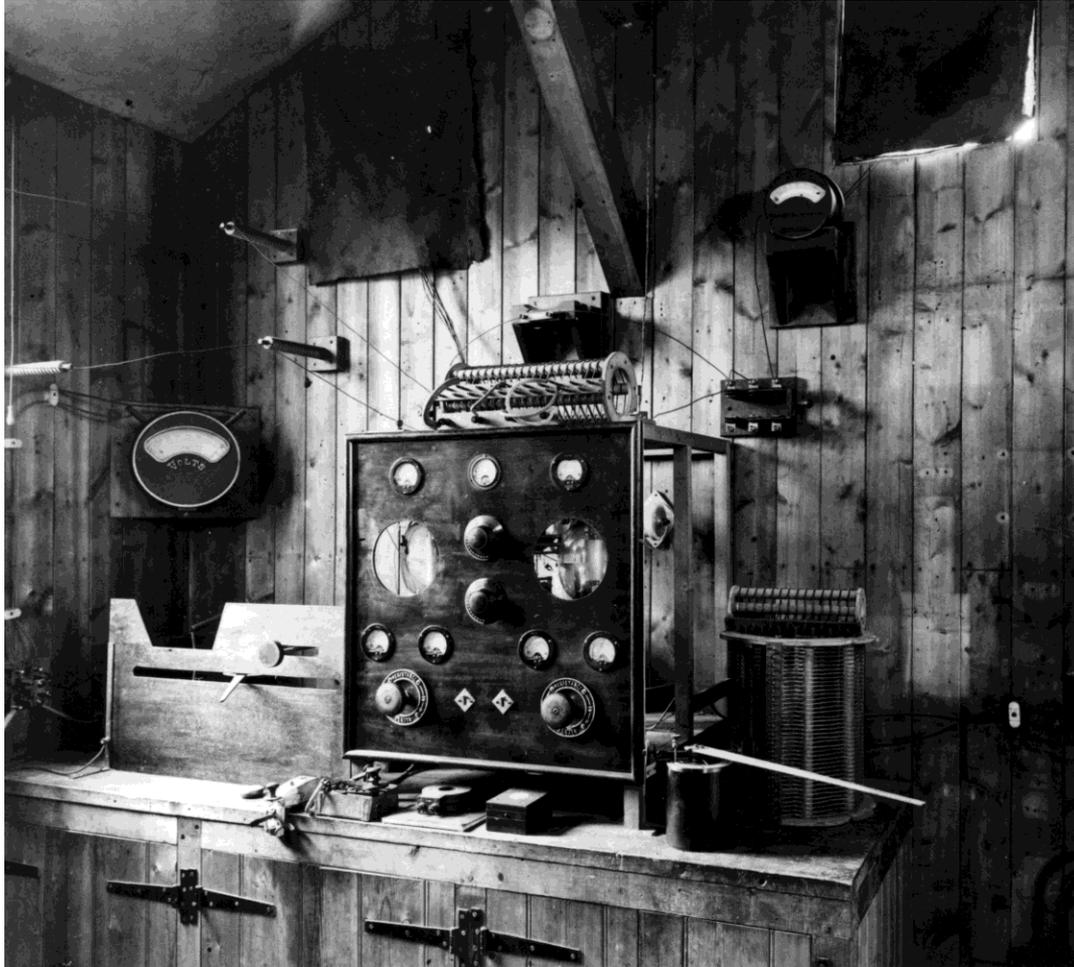


Ionosondes

Sarah James

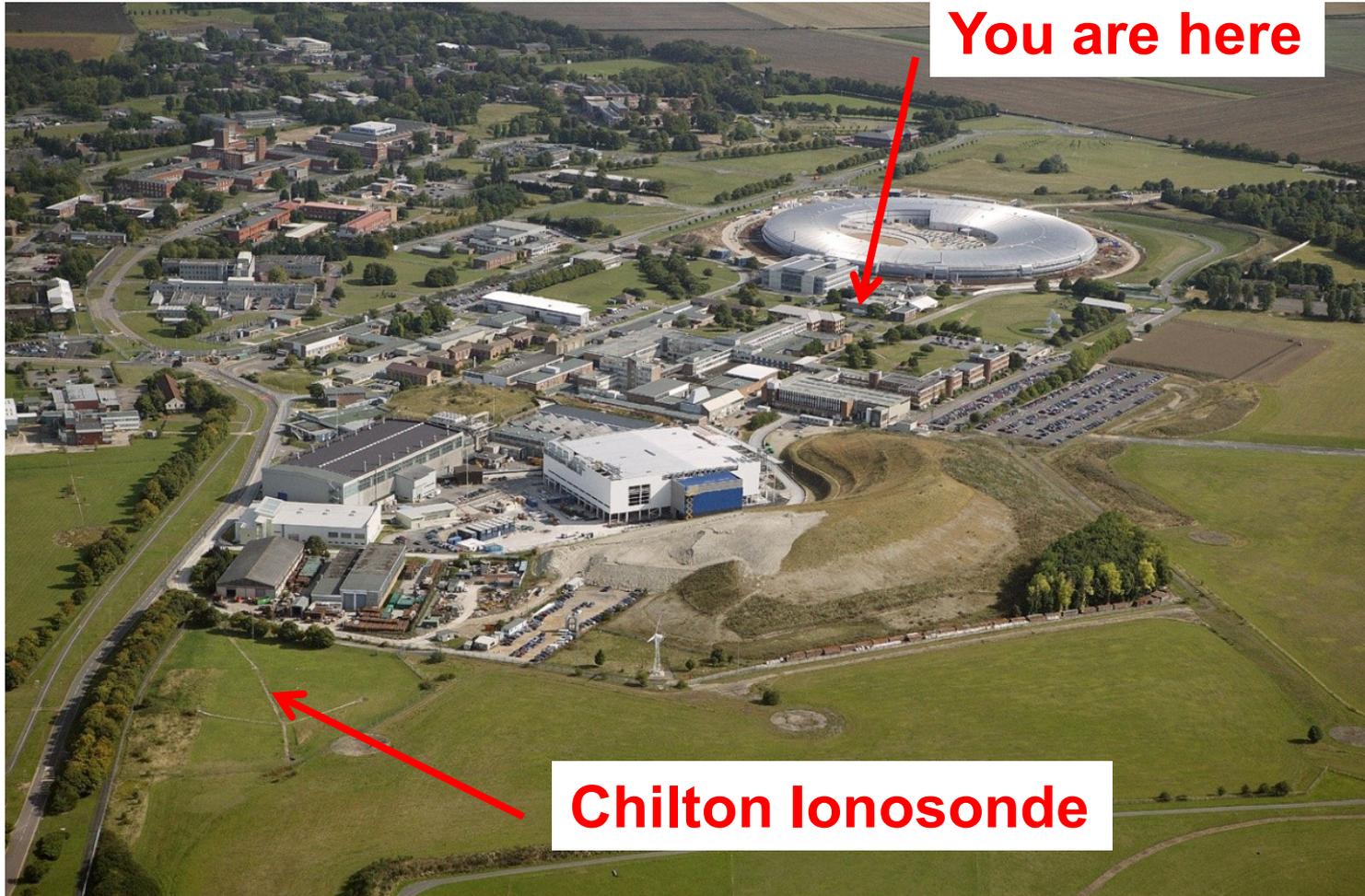




Since records began...

The first routine ionosonde measurements began at Ditton Park, Slough in 1931.

Now here at RAL



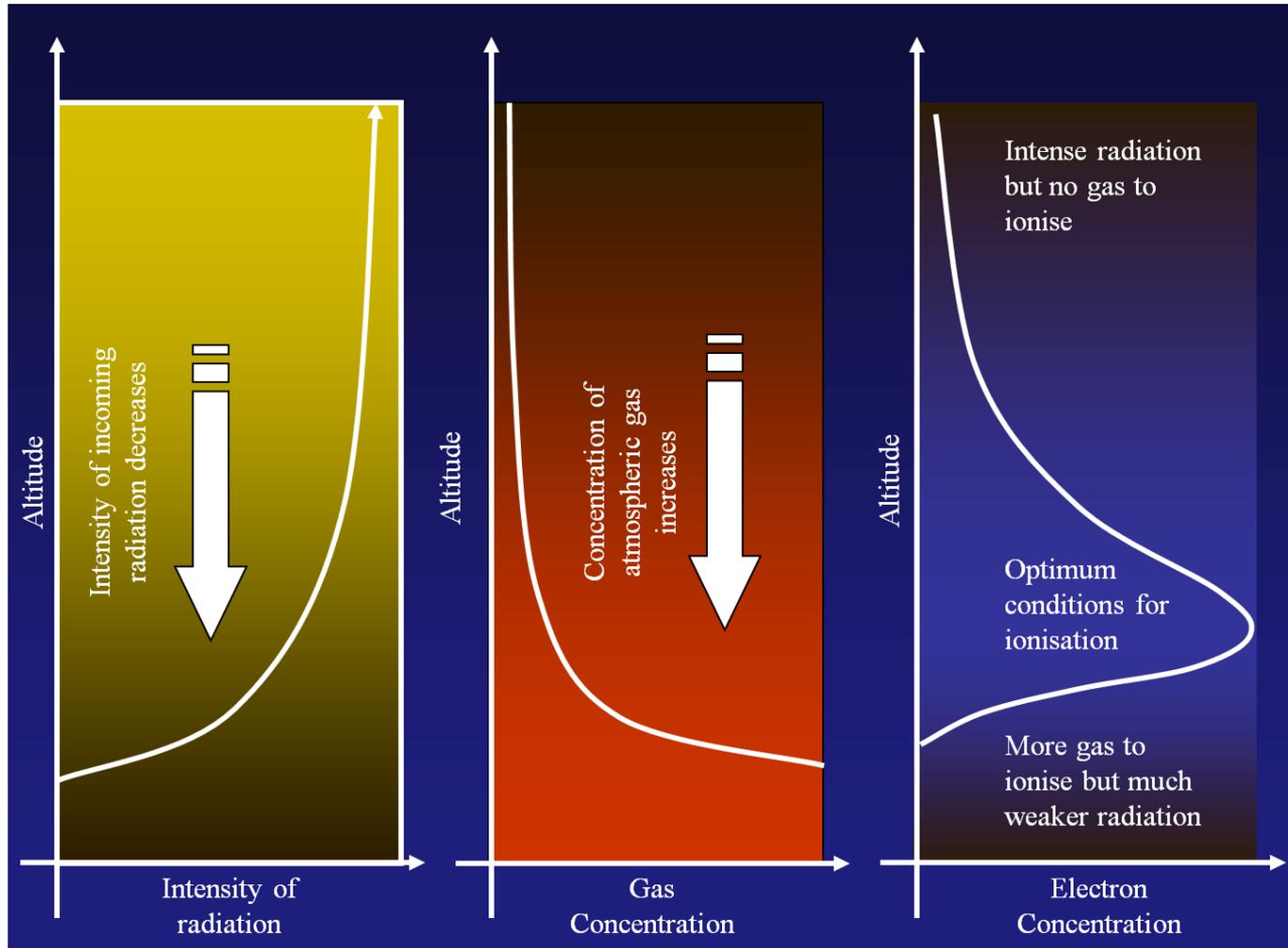




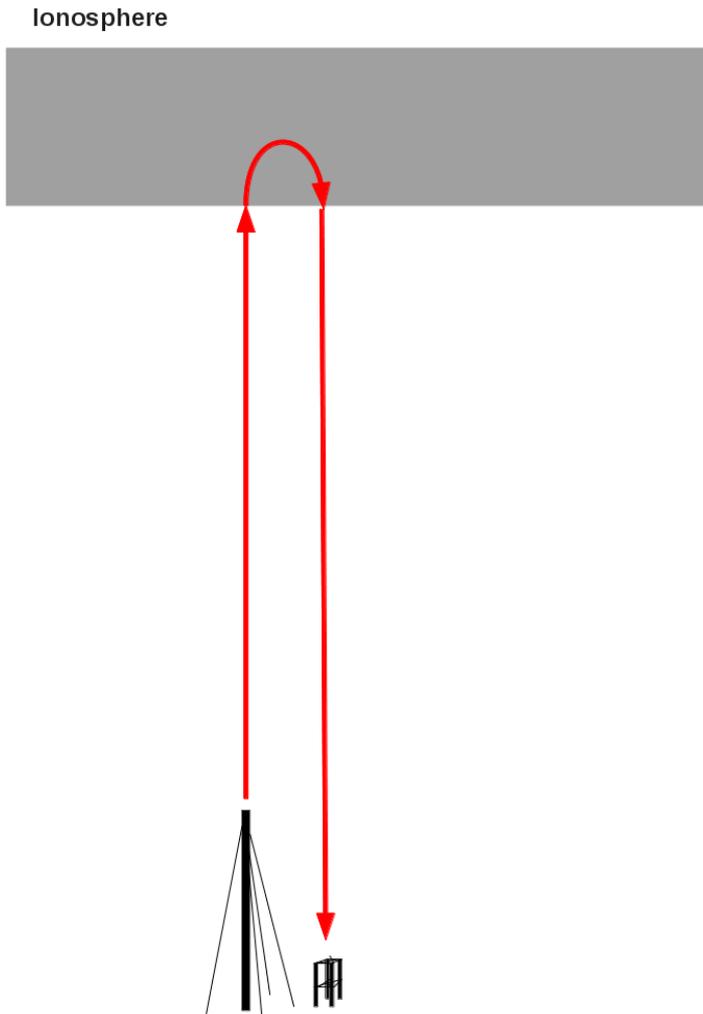
What is the ionosphere?

Marconi's transatlantic radio transmission.

How the ionosphere forms



What is an Ionosonde?

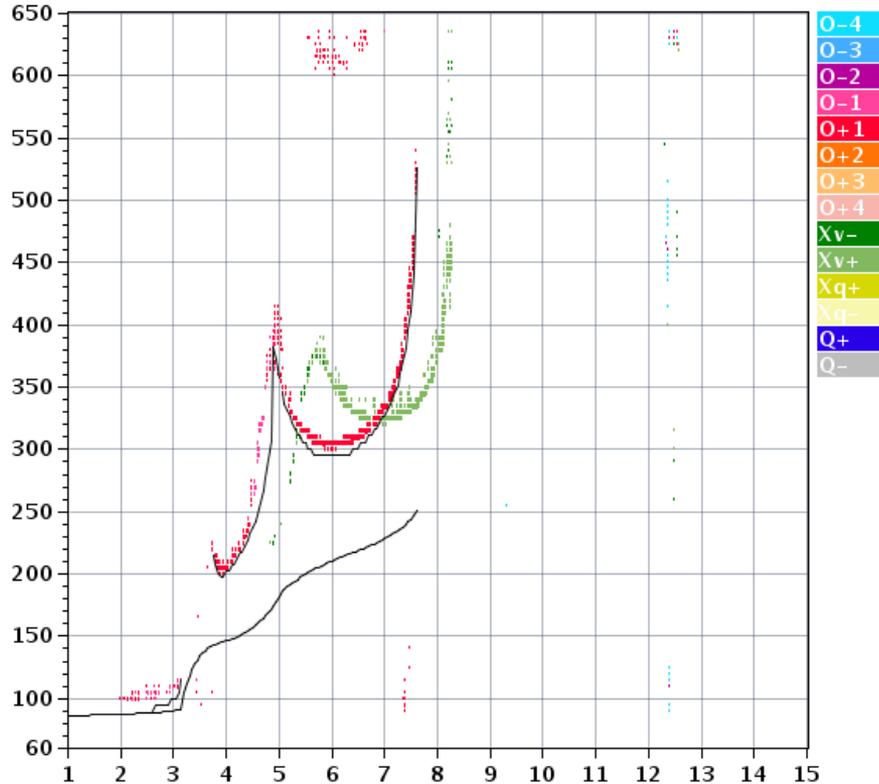


What is an Ionogram?

Lowell
DIGISONDE

foF2	7.625
foF1	5.02
foF1p	4.23
foE	3.16
foEp	3.13
fxI	8.40
foEs	3.15
fmin	2.60
MUF(D)	24.39
M(D)	3.21
D	3000.0
h F	197.0
h F2	296.0
h E	95.0
h Es	95.0
hmF2	256.4
hmF1	185.4
hmE	92.0
yF2	71.7
yF1	63.7
yE	5.9
E0	86.0
B1	1.92
C-level	11
Auto:	
Artist4.5	
200311	

Station YYYY DAY DDD HHMM P1 FFS S AXN PPS IGA PS
Chilton 2012 Jun18 170 1130 MMM 1 015 200 10+ A1

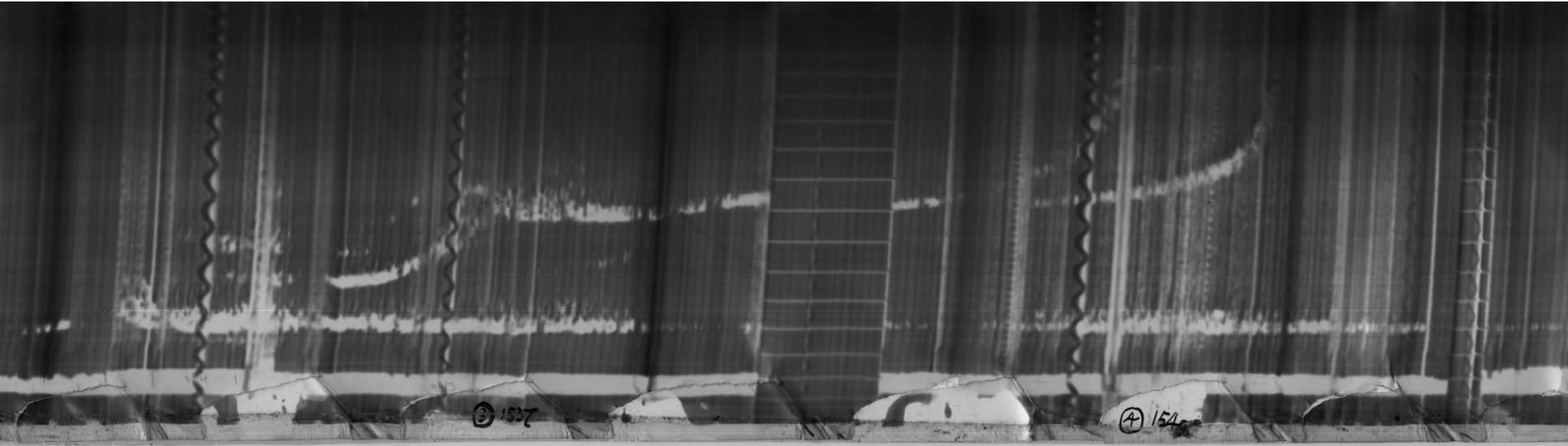


D 100 200 400 600 800 1000 1500 3000 [km]
MUF 8.3 8.3 8.7 9.3 10.2 11.4 15.1 24.4 [MHz]

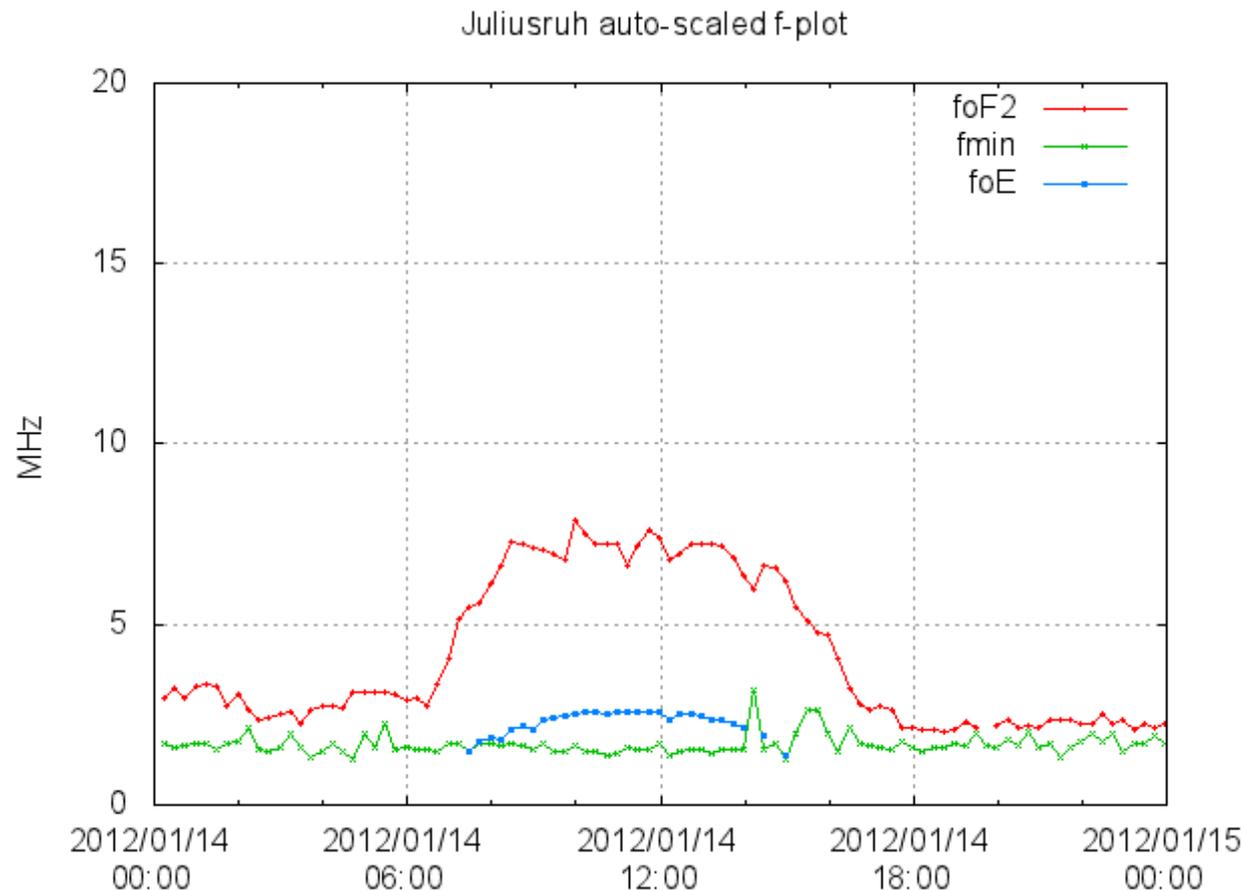
RL052_2012170113000.MMM / 280fs:128h 50 kHz 5.0 km / DPS-1 RL052 052 / 51.6 N 358.7 E

Ion2Png v. 1.3.03

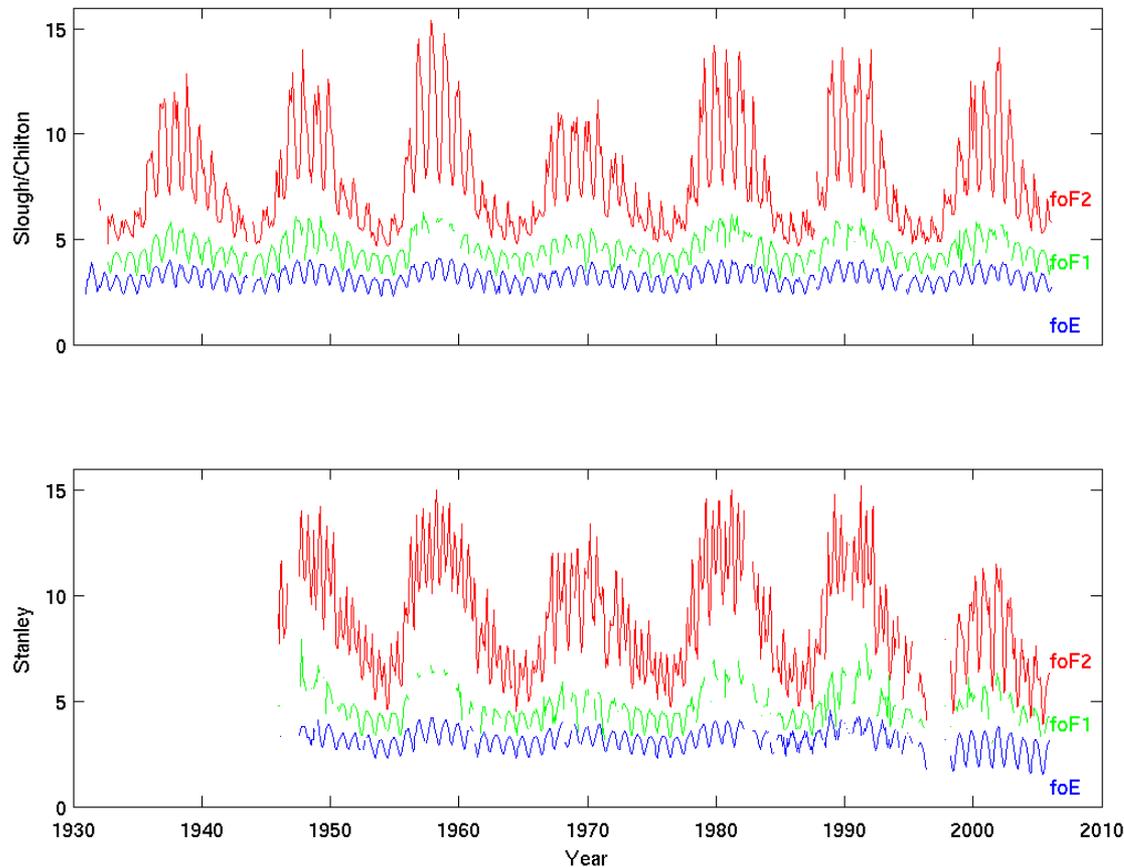
1940 Ionogram from Slough



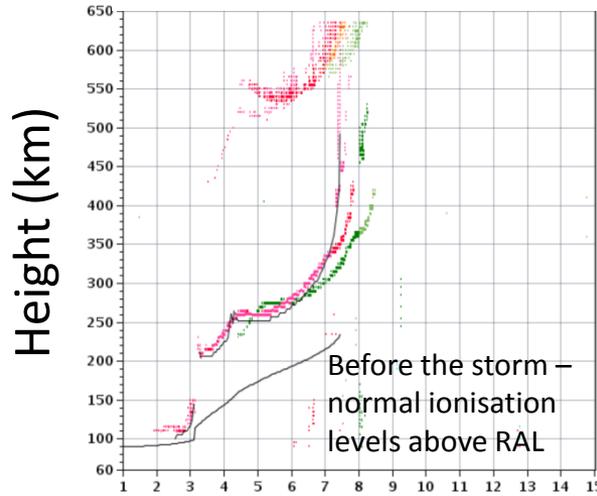
What do ionosondes show us?



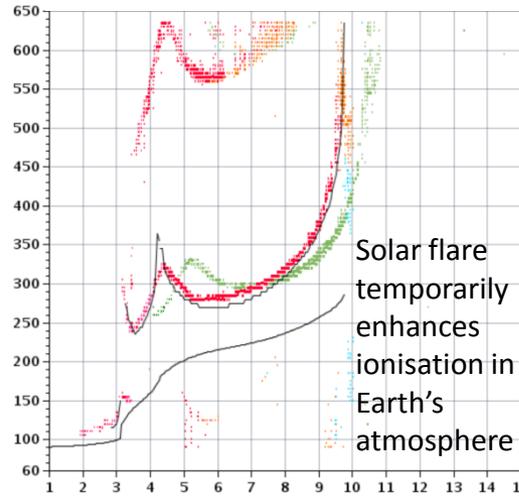
Value of long-term monitoring



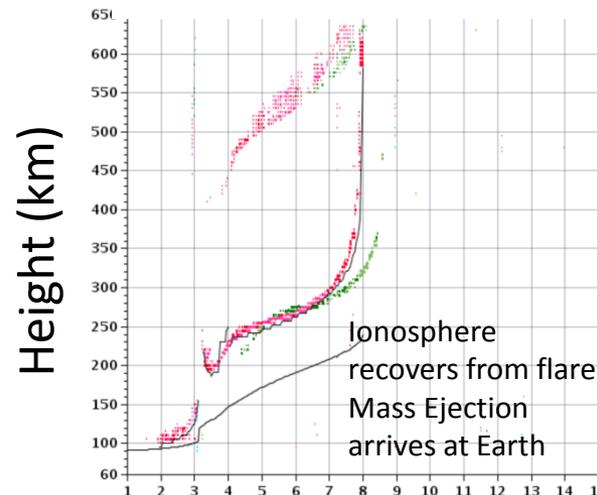
Noon March 6 2012



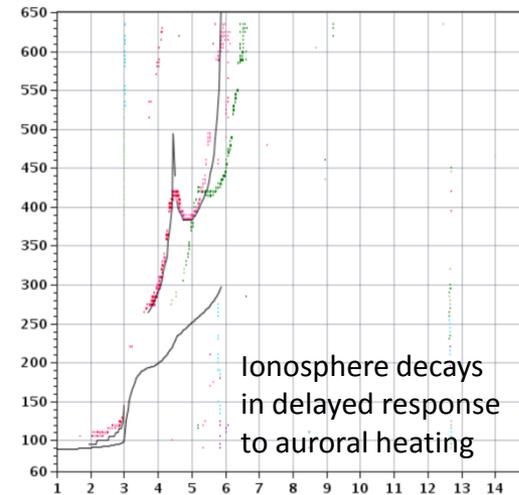
Noon March 7 2012



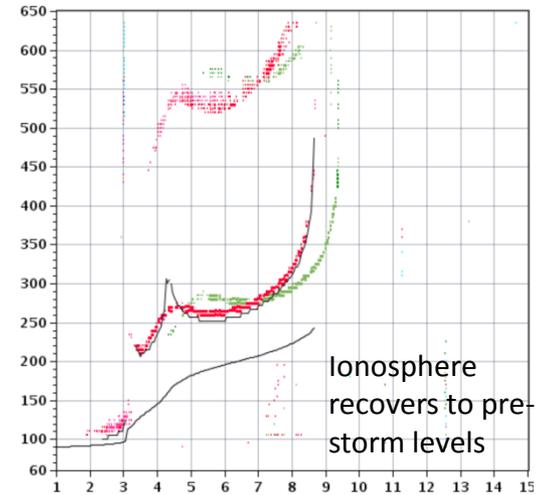
Noon March 8 2012



Noon March 9 2012

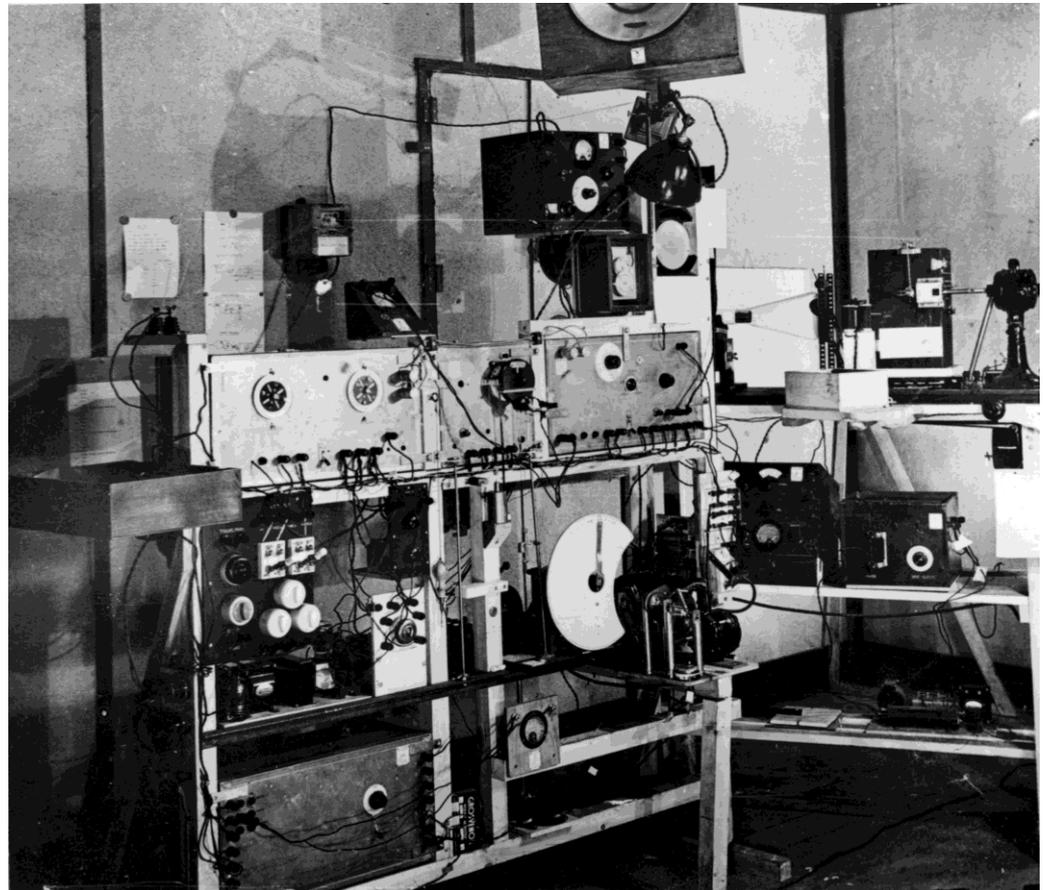


Noon March 10 2012



Ionosondes through the ages

- 1933 Pulse Ionosonde receiver



Ionosondes through the ages



- 1940s 249 Pattern Ionosonde

Ionosondes through the ages

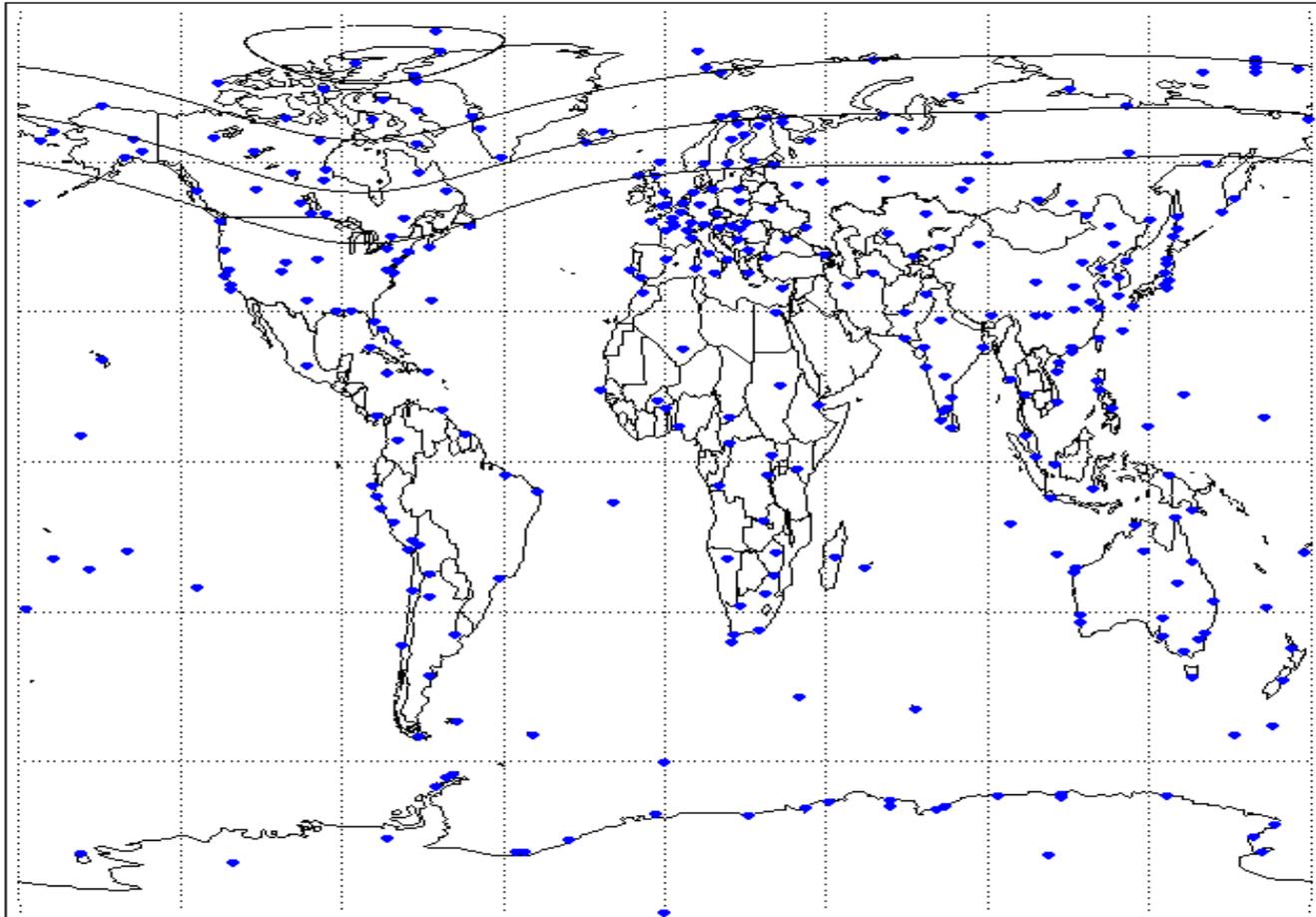
- Union Radio Ionosonde in 1957



The RAL Digisonde



Ionosondes around the world



Overseas

Singapore

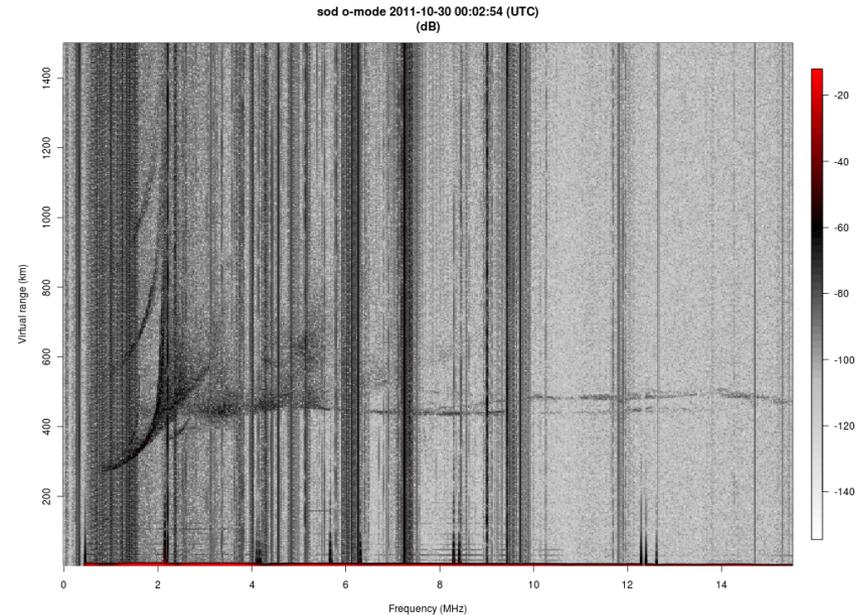


Stanley



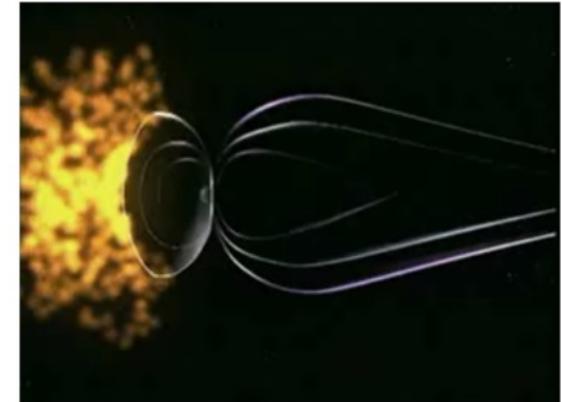
The Ionosonde of the Future

Software not hardware



The Science to Come

Space Weather



Radio Astronomy



Any Questions?

