



<http://HamShare.com>

NVIS

Antennas

by

Bill Balzarini

KL7BB





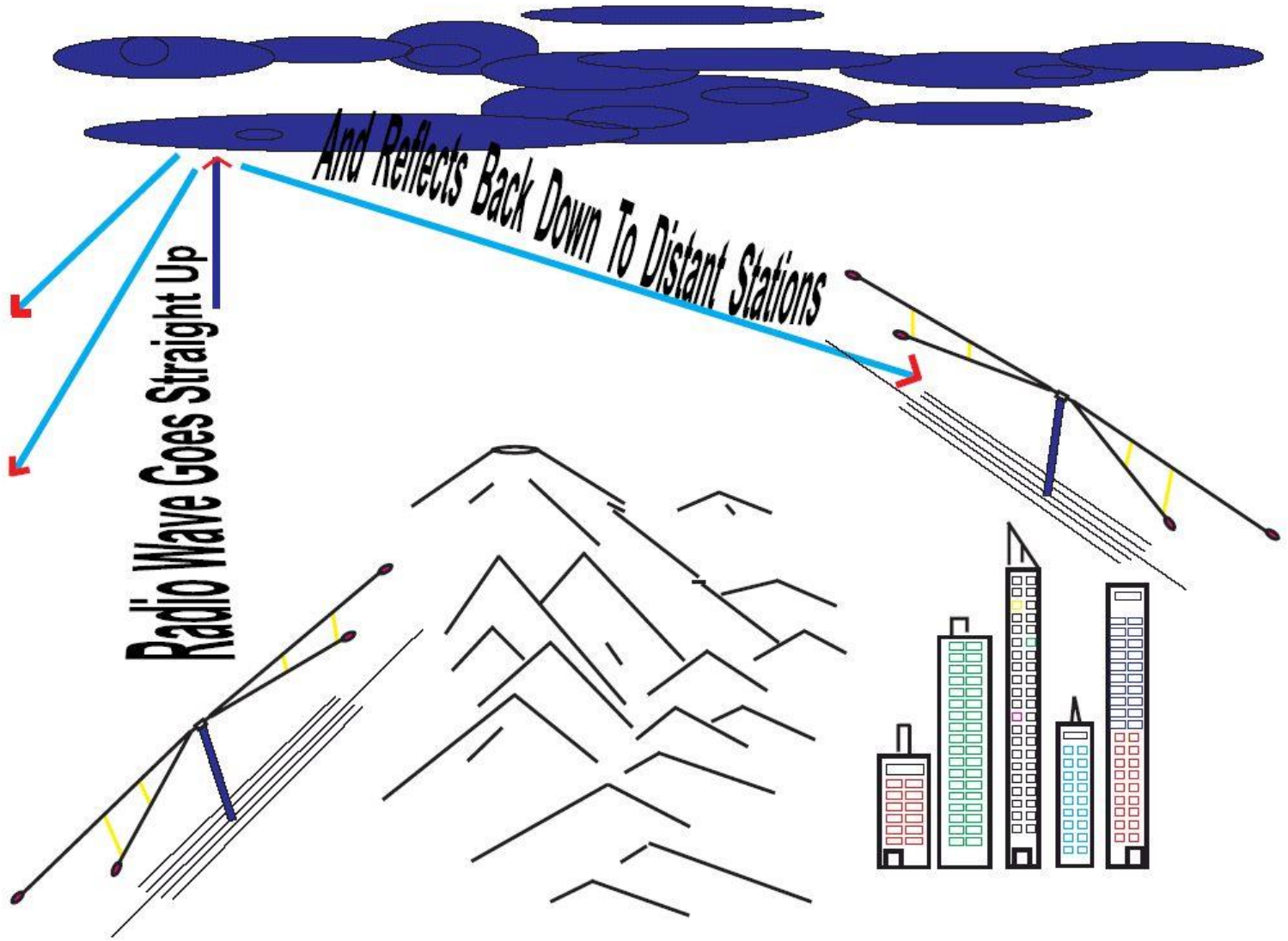
Served Agency



NVIS Antennas

The Words of ARRL Communications Manager George Hart W1NJM at the Washington State ARRL Hamfest in Yakima, paraphrased JFK's words and asked,

“Ask not what the ARRL can do for you, Ask what you can do for the ARRL and Amateur Radio”.



Visualize the Dipole Antenna

Visualize the Dipole Antenna



Visualize the Dipole Antenna

**Wire End View
of Antenna**



What is the Antenna's Frequency ?



What is the Antenna's Frequency ?

In MHz or
WaveLength

A circular graphic with the text "In MHz or" at the top and "WaveLength" at the bottom, both in a yellow, bold, sans-serif font. In the center of the circle is a small grey circle containing the letters "DE" in red.

Visualize the RF Field !




Visualize the RF Field !

Visualize
DE
The RF Field

Visualize the RF Field !

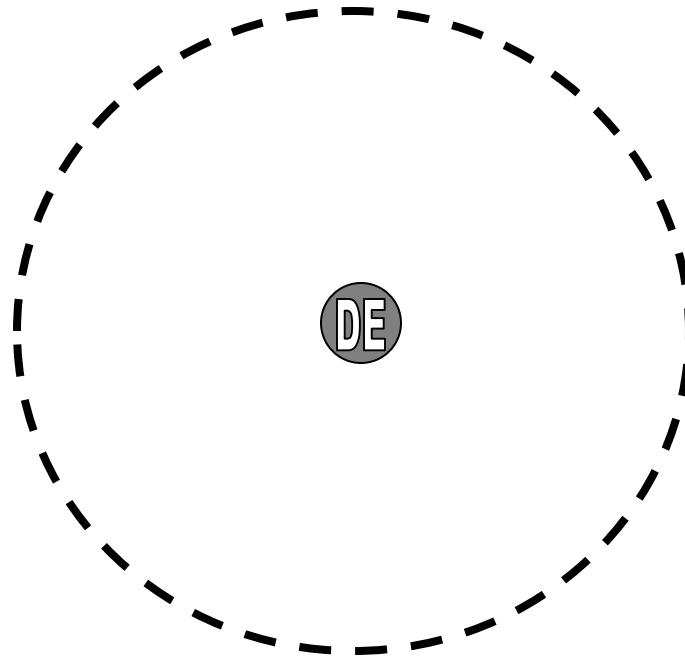
Do You See
The RF Field ?



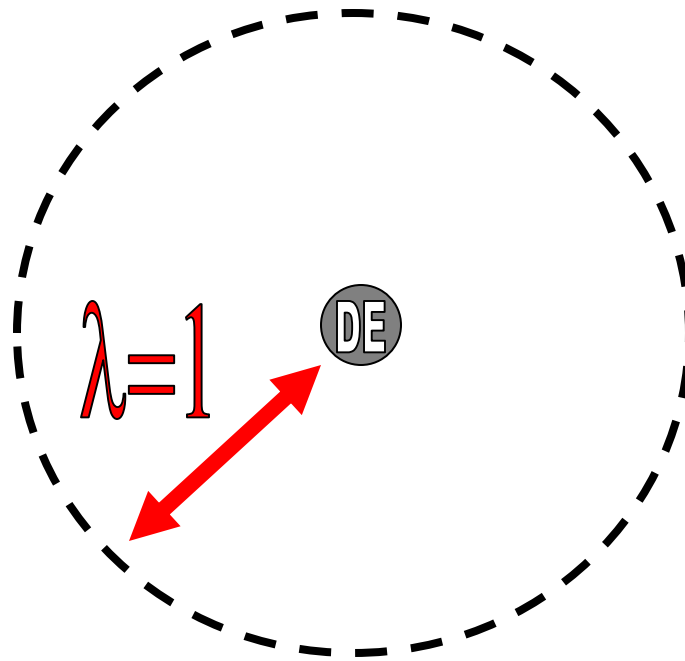
Visualize the RF Field !



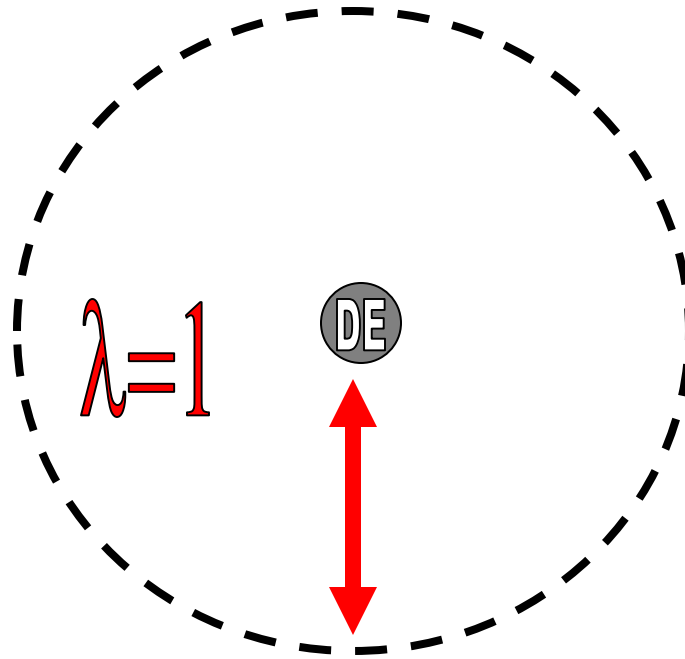
Visualize the RF Field λ



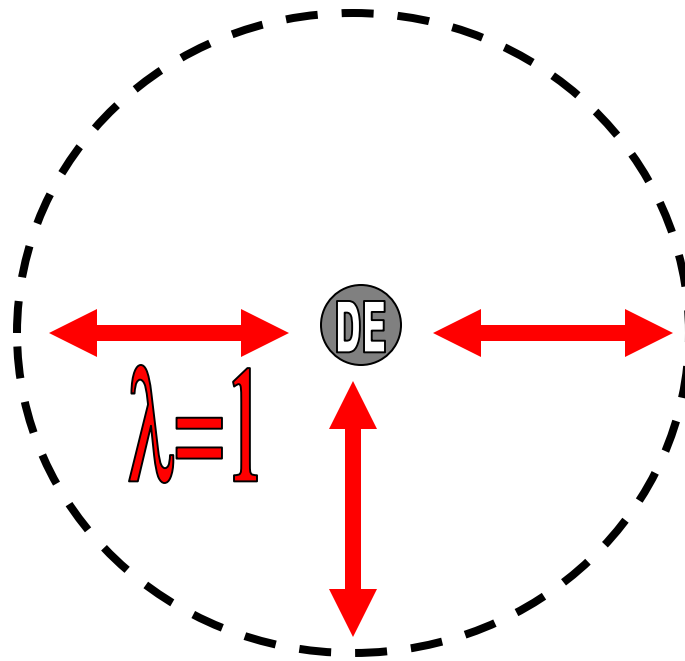
Visualize the RF Field $\lambda=1$



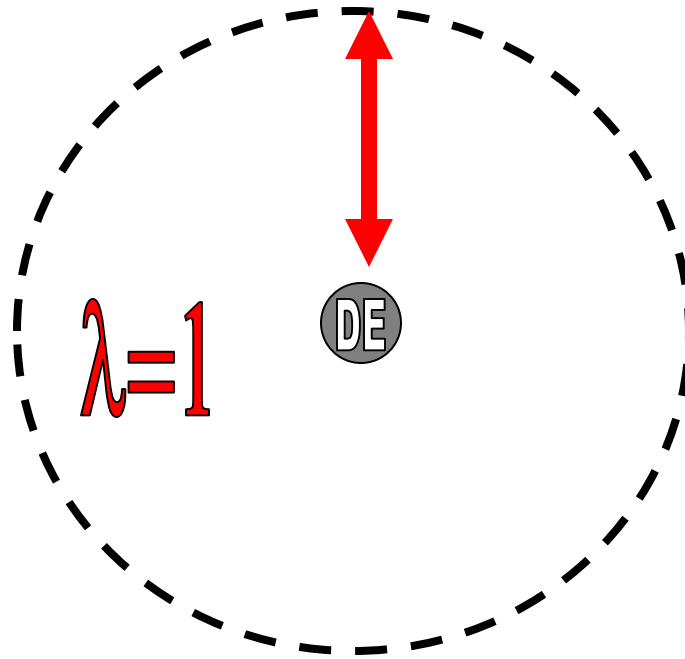
Visualize the RF Field $\lambda=1$



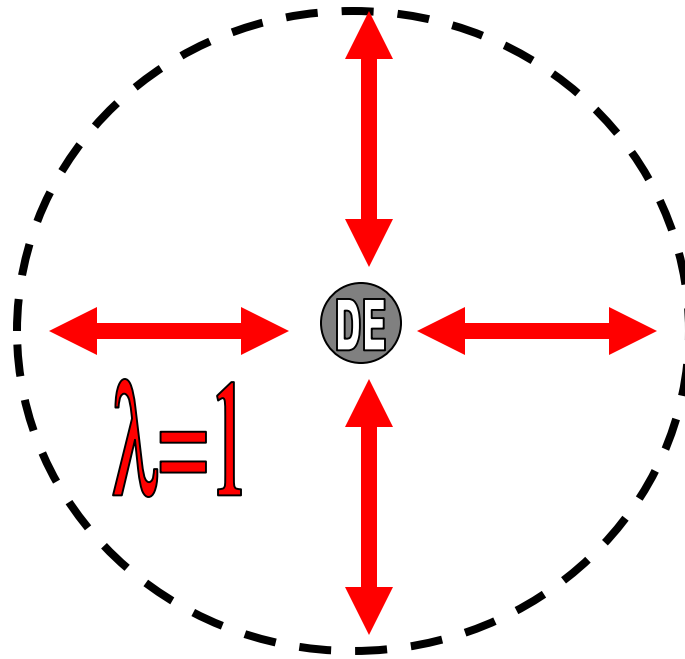
Visualize the RF Field $\lambda=1$



Visualize the RF Field $\lambda=1$



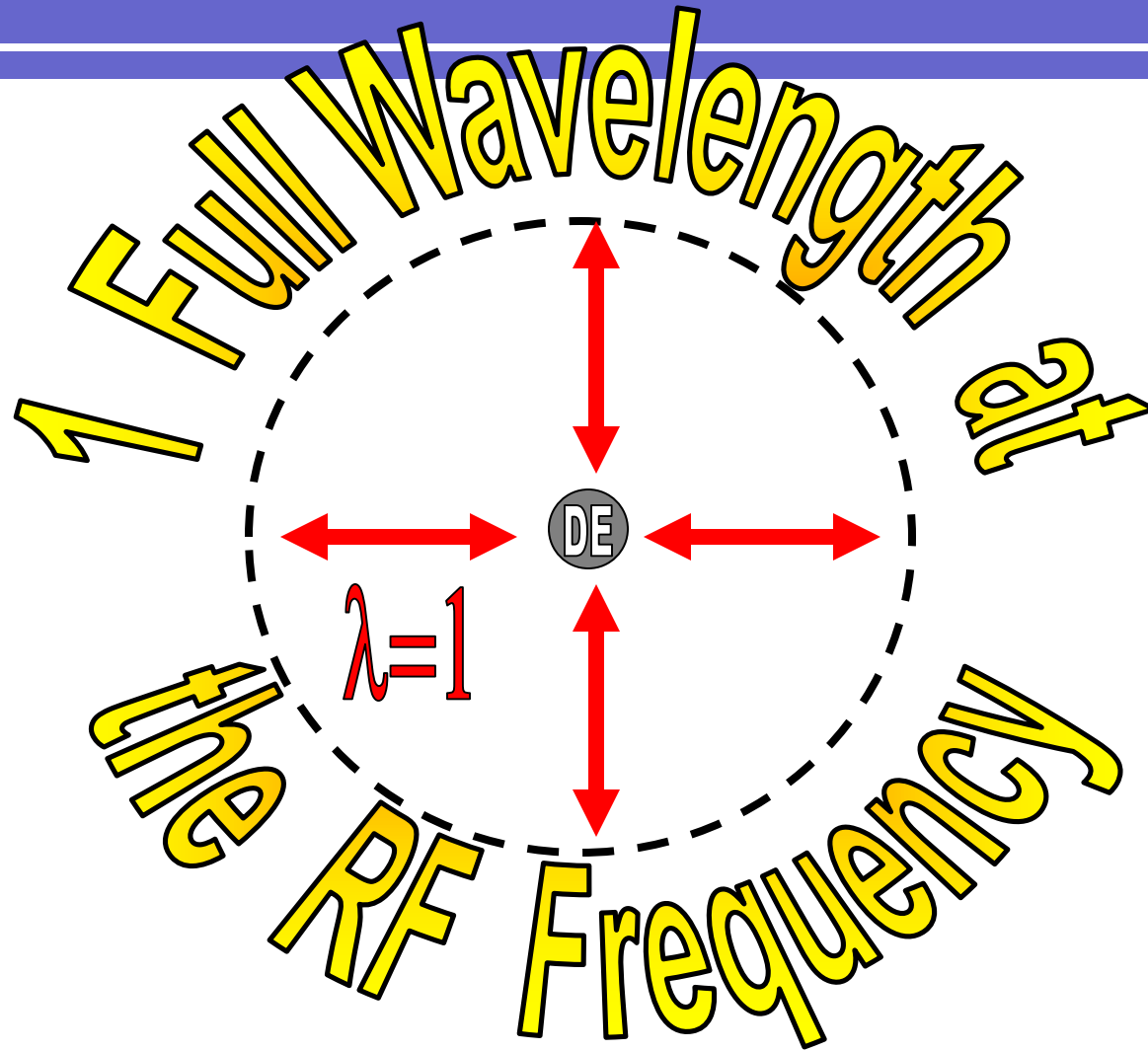
Visualize the RF Field $\lambda=1$



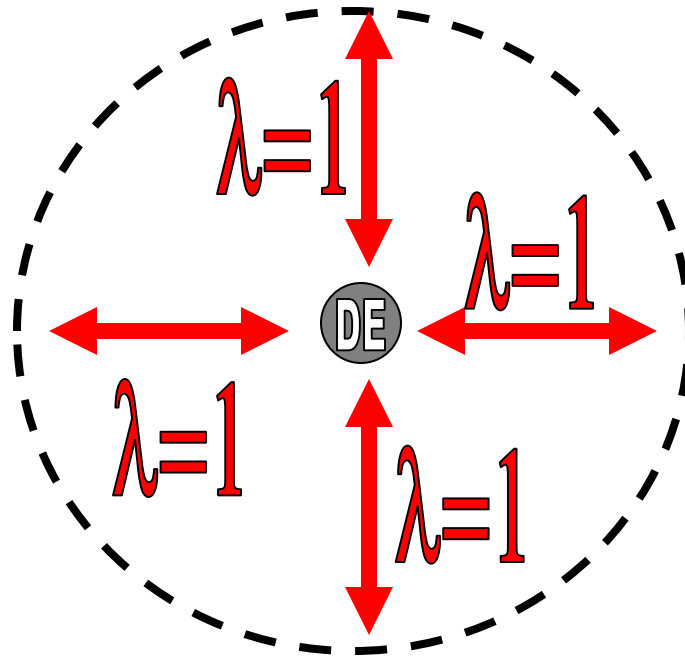
Visualize the RF Field !



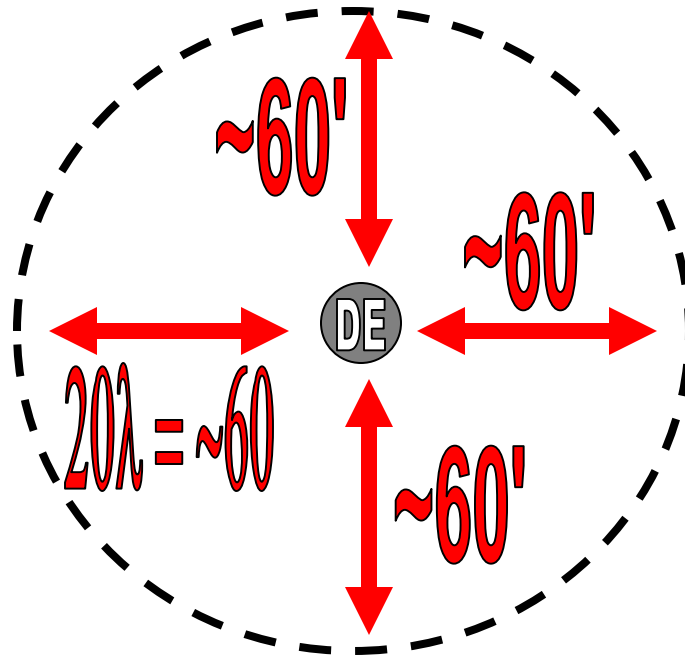
Visualize the RF Field $\lambda=1$



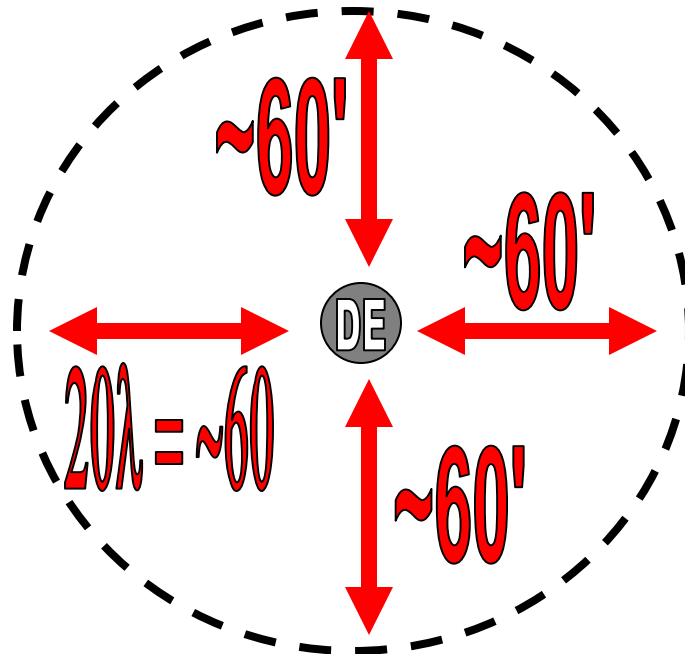
Visualize the RF Field $\lambda=1$



Visualize the RF Field $\lambda=1$



Visualize the RF Field $\lambda=1$



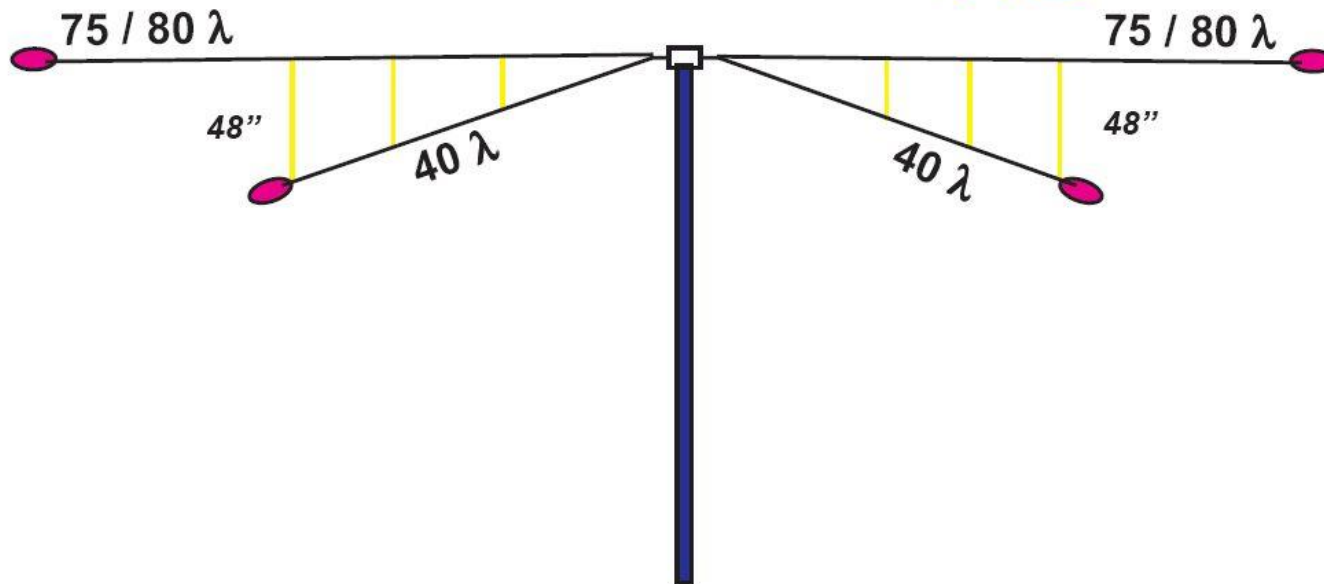
**The *Dipole* RF Field at 14.225MHz
= ~60' Feet ($\lambda=1$)**

Visualize the RF Field ?

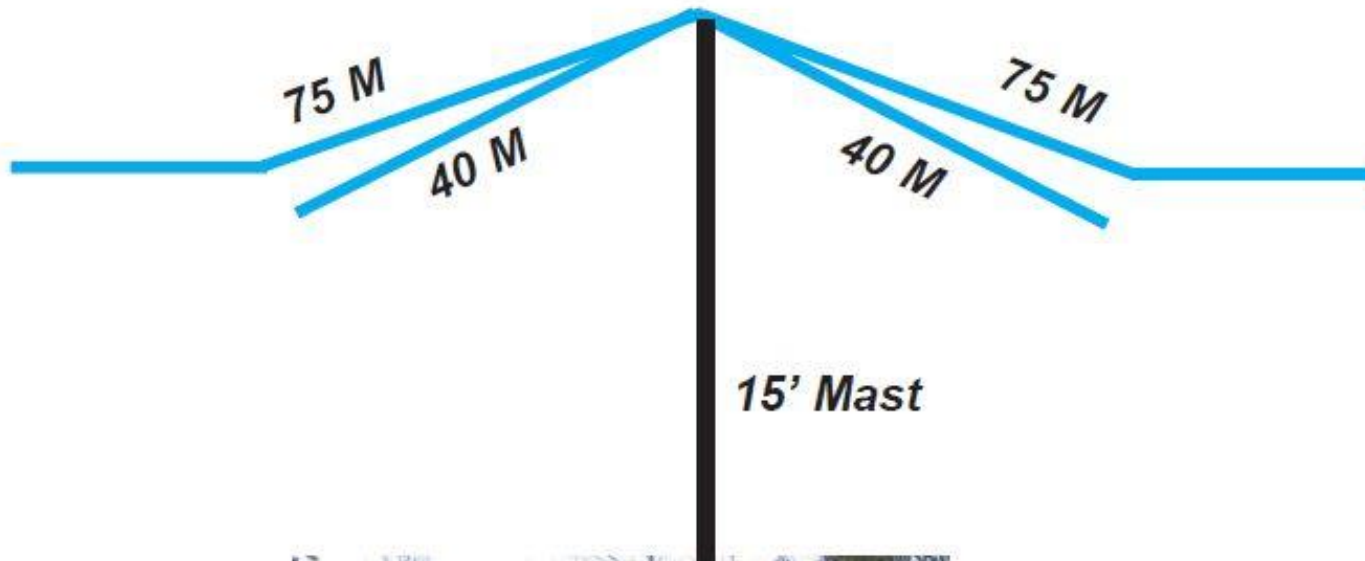


NVIS Antennas

NVIS Dual-BAND ANTENNA



NVIS Antennas



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NVIS Antennas
How to Fund the Project

Use Infinite Money in
Planning the Very Best Desired Results,
No Holds Barred.

This produces the very best product and
makes the best use of your Imagination

People with Funding usually Follow.

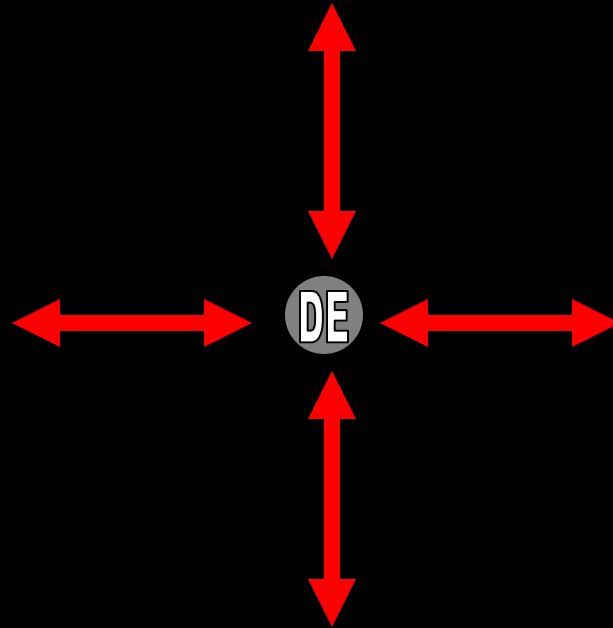
NVIS Dual-BAND ANTENNA



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Visualize the RF Field ?

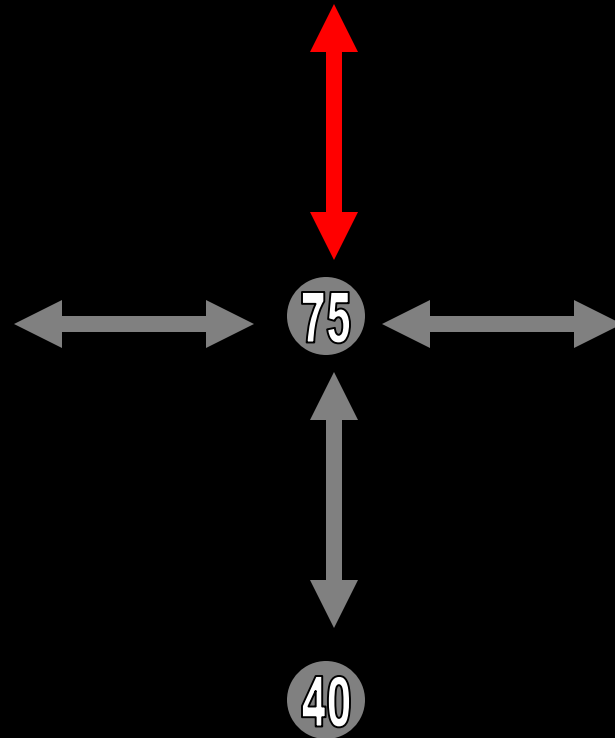
Wire “End View” of Dipole Antenna and RF Field



DE and RF Field are now 1 wave-length above the Ground

Visualize the RF Field ?

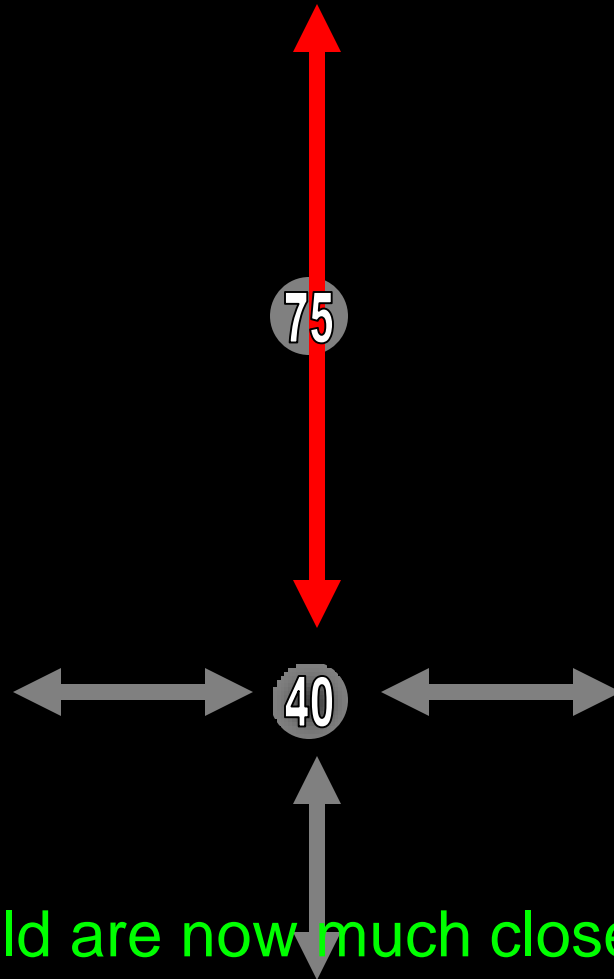
Wire “End View” of NVIS Antenna and RF Field



DE and RF Field are now much closer to the Ground

Visualize the RF Field ?

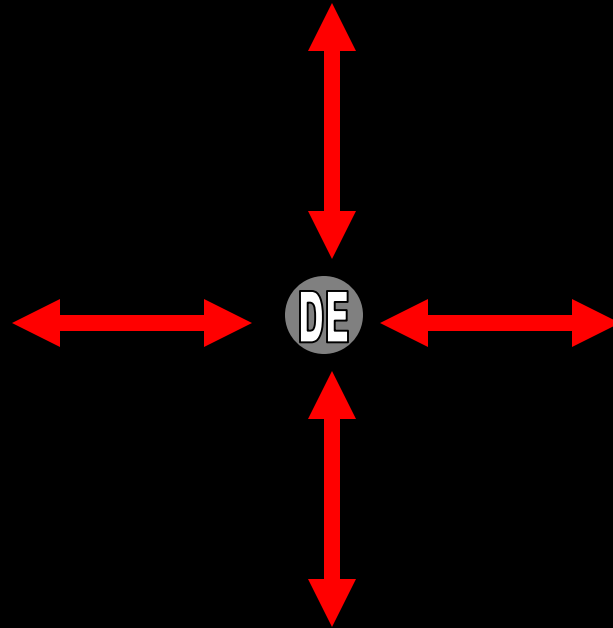
Wire "End View" of NVIS Antenna and RF Field



DE and RF Field are now much closer to the Ground

Visualize the RF Field ?

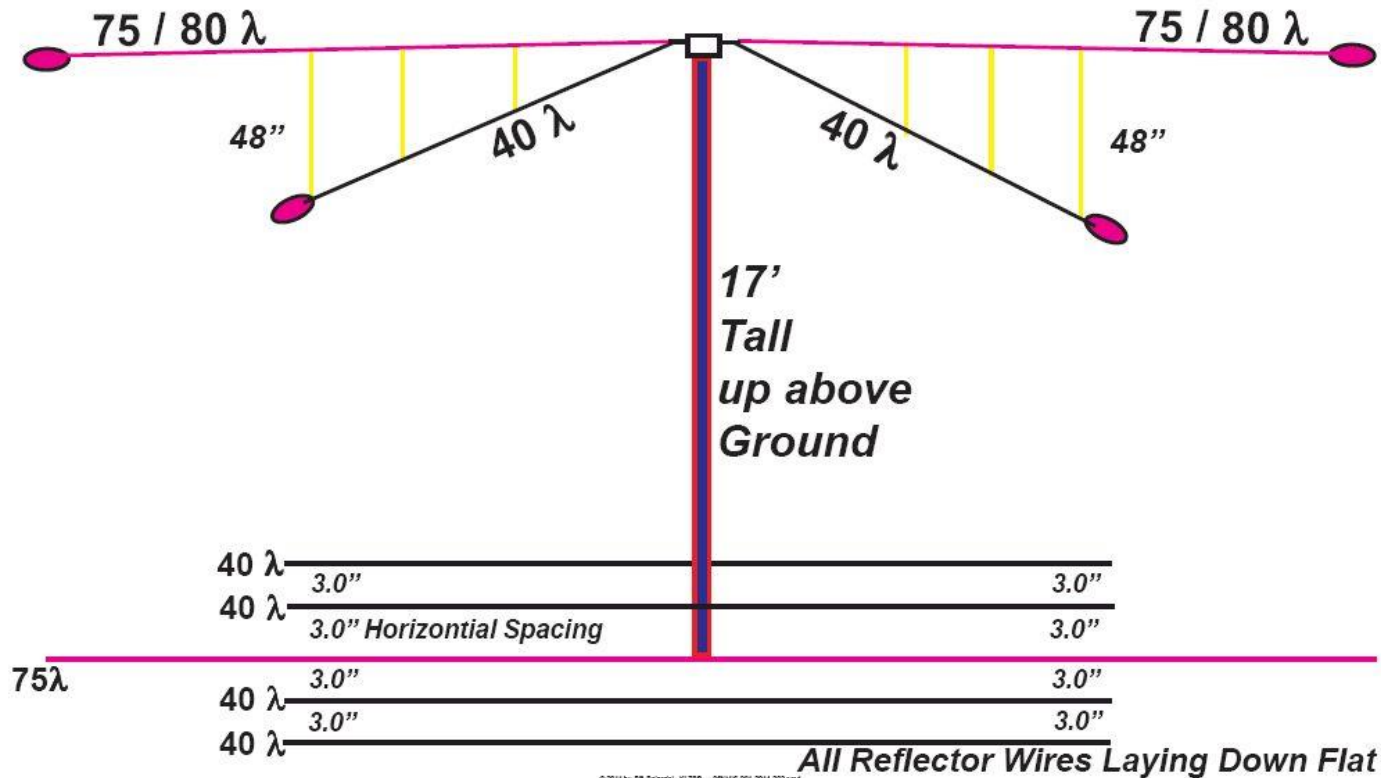
Wire “End View” of Dipole Antenna and RF Field



DE and RF Field are now 1 wave-length above the Ground

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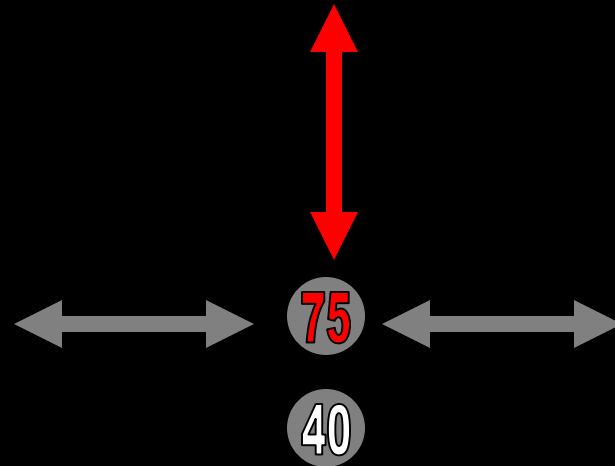
NVIS Dual-Band Antenna for 75λ / 80λ , & 40λ Meters.
Side View with Reflector Wires



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Visualize the RF Field ?

Wire “End View” of NVIS Antenna and RF Field

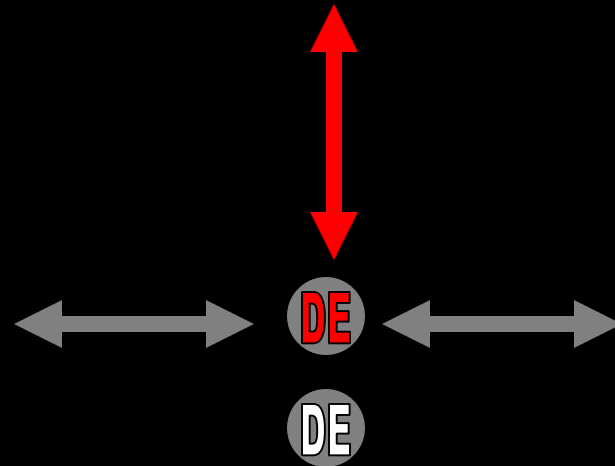


DE and RF Field are now much closer to the Ground



Visualize the RF Field ?

Wire "End View" of NVIS Antenna and RF Field



DE and RF Field are now much closer to the Ground



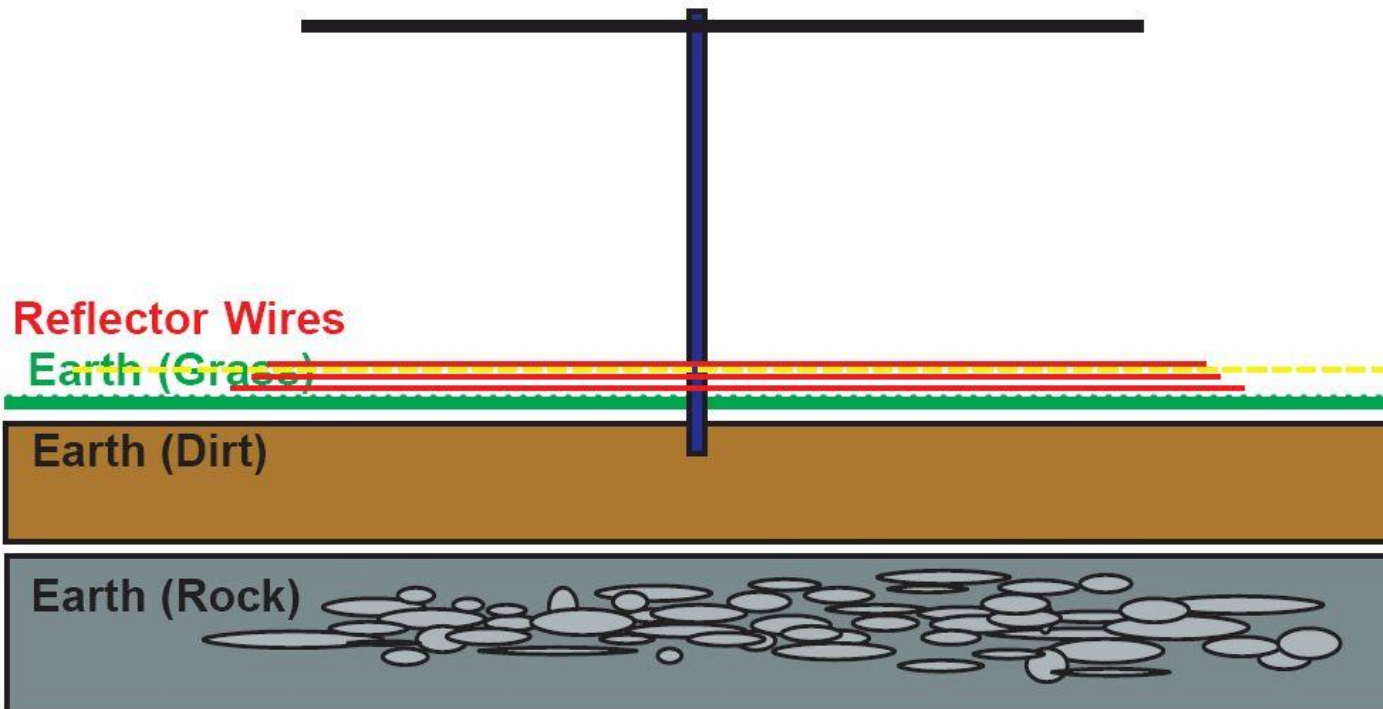
NVIS Antennas



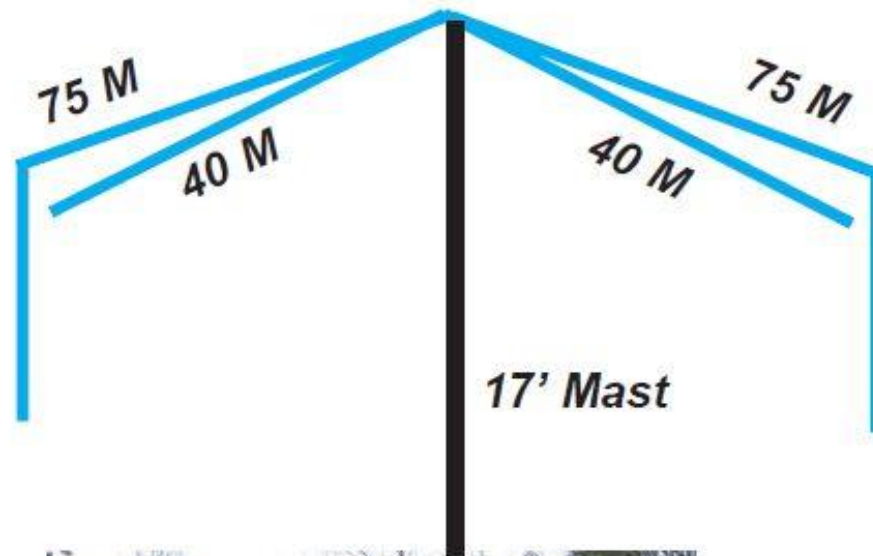
NVIS Antennas

Antenna “Reflector” Will Be The *Reflector Wires* When Installed

Antenna “Driven Element”



NVIS Antennas

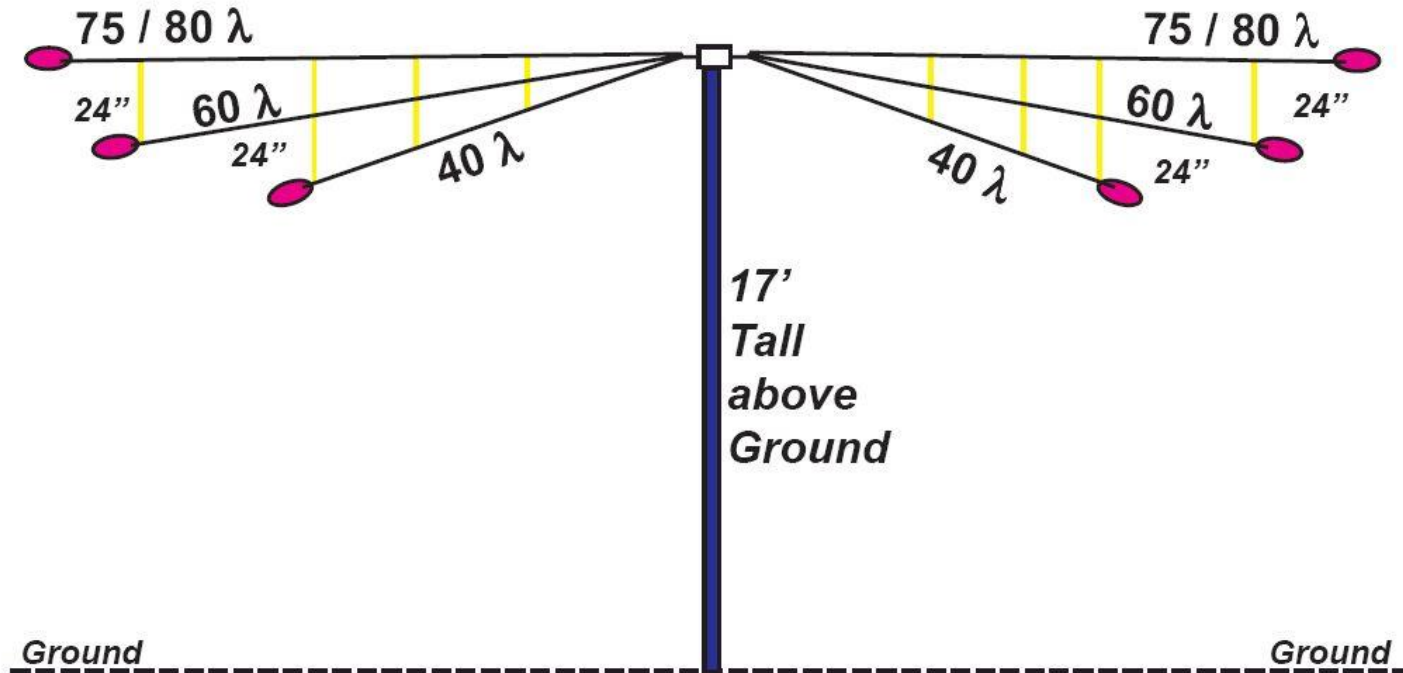


NVIS Antennas



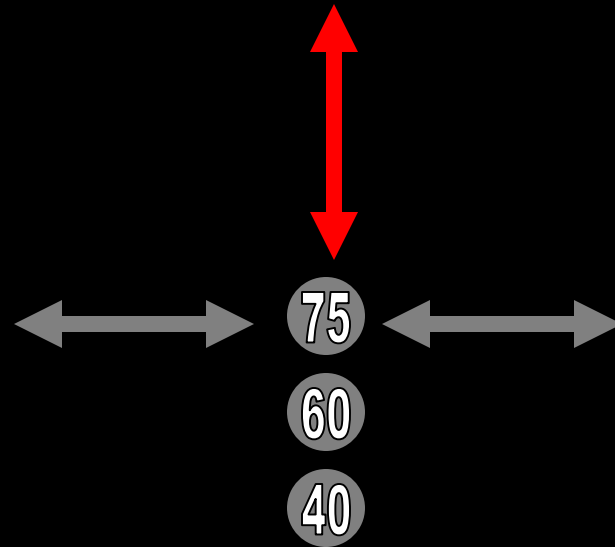
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NVIS Tri-Band Antenna for $75\lambda / 80\lambda$, 60λ , & 40λ Meters.
Side View



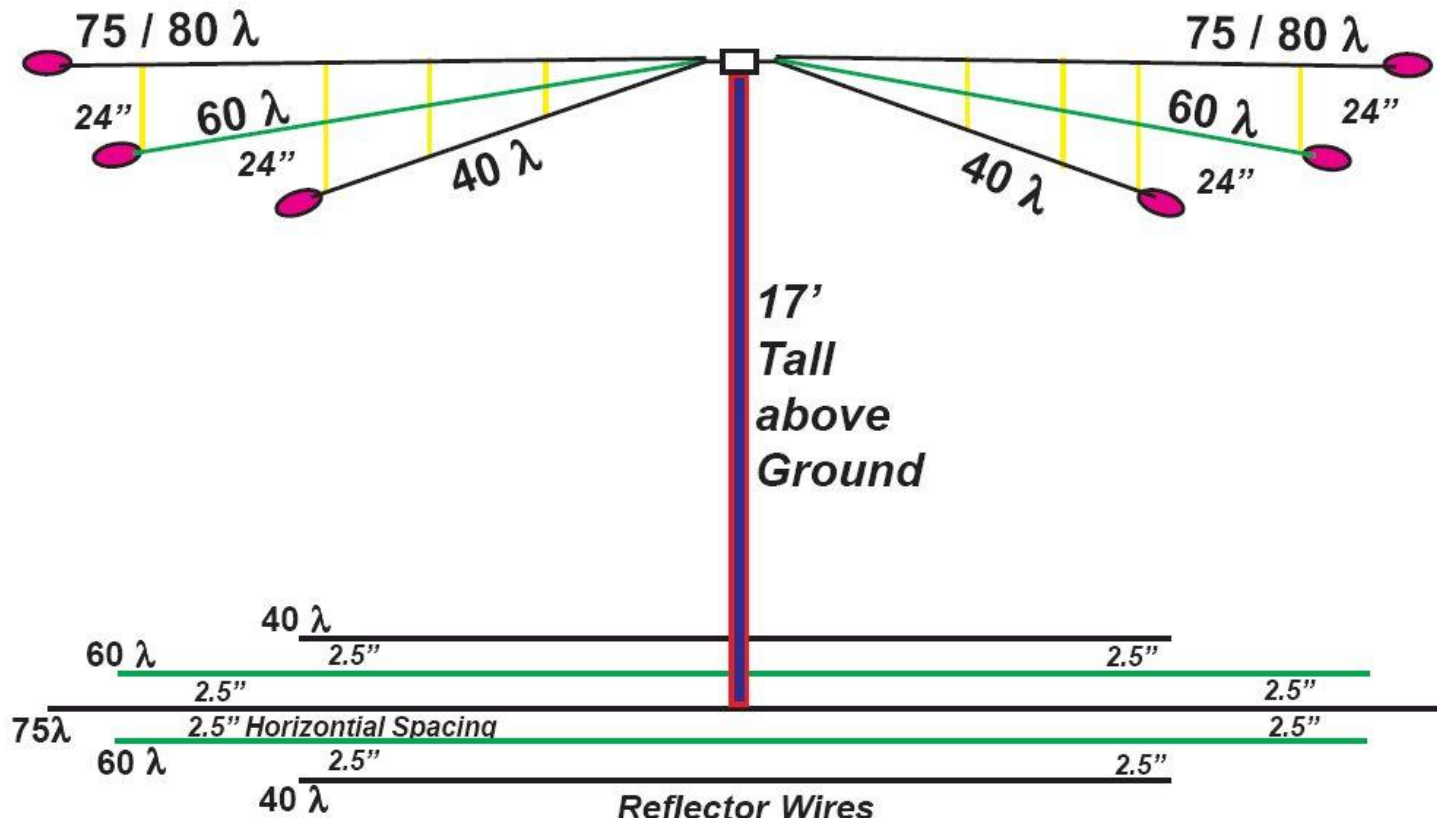
Visualize the RF Field ?

Wire “End View” of NVIS 3 Band Antenna and RF Field



NVIS Antennas

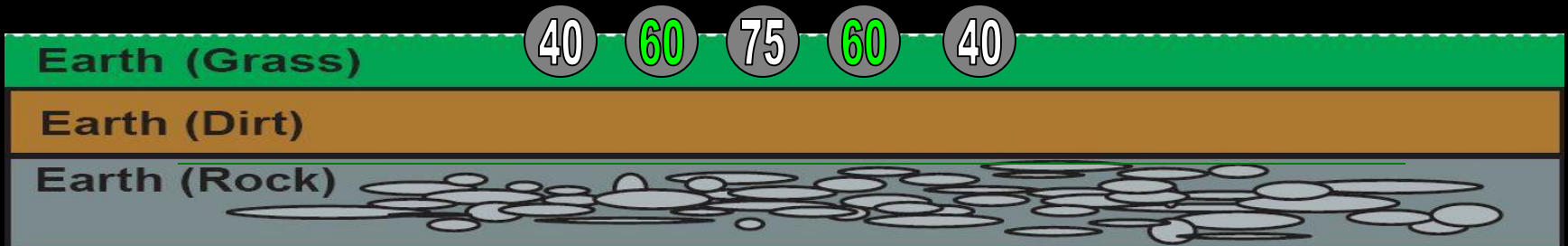
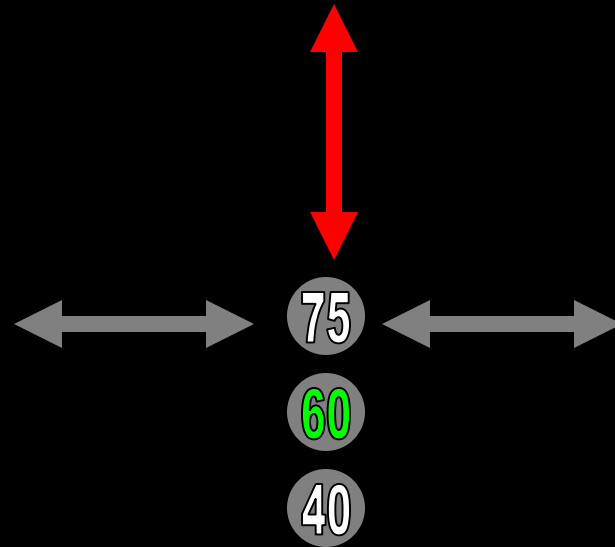
NVIS Tri-Band Antenna for 75λ / 80λ , 60λ , & 40λ Meters.
Side View with Reflector Wires



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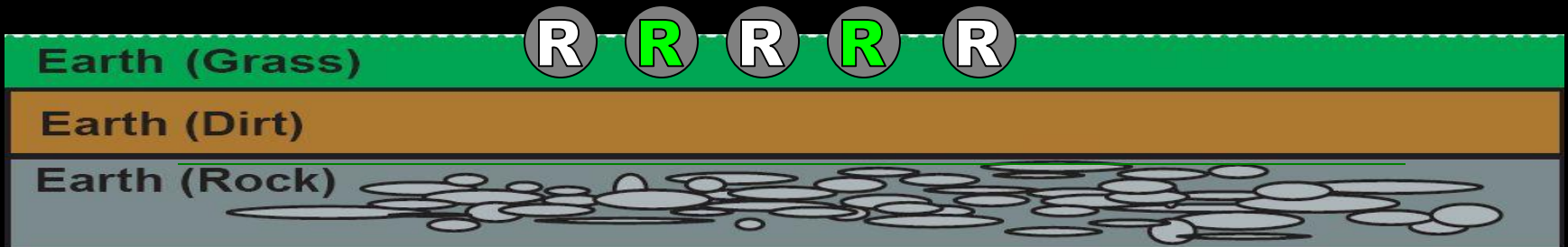
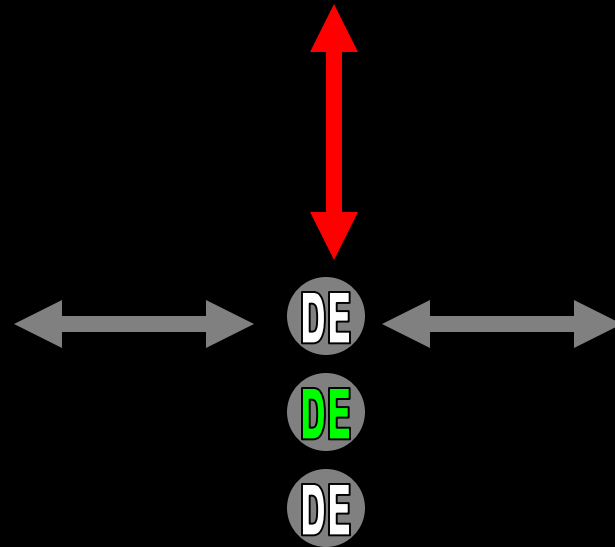
Visualize the RF Field ?

Wire "End View" of NVIS 3 Band Antenna and RF Field



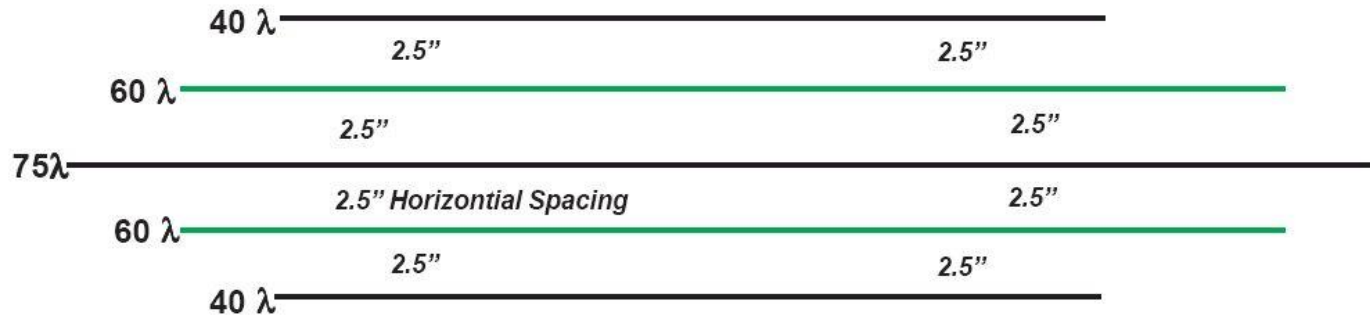
Visualize the RF Field ?

Wire "End View" of NVIS 3 Band Antenna and RF Field



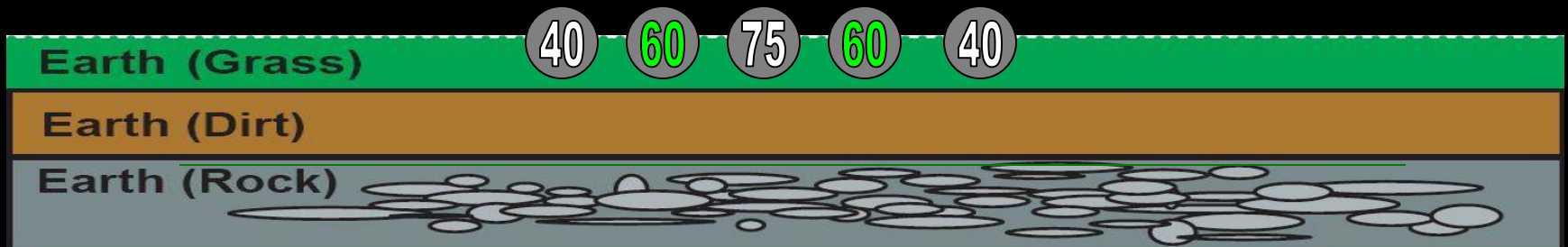
NVIS Antennas

NVIS Tri-Band Antenna for 75λ / 80λ , 60λ , & 40λ Meters.
Top-Down View of Reflector Wires
laying flat on the Surface/Ground.



Visualize the RF Field ?

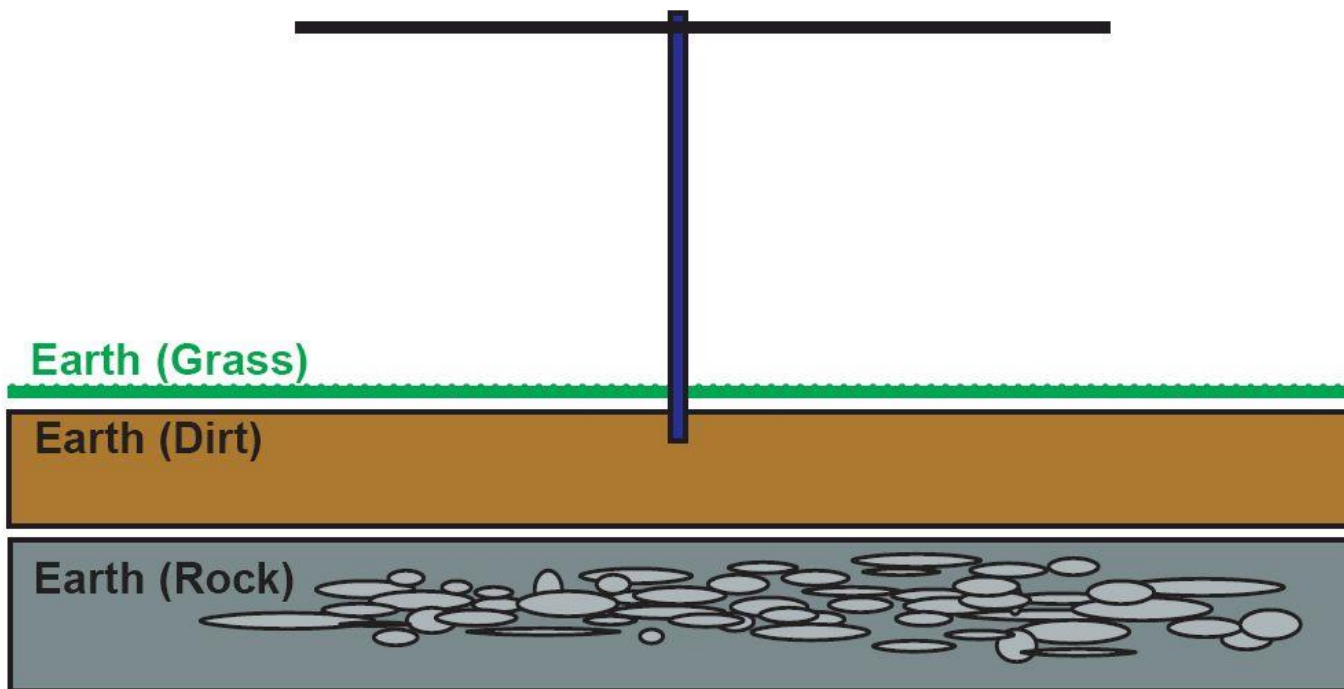
Wire "End View" of NVIS 3 Band Antenna Reflectors





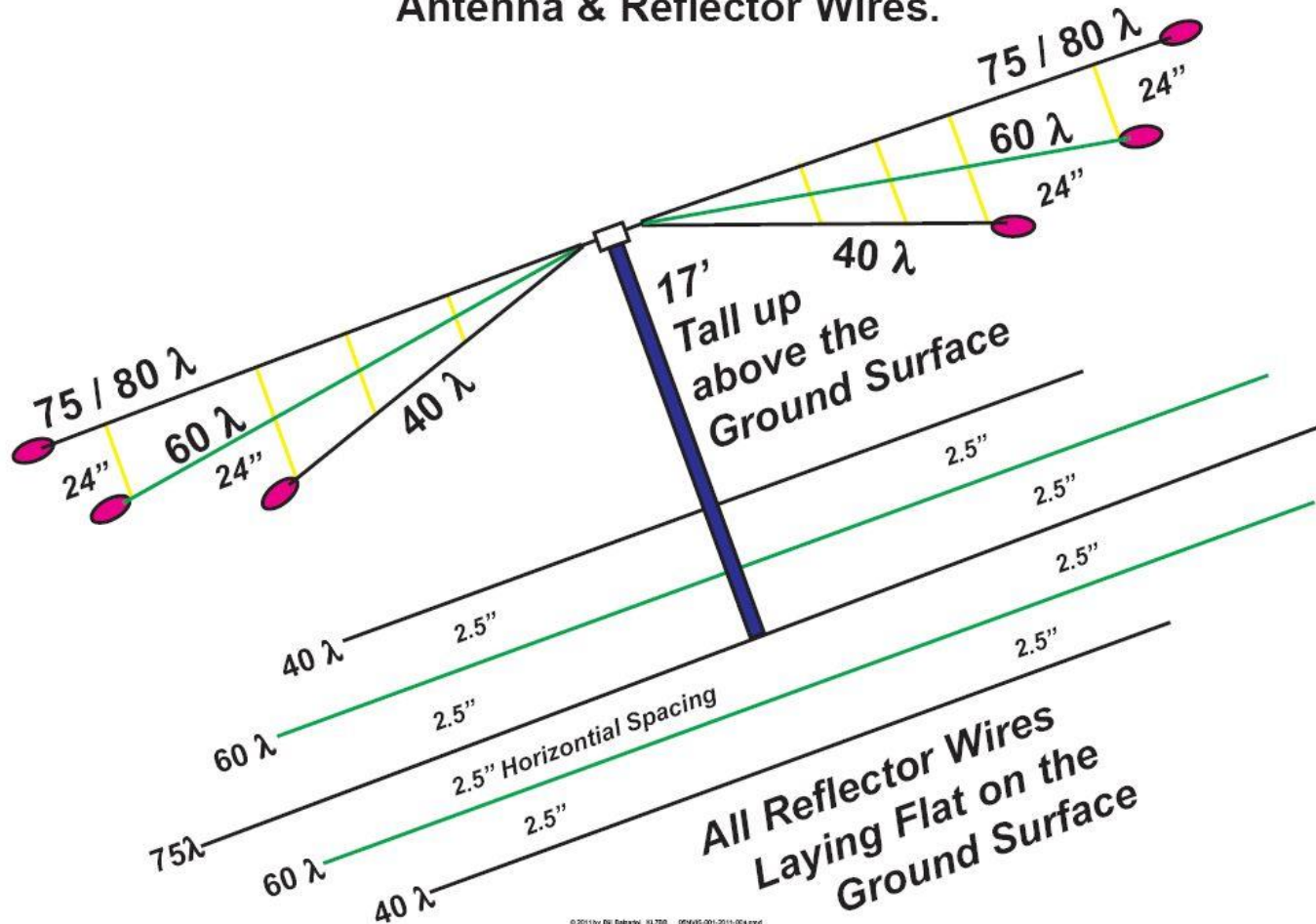
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Antenna "Driven Element"



NVIS Antennas

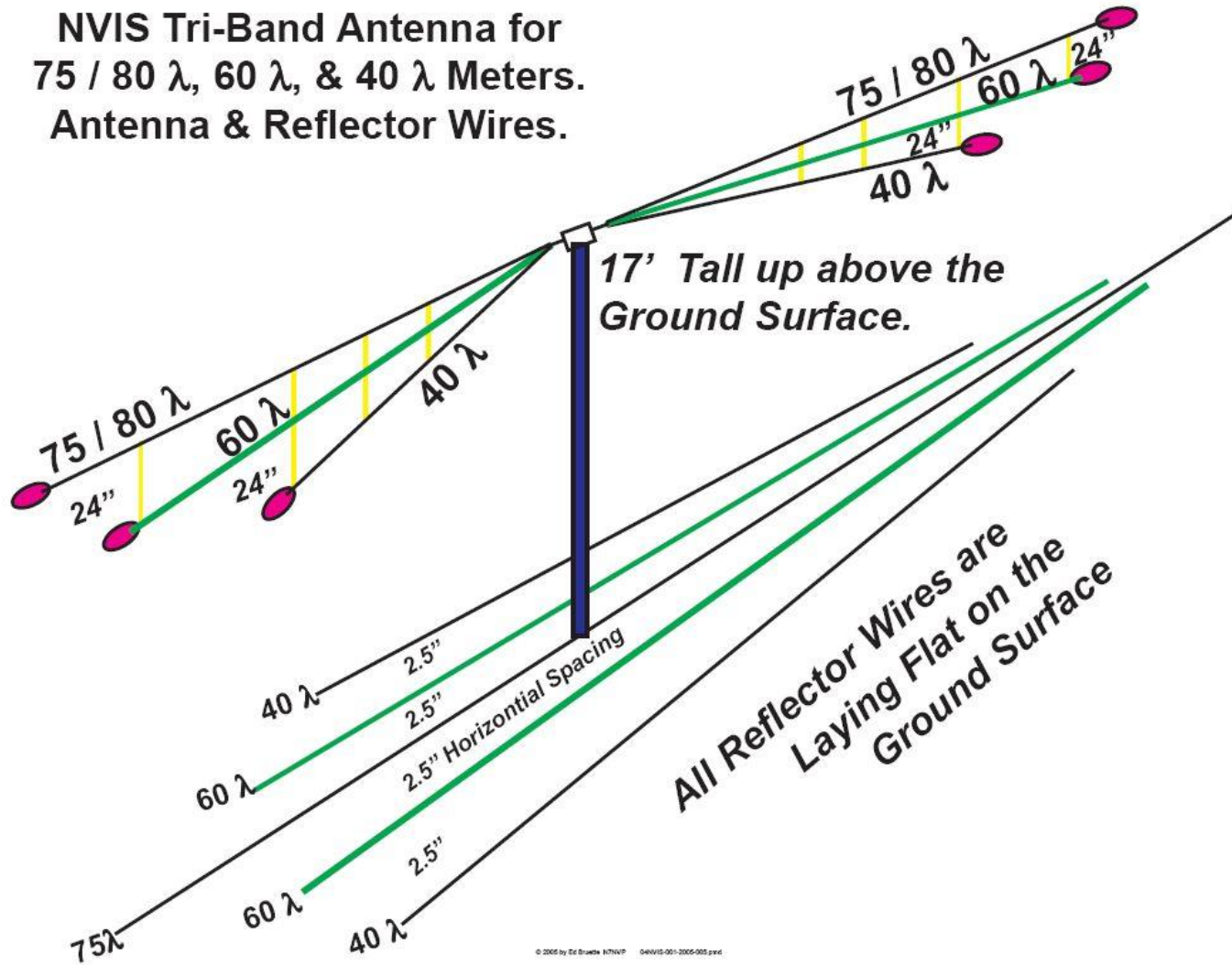
NVIS Tri-Band Antenna for 75λ / 80λ , 60λ , & 40λ Meters.
Antenna & Reflector Wires.



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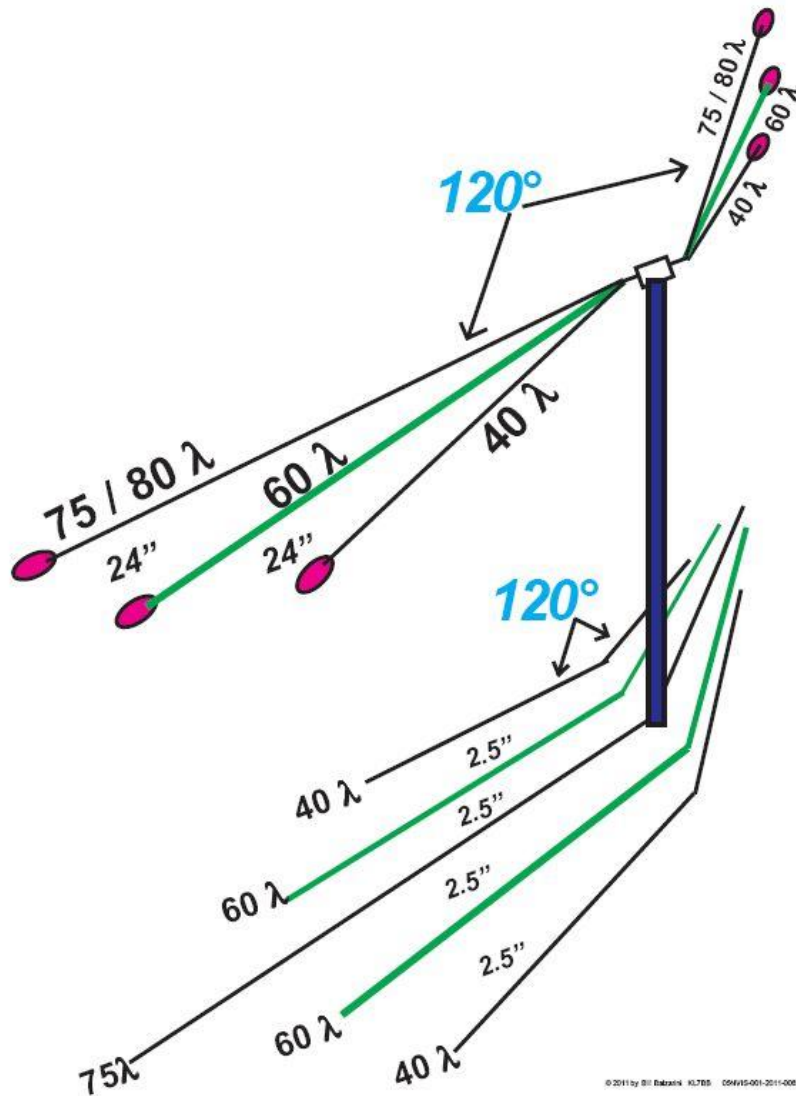
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NVIS Tri-Band Antenna for
75 / 80 λ , 60 λ , & 40 λ Meters.
Antenna & Reflector Wires.



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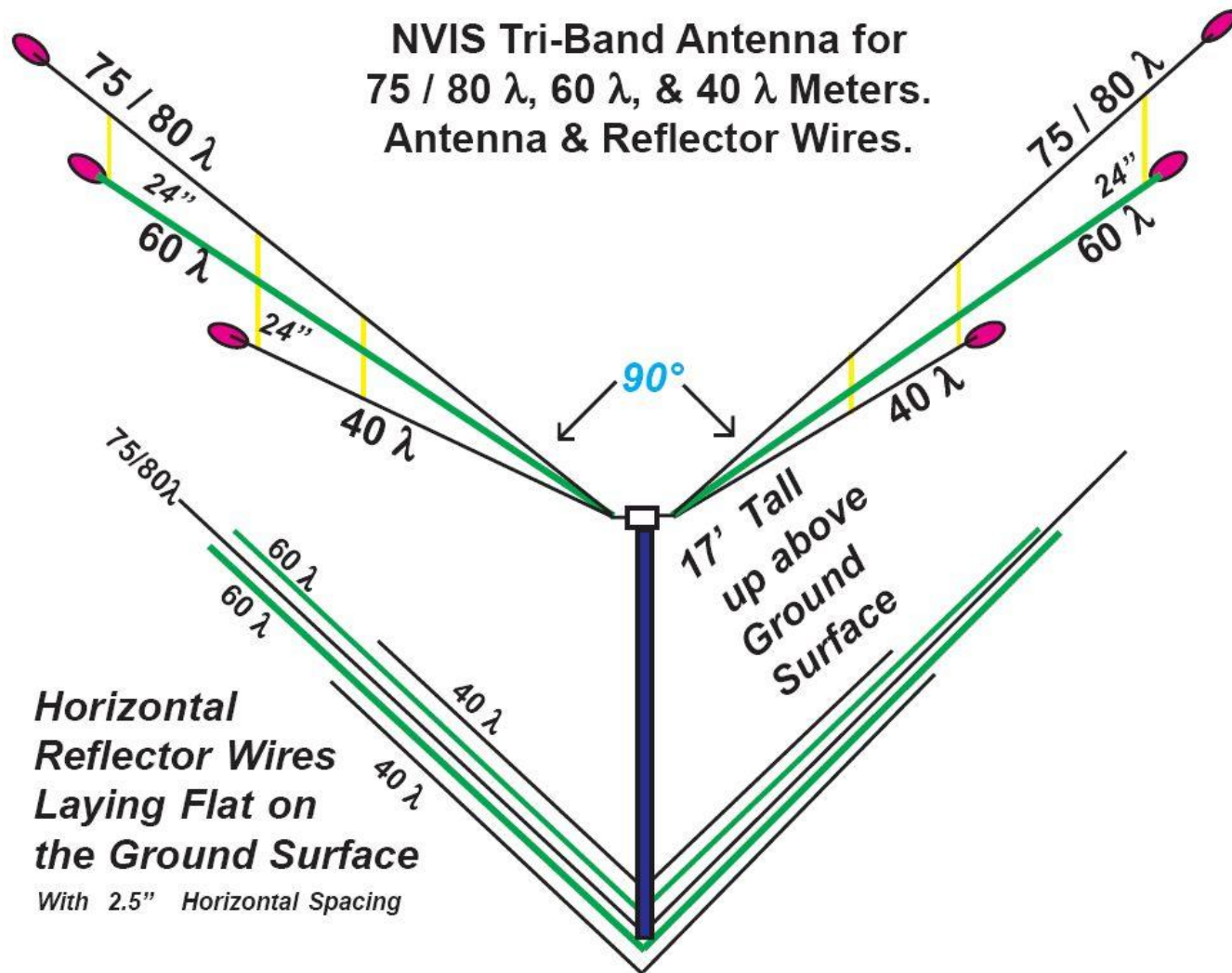
NVIS Tri-Band Antenna for
 $75 / 80 \lambda$, 60λ , & 40λ
Meters.

Antenna &

Reflector Ground Wires

@ 120° .

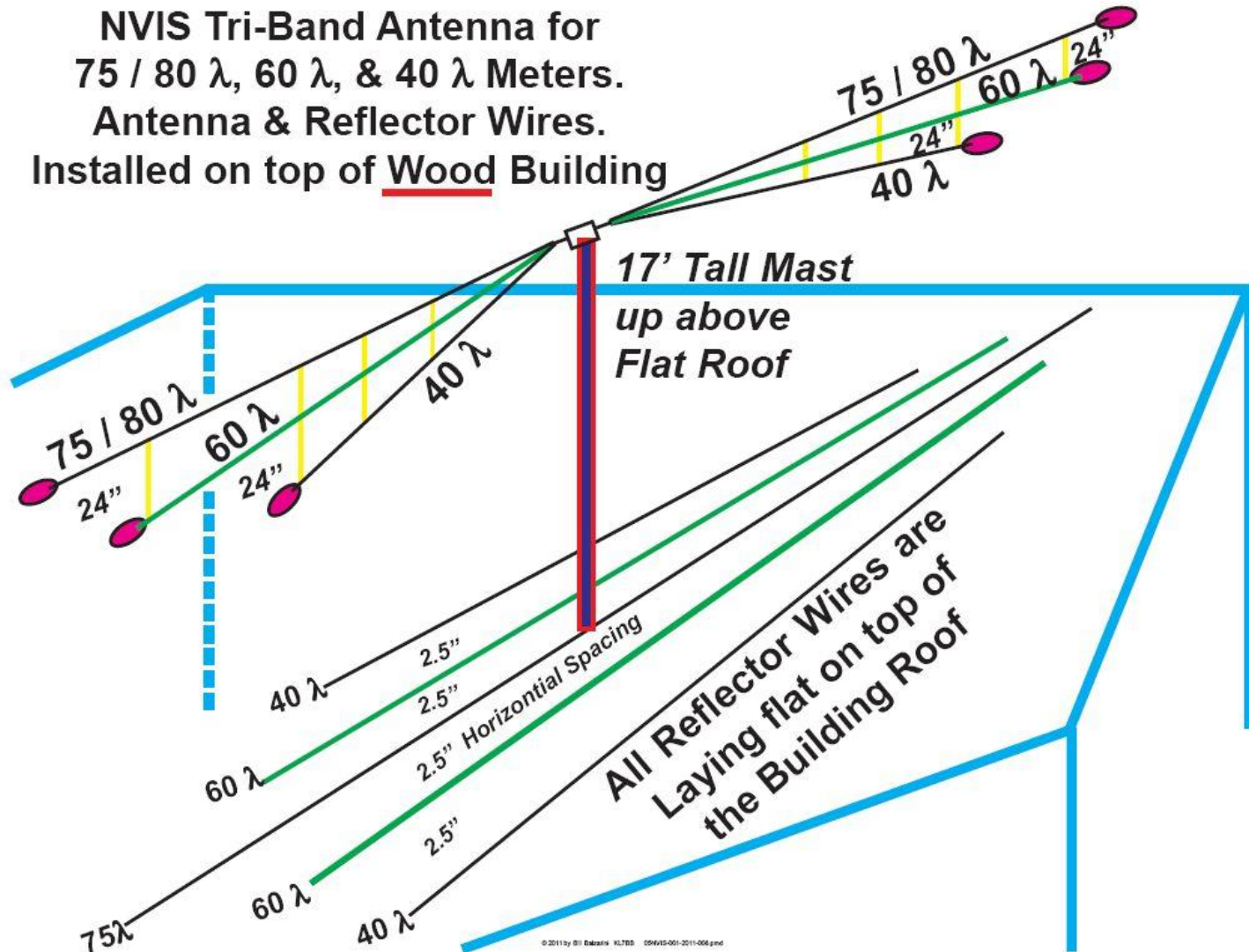
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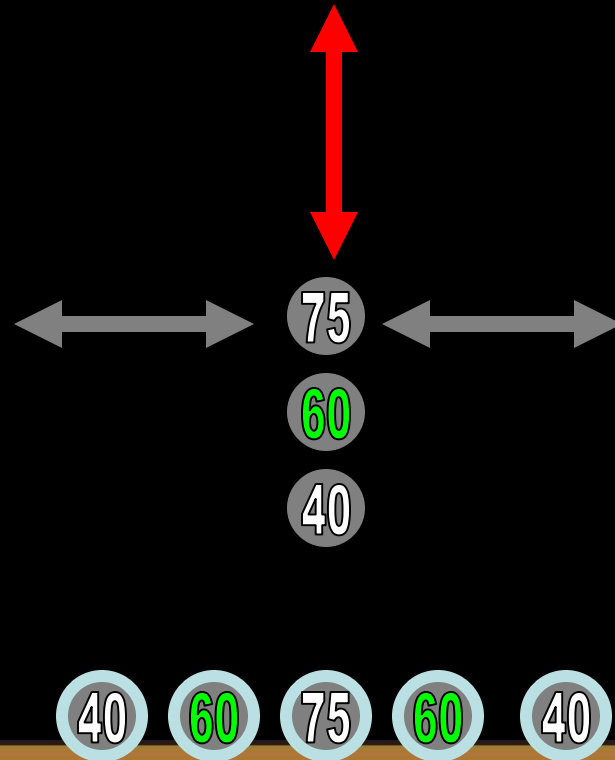
NVIS Antennas

NVIS Tri-Band Antenna for
75 / 80 λ , 60 λ , & 40 λ Meters.
Antenna & Reflector Wires.
Installed on top of Wood Building



Visualize the RF Field ?

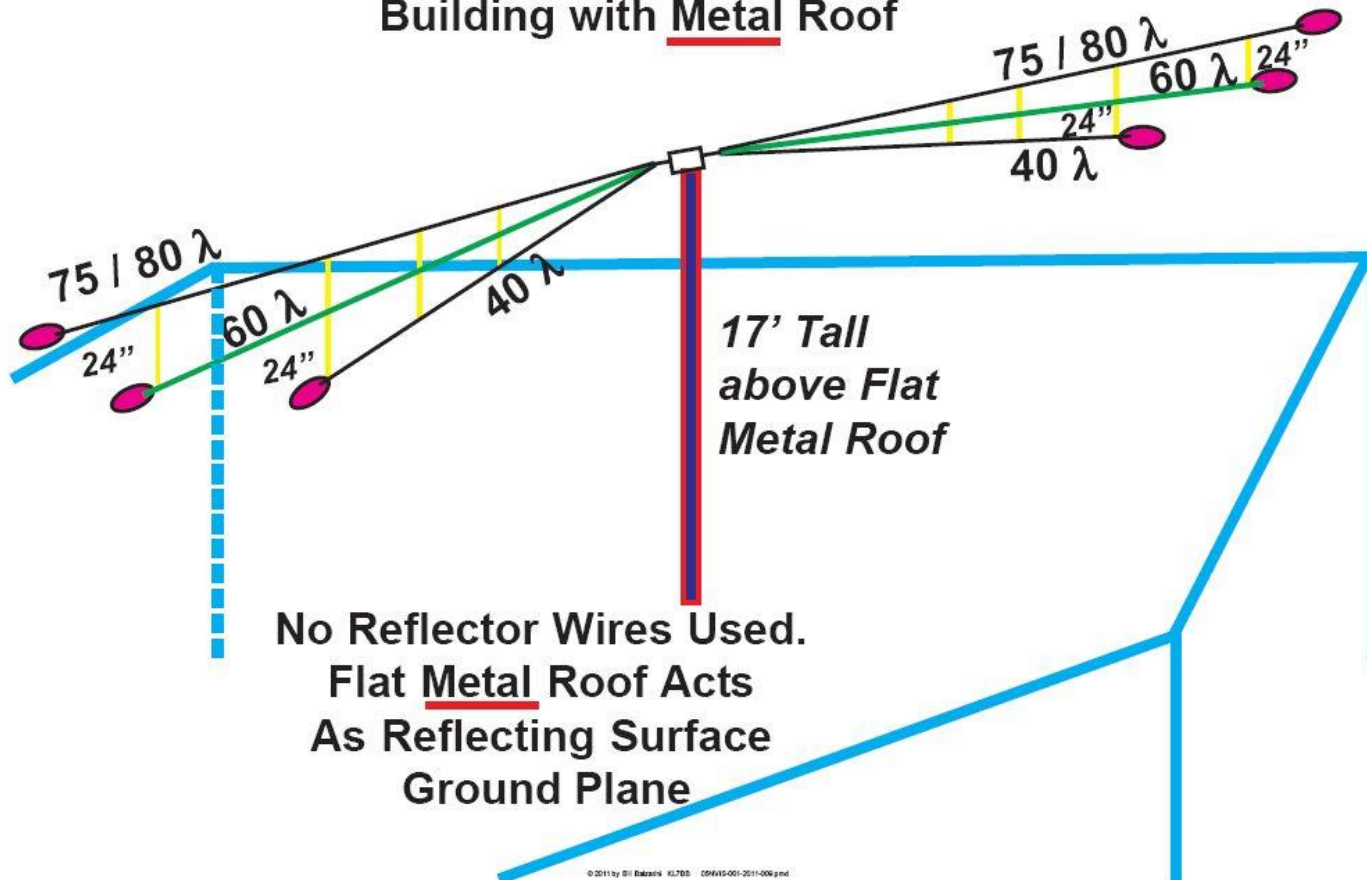
Wire "End View" of NVIS 3 Band Antenna and RF Field



Roof (Wood)

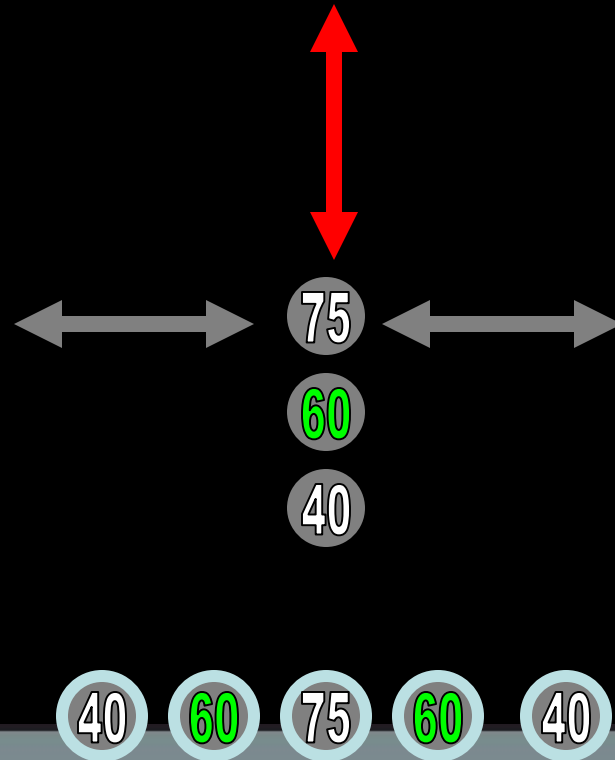
NVIS Antennas

NVIS Tri-Band Antenna for
75 / 80 λ , 60 λ , & 40 λ Meters.
Antenna Installed on top of
Building with Metal Roof



Visualize the RF Field ?

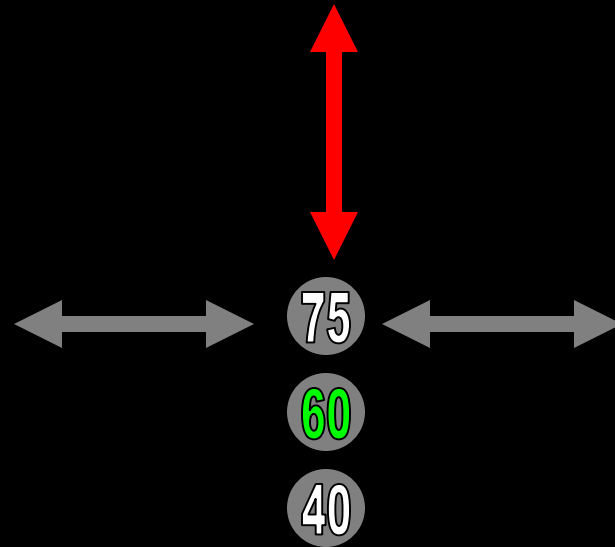
Wire "End View" of NVIS 3 Band Antenna and RF Field



Roof (Metal)

Visualize the RF Field ?

Wire "End View" of NVIS 3 Band Antenna and RF Field

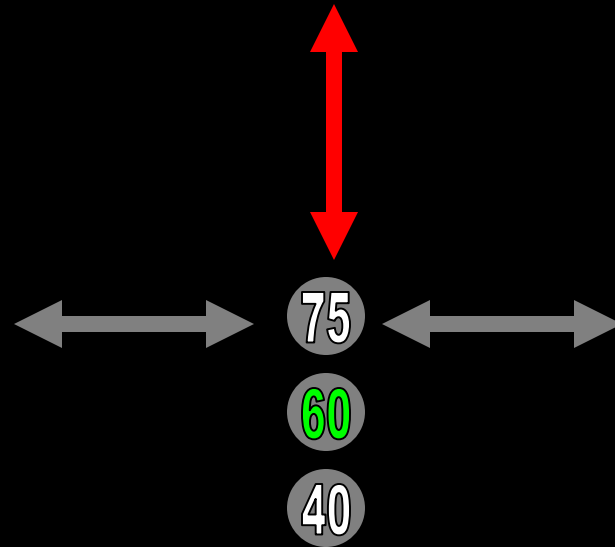


Roof (Metal)



Visualize the RF Field ?

Wire "End View" of Antenna and RF Field

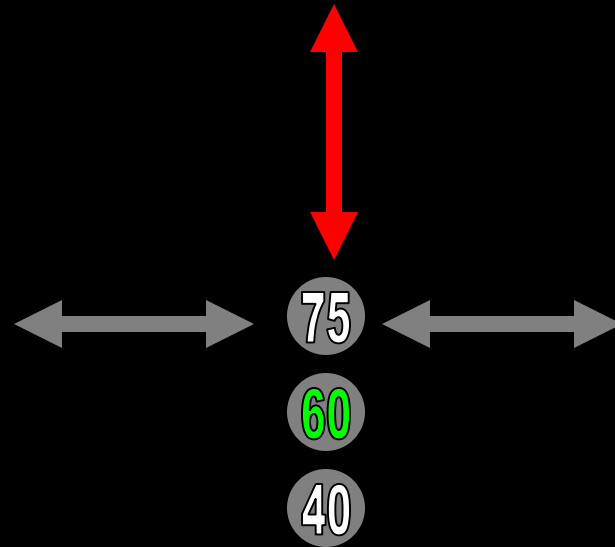


Roof (Metal)

40 60 75 60 40

Visualize the RF Field ?

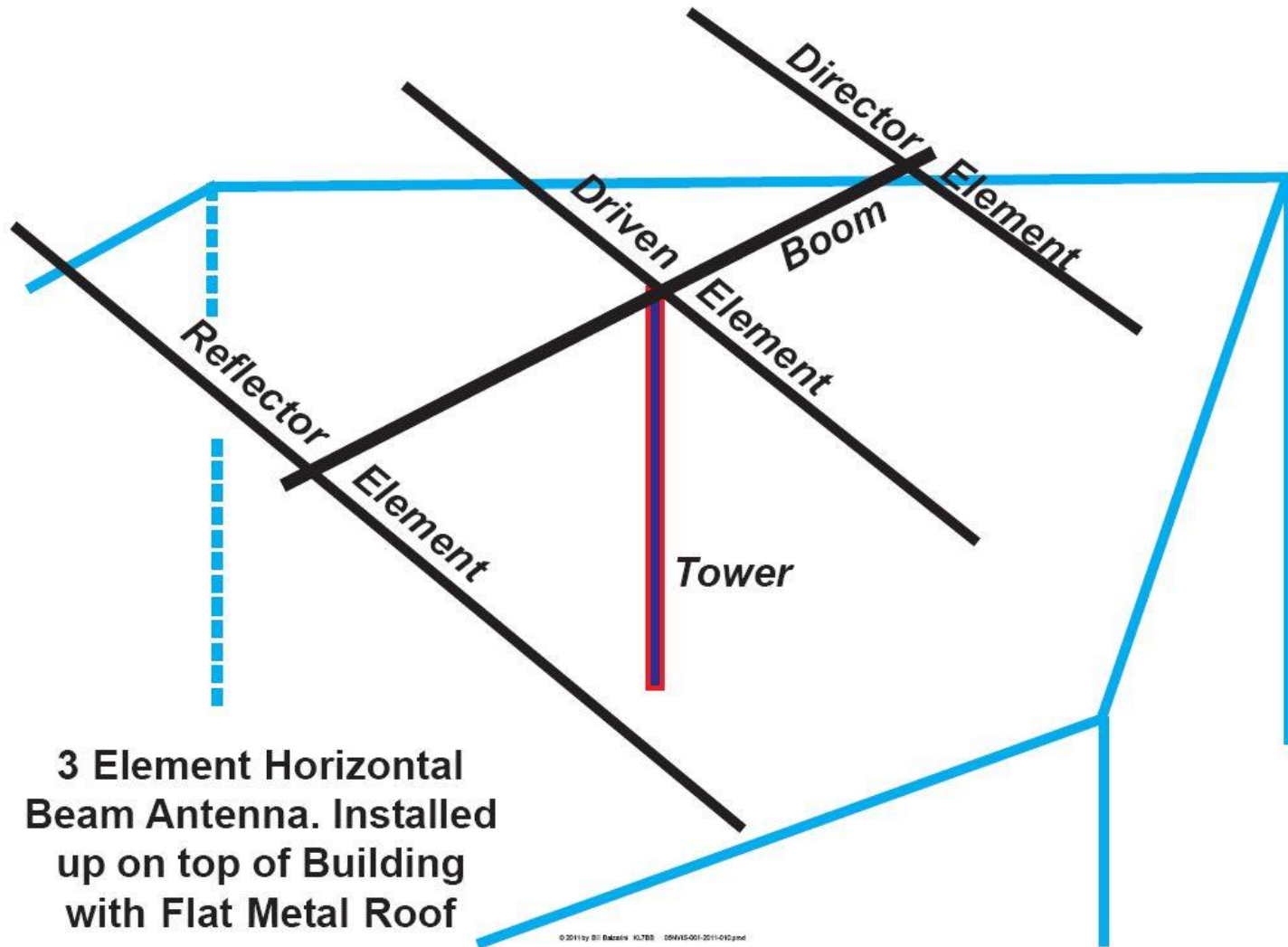
Wire "End View" of Antenna and RF Field



Roof (Metal)



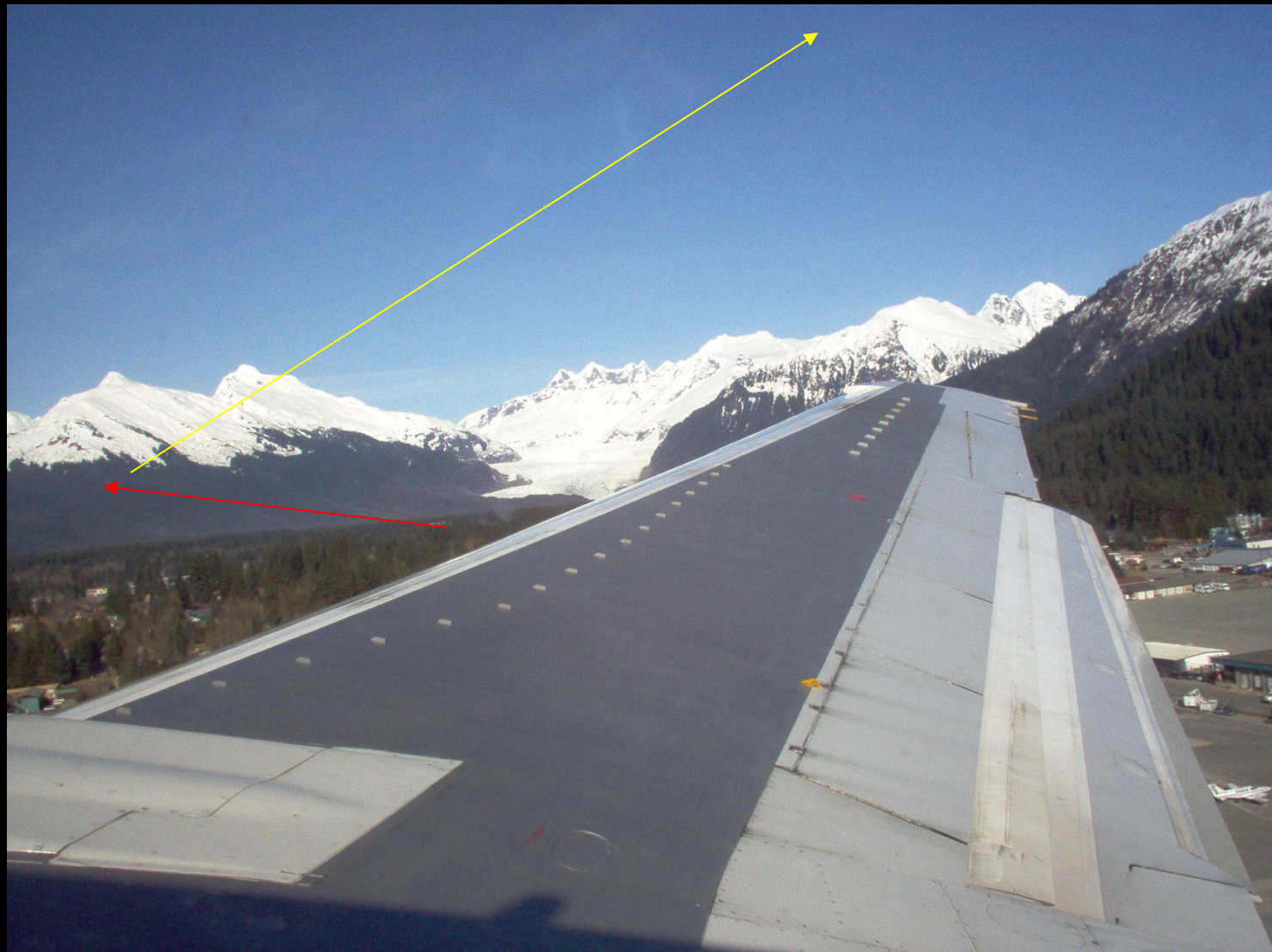
NVIS Antennas



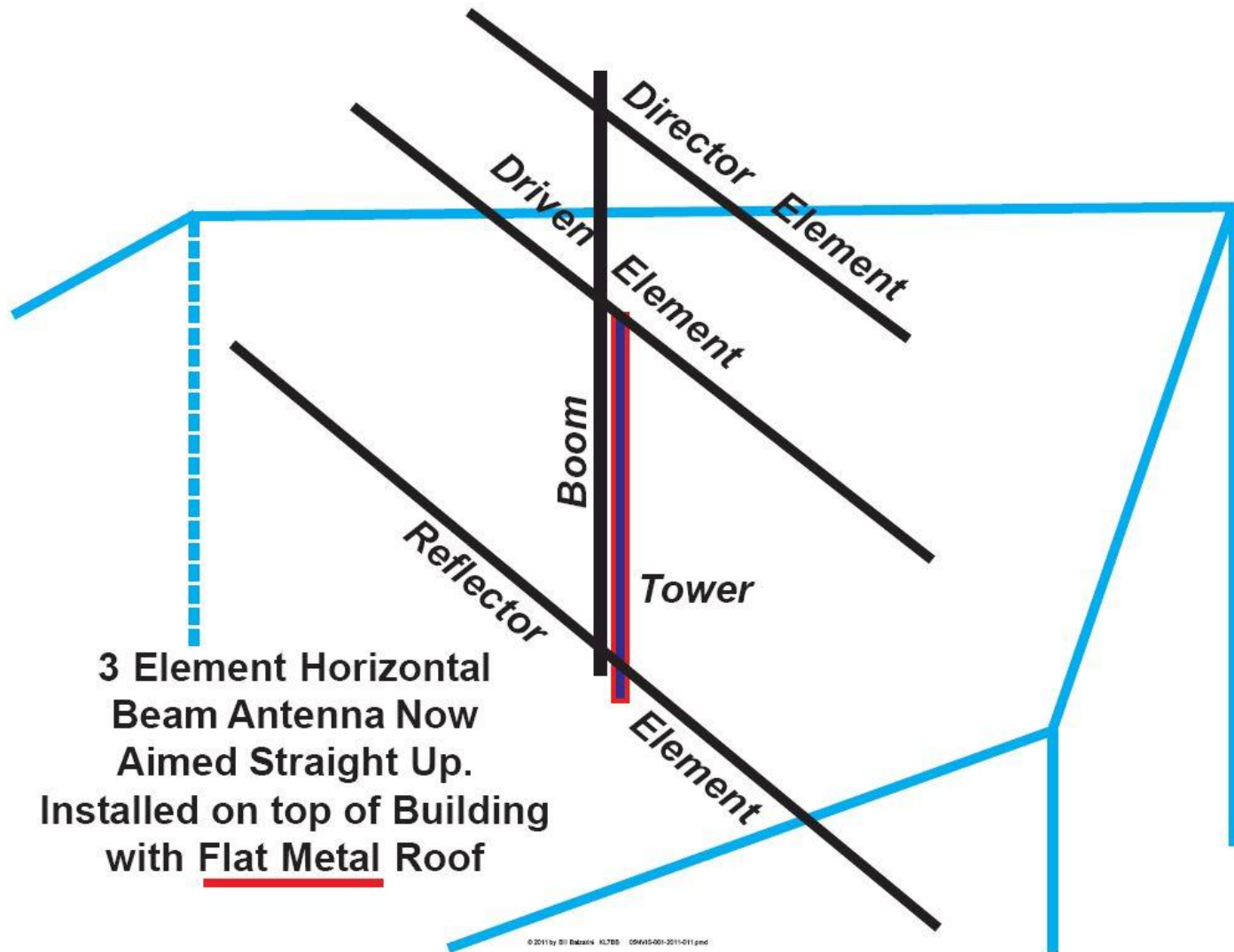
NVIS Antennas



NVIS Antennas



NVIS Antennas

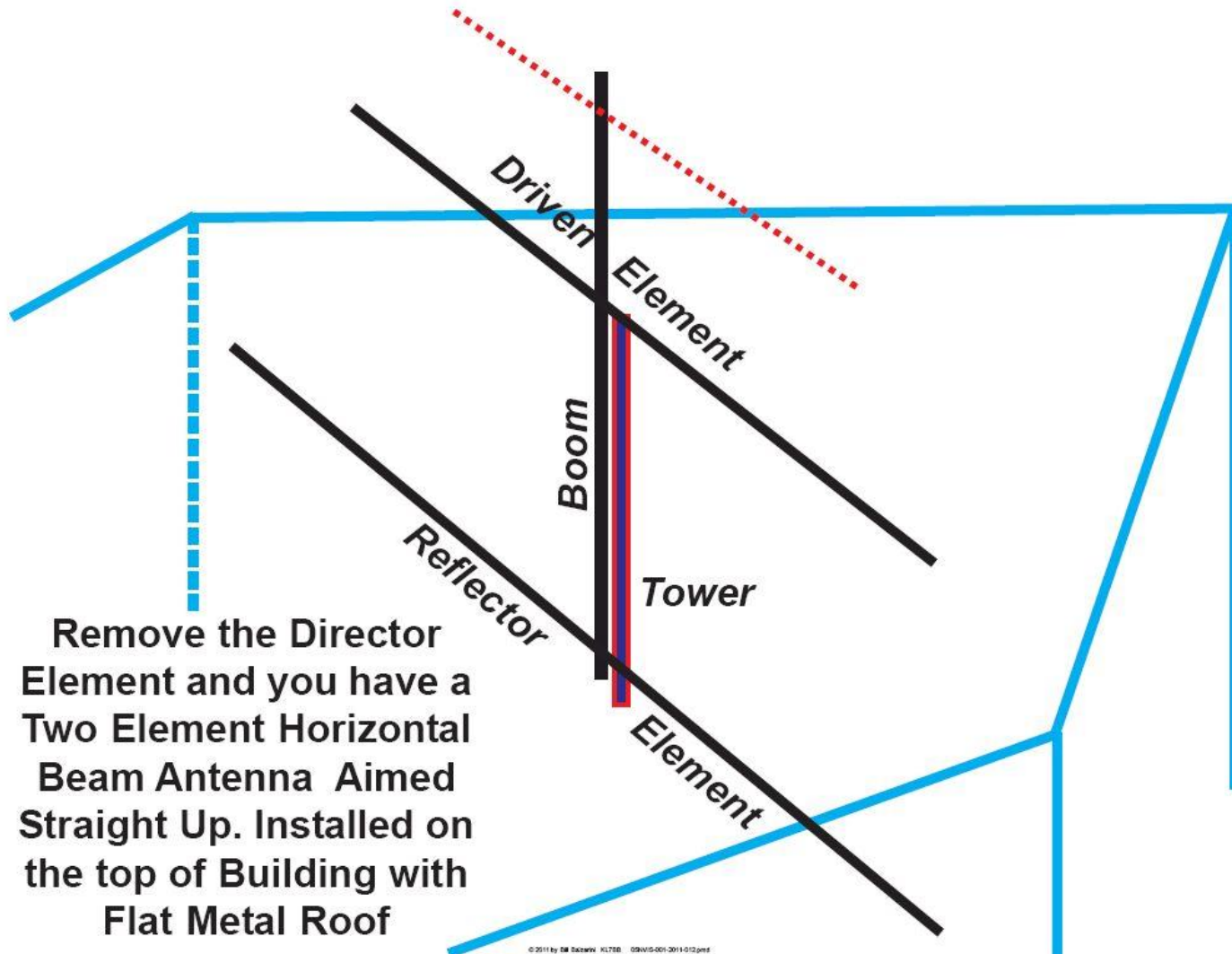


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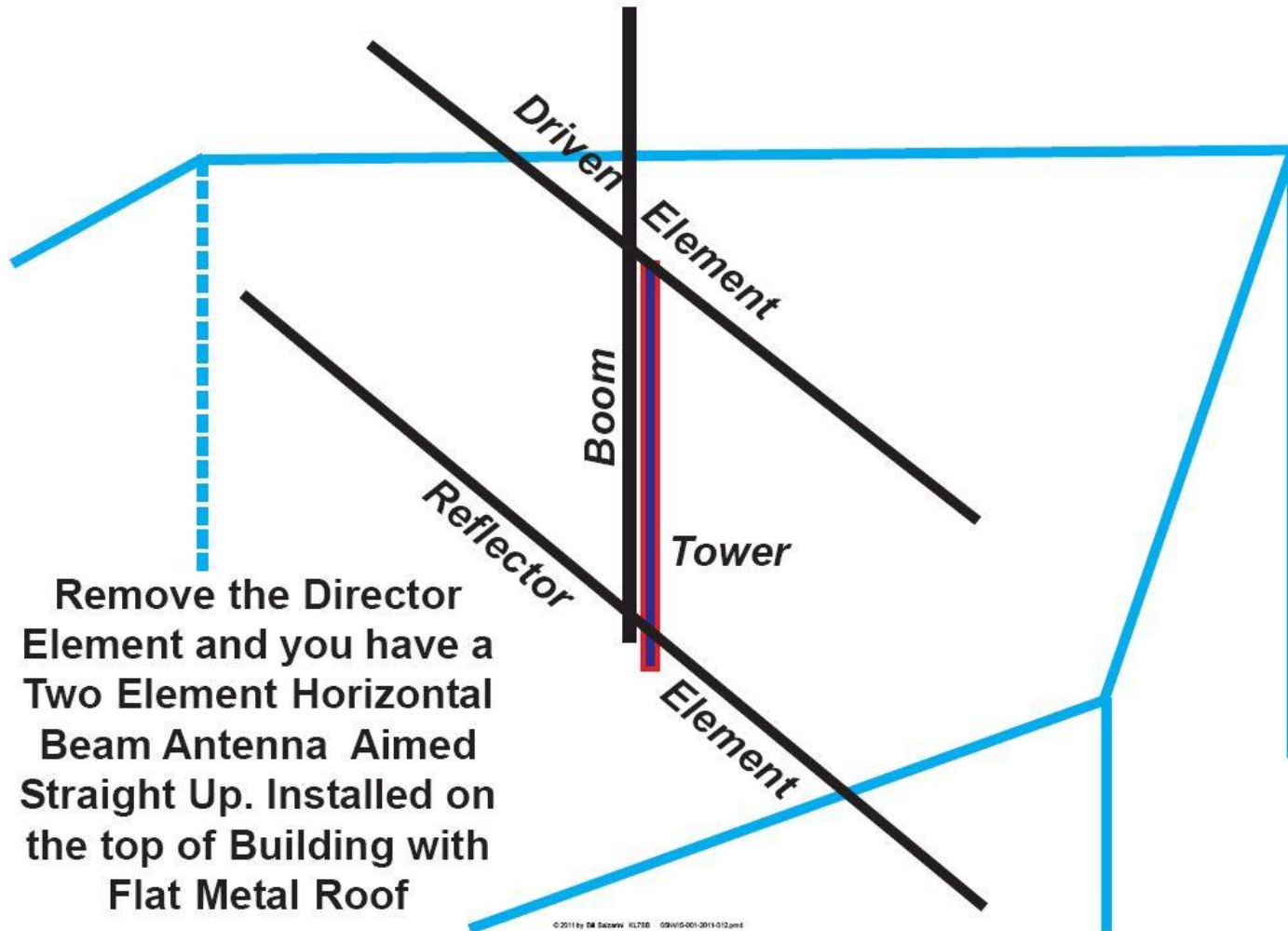
NVIS Antennas



NVIS Antennas

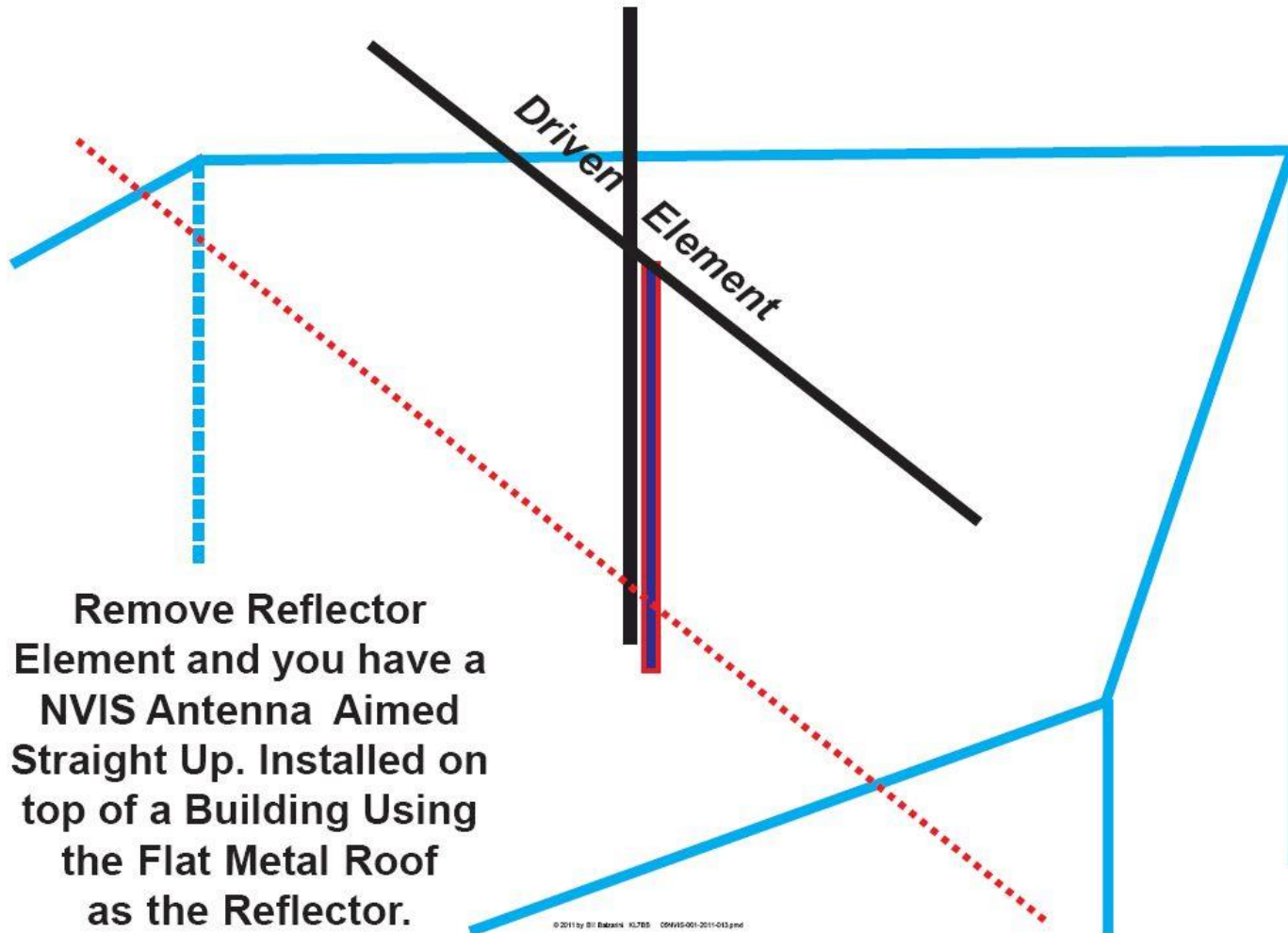


NVIS Antennas

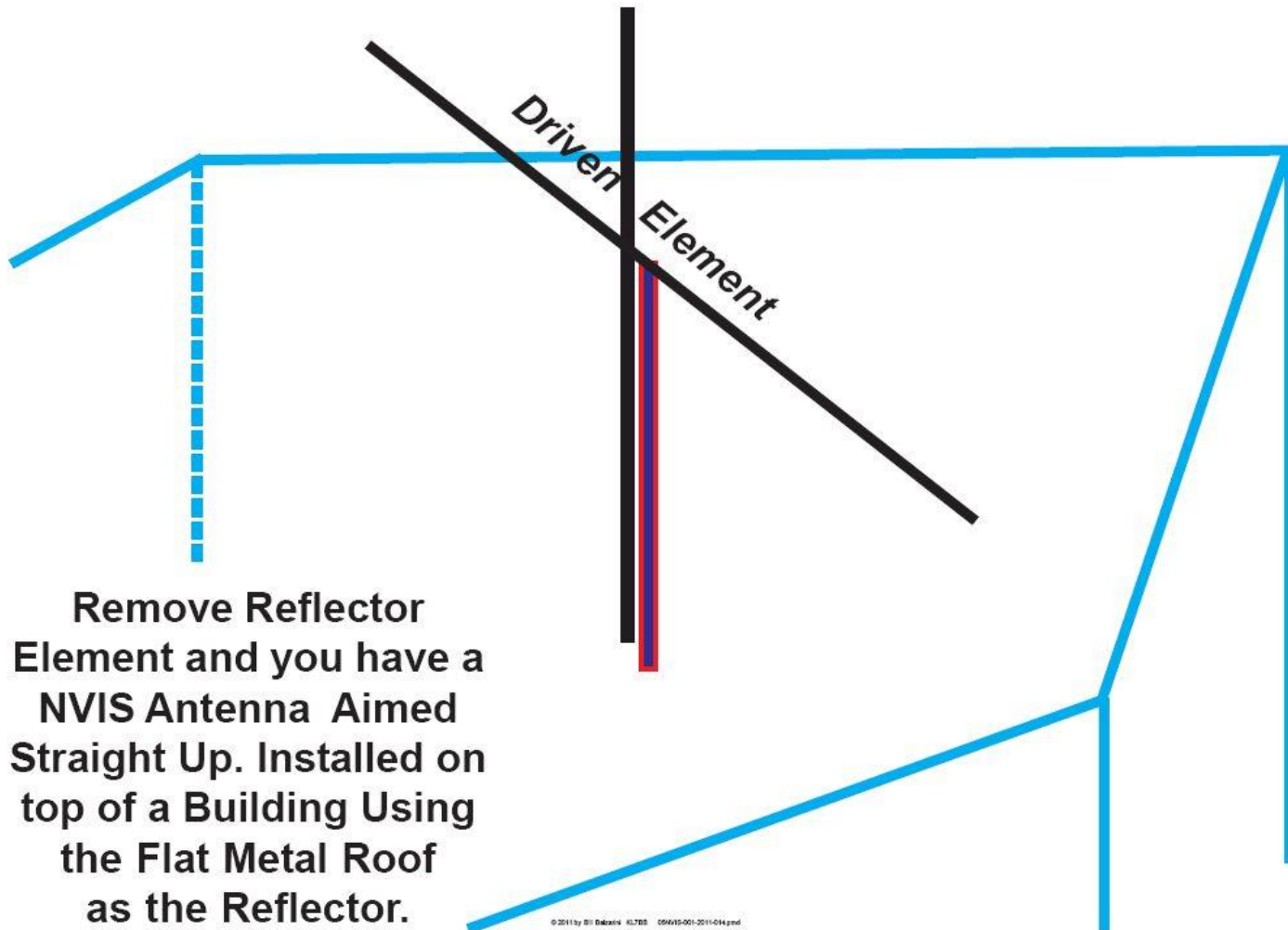


Remove the Director Element and you have a Two Element Horizontal Beam Antenna Aimed Straight Up. Installed on the top of Building with Flat Metal Roof

NVIS Antennas



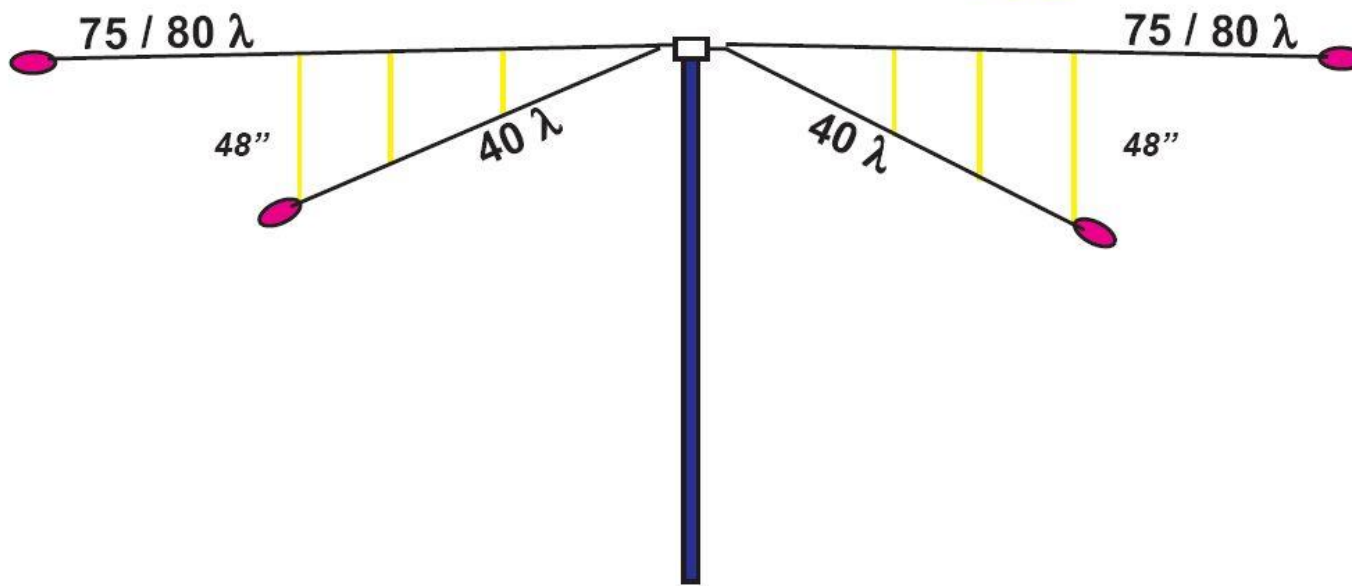
NVIS Antennas



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NVIS Antennas

NVIS Dual-BAND ANTENNA

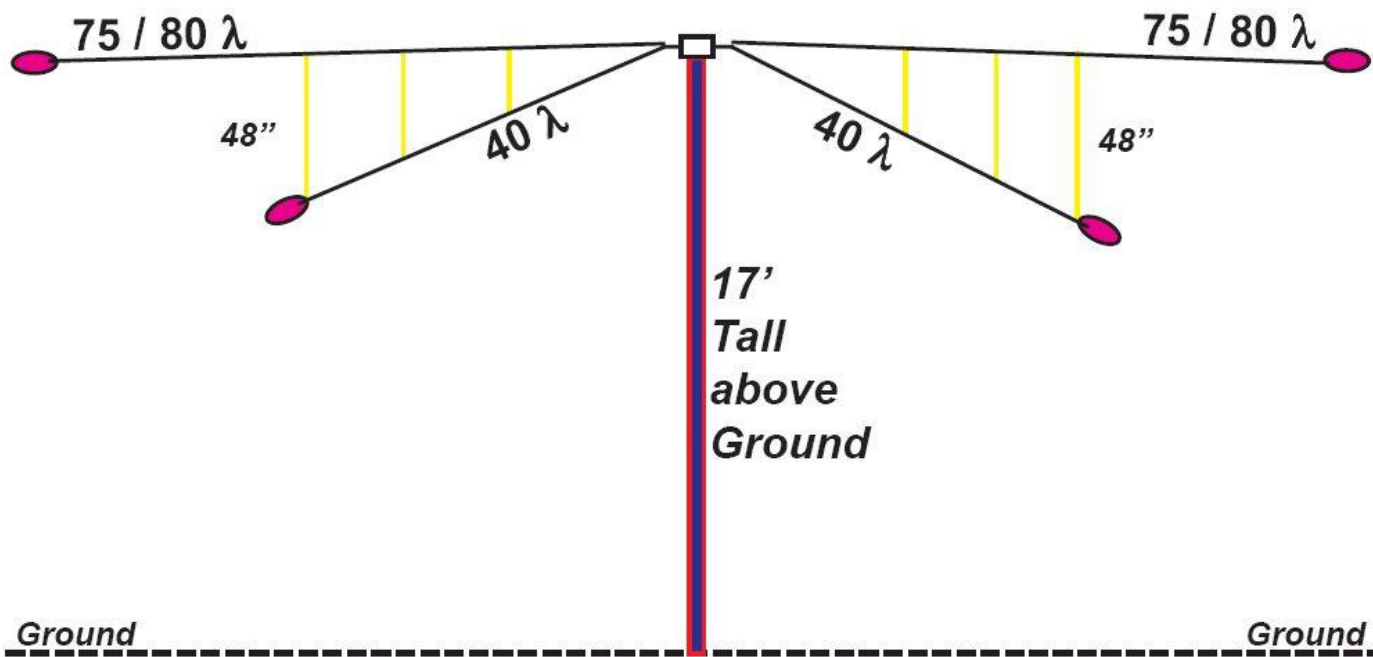


NVIS Antennas



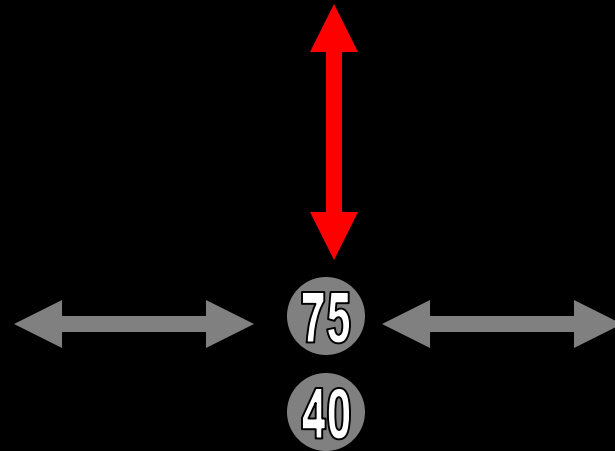
NVIS Antennas

NVIS Dual-Band Antenna for $75\lambda / 80\lambda$, & 40λ Meters.
Side View



Visualize the RF Field ?

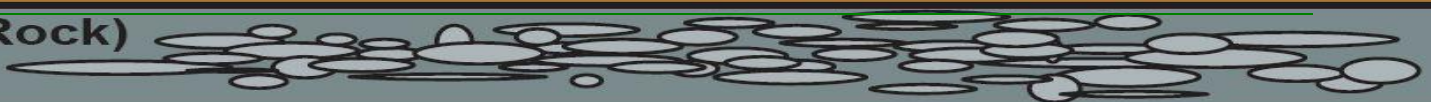
Wire "End View" of NVIS 2 Band Antenna and RF Field



Earth (Grass)

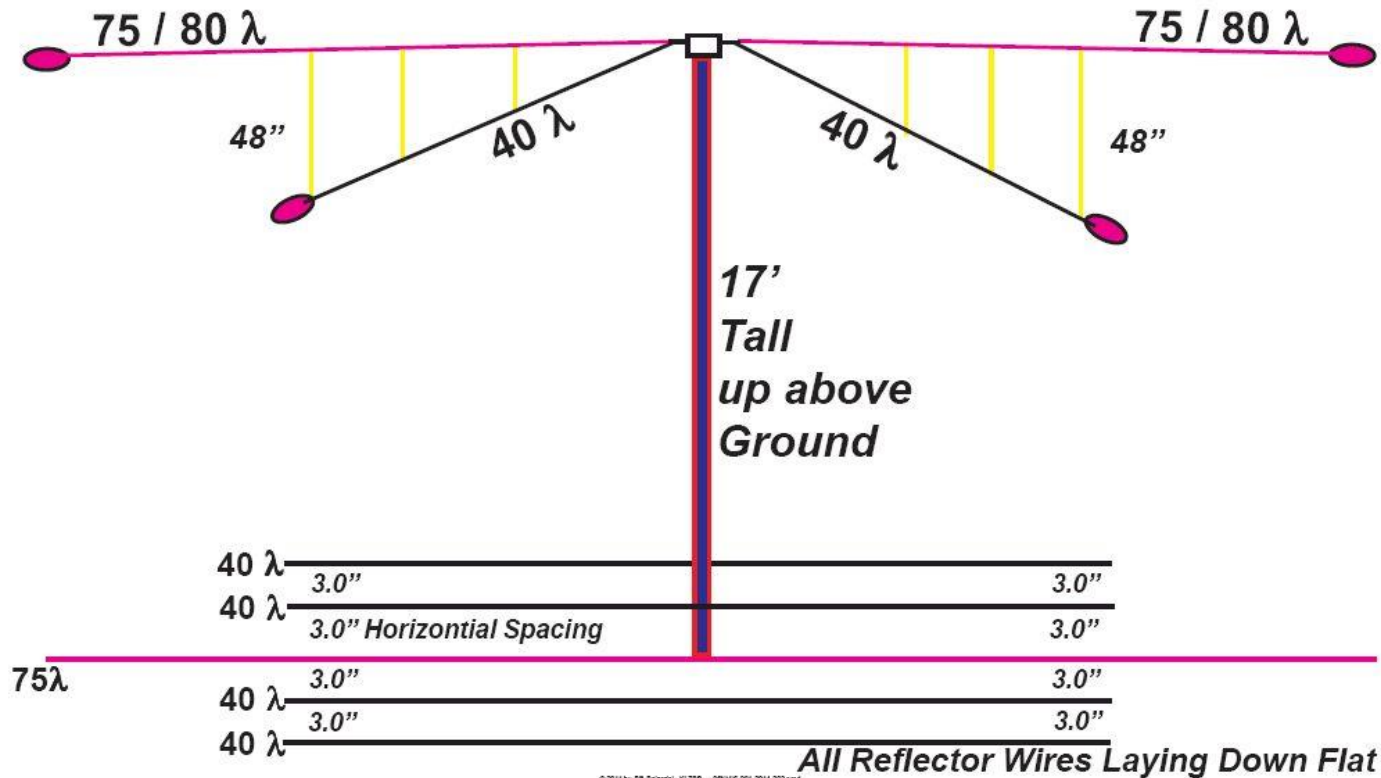
Earth (Dirt)

Earth (Rock)



NVIS Antennas

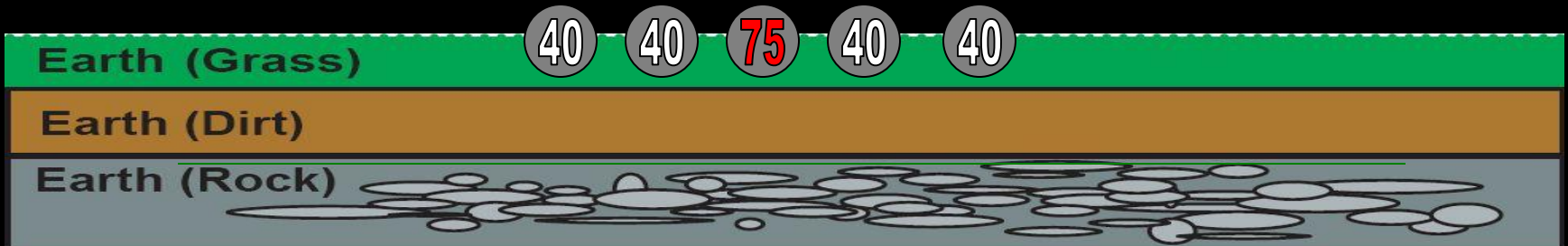
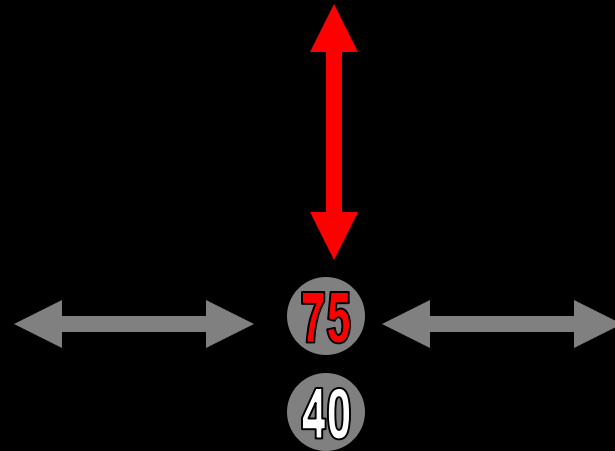
NVIS Dual-Band Antenna for 75λ / 80λ , & 40λ Meters.
Side View with Reflector Wires



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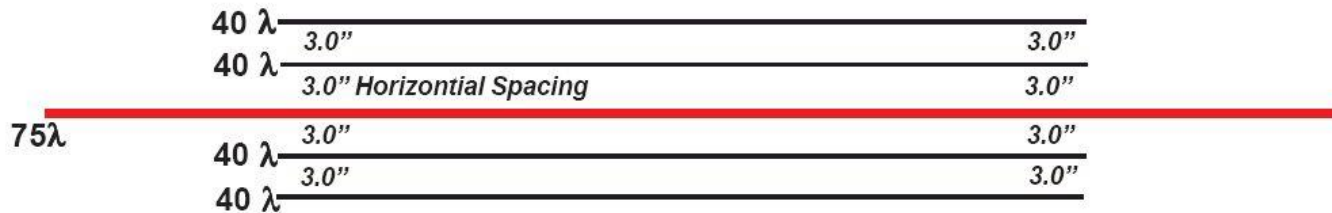
Visualize the RF Field ?

Wire "End View" of NVIS 2 Band Antenna and RF Field



NVIS Antennas

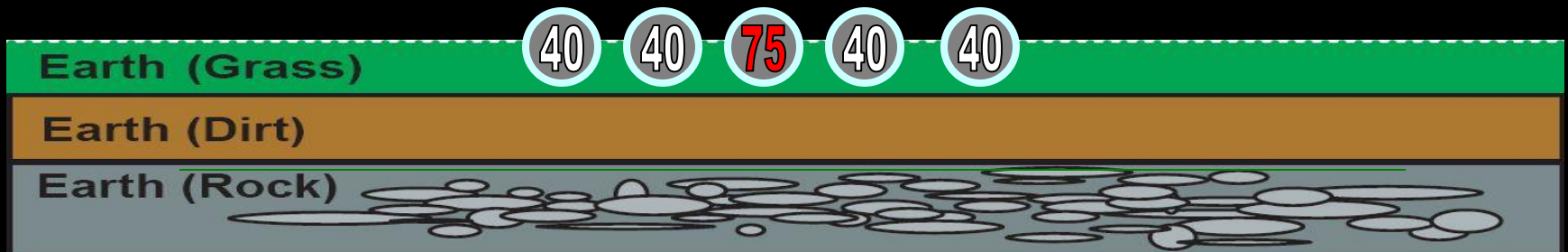
NVIS Dual-Band Antenna for 75λ / 80λ , & 40λ Meters.
Top Down View of Reflector Wires.



*All Reflector Wires are Laying Down Flat
on the Ground Surface*

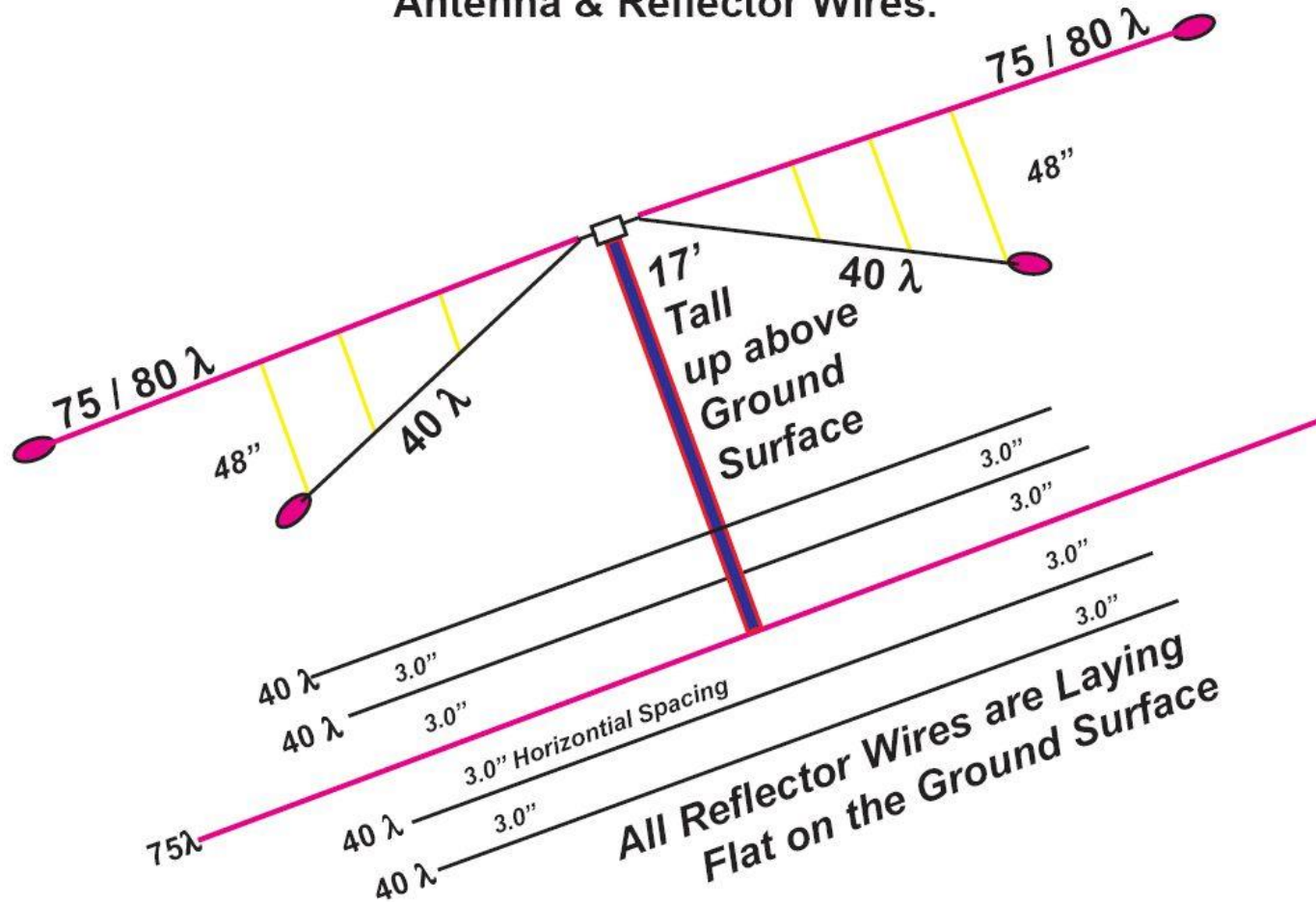
Visualize the RF Field ?

Wire "End View" of NVIS Reflectors



NVIS Antennas

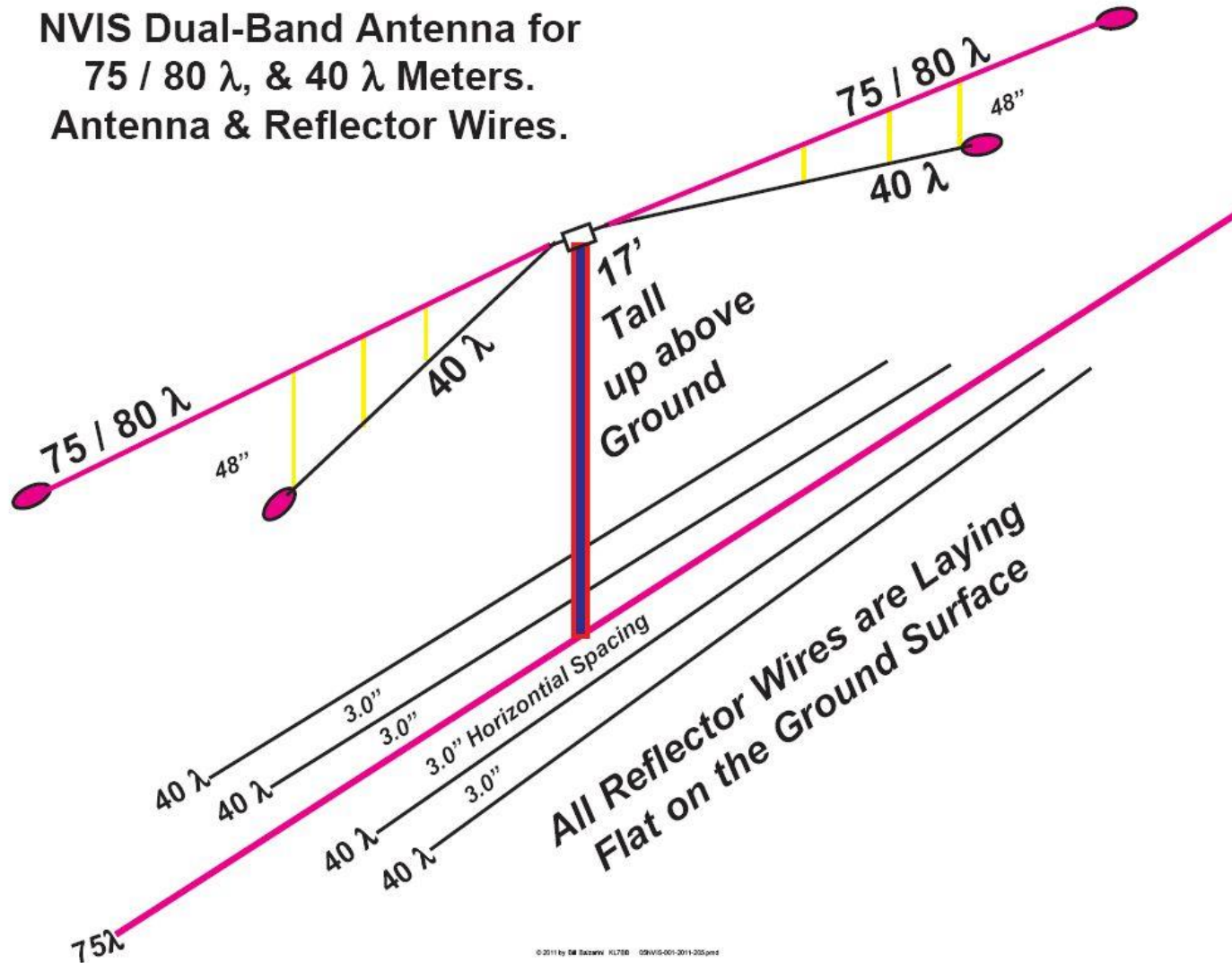
NVIS Dual-Band Antenna for 75λ / 80λ , & 40λ Meters.
Antenna & Reflector Wires.



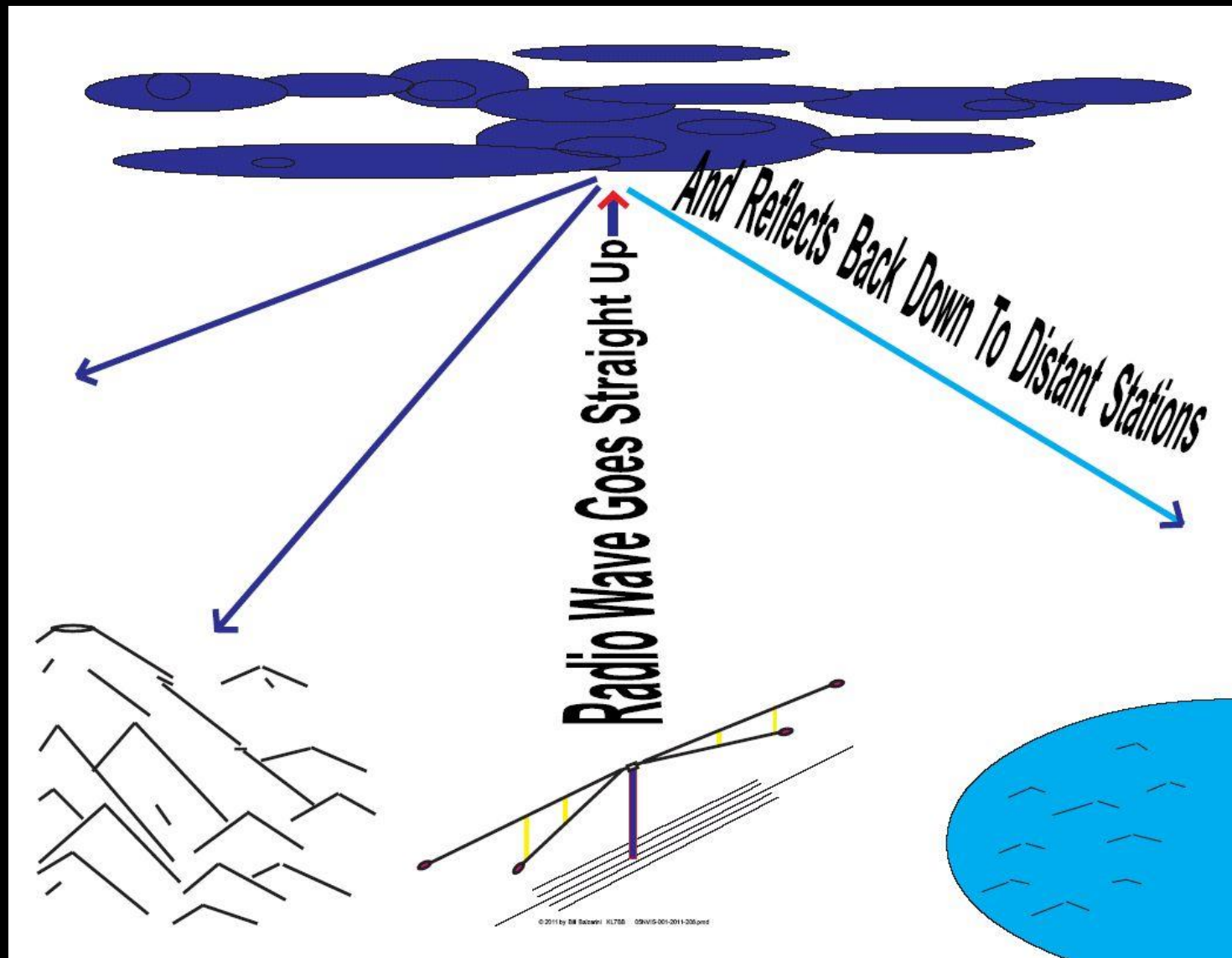
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NVIS Antennas

NVIS Dual-Band Antenna for
75 / 80 λ , & 40 λ Meters.
Antenna & Reflector Wires.



NVIS Antennas



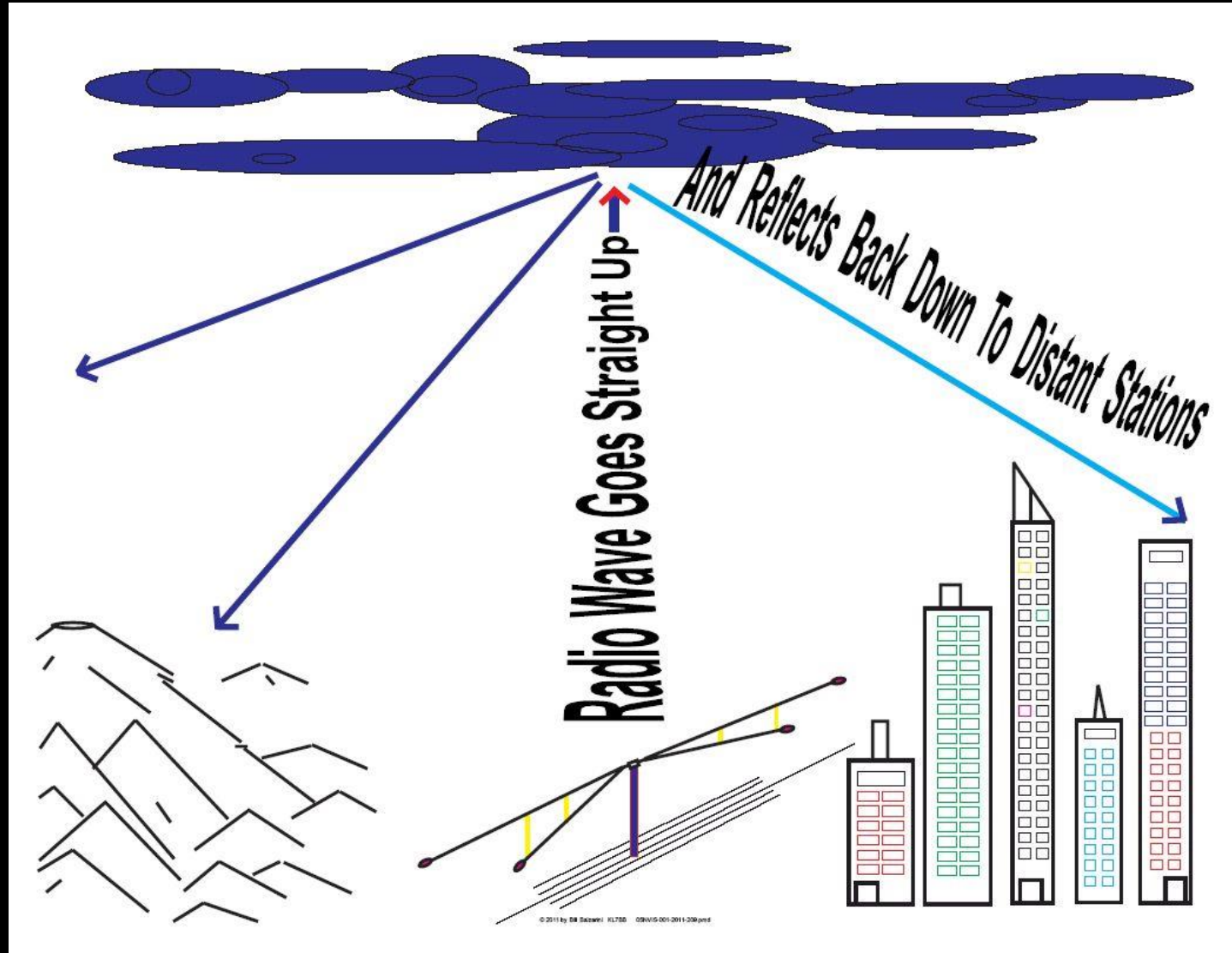
NVIS Antennas

KL7BB IN JUNEAU ALASKA



VHF HT 146.82MHz CONTACT WITH AL7AQ

NVIS Antennas

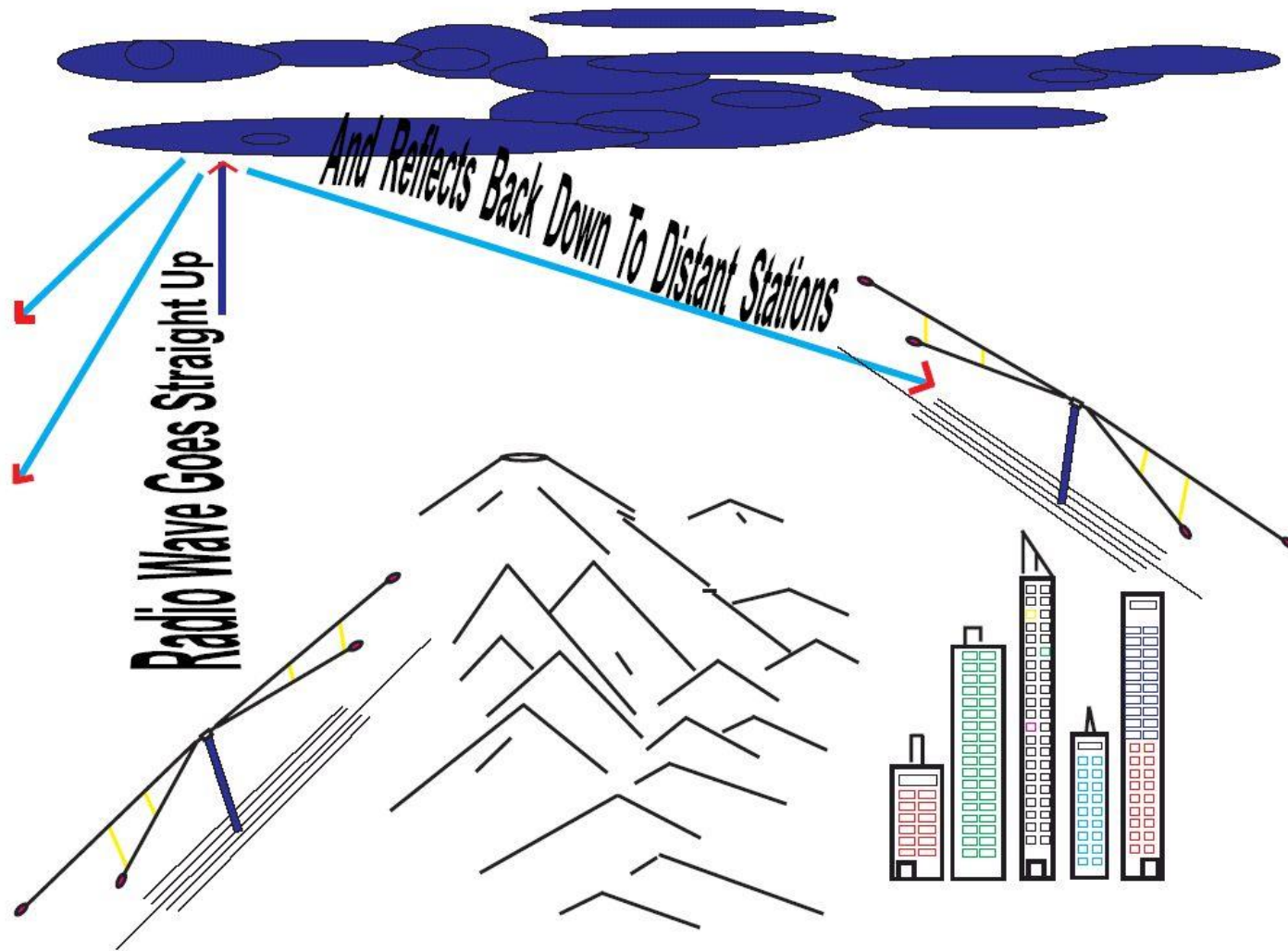


NVIS Antennas

XIP and JUNEAU ALASKA

QTH of AL7AQ at XIP

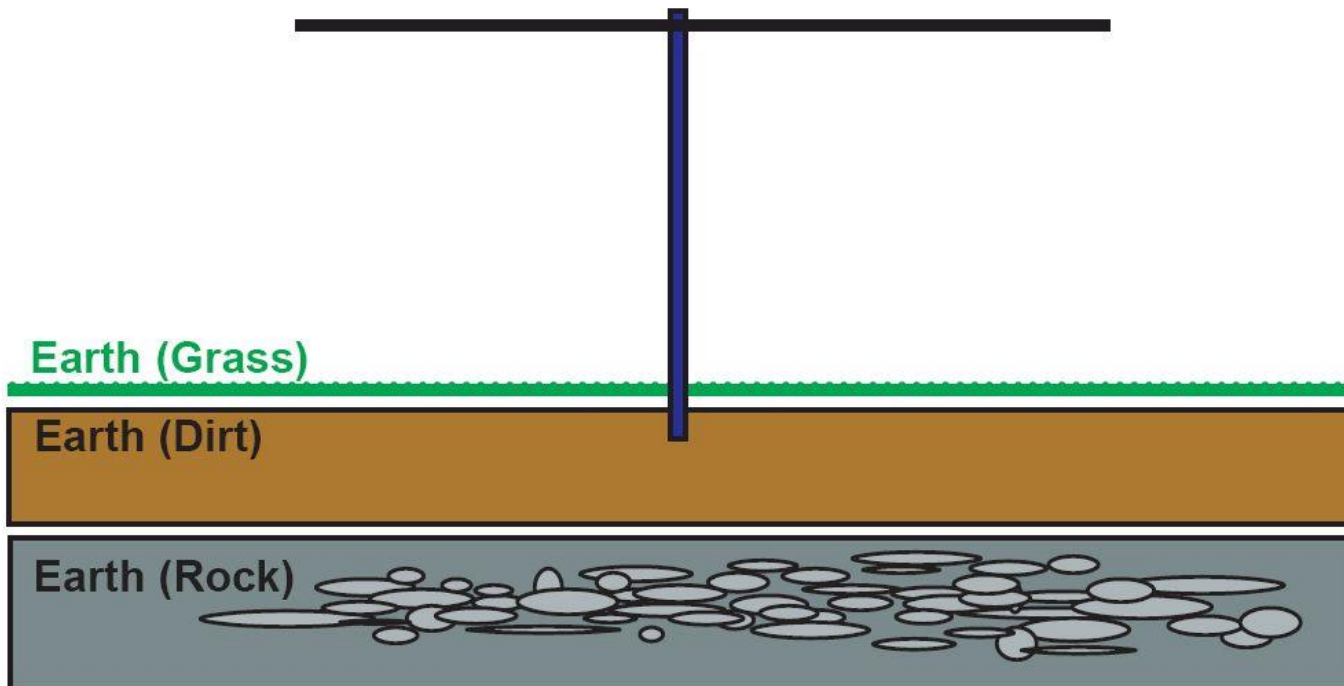
NVIS Antennas





NVIS Antennas

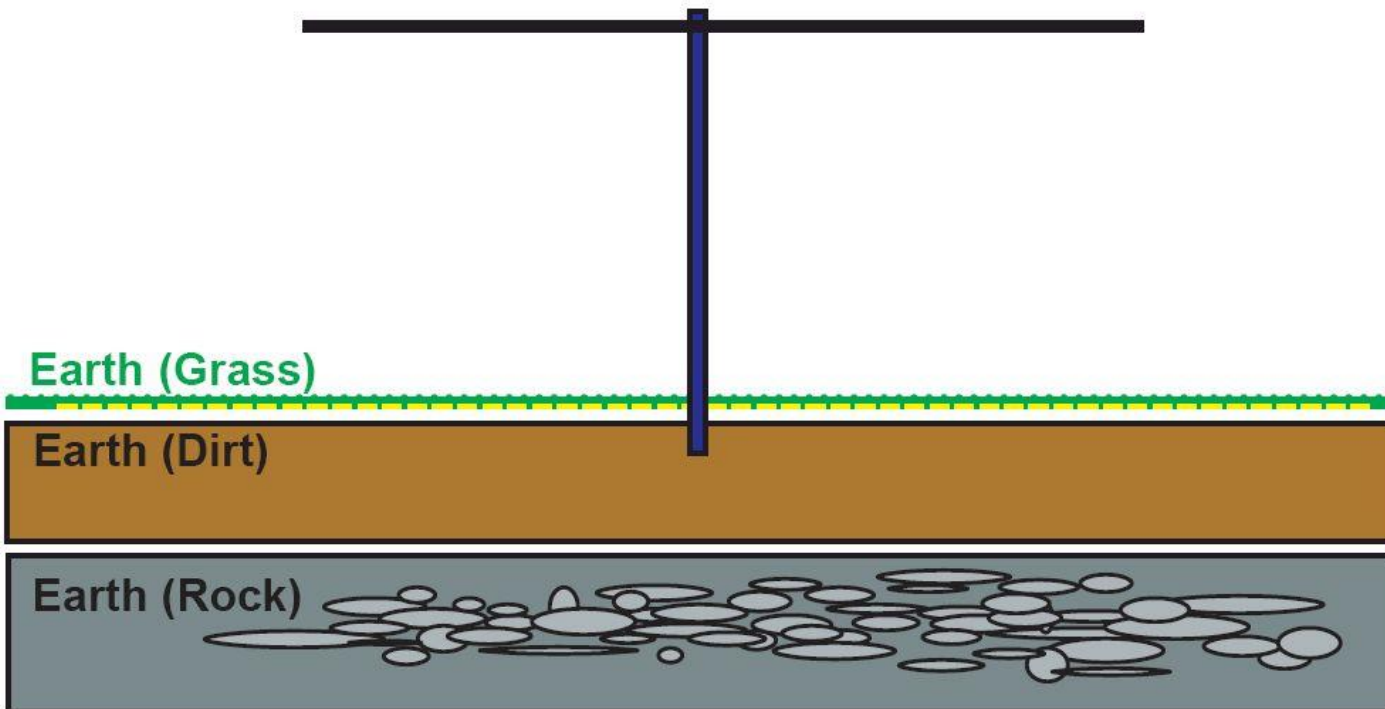
Antenna "Driven Element"



NVIS Antennas

Antenna “Reflector” Could Be The **Grass Layer** if Really Wet.

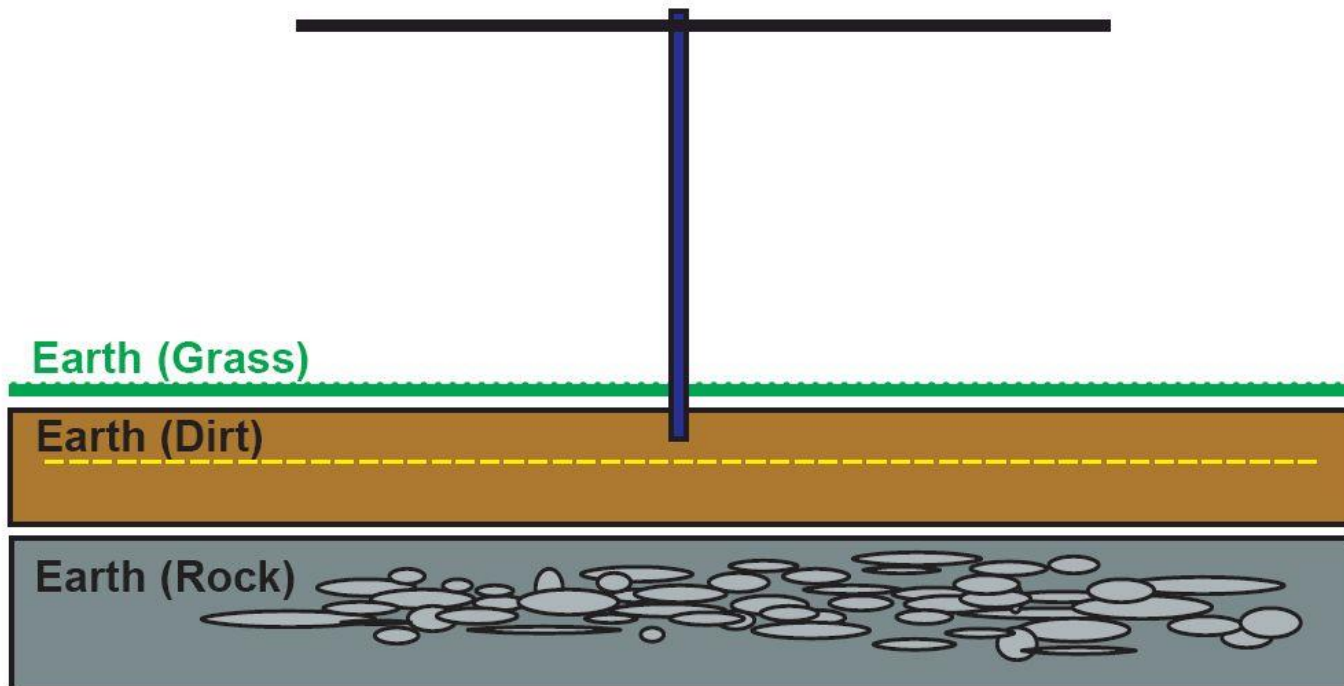
Antenna “Driven Element”



NVIS Antennas

Antenna “Reflector” Could Be The *Dirt Layer*, if Really Wet.

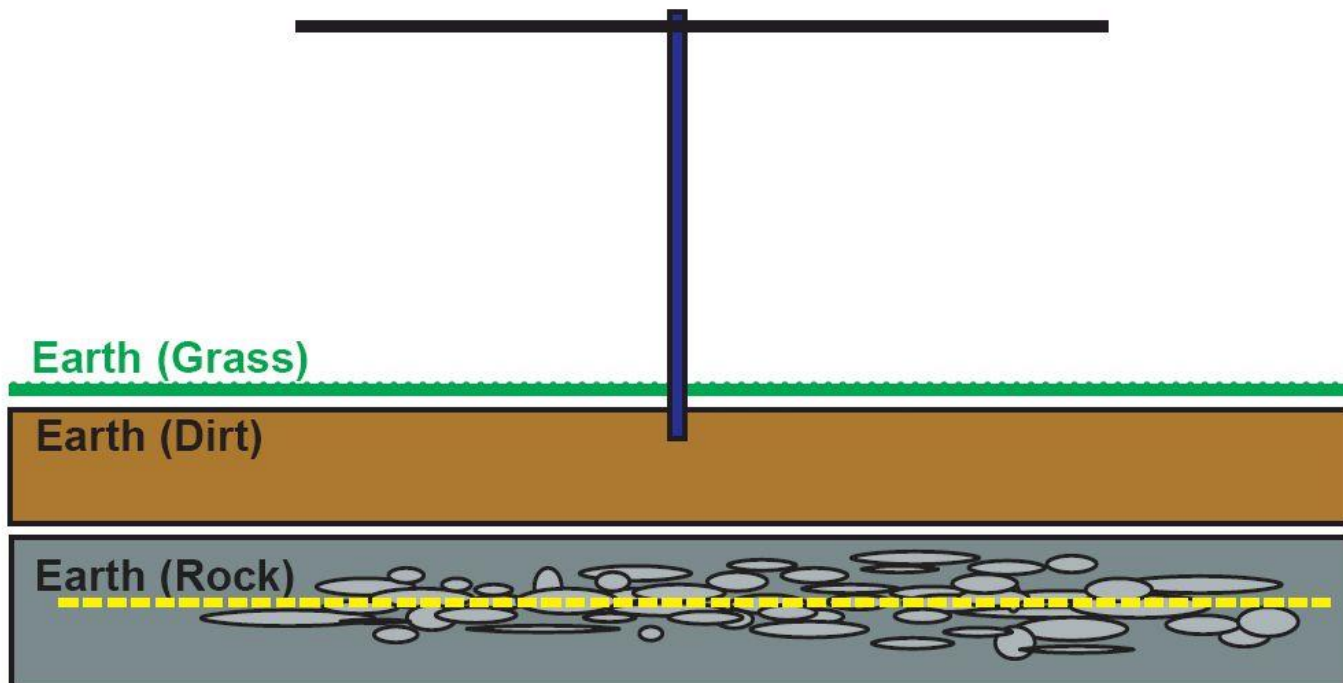
Antenna “Driven Element”



NVIS Antennas

Antenna “Reflector” Could Be The Rock Layer, if Right Material.

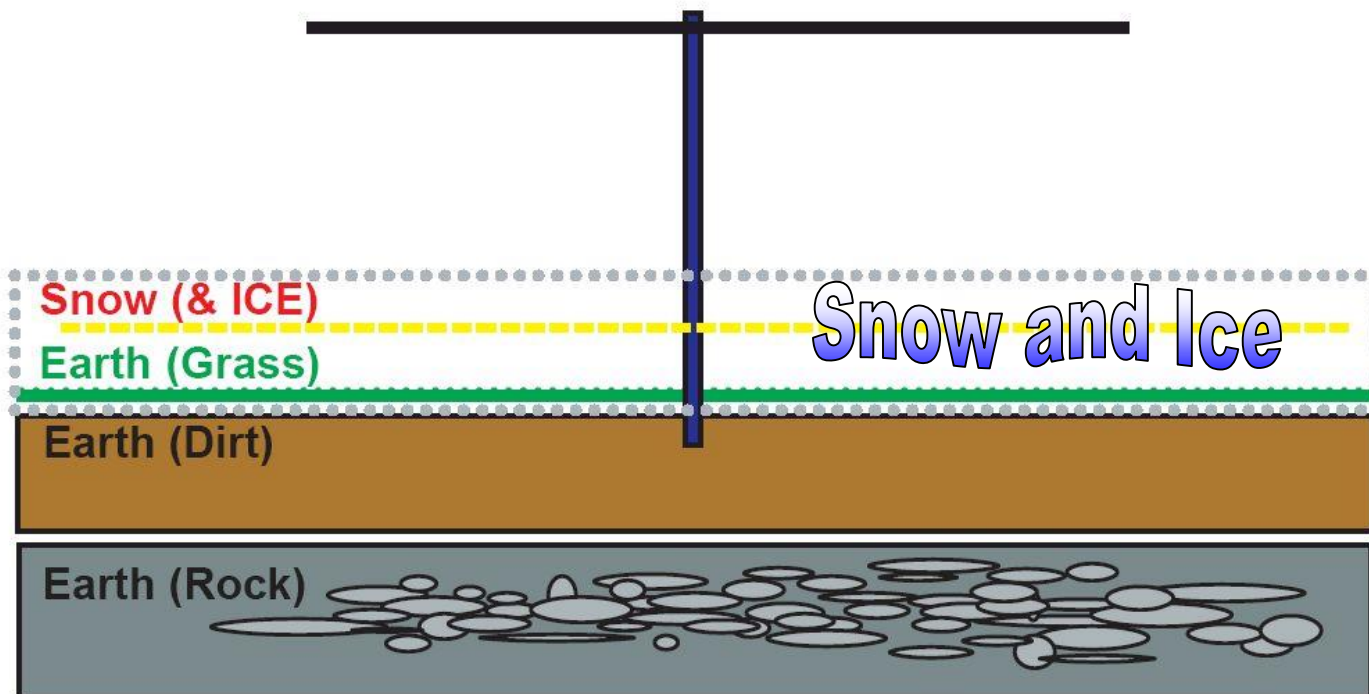
Antenna “Driven Element”



NVIS Antennas

Antenna “Reflector” Could Be The **Snow & ICE**, Layer.

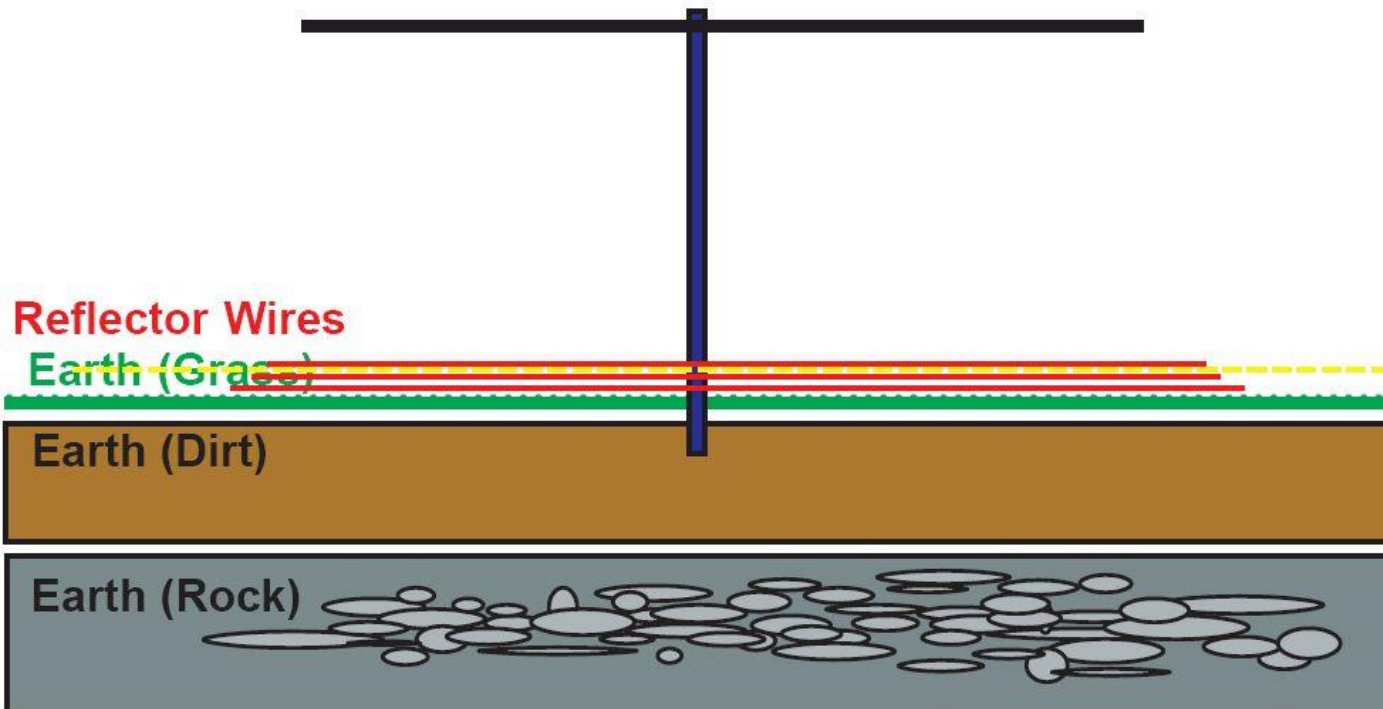
Antenna “Driven Element”



NVIS Antennas

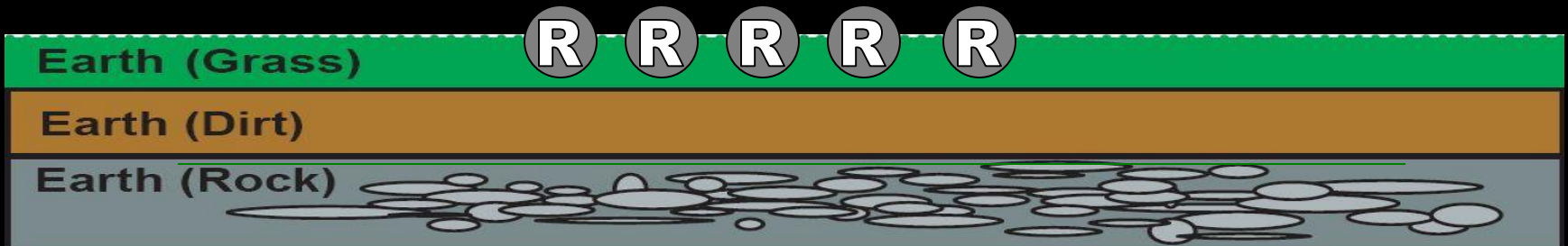
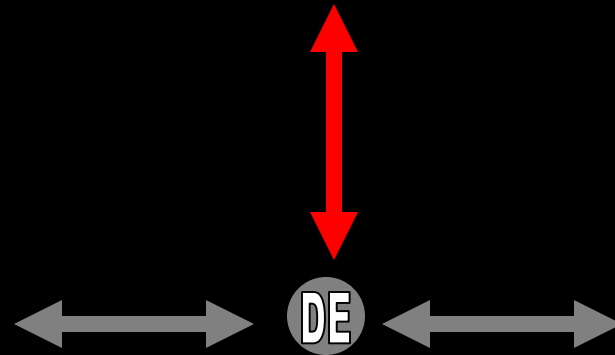
Antenna “Reflector” Will Be The *Reflector Wires* When Installed

Antenna “Driven Element”



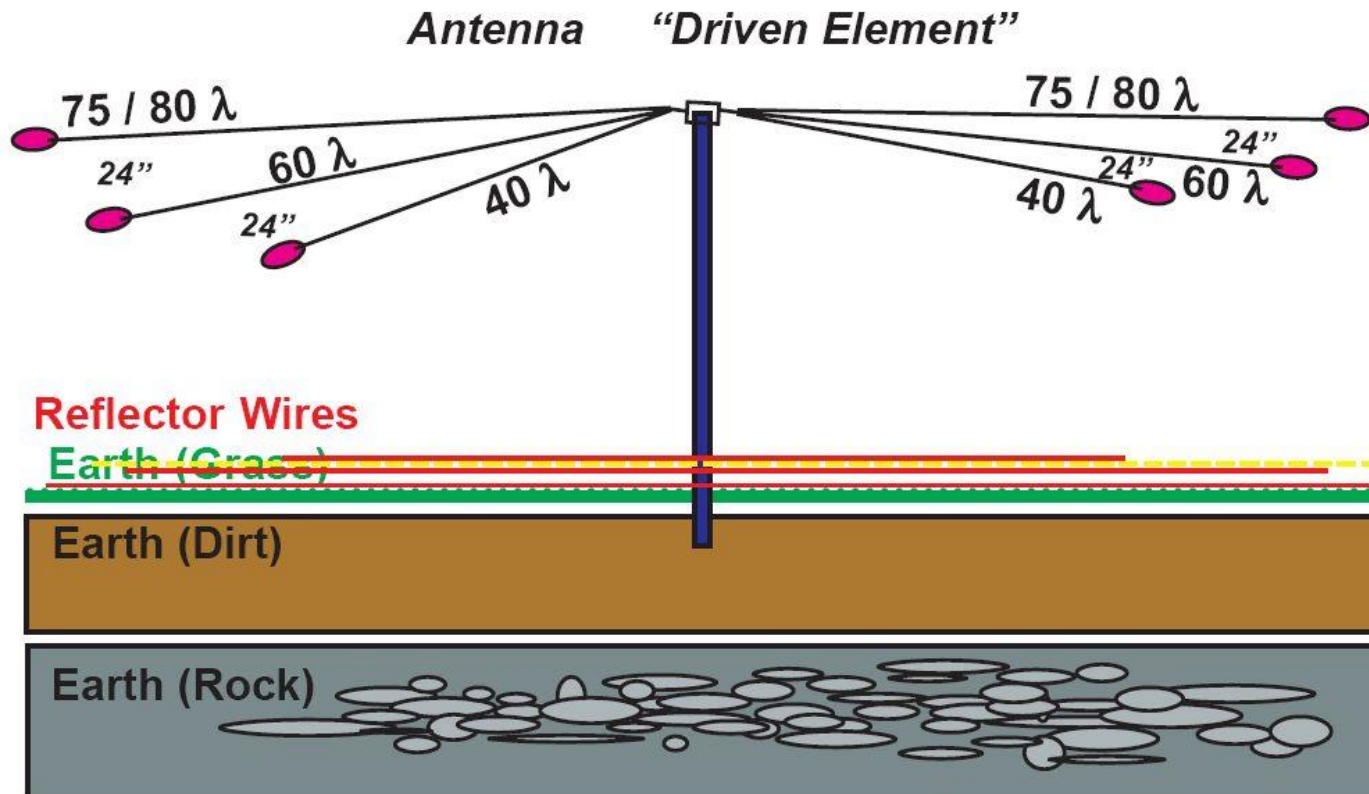
Visualize the RF Field ?

Wire "End View" of NVIS Antenna and RF Field



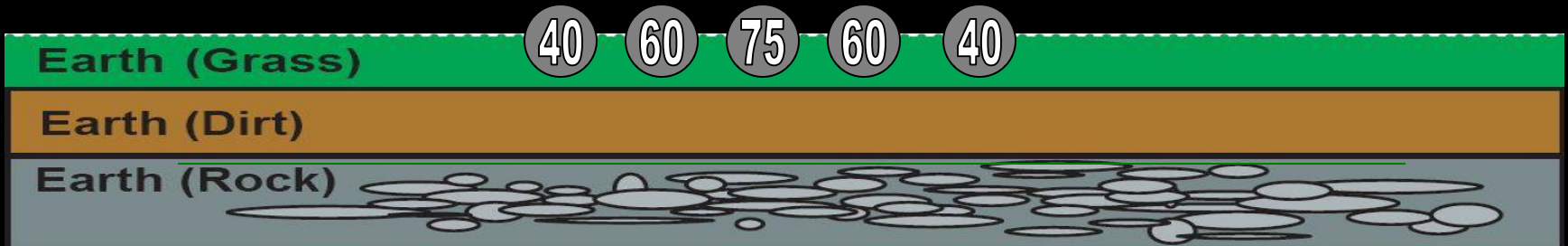
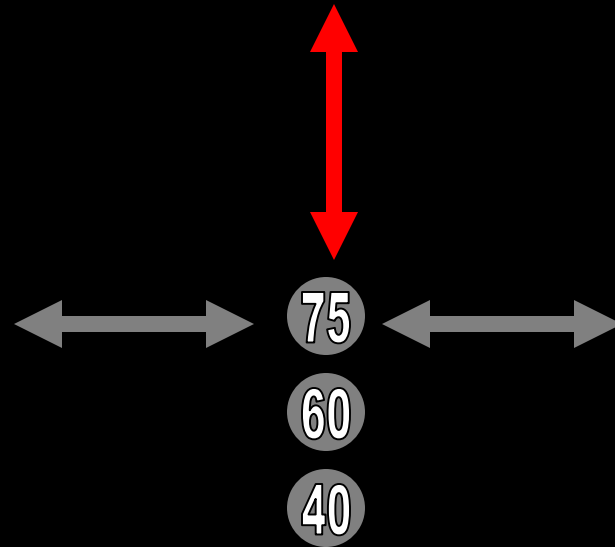
NVIS Antennas

Antenna "Reflector" Will Be The **Reflector Wires** When Installed



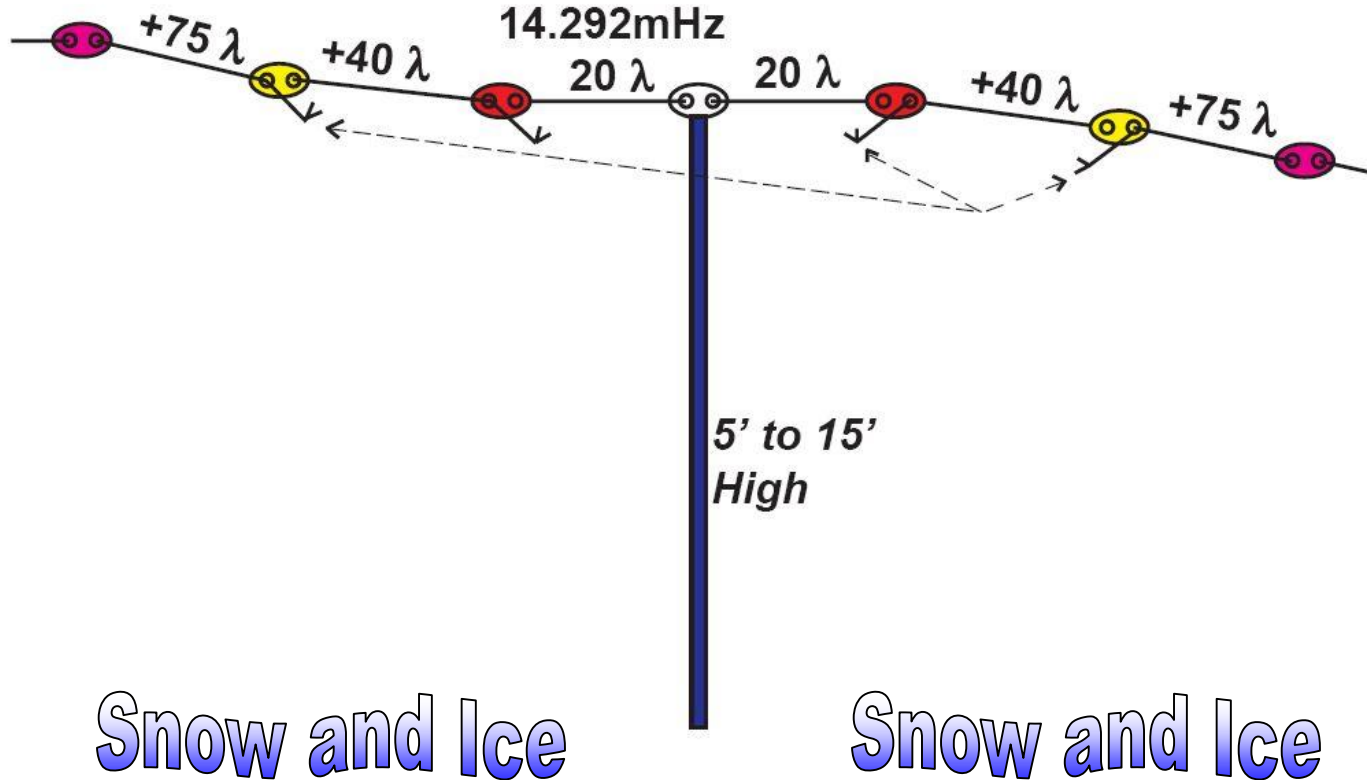
Visualize the RF Field ?

Wire "End View" of NVIS 3 Band Antenna and RF Field



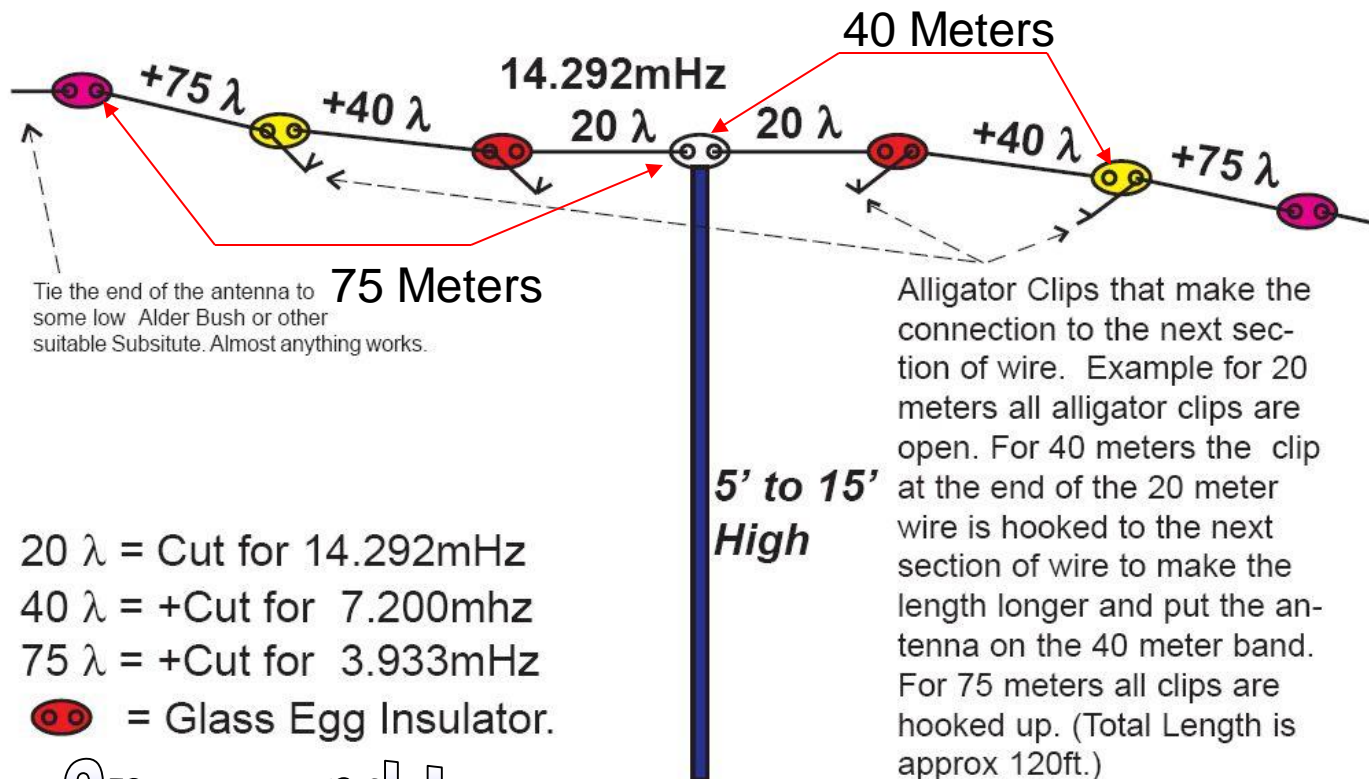
NVIS Antennas

Iditarod Tri-Band Antenna for 75λ , 40λ , & 20λ Meters.
Side View




NVIS Antennas

**Iditarod Tri-Band Antenna for 75λ, 40λ, & 20λ Meters.
Side View**



Tie the end of the antenna to some low Alder Bush or other suitable Substitute. Almost anything works.

Alligator Clips that make the connection to the next section of wire. Example for 20 meters all alligator clips are open. For 40 meters the clip at the end of the 20 meter wire is hooked to the next section of wire to make the length longer and put the antenna on the 40 meter band. For 75 meters all clips are hooked up. (Total Length is approx 120ft.)

- 20 λ = Cut for 14.292mHz
- 40 λ = +Cut for 7.200mhz
- 75 λ = +Cut for 3.933mHz
-  = Glass Egg Insulator.

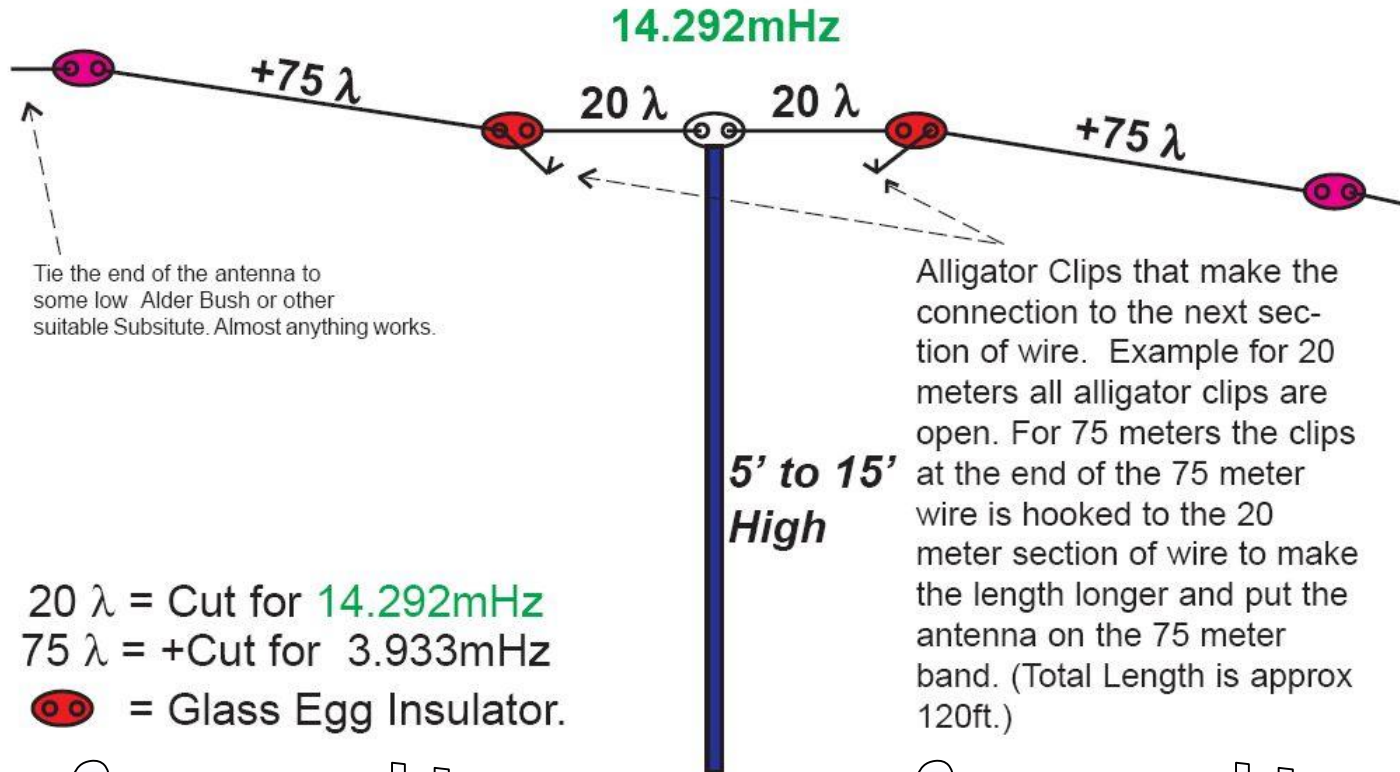
Snow and Ice

NVIS Antennas



NVIS Antennas

Iditarod Dual-Band Antenna for 75λ , & 20λ Meters. Side View

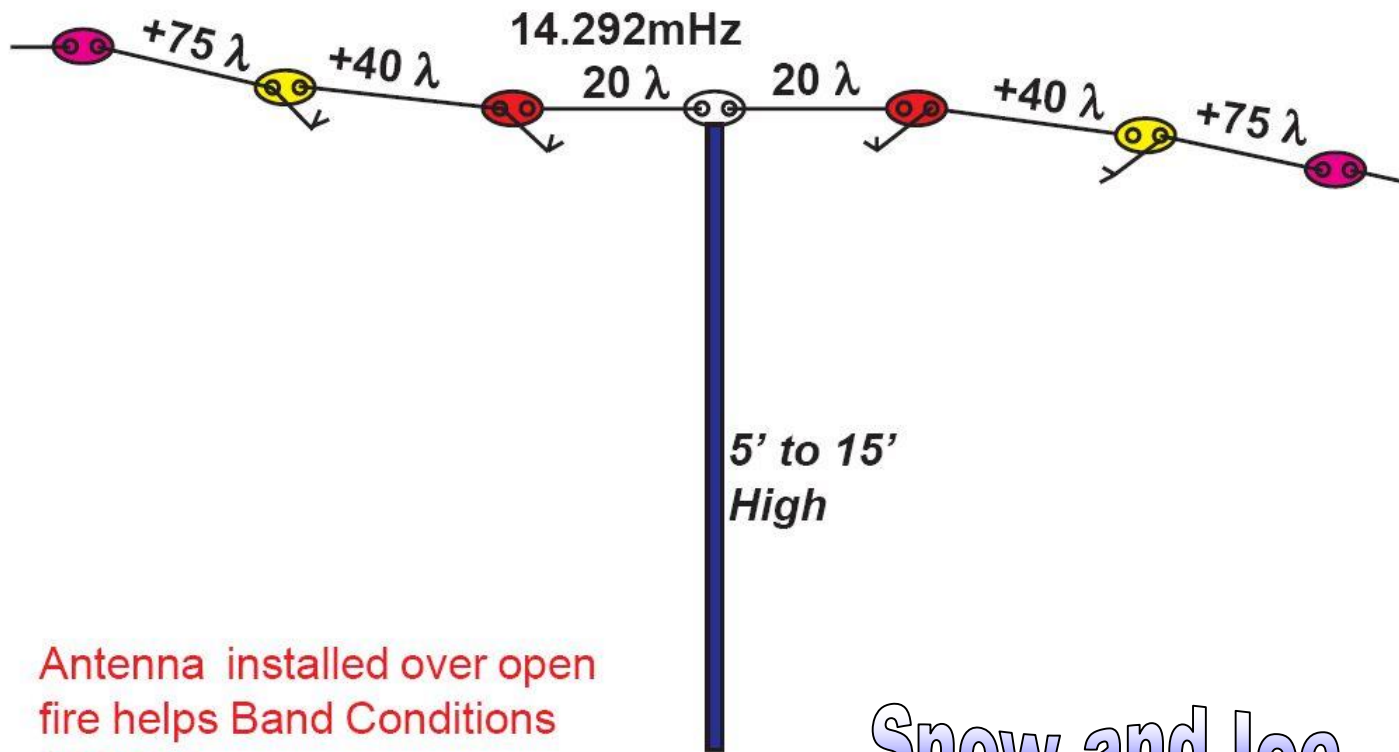


Snow and Ice

Snow and Ice

NVIS Antennas

Iditarod Tri-Band Antenna for 75 λ , 40 λ , & 20 λ Meters.
Side View

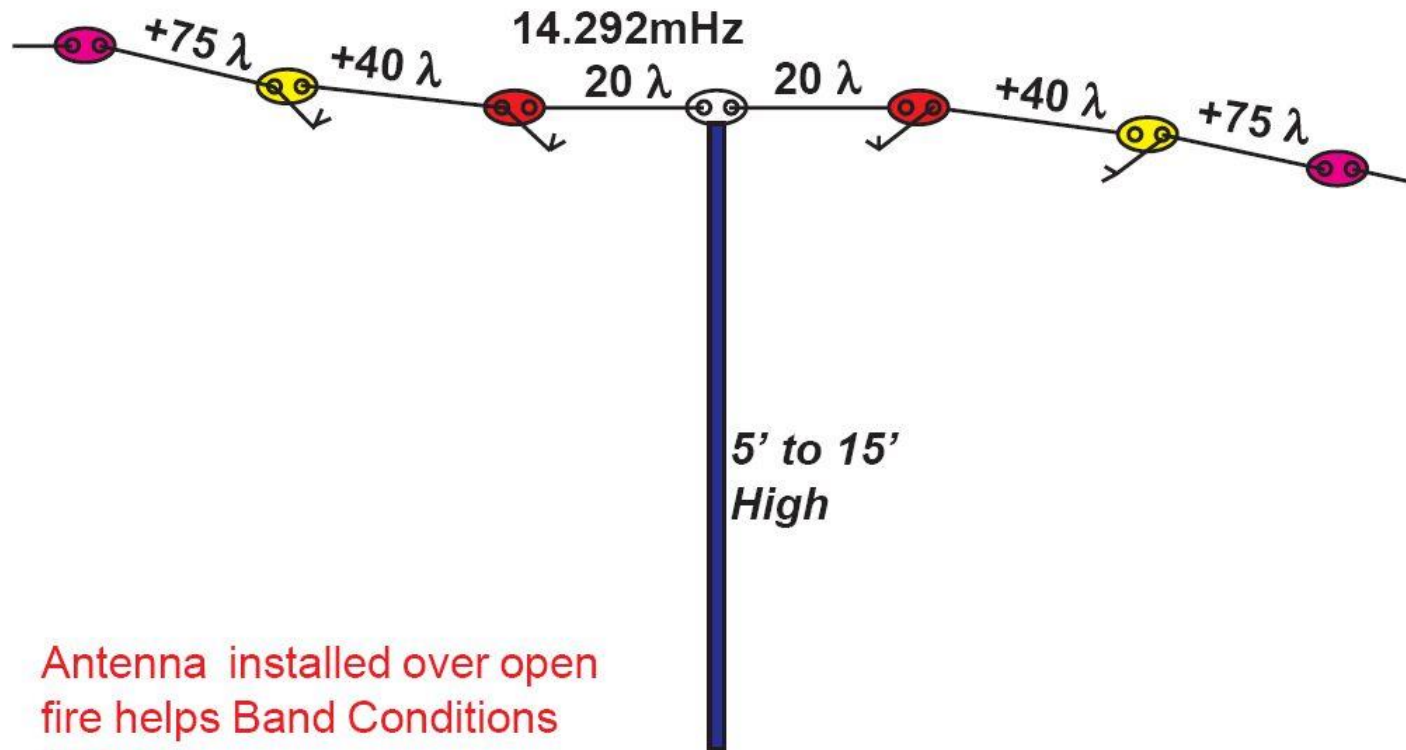


Antenna installed over open fire helps Band Conditions Improve.

Snow and Ice

NVIS Antennas

Iditarod Tri-Band Antenna for 75 λ , 40 λ , & 20 λ Meters.
Side View



Antenna installed over open
fire helps Band Conditions
Improve.

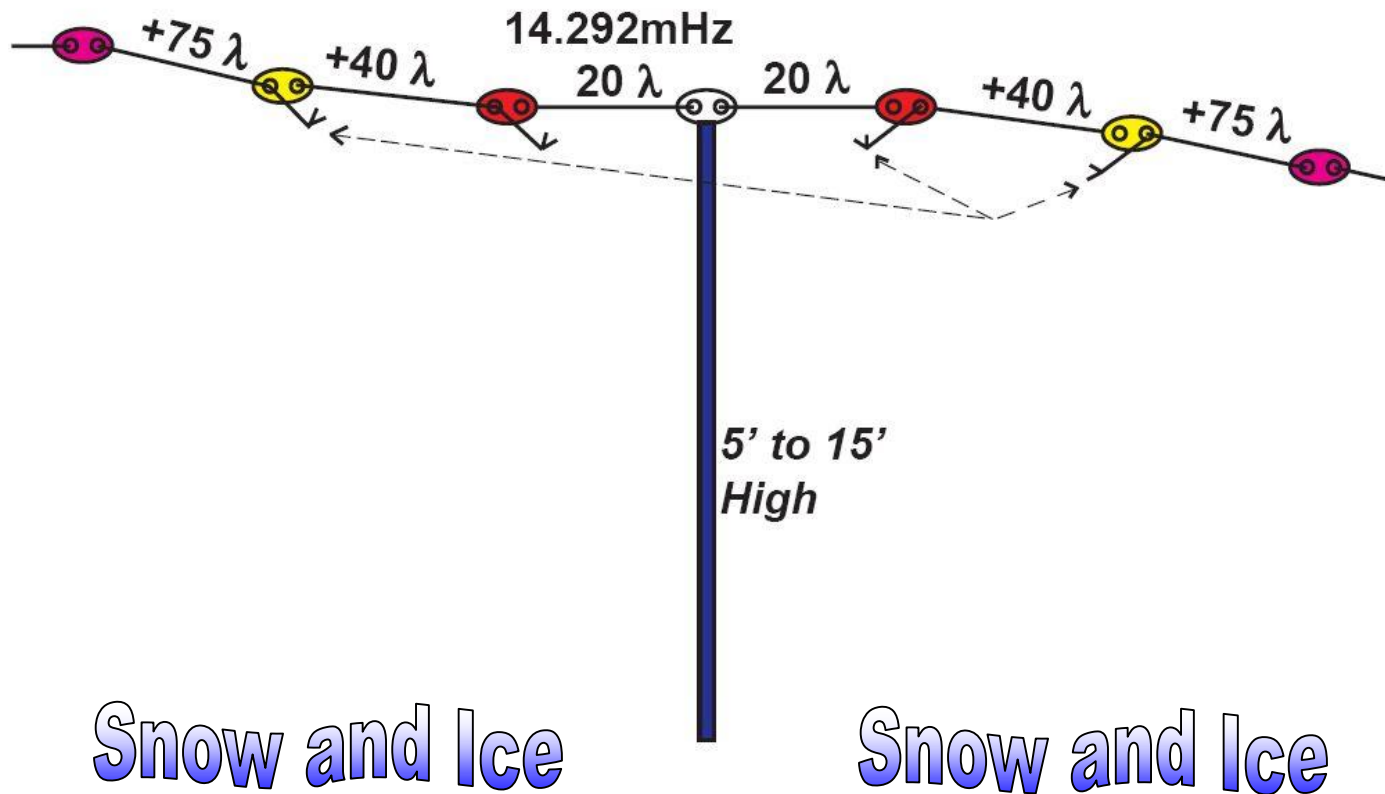
And it is even better with Marshmallows

Visualize the Marshmallow

Now Visualize the Chocolate

NVIS Antennas

Iditarod Tri-Band Antenna for 75λ , 40λ , & 20λ Meters.
Side View

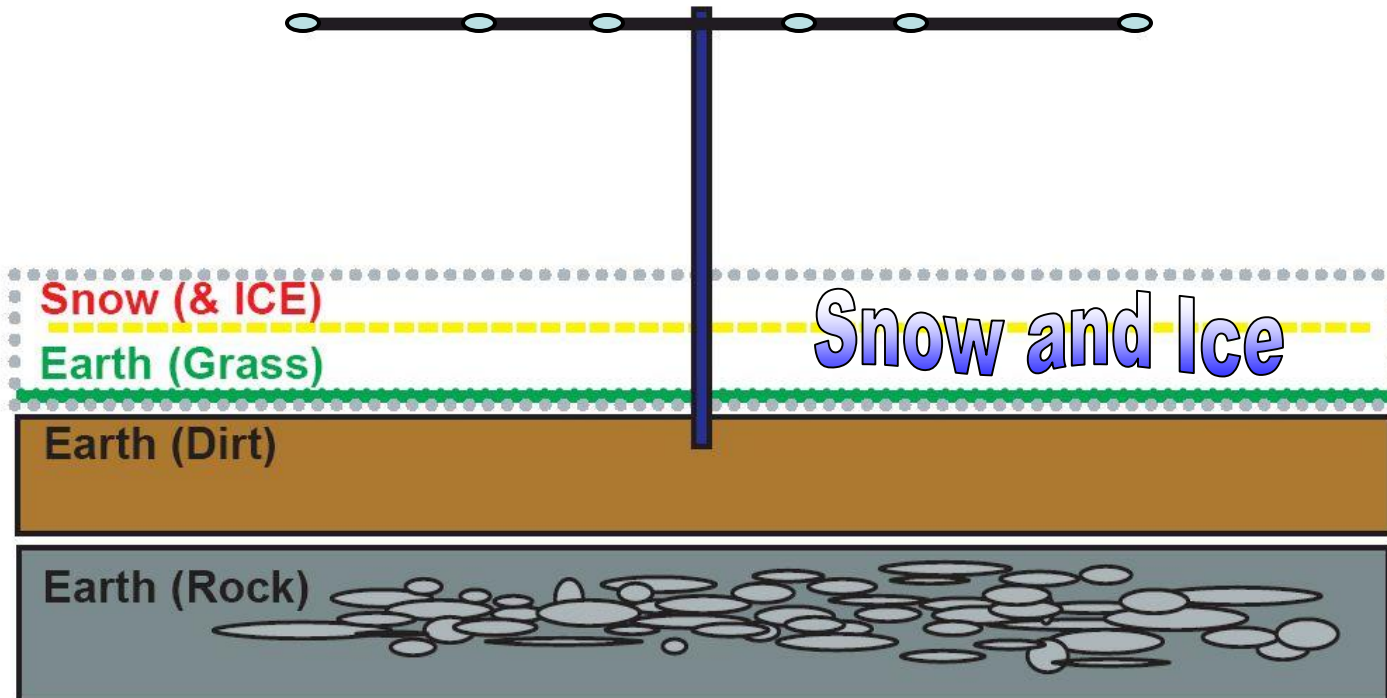


© 2011 by Ed Szwedki, KL7BB 004445-001-2011-060L7-Iditarod-001.pdf

NVIS Antennas

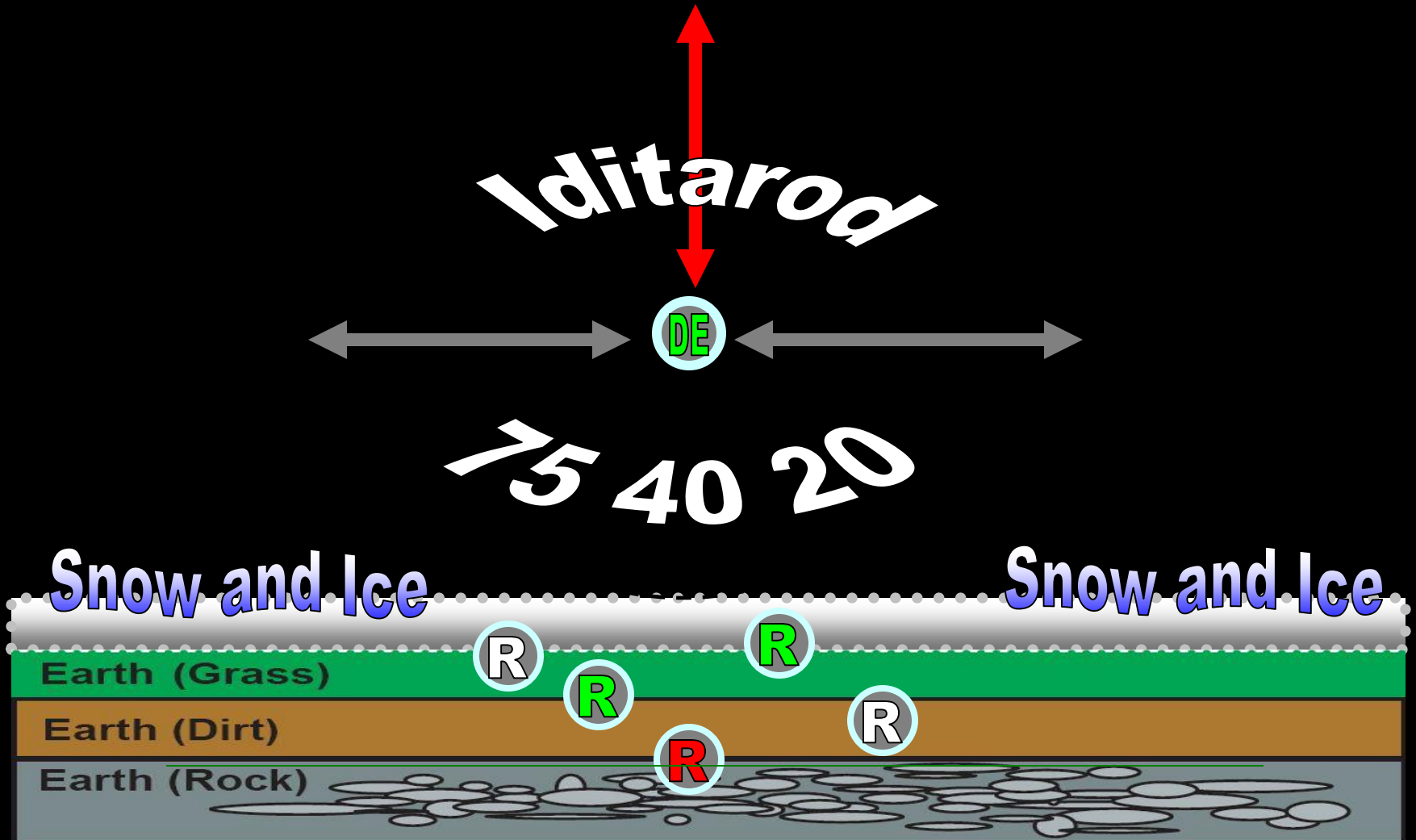
Antenna "Reflector" Could Be
The **Snow & ICE**, **Grass**, **Dirt**, or **Rock**, Layer.

Antenna "Driven Element"



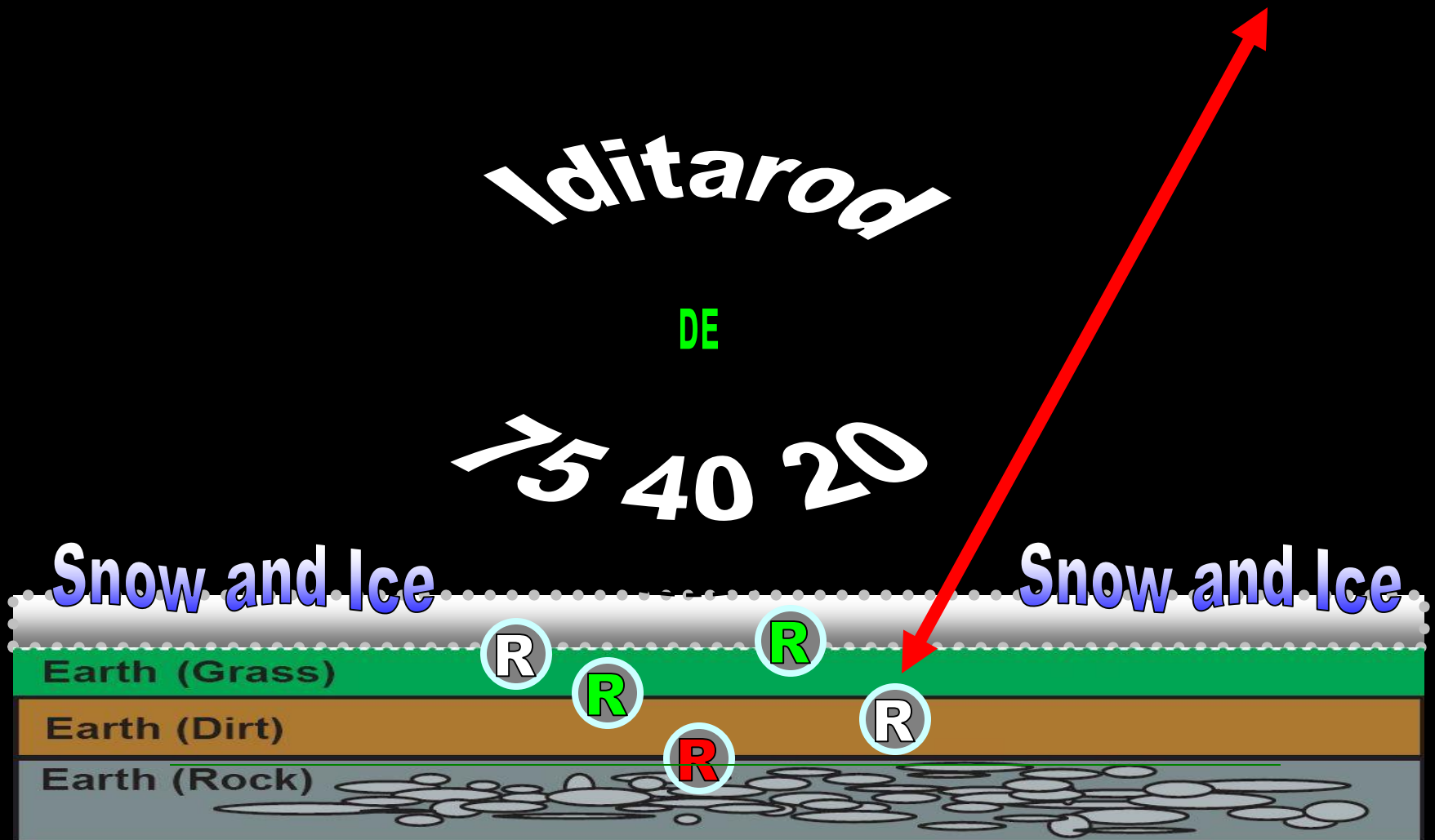
Visualize the RF Field ?

Wire "End View" of Iditarod Antenna and RF Field



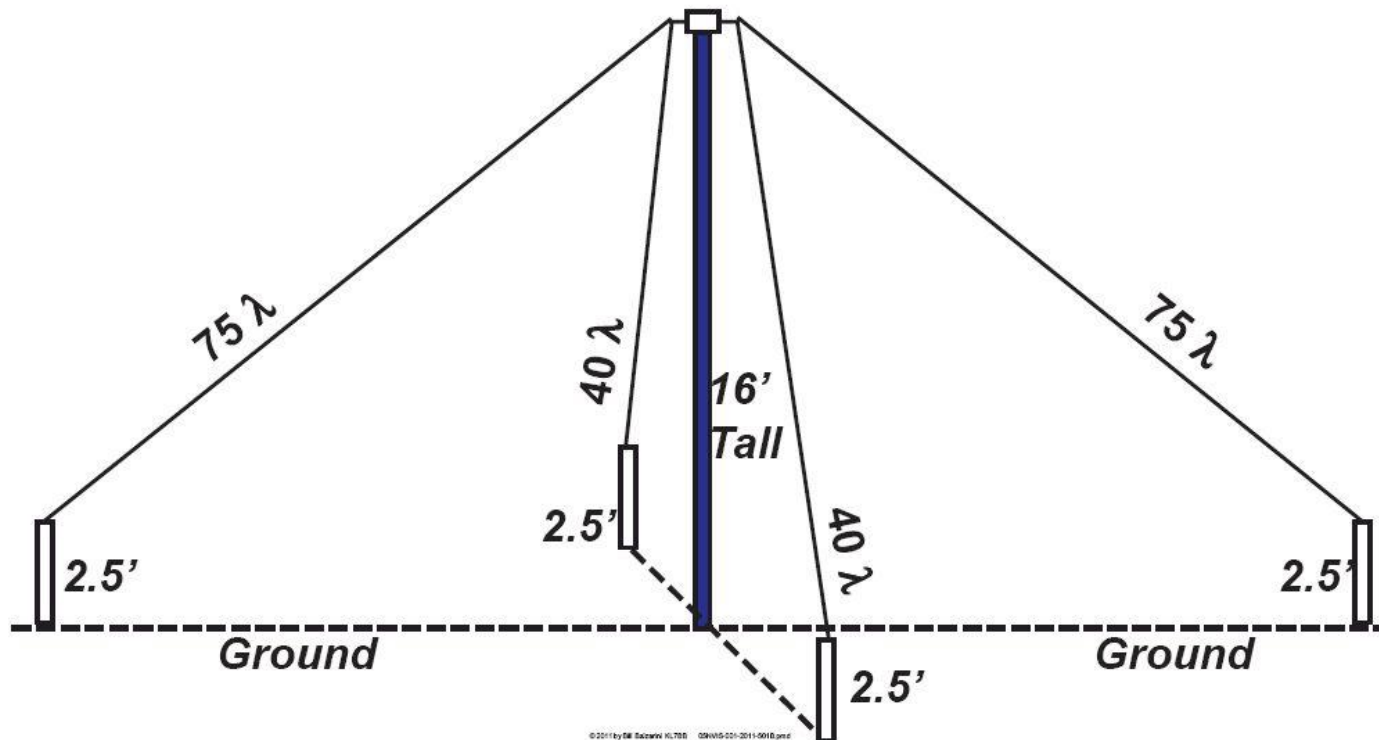
Visualize the RF Field ?

Wire "End View" of Iditarod Antenna Ground "imaginary"

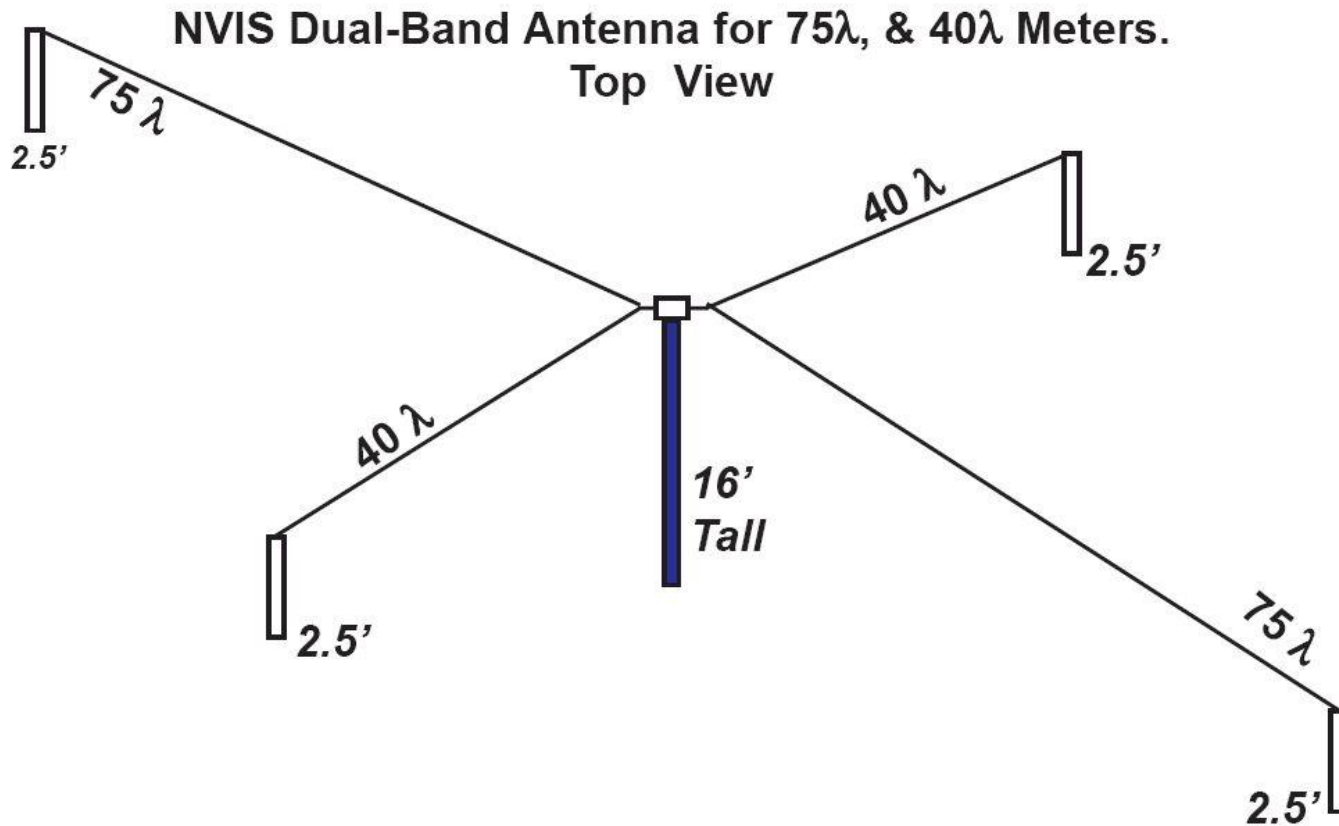


NVIS Antennas

NVIS Dual-Band Antenna for 75λ , & 40λ Meters.
Side View



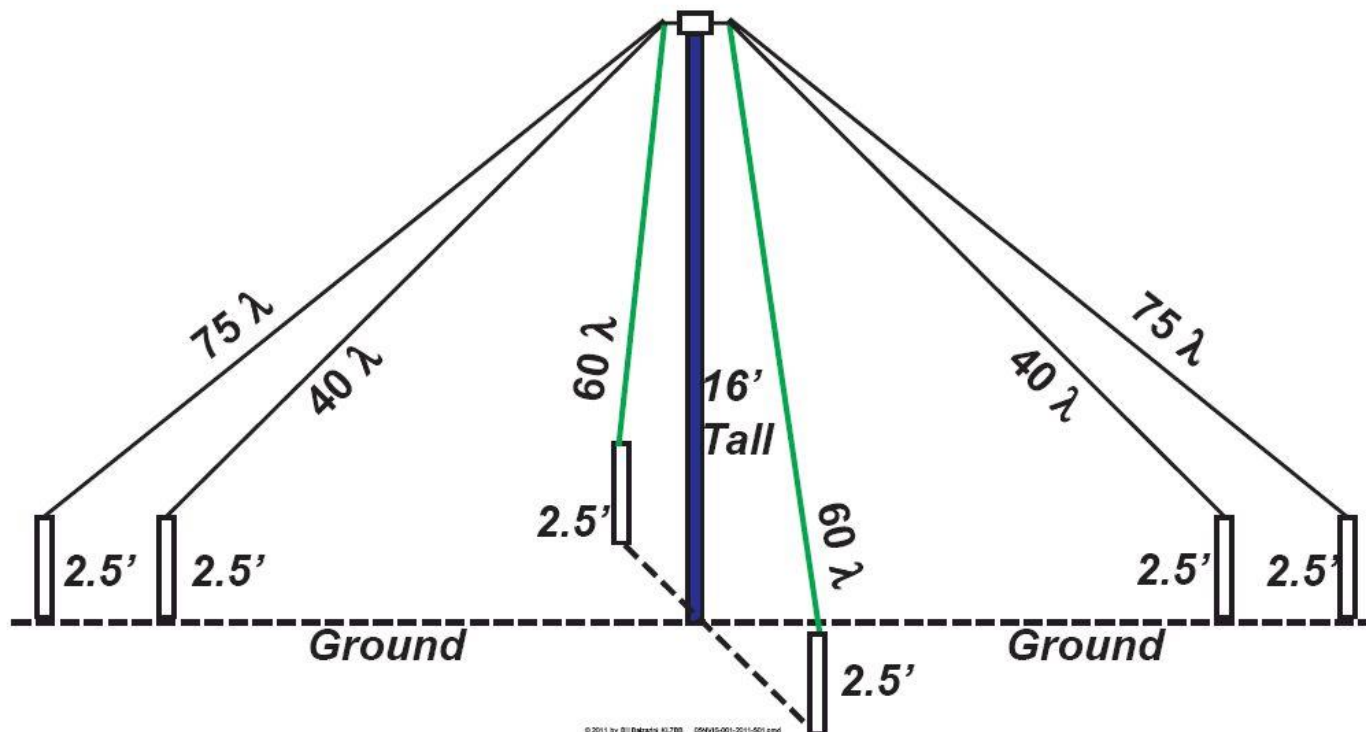
NVIS Antennas



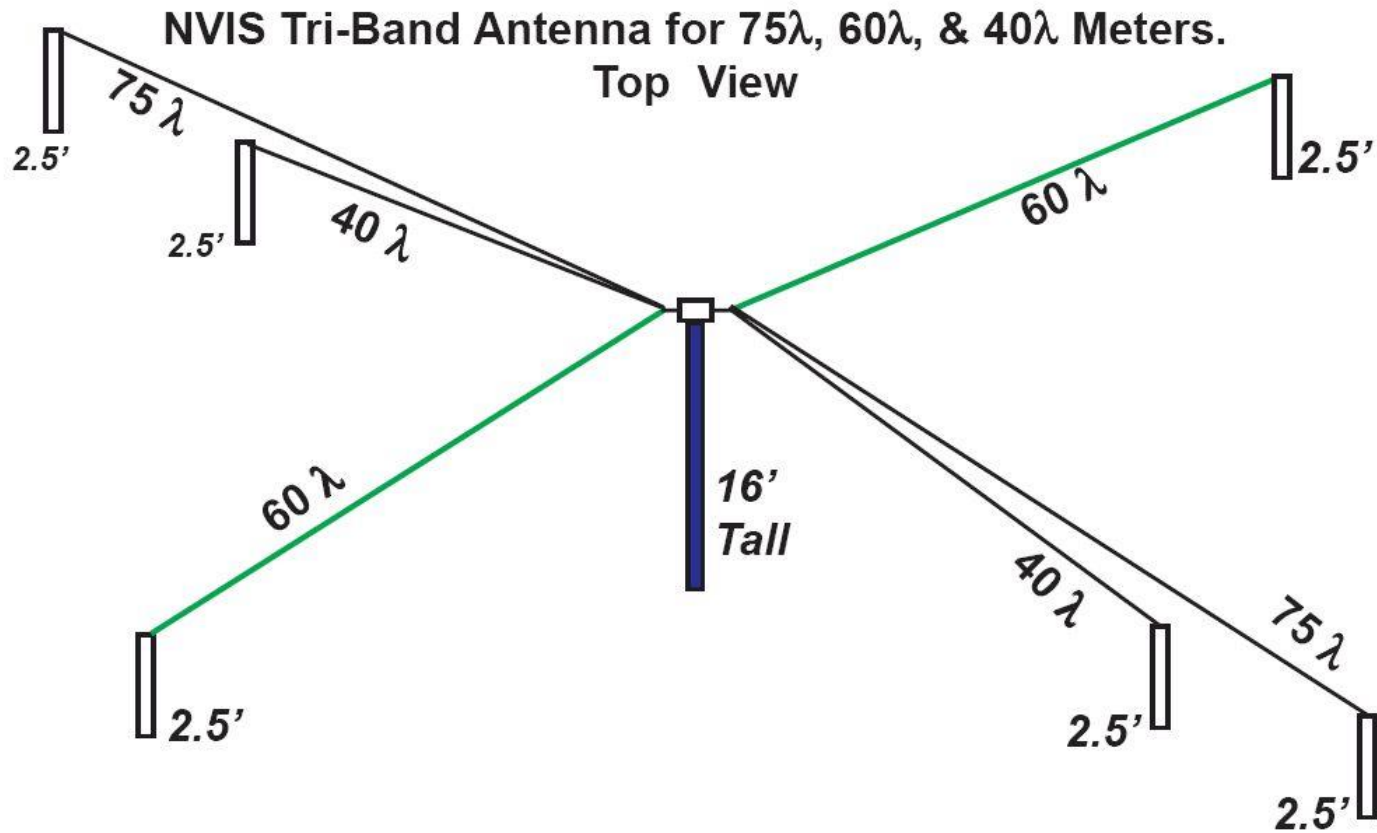
© 2011 by Bill Debrazi KL7BB 09W/5001-2011-0228.pdf

NVIS Antennas

NVIS Tri-Band Antenna for 75λ , 60λ , & 40λ Meters.
Side View



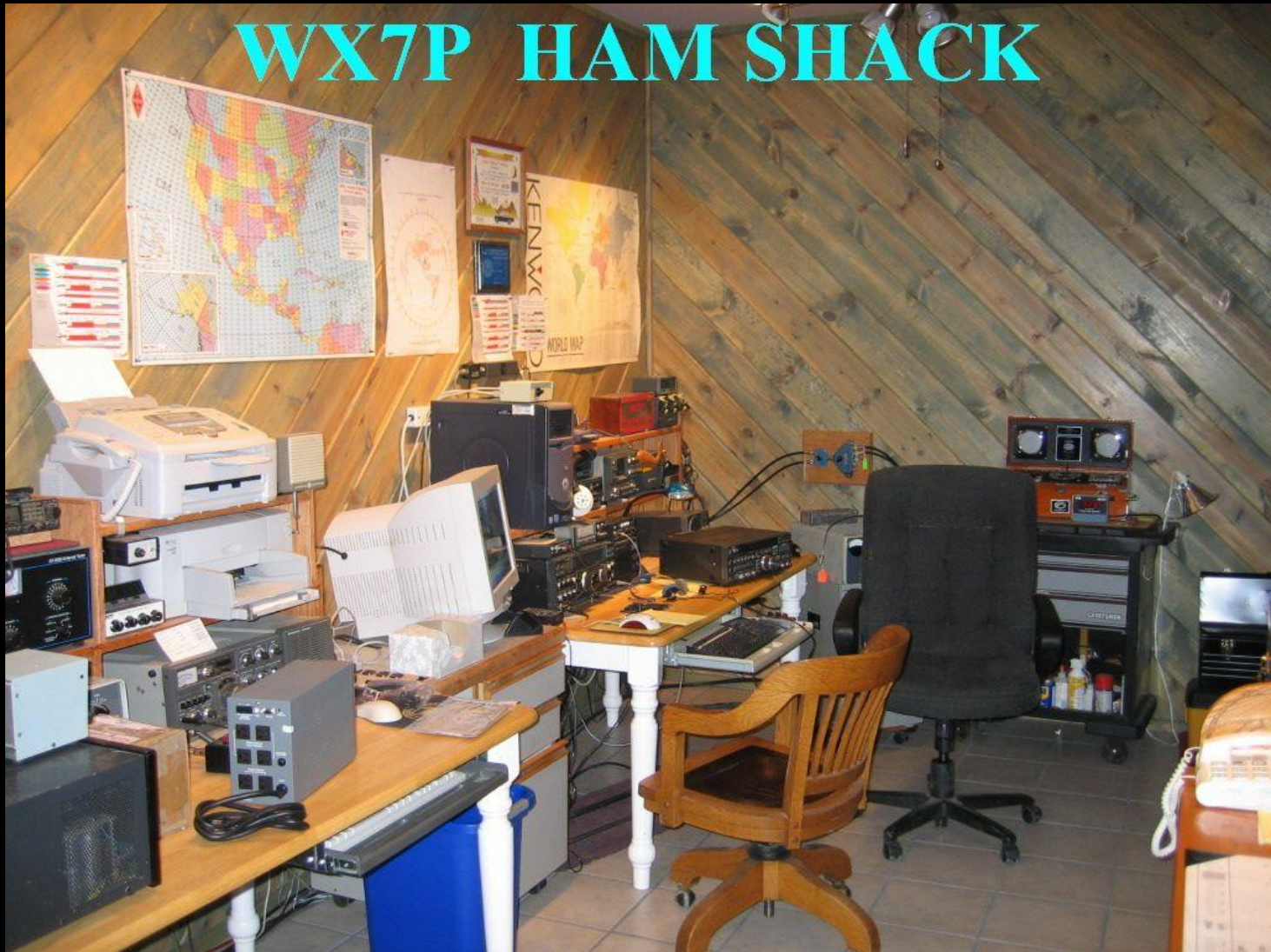
NVIS Antennas



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NVIS Antennas

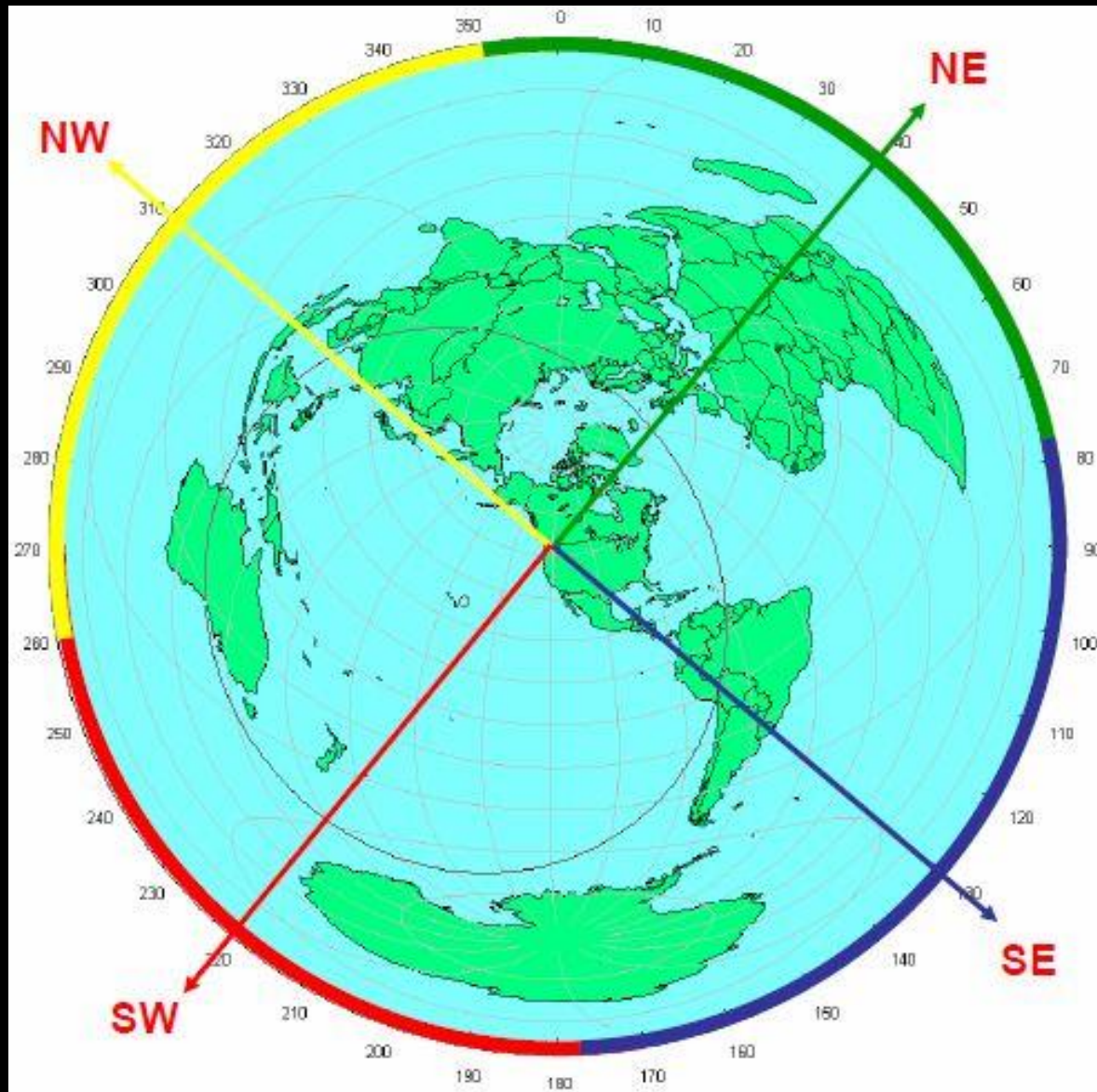
WX7P HAM SHACK



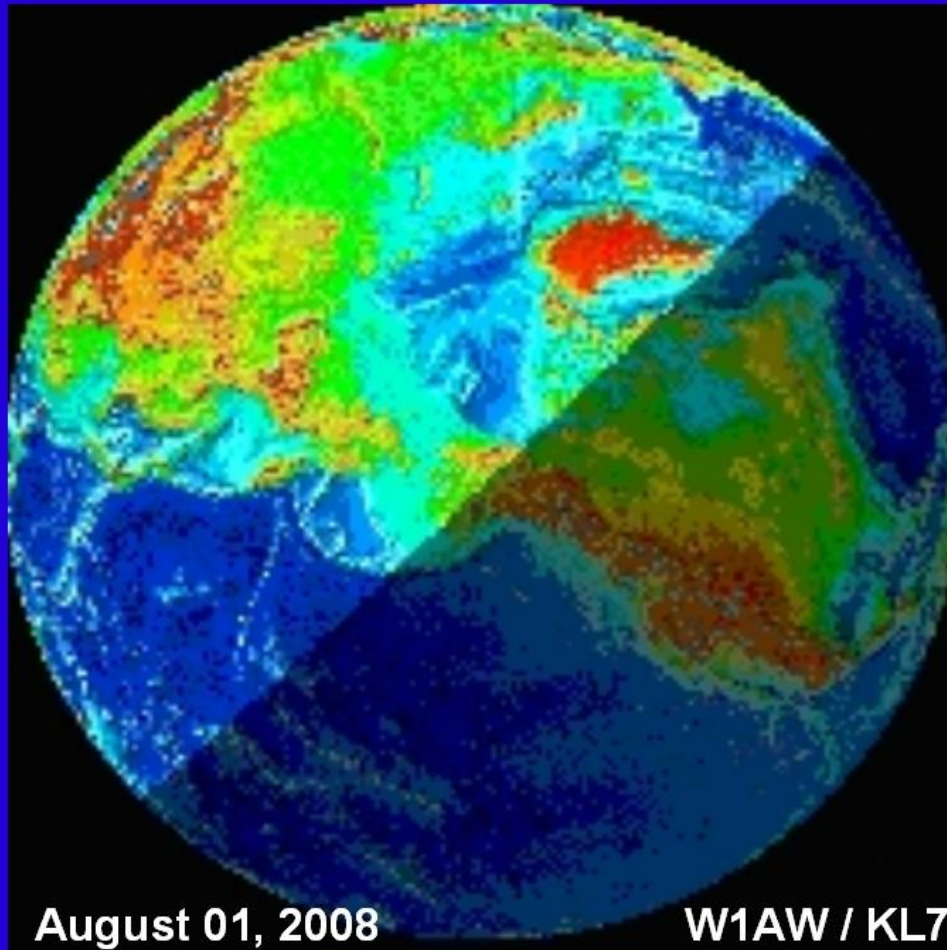
NVIS Antennas



NVIS Antennas



NVIS Antennas



07:00 UTC

23:00 AKDT

00:00 PDT

03:00 EDT

21:00 Local
Arctic Circle
Sun Time @
66° 33' N
150° 50' W

BP - 56

August 01, 2008

W1AW / KL7

NVIS Antennas

7-26-2008 IOTA Contest

05:50Z	DL8FL	
05:56Z	RX9WN	
05:57Z	RA1OD	
05:58Z	IK2QPR	
06:01Z	OH1TIN	
06:02Z	HA0DU	
06:03Z	OA8A	
06:06Z	OE8HAQ	
06:07Z	SP9LJD	06:40Z DK2BS
06:09Z	I5YSZ	06:41Z EA3CC
06:13Z	ES7FQ	06:42Z F6EKS
06:15Z	HB9AFI	06:43Z DL5FU
06:16Z	DL8UP	06:44Z DL6FBH
06:20Z	RN3AHL	06:50Z SM6CWK
06:25Z	OE8HIK	06:51Z IW1GGN
06:27Z	I0MPF	06:53Z IK0IOL
06:29Z	IK2TDR	06:55Z ON4WNF
06:32Z	IK2WFI	06:55Z ON4OSN
06:36Z	LA4UOA	06:56Z ON4IZ
06:38Z	RU4SU	06:58Z SM5AQD
		06:58Z SM5SQD

06:00 UTC

22:00 AKDT

23:00 PDT

02:00 EDT

20:00 Local
Arctic Circle
Sun Time @
66° 33' N
150° 50' W

BP - 56

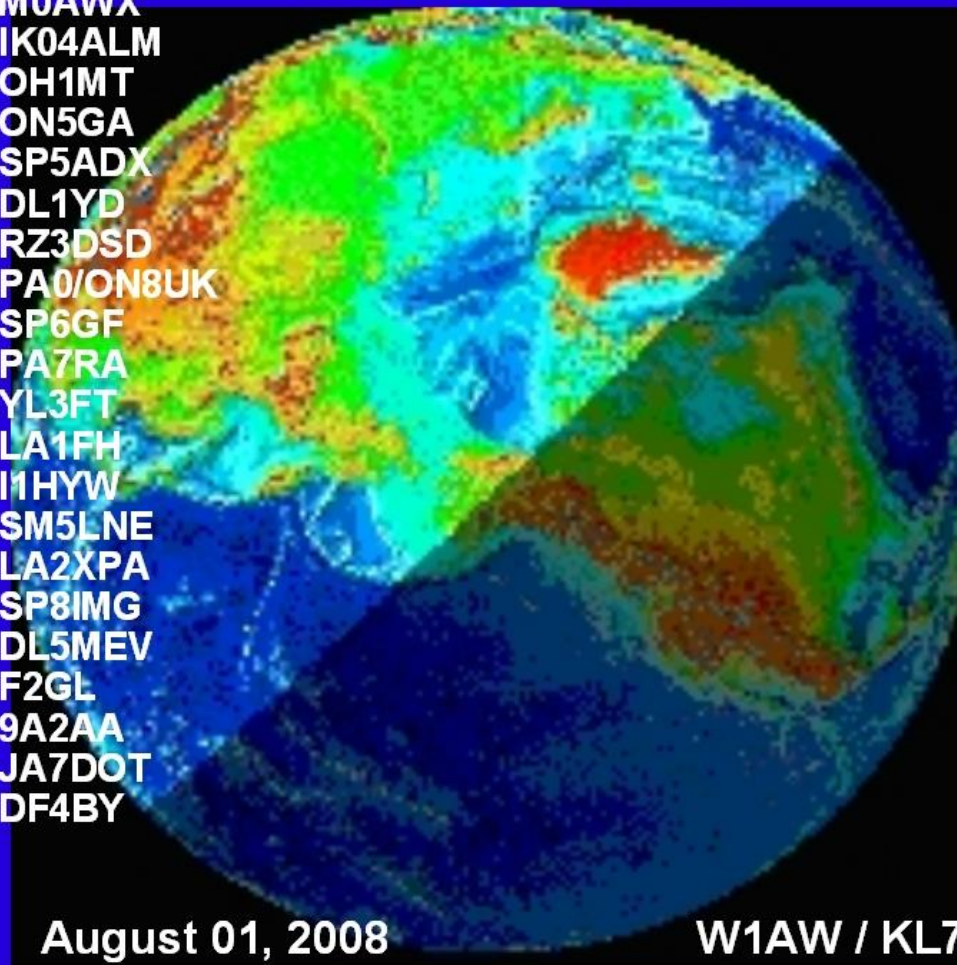
August 01, 2008

W1AW / KL7

NVIS Antennas

7-26-2008 IOTA Contest

07:00Z M0AWX
07:11Z IK04ALM
07:12Z OH1MT
07:14Z ON5GA
07:17Z SP5ADX
07:19Z DL1YD
07:22Z RZ3DSD
07:23Z PA0/ON8UK
07:25Z SP6GF
07:29Z PA7RA
07:30Z YL3FT
07:33Z LA1FH
07:37Z I1HYW
07:39Z SM5LNE
07:43Z LA2XPA
07:45Z SP8IMG
07:47Z DL5MEV
07:50Z F2GL
07:51Z 9A2AA
08:05Z JA7DOT
08:06Z DF4BY



07:00 UTC

23:00 AKDT

00:00 PDT

03:00 EDT

21:00 Local
Arctic Circle
Sun Time @
66° 33' N
150° 50' W

BP - 56

August 01, 2008

W1AW / KL7

NVIS Antennas

The 4-Square does work!



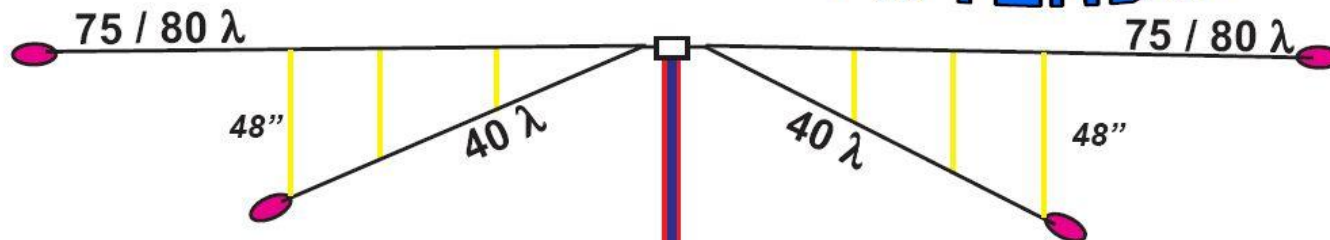
...73's

NVIS Antennas



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THANK YOU FOR ATTENDING



<http://HamShare.com>



NVIS Antennas

NVIS Antennas

“Network Vertical Internet Stack”

The Blue Cloud

&

The Ionospheric Internet

Repeater Sites

146.84 MHz DV + SDD

443.85 MHz DV + SDD

1290.1 MHz DV + SDD

1249.25 MHz Digital Data

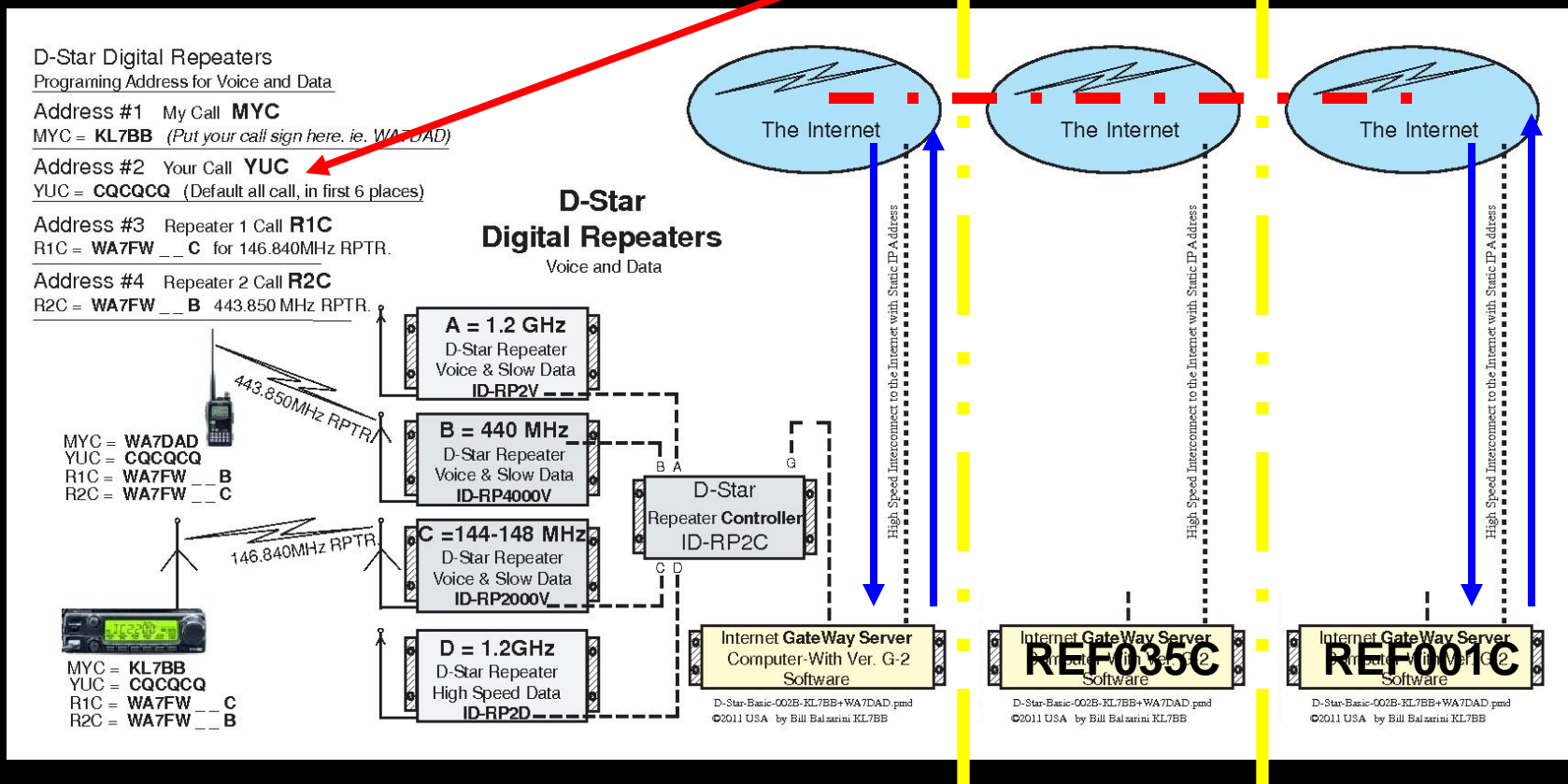
Simplex Direct (Talk-Around)

Reflector 035C and 035A, 035B

NVIS Antennas

“Network Vertical Internet Stack”

if you know the linking REFLECTOR language.



NVIS Antennas

“Network Vertical Internet Stack”

if you know the linking language.



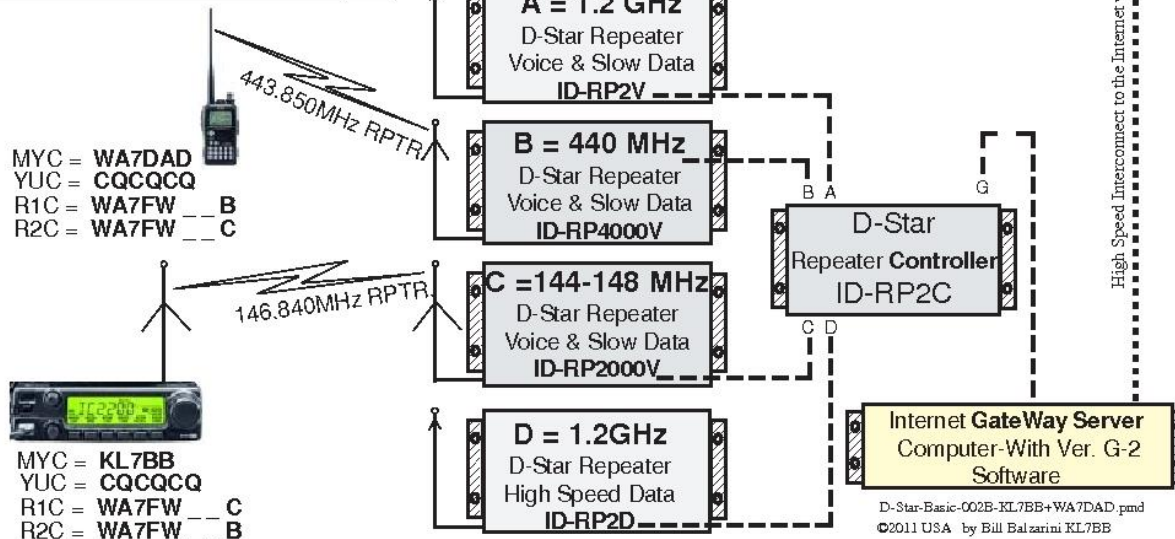
D-Star Digital Repeaters
Programing Address for Voice and Data

Address #1 My Call **MYC**
MYC = **KL7BB** (Put your call sign here, ie. WA7DAD)

Address #2 Your Call **YUC**
YUC = **CQCQCQ** (Default all call, in first 6 places)

Address #3 Repeater 1 Call **R1C**
R1C = **WA7FW __ C** for 146.840MHz RPTR.

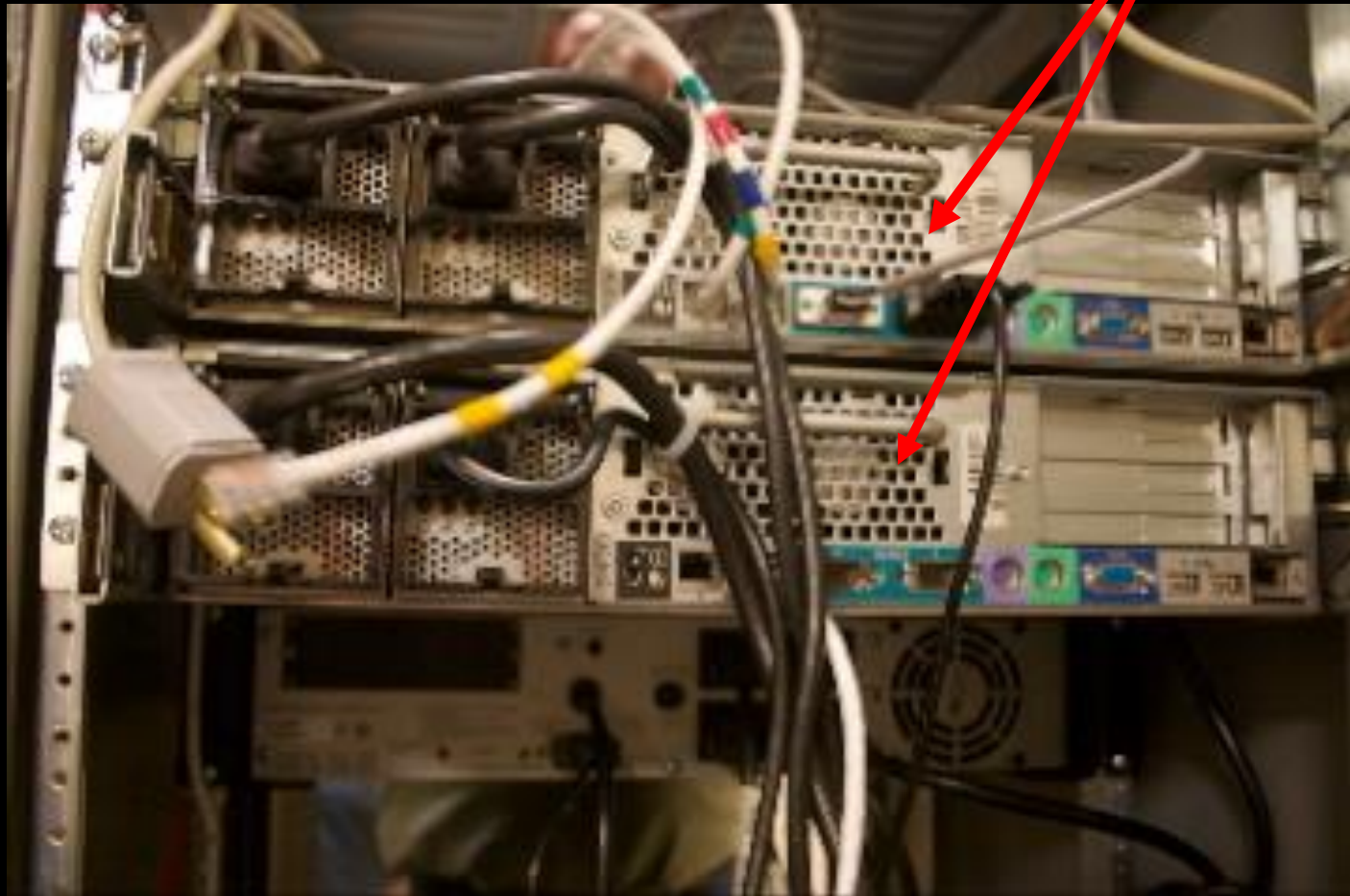
Address #4 Repeater 2 Call **R2C**
R2C = **WA7FW __ B** 443.850 MHz RPTR.



NVIS Antennas

“Network Vertical Internet Stack”

if you know the linking language.



NVIS Antennas

“Network Vertical Internet Stack”

if you know the linking language.



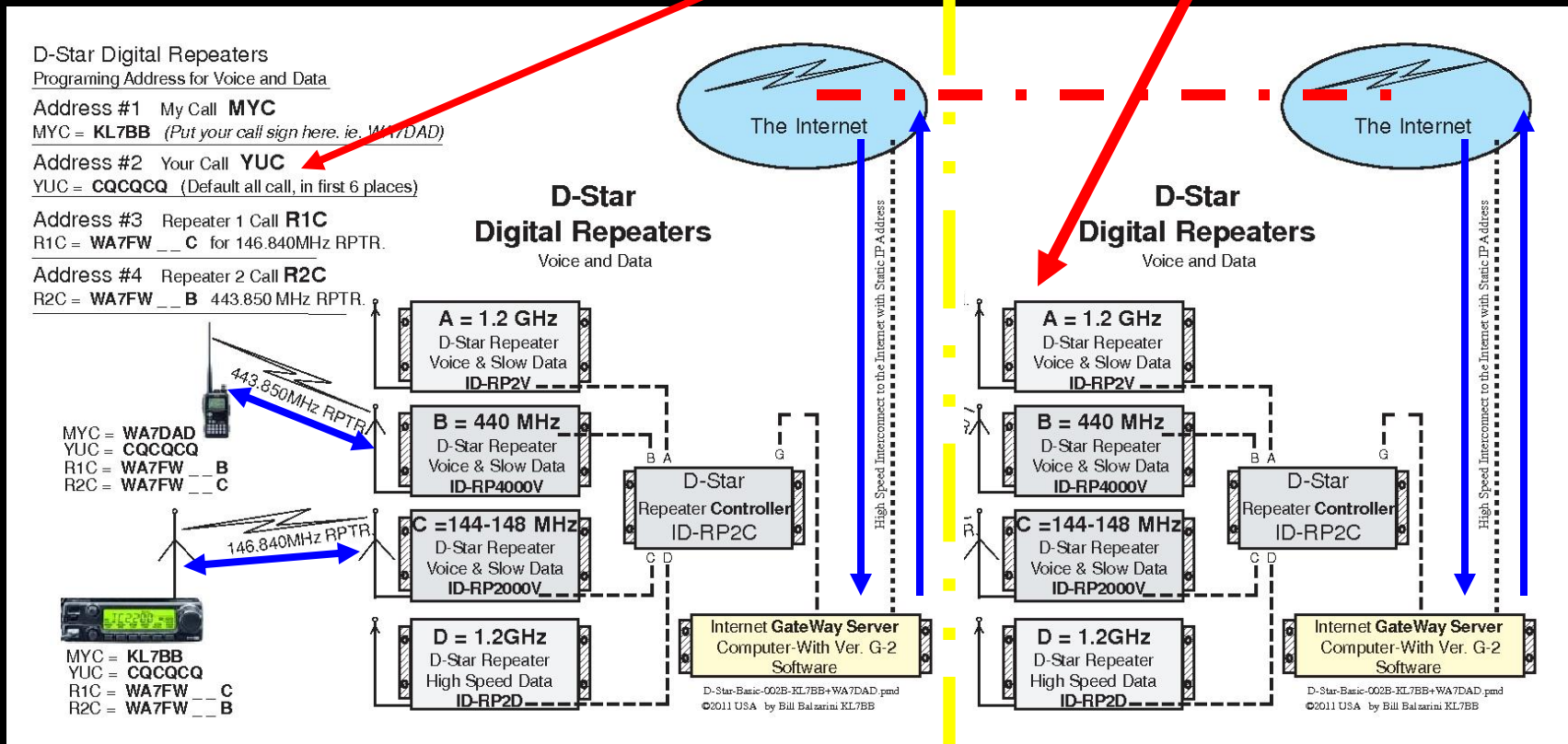
Vertical Internet Stack



NVIS Antennas

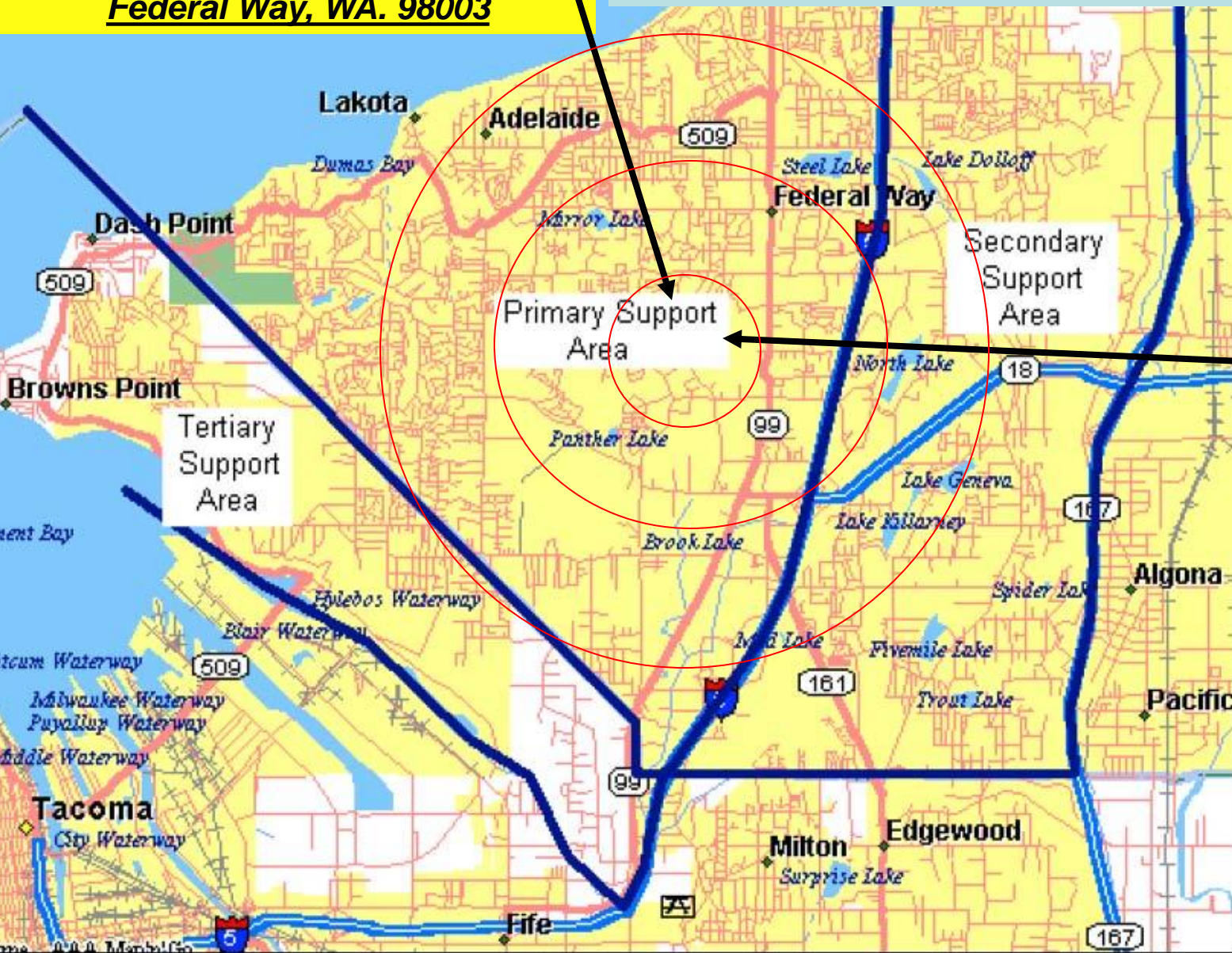
“Network Vertical Internet Stack”

if you know the linking language.



146.84 MHz Rptr. Site
876 S. 333rd Street
Federal Way, WA. 98003

NVIS Antennas
"Network Vertical Internet Stack"



146.84
443.85
1290.1
1249.25
MHz
DV & DD
Rptr. Site
876 S.
333rd
Street
Federal Way,
WA. 98003



Lakehaven EOC

Lakehaven Lakota

Fire Dept. EOC

City Hall EOC

Primary Support Area

Secondary Support Area

Tertiary Support Area

St. Francis Hospital

Weyerhaeuser EOC

NVIS Antennas

“Network Vertical Internet Stack”

Involvement

- City Hall and the Greater Federal Way EOC
- South King Fire & Rescue. (Station 62)
- Lakehaven Utility Dist. (62)(Y2K 146.76MHz)
- 146.76MHz, 147.04MHz, 442.950MHz Rptrs.
- 146.84MHz, 443.85MHz, 1290.1MHz Rptrs.
- Amateur Radio nets fully operational 147.04
- 5th Saturday Drills EOC to EOC



Nisqually Earthquake 2001 Perfect for NVIS Antennas

- ❑ February 2001
- ❑ Amateur Radio Net became operational.
- ❑ Amateur Radio provided communications to Police, Fire, Gov, Utilities. (by relaying messages)
- ❑ Live Field reports on city conditions.
- ❑ Reports on surrounding areas.

Are Your NVIS Antennas & “Network Vertical Internet Stack” Ready?

Thank you for your
continuing support of
amateur radio in
YOUR Community!



<http://HamShare.com>



The American Radio Relay League RADIOGRAM Via Amateur Radio

Number	Precedence	HX	Station of Origin	Check	Place of Origin	Time Sent	Date

TO:

<http://HamShare.com>

This Radio Message was received at:

Amateur Station _____ Date _____

Name _____

Street Address _____

City, State, Zip _____

Telephone Number:



REC'D	From	To	Time	SENT	To	Date	Time
-------	------	----	------	------	----	------	------

A licensed Amateur Radio Operator, whose address is shown above, handled this message free of charge. As such messages are handled solely for the pleasure of operating, a "Ham" Operator can accept no compensation. A return message may be filed with the "Ham" delivering this message to you. Further information on Amateur Radio may be obtained from ARRL Headquarters, 225, Main Street, Newington, CT 06111.

The American Radio Relay League, Inc. is the National membership society of licensed radio amateurs and the publisher of QST Magazine. One of its functions is the promotion of public service communication among Amateur Operators. To that end, The League has organized the National Traffic System for daily nationwide message handling.

<http://HamShare.com>

NVIS

Antennas

by

Bill Balzarini

KL7BB



