



FIELD DAY 2023

HF Antennas

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W5IFQ

6 JUN 2023

Purpose of Field Day

- Demonstrate the ability to set up an Amateur radio station in the field on emergency power and communicate effectively over all of CONUS.
- Increase public awareness of Amateur Radio
- Operator Training
- Recruitment of new hams
- Have fun



Austin Amateur
Radio Club
Serving our community since 1919.

Field Day 2023

When: 24 – 25 June, 1 PM Saturday till 1 PM Sunday

Where: Red Cross building – 2218 Pershing Ave.

Operations Details:

- **Four stations:**
 - **TCARES Emergency Trailer – HF Multi-mode + Emergency Power**
 - **VHF/UHF Multi-mode building A**
 - **HF Multi-mode (CW, Digital, and SSB) building B**
 - **GOTA (Get on the Air) – HF SSB building B**
 - **Designation – 3A STX**
 - **Scoring – N3FJP Wireless Network**
 - **Operating spaces are air-conditioned!**
- **Meals**
 - **Saturday Lunch – Pizza**
 - **Saturday Evening - BBQ**

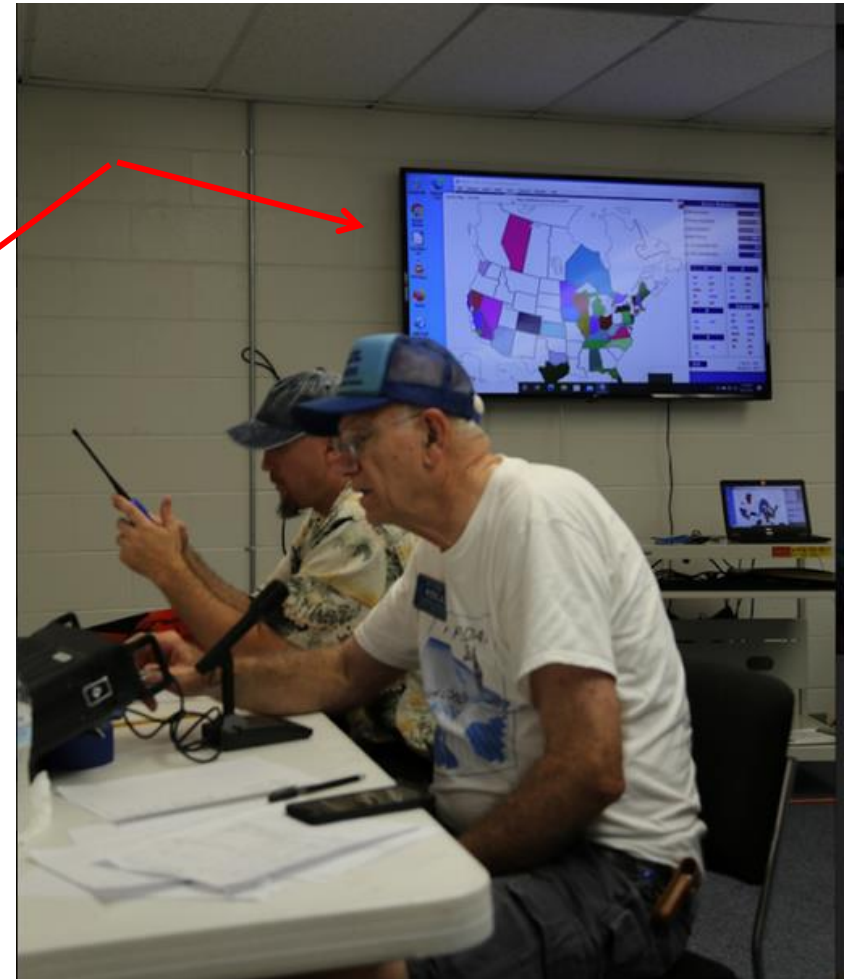
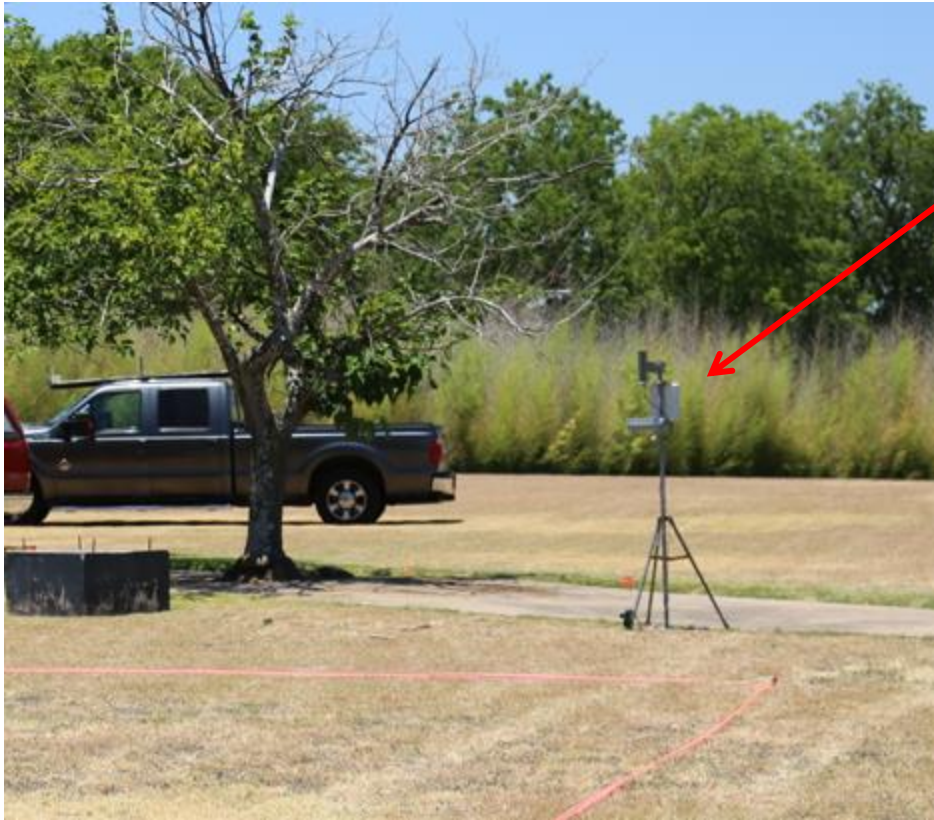
Scoring Using N3FJP Wireless Network (Paul Kinney, KD5VRU)

The screenshot displays the N3FJP software interface, which is used for logging and scoring contacts. The interface is divided into several sections:

- Recent Contacts:** A table listing recent contacts with columns for Rec, Call, Class, Sec, Date / Time, Bnd, Mode, Country, and Operator. The table shows 17 contacts from 06/24 16:22 to 06/24 15:42.
- Score Statistics:** A summary of contact statistics:
 - Total CW Contacts: 8
 - Total Phone Contacts: 309
 - Total DIG Contacts: 0
 - Total QSO Points: 325
 - QSOs / Hr (Last 20 min): 0
 - QSOs / Hr (Last 60 min): 0
- Call, Class, Section:** Input fields for the current contact, currently showing 'K'.
- Possible Duplicates:** A list of call signs that might be duplicates: K2VN, K1EEE, K4HJ, W3K3, KG3NE, K14QJP, K8HRC, K2Y3, KC2WI, KC9PQA, W4IJK, KB1EKZ, KB1TJC, KB1QJK, KB4KY, K9LA, K2YWR.
- Grid of State Abbreviations:** A grid of state abbreviations arranged in columns and rows, numbered 1 through 9. The states shown include CT, RI, MA, VT, ME, WMA, NH, NY, NJ, WNY, DE, MDC, EPA, WPA, AL, SC, GA, SFL, KY, TN, NC, VA, PR, WCF, AR, NTX, LA, OK, MS, STX, NM, WTX, EB, SCV, LAX, SDG, ORG, SF, PAC, SJV, SB, SV, MI, WV, OH, IL, WI, IN, AK, NV, AZ, OR, EWA, UT, ID, WWA, MT, WY, CO, MO, IA, ND, KS, NE, MN, SD, Canada, AB, NT, BC, ONE, GTA, ONN, MAR, ONS, MB, QC, NL, SK.
- Band and Mode:** Currently set to Band: 40 and Mode: PH.
- Bottom Panel:** A table of frequency bands and their corresponding call signs and frequencies.

Band	Freq	Country	Call Sign	Freq	Country	Call Sign	Freq	Country	Call Sign
ZS1AFS	18.130	South Africa	de NATSC: ST on Florida	ZS	1834Z	AF	102	8.668	
DF1LX	7.063	Federal Republic of	de SV1RLLA: 02 00 00	DF	1834Z	EU	42	4.767	
FM1R5GA	14.027	Moritzburg	de F4R0DD: Trk 500	FM	1834Z	NA	122	2.450	
ZK3T	14.065	Tokelau Is	de D4R0RD: up	ZK3	1833Z	OC	256	0.043	
TK4LS	7.015	Comoros	de UR2EU	TK	1833Z	EU	50	5.017	

Scoring Using N3FJP Wireless Network (Paul Kinney, KD5VRU)



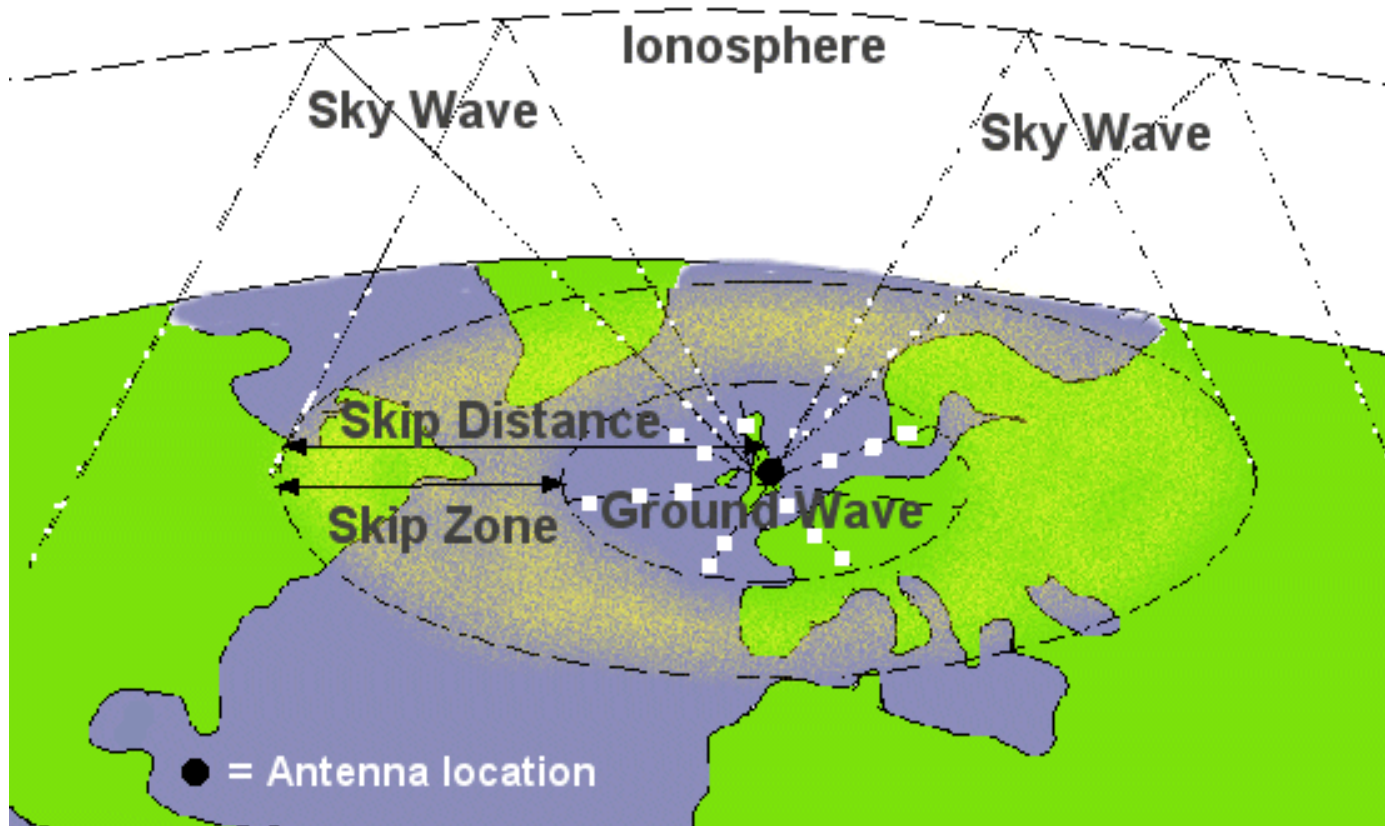
HF Propagation Modes

- Free Space – Line of site
- Ground Wave – Follows Earth's curvature
- Ionospheric Skip
 - Long Distance with a “dead-zone”
 - NVIS (Near Vertical Incidence Sky Wave)

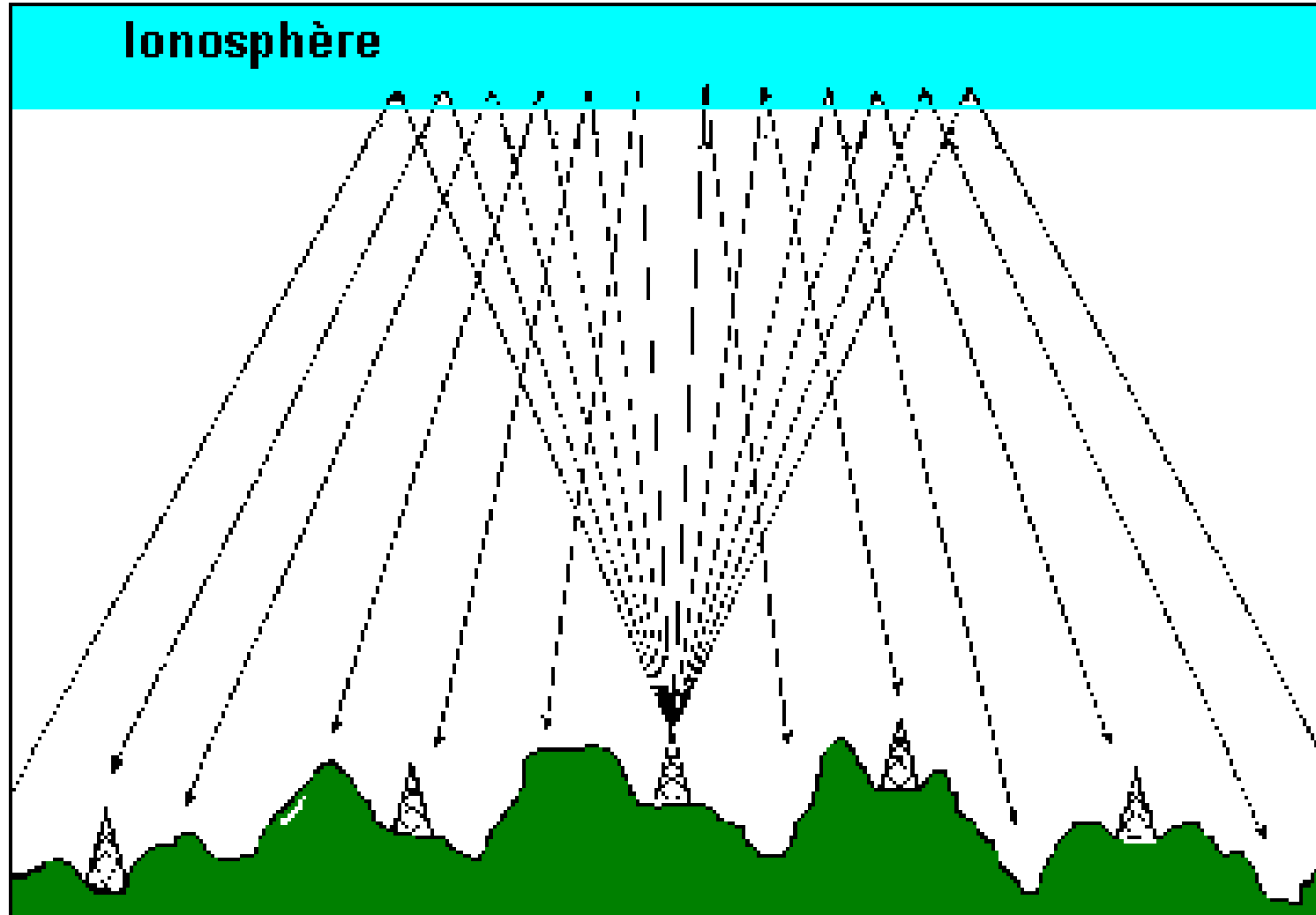
Optimizing HF Communications

- Ionospheric propagation
 - Frequency selection (MUF for target area)
 - Other propagation factors
- Antenna design
 - Correct directivity pattern
 - Provide usable impedance to RF transmitter

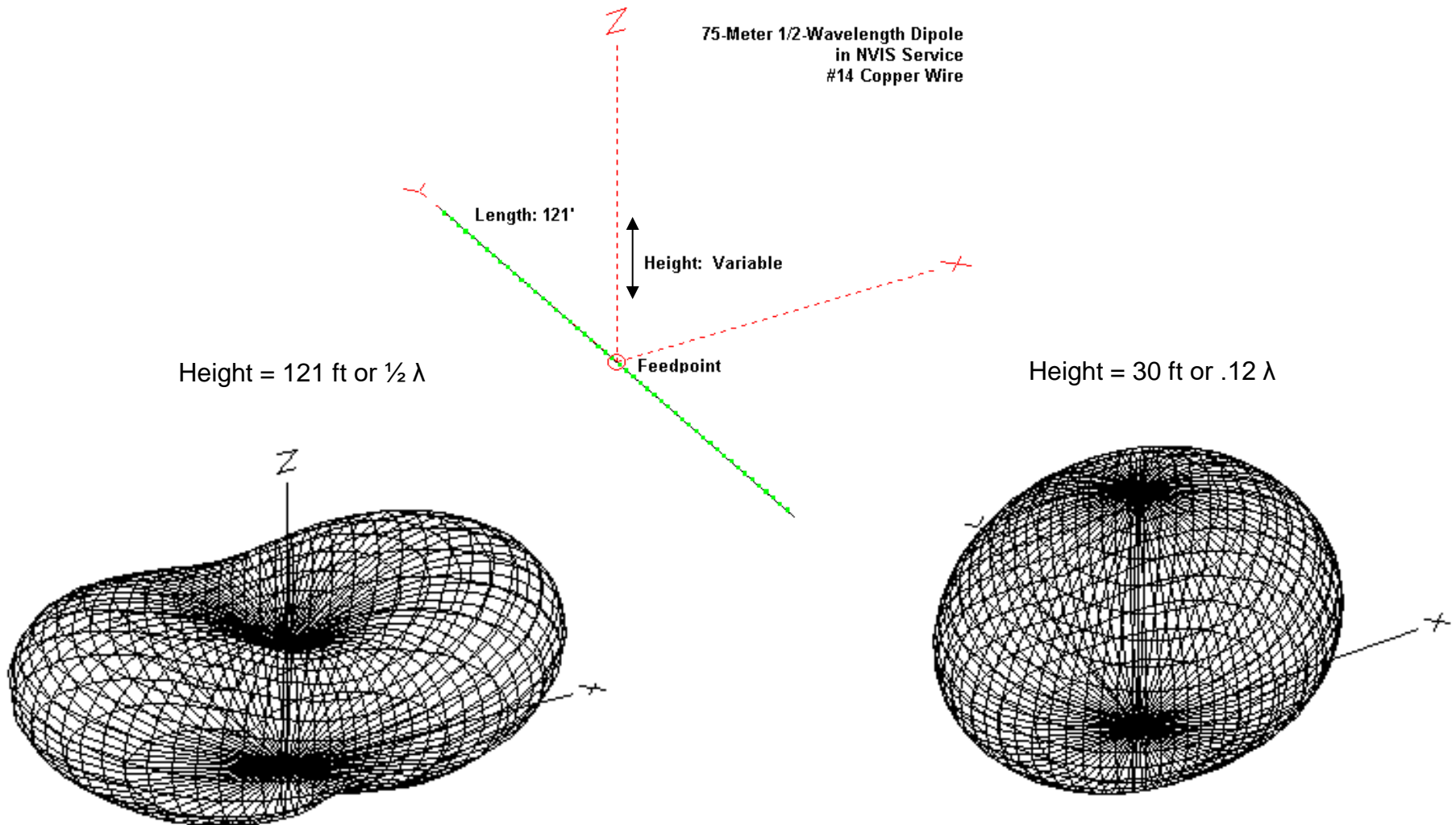
Long Distance Sky Wave



NVIS Propagation



Dipole Height Versus Directivity



MARS Portable Dipole (TCARES Emergency trailer)

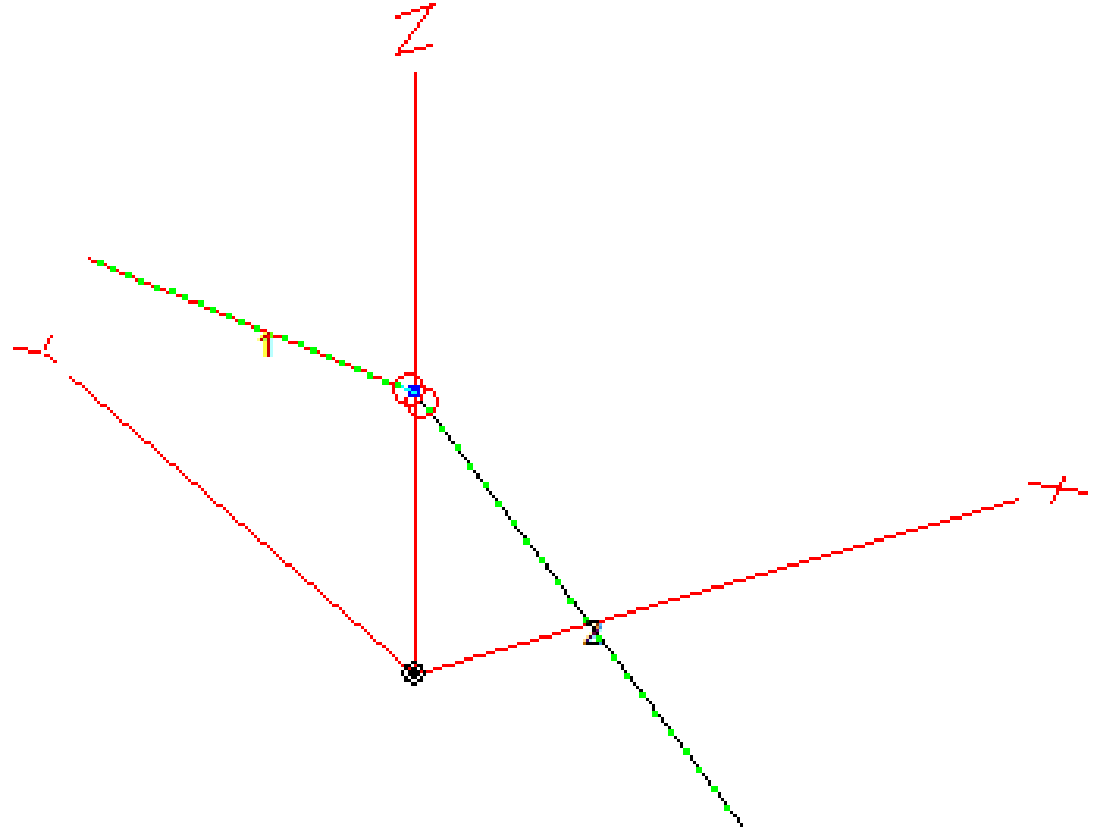
Inverted-V:

Apex – 32 ft.

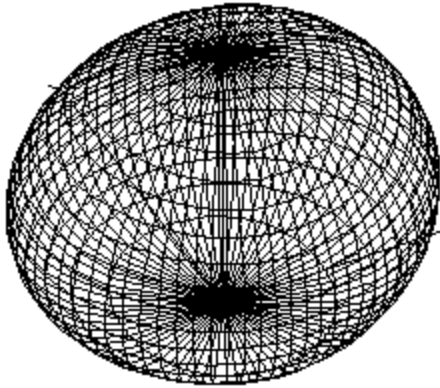
Length – 65 ft.

End heights – 15 ft.

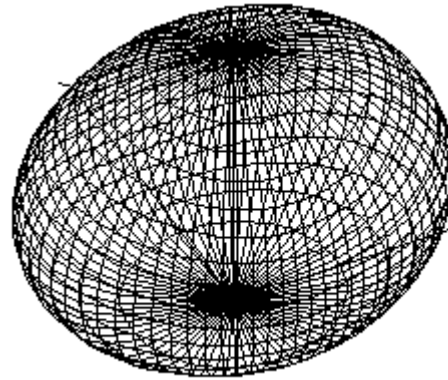
Wire - #14 AWG



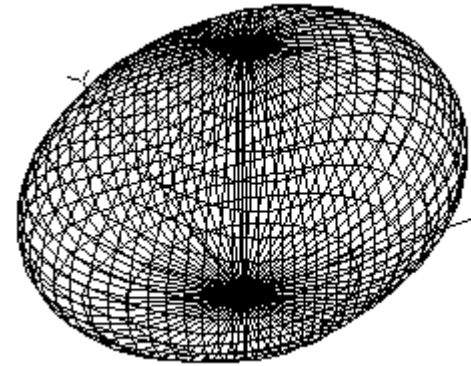
NVIS Performance



3.8 MHz

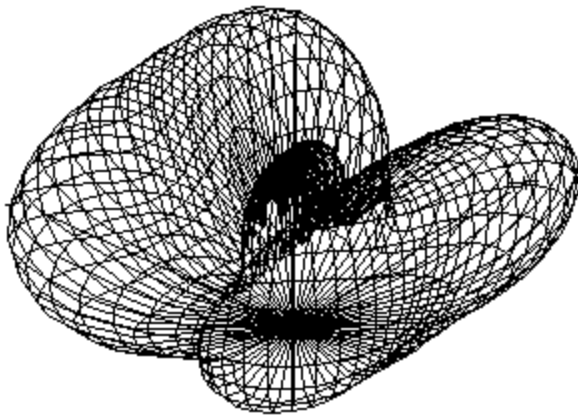


5.2 MHz

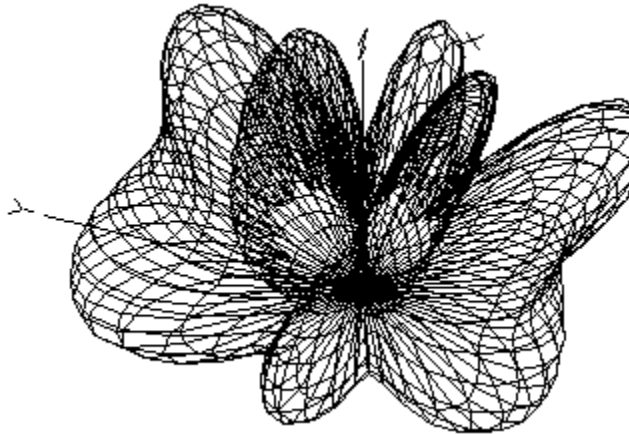


7.2 MHz

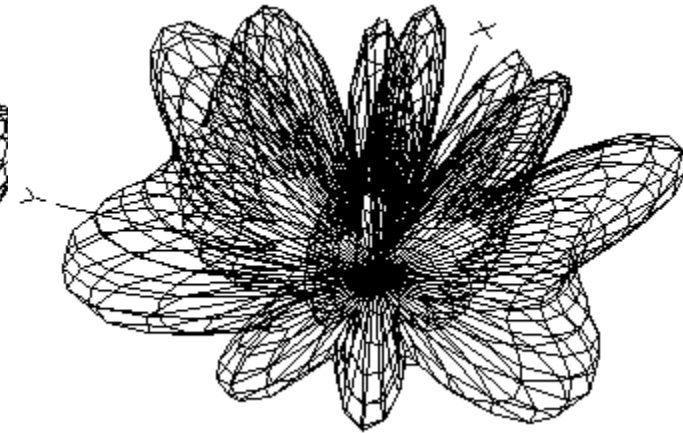
Skip Performance - BAD



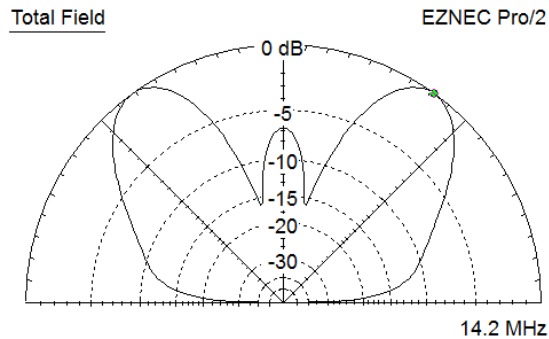
14.3 MHz



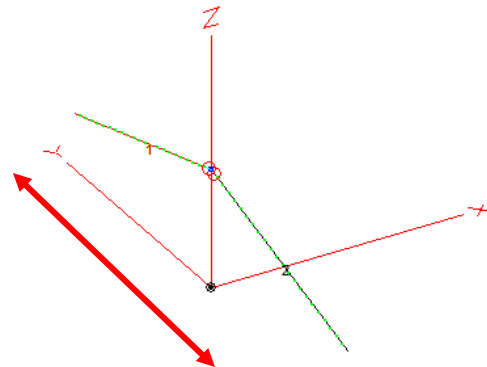
21.4 MHz



28.4 MHz



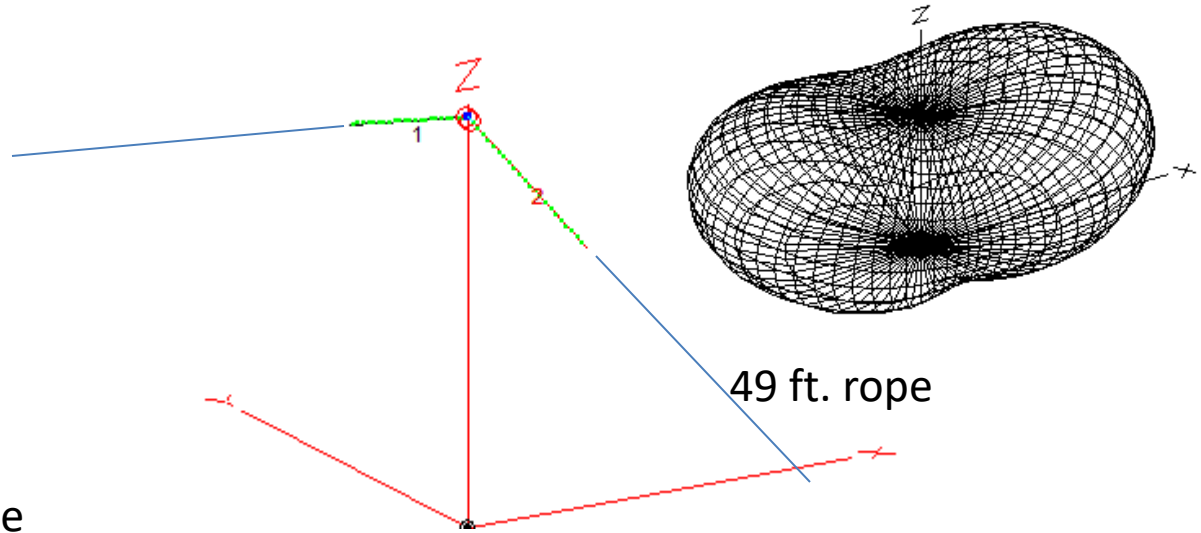
Poor Take-off Angle



Note: Maximum gain
Off ends of wires

Corrections To Directivity

(Shorten each leg from 65 ft. to 18 ft.)



Inverted-V

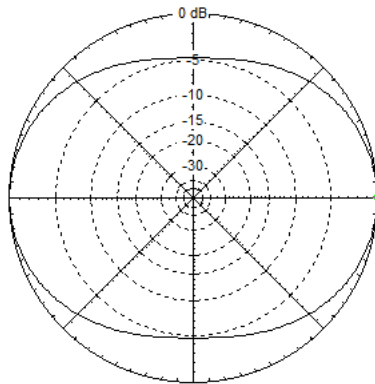
Height – 32 ft.

Leg Length – 18 ft.

Same angle as full dipole

Original dipole folded back to length of 18 ft. on each leg.

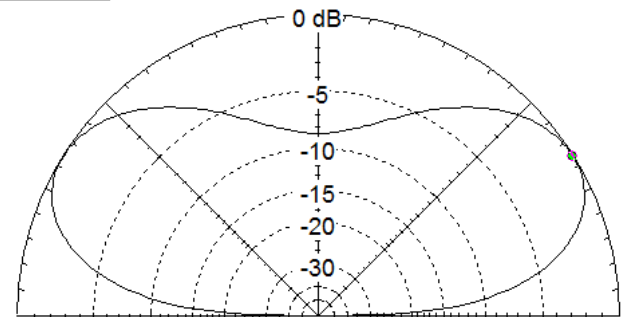
Total Field



EZNEC Pro/2

14.3 MHz

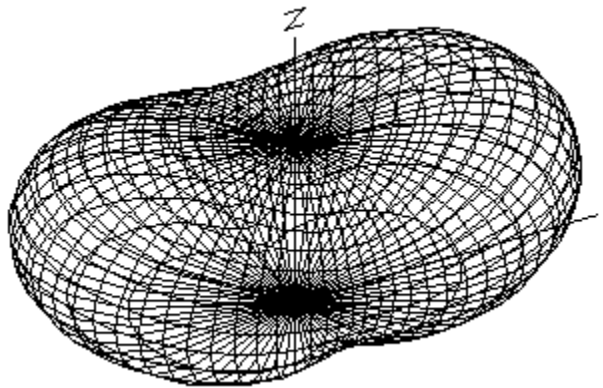
Total Field



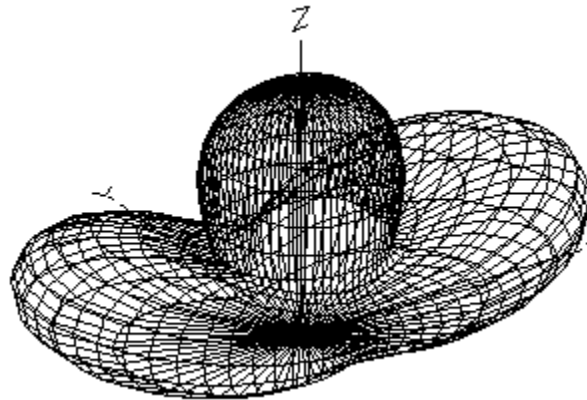
EZNEC Pro/2

14.3 MHz

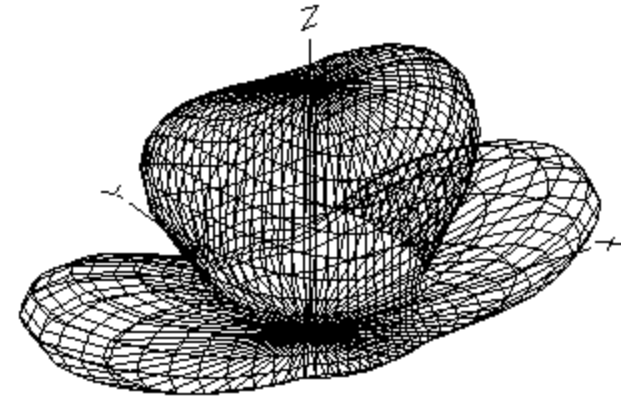
Skip Performance – 20m dipole



14.3 MHz

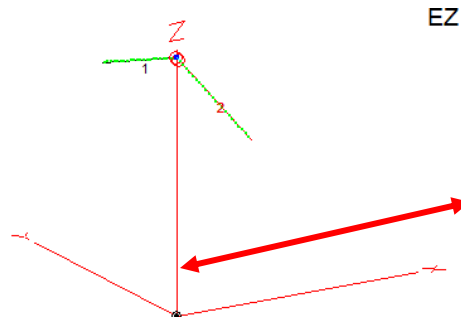
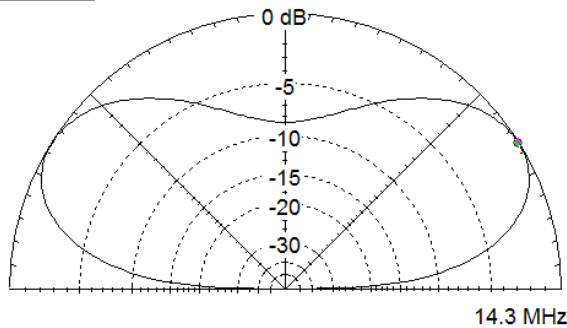


21.4 MHz



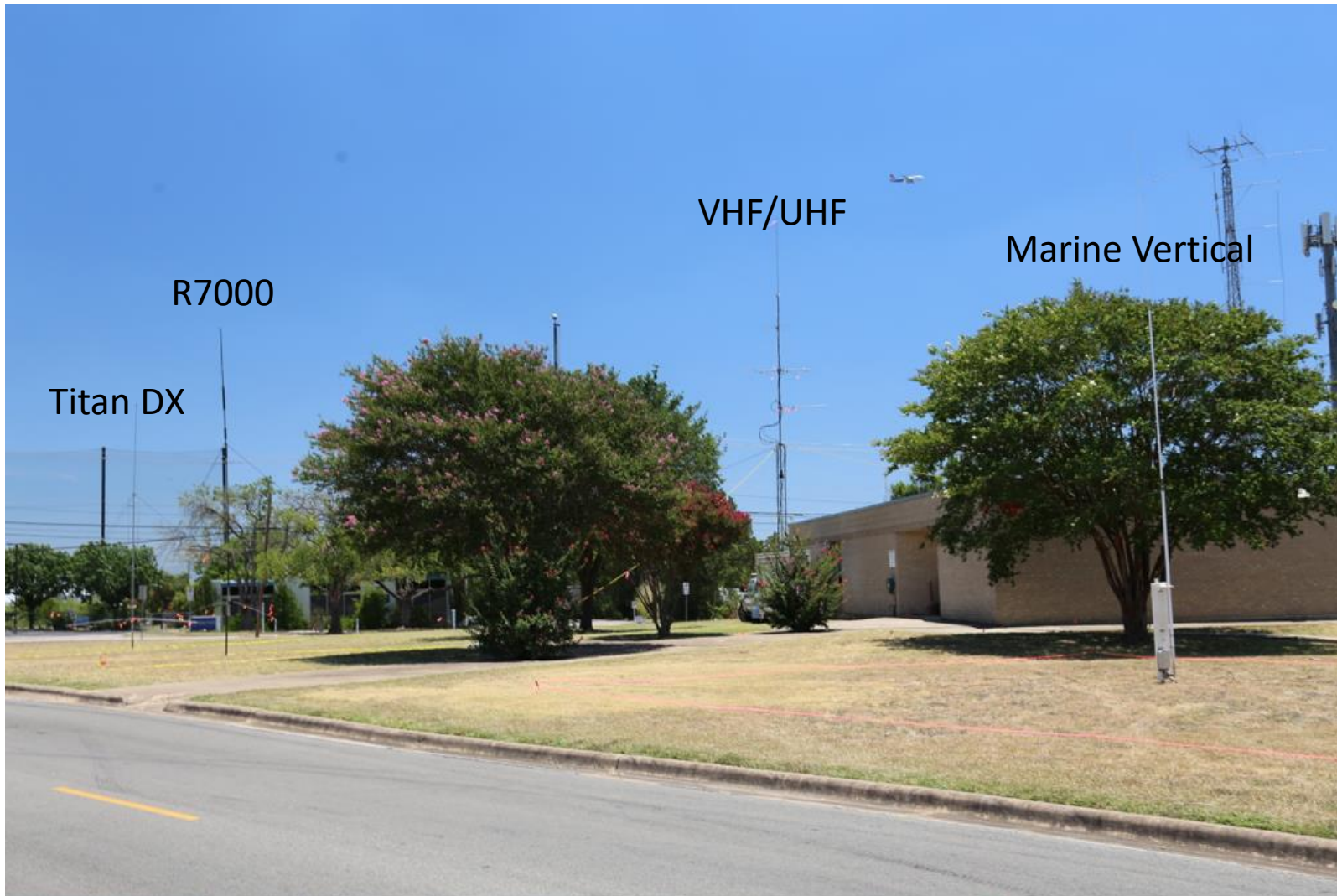
28.4 MHz

Total Field EZNEC Pro/2



Note: Maximum gain
Right angle to wires

2022 FD Antenna Locations at Red Cross (TCARES Trailer Behind Building)



Titan DX

R7000

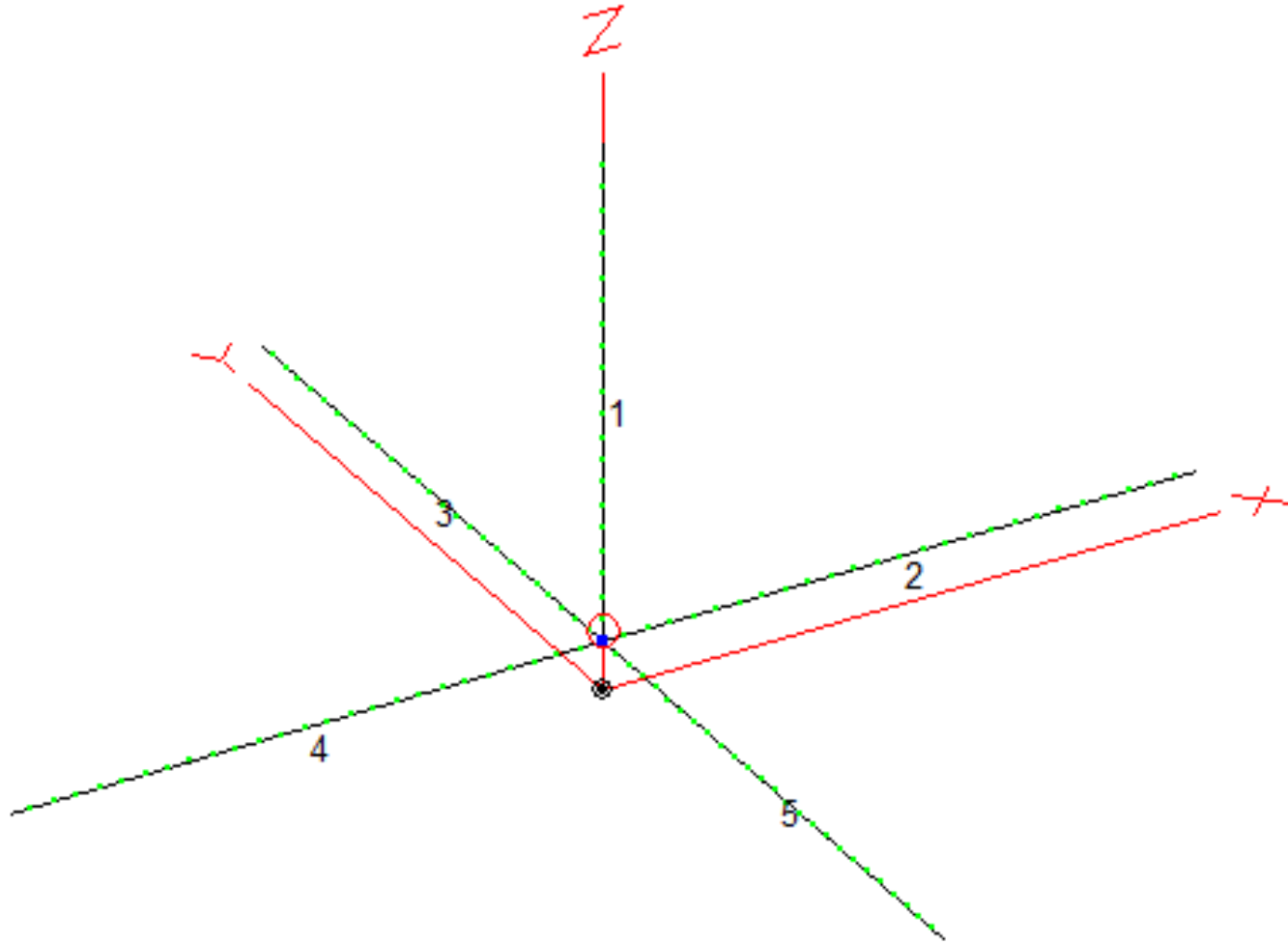
VHF/UHF

Marine Vertical

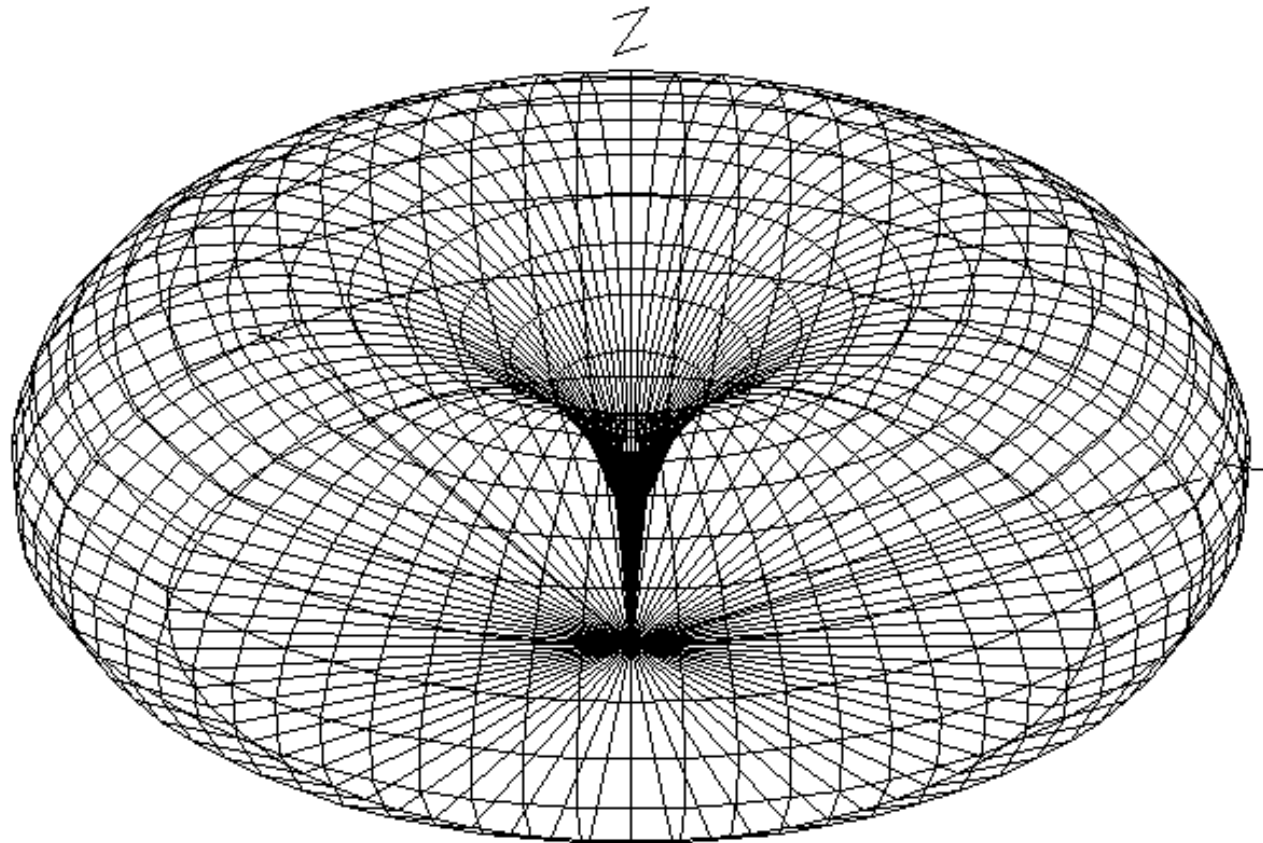
Vertical Antenna 1: Description

- Auto-tuned vertical with ground radials
- Base height above ground – 2 ft.
- Vertical height – 23 ft.
- Vertical Type – Shakespeare 393 Marine SSB HF
- Ground Radial length (each) – 25 ft.
- Number of ground radials – 4
- Auto-tuner – ICOM AH-4
- Coax – 200 ft. of RG8X

Original FD Vertical

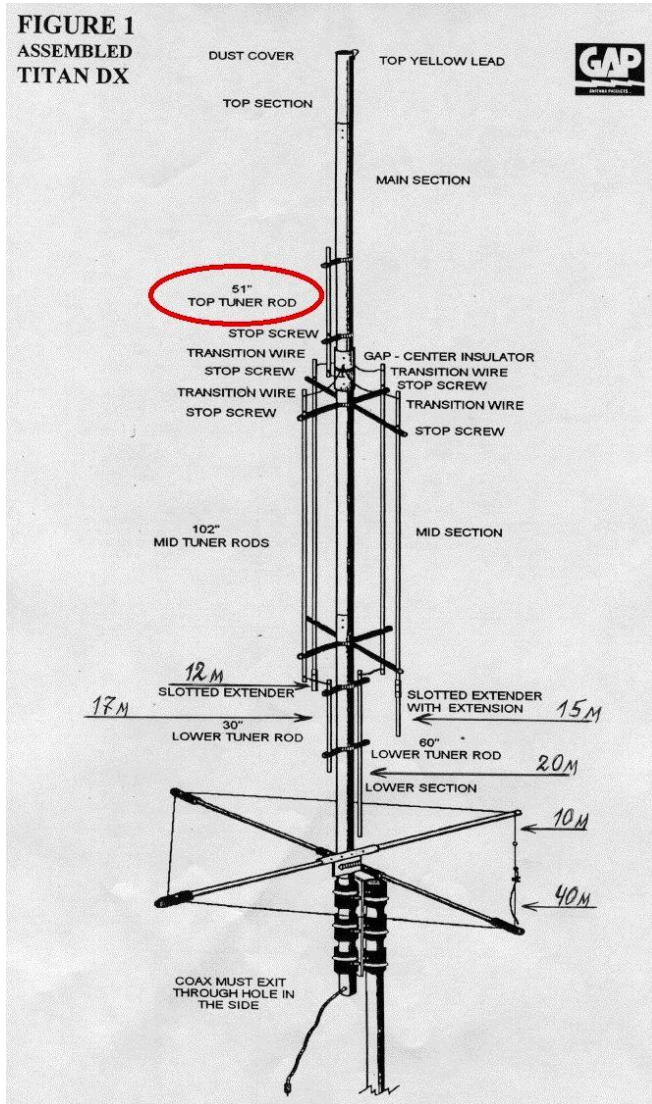


Vertical Antenna Pattern



Other Vertical Antennas

(Tuned "TRAP" Verticals)

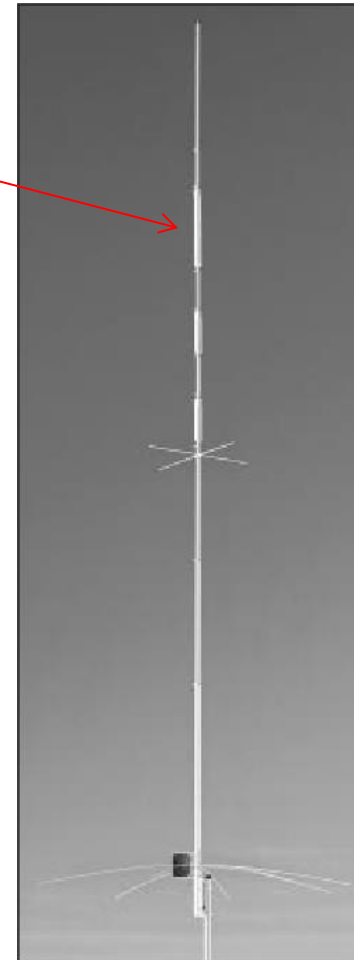
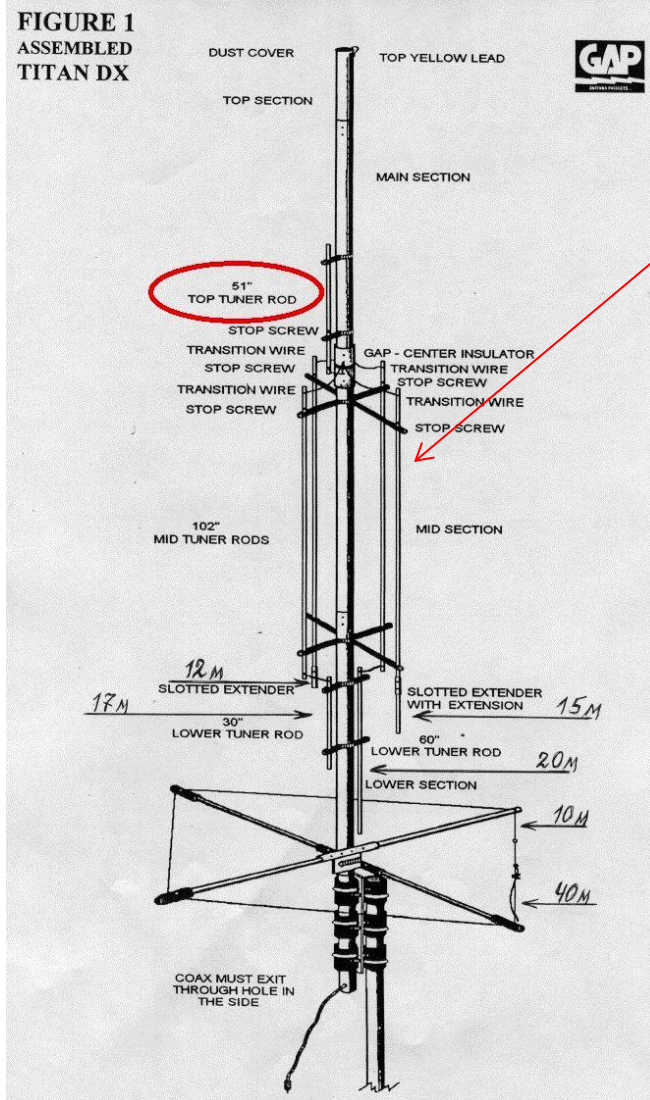


R7000

Optimizing HF Communications

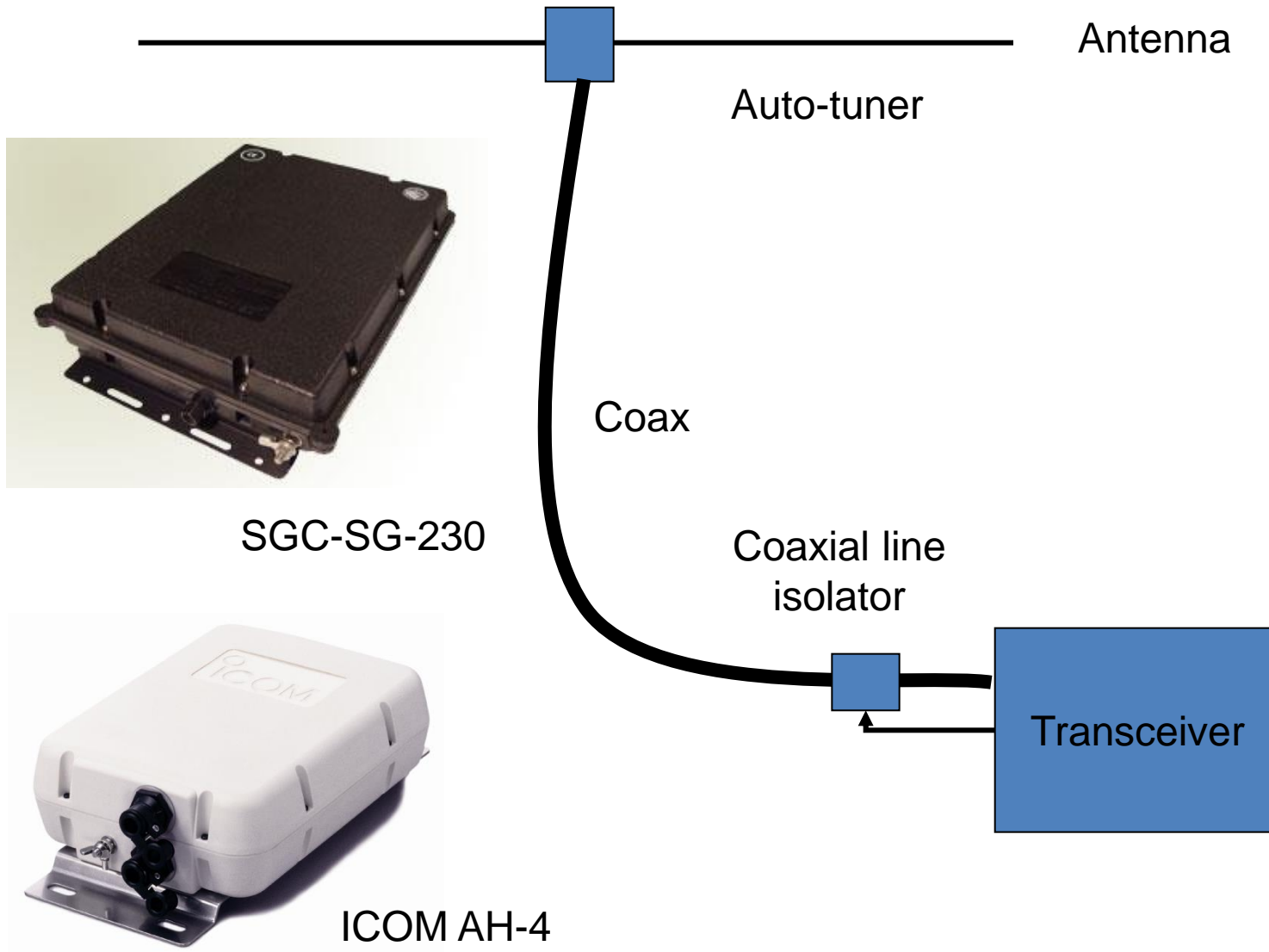
- Ionospheric propagation
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 - Other propagation factors
- Antenna design
 - Correct directivity pattern
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Special Tuning Elements



R7000

TUNER AT ANTENNA (TCARES Emergency Trailer)



Station Details From Station Captains

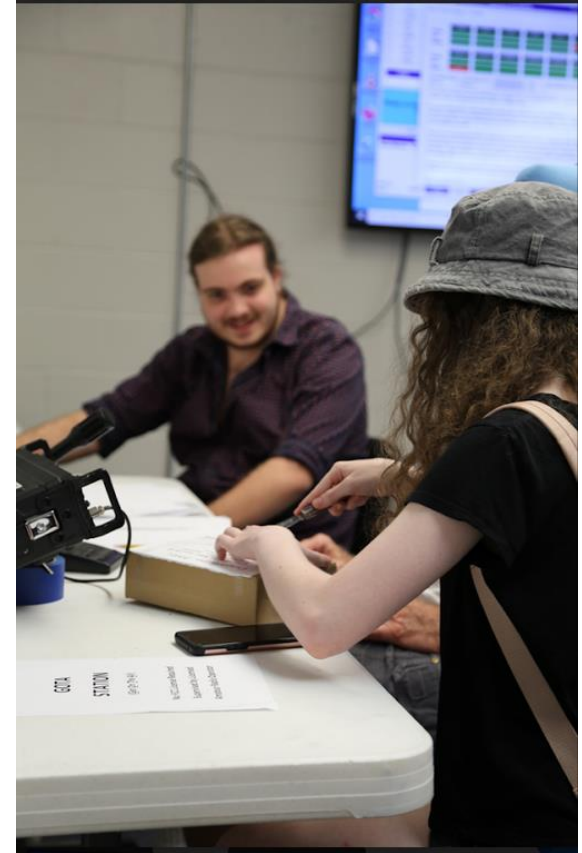
- CW, Digital and SSB – Lew W5IFQ
 - ICOM IC-756Pro3
 - CW - Bencher paddle, straight key
 - SSB - Desk Mic, Heil headset
 - Signalink USB Sound Card
 - Laptop with WSJTX - FT8, RTTY - MMTTY, FLdigi
 - Multiple Vertical Antennas
- TCARES Trailer – Rex K8REX
 - Auto-tuned Dipole
 - ICOM IC-7100
- GOTA – Ronny KC5EES
 - ICOM IC-706Miig with auto tuner
 - Multiple Vertical Antennas
- VHF/UHF – Jeff N5MNW

2022 FIELD DAY PICTURES

2022 FD CW Station



2022 FD GOTA Station



TCARES EmComm Trailer



2022 FD Information Booth



2022 FD Food - Dinner

