GB2RS Propagation Report

Steve Nichols G0KYA
Chairman, Propagation Studies Committee

How do we produce it? What can we learn?

History

- GB2RS started on Sunday 25 September 1955

- GPO said “that the broadcasts would be made on Sunday mornings on a frequency in the 3.5 to 3.8Mc/s band, and that telephony and/or telegraphy may be used.”

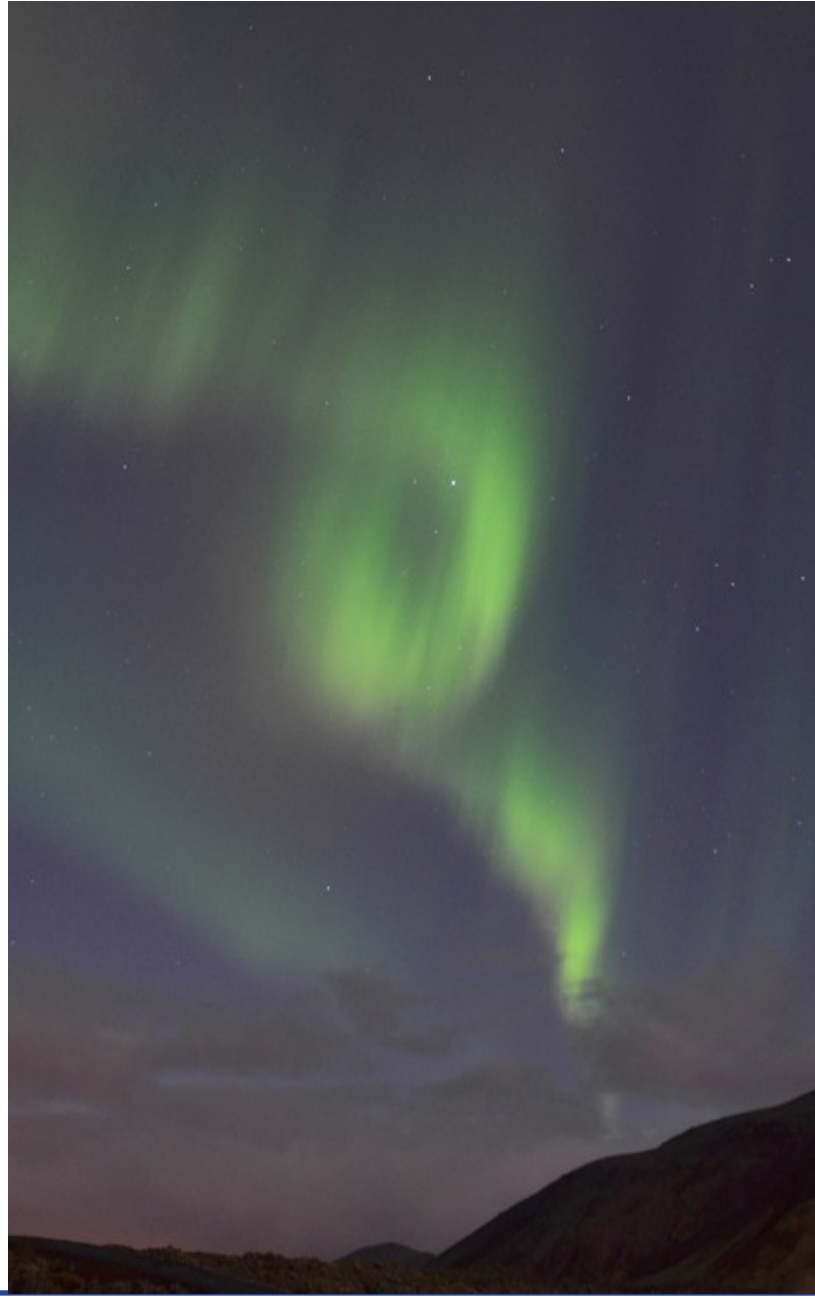
- 7MHz came on board 14 May 1956

- The propagation segment was produced by Neil G0CAS and Martin G3USF for more than 20 years

- Consisted of the solar factual data and the solar forecast

History

- What's all this Bz stuff?
- Can we make it more relevant to radio users?
- Can we include VHF?
- Can you include HF predictions?
- But don't make it any longer....



Current contents

Steve G0KYA	HF	VHF/ UHF	Jim G3YLA
Jim G3YLA	Es	EME Aurora Meteor Scatter	John G4BAO Sam G4DDK

But where do the data come from?

Current contents - HF

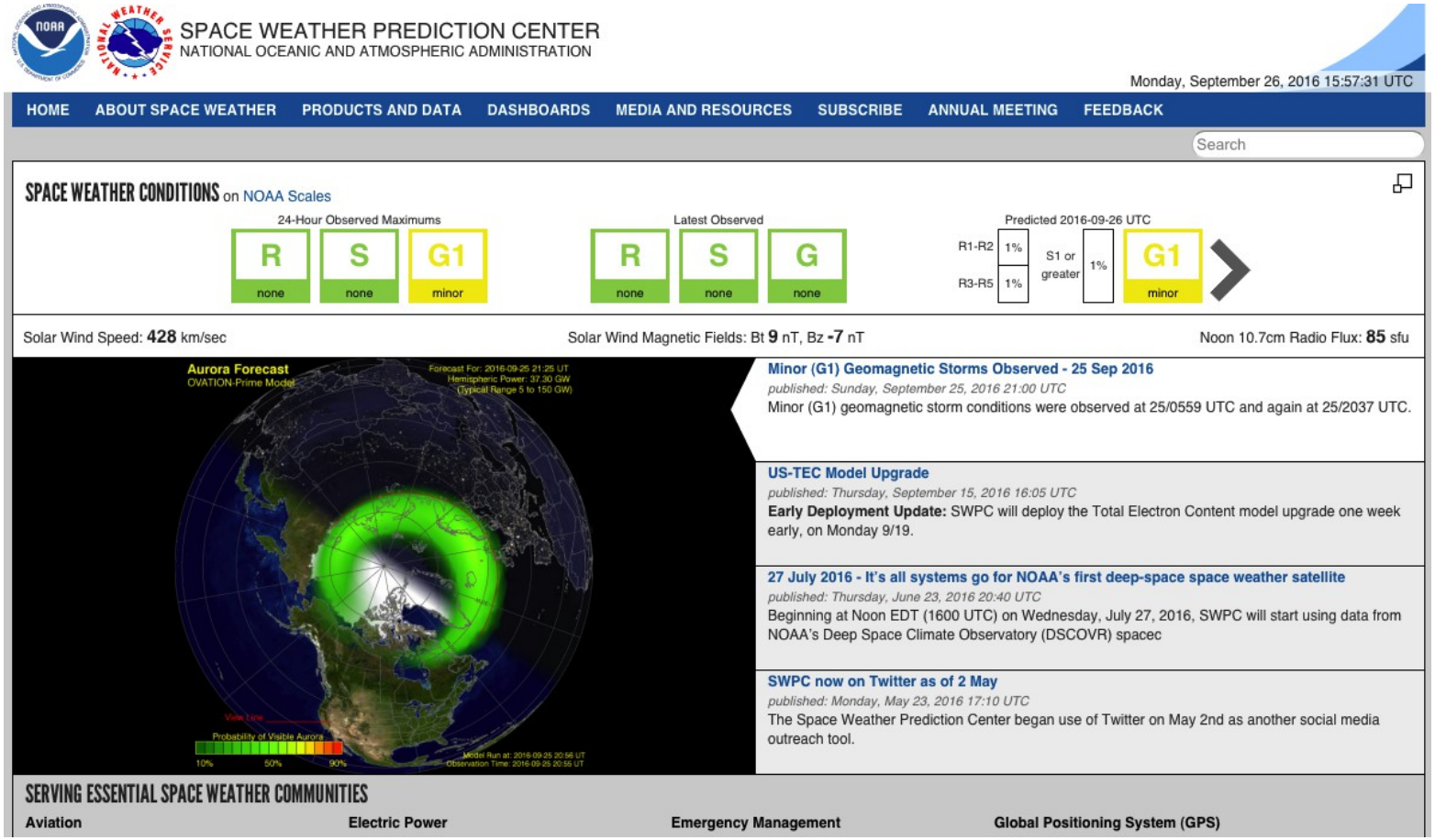
Last week's solar flux index, K indices, events

```
:Product: Daily Solar Data                DSD.txt
:Issued: 1425 UT 26 Sep 2016
#
#  Prepared by the U.S. Dept. of Commerce, NOAA, Space Weather Prediction Center
#  Please send comments and suggestions to SWPC.Webmaster@noaa.gov
#
#                 Last 30 Days Daily Solar Data
#
#                             Sunspot       Stanford GOES15
#            Radio  SESC       Area            Solar  X-Ray  ------ Flares ------
#            Flux  Sunspot   10E-6    New      Mean  Bkgd     X-Ray       Optical
#  Date      10.7cm Number   Hemis. Regions Field  Flux    C  M  X  S  1  2  3
#-----------------------------------------------------------------------------
2016 08 27    84      52       130       1    -999    B1.0   0  0  0  0  0  0  0
2016 08 28    85      64       200       1    -999    B1.1   1  0  0  2  0  0  0
2016 08 29    88      67       350       0    -999    B2.7   3  0  0  8  0  0  0
2016 08 30   100      64       290       0    -999    B5.0   2  0  0  1  0  0  0
2016 08 31    98      91       575       2    -999    B4.2   2  0  0  3  0  0  0
2016 09 01    95      66       730       1    -999    B3.0   0  0  0  3  0  0  0
2016 09 02    95      50       620       0    -999    B3.4   0  0  0 10  0  0  0
2016 09 03    99      46       690       0    -999    B2.1   0  0  0  2  0  0  0
2016 09 04    97      59       560       1    -999    B1.9   0  0  0  2  0  0  0
2016 09 05    94      22       420       0    -999    B1.4   0  0  0  1  0  0  0
2016 09 06    92      32       410       1    -999    B1.3   0  0  0  1  0  0  0
2016 09 07    93      50       470       0    -999    B1.4   0  0  0  0  0  0  0
2016 09 08    95      49       400       1    -999    B1.0   0  0  0  1  0  0  0
2016 09 09    91      65       430       1    -999    B1.1   0  0  0  3  0  0  0
```

From:
ftp://ftp.swpc.noaa.gov/pub/indices/DSD.txt
ftp://ftp.swpc.noaa.gov/pub/indices/DGD.txt

Current contents - HF

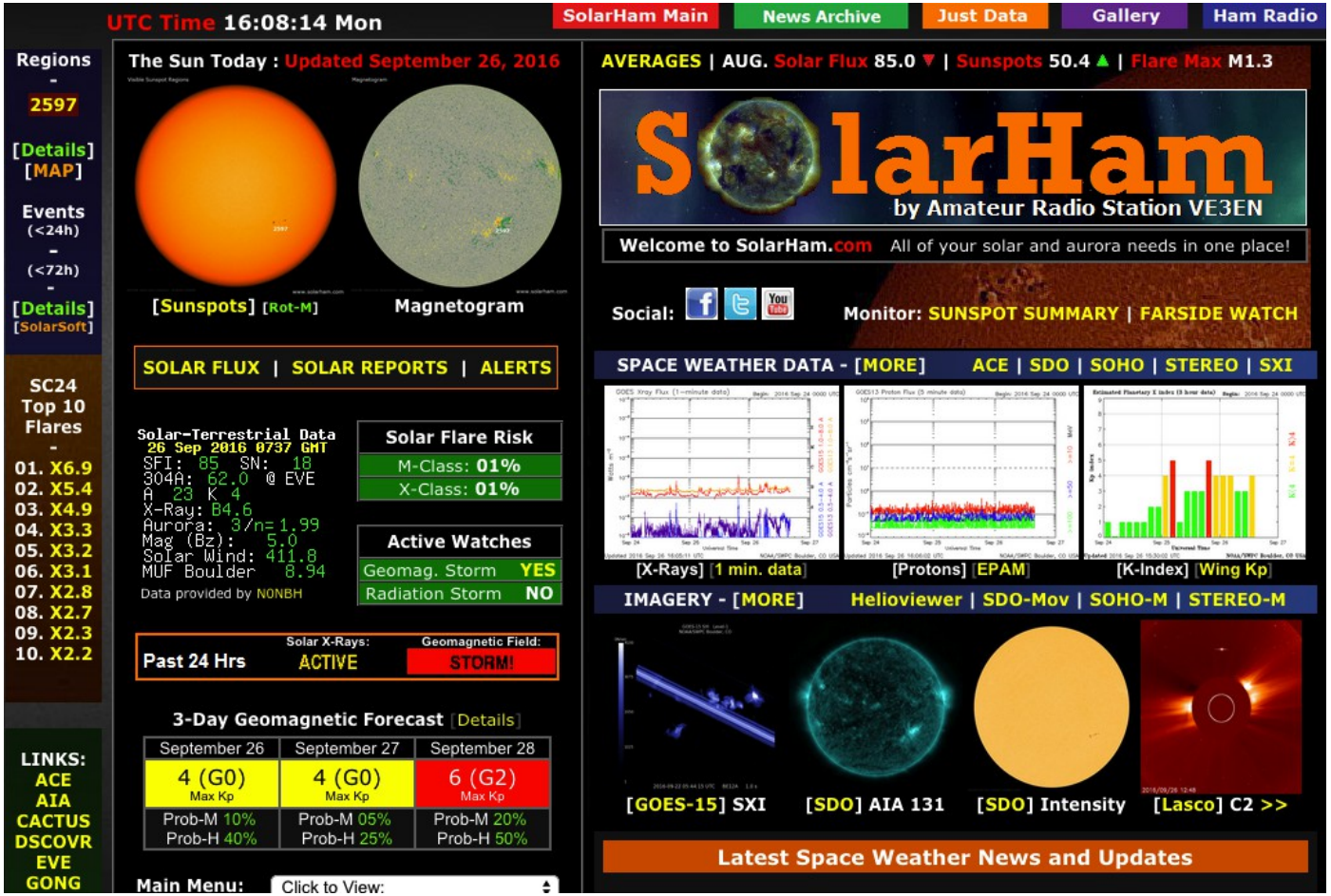
Next week's solar flux index, A/K indices, events



From:
http://www.swpc.noaa.gov/

Current contents - HF

State of the sun



From:
http://www.solarham.net/

Current contents - HF

Next week's solar flux index, A/K indices, events – both NOAA and USAF

27-DAY OUTLOOK OF 10.7 CM RADIO FLUX AND GEOMAGNETIC INDICES

```
:Product: 27-day Space Weather Outlook Table 27DO.txt
:Issued: 2016 Sep 26 0104 UTC
# Prepared by the US Dept. of Commerce, NOAA, Space Weather Prediction Center
# Product description and SWPC contact on the Web
# http://www.swpc.noaa.gov/wwire.html
#
#      27-day Space Weather Outlook Table
#                Issued 2016-09-26
#
#   UTC       Radio Flux   Planetary   Largest
#  Date        10.7 cm      A Index    Kp Index
2016 Sep 26       85           18          5
2016 Sep 27       85           12          4
2016 Sep 28       85           35          6
2016 Sep 29       85           35          6
2016 Sep 30       80           35          6
2016 Oct 01       80           25          5
2016 Oct 02       80           20          5
2016 Oct 03       80           16          4
2016 Oct 04       80           10          3
2016 Oct 05       85            8          3
2016 Oct 06       85            5          2
```

USAF 45-DAY AP AND F10.7CM FLUX FORECAST

```
:Issued: 2016 Sep 25 2101 UTC
# Prepared by the U.S. Air Force.
# Retransmitted by the Dept. of Commerce, NOAA, Space Weather Prediction Center
# Please send comments and suggestions to SWPC.Webmaster@noaa.gov
#
#
#          45-Day AP and F10.7cm Flux Forecast
#-------------------------------------------------------------
45-DAY AP FORECAST
26Sep16 018 27Sep16 012 28Sep16 035 29Sep16 035 30Sep16 035
01Oct16 025 02Oct16 020 03Oct16 015 04Oct16 015 05Oct16 015
06Oct16 005 07Oct16 005 08Oct16 005 09Oct16 005 10Oct16 005
11Oct16 005 12Oct16 005 13Oct16 005 14Oct16 005 15Oct16 005
16Oct16 018 17Oct16 020 18Oct16 012 19Oct16 008 20Oct16 005
21Oct16 005 22Oct16 005 23Oct16 015 24Oct16 010 25Oct16 035
26Oct16 035 27Oct16 035 28Oct16 030 29Oct16 015 30Oct16 015
31Oct16 015 01Nov16 015 02Nov16 005 03Nov16 005 04Nov16 005
05Nov16 005 06Nov16 005 07Nov16 005 08Nov16 005 09Nov16 005
45-DAY F10.7 CM FLUX FORECAST
26Sep16 085 27Sep16 085 28Sep16 085 29Sep16 085 30Sep16 080
01Oct16 080 02Oct16 080 03Oct16 080 04Oct16 090 05Oct16 090
06Oct16 090 07Oct16 085 08Oct16 085 09Oct16 085 10Oct16 085
11Oct16 085 12Oct16 085 13Oct16 085 14Oct16 080 15Oct16 080
16Oct16 085 17Oct16 085 18Oct16 085 19Oct16 085 20Oct16 085
```

* K/A index prediction may also inform us about VHF aurora

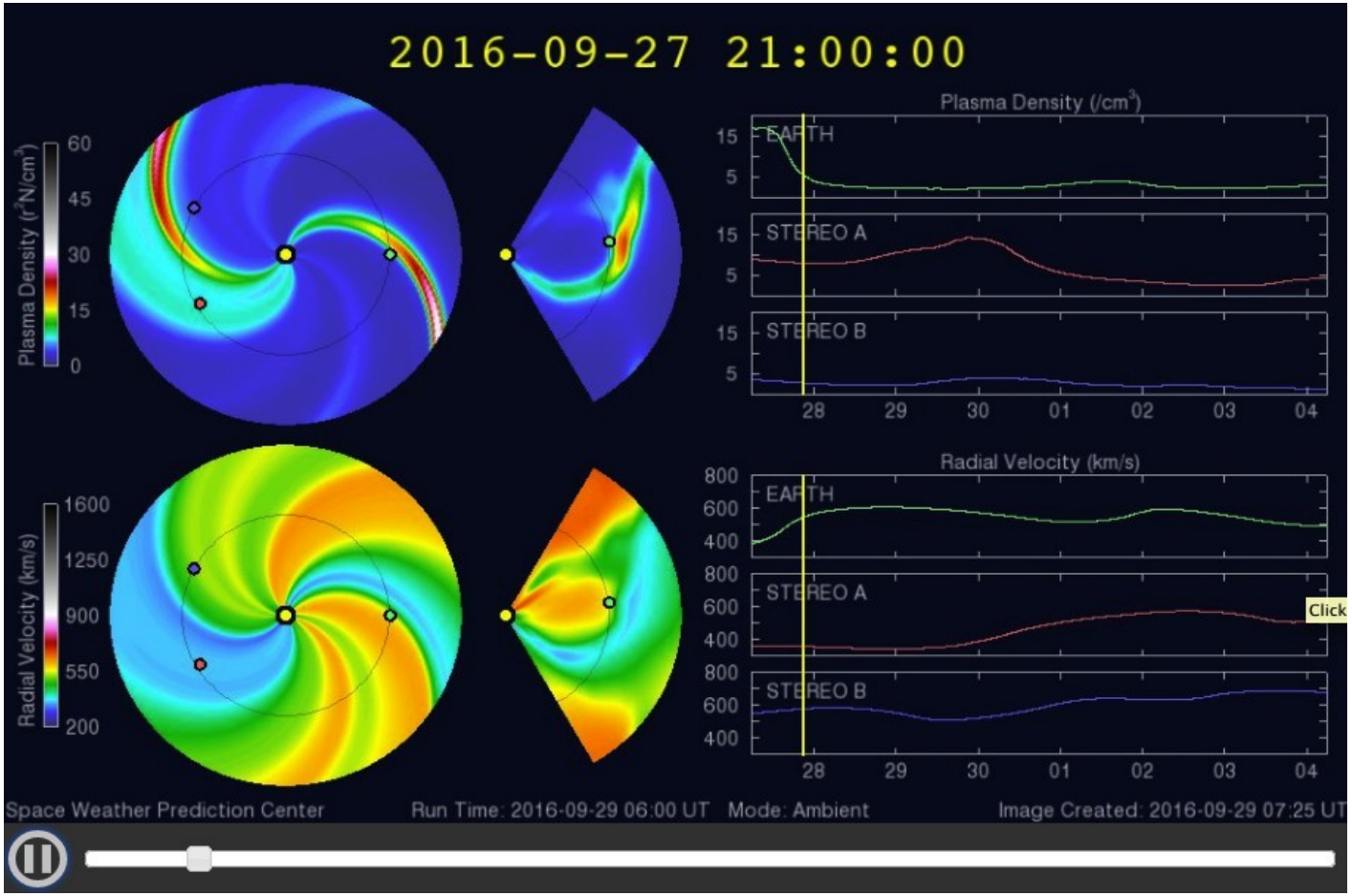
From:

http://www.swpc.noaa.gov/products/27-day-outlook-107-cm-radio-flux-and-geomagnetic-indices

http://www.swpc.noaa.gov/products/usaf-45-day-ap-and-f107cm-flux-forecast

Current contents - HF

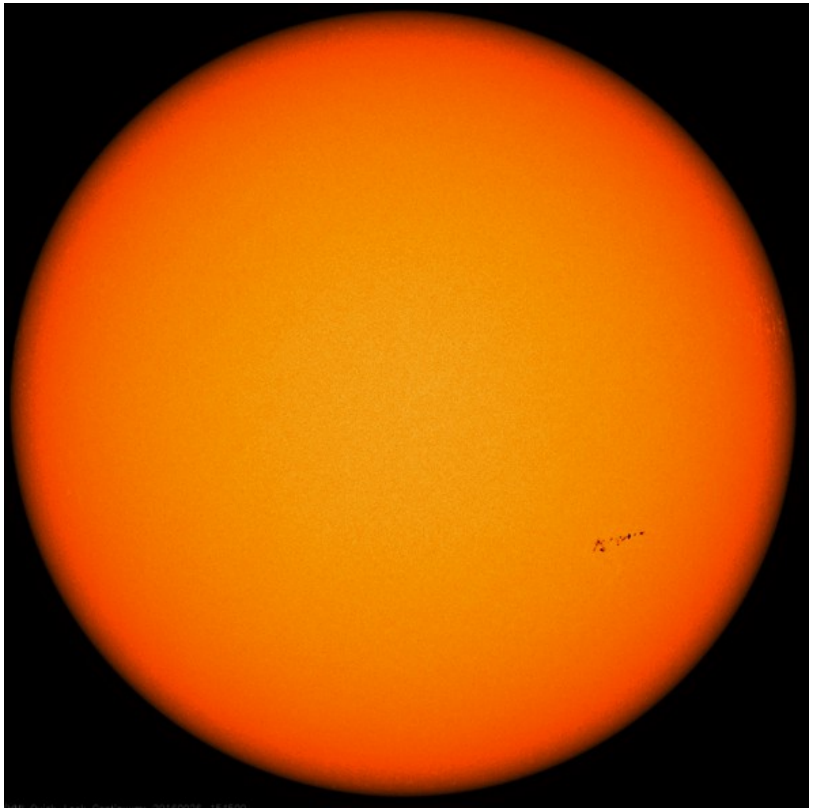
Coronal mass ejection (CME) prediction – www.solarham.com

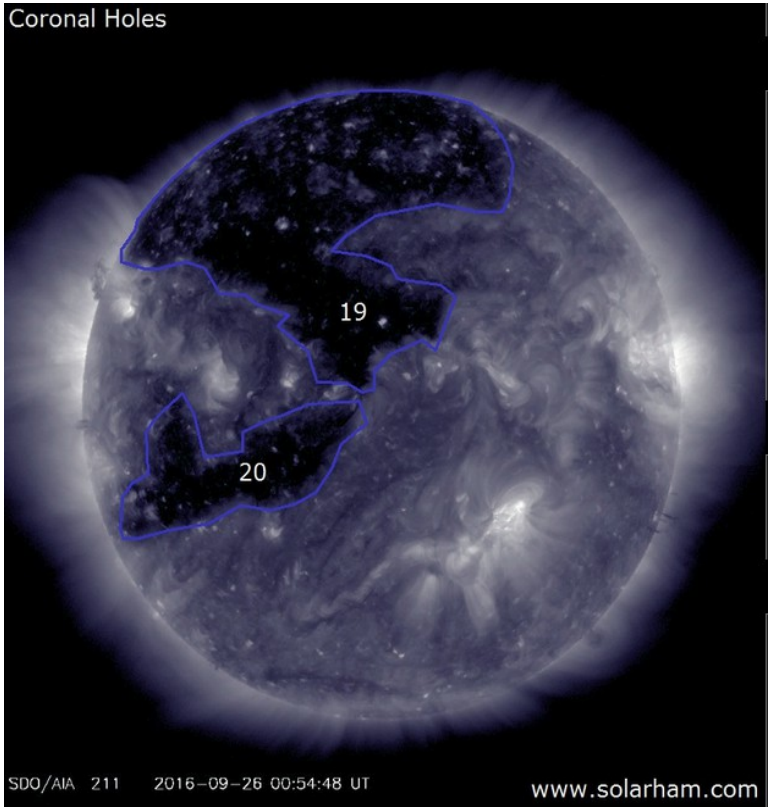


* May also inform us about VHF aurora

Current contents - HF

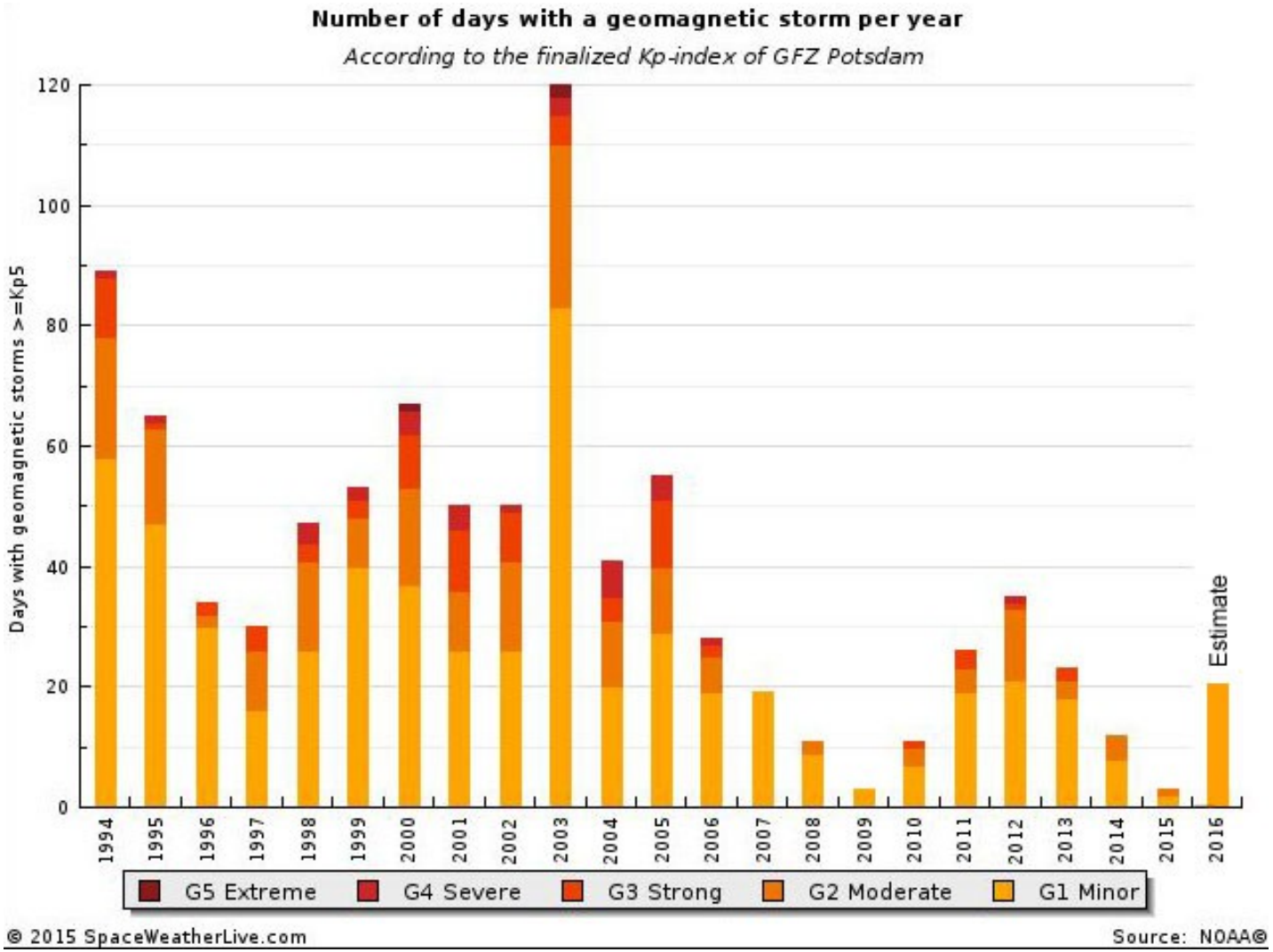
State of the sun – in both visible and extreme ultraviolet using SDO





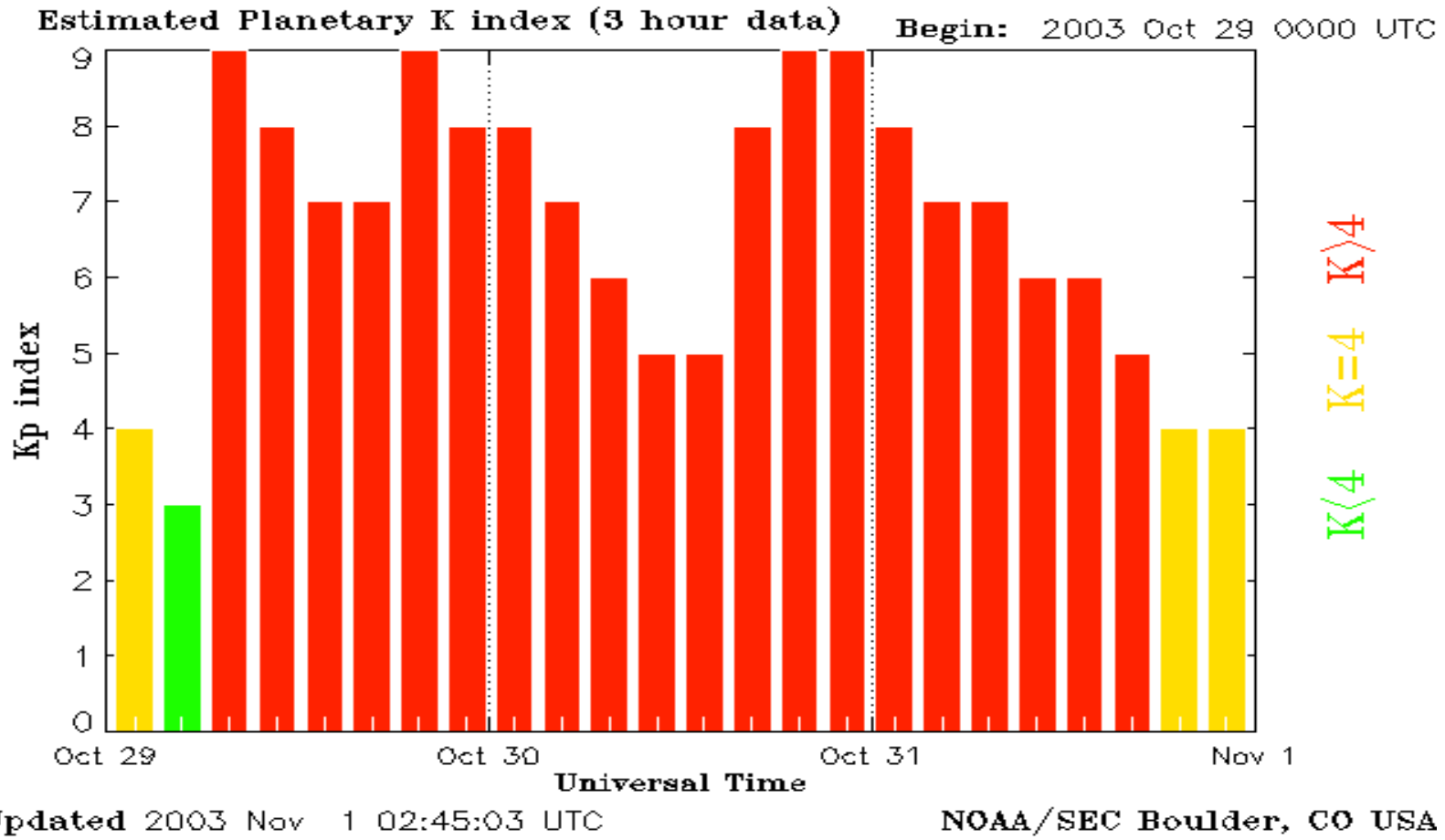
From:
http://www.solarham.net/latest_imagery/hmi1.htm
http://www.solarham.net/latest_imagery/211b.htm

Current contents - HF



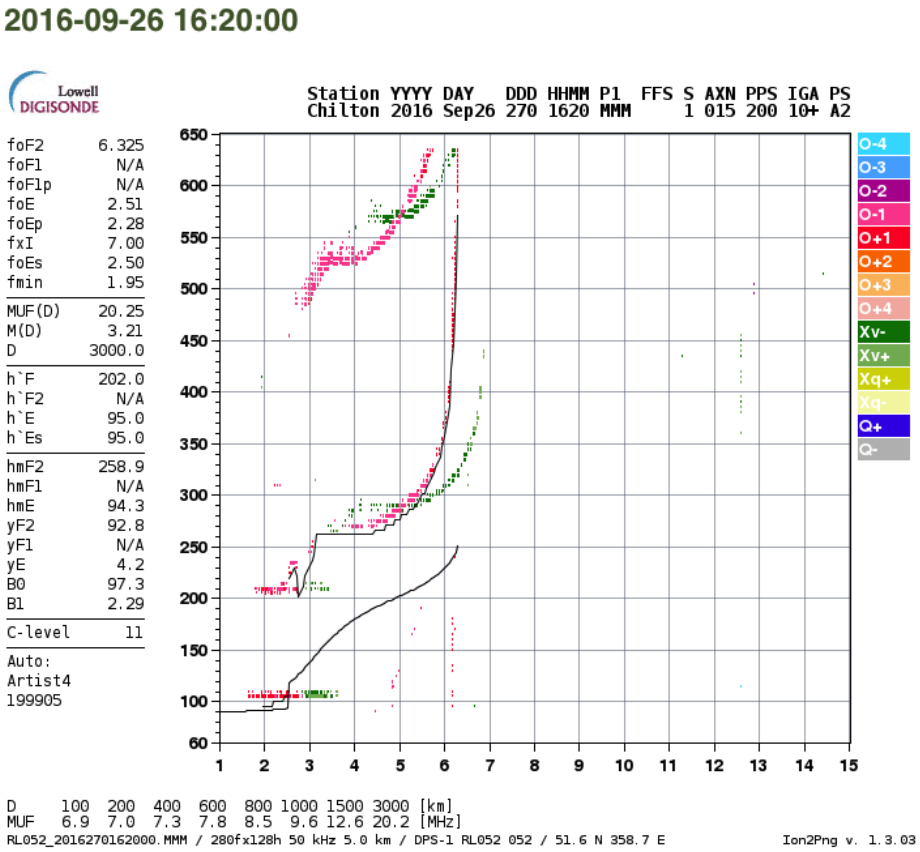
Current contents - HF

The current unsettled geomagnetic conditions are typical of this point in the solar cycle. This is October 29 2003.



Current contents - HF

Real-life/historical conditions using RAL Chilton (near Harwell) ionosonde



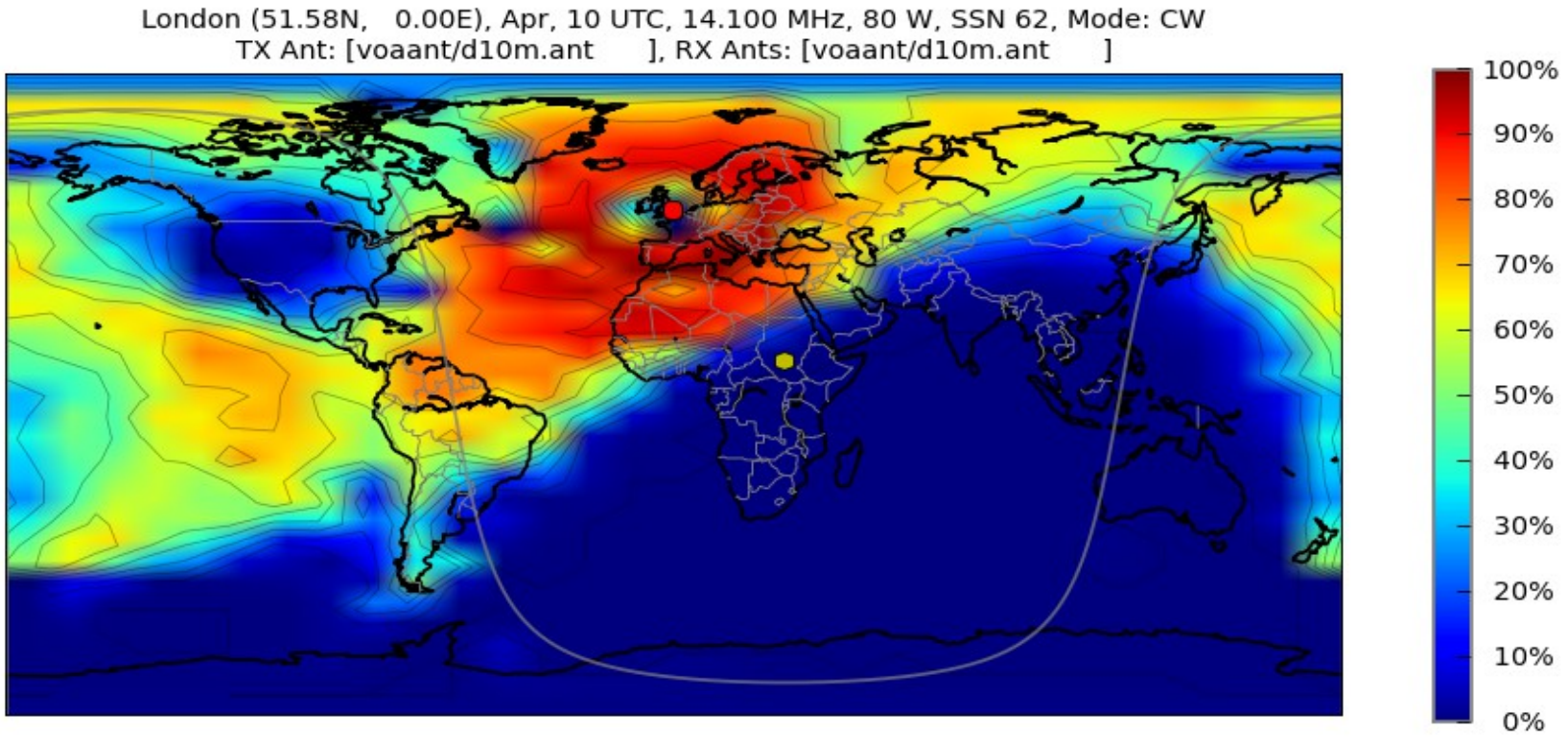
From:

http://www.ukssdc.ac.uk/ionosondes/view_latest.html

http://car.uml.edu/common/DIDBFastStationList

Current contents - HF

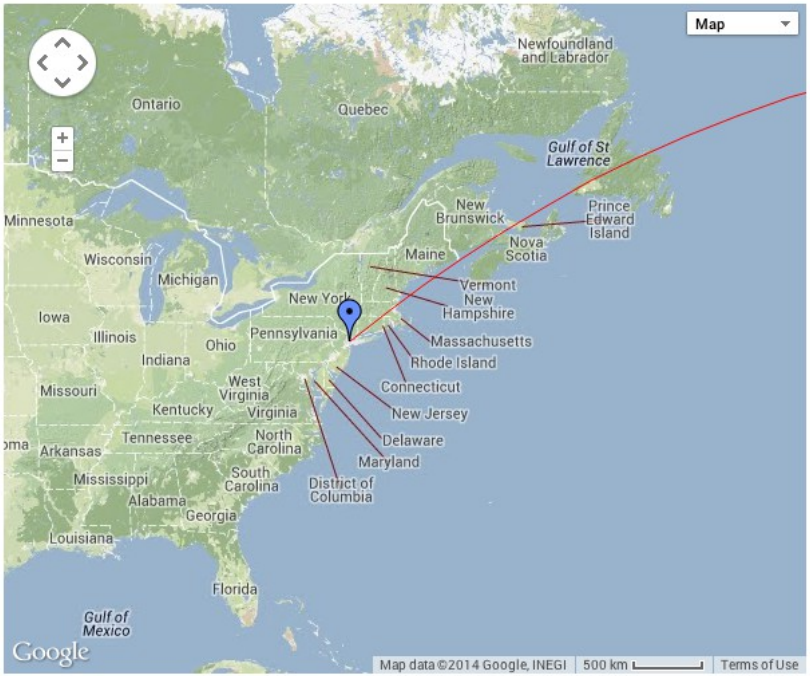
Putting it all together – knowledge, past experience, VOACAP, Predtest

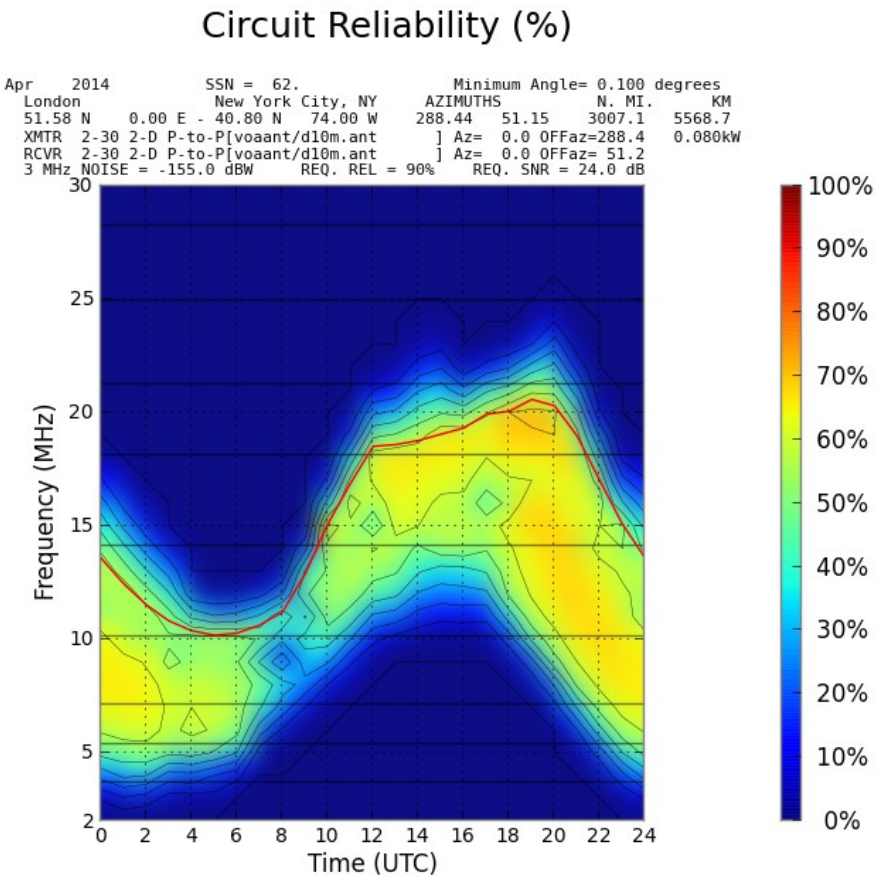


From:
www.voacap.com

Current contents - HF

Putting it all together – knowledge, past experience, VOACAP, Predtest



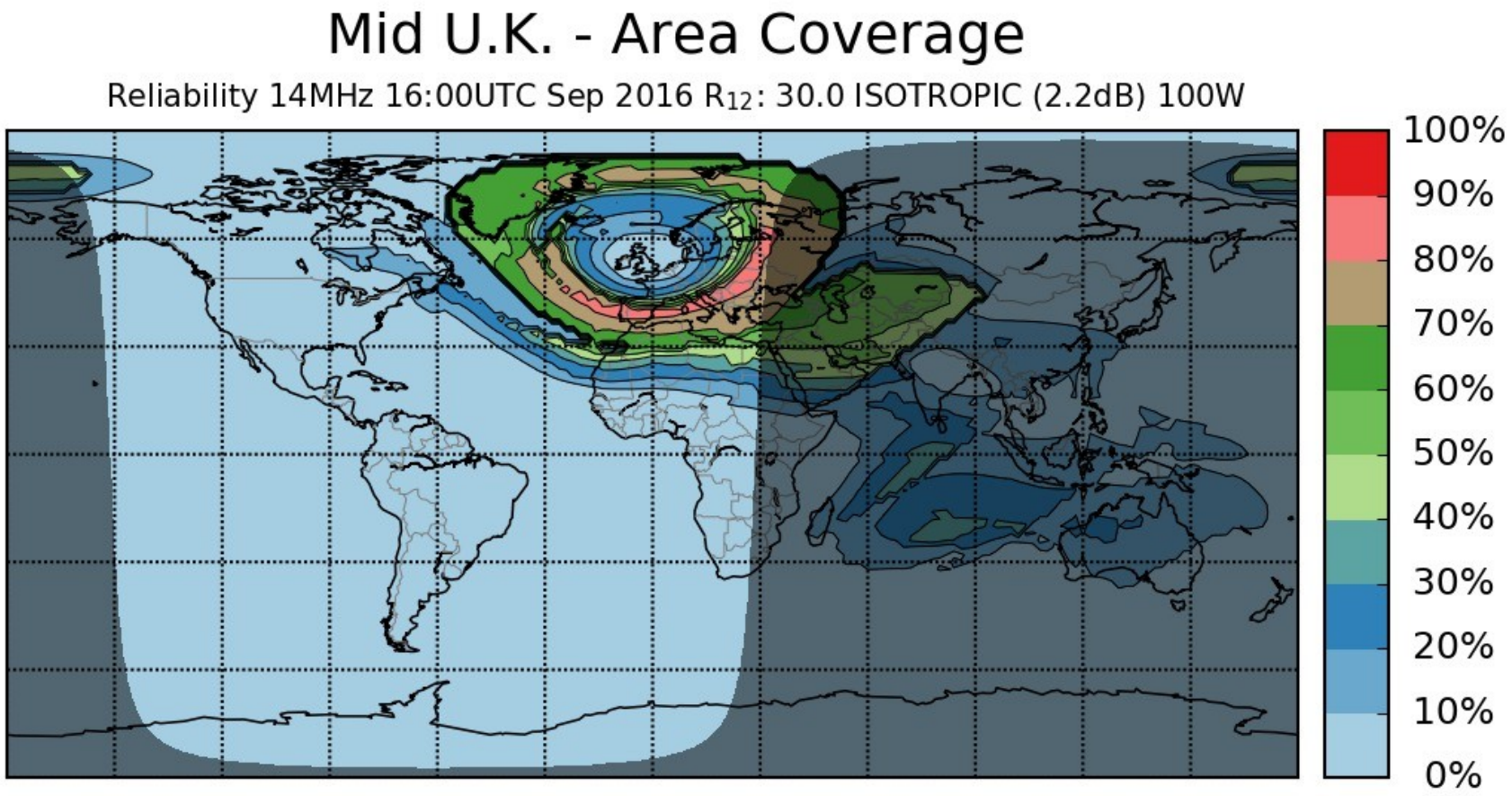


From:
www.voacap.com

Note: Use smoothed sunspot number

Current contents - HF

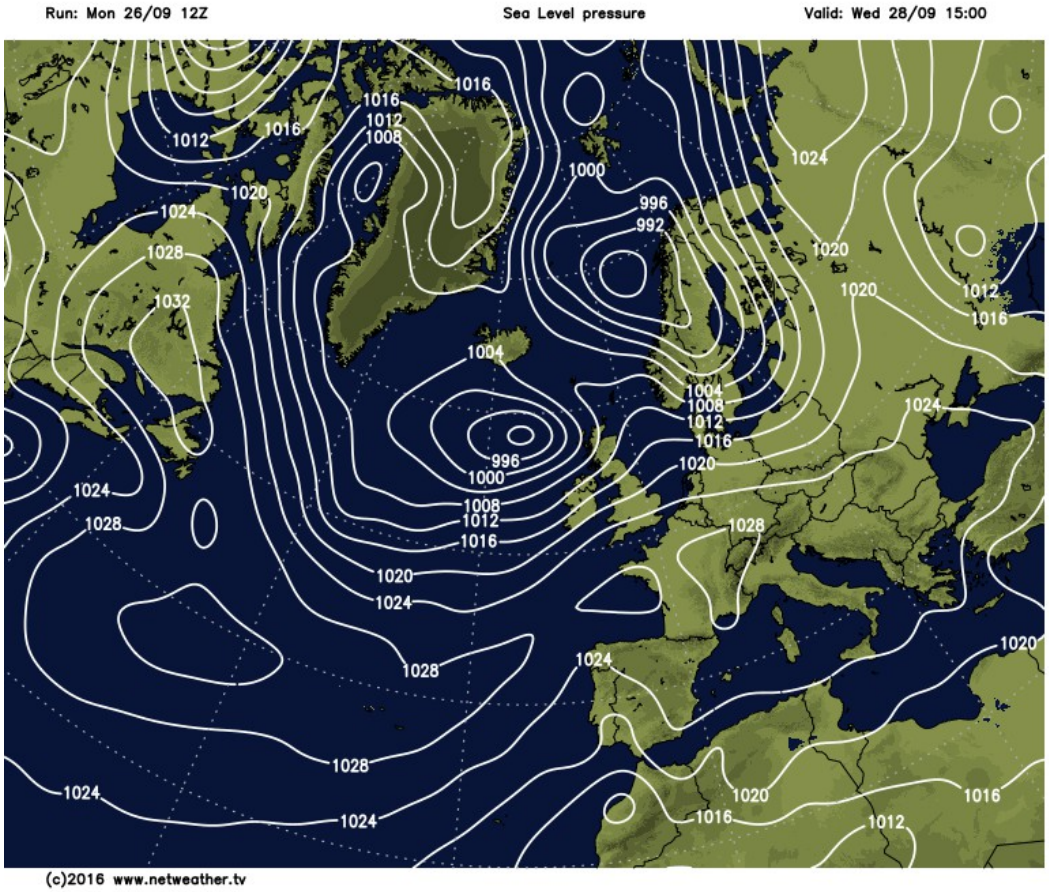
Putting it all together – knowledge, past experience, VOACAP, Predtest



From:
www.predtest.uk

Current contents - VHF

Looking for tropospheric enhancements

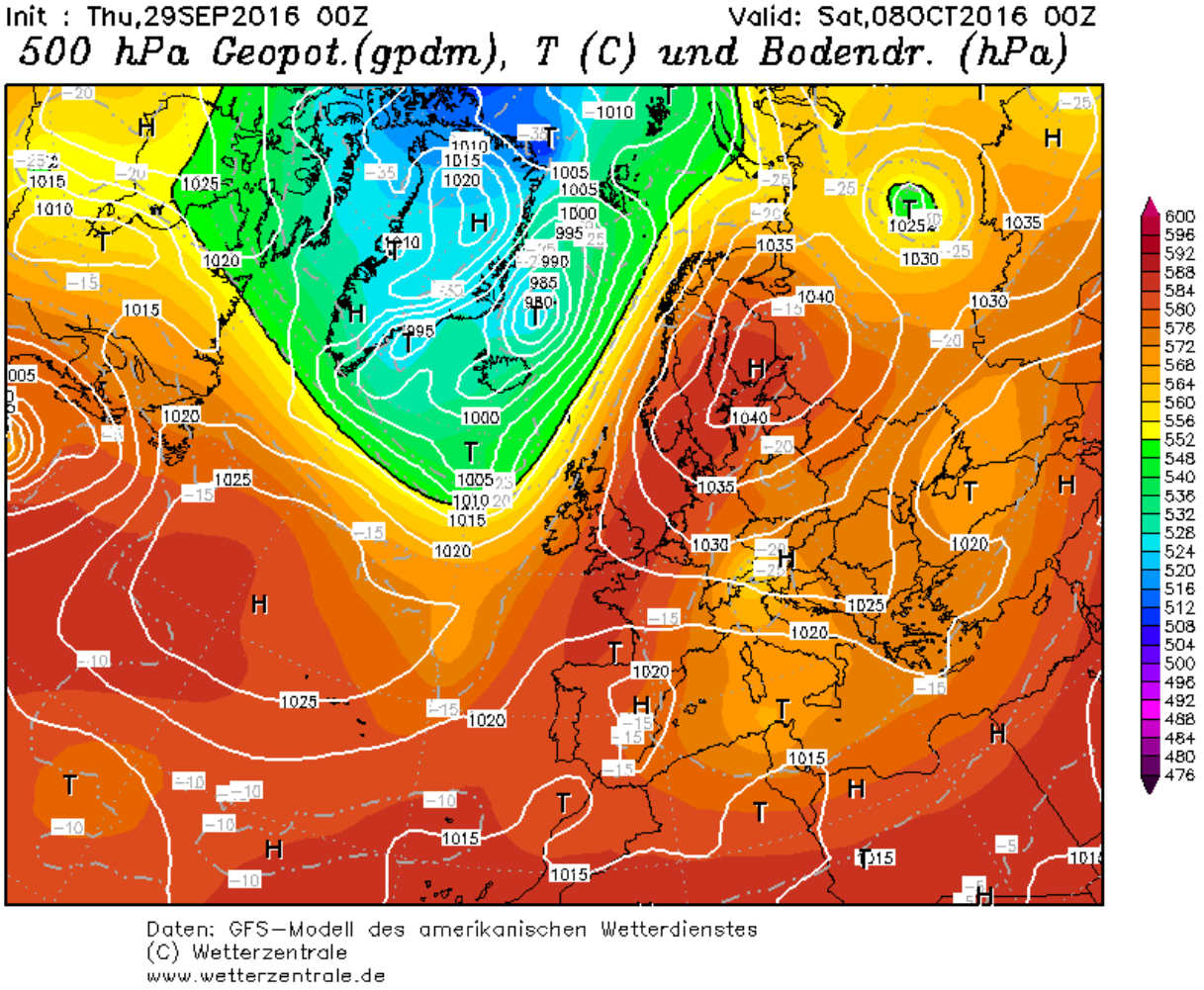


From:
http://www.netweather.tv/

Sea level pressure

Current contents - VHF

Looking for tropospheric enhancements

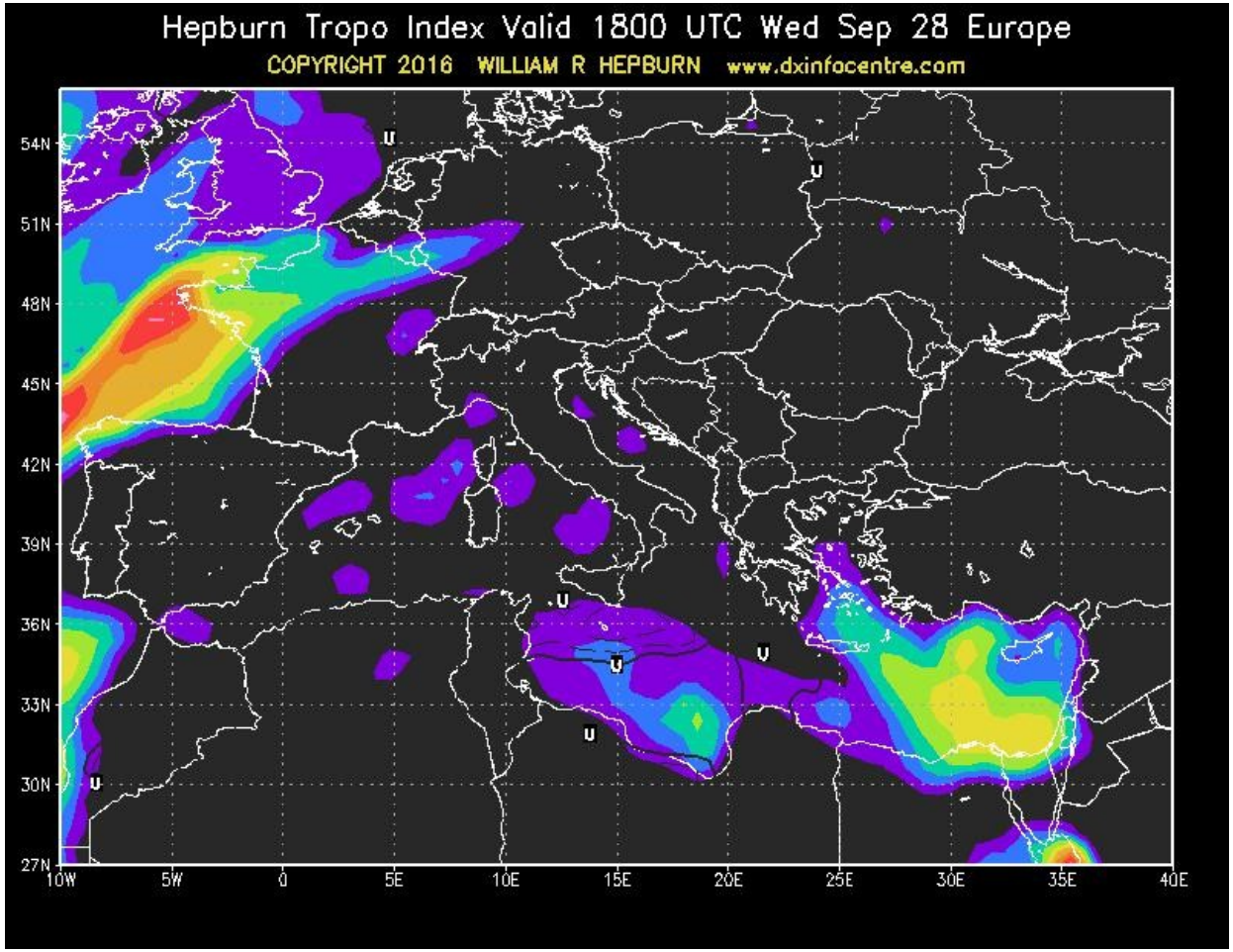


From:
http://old.wetterzentrale.de/pics/avnpanel1.html

Sea level pressure

Current contents - VHF

Looking for tropospheric enhancements

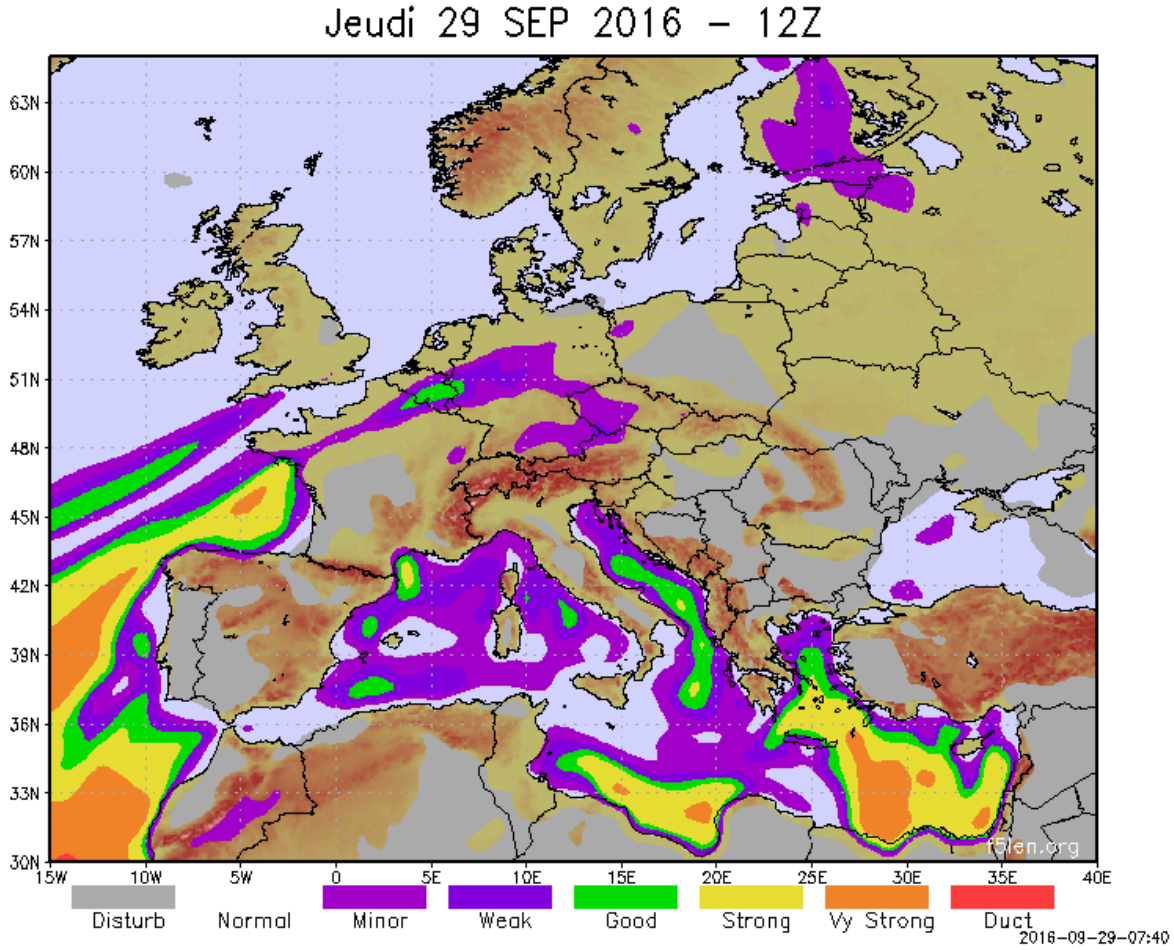


From:

http://www.dxinfocentre.com/tropo_eur.html

Current contents - VHF

Looking for tropospheric enhancements

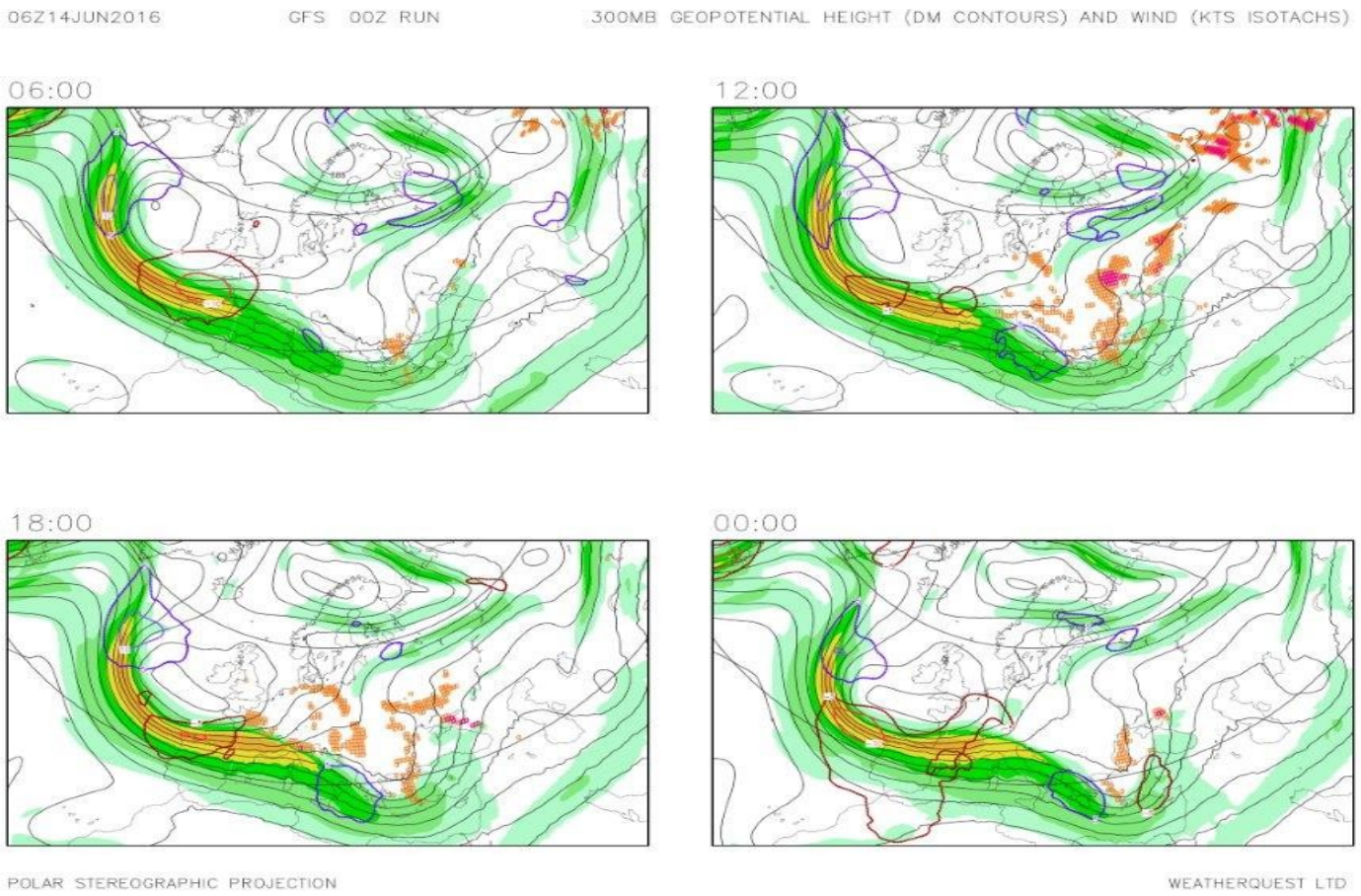


From:

http://tropo.f5len.org/forecasts-for-europe/

Current contents - VHF

Looking for Sporadic E – May to end of August



From:

http://forums.thersgb.org/index.php?threads/jet-stream-weather-charts-for-es-research-chart-drawer.140/

300mb jet stream

Current contents - VHF

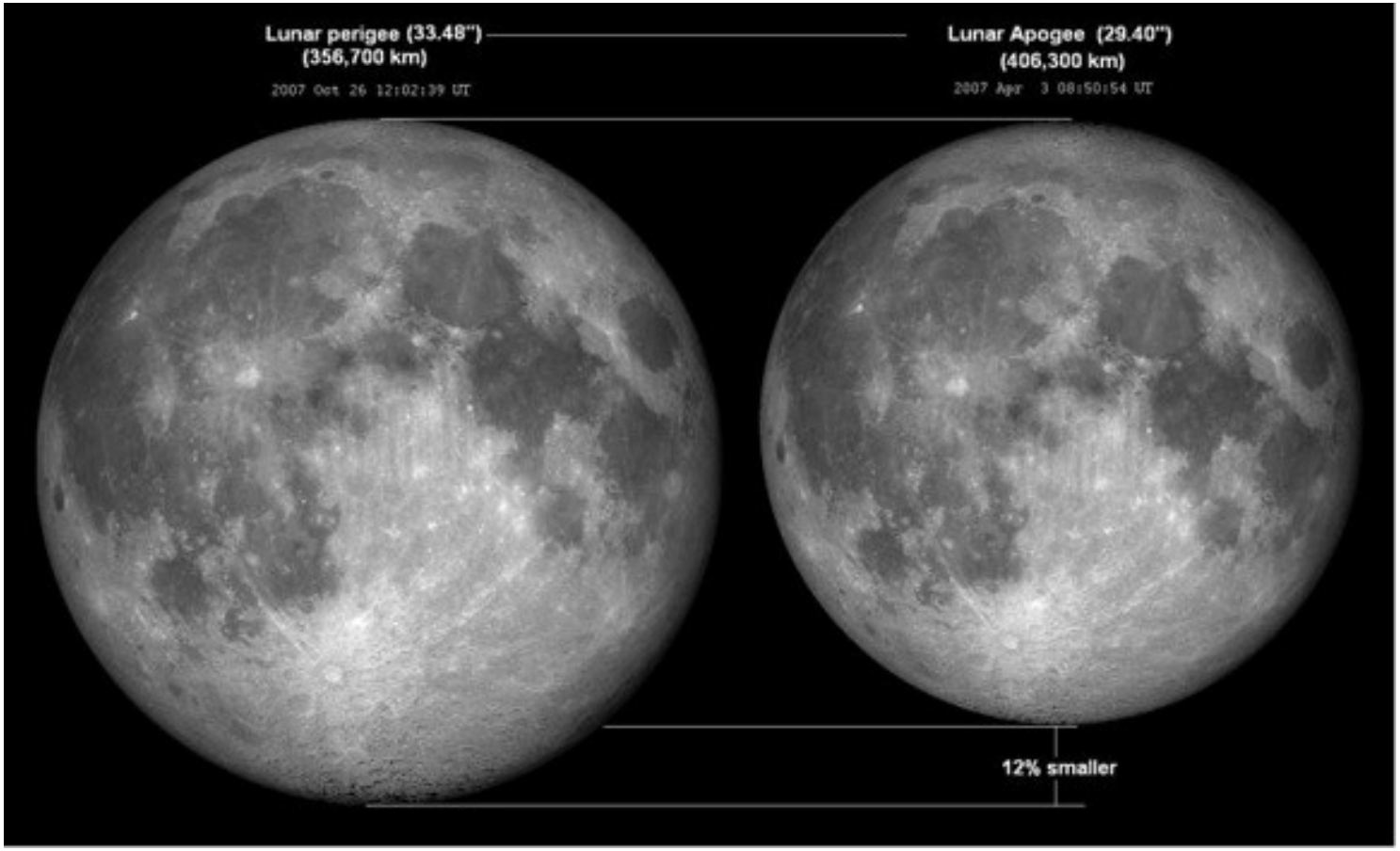
Meteor Scatter – main showers

Name	Date of Peak	Moon
Quadrantids	Night of January 3	Rises after midnight
Lyrids	Night of April 21	Full moon
Eta Aquarids	Night of May 4	New Moon
Perseids	Night of August 11	Sets after midnight
Orionids	Night of October 21	Sets after midnight
Leonids	Night of November 16	Just past full
Geminids	Night of December 13	Full Moon

From:
https://stardate.org/nightsky/meteors

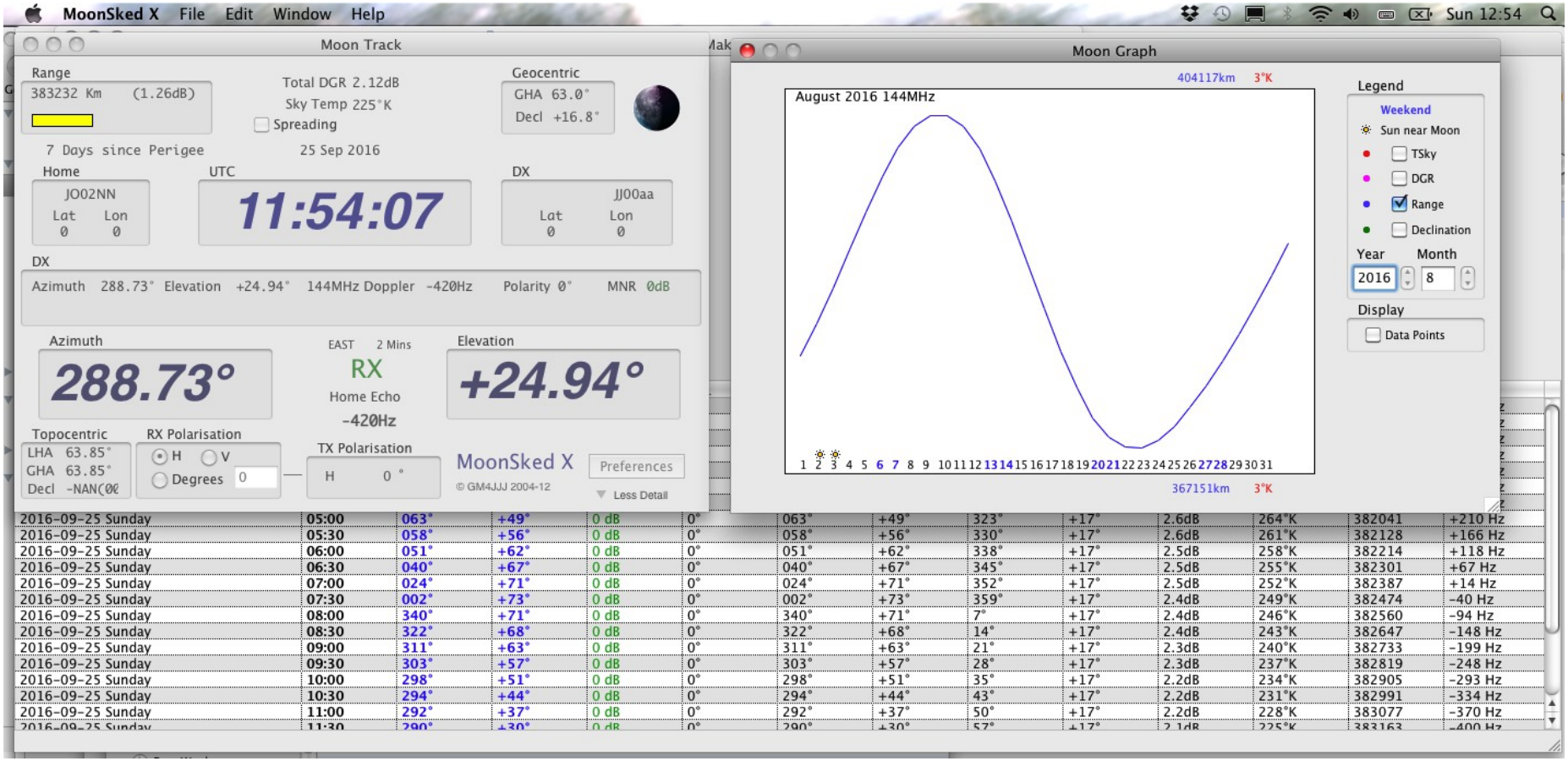
Current contents - VHF

Moon bounce (EME)



Current contents - VHF

Moon bounce (EME)



2016-09-25 Sunday	05:00	063°	+49°	0 dB	0°	063°	+49°	323°	+17°	2.6dB	264°K	382041	+210 Hz
2016-09-25 Sunday	05:30	058°	+56°	0 dB	0°	058°	+56°	330°	+17°	2.6dB	261°K	382128	+166 Hz
2016-09-25 Sunday	06:00	051°	+62°	0 dB	0°	051°	+62°	338°	+17°	2.5dB	258°K	382214	+118 Hz
2016-09-25 Sunday	06:30	040°	+67°	0 dB	0°	040°	+67°	345°	+17°	2.5dB	255°K	382301	+67 Hz
2016-09-25 Sunday	07:00	024°	+71°	0 dB	0°	024°	+71°	352°	+17°	2.5dB	252°K	382387	+14 Hz
2016-09-25 Sunday	07:30	002°	+73°	0 dB	0°	002°	+73°	359°	+17°	2.4dB	249°K	382474	-40 Hz
2016-09-25 Sunday	08:00	340°	+71°	0 dB	0°	340°	+71°	7°	+17°	2.4dB	246°K	382560	-94 Hz
2016-09-25 Sunday	08:30	322°	+68°	0 dB	0°	322°	+68°	14°	+17°	2.4dB	243°K	382647	-148 Hz
2016-09-25 Sunday	09:00	311°	+63°	0 dB	0°	311°	+63°	21°	+17°	2.3dB	240°K	382733	-199 Hz
2016-09-25 Sunday	09:30	303°	+57°	0 dB	0°	303°	+57°	28°	+17°	2.3dB	237°K	382819	-248 Hz
2016-09-25 Sunday	10:00	298°	+51°	0 dB	0°	298°	+51°	35°	+17°	2.2dB	234°K	382905	-293 Hz
2016-09-25 Sunday	10:30	294°	+44°	0 dB	0°	294°	+44°	43°	+17°	2.2dB	231°K	382991	-334 Hz
2016-09-25 Sunday	11:00	292°	+37°	0 dB	0°	292°	+37°	50°	+17°	2.2dB	228°K	383077	-370 Hz

Source: Moonsked software by GM4JJJ (www.gm4jjj.co.uk)

GB2RS Propagation Report

Any questions + club presentations

- Understanding HF Propagation
- Understanding VHF Propagation

Steve Nichols G0KYA
psc.chairman@rsgb.org.uk

Presentation at: g0kya.blogspot.co.uk