SIX METERS

THE “MAGIC BAND”

Revisited

HISTORY

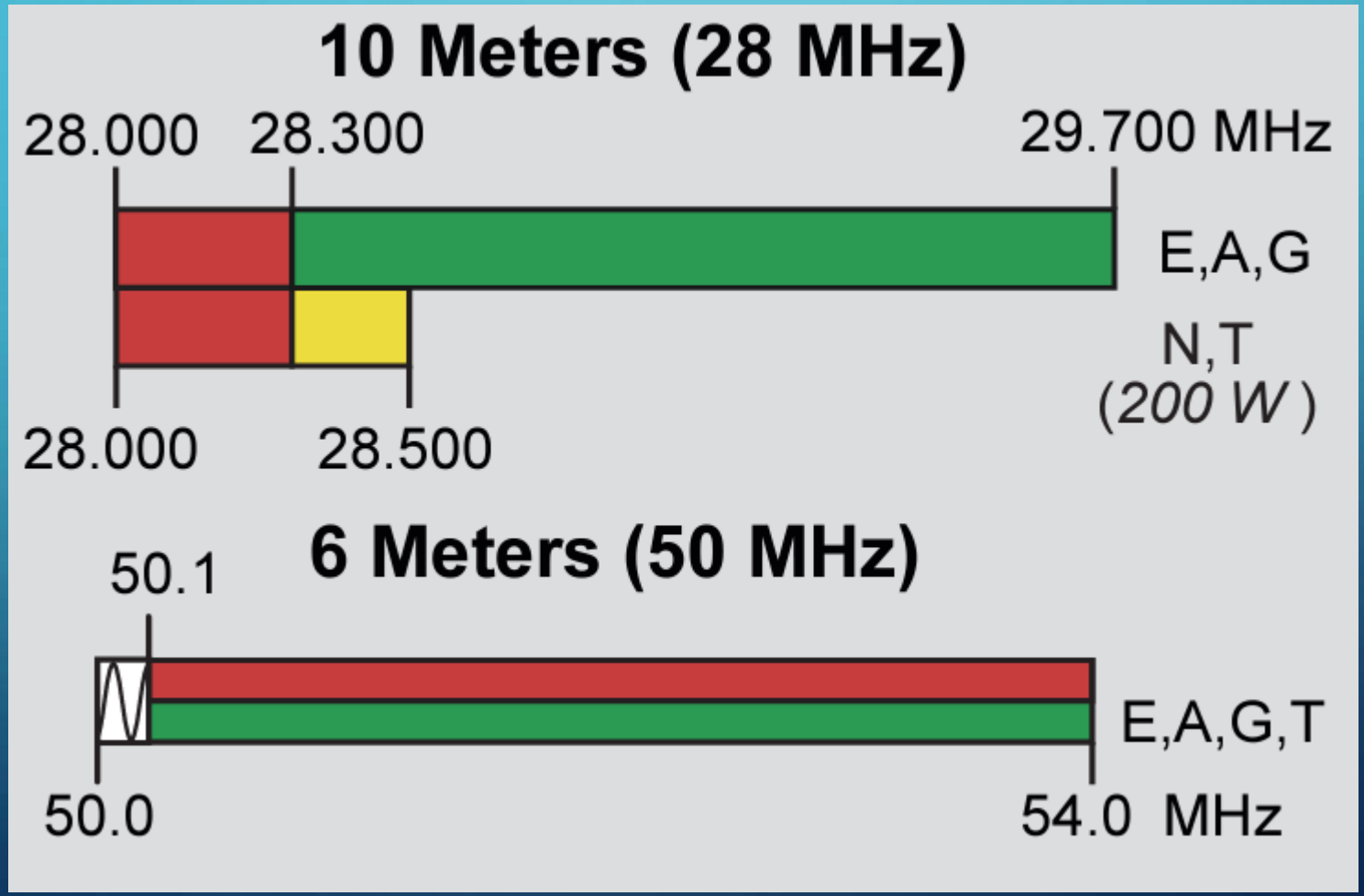
Whatever happened to TV Channel 1?

Year		6 Meter Band	FM	TV 1	TV 2
1924	US action	56-64 MHz			
1927	International action	56-60 MHz			
1934	FCC established				
1937-1938	6 MHz TV channels	56-60 MHz		44-50 MHz	50-56 MHz
1940	FCC action	56-60 MHz	42-50MHz	50-56 MHz	60-66 MHz
1941	World War II				
1946	FCC action	50-54 MHz	88-108 MHz	44-50 MHz	54-60 MHz
1948	TV 1 removed				

And what is TVI?

30.0
30.56
32.0
33.0
34.0
35.0
36.0
37.0
37.5
38.0
38.25
39.0
40.0
42.0
43.69
46.6
47.0
49.6
50.0
54.0
72.0
MOBILE
LAND MOBILE
FIXED
Radio Astronomy
RADIO ASTRONOMY
AMATEUR
BROADCASTING
(TV CHANNELS 2-4)
30 MHz
ISM – 40.68 ± .02 MHz

ALL AMATEURS HAVE SAME PRIVILEGES



Weak Signal Operating	
50.0-50.1	CW, beacons
50.1-50.3	SSB, CW
50.1-50.125	DX window (CW & SSB)
50.11	DX Calling Frequency
50.125	SSB calling
50.3-50.6	All modes
51.0-51.1	Pacific DX window
50.180-50210	EME
50.260	MSK144
50.276	JT65
50.290	PSK31
50.293	WSPR
50.313	FT8

FM Simplex	
51.500	Simplex
51.520	
51.540	
51.560	
51.580	
51.600	
52.020	
52.040	
52.525	National Calling
52.545	
53.020	
53.520	
53.900	

Radio Remote Control
50.800
50.820
50.840
50.860
50.880
50.900
50.920
50.940
50.960
50.980
51.000
53.100
53.200
53.300
53.400
53.500
53.600
53.700
53.800

Other Operations	
50.060-50.080	beacon sub-band
50.600-50.800	Non-voice communications
53.000	Remote base FM simplex
52.200	Test Pair (input)
52.700	Test Pair (output)

Digital Modes	
51.120	Digital repeater inputs
51.180	
51.620	Digital repeater outputs
51.680	
50.620	Packet calling

Group 1 Repeaters +0.5 MHz Offset	
51.120	Inputs
51.140	
51.160	
51.180	

Group 2 Repeaters +0.5 MHz Offset	
52.000	Inputs
52.060	
52.080	
52.100	

Group 3 Repeaters +0.5 MHz Offset	
53.040	Inputs
53.060	
53.080	
53.120	

51.6400 -	141.3 / 141.3	Brandon	Hillsborough	W4HSO	OPEN	FM	
53.0100 -		Crescent City	Putnam	KI4NAD	OPEN	FM	
53.0300 -	107.2	Miami	Miami-Dade	AC4XQ	OPEN	FM	
53.0300 -	94.8 / 94.8	Tallahassee	Leon	K4TLH	OPEN	FM	
53.0500 -	100.0 / 100.0	Holly Hill	Volusia	KI4RF	OPEN	FM EchoLink	
53.0500 -		Panama City	Bay	AC4QB	OPEN	FM	
53.0700 -	118.8 / 118.8	Cocoa	Brevard	WB4OEZ	OPEN	FM	
53.0900 -	123.0 / 123.0	High Springs, Poe Springs Park	Alachua	WA4QLA	OPEN	FM	
53.1300 -	100.0 / 100.0	Weeki Wachee	Hernando	KF4CIK	OPEN	FM	
53.1500 -	146.2 / 146.2	Pinellas Park	Pinellas	W4ORM	OPEN	FM	
53.1700 -	103.5 / 103.5	Elkton	Saint Johns	KI4NAD	OPEN	FM	
53.1900 -	100.0 / 100.0	Orange Park	Clay	K4SIX	OPEN	FM	
53.2300 -	103.5 / 103.5	Eustis	Lake	KD4MBN	OPEN	FM	
53.3300 -	127.3 / 127.3	Jacksonville	Duval	W4RNG	OPEN	FM	
53.3300 -	100.0 / 100.0	Vero Beach	Indian River	KG4ORQ	OPEN	FM EchoLink	
53.3900 -		Lake City	Suwannee	N4SVC	OPEN	FM	
53.4300 -	100.0 / 100.0	Melbourne	Brevard	K4MRG	OPEN	FM AllStar	
53.7300 -		Crescent City	Putnam	KJ4UOP	OPEN	FM	
53.7500 -	110.9 / 110.9	Fort Lauderdale	Broward	KF4LZA	OPEN	FM	

What Makes It So Magic?

PROPAGATION

6m Modes

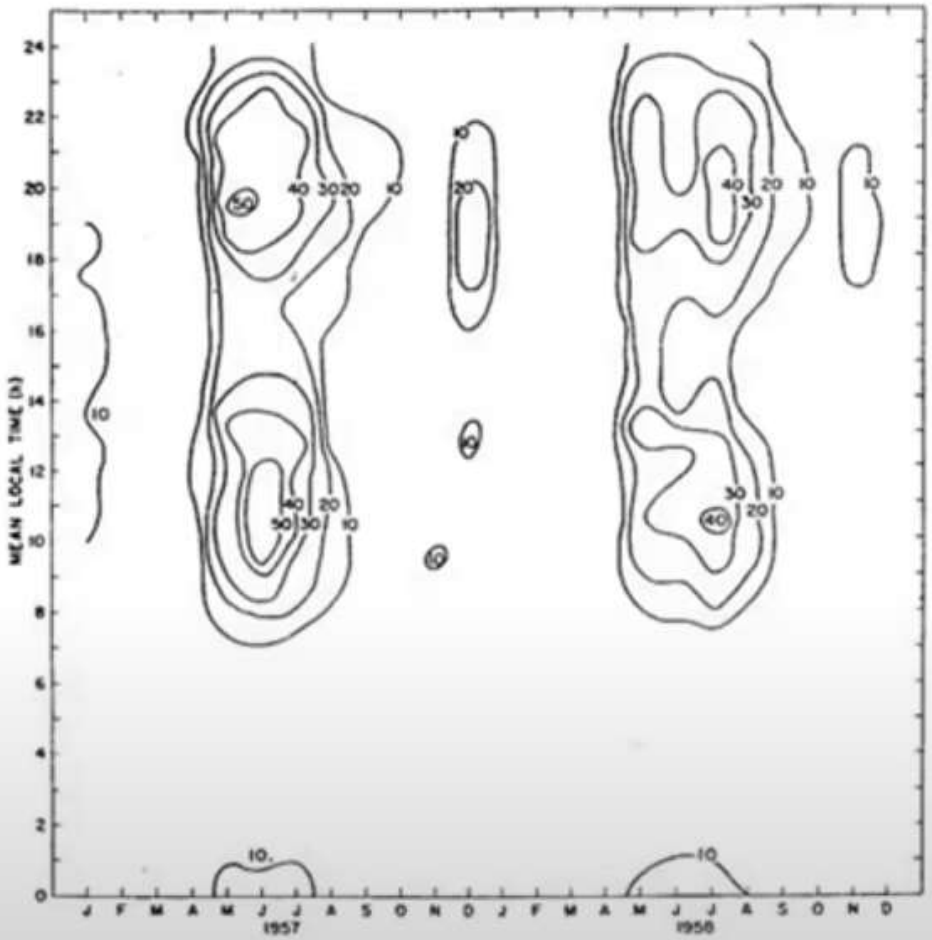
NON-ATMOSPHERIC AND NON-IONOSPHERIC	ATMOSPHERIC	IONOSPHERIC	EXTRATERRESTRIAL
line-of-sight ground wave	tropospheric scatter tropospheric ducting SSSP meteor scatter	aurora/auroral-E ionospheric scatter E hops sporadic-E F2 hops TEP Ducting/chordal hops combos of E & F hops above-the-MUF skewed paths	moon bounce

Sporadic E (Es)

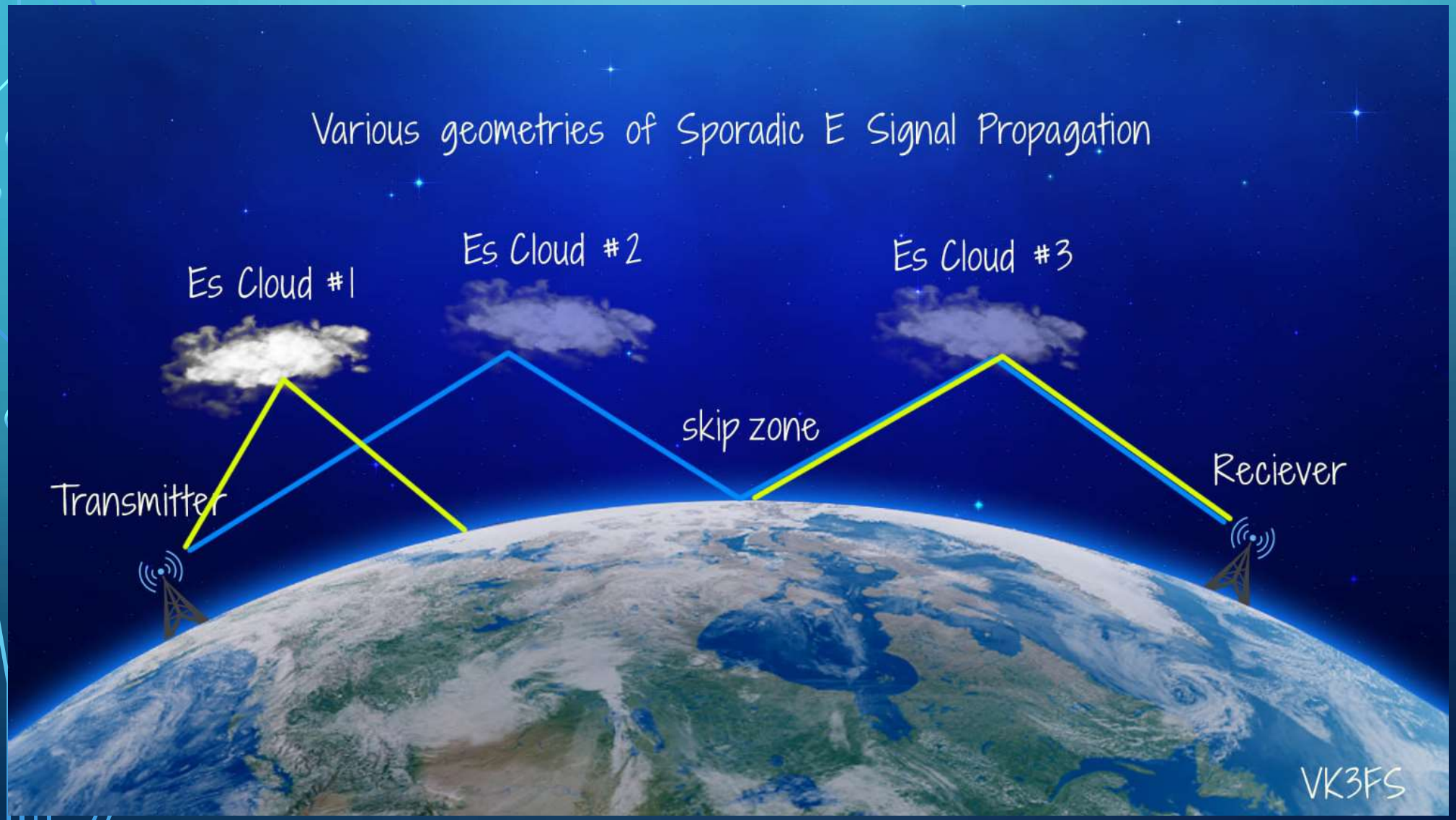
- Seasonal
  - May – July (Northern Hemisphere)
  - Smaller peak in mid-winter
- Unpredictable
  - Es Clouds vary greatly in size
  - They move
- Their method of creation is unknown
  - Several theories – wind shear, meteors
- Signals can double hop

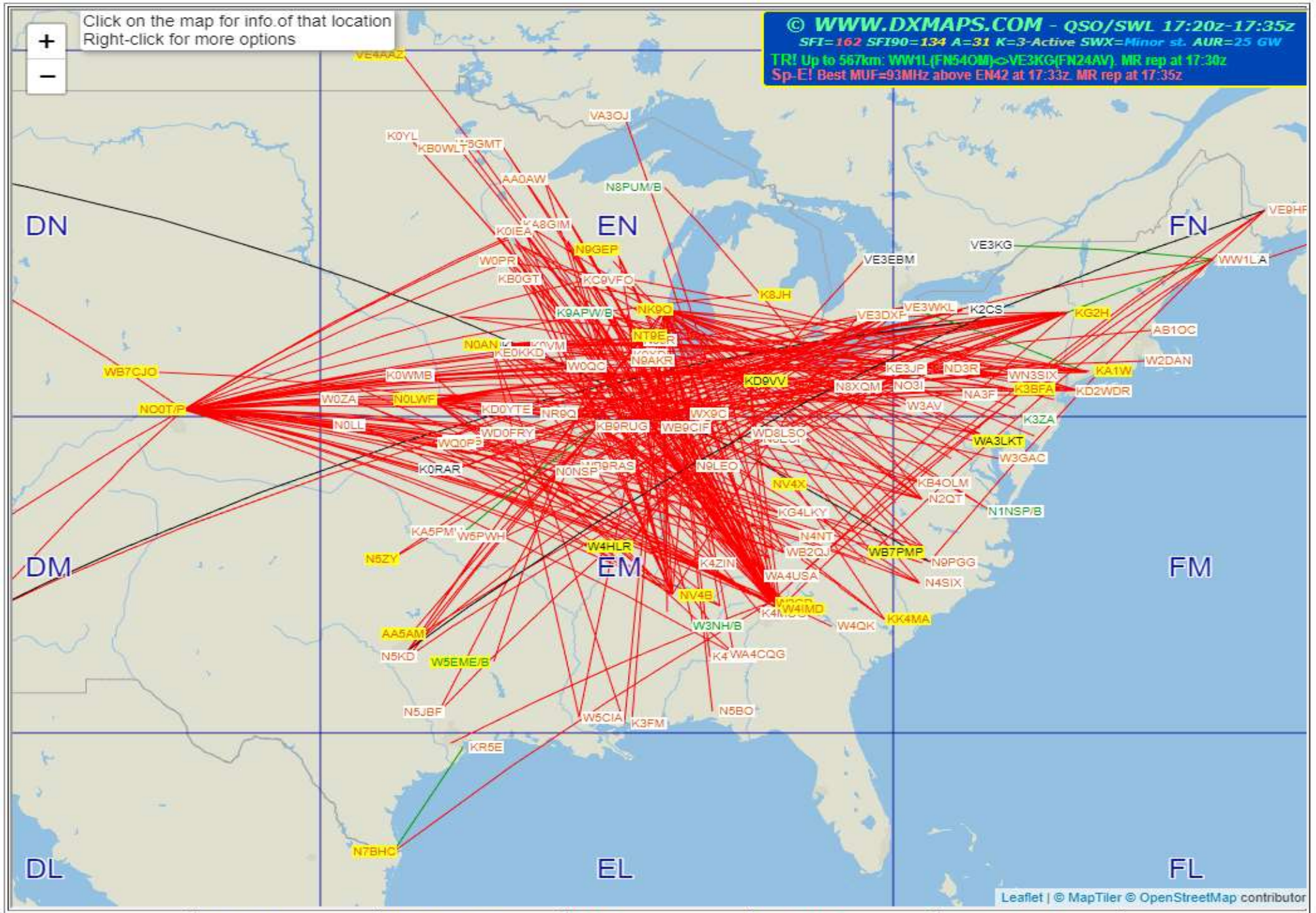
Sporadic-E

- It's called sporadic-E because we can't predict it
- We know the general pattern with respect to month and local time
- We don't know on which days it will occur
- Summer is best
- Bi-modal probability
  - Late morning (local)
  - Early/late evening (local)
- Bi-modal probability can allow long distance QSOs



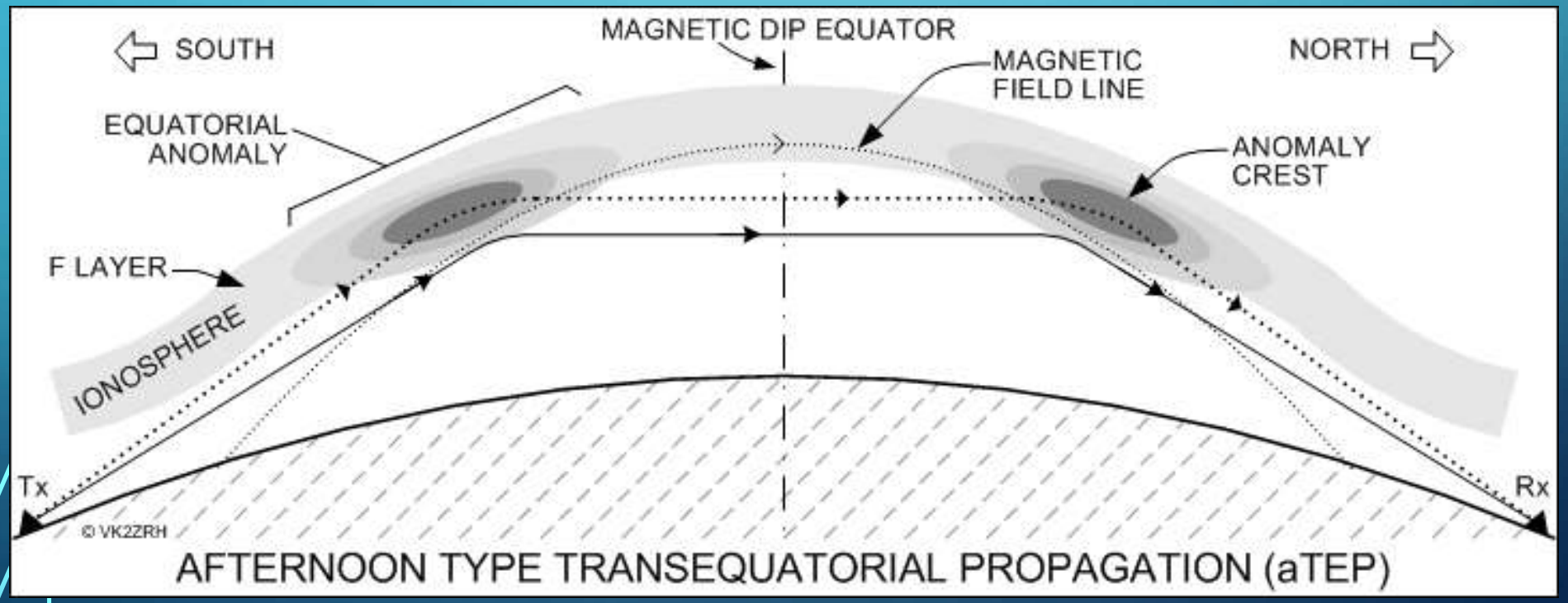
SPORADIC E (Es)




Click on the map for info.of that location
Right-click for more options
© WWW.DXMAPS.COM - QSO/SWL 17:20z-17:35z
SFI=162 SFI90=134 A=31 K=3-Active SWX=Minor st. AUR=25 GW
TR! Up to 567km: WW1L(FN54OM)<>VE3KG(FN24AV). MR rep at 17:30z
Sp-E! Best MUF=93MHz above EN42 at 17:33z. MR rep at 17:35z
DN
EN
FN
DM
EM
FM
DL
EL
FL
VE4AAZ
VA3OJ
K0YL
KB0WLT
AA0AW
N8PUM/B
K0IEA
A8GIM
N9GEP
W0PR
KB0GT
KC9VFO
K8JH
K9APW/B
NK9O
NT9E
N0AN
KE0KKD
N9AKR
W0QC
WB7CJO
K0WMB
KD9VV
W0ZA
N0LWF
NC0T/P
KD0YTE
NR9Q
WX9C
N0LL
WD0FRY
KB9RUG
WB9CIF
WD8LSO
WA3LKT
W3GAC
K0RAR
N0NSP
N9LEO
NV4X
KB4OLM
N2QT
N1NSP/B
KG4LKY
KA5PM
W6PWH
N4NT
W4HLR
N5ZY
WB2QJ
WB7PMP
N9PGG
K4ZIN
WA4USA
N4SIX
NV4B
W4IMD
KK4MA
W4QK
W3NH/B
AA5AM
N5KD
W5EME/B
WA4CQG
N5JBF
W5CIA
K3FM
N5BO
KR5E
N7BHC
VE9HF
VE3KG
WW1LA
VE3EBM
VE3DXF
VE3WKL
K2CS
KG2H
AB1OC
W2DAN
KE3JP
ND3R
WN3SIX
KA1W
N8XQM
NO3I
NA3F
K3BFA
KD2WDR
W3AV
K3ZA
Leaflet | © MapTiler © OpenStreetMap contributor
Aurora
Aurora-E
Back-Scatter
EME
Sporadic-E
Multihop Sp-E
FAI

TEP

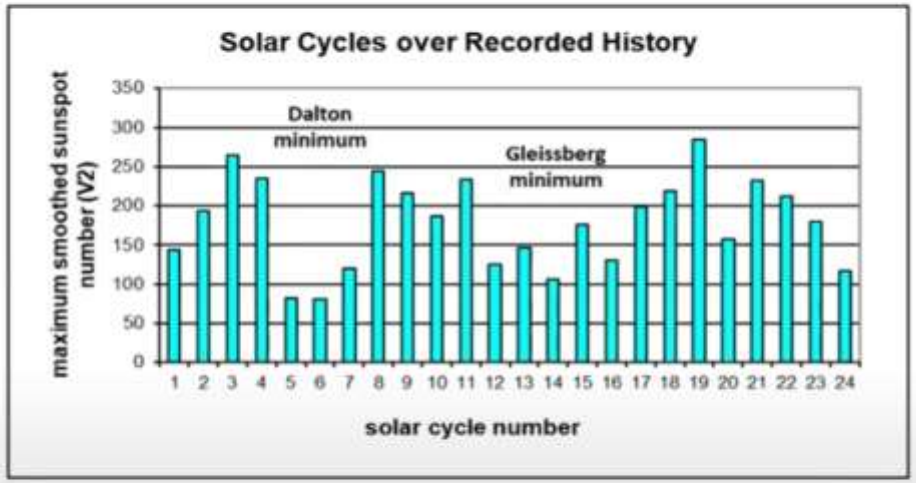
Trans-Equatorial Propagation



F Layer

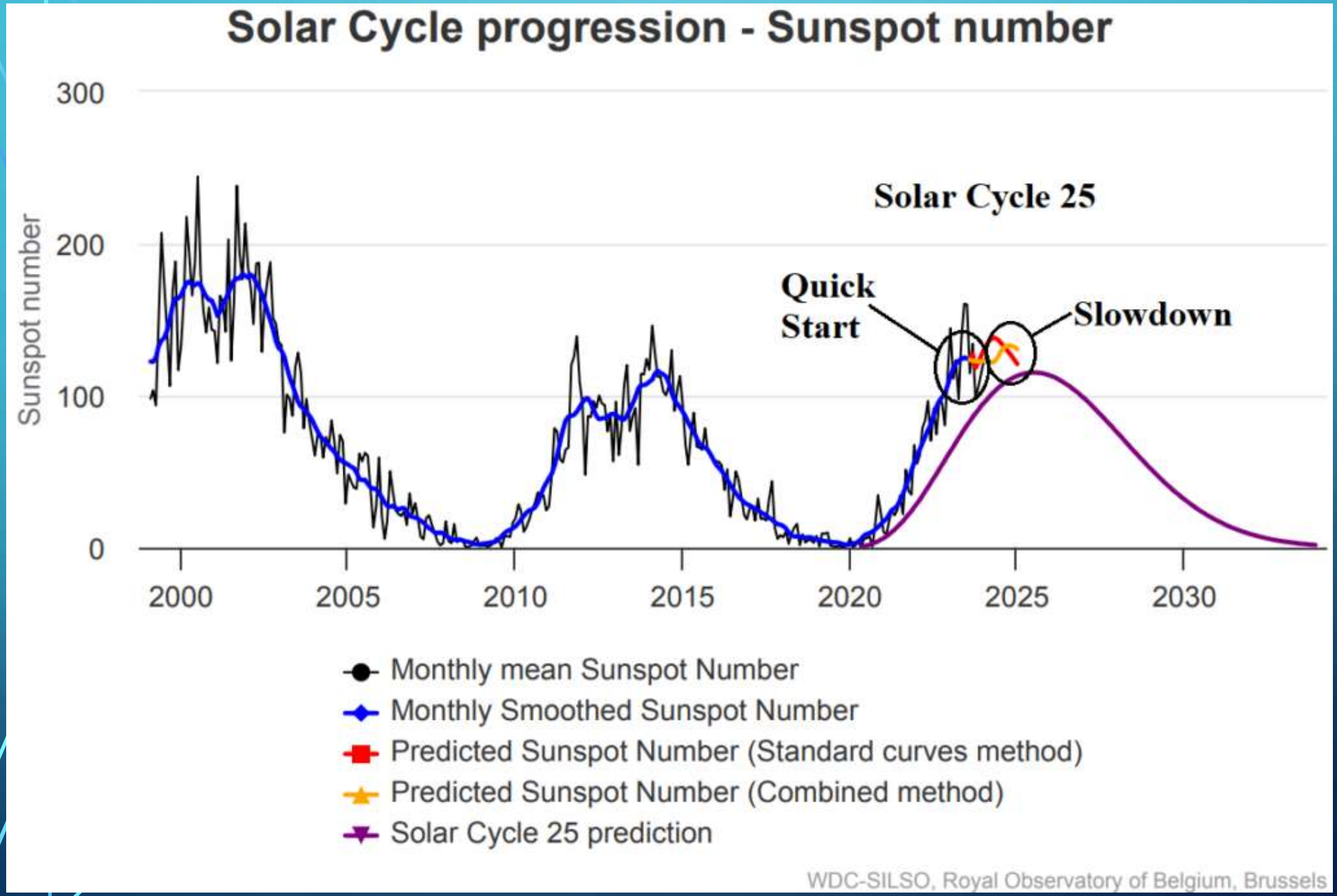
Refraction occurs only when solar flux is high

Recorded History



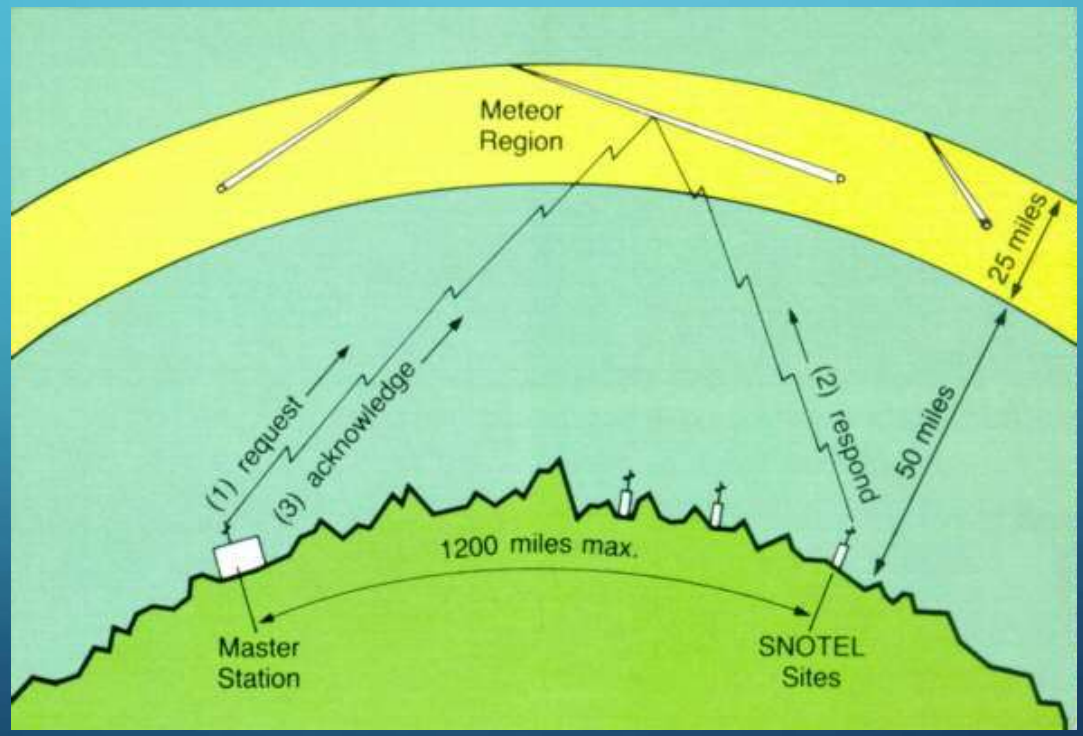
Cycle 24 was the smallest in our lifetimes and the 4th smallest in recorded history

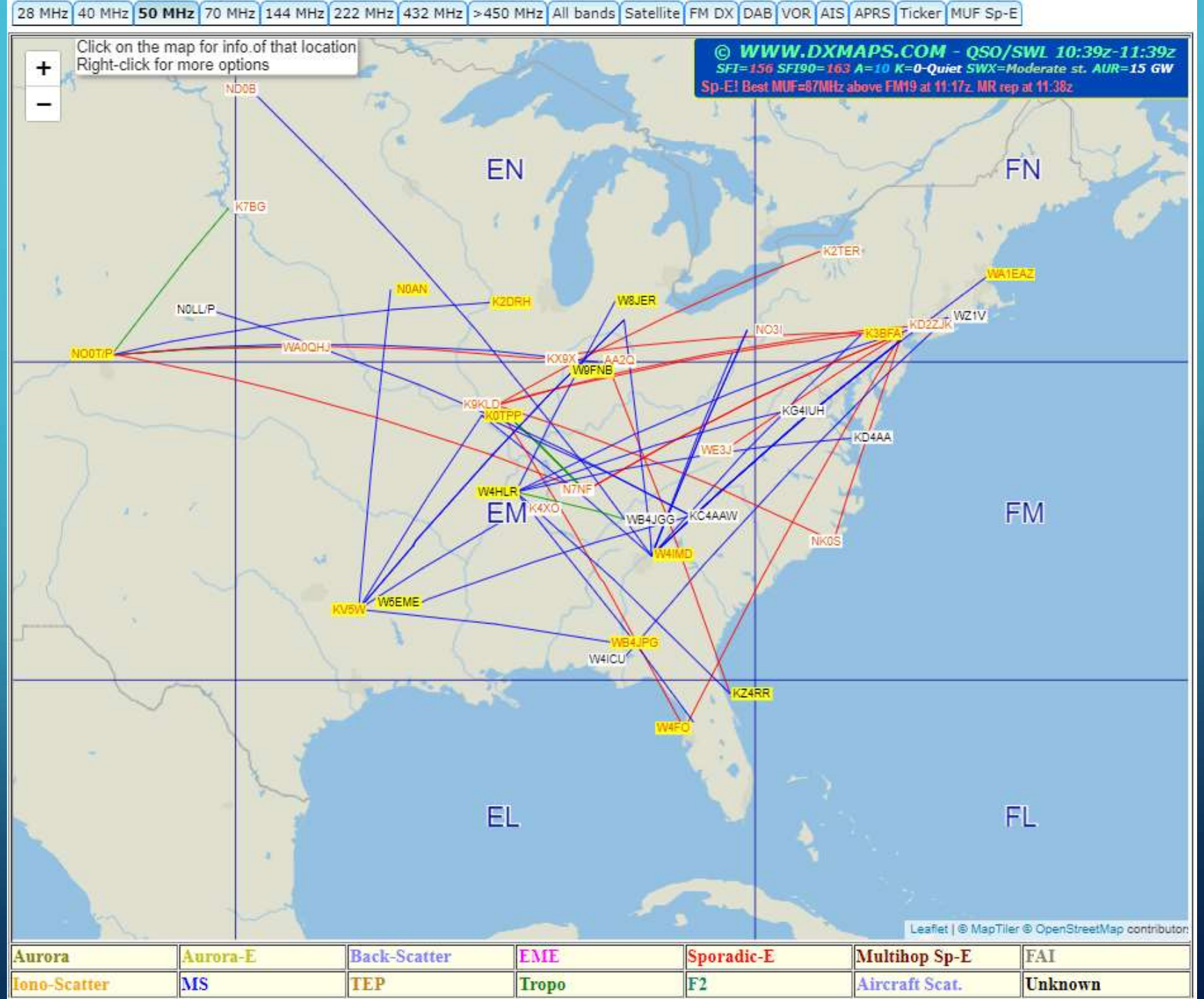
Critical question – will Cycle 25 get us out of the third period of small cycles?


Solar Cycle progression - Sunspot number
300
200
100
0
Sunspot number
2000
2005
2010
2015
2020
2025
2030
Solar Cycle 25
Quick Start
Slowdown
Monthly mean Sunspot Number
Monthly Smoothed Sunspot Number
Predicted Sunspot Number (Standard curves method)
Predicted Sunspot Number (Combined method)
Solar Cycle 25 prediction
WDC-SILSO, Royal Observatory of Belgium, Brussels

Meteor Scatter

Ionoscatter

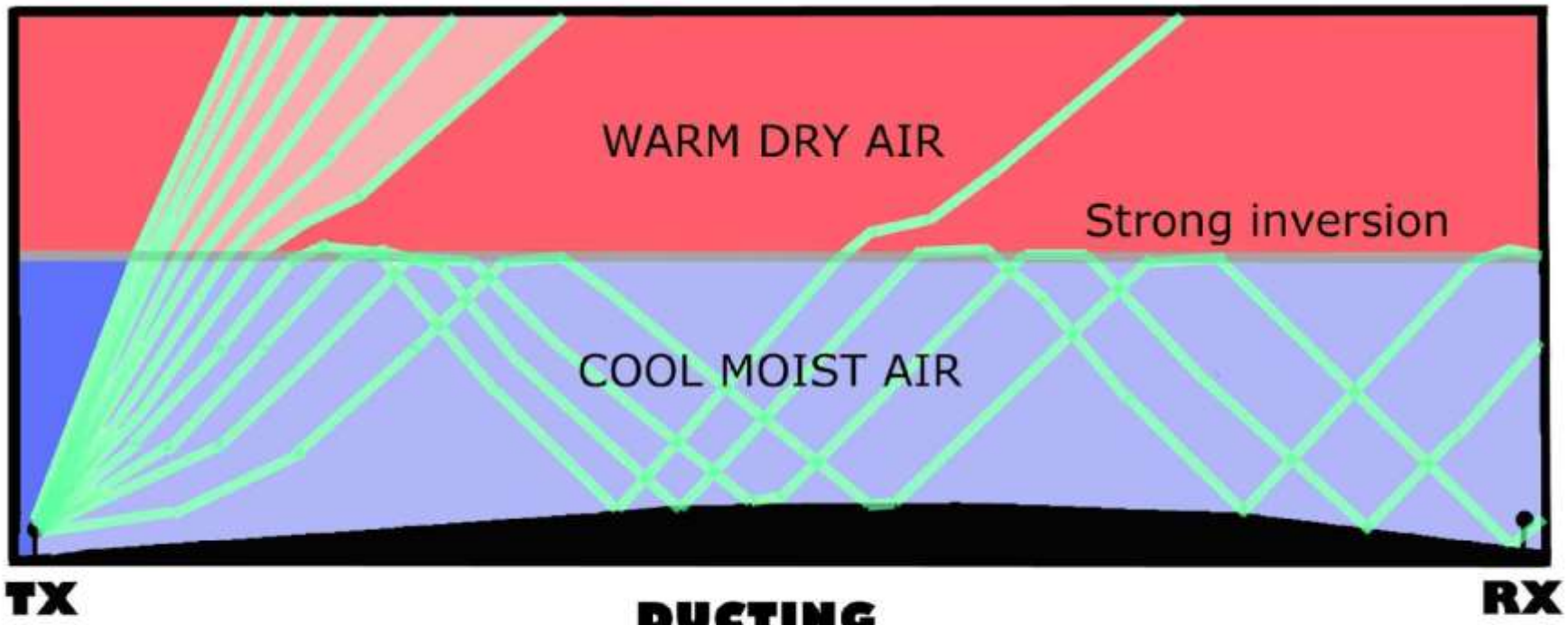



28 MHz
40 MHz
50 MHz
70 MHz
144 MHz
222 MHz
432 MHz
>450 MHz
All bands
Satellite
FM DX
DAB
VOR
AIS
APRS
Ticker
MUF Sp-E
Click on the map for info of that location
Right-click for more options
© WWW.DXMAPS.COM - QSO/SWL 10:39z-11:39z
SFI=156 SFI90=163 A=10 K=0-Quiet SWX=Moderate st. AUR=15 GW
Sp-E! Best MUF=87MHz above FM19 at 11:17z. MR rep at 11:38z
EN
FN
EM
FM
EL
FL
ND0B
K7BG
N0LL/P
N0AN
K2DRH
NO0T/P
WA0QHJ
KX9X
AA2Q
W9FNB
W8JER
K2TER
WA1EAZ
WZ1V
KD2ZJK
K3BFA
NO3I
K9KLD
K0TPP
KG4IUH
KD4AA
WE3J
W4HLR
N7NF
K4XO
WB4JGG
KC4AAW
NK0S
W4IMD
KV5W
W5EME
WB4JPG
W4ICU
KZ4RR
W4FO
Leaflet | © MapTiler © OpenStreetMap contributors
Aurora
Aurora-E
Back-Scatter
EME
Sporadic-E
Multihop Sp-E
FAI
Iono-Scatter
MS
TEP
Tropo
F2
Aircraft Scat.
Unknown

2024 Major Meteor Showers (Class I)

Shower	Activity Period	Maximum		Radiant		Velocity	r	Max.	Time	Moon
		Date	S. L.	R.A.	Dec.	km/s		ZHR		
Quadrantids (QUA)	Dec 26-Jan 16	Jan 04	283.3°	15:20	+49.7°	40.2	2.1	120	0500	23
Lyrids (LYR)	Apr 15-Apr 29	Apr 22	032.4°	18:10	+33.3°	46.8	2.1	18	0400	14
eta Aquarids (ETA)	Apr 15-May 27	May 05	046.2°	22:30	-01.1°	65.5	2.4	60	0400	26
Southern delta Aquarids (SDA)	Jul 18-Aug 21	Jul 30	127.6°	22:42	-16.3°	40.3	3.2	20	0300	25
Perseids (PER)	Jul 14-Sep 01	Aug 12	140.0°	03:13	+58.0°	58.8	2.6	100	0400	07
Orionids (ORI)	Sep 26-Nov 22	Oct 20	207.5°	06:21	+15.6°	66.1	2.5	23	0500	17
Leonids (LEO)	Nov 03-Dec 02	Nov 18	236.0°	10:17	+21.6°	70.0	2.5	15	0500	18
Geminids (GEM)	Nov 19-Dec 24	Dec 13	262°0	07:34	+32.3°	33.8	2.6	120	0100	12
Ursids (URS)	Dec 13-Dec 24	Dec 22	270°5	14:36	+75.3°	33.0	3.0	10	0500	22

Tropospheric Ducting

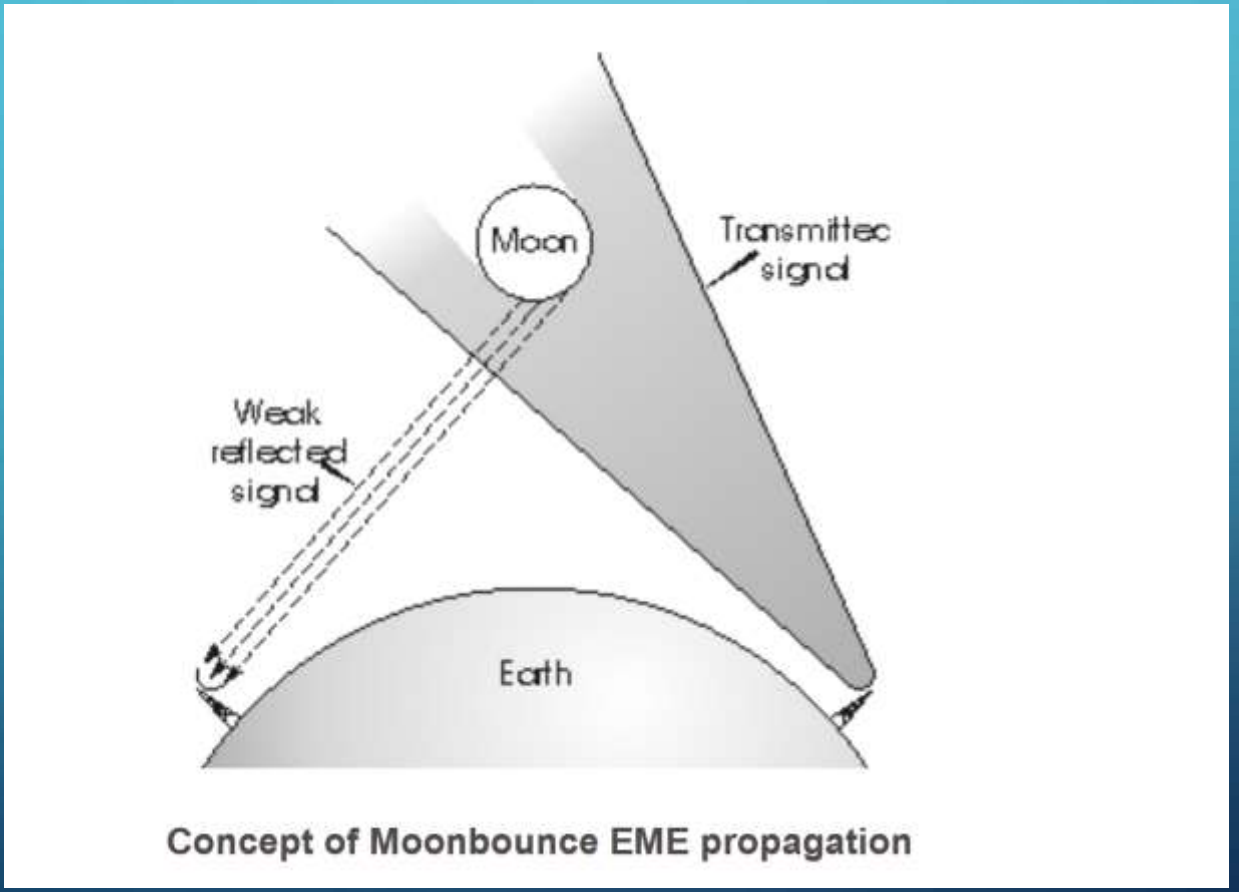


DUCTING

Signals bend down and reflect off the ground.
RX receives signal from TX. Radar shows strong ground clutter.

W. HEPBURN

EME



Concept of Moonbounce EME propagation

RADIOS


COMMUNICATOR


SIX METER AMATEUR TRANSCEIVER
HEATHKIT
THE "SIXER"
MICROPHONE
VOLUME
TUNING
POWER
TRANS.


ICOM
IC-7300
TWIN PBT
POWER
TRANSMIT
TUNER
VOX/BK-IN
PHONES
MIC
NOTCH
NB
NR
AF
RF/SQL
SD CARD
CW
FIL2
21:05
7.025.00
VFO A
P.AMP1 AGC-M
SPECTRUM SCOPE
< 1 >
SPAN
HOLD
CENT/FIX
EXPD/SET
MULTI
XFC
TX/RX
AUTO TUNE
RIT
ΔTX
CLEAR
SPLIT
A/B
V/M
MPAD
MENU
FUNCTION
M.SCOPE
QUICK
EXIT
SPEECH


YAESU
21.295.000
21.300.000
NB
SCP
SFT
CLAR


ELECRAFT K3 TRANSCEIVER
14.195.000
14.200.00
BAND
VOX
QSK
MENU
GROUP
DISP
METER
MODE
ALT
±/TEST
XMIT
TUNE
ATU TUNE
ATU
POWER
RX ANT
ANT
TX
Δf
PHONES
MIC
RF
SQL
AF
SUB
SHIFT
LO
CUT
HI
WIDTH
NORM
SPEED
IN
MIC
CMP
OUT
PWR
DELAY
MON
FREQ ENT
SCAN
FINE
RSE
LOCK
SUB
A/B
REV
A►B
B SET
VFO
SPLIT
AF REC
AF PLAY
PRE
ATT
AGC
OFF
XFIL
DISP BW
NB
LEVEL
NR
ADJ
NTCH
MAN
MESSAGE
SPOT
PF1
CWT
PF2
AFX
PF3
RIT
RATE
XIT
DISP OFS
CLR
www.rigpix.com

ANTENNAS

Small size due to short wavelength
Easy to build and erect
Clever designs
Polarization becomes a factor

AMATEUR RADIO ANTENNA LENGTH CHART

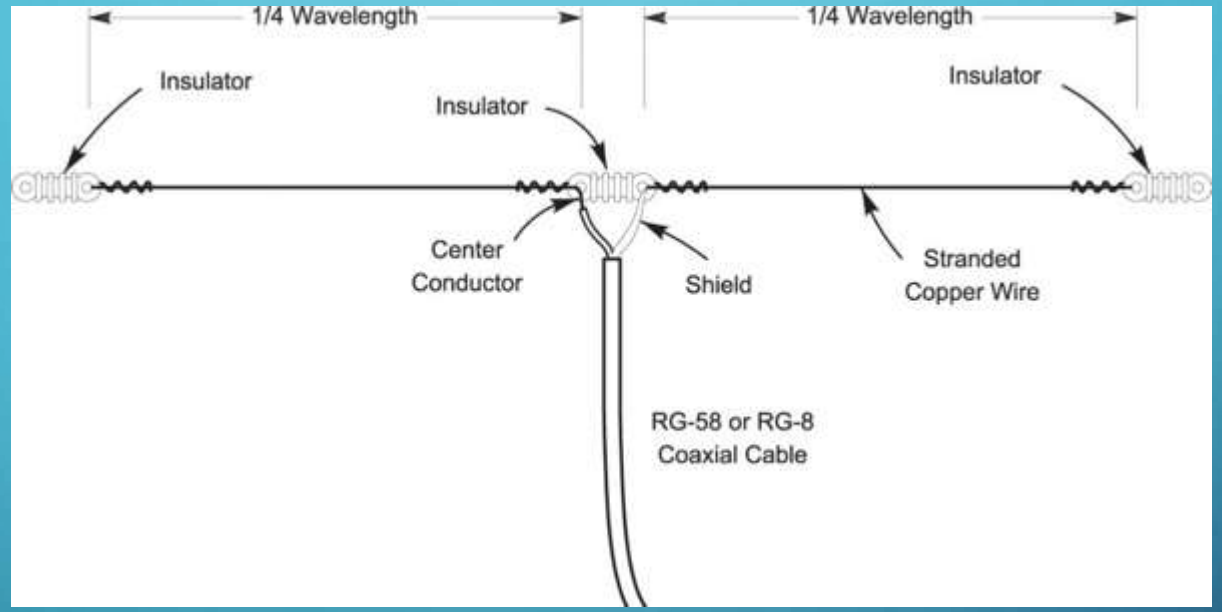
	FREQUENCY (Mhz)	1/4λ (Feet)	1/2λ (Feet)	1λ (Feet)	1/2λ Inv Vee 90° (Feet)
	1.800	130' 0"	260' 0"	558' 4"	257' 5"
	1.850	126' 6"	253' 0"	543' 3"	250' 5"
160 METERS	1.900	123' 2"	246' 4"	528' 11"	243' 10"
	2.000	117' 0"	234' 0"	502' 6"	231' 8"
	3.500	66' 10"	133' 9"	287' 2"	132' 5"
	3.750	62' 5"	124' 10"	268' 0"	123' 7"
80 METERS	3.900	60' 0"	120' 0"	257' 8"	118' 10"
	4.000	58' 6"	117' 0"	251' 3"	115' 10"
	7.000	33' 5"	66' 10"	143' 7"	66' 2"
40 METERS	7.150	32' 9"	65' 5"	140' 7"	64' 10"
	7.300	32' 1"	64' 1"	137' 8"	63' 6"
30 METERS	10.100	23' 2"	46' 4"	99' 6"	45' 10"
	10.150	23' 1"	46' 1"	99' 0"	45' 8"
	14.000	16' 9"	33' 5"	71' 9"	33' 1"
	14.150	16' 6"	33' 1"	71' 0"	32' 9"
20 METERS	14.300	16' 4"	32' 9"	70' 3"	32' 5"
	14.350	16' 4"	32' 7"	70' 0"	32' 3"
17 METERS	18.068	12' 11"	25' 11"	55' 7"	25' 8"
	18.168	12' 11"	25' 9"	55' 4"	25' 6"
	21.000	11' 2"	22' 3"	47' 10"	22' 1"
15 METERS	21.200	11' 0"	22' 1"	47' 5"	21' 10"
	21.450	10' 11"	21' 10"	46' 10"	21' 7"
12 METERS	24.890	9' 5"	18' 10"	40' 5"	18' 7"
	24.990	9' 4"	18' 9"	40' 3"	18' 6"
	28.000	8' 4"	16' 9"	35' 11"	16' 7"
10 METERS	28.500	8' 3"	16' 5"	35' 3"	16' 3'
	29.700	7' 11"	15' 9"	33' 10"	15' 7"
6 METERS	50.000	4' 8"	9' 4"	20' 1'	9' 3"
	54.000	4' 4"	8' 8"	18' 7"	8' 7"
2 METERS	144.000	1' 8"	3' 3"	7' 0"	3' 3"
	148.000	1' 7"	3' 2"	6' 9"	3' 2"

Antenna length calculations are based on the following formulas:
1/2 wave dipole (feet) = 468/frequency in Mhz
Full wave loop (feet) = 1005/frequency in Mhz
Inverted Vee with 90 degree included angle is 95% the length of 1/2 wave dipole

Note:
Cut wire slightly longer to allow for connecting insulators and pruning.
Height above ground, nearby wires, trees, etc. will change tuning slightly.

MILLENNIA ARTS

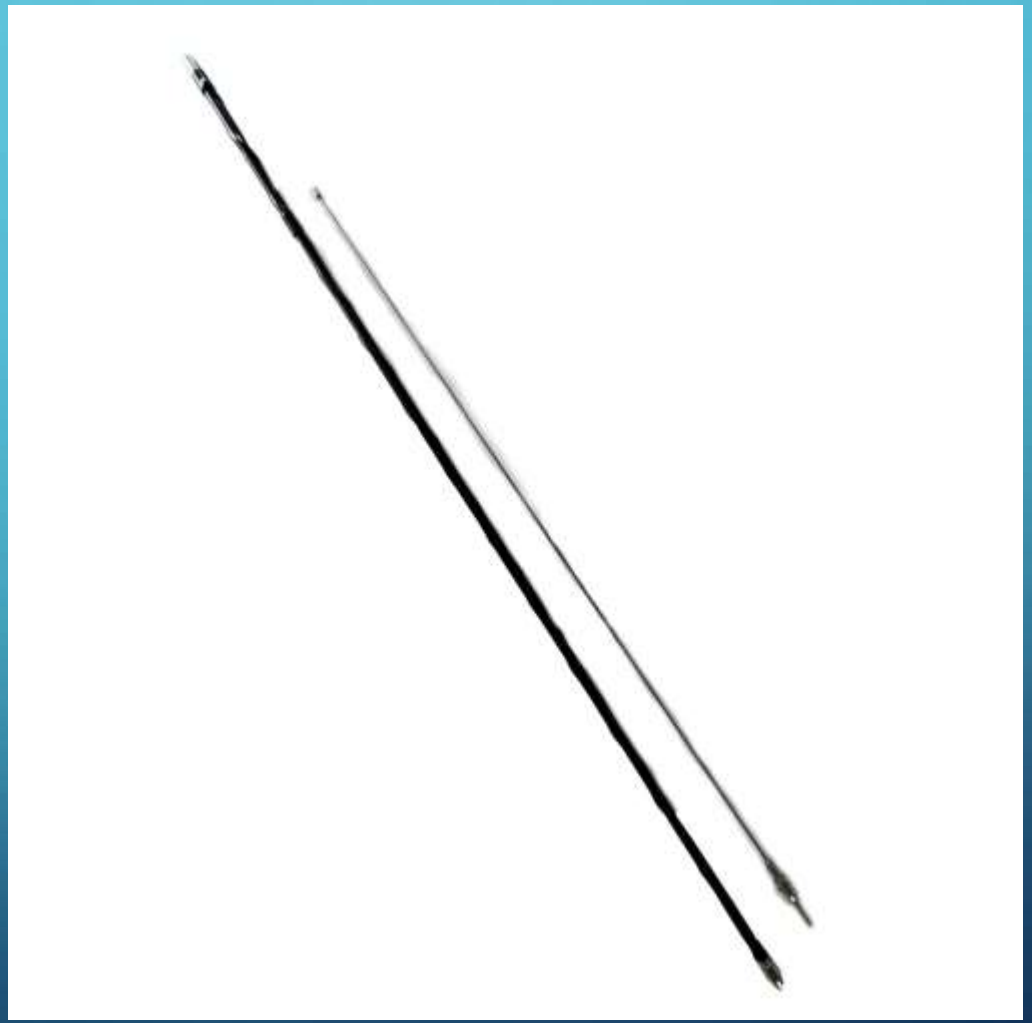
Simple Dipole



$$L = \frac{468}{f}$$

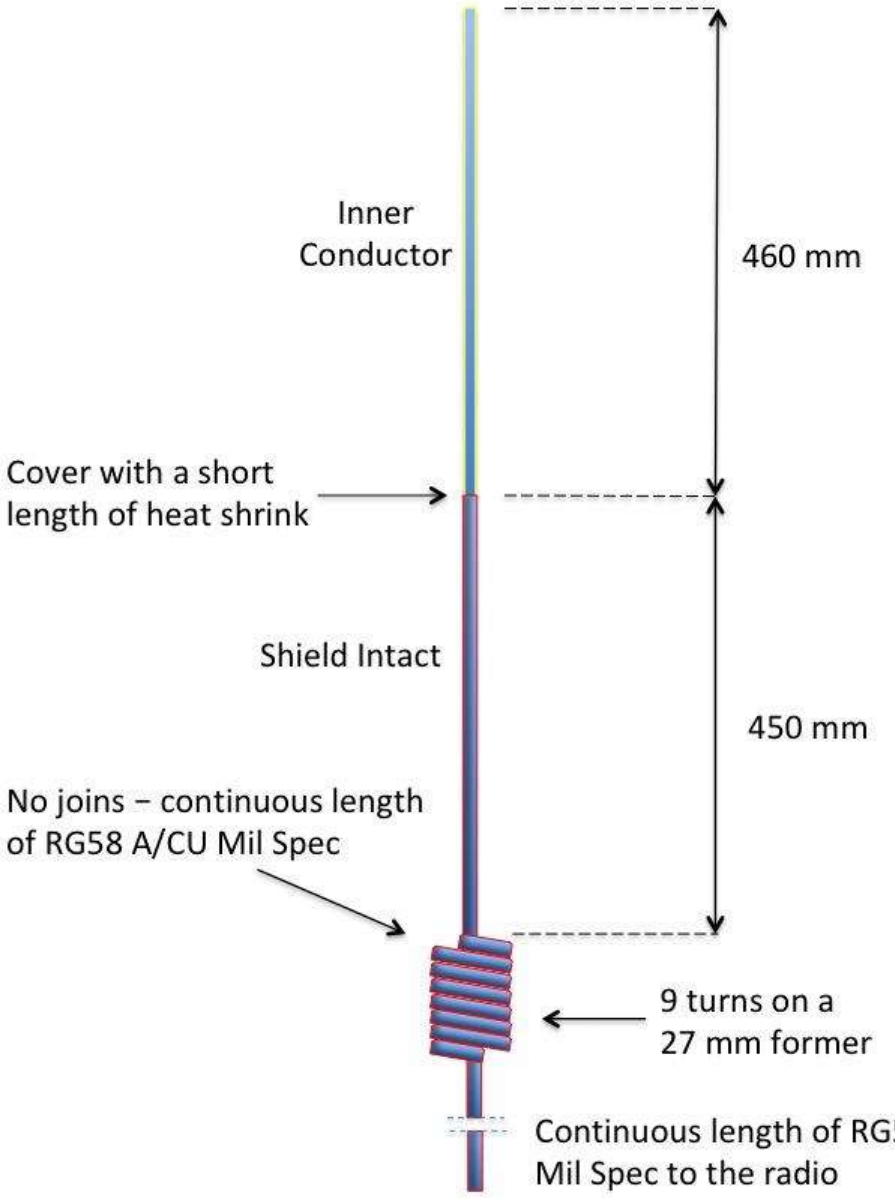
468 / 50.313 = 9.3 ft

Hamstick



FlowerPot

“Coaxial Antenna”



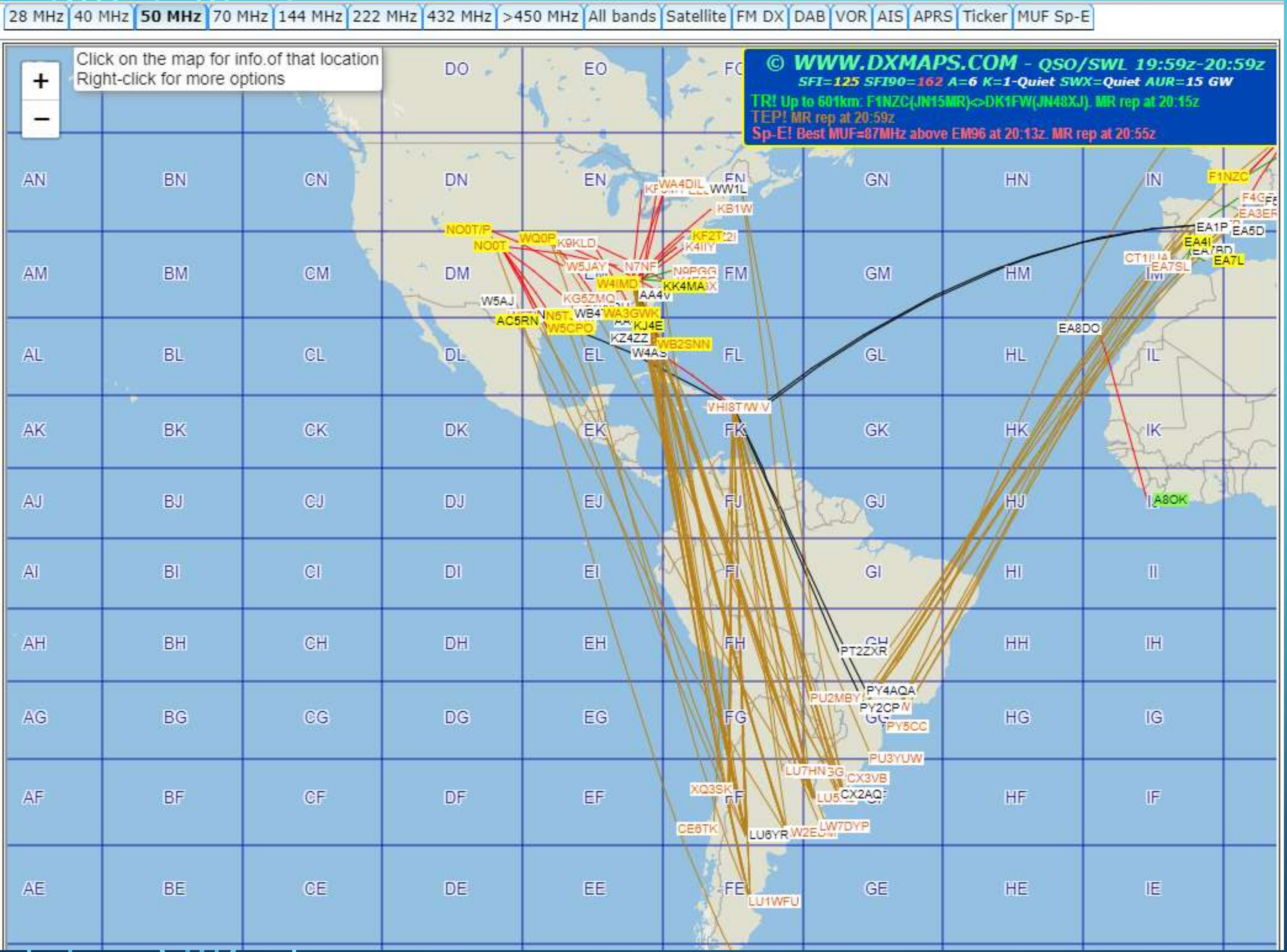
2m 144.2 MHz ½ wave Coaxial Dipole VK1AD

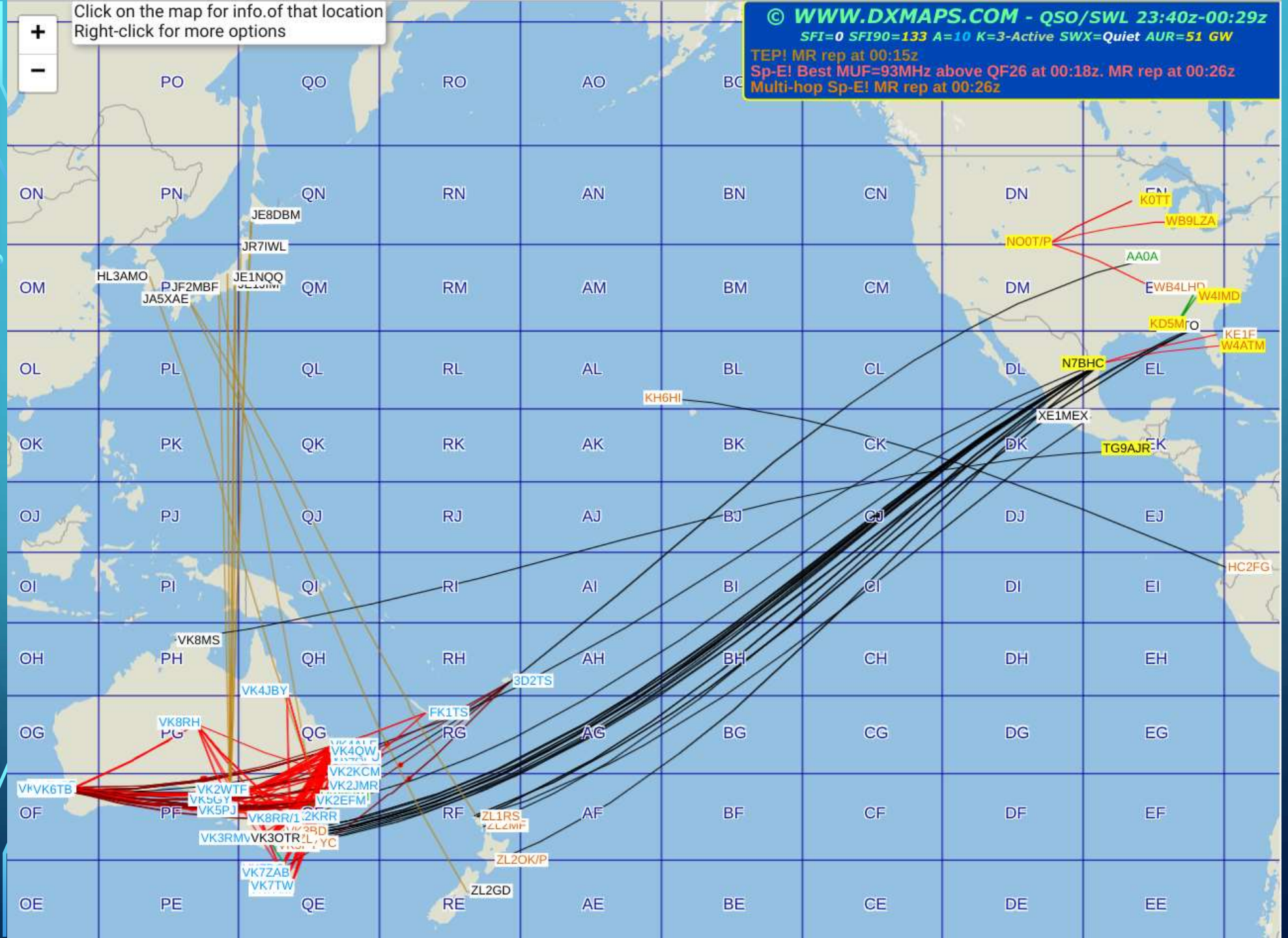
Moxon

Yagi

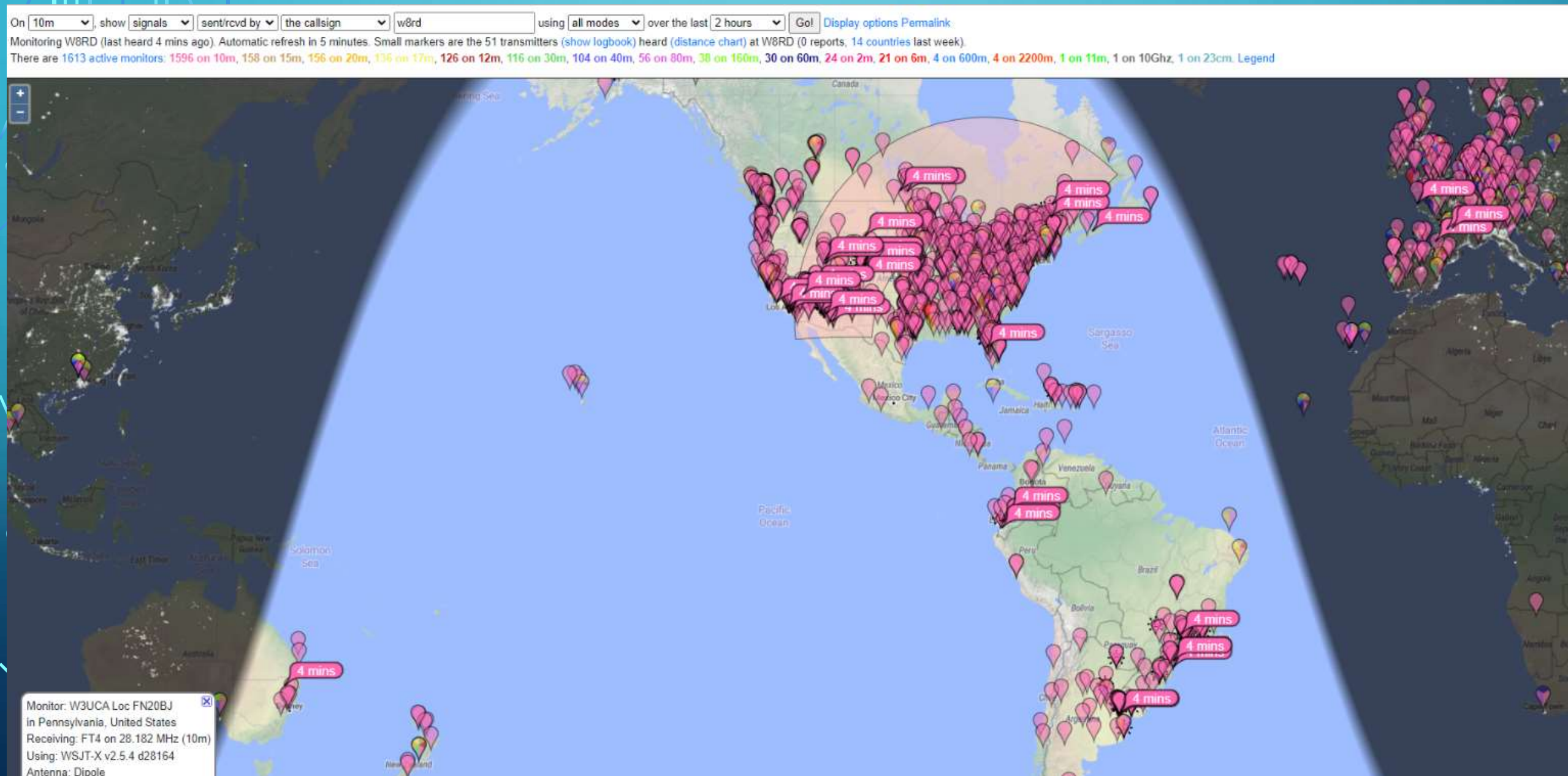
SOFTWARE

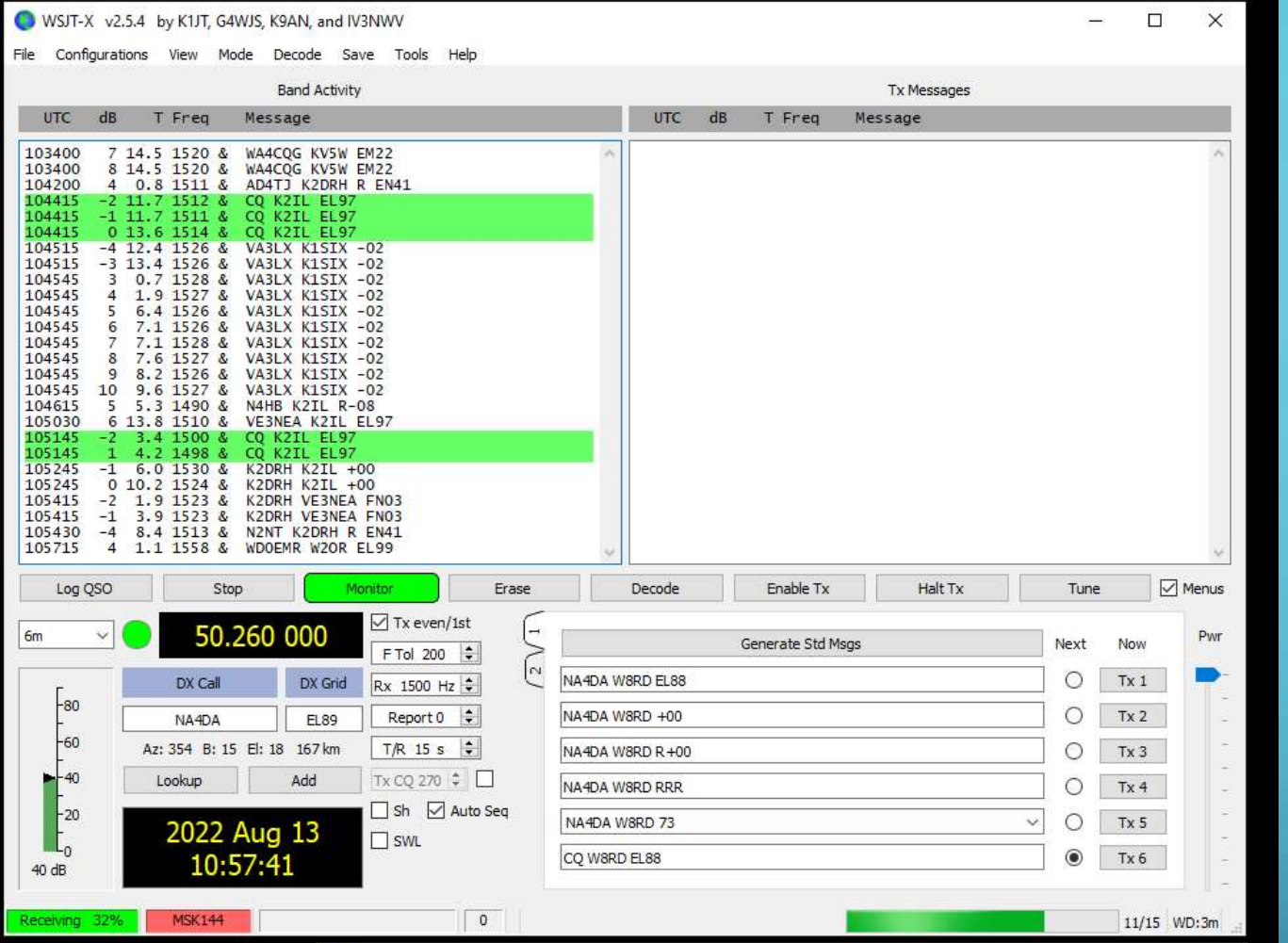
DXMaps.com

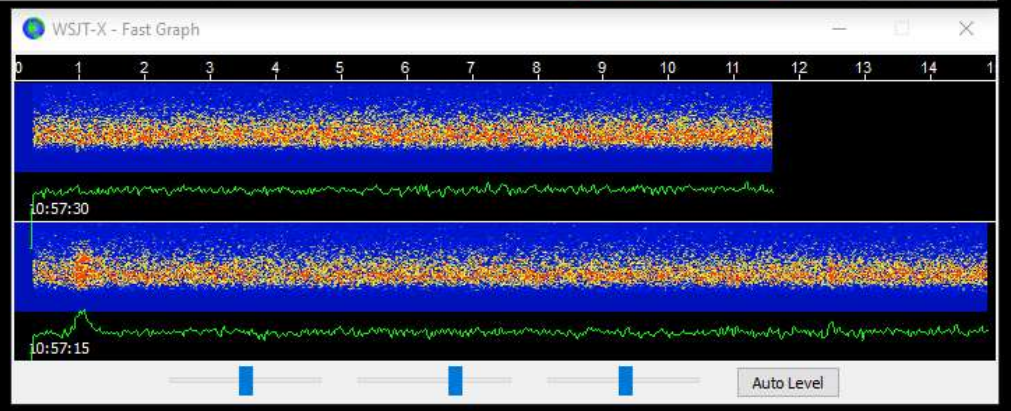

28 MHz 40 MHz 50 MHz 70 MHz 144 MHz 222 MHz 432 MHz >450 MHz All bands Satellite FM DX DAB VOR AIS APRS Ticker MUF Sp-E
Click on the map for info.of that location
Right-click for more options
© WWW.DXMAPS.COM - QSO/SWL 19:59z-20:59z
SFI=125 SFI90=162 A=6 K=1-Quiet SWX=Quiet AUR=15 GW
TR! Up to 601km: F1NZC(JN15MR)<>DK1FW(JN48XJ). MR rep at 20:15z
TEP! MR rep at 20:59z
Sp-E! Best MUF=87MHz above EM96 at 20:13z. MR rep at 20:55z


Click on the map for info.of that location
Right-click for more options
© WWW.DXMAPS.COM - QSO/SWL 23:40z-00:29z
SFI=0 SFI90=133 A=10 K=3-Active SWX=Quiet AUR=51 GW
TEP! MR rep at 00:15z
Sp-E! Best MUF=93MHz above QF26 at 00:18z. MR rep at 00:26z
Multi-hop Sp-E! MR rep at 00:26z
PO QO RO AO BO
ON PN QN RN AN BN CN DN EN
OM PM QM RM AM BM CM DM EM
OL PL QL RL AL BL CL DL EL
OK PK QK RK AK BK CK DK EK
OJ PJ QJ RJ AJ BJ CJ DJ EJ
OI PI QI RI AI BI CI DI EI
OH PH QH RH AH BH CH DH EH
OG PG QG RG AG BG CG DG EG
OF PF QF RF AF BF CF DF EF
OE PE QE RE AE BE CE DE EE
JE8DBM
JR7IWL
HL3AMO
JE1NQQ
PJF2MBF
JA5XAE
K0TT
WB9LZA
NO0T/P
AA0A
W4IMD
KD5M
KE1F
W4ATM
N7BHC
KH6HI
XE1MEX
TG9AJR
HC2FG
VK8MS
3D2TS
VK4JBY
FK1TS
VK8RH
VK4QW
VK2KCM
VK2JMR
VK6TB
VK2WTF
VK5PJ
VK2EFM
VK8RR/1
VK3RM
VK3OTR
ZL1RS
ZL2OK/P
VK7ZAB
VK7TW
ZL2GD

PSK Reporter







Meteor Scatter MSK144

Shower	Activity Period
Quadrantids (QUA)	Dec 26-Jan 16
Lyrids (LYR)	Apr 15-Apr 29
eta Aquarids (ETA)	Apr 15-May 27
Southern delta Aquarids (SDA)	Jul 18-Aug 21
Perseids (PER)	Jul 14-Sep 01
Orionids (ORI)	Sep 26-Nov 22
Leonids (LEO)	Nov 03-Dec 02
Geminids (GEM)	Nov 19-Dec 24
Ursids (URS)	Dec 13-Dec 24

Ping Jockey Central.

Relief page	Skeds in-progress	CQ Announcements	splat-65 Link
Refresh	Look back	Distance/Bearing Locator	Who's Earwigging?
Update User details	AA1YN Callsign database	Ray, W8RD FL EL88oa	Refreshed 13Aug 11:20

This page is to be used only for the purposes of discussing matters related to amateur radio meteor scatter communications.Any non-meteor scatter use is strictly prohibited.

That means DO NOT USE THIS PAGE TO WORK splat-65 or for General chit-chat.

Remember, in North America, 50.260MHz and 144.140MHz are calling not operating frequencies.

Exchanging any contact details on here before you're complete, invalidates the contact, and, if it's not HIGH-SPEED METEOR SCATTER, it doesn't belong here!

Enter your message here Go!

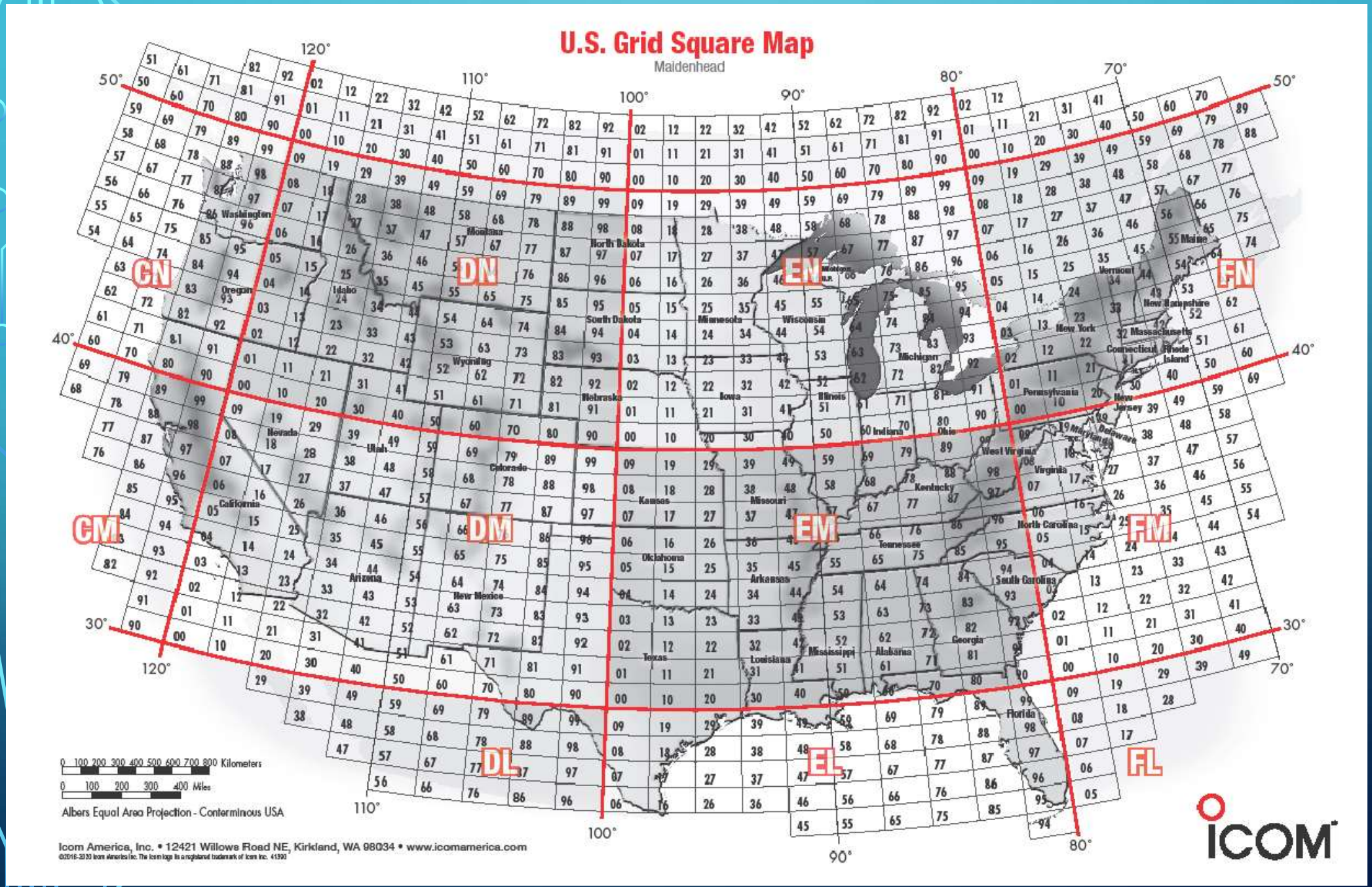
DDMMM UTC
13Aug 11:20 N5BO Justin, calling you from EM40 (W5ADD/6M Parker LA EM40wl)
13Aug 11:19 KC9ELU - Answering on 2 Mike (WA2FZW/6M/2M John NJ FN20tp)
13Aug 11:19 N1SV - tnx 2m q - ur best +13 (KC9ELU Mike IN EM79hj)
13Aug 11:18 Tnx new grid (N1SV Les MA FN42ep)
13Aug 11:18 111800 8 7.6 1599 & N1SV KC9ELU 73 (N1SV Les MA FN42ep)
13Aug 11:18 wow your killing it andy (K0TPP/2/6/222 Larry mo EM48rk)
13Aug 11:17 and another! (N1SV Les MA FN42ep)
13Aug 11:17 111700 5 11.4 1437 & WA2FZW K2DRH RRR - Thanks again Bob - Best ~Plus~14 - Looks like 2M Es! (WA2FZW/6M/2M John NJ FN20tp)
13Aug 11:17 full frame burn on 2m here (N1SV Les MA FN42ep)
13Aug 11:16 N2NT Andy, nice rocks on 222 on you (K0TPP/2/6/222 Larry mo EM48rk)
13Aug 11:16 N2NT loud here on 222 Andy (N0AKC Charlie WI EN44gu)
13Aug 11:15 NX3B Tom are you here? (WQ5S/6/2 Brad TX EM13ci)
13Aug 11:15 N4QWZ running 222085 (N2NT/6M2M/KW Andy NJ FN20si)
13Aug 11:13 N2NT calling 222.085 QWZ 1st running now (N4QWZ/6/2/222 Todd TN EM66ok)
13Aug 11:13 222085 (N2NT/6M2M/KW Andy NJ FN20si)
13Aug 11:12 watching (K0TPP/2/6/222 Larry mo EM48rk)
13Aug 11:12 wq0p tnx (N2NT/6M2M/KW Andy NJ FN20si)
13Aug 11:12 N2NT Andy, wathing too on 222 (K0TPP/2/6/222 Larry mo EM48rk)
13Aug 11:12 111115 20 0.5 1517 & WQ0P N2NT RRR thanks for the contact!!! (WQ0P/6/2/222 Greg KS EM19wf)
13Aug 11:11 N2NT, will be listening in on 222.085 as well (W0PN/2/222 Dan MO EM39rk)
13Aug 11:10 stop cq (K7ULS/6N2 Mike UT DN41bh)

CONTESTING AND AWARDS

ARRL January VHF Contest
ARRL June VHF Contest
CQ Worldwide VHF Contest
ARRL September VHF Contest

All modes are allowed

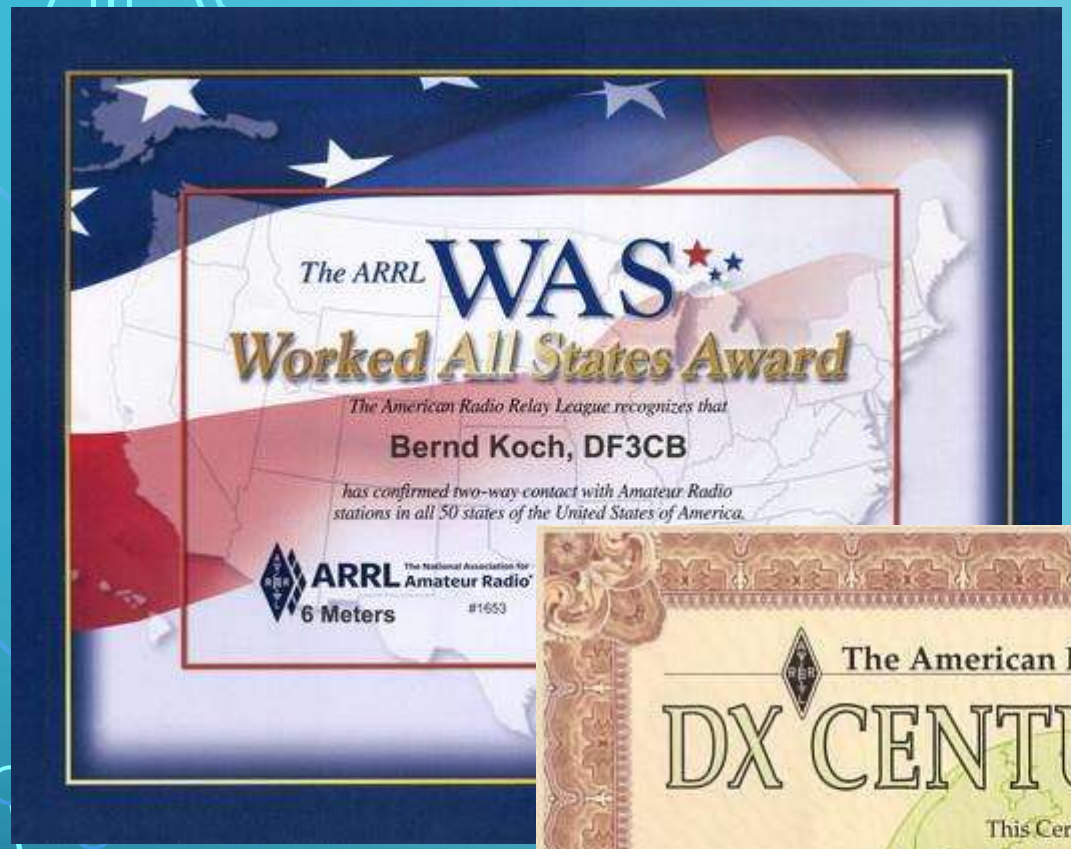
CW – SSB - Digital

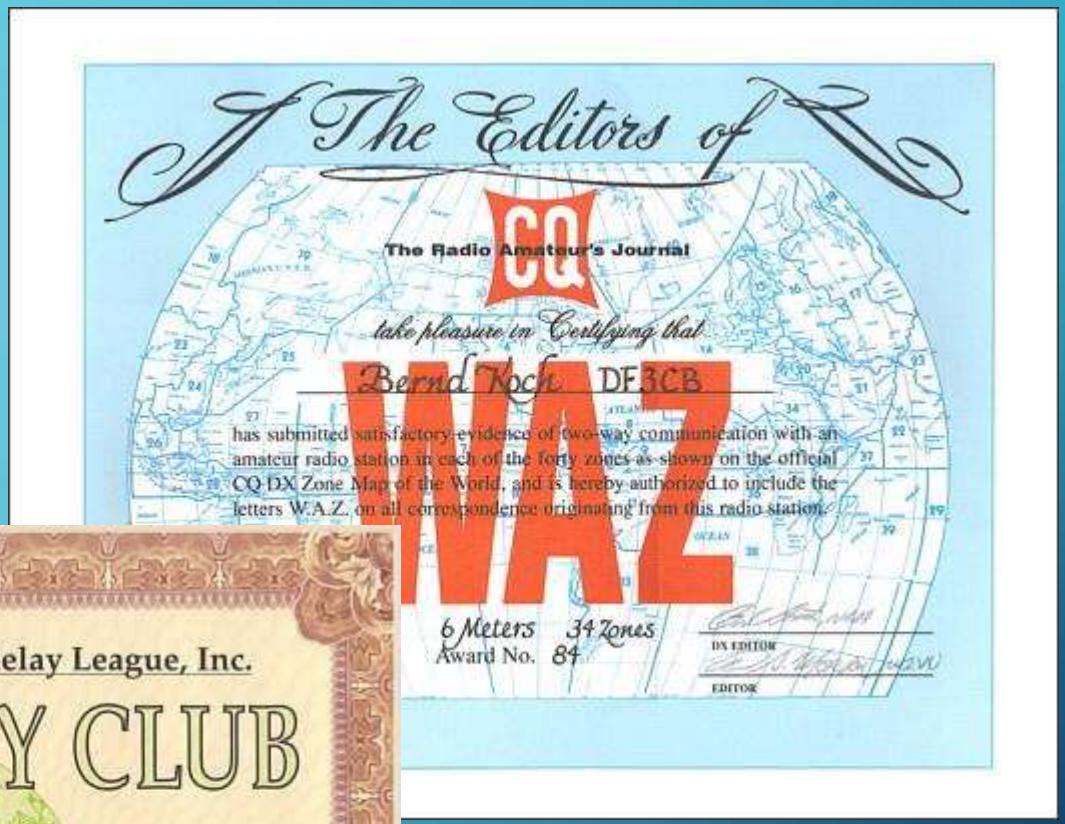

U.S. Grid Square Map
Maidenhead
CN
DN
EN
FN
CM
DM
EM
FM
DL
EL
FL
120°
110°
100°
90°
80°
70°
50°
40°
30°
Washington
Oregon
California
Nevada
Idaho
Montana
Wyoming
Utah
Arizona
Colorado
New Mexico
North Dakota
South Dakota
Nebraska
Kansas
Oklahoma
Texas
Minnesota
Iowa
Missouri
Arkansas
Louisiana
Wisconsin
Illinois
Michigan
Indiana
Ohio
Kentucky
Tennessee
Mississippi
Alabama
Georgia
Florida
South Carolina
North Carolina
Virginia
West Virginia
Pennsylvania
New York
Maine
Vermont
New Hampshire
Massachusetts
Connecticut
Rhode Island
New Jersey
Delaware
Maryland
0 100 200 300 400 500 600 700 800 Kilometers
0 100 200 300 400 Miles
Albers Equal Area Projection - Conterminous USA
Icom America, Inc. • 12421 Willows Road NE, Kirkland, WA 98034 • www.icomamerica.com
ICOM

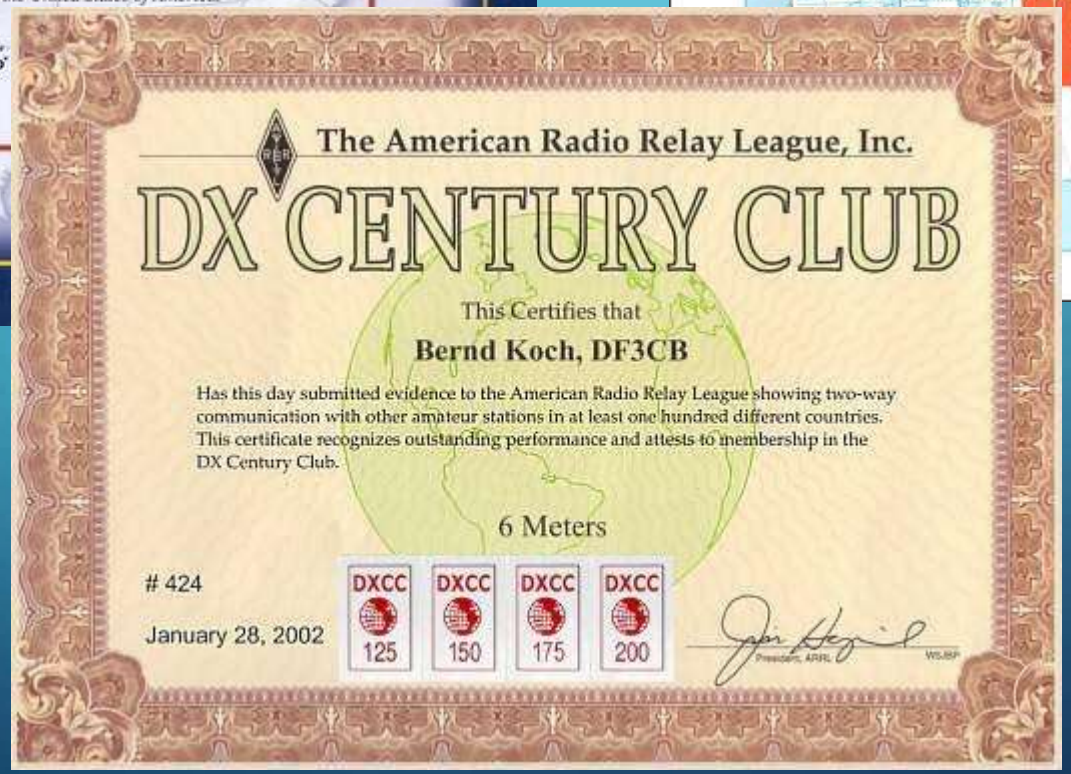
The Fred Fish Memorial Award

The Fred Fish Memorial Award was created in honor of Fred Fish, W5FF (SK), who was the first amateur to have worked and confirmed all 488 Maidenhead grid squares in the 48 contiguous United States on 6 Meters. The award will be given to any amateur who can duplicate W5FF's accomplishment.

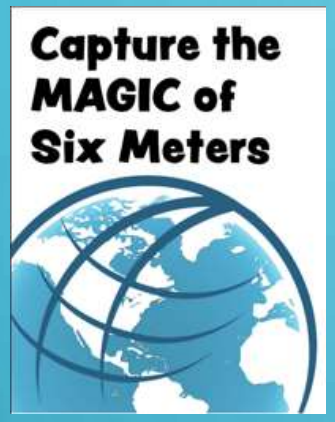

VUCC 125 50 MHz
VUCC 150 50 MHz
VUCC 175 50 MHz
VUCC 200 50 MHz
VHF/UHF Century Club
VUCC Award
Presented to
50 MHz
100 Grid Locators
Ray Dabkowski, W8RD
For submitting confirmation of two-way communication with amateur stations in 2° longitude × 1° latitude grid squares on the frequency band indicated. This outstanding achievement has earned the above membership in the exclusive VHF/UHF Century Club (VUCC).
Certificate #3461
June 10, 2022
K5UR
ARRL President
ARRL The national association for AMATEUR RADIO
VUCC 225 50 MHz
VUCC 250 50 MHz


The ARRL WAS
Worked All States Award
The American Radio Relay League recognizes that
Bernd Koch, DF3CB
has confirmed two-way contact with Amateur Radio stations in all 50 states of the United States of America.
ARRL The National Association for Amateur Radio
6 Meters
#1653

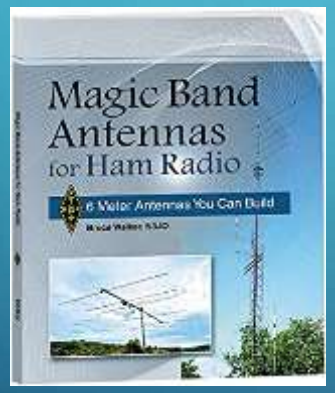

The Editors of
CQ
The Radio Amateur's Journal
take pleasure in Certifying that
Bernd Koch DF3CB
has submitted satisfactory evidence of two-way communication with an amateur radio station in each of the forty zones as shown on the official CQ DX Zone Map of the World, and is hereby authorized to include the letters W.A.Z. on all correspondence originating from this radio station.
WAZ
6 Meters 34 Zones
Award No. 84
DX EDITOR
EDITOR


The American Radio Relay League, Inc.
DX CENTURY CLUB
This Certifies that
Bernd Koch, DF3CB
Has this day submitted evidence to the American Radio Relay League showing two-way communication with other amateur stations in at least one hundred different countries. This certificate recognizes outstanding performance and attests to membership in the DX Century Club.
6 Meters
424
January 28, 2002
DXCC 125
DXCC 150
DXCC 175
DXCC 200

RESOURCES



Free eBook from K5ND
(see K5ND.net)



ARRL Book
“Magic Band Antennas”

YouTube is your
friend

What's your favorite band?