Ground Control Station which uses differential GPS waypoint navigation combined with state-of-the-art digital data link technology that can expand to control multiple air vehicles with a single operator. Operational and data range of the Viking 400 UAS is >70 nautical miles line-of-sight (LOS) data link range with an endurance of 8-12 hours depending on payload weight integrated. Embedded sensor data processing provides automated Multi-INT ISR Operations.

Enerdyne Datalink

Datalink Receiver: The Datalink provides bidirectional radio communication on the L and S Band frequencies. The datalink consists of video, serial (RS-232) and Ethernet data paths.

L-Band Downlink Receiver: Receives 1710 MHz to 1850 MHz

S-Band Uplink Transmitter: Transmits 2200MHz to 2400MHz

AVO Interface

Air Vehicle Operator Console: Hosts the hardware and software utilized by the AVO to provide mission planning, aircraft control and systems monitoring.

AVO Computer: Interface computer providing the interface between the AVO and the UAV and processes outgoing telemetry data as directed by the AVO for vehicle commands. This interface allows input from the AVO through keyboard, touchpad pointing device and joysticks entry and provides a visual representation of vehicle location and surrounding terrain as well as vehicle state parameters.

Mission Payload Operator Console: Hosts the interface software allowing the hardware interface between the MPO

MPO Computer: The MPO Computer is the primary payload computer hosting the Geneva video switching application, InSyte video storage/DVR application, VideoScout PCI Card and any proprietary payload control applications to be used (none currently). The MPO computer has 3 hard disk drives, each with 1TB capacity. RAID1-D0 is the primary operating drive hosting the Operating System (Windows XP SP3) and the Geneva video switching application and InSyte video storage/DVR application. RAID1-D1 is a RAID-1 backup of the primary operating drive to be installed and used in the event of RAID1-D0 drive failure. DATA is the data storage drive to be used to store all mission data.

Antenna System: The antenna system consists of two tripod mounted support systems that contains the transmitter and receiver antennas. The primary system contains an S-Band Omni (transmit), L-Band Omni (receive) (Figure 1-35) and L\S-Band Directional transmit and receive antennas. The maximum wind speed for the tripod mounted antenna systems is 80 kts.

L-Band Omni: Used during local operations or when the UAV is in close range to the GCS that receives the RF datalink and video that is transmitted from the UAV. The L-Band Omni antenna is a Omni directional co-linear dipole array providing 6 dBi gain on the 1710 thru 1850 MHz band. The vertical linear polarization pattern provides a null on bore sight and a maximum gain on the horizon, making it suitable for longer range horizontal paths. Being an Omni-directional, no azimuth adjustment is required to maintain its specified gain.

S-Band Omni: Used during local operations or when the UAV is in close range to the GCS that transmits the RF datalink carrying payload and UAV commands. The SBand Omni antenna is an Omni-directional co-linear dipole array providing 6 dBi gain on the 2.20 thru 2.50 Ghz band. The vertical linear polarization pattern provides a null on bore sight and a maximum gain on the horizontal paths. Being an Omni-directional, no azimuth adjustment is required to maintain its specified gain.

L-Band/S-Band Directional: Used during flight when the UAV is not within close range to the GCS that receives the RF signal carrying telemetry to the GCS. The directional antenna provides 16 dBi gain on the 1.7 to 2.5 GHz band.

GPS Antenna (GCS): Allows the GPS receiver (Communications Rack) to receive satellite information. The antenna is L1/L2 capable.

Global Positioning System (GPS) Receiver: Receives position signals from multiple satellites to determine the location of the GCS.

GCS Communication / Camera Selection Software: The Viking 400 ground station uses Enerdyne Enerlinks software to provide real-time datalink health and diagnostics. This software is also used to configure the ground Enerdyne radio settings (frequency, other). Selection of the nose EO, nose IR, or payload cameras is also performed via
the video selection software.

ROS Application: The ROS application is the software that controls the directional control of the GCS antennas. It receives pointing commands as formulated by the missionTEK® computer. This software starts automatically when the GCS AVO console is turned on.