



How Do You Make a Weather Satellite?

This booklet was adapted from the original work by
Ed Koenig



http://www.nasa.gov/pdf/112194main_weather_satellite_booklet.pdf

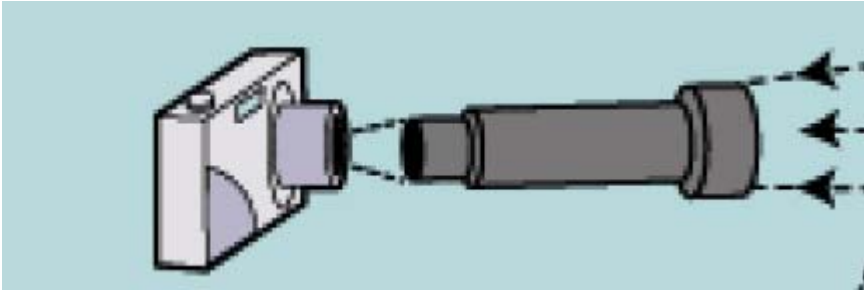
Let's say your homework is to think about how to observe the clouds over North America, both day and night....

Move your hand over the ice, then over the hot water. Do you feel the difference?



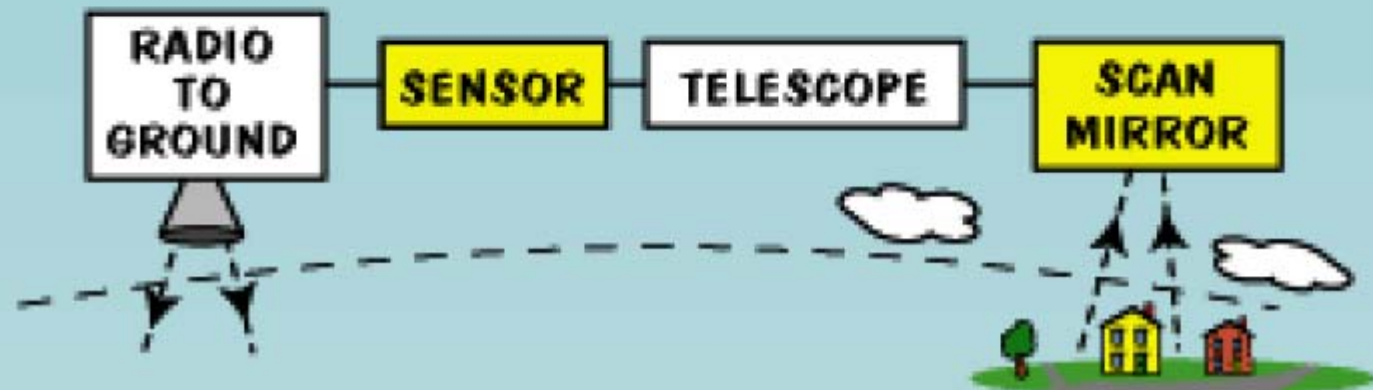
The cold area could be the North Pole or a cloud.
The hot area could be a desert.

Instead of a hand in orbit, satellite builders use a little sensor chip, which changes an electrical current, depending on whether it senses hot or cold.



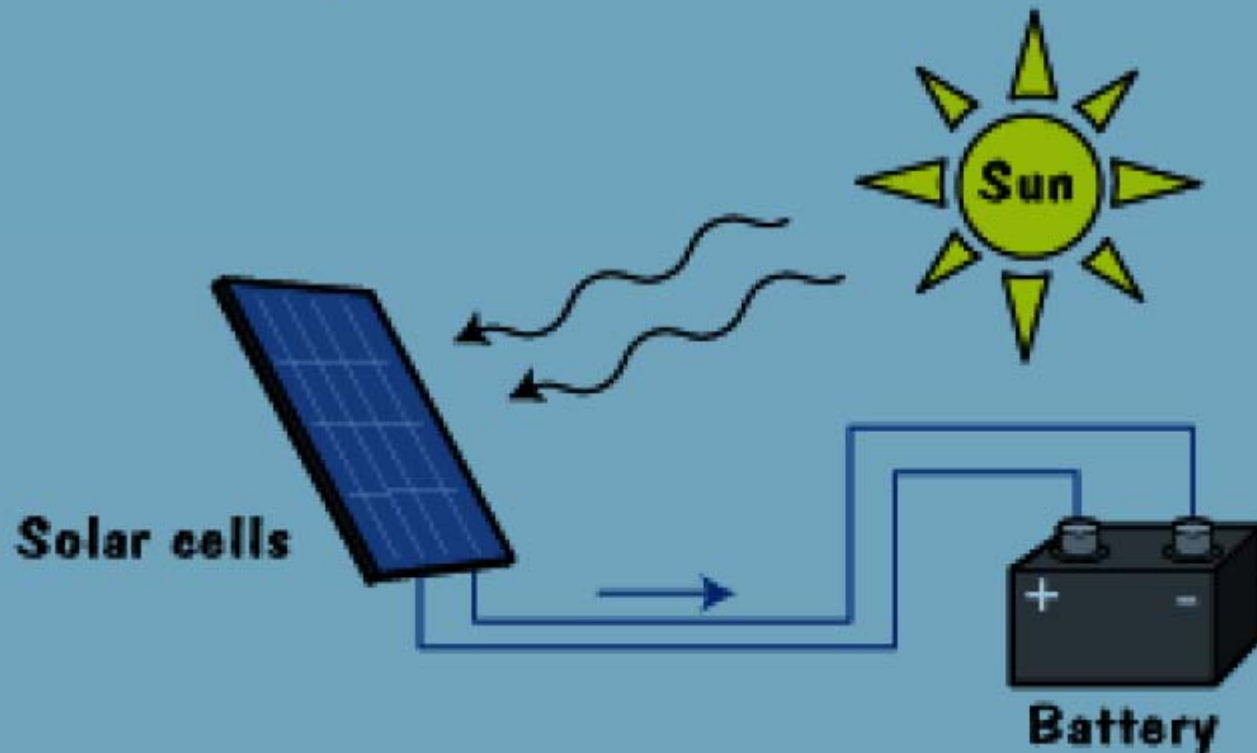


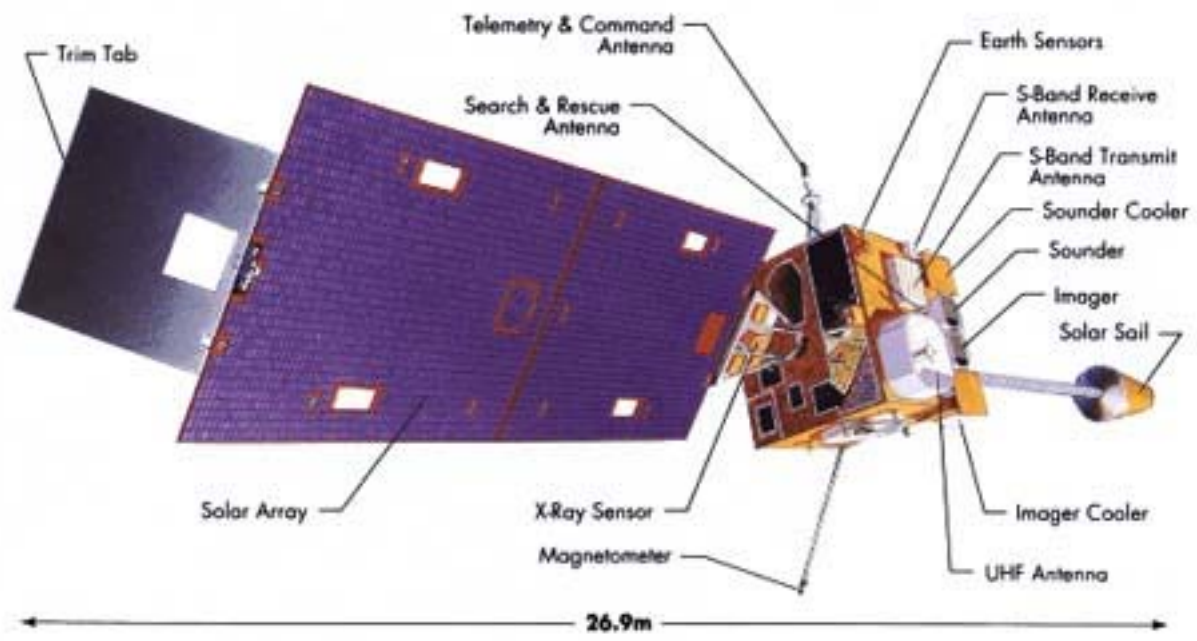
Communication! We need a transmitter to send information from the satellite to the satellite operations control center on Earth. And we need an antenna on the satellite so it can receive instructions from the command center.



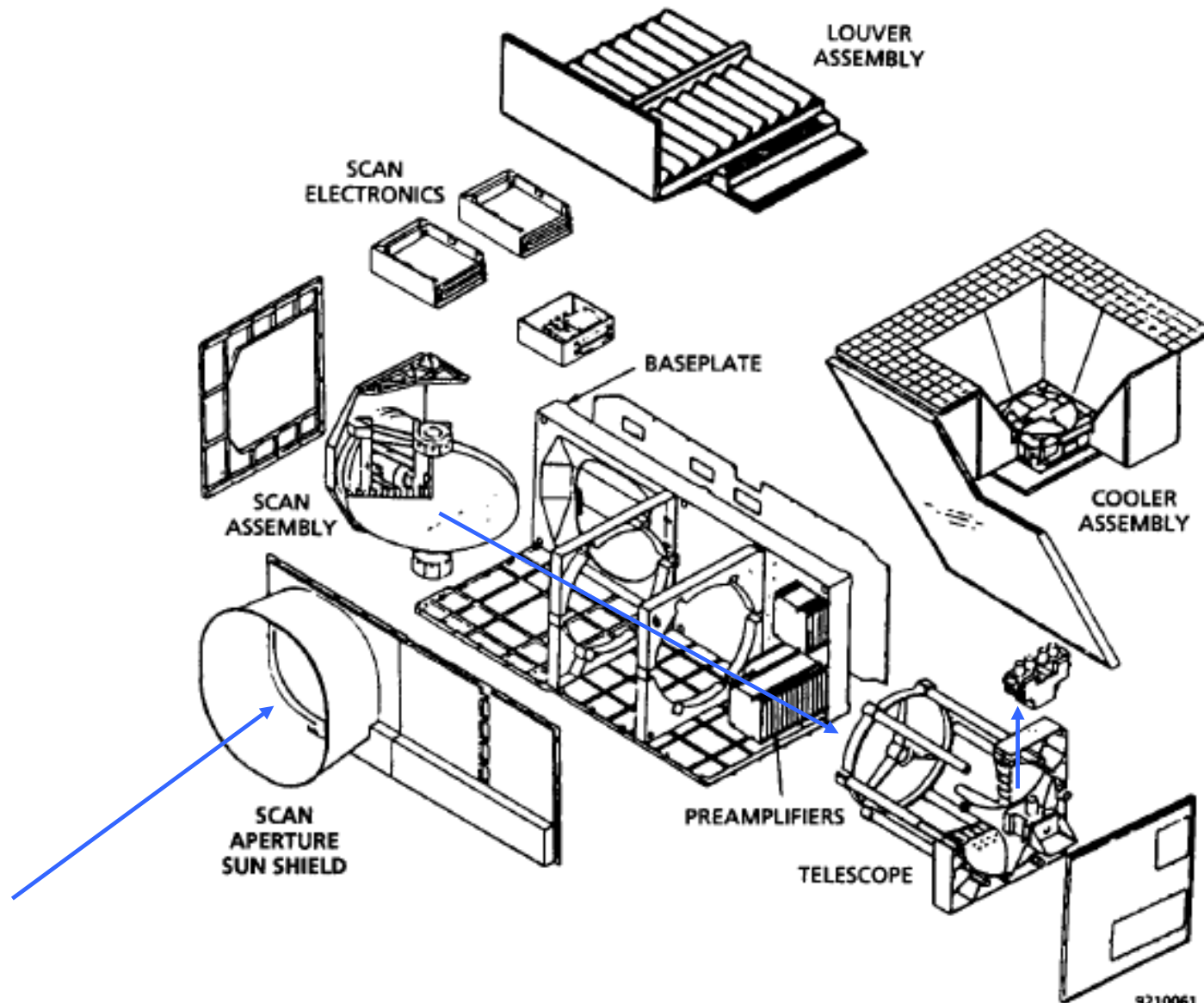
We will also need a way to make and store electricity for the camera, scan mirror, transmitter, and a computer to control everything.

We can use solar cells to convert sunlight to electricity, and batteries to store the electricity.





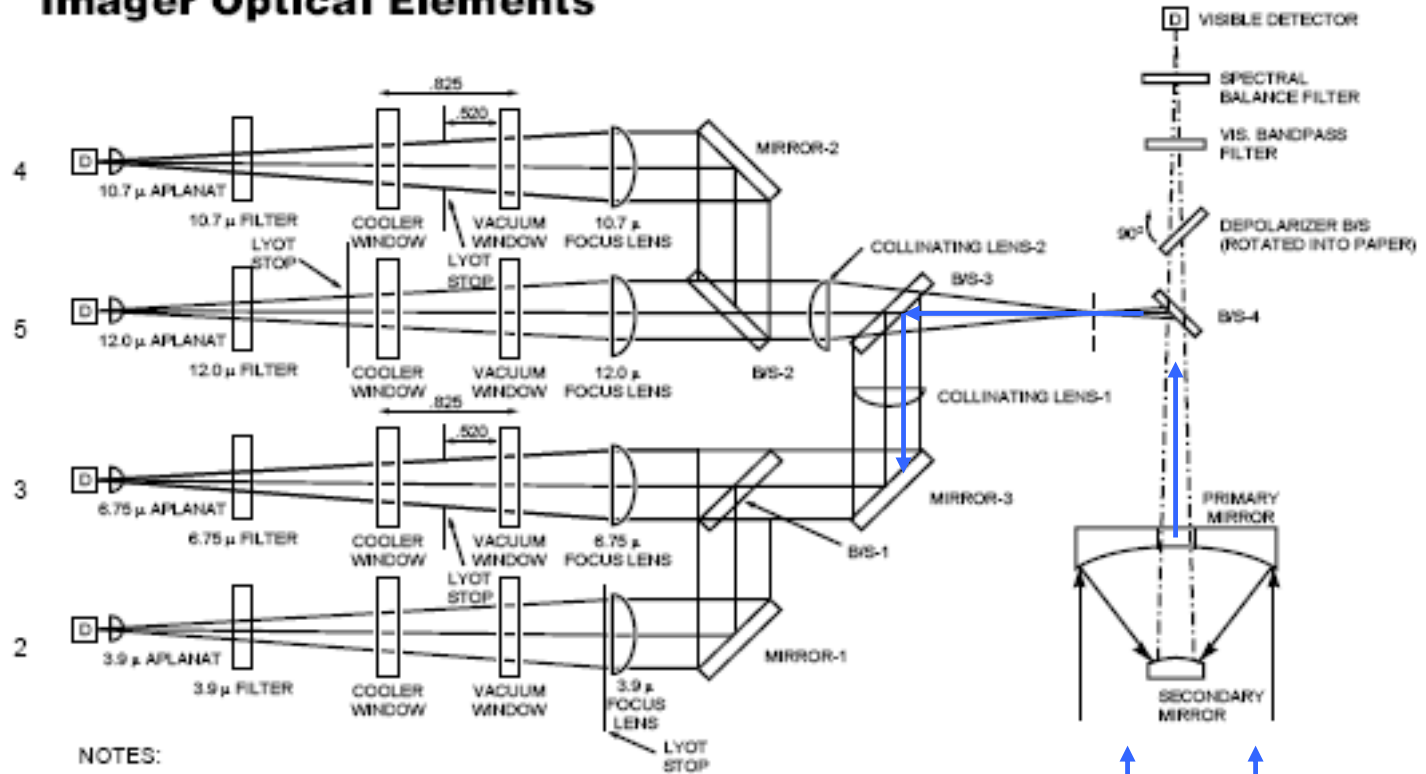
Expanded View of Sensor Module



Visible detectors

Imager Optical Elements

Infrared detectors



NOTES:

- 1) SCAN MIRROR NOT SHOWN
- 2) COMPONENTS AND SPACINGS ARE NOT TO SCALE

9310227

Earth

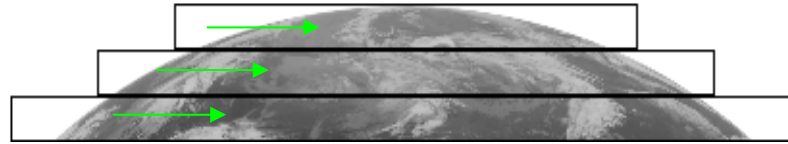
Full Disk with stepped-edge



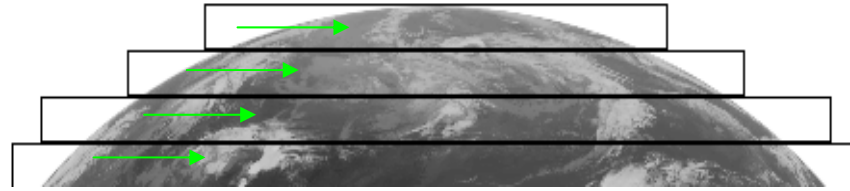
Full Disk with stepped-edge



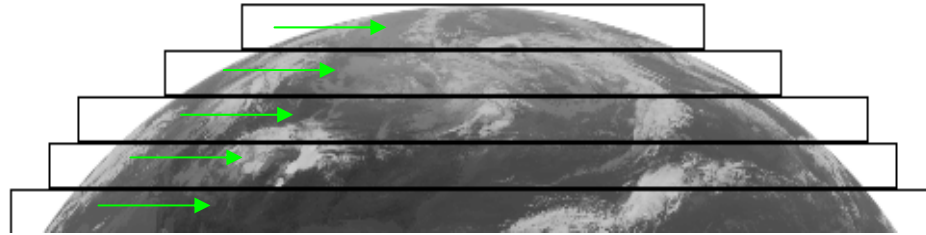
Full Disk with stepped-edge



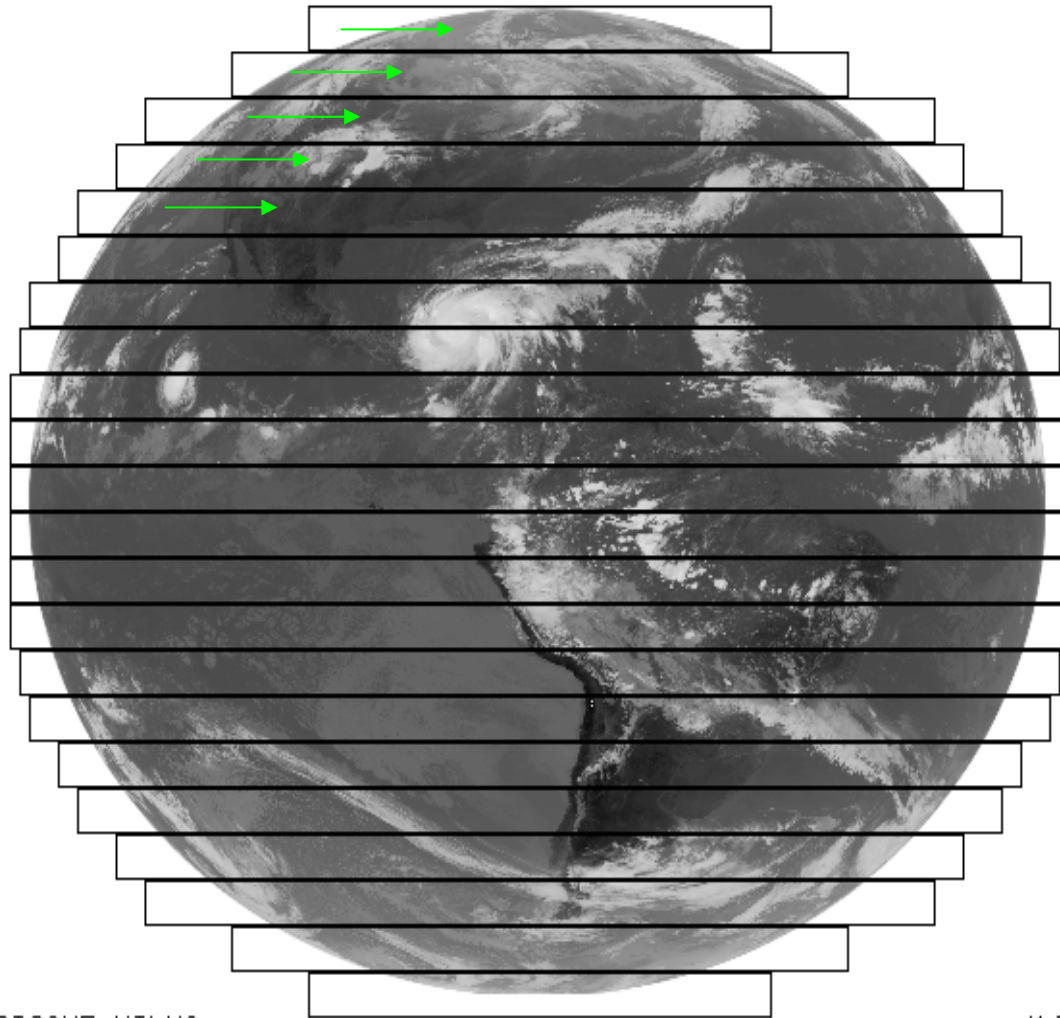
Full Disk with stepped-edge



Full Disk with stepped-edge

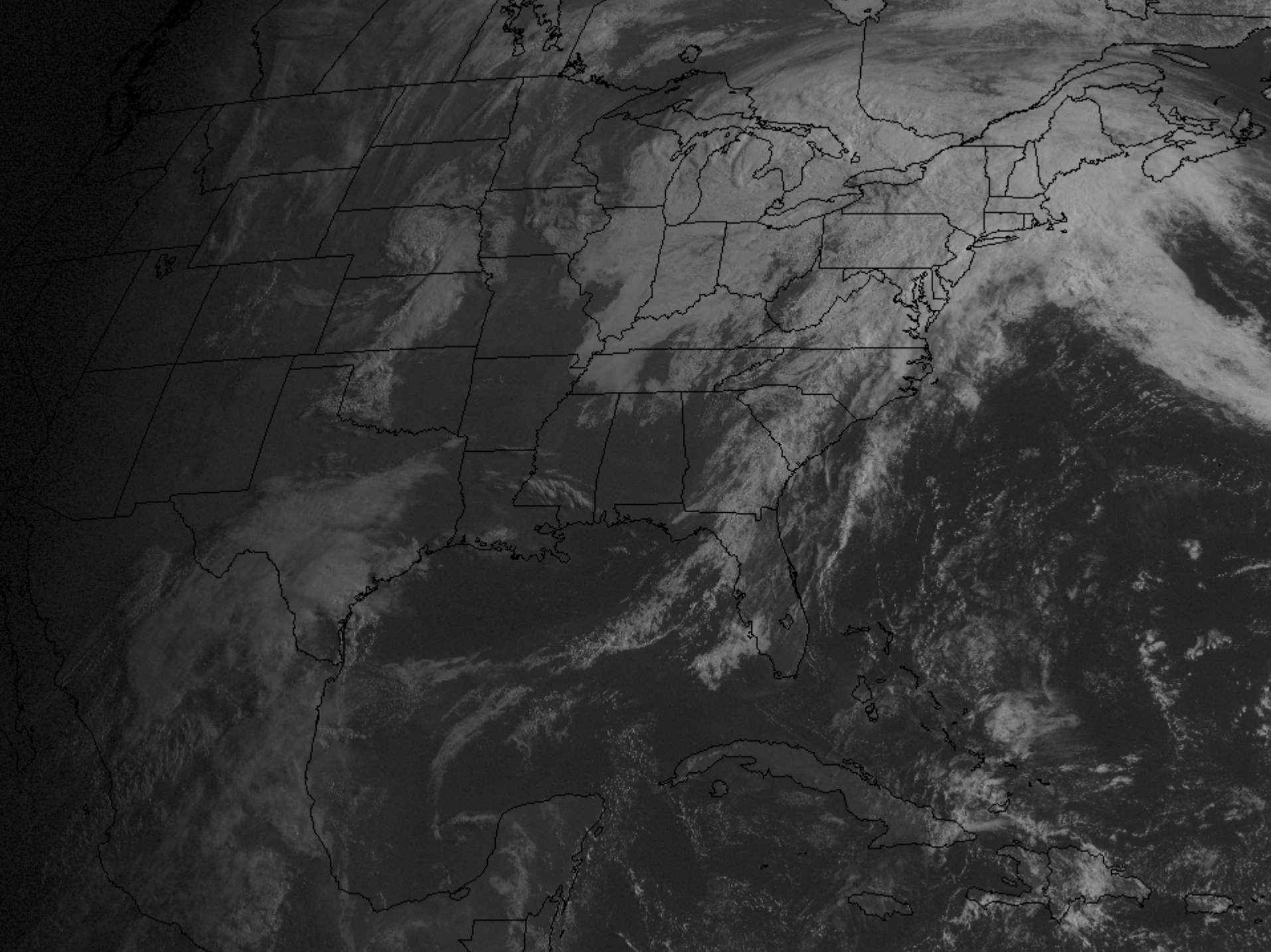


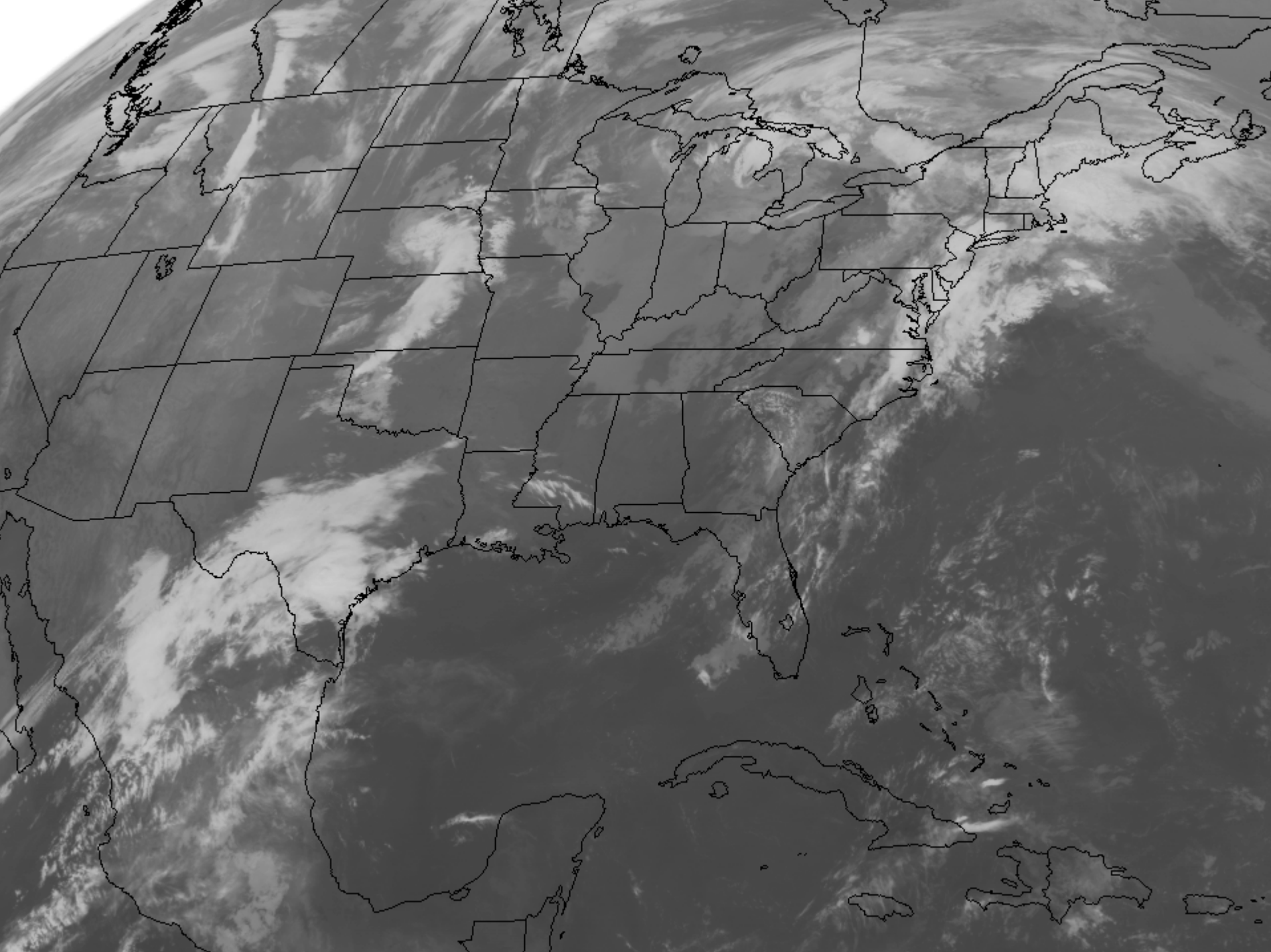
Full Disk with stepped-edge

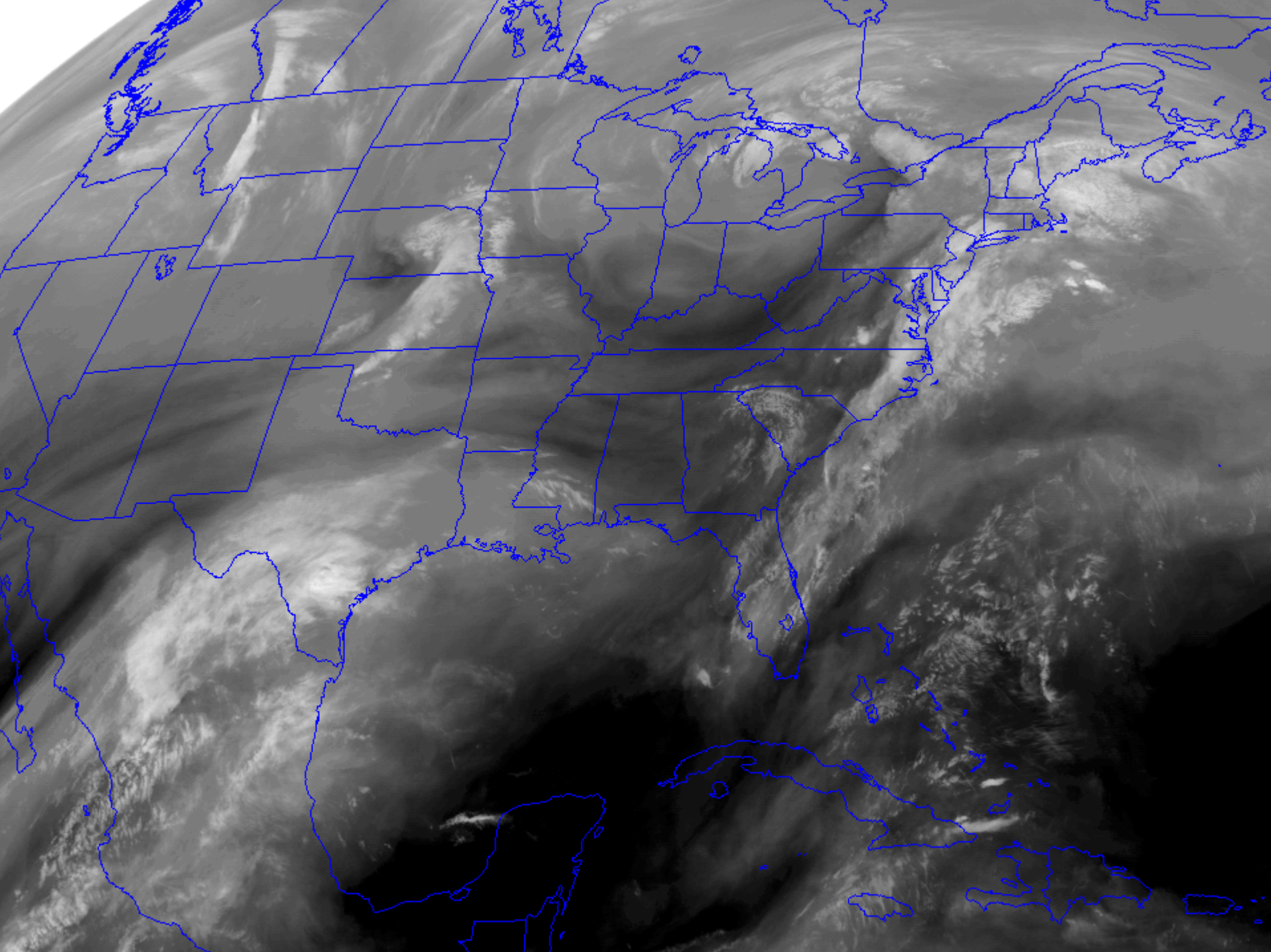


HURRICANE WILMA

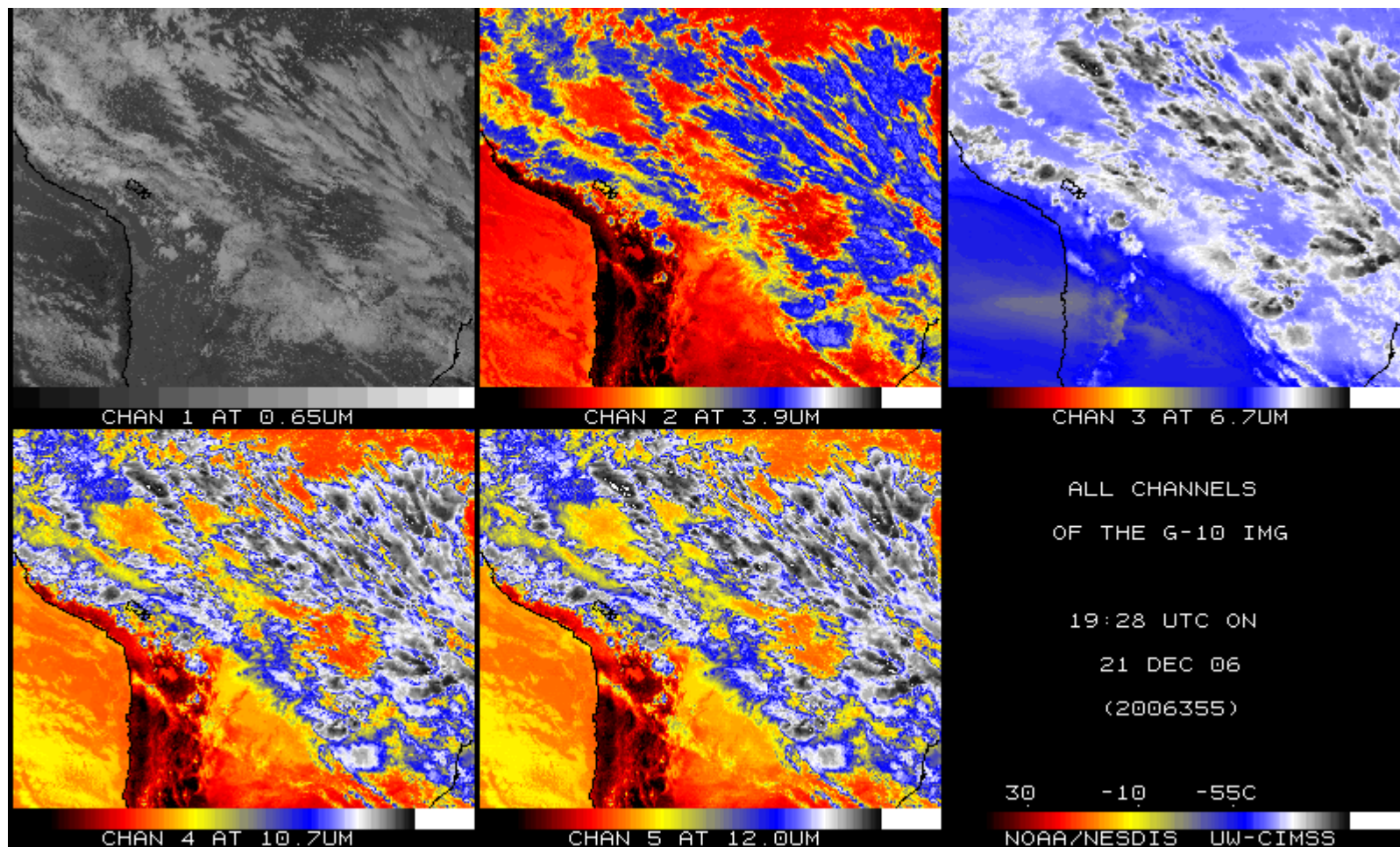
McIDAS



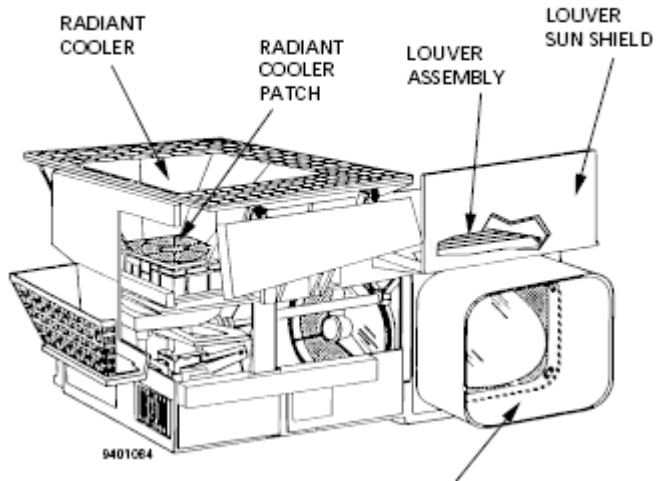




GOES-10 Imager – Multi-band example

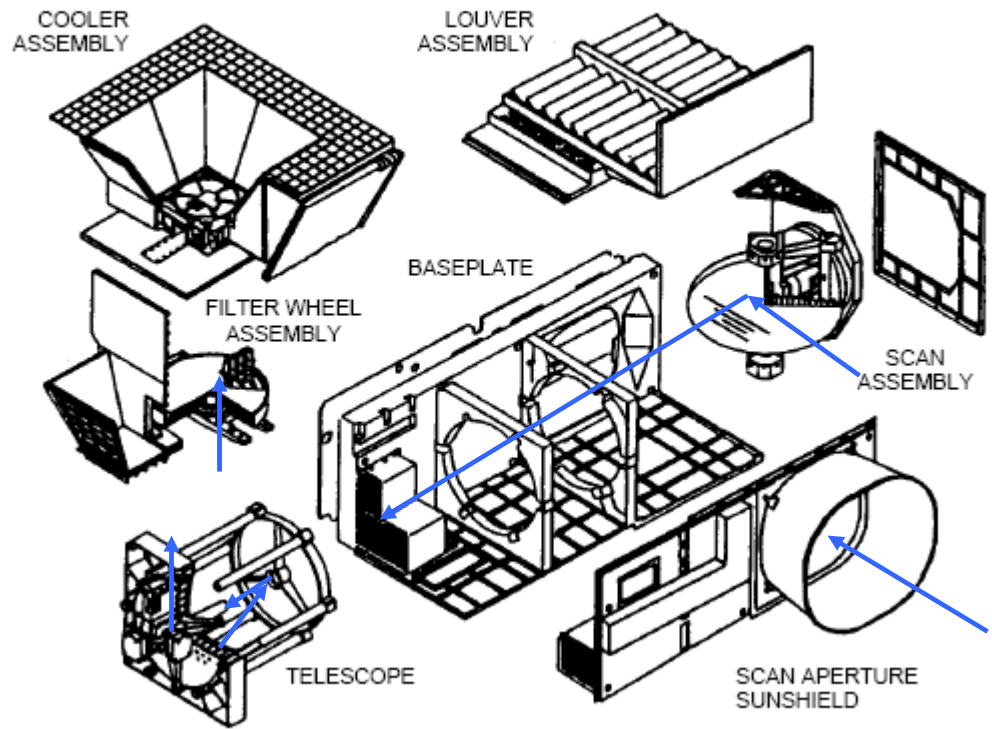


Sounder Instrument Characteristics

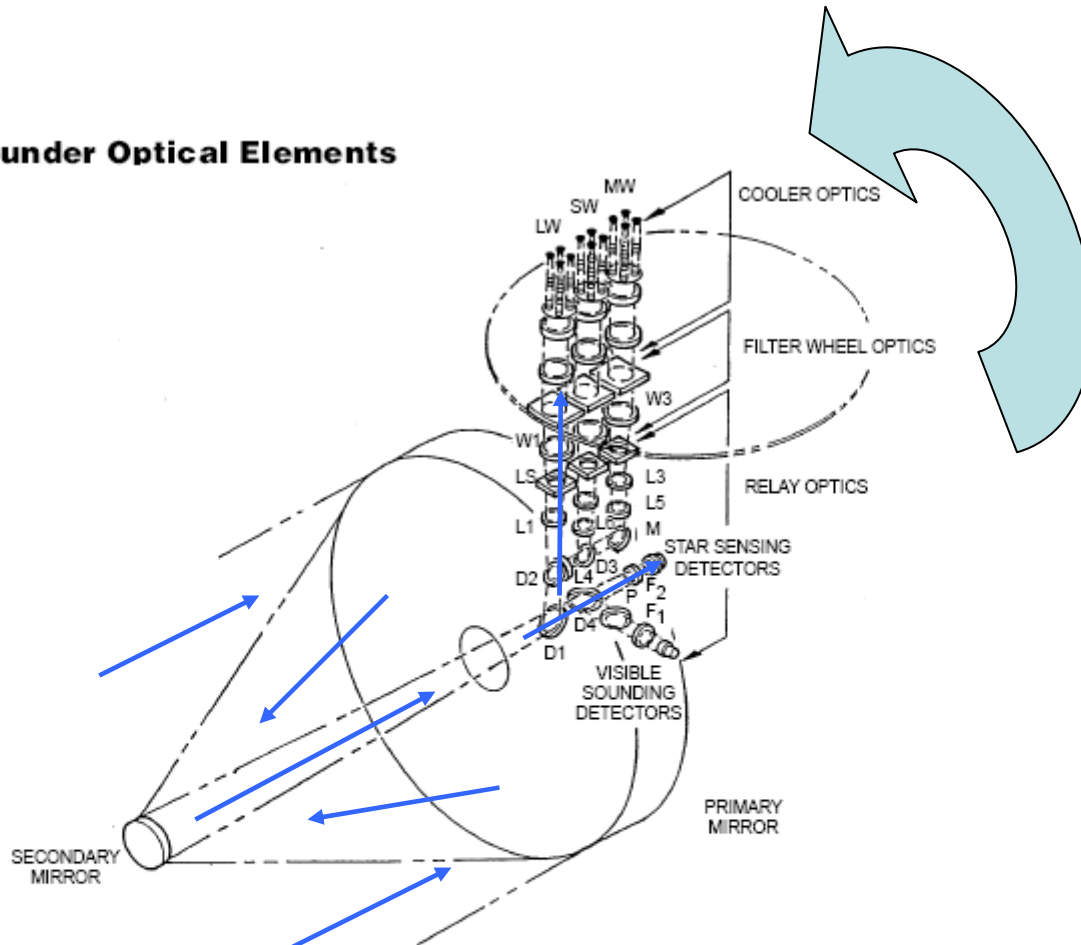


GOES Sounder

Expanded View of Sensor Module



Sounder Optical Elements

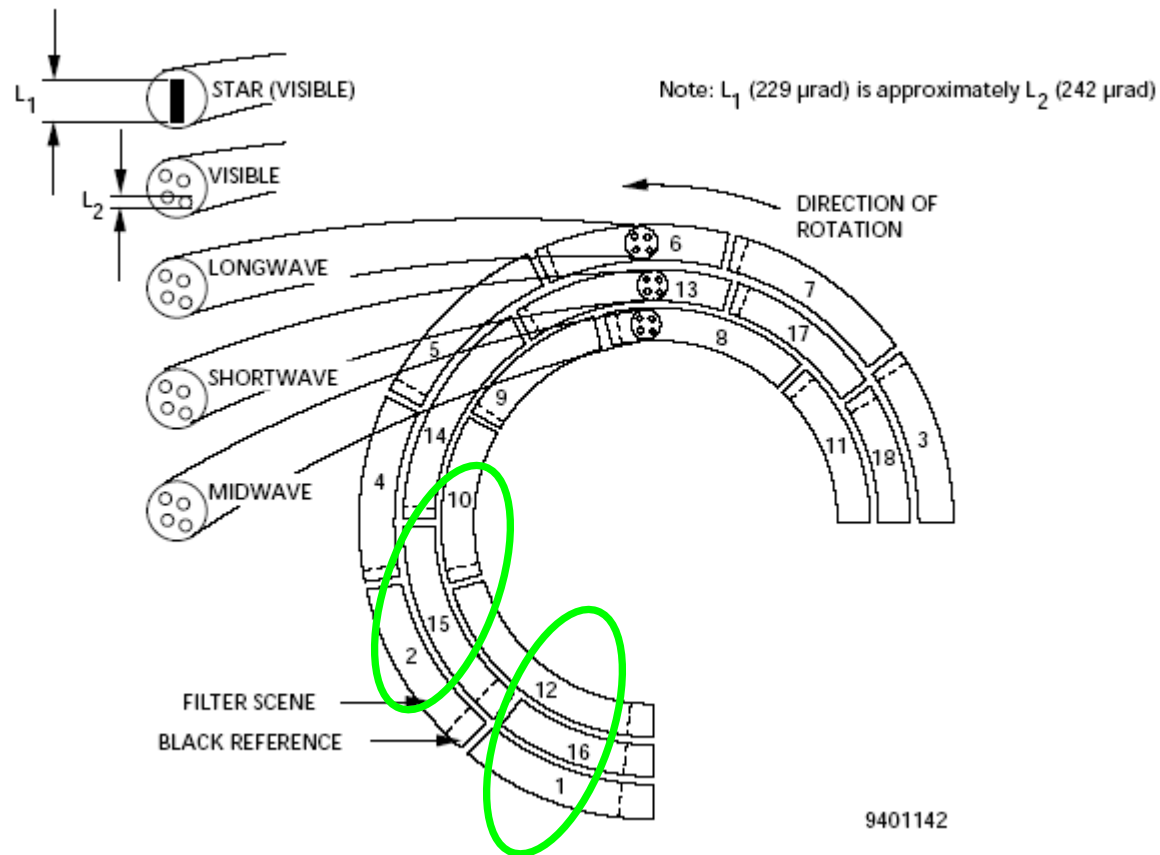


LEGEND

D1	Dichroic Beamsplitter, Visual/IR
D2	Dichroic Beamsplitter, LW/(SW+MW)
D3	Dichroic Beamsplitter, SW/MW
L1-L6	Intermediate Lenses
M	Folding Mirror (MW)
D4	STAR/Visual Trichroic Beamsplitter
W1	Filter Wheel, Window
W2	Filter Wheel, Window
W3	Filter Wheel, Window
F ₁	Visible Filter
F ₂	Star Sensing Filter
P	Depolarizing Window
LS	Lyot Stop

Filter Wheel

- Continuously spinning filter wheel



GOES Sounder Image

