Fun on Old TV Channel 1

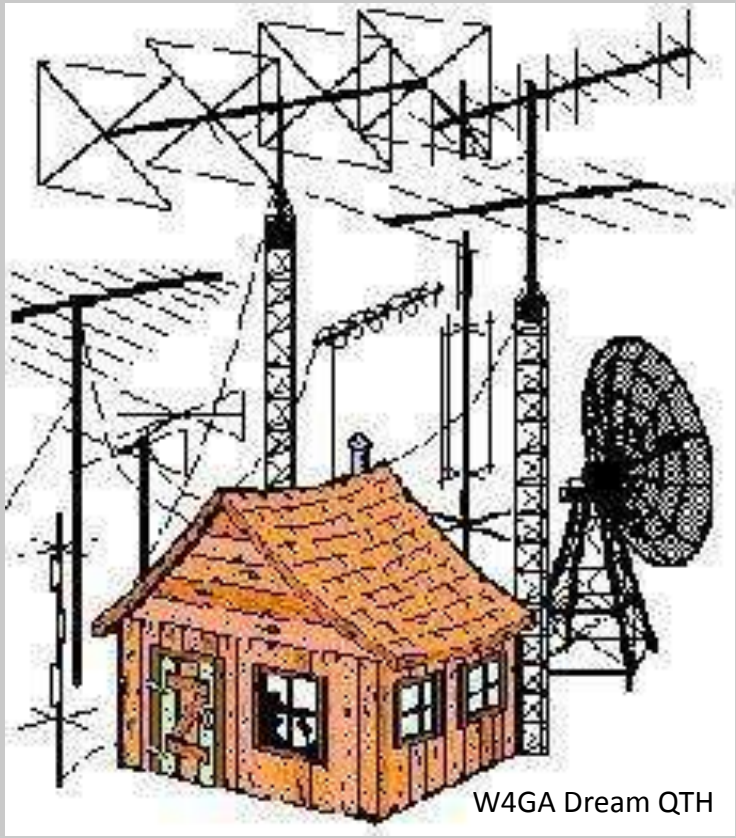
(well sorta)

Your Guide Tonight

Bob Mantell, W4GA

First Licensed 1987 KB4YQU
2nd Time as KJ4ESA in 2008
2008 General upgrade K4ESA
2010 Extra upgrade N4AN , Then W4GA
Other hobbies include: Auto Racing, Sailing, Rocking on the front porch in the Mountains

Last 20 years worked in the auto racing industry selling driver safety gear…
RaceQuip, G-Force, RacerWholesale


W4GA Dream QTH

My mission is to stimulate you to learn more about the parts of 6 Meters you find interesting

You will have a overview…
Use your search engine for the rest!

Terms and Slang to Know

- Enthusiast vs Expert
- “125”… 50.125 SSB home base
- Es, E-skip - Sporadic E layer Propagation
- MS - Meteor Scatter ….non the state
- Rocks (Rox), rock burns, rock bumps, blue whizzers - MS terms
- The band is only dead if everyone is listening
- Make some noise….. Get on VHF and call CQ

“ The Magic Band”
Topics for Tonight

- 6 Meter History
- Where to Tune…What to Hear…How to Do it
- Collecting on Six…Grids, VUCC, FFMA, & DXCC
- Propagation- Es Basics , over view of others
- 6M antennas

How did we get a 6 M allocation? 50.0 to 54.0 MHz

50.0-50.1	CW, beacons
50.060-50.080	beacon subband
50.1-50.3	SSB, CW
50.10-50.125	DX window
50.125	SSB calling
50.3-50.6	All modes
50.6-50.8	Nonvoice communications
50.62	Digital (packet) calling
50.8-51.0	Radio remote control (20-kHz channels)
51.0-51.1	Pacific DX window
51.12-51.48	Repeater inputs (19 channels)
51.12-51.18	Digital repeater inputs
51.5-51.6	Simplex (six channels)
51.62-51.98	Repeater outputs (19 channels)
51.62-51.68	Digital repeater outputs
52.0-52.48	Repeater inputs (except as noted; 23 channels)
52.02, 52.04	FM simplex
52.2	TEST PAIR (input)
52.5-52.98	Repeater output (except as noted; 23 channels)
52.525	Primary FM simplex
52.54	Secondary FM simplex
52.7	TEST PAIR (output)
53.0-53.48	Repeater inputs (except as noted; 19 channels)
53.0	Remote base FM simplex
53.02	Simplex
53.1, 53.2, 53.3, 53.4	Radio remote control
53.5-53.98	Repeater outputs (except as noted; 19 channels)
53.5, 53.6, 53.7, 53.8	Radio remote control
53.52, 53.9	Simplex

Q-1 What year did 6M Ham band start is US?

A-1 1946

Short TV Channel 1 History Lesson

Channel 1 was at 44–50 MHz from 1937 to 1940.

TV channel 1 frequency was moved to 50–56 MHz in 1941, visual at 51.25 MHz and audio at 55.75 MHz. FM Radio band was 42 to 50 MHz during this time.

Spring of 1946, Channel 1 moved back to 44–50 MHz. FM moved to 88–108 MHz band.

Channel 1 was reserved for low power community stations

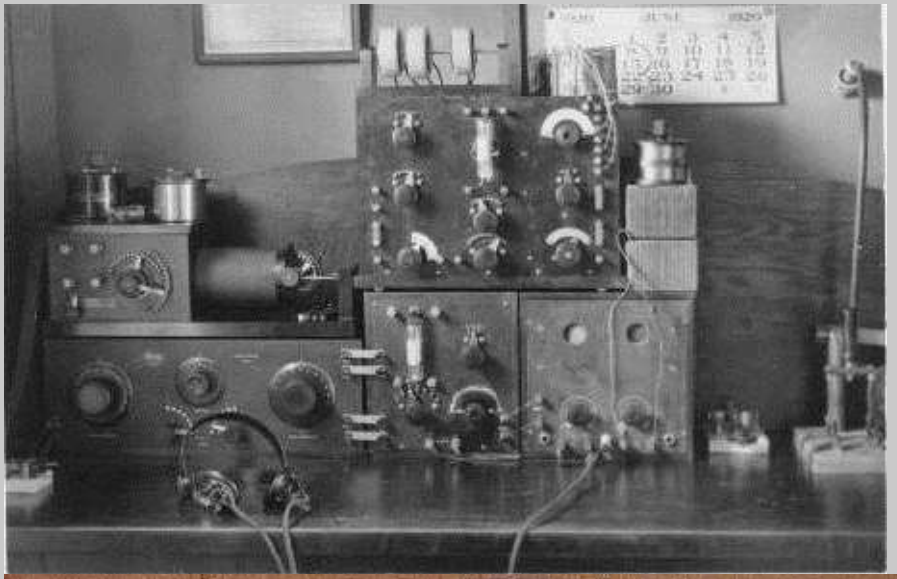
Handful of construction permits issued for this final version of Channel 1, no station ever broadcast on it before it was removed from use in 1948

On October 10, 1924, the 5-meter band (56 – 64 MHz) made available to US amateurs

October 4, 1927, worldwide basis 56 – 60 MHz was allocated for amateur.

In 1938 TV broadcasting given priority in part of the 5 and 6 meter band in Europe.

FCC Order 130-C on March 1, 1946 created the 6-meter Ham Band, 50 – 54 MHz.



Getting on the air on 6M SSB/CW

- Most current HF rigs have 6 M
- Dipole: 1/2 wave length at 50.150 is just over 9 ft
- Antennas easy to build and put up
- 18 to 25 feet up with a 3 ele yagi +100W = LOTS of contacts on Es openings
- Your 40/15 wire or tri-bander yagi may tune you and work well in for strong Es

More on 6M antennas later

Ham Band (Meters)	Frequency (Mhz)	1/4 wave (Feet)	1/2 wave Dipole (Feet)	1 wave Loop (Feet)
6	50.000	4' 8''	9' 4''	21' 1''
	54.000	4' 4''	8' 8''	18' 7''
2	144.000	1' 8''	3' 3''	7' 0''
	148.000	1' 7''	3' 2''	6' 9''

Antenna length is based on the following formulas

1/2 wave dipole (feet) = 468 / frequency in Mhz.
(1/4 wave, use 234 / frequency in Mhz)

Full wave loop (feet) = 1005 / frequency in Mhz

Cut total wire length slightly longer for connecting insulators/pruning as needed for lowest swr.

6M Modes, Where the Action is, & Band Plan

Band range 50.000 to 53.999
Beacon sub band 50.060 to 50.080
CW only(no digital!) 50.000 to 50.099
Where to find CW 50.080 to 50.100, or higher
DX window 50.100 to 50.124
DX Calling 50.110
SSB Calling 50.125
Digi modes MS, EME 50.240-270
AM calling 50.400
Above 51.1…
Does not matter cause your proper SSB/CW antenna does not work there
FM Simplex Calling 52.525
FM Repeaters…..Somewhere above 51.125… look it up if needed.

Digital modes gaining popularity

I propose an ATL "go to", 50.170. If you are moving a QSO off 50.125, maybe a Net some day? 9:30 Monday 6 M gathering after Tech Net?

More 6M Tips

Lots of waiting on 6M ….listening to static… time to do QSL cards

Have your Headset handy….rare ones can be weak!

Listen for beacons… 50.060 to 50.080

W4CLM/B Cartersville on 50.064

Watch spots for W4CLM/B to know if band is open to North GA

Spot pages:

DX Heat…… Targeted

DXMAPS… ex DXVHF site. Has Line maps and VHF MUF Map

SSB Nets near by:

Monday Net LaGrange, Ga 50.155 8PM Buzzard net
M-F Huntsville, AL 50.150 10PM , Calls for Eastern time zone at 10:05
Wednesday Milledgeville, Ga hole in the wall net 50.135 8PM-9PM

Still More 6 Meter Operating Tips

The band is only dead when if everyone is listening and no one is making noise

Always someone listening on 50.125 local.
Higher your antenna, further away you hear them, 100-150 miles with 3 ele yagi and 100W

50.125 Is “calling frequency”
Share it, don’t hog it
Slow key to allow DX in “ you guys want DM93?”
Move Ragchews up band…higher the better

Move up band to run pileups to let new and smaller stations have .125 as opening expands
You will do better with a run in the clear as 50.125 has locals on it everywhere.
Multi hops are often weaker, listen and call for weak ones in the pile up.
Listen for the rover, mobiles and QRP folks, often weaker, but with rare grids

Look to 50.200 or higher during major opening and contests for clear room or for contacts

Spread out…Lots of folks do not have K3s and have set ups for weak signals…there is plenty of room up to 50.400 (or higher) to make contacts. Plus often you can work stations who are not showing any signal on your meter if the other strong ones are 5kc away

Openings move FAST on 6M…Keep you transmissions short are you may find yourself talking to static.

“What's your grid square?"

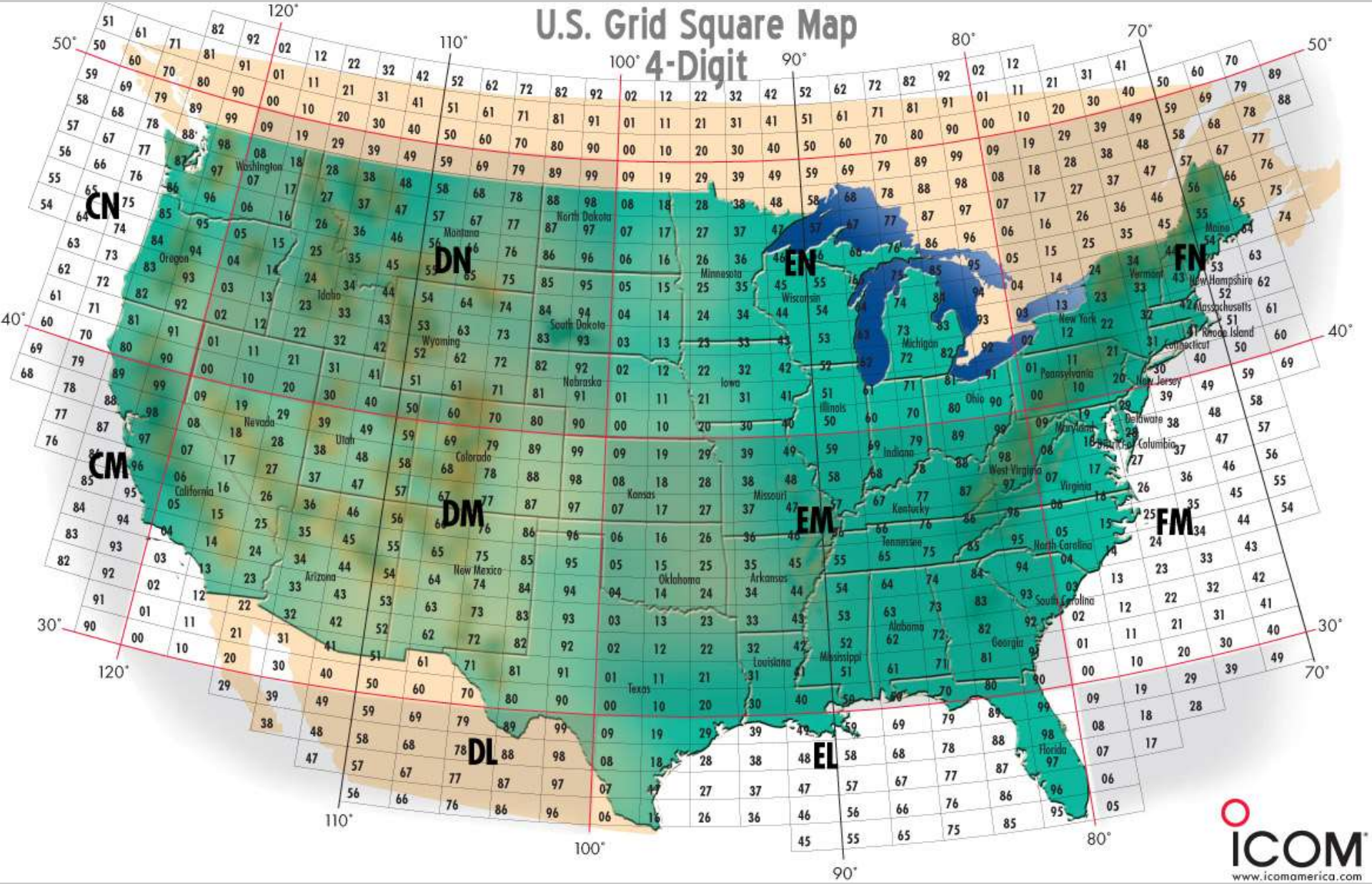
This is Whiskey Four Gulf Alpha, Echo Mike Seven Four

Maidenhead grid-square system, formalized at a VHF meeting in Britain in 1980 and adopted world-wide by the International Amateur Radio Union in 1985, used as a locator system by VHF, UHF and microwave operators. The Maidenhead system divides the world into 32,400 squares, each 2 degrees of longitude by 1 degree of latitude. There are larger "fields" of 100 locator squares each, and each square is divided into smaller "subsquares." For most purposes, knowing your 2 degree by 1 degree square is sufficient.

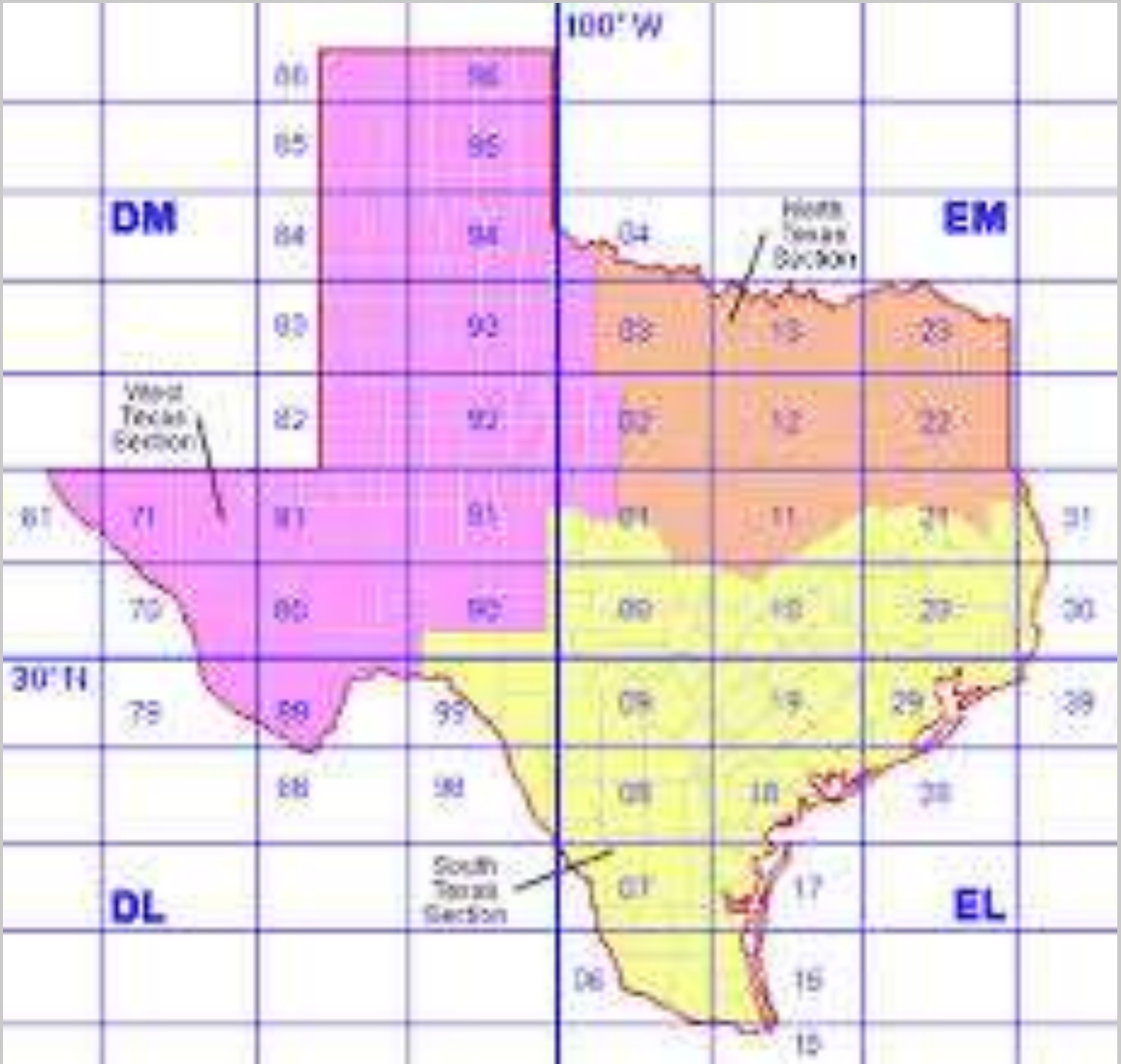
We are in EM??

What grid am I in ? Find out here:

http://www.levinecentral.com/ham/grid_square.php



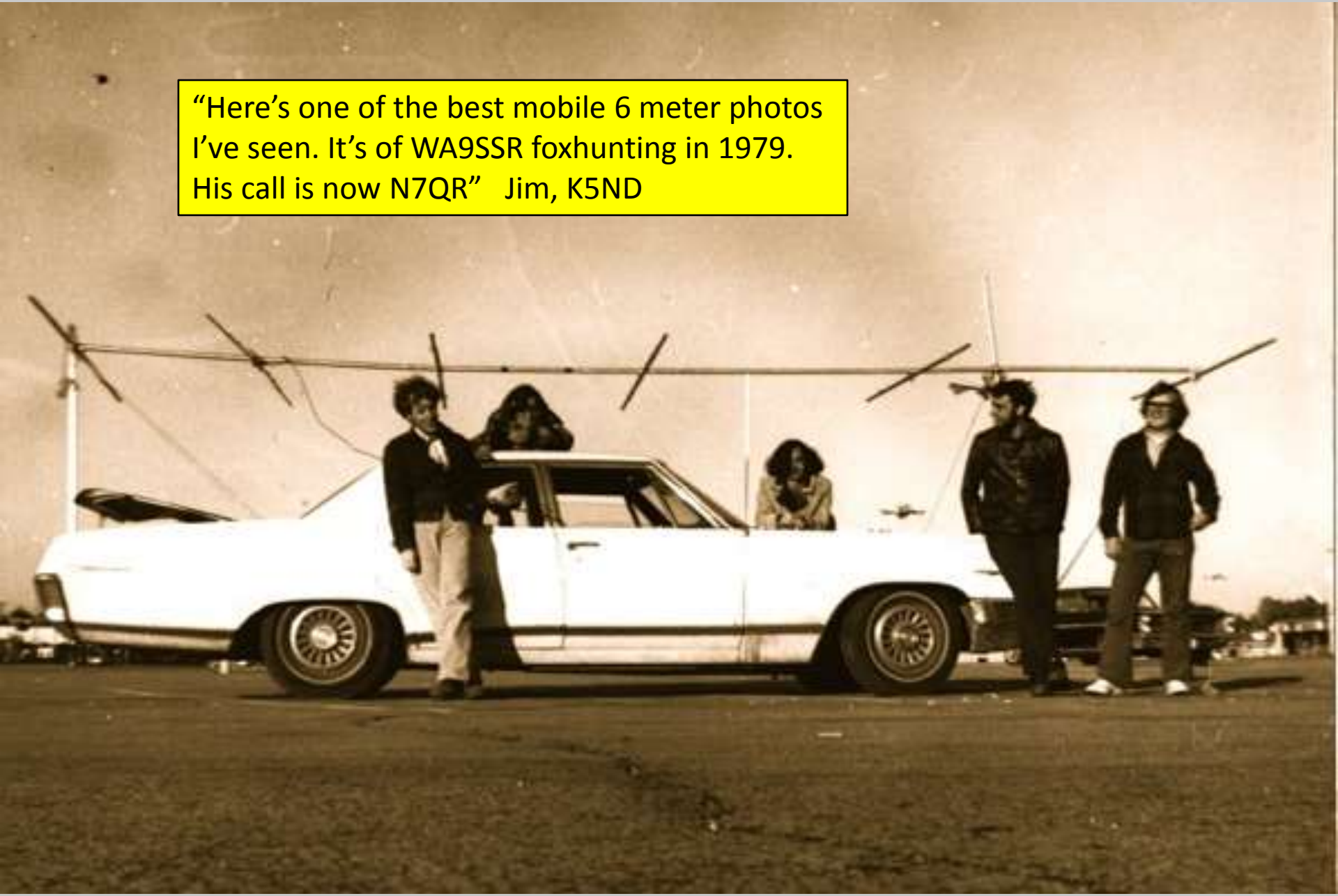
ICOM
www.icomamerica.com


100° W
DM
EM
DL
EL
30° N
West Texas Section
North Texas Section
South Texas Section

VHF operators collect grid squares like HF operators collect countries. The ARRL's Century Club (VUCC) award, requires confirmed contacts with 100 grid squares on 6 . During VHF contests, "Gridexpeditions," put rare grid squares on the air, while others become "rovers" to operate from several grids during the contest. Like states or countries serve as multipliers for HF-contest scores, grid squares are the typical multipliers for VHF-contest scores.

W7GJ July 2015 At 10,350' elevation, DN24
Twin Peaks Lookout in Custer County, Idaho

More Rovering and Portable ops on 6M


"Here's one of the best mobile 6 meter photos I've seen. It's of WA9SSR foxhunting in 1979. His call is now N7QR" Jim, K5ND

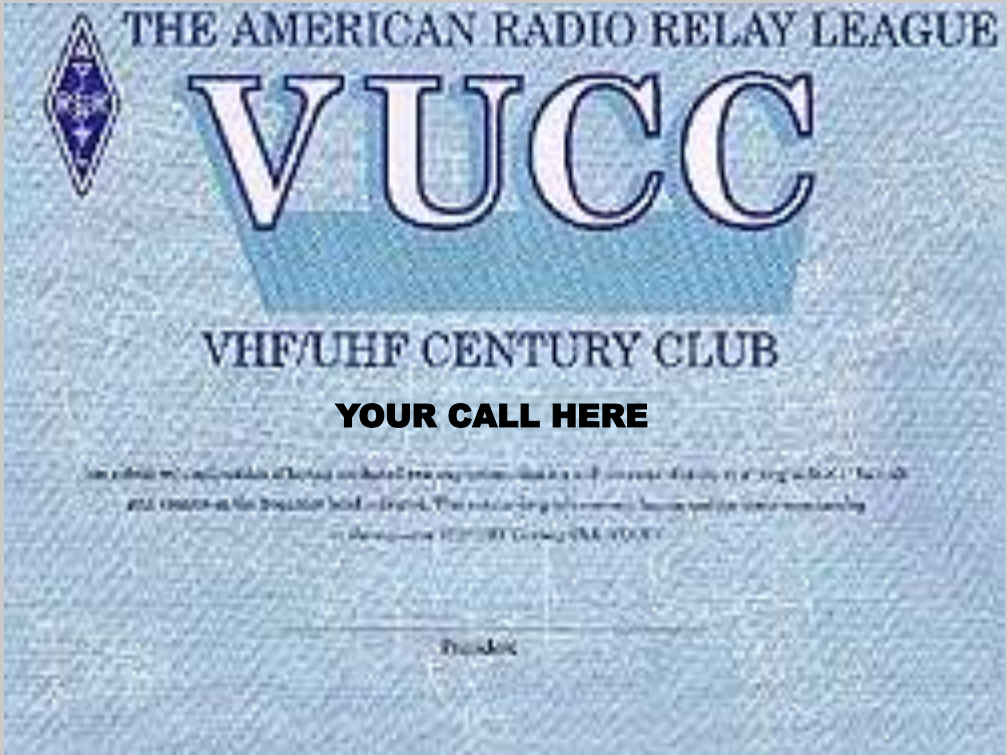
Awards to earn on 6M

DXCC…..Yes 100 entities on 6M

WAS…. First 48 are easy, last 2 are VERY hard (unless you did it before Cycle 24)

VUCC… 100 grids on 6M

FFMA…. All 488 US 48 state Grids



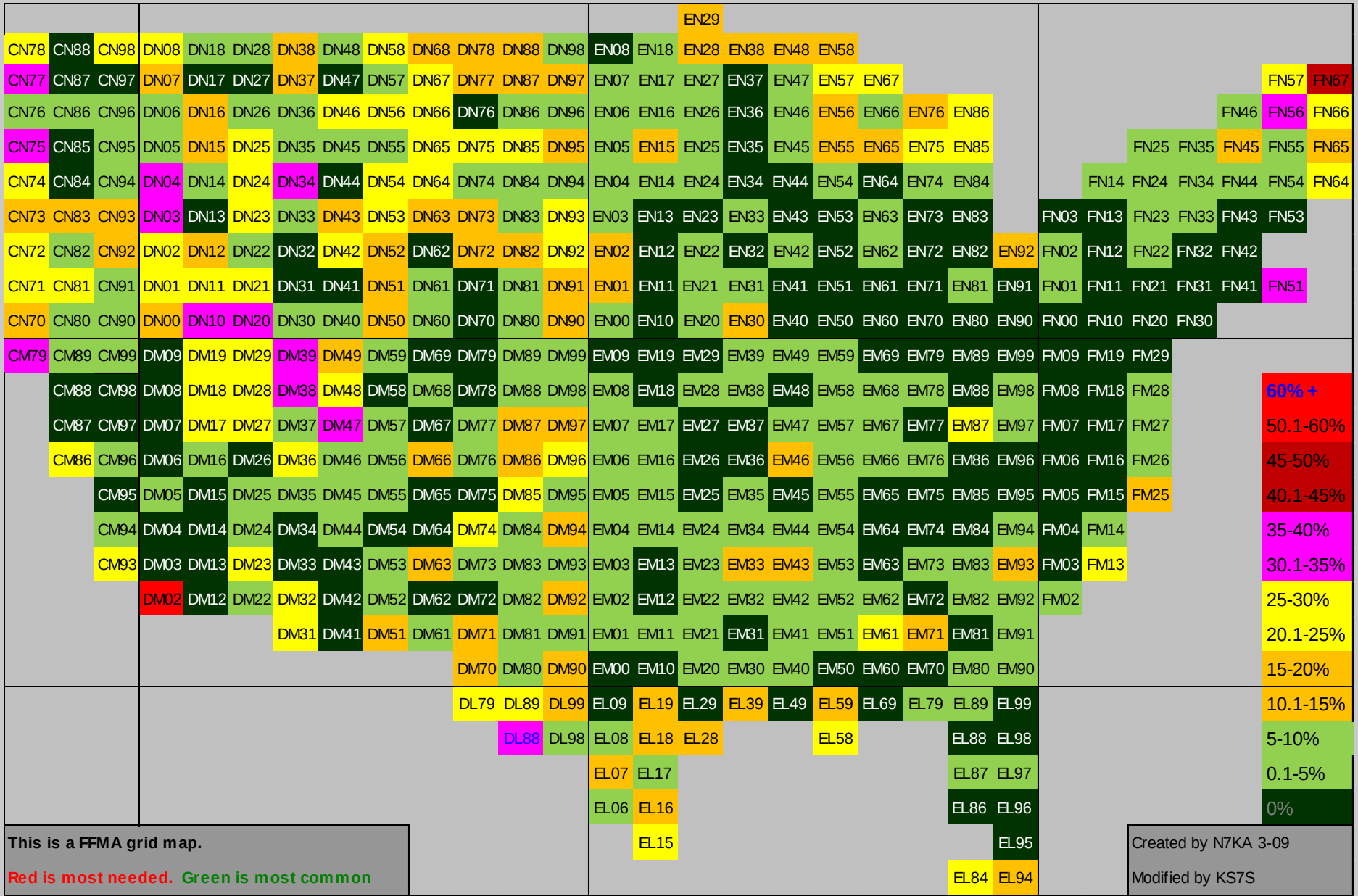
FFMA Fred Fish Memorial Award

The Fred Fish Memorial Award was created in honor of Fred Fish, W5FF (SK), who is 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. Total of 5 so far (W5FF #1, 4 others awarded, 6th one complete, not applied for!?!)

This award also encourages operation on the VHF bands from rare grid squares (known as Grid DXpedtitions) to help activate all 488 grids.
The rules of FFMA follow the VUCC grid rules.

What Are the Rare FFMA Grids?



This is a FFMA grid map.

Red is most needed. Green is most common

Created by N7KA 3-09

Modified by KS7S

Types of 6 Meter Propagation

Line of Sight (+)
Tropospheric Enhancement
Tropospheric Ducting
Tropospheric Scatter
Tropospheric Bending
Iono Scatter
Meteor Scatter
Sporadic E Layer Skip (Ionospheric)
F2 Layer Skip (Ionospheric)
FAI (Field Aligned Irregularities….Post Big Es)
TEP
EME

Magic part of 6M is often two of more will combine to product great contacts !

Home Study assignment…Read about each of the above while waiting for the band to open

Es on 6 Meters

Sporadic-E is the most common workhorse for six-meter operators. E-skip Propagation can provide contacts over a few hundred miles or a couple of thousand miles or more with a "double-hop.“ Sporadic-E paths in the 1120-1360 mile range are most common. This is because the single-hop distances near the maximum useable frequency (MUF) are also the longest. As the MUF rises above 50 MHz, the paths shorten up.“ Short side can be under 250 miles! Plus 2000 to 2500 mile double hops

With peaks around the solstices, the "E-skip season" runs from May to July, with another, shorter, peak in December and early January, but can appear at any time.

Seasons happen every year! “ We don’t need no stinkin’ sunspots on 6M!”

Sporadic-E discovered by hams during the 1930s, when the old 5-meter band (56 MHz) produced contacts covering "impossible" distances. (W4QO first QRP Es on 5M band?)

A sporadic-E opening typically lasts for a few hours or less, but can last for days.

For a thorough discussion of Sporadic-E, see the article by Emil Pocock, W3EP, in the April 1988 issue of *QST.*

How do I know when the Es are Running?

Or…Why do some folks do not miss many 6M openings??? Email Spotting via DXMAPS.com

Possible Sporadic-E from EM74 on 6m. Try towards DM94 (275 degrees

•warnings@dxmaps.com
•Jul 15 at 9:02pm

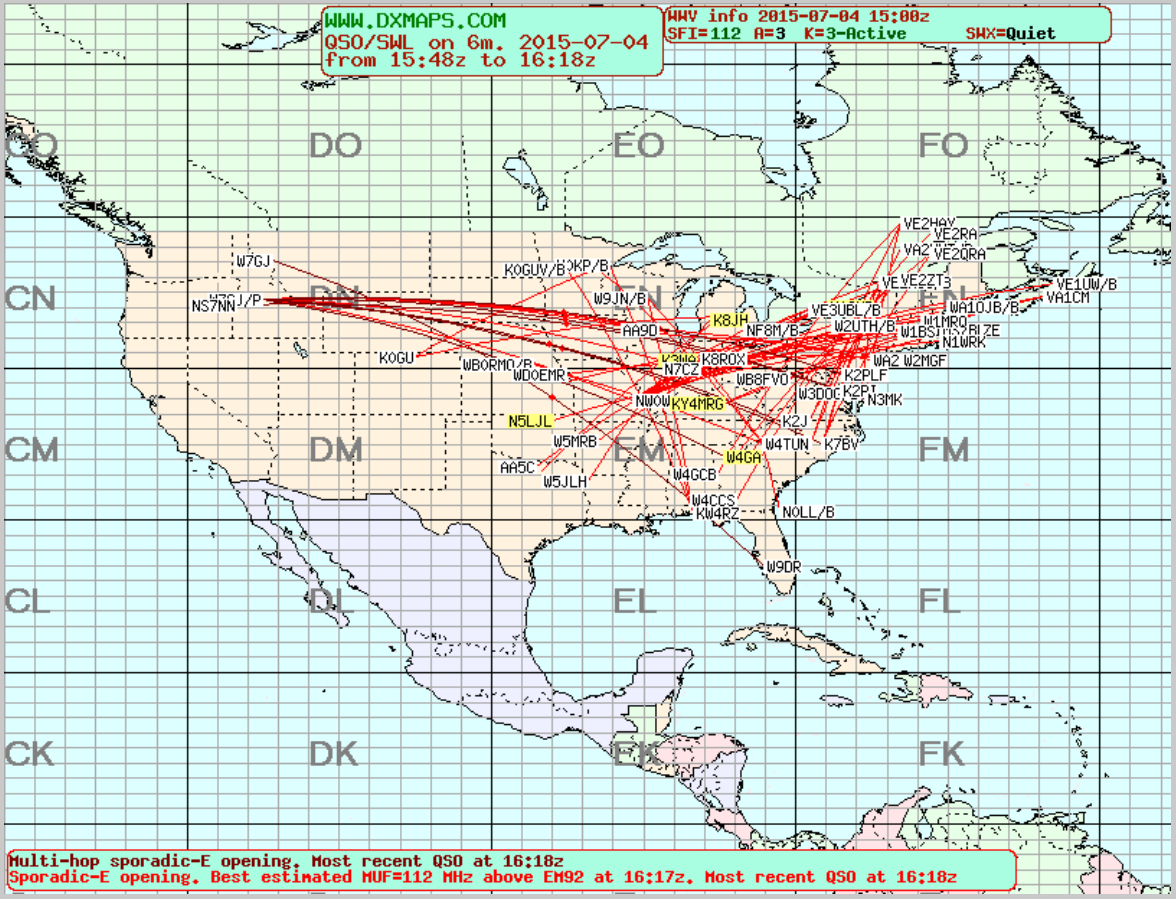
To
• k4esa@yahoo.com

Possible Sporadic-E from EM74 on 6m. Try towards DM94 (275 degrees)
Sporadic-E opening on 6m. Best estimated MUF 82 MHz above EM34

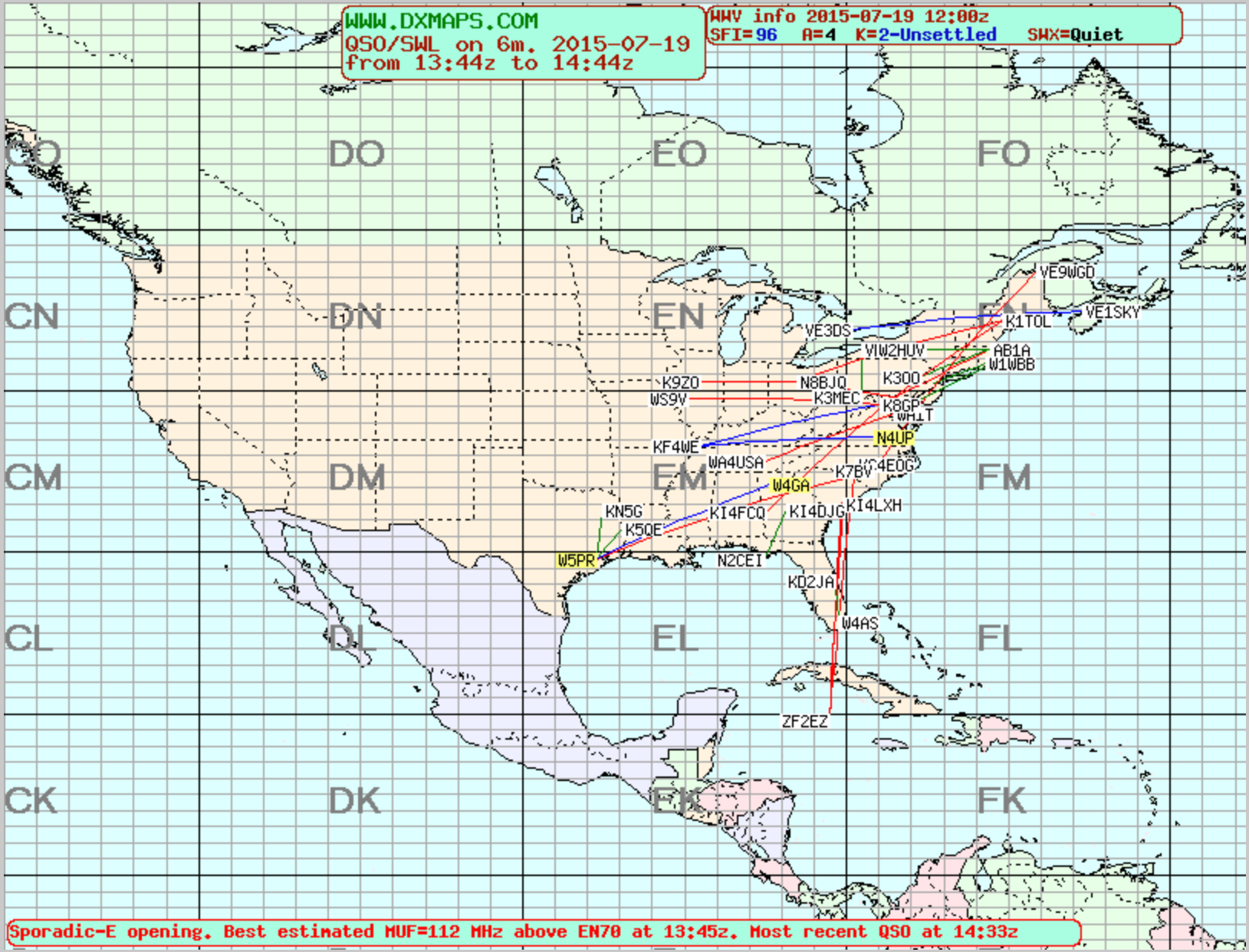
For details please visit http://www.dxmaps.com/spots/map.php?Frec=50&Map=NA

W7GJ/P in DN24

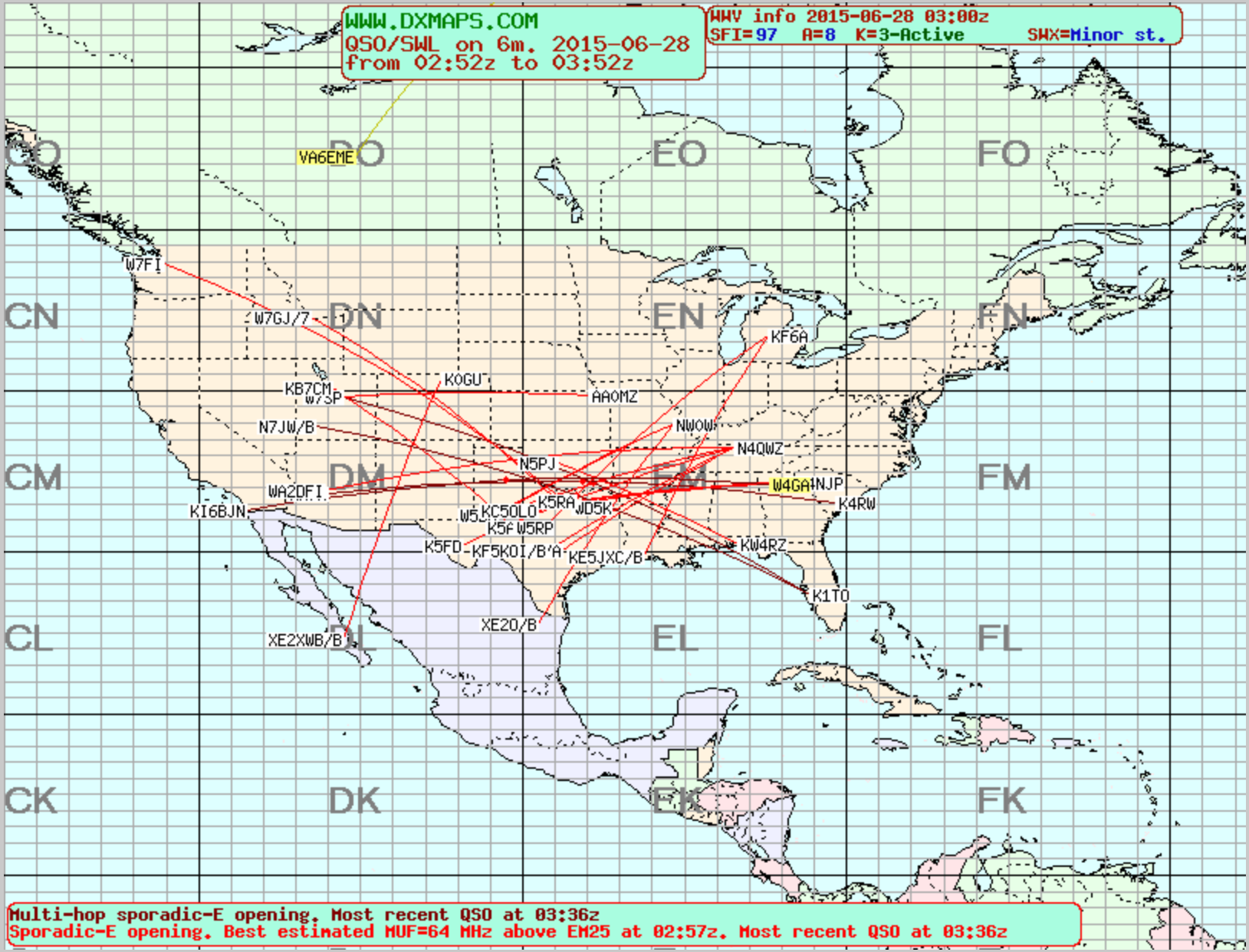
DXMAPS live map



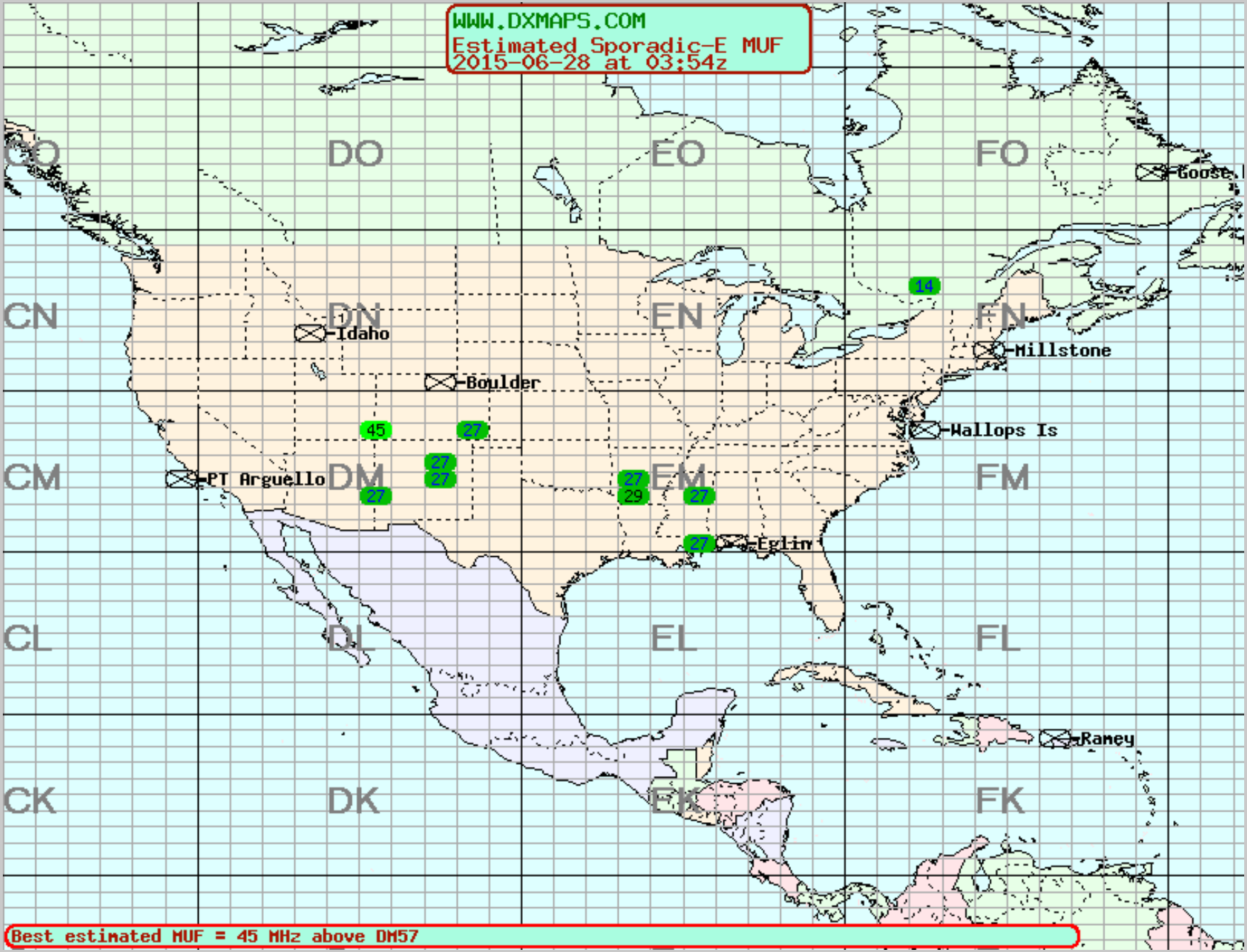
BLUE LINES = MS

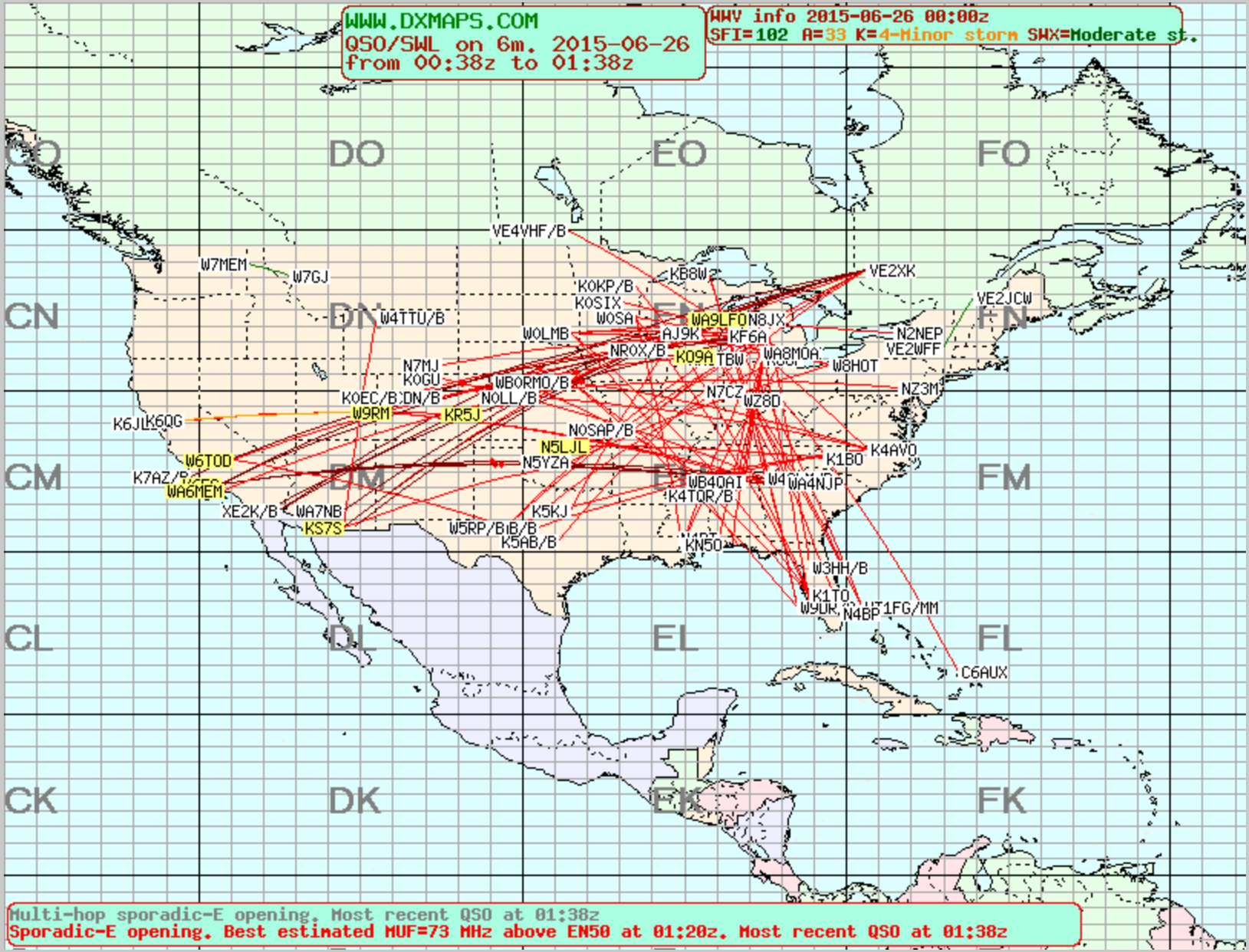


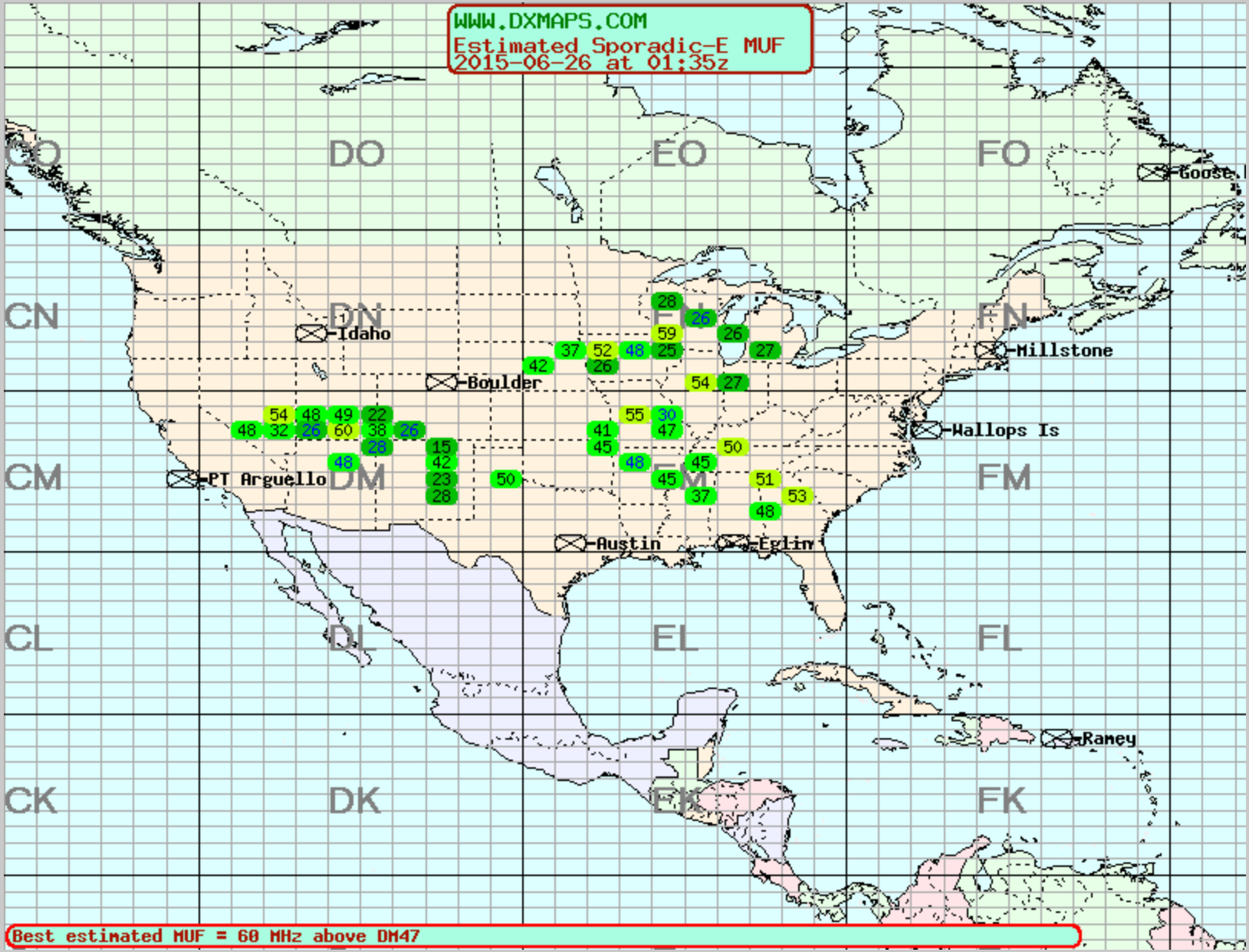
Double hop Es Coast to coast on 50 MHZ

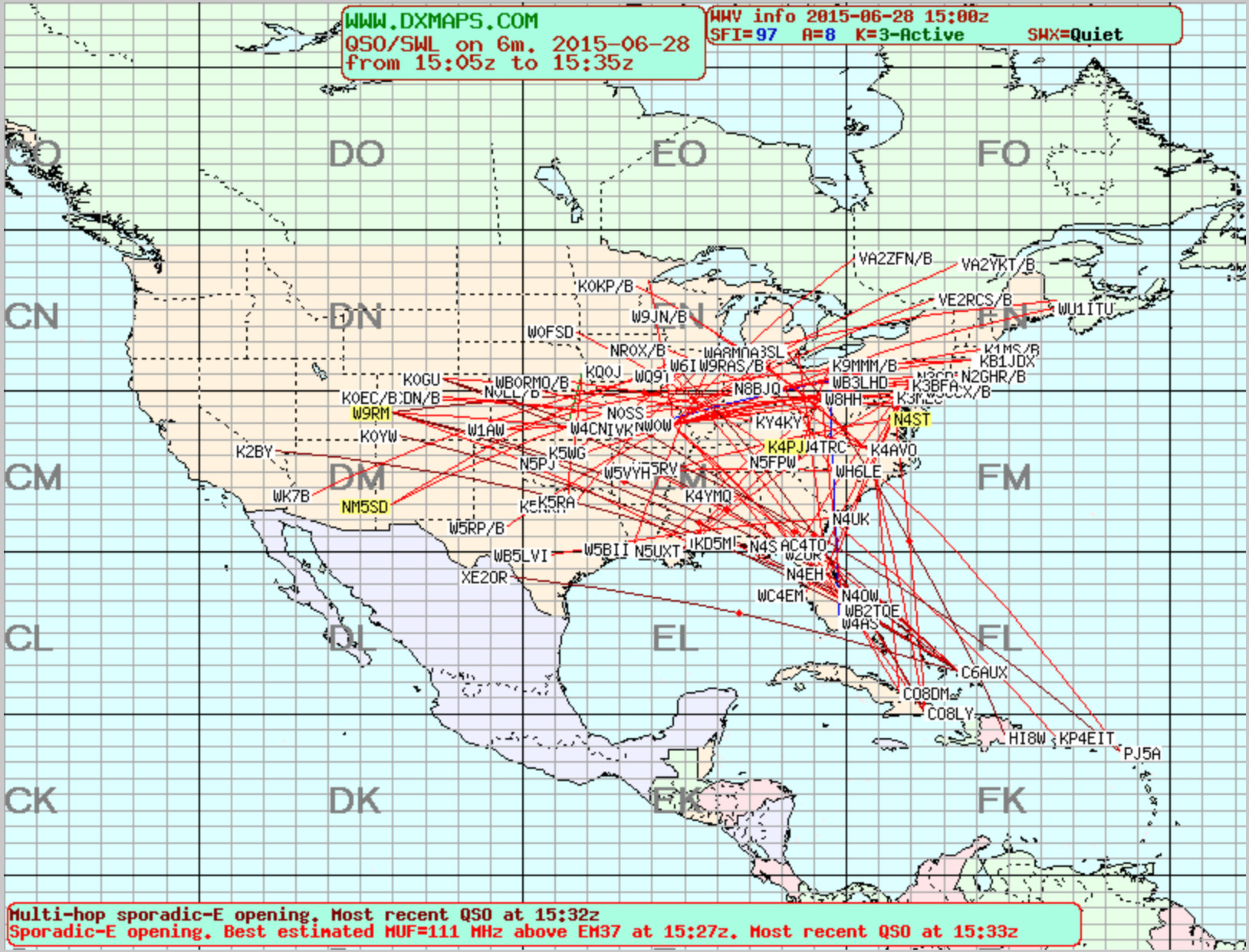


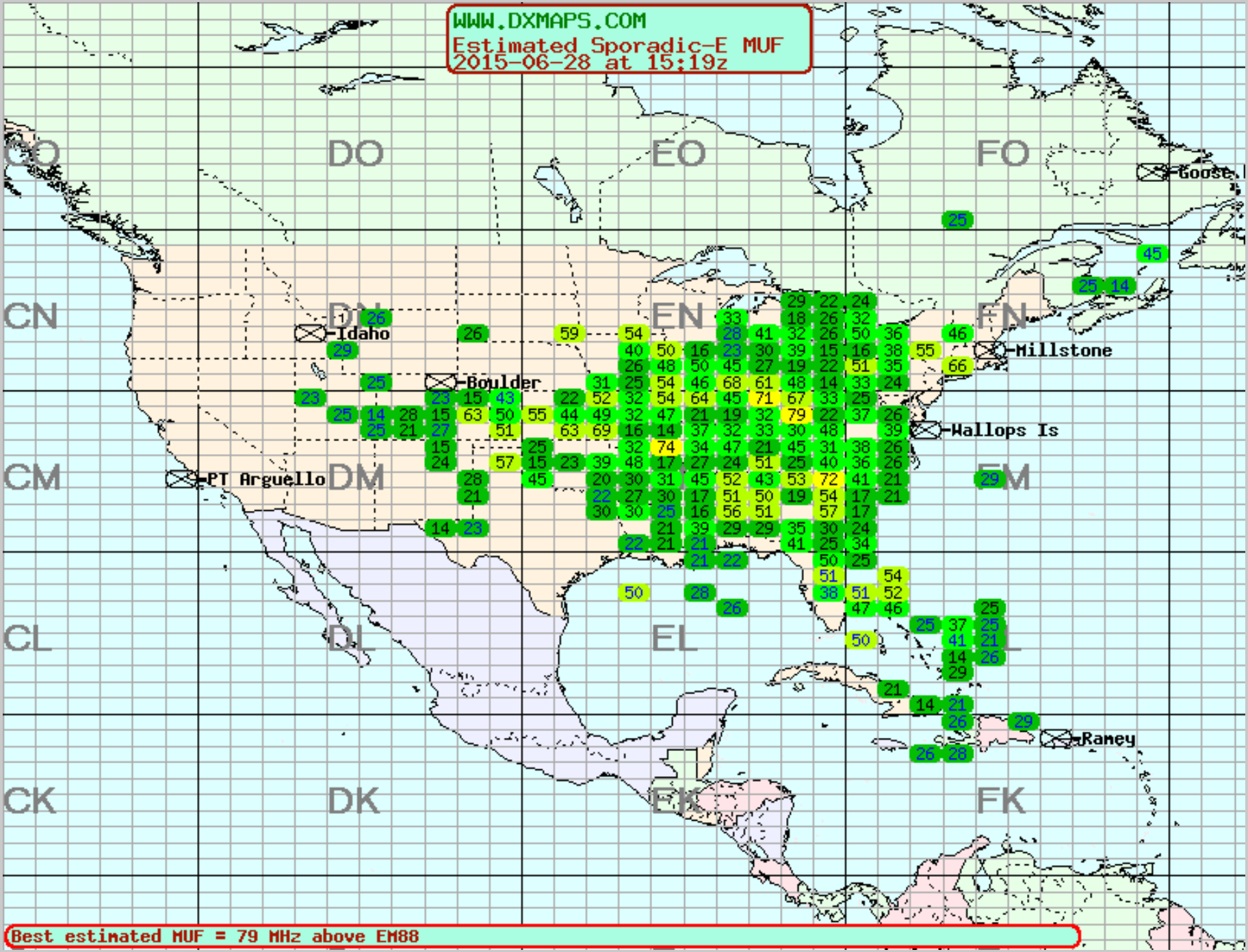
How the E “clouds “ can line up for Double Hop Propagation




WWW.DXMAPS.COM
QSO/SWL on 6m. 2015-06-26
from 00:38z to 01:38z
WWV info 2015-06-26 00:00z
SFI=102 A=33 K=4-Minor storm SWX=Moderate st.
CO
DO
EO
FO
CN
DN
EN
FN
CM
DM
EM
FM
CL
DL
EL
FL
CK
DK
EK
FK
VE4VHF/B
W7MEM
W7GJ
KB8W
VE2XK
K0KP/B
K0SIX
W0SA
WA9LFO
N8JX
VE2JCW
W4TTU/B
W0LMB
AJ9K
KF6A
N2NEP
VE2WFF
NROX/B
K09A
TBW
WA8MOA
W8HOT
N7MJ
K0GU
WB0RMO/B
N7CZ
WZ8D
NZ3M
K0EC/B
DN/B
NOLL/B
W9RM
KR5J
K6JLK6QG
NOSAP/B
N5LJL
K4AVO
W6TOD
N5YZA
K1BO
K7AZ/B
WA6MEM
WB4OAI
K4TOR/B
W4
WA4NJP
XE2K/B
WA7NB
K5KJ
KS7S
W5RP/B
IB/B
K5AB/B
KN50
W3HH/B
K1TO
W9UK
N4BP
F1FG/MM
C6AUX
Multi-hop sporadic-E opening. Most recent QSO at 01:38z
Sporadic-E opening. Best estimated MUF=73 MHz above EN50 at 01:20z. Most recent QSO at 01:38z


WWW.DXMAPS.COM
Estimated Sporadic-E MUF
2015-06-26 at 01:35z
CO
DO
EO
FO
CN
DN
EN
FN
CM
DM
EM
FM
CL
DL
EL
FL
CK
DK
EK
FK
Idaho
Boulder
PT Arguello
Austin
Eglin
Millstone
Wallops Is
Raney
Best estimated MUF = 60 MHz above DM47


WWW.DXMAPS.COM
QSO/SWL on 6m. 2015-06-28
from 15:05z to 15:35z
WWV info 2015-06-28 15:00z
SFI=97 A=8 K=3-Active SWX=Quiet
CO
DO
EO
FO
CN
DN
EN
FN
CM
DM
EM
FM
CL
DL
EL
FL
CK
DK
EK
FK
VA2ZFN/B
VA2YKT/B
VE2RCS/B
WU1ITU
K0KP/B
W9JN/B
W0FSD
NROX/B
WARMNA3SL
K1MS/B
KB1JDX
W6IW9RAS/B
K9MMM/B
N2GHR/B
KQ0J
WQ9I
WB3LHD
K3BFA-X/B
K0GU
WB0RMO/B
N8BJQ
W8HH
K0EC/B:DN/B
W9RM
NOSS
N4ST
KY4KY
W1AW
W4CNI
VK
NW0W
K0YW
K4PJ
J4TRC
K4AVO
K2BY
K5WG
N5PJ
N5FPW
W5VYH
5RV
WH6LE
WK7B
NM5SD
K4YMQ
K5RA
N4UK
W5RP/B
JKD5M
N4S
AC4TO
W5BII
N5UXT
WB5LVI
XE2OR
N4EH
WC4EM
N4OW
WB2TOE
W4HS
C6AUX
CO8DM
CO8LY
HI8W
KP4EIT
PJ5A
Multi-hop sporadic-E opening. Most recent QSO at 15:32z
Sporadic-E opening. Best estimated MUF=111 MHz above EM37 at 15:27z. Most recent QSO at 15:33z


WWW.DXMAPS.COM
Estimated Sporadic-E MUF
2015-06-28 at 15:19z
CO
DO
EO
FO
CN
DN
EN
FN
CM
DM
EM
CL
DL
EL
CK
DK
EK
FK
Idaho
Boulder
Millstone
Wallops Is
PT Arguello
Raney
Best estimated MUF = 79 MHz above EM88

6 Meter Antennas

To get started….any antenna in your yard that works on 40/15 M may tune on six!

½ dipole…..less than 10 feet long, Wire, hamsticks, Upright L 4 dual polarization

½ wave square loop ….Squalo, PAR, Loop

Hentenna.. From JA land..trick small space antenna to build

Moxon.. Easy to build and light weight 2 ele yagi but compact

Small Yagi 3,4, 5 elements boom lengths under 1 wave length 5, ½ for 4, 1/3 for 3

Bigger the yagi = More modes. more fun, more contacts

Horizontal "omni" 6 Meter Antennas to Build

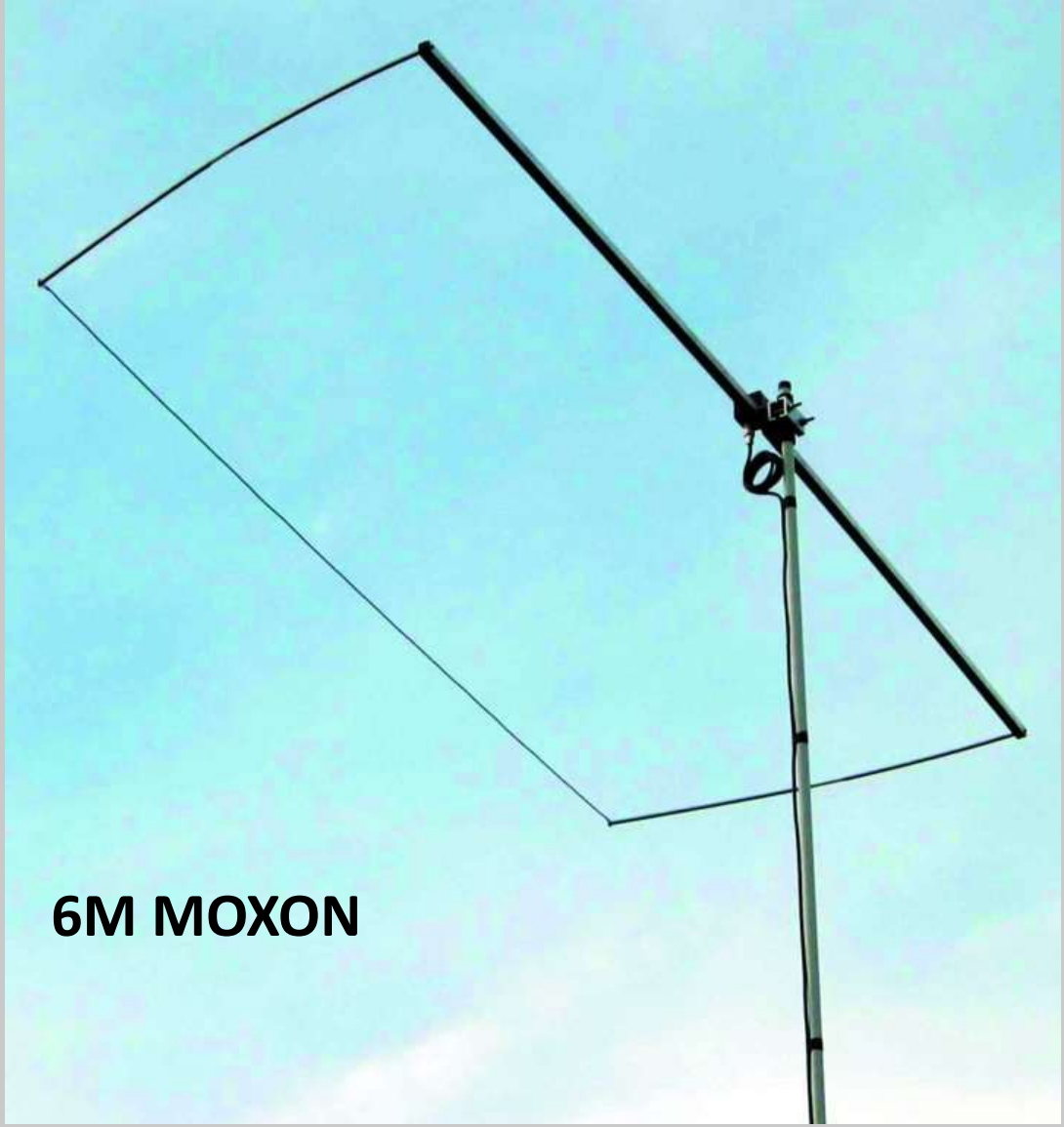
6-Meter Quad-Turnstile
http://www.qsl.net/xe1cdx/Hamdocs/6/6%20mts%20quad.pdf

Recycled Lawn Chair Parts to make Loop, Halo or Squalo

Hentenna

Copper Squalo

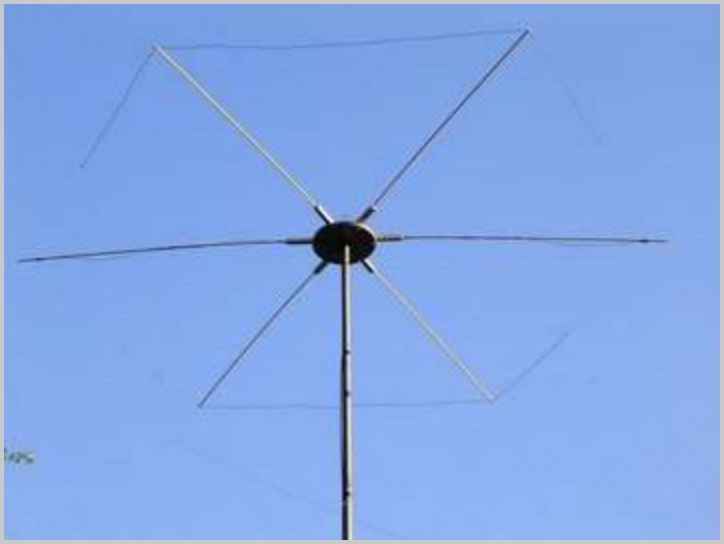
Ask N4CLA about the Jig to build one of these



6M MOXON

https://sites.google.com/site/wb3bel/

3 element Hex beam 6M only



http://www.moxonantennaproject.com/n1rik/n1rik.htm

http://www.jpole-antenna.com/2014/06/11/building-the-6-meter-moxon-antenna/

For those of You who Have A Bunch Of Bucks Laying Around…

YAGI on 6 Meters

“I’m going to need a bigger antenna”

4 x 6 ele for 6 Meters

EF0611 built by OA4TT

Do not fear the big yagi pix

5 elemnets with 18 foot boom

Will turn with a TV rotor and

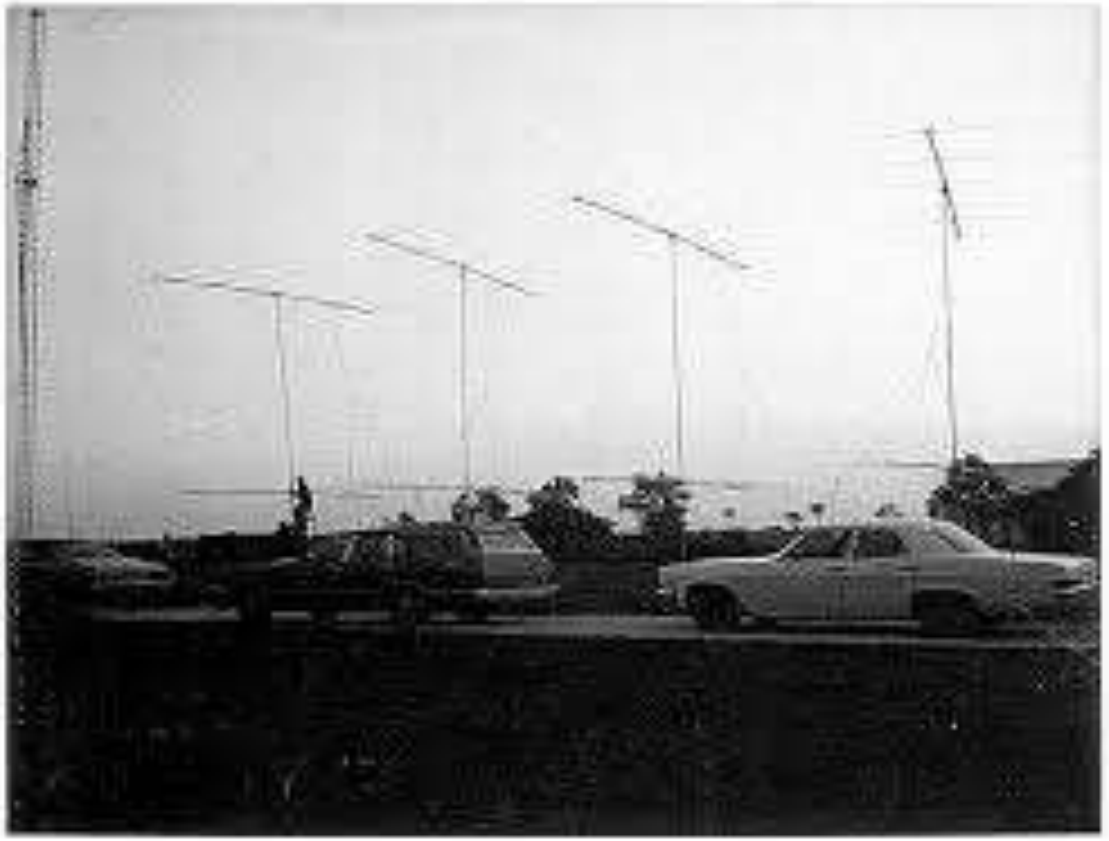
At 25-30 feet be a blast on 6M

6M 18 element 100 ft Rope Yagi

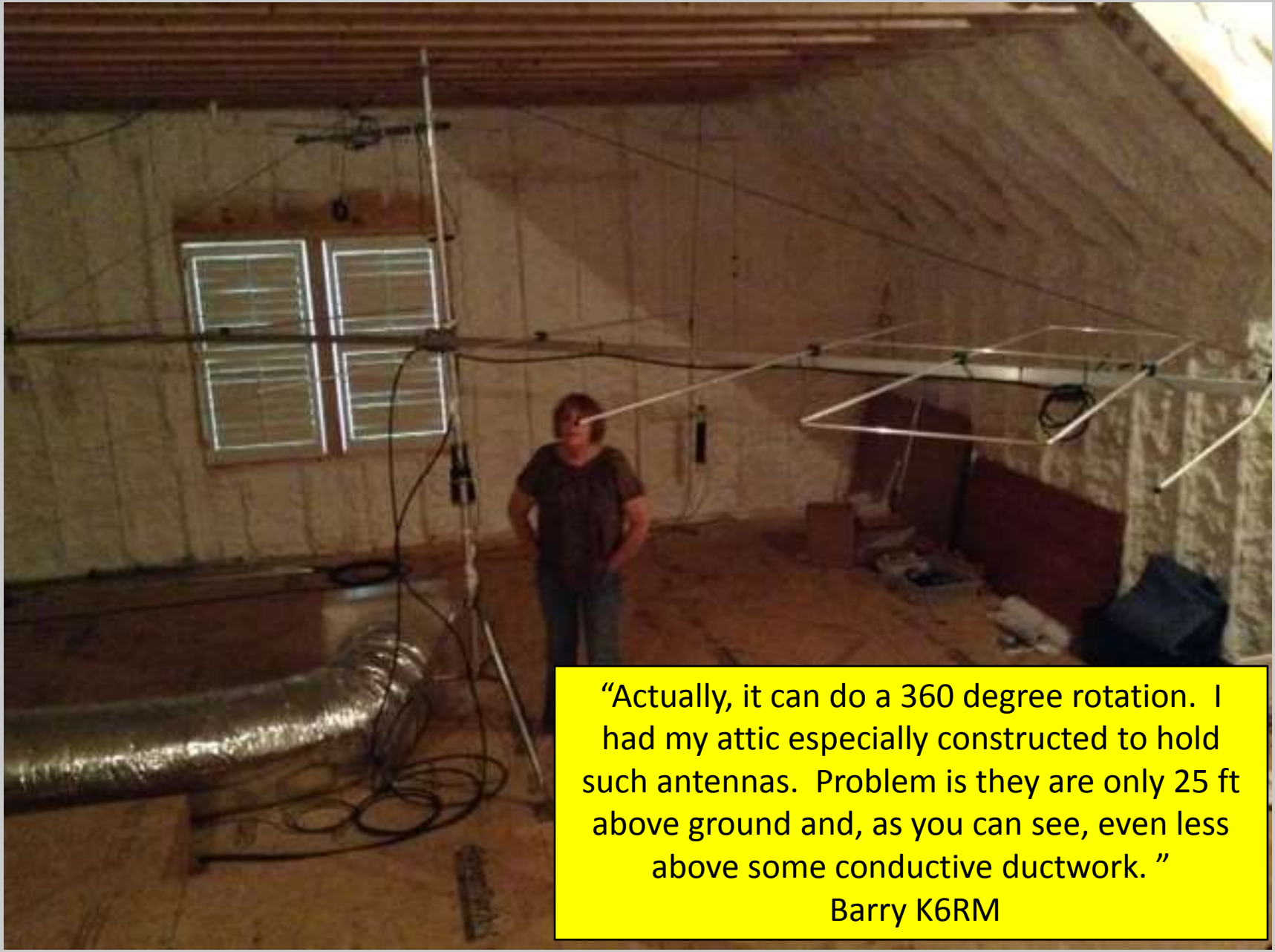
First 50-MHz EME QSO

WA5HNK and W5SXD, Houston, pictured in our August *QST* column, p. 88, and K5WVX and W5WAX, Muskogee, Oklahoma, close to completing exchanges on 50 MHz via the EME route, finally made it at 0433 GMT on the 30th. Communication was first established on cw, using the calls W5SXD/5 and K5WVX. Then changing operators and signing WA5HNK and W5WAX/5, a try was made on ssb, with only partial readability.

Their similar 48-element arrays of 8 6-element Yagis each (see photo herewith) were aimed east, at the rising moon, for maximum horizon gain. This is a must, with antenna gains estimated at 18 dB over a dipole, but it also adds to the noise problems. The arrays are not rotatable, in the usual sense, but can be moved by hand for various "windows." Good tapes were made several times earlier in the month. We now have confirmed EME communication on all amateur bands from 50 through 2400 MHz.



6 Element 6 Meter yagi in the House Attic



"Actually, it can do a 360 degree rotation. I had my attic especially constructed to hold such antennas. Problem is they are only 25 ft above ground and, as you can see, even less above some conductive ductwork. "
Barry K6RM

W4GA EM74wv near Blairsville

The End

Now go make some noise on 6M

Sources

(‘cause I ain’t no Xpert, I just read a lot!)

Six Meters: An Introduction By Dave Finley, N1IRZ

Wikipedia the free encyclopedia

www.arrl.org/ffma

www.dxmaps.com

April 1988 issue of *QST*

http://home.iprimus.com.au/toddemslie/Es_distances.html

http://www.qsl.net/w/wa5iyx/

http://www.arrl.org/vucc

http://www.anarc.org/wtfda/sporade.pdf

http://www.uksmg.org/content/sporade.htm

Extra Credit reading

- Below here is extra material not used in the 45 min presentation….Maybe next time

Iono Scatter

“The Ionosphere will always reflect signals between (about) 30 MHz and 100 MHz, regardless of MUF, over 600~1400 mile paths”.

“Six meters is the only ham band that IS where is feasible” (NOT TRUE!!! , we do it on 10M)

High power and large yagi are required (1KW+,10 dbi)

On 50.145 from 7-8am Use this mixed with Rox and Tropo to have daily net. Listen you will hear bits and pieces on the rock burns if you do not have enough gain

is one of only two ham bands (2 meters is the other) with a CW-only subband which excludes all data transmissions. That CW-only subband runs from 50.0 to 50.1 MHz. Almost all weak-signal activity on six occurs between 50.1 and 50.4 MHz.

Calling frequencies are used extensively. From 50.100 to 50.125 is a "DX Window," in which domestic QSOs are discouraged. The DX calling frequency is 50.110. The traditional domestic calling frequency is 50.125. However, there has been a movement recently to extend the DX window to 50.130 and make 50.200 the new domestic calling frequency. This movement has been precipitated by the extension of six-meter privileges to hams in new countries around the world, and the associated increase in the number of DX stations on the air. Such band plans are, of course, voluntary, but are observed widely by the six-meter community.

The recommended CW calling frequency is 50.090, but you will often hear CW CQs on 50.125, too. Under the old band plan, you would hear many stations on 50.125 as the band opened up, then, as more stations discovered the opening, activity would spread upward in frequency, reaching 50.3 or 50.4 during a good opening. It seems likely that, while the new, expanded DX window probably will catch on, many operators will take some time to "let go" of the old, familiar 50.125. I would recommend monitoring both 50.125 and 50.200, as well as 50.090, during an opening. If the opening seems real good, start checking 50.110 for DX stations, too.

Most domestic weak-signal contacts on six are SSB, but in recent years, there has been an increase in CW activity. As mentioned above, the CW activity often is intermingled freely among the SSB signals. It would be nice to see more CW activity down around 50.090, and use the CW-exclusive subband to better advantage.