AA3505 Bispectral Scanner System

The AA3505 is a dual band passive remote sensing system designed for airborne use. The system is formed from components originally delivered as the Daedalus model AA2000 plus new subsystems. The AA3505 modernizes the data system electronics, providing both analog and digital recorded outputs, a real time image display for the operator and adds a closed cycle cryostat cooler for the infrared detector, while reusing some of the original assemblies, principally the optical scan head. Two major assemblies make up the AA3505, these are: the Optical Scan Head with sensors and the Data Subsystem. The Data Subsystem consists of two subassemblies: the Operator Console and the Digitizer.

The compact scan head and electronics can be installed in a wide range of aircraft using standard 16" aerial camera ports and seat assemblies. The sensor configuration includes a thermal infrared detector and an ultraviolet detector. This spectral band combination is specifically aimed at coastal patrol applications seeking to detect and map oil on water and other pollution.

The system's built-in test (BIT) capability delivers a high level of confidence in mission success. An on-board image display provides a real-time check of flight line coverage and data quality. A built-in GPS receiver automatically inserts navigation data into the housekeeping message in the header of each scan line. Continuous monitoring and operator control is provided by a simple user interface.

The AA3505 digital tape output matches the Argon ST AMS, ABS and enhanced ATM formats. This means that ground playback and analysis of the recorded data can be accomplished with the “Daedalus” importer, included as a standard part of the ERDAS IMAGINE (or equivalent) image processing software.

TECHNICAL SPECIFICATIONS

INSTANTANEOUS FIELD OF VIEW
5 milliradians

DIGITIZED FIELD OF VIEW
>77° 360 scene pixels

SCAN RATE
160 scans/sec

VELOCITY/HEIGHT RATIIO (V/H)
0.8 radians/sec

ROLL CORRECTION
Image is automatically corrected for ±10° aircraft roll using built in gyroscope

POWER REQUIREMENTS
28 ± 3 VDC, 30 amps maximum

IMAGE DISPLAY
Continuous moving window “waterfall” display plus RS-170/CCIR output

DIGITIZATION PRECISION
12-bits per pixel

DIGITAL RECORDED OUTPUT
Two channels full resolution plus header
20 hours recording per 8 mm cassette tape

ANALOG RECORDED OUTPUT
S-VHS recording of one operator selected spectral band

GPS RECEIVER
A GPS receiver is integral to the system. Date, time, ground speed, latitude, longitude and track angle are recorded in the header of the 8 mm tape output.

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SPECTRAL BANDS

		Band Edges	NER
1	Ultraviolet	0.32 - 0.38 µm	≤0.06
2	Infrared	8.5 - 12.5 µm	≤0.2 NETD

NER is $\mu W/cm^2 \cdot nm \cdot sr$ and NETD in °C

PHYSICAL SPECIFICATIONS

	inch	cm
Scan Head	15 H x 15 W x 15 D	38 H x 38 W x 38 D
Electronics	28 H x 19 W x 18.5 D	87 H x 48 W x 47 D
Total System Weight (approx.)	190 lbs.	87 kg

** Depth not including connectors and cables*

ENVIRONMENTAL SPECIFICATIONS

	Temperature	Relative. humidity (non-condensing)
Scan Head	-55° to +70°C	0 - 95%
Electronics (operating)	+5° to +40°C	20 - 80%

Rev. 2 - Feb. 2005

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