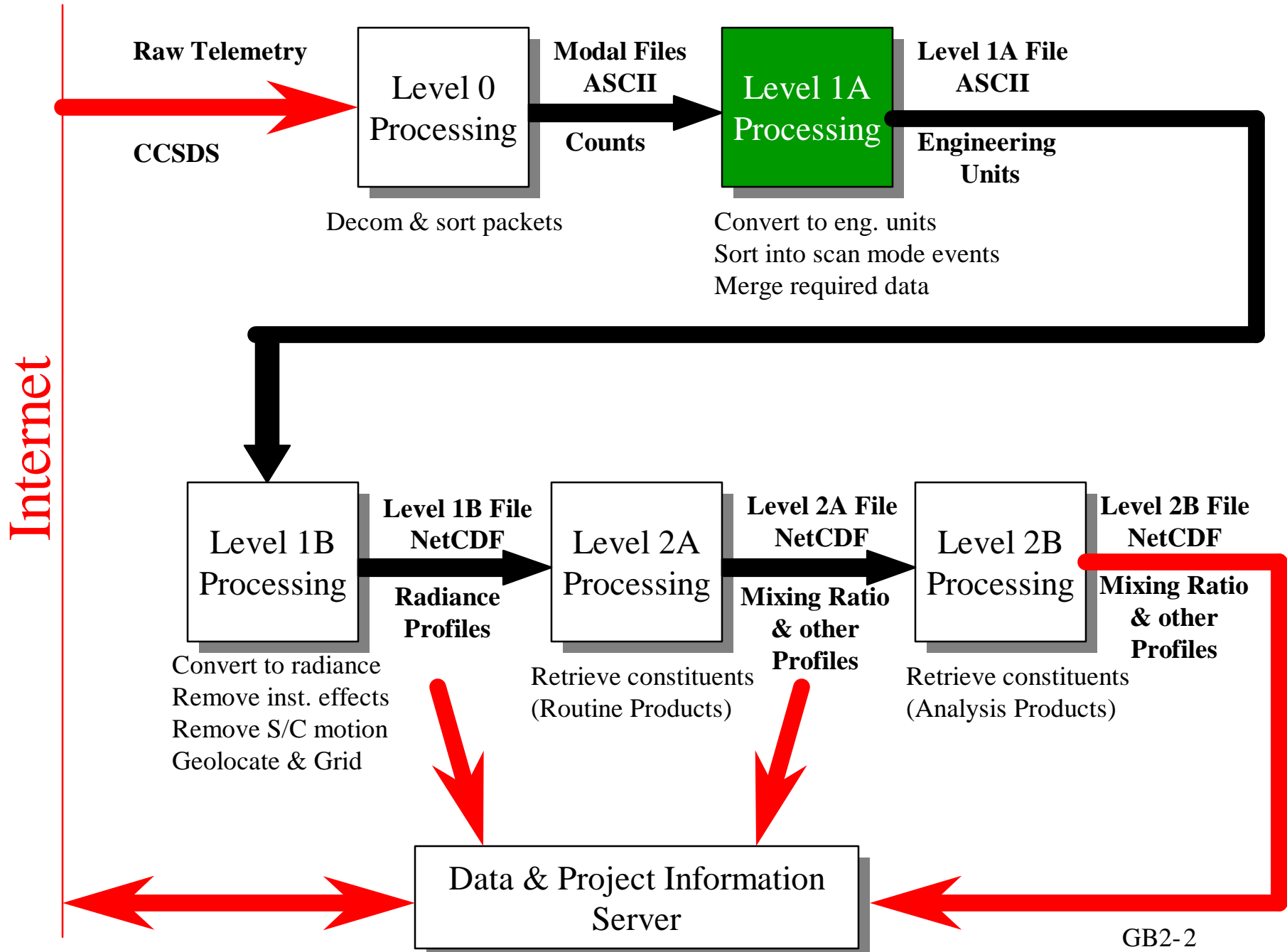
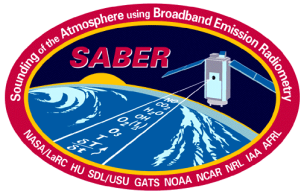


SABER Calibration/Level 1A Processing

Guy Beaver
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GB2-1





SABER Level 1A Heritage

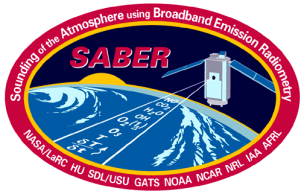


GATS heritage for Level 1 processing:

Software & Lessons Learned from:

- LIMS Level 1
- MASDA (LIMS reprocessing) Level 1
- HALOE Level 1

GB2-3



SABER Level 1A System Requirements



Input: Level 0B Modal Files

- Unpacked Counts, Sorted by Packet Type, Time-Ordered

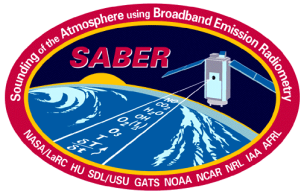
Output: Level 1A File (1 per day)

- Engineering Units, Grouped by Atmospheric Scan

Processing:

- Merge data into scan events
- Convert to engineering units
- Quality Check

GB2-4

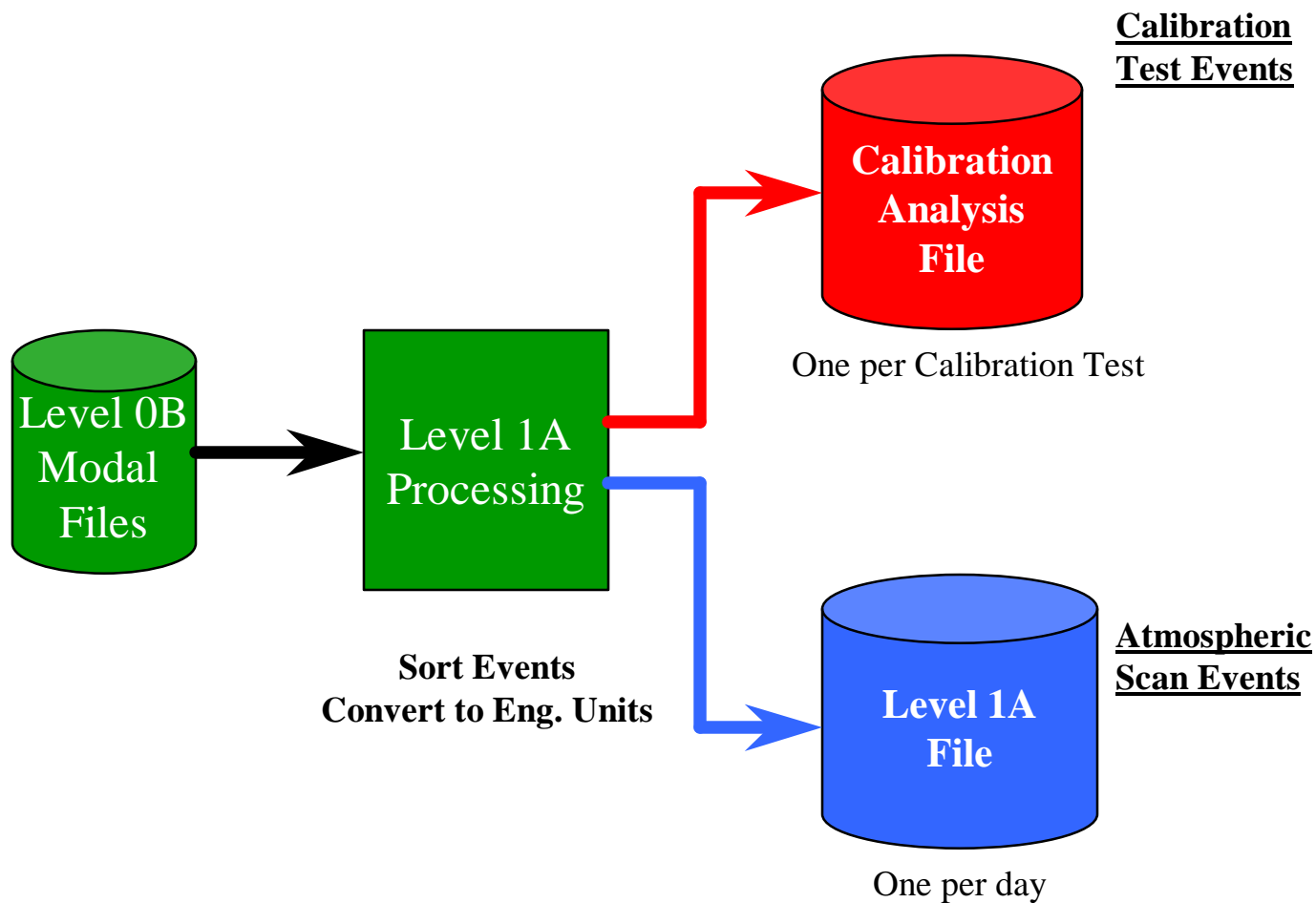


SABER Level 1A/Calibration Common System Design

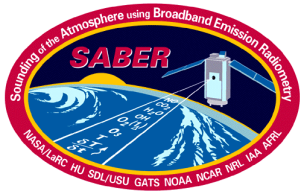


Color Key
Calibration
Operation
Both

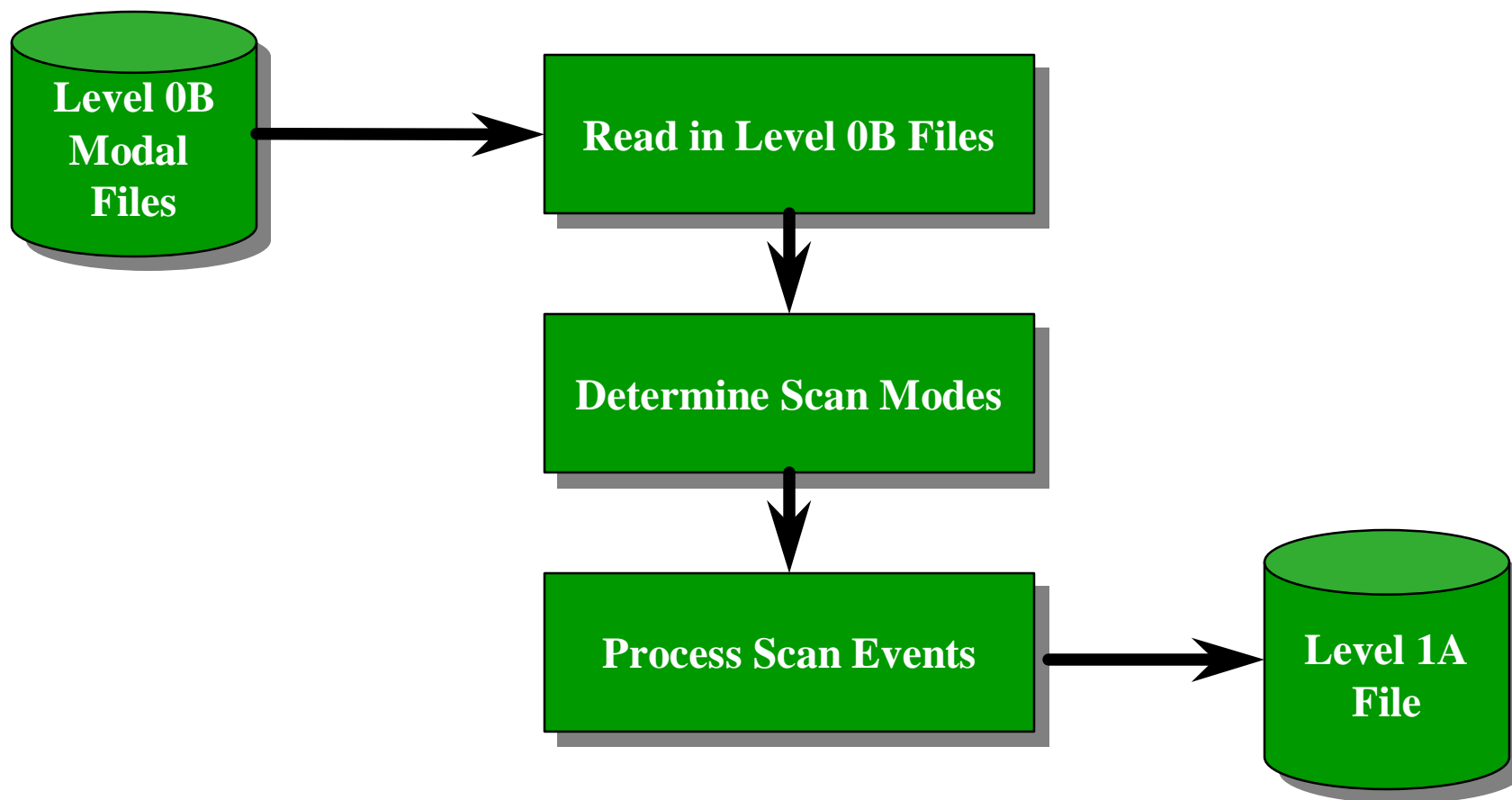
- Data Collection
- HouseKeeping
- Status
- GSE Test Chamber
- GSE BB
- GSE FFC
- GSE Other
- NMC
- PVAT
- Solar



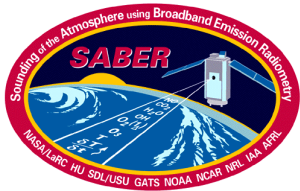
GB2-5



SABER Level 1A System Design



GB2-6



CSCI: Read in Level 0B Files Requirements



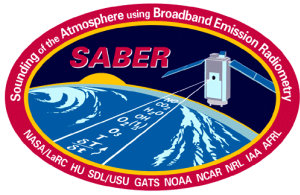
Requirements:

- (1) Open and read Level 0B files for current and previous day.
- (2) Pass through errors flagged in status file.
- (3) Handle scan that begins in previous day
- (4) Handle Ancillary NetCDF data from MDC

Formats defined in SDD

Level 0B File	Type	Format
Data Collection	Packet-Generated	ASCII
HouseKeeping	Packet-Generated	ASCII
NMC	Ancillary	NetCDF
PVAT	Ancillary	NetCDF
Solar Indices	Ancillary	NetCDF
Status (Record Count/Error Log)	Status	ASCII
Orbit Number	Ancillary	ASCII

GB2-7



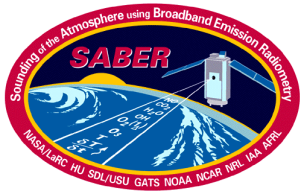
CSCI: Read in Level 0B Files Testing



Testing:

<u>Test</u>	<u>Requirement</u>
•Test data will be generated during Engineering Calibration (September-October 1998).	1
•Same classes & structures from Level 0B are filled during read.	1
•Files are ASCII: Point-by-point comparison can be made on dumped data.	1
•Cross-over day boundaries & errors will be implanted.	2, 3
•Will simulate MDC generated data (NetCDF) using HALOE data.	4

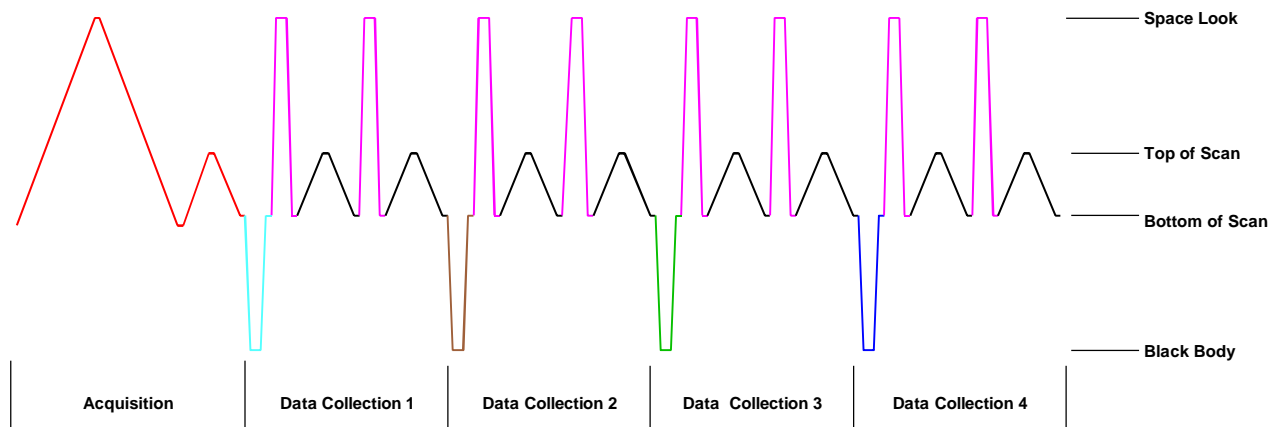
GB2-8



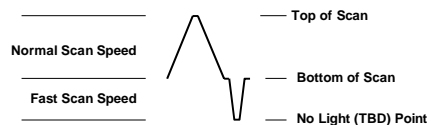
CSCI: Determine Scan Modes Requirements



SABER DEFAULT LIMB SCAN SEQUENCE
Ver 2.0



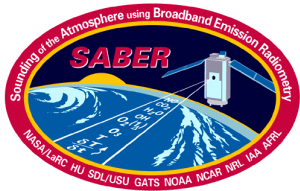
Alternative Stray Light Adaptive Scan



Not to Scale

5/27/98

GB2-9

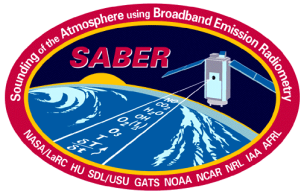


CSCI: Determine Scan Modes Requirements



- Requirements:**
- (1) Determine scan mode as function of time from scan mode flag, scan angle, scan velocity (*see table below*).
 - (2) Trap scan mode errors.
 - (3) Handle scan events which begin in previous day.

Scan Mode	Scan Mode Flag	Scan Angle Velocity [degrees/sec]	Scan Angle Range [degrees]	Description
Adaptive Down	ADPTSCAN	+0.194	17.631-26.214	Nominal scan down
Adaptive Up	ADPTSCAN	-0.194	17.631-26.214	Nominal scan up
IFC	IFCBBXXX	0	180	Stare at Internal Flight Calibrator
Space Look	SPACLOOK	0	10.24	Stare at cold space
Acquisition Down	ACQNSCAN	+0.178	11.09-26.21	Acquisition scan down
Acquisition Up	ACQNSCAN	-0.178	11.09-26.21	Acquisition scan up
Lower Baffle Look	ACQNSCAN	TBD	TBD	Mirror Scans into lower baffle
Upper Baffle Look	ACQNSCAN	TBD	TBD	Mirror Scans into upper baffle
TBD 1-?	SPARE1-?	TBD	TBD	Spares for future modes



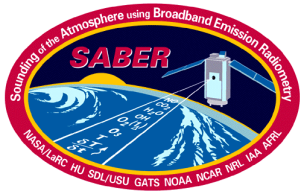
CSCI: Determine Scan Modes Testing



Testing:

<u>Test</u>	<u>Requirement</u>
•Test data generated during Engineering Calibration will command instrument through all scan modes.	1
•Cross-over day boundaries & errors will be implanted.	2, 3

GB211

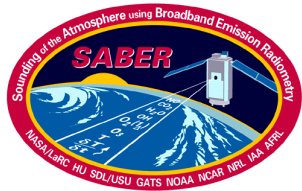


CSCI: Process Scan Events Requirements



Requirements:

- (1) For each adaptive scan, gather all data required to process event (*see table next slide*).
- (2) Identify & process bracketing IFC and Space-look events.
- (3) Process PVAT to determine tangent point location.
- (4) Get NMC profile for tangent point location.
- (5) Get Solar indices for current day.
- (6) Get Orbit numbers for current day.
- (7) Output Level 1A file (*Format defined in SDD*)

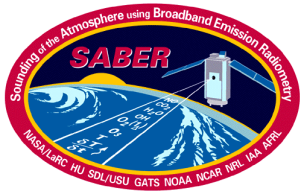


CSCI: Process Scan Events Requirements



Requirements:

Scan Mode	Event Data Requirements	Processing Requirements
Adaptive Down	Scan Mirror Angle Channel Voltages & Gains HouseKeeping NMC Profile for tangent point location. Solar Indices for current day. PVAT. Orbit Number. Bracketing IFC events. Bracketing Space-Look events Baffle-Looks (if scanned)	Convert to Engineering Units. Compute tangent point location. Extract NMC profile. Merge data.
Adaptive Up	Same as Adaptive Down	Same as Adaptive Down.
IFC	Scan Mirror Angle Channel Voltages & Gains IFC & Jones Source Temperatures	Convert to Engineering Units. Merge data.
Space Look	Scan Mirror Angle Channel Voltages & Gains PVAT.	Convert to Engineering Units. Compute tangent point location. Merge data.
Acquisition Down	Same as Adaptive Down	Same as Adaptive Down.
Acquisition Up	Same as Adaptive Up	Same as Adaptive Up.
Lower Baffle Look	Scan Mirror Angle Channel Voltages & Gains HouseKeeping	Convert to Engineering Units. Merge data.
Upper Baffle Look	Scan Mirror Angle Channel Voltages & Gains HouseKeeping	Convert to Engineering Units. Merge data.
Spare	Derived	Derived as needed.



CSCI: Process Scan Events Testing



Testing:

<u>Test</u>	<u>Requirement</u>
•Test data generated during Engineering Calibration will command instrument through all scan modes. The output Level 1A file can be analyzed to verify that the data were correctly processed, merged and output in the correct format for each scan event & scan mode.	1,2,7
•Will simulate MDC generated data using HALOE data	3,4,5,6



SABER Calibration/Level 1A Summary



- Overall system design for Level 1A is complete
- Calibration Analysis has been reviewed
 - PDR (June '97), CDR (October '97).
 - CSCI's are being coded now.
- Level 1A front end uses Calibration Analysis code.
- Level 1 has been through PDR (June '97)
- GATS Heritage for Level 1:

Software & Lessons Learned from:

- HALOE Level 1
- LIMS Level 1
- MASDA (LIMS reprocessing) Level 1