

ABS Airborne Bispectral Scanner

The ABS system is a dual optical port scanner which simultaneously records two spectral channels directly onto an 8 mm digital tape. The ABS provides calibrated thermal information for the determination of radiometric temperature relationships for various remote sensing applications. 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 system performs simultaneous scanning for thermal infrared and a second spectral region: either shortwave infrared, visible/near infrared, or ultraviolet. Bandpass filters can be used to obtain specific spectral bands in the V/NIR (0.4 - 1.1 μm) region. Calibration of the thermal IR channel is standard and uses the built-in blackbody references.

The system's Built-In Test (BIT) capabilities deliver 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 differential ready GPS receiver automatically inserts navigation data into the housekeeping message in the header of each scan line.

The ABS provides operator control via a menu-driven touch screen. An optional printer can provide continuous real-time hard copy images plus a VHS video recording can be made from the monitor output.

ABS data tapes may be read and processed by ERDAS Imagine® image processing software, using the "Daedalus" importer.

The ABS collects data for applications as diverse as:

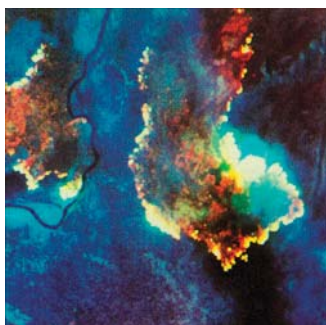
- ▣ Geologic mapping
- ▣ Vegetation studies
- ▣ Pollution monitoring
- ▣ Maritime surveillance
- ▣ Heat loss detection
- ▣ And many more.



System photo depicts one variation of system.

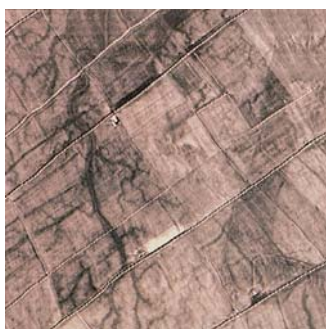
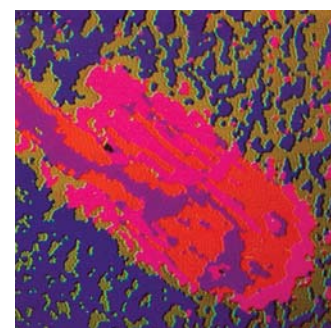


- Digital performance – 8-bit and 12-bit resolution



Forest fire smoke is penetrated here using several regions of the infrared to pinpoint hot spots and fire fronts for ground personnel. (Courtesy of NASA/Ames Research Center) NASA does not endorse any commercial product.

Oil spill monitoring using thermal IR and UV channels. The UV assists in determining total area of oil slick while the IR is used for oil thickness estimates. (Courtesy Canada Centre for Remote Sensing)



Thermal imagery of an area in Lincolnshire, England, showing otherwise invisible drainage patterns and ground temperatures relating to soil moisture conditions. (Courtesy of Hunting Geology & Geophysics Ltd. and Global Earth Sciences, Ltd.)



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Environmental
Remote Sensing
Technology

ABS Airborne Bispectral Scanner

DETECTOR COMBINATION				
Partial Listing of Applications:	UV	V/NIR	SWIR	LWIR
Geologic mapping				X
Ground water discharge				X
Offshore spring mapping				X
Thermal discharge monitoring				X
Fire detection/mapping			X	X
Geothermal exploration			X	X
Search and rescue			X	X
Ice mapping			X	
Soil moisture studies		X		X
Thermal inertia mapping		X		X
Crop and forestry studies		X		X
Oil spill detection/mapping	X			X

Examples of typical applications and their recommended spectral combinations are depicted in the chart above.

NOTE: The ABS can be easily upgraded to the 10-band AMS (Airborne Multispectral Scanner).

OPTIONS

SECOND CHANNEL DETECTORS

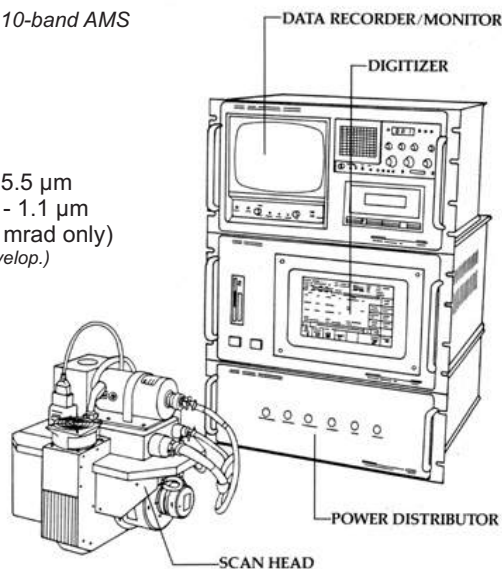
Shortwave Infrared Detector (SWIR) 3.0 - 5.5 μm
 Visible/Near Infrared Detector (V/NIR) 0.4 - 1.1 μm
 Ultraviolet Detector (UV) 320 - 380 nm (5.0 mrad only)
 (Note: Detectors can be purchased later as needs develop.)

HARDCOPY PRINTER

Continuous hardcopy image of raw video data (corrected for s-bend and V/H geometric distortions)

DETECTOR CRYO-COOLING

INSTALLATION ASSISTANCE



TECHNICAL SPECIFICATIONS

STANDARD THERMAL INFRARED DETECTOR
 LWIR, 8.5 - 12.5 μm

INSTANTANEOUS FIELD OF VIEW
 2.5 milliradians (1.25 mrad optional)

DIGITIZED FIELD OF VIEW - 86°
 720 pixels @ 2.5 mrad
 1440 pixels @ 1.25 mrad

SCAN RATES
 100, 50, 25, 12.5, 6.25 scans/sec
 (operator selectable)

VELOCITY/HEIGHT RATIO (V/H)
 0.25 radians/sec @ 100 scans/sec @
 2.5 mrad IFOV; 0.125 radians/sec @
 1.25 mrad IFOV

ROLL CORRECTION
 $\pm 15^\circ$ of roll correction (automatic)

POWER REQUIREMENTS
 28 ± 3 VDC, 30 amps continuous (not including optional hardcopy printer)

IMAGE DISPLAY
 9" CRT (640 pixels wide in continuous moving window, RS-170/CCIR output)

DIGITIZATION PRECISION
 8-bit or 12-bit (operator selectable)

RECORD TIME AT 100 SCANS/SEC
 (2 channel operation)

2.5 mrad	1.25 mrad
12-bit - 6.2 hrs min	12-bit - 3.2 hrs min
8-bit - 9.2 hrs min	8-bit - 4.7 hrs min

THERMAL REFERENCE SOURCES
 Two controllable field-filling blackbody reference sources. Range of -15° to $+25^\circ\text{C}$ with respect to scan head heat sink temperature.

GPS RECEIVER

A GPS receiver is integral to the system. Date, time, ground speed, latitude, longitude and track angle are recorded on the system data tape.

PHYSICAL SPECIFICATIONS

	Height		Width		Depth*	
	in	cm	in	cm	in	cm
Scan Head	15.0	38.0	15.0	38.0	15.0	38.0
Electronics	28.0	71.2	20.0	50.8	20.0	50.8
Total System Weight (approx.)		lbs		kg		
		178		81		

* Depth not including connectors and cables

ENVIRONMENTAL SPECIFICATIONS

	Temperature	Rel. Humidity (non-condensing)	Altitude
Scan Head	-55° to $+70^\circ\text{C}$	0 - 95%	50,000 ft (15,200 m)
Electronics (operating)	$+5^\circ$ to $+40^\circ\text{C}$	20 - 80%	25,000 ft* (7,600 m)
Electronics (non-operating)	-40° to $+60^\circ\text{C}$	0 - 95%	50,000 ft (15,200 m)

* Video monitor will automatically switch off above 14,500 ft (4,400 m)

Specifications subject to change. Argon ST reserves the right to substitute components of equal or superior performance at any time without notice.

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