A photograph of a tall antenna tower on a roof at dusk. The tower is a vertical mast with a horizontal boom extending from it, supported by a tripod base. Two long wires are strung from the mast to the roof edges. The background is a clear, dark blue sky. The foreground shows the silhouette of a roof with a chimney and some trees on the right.

Using the AA-650 Zoom Antenna Analyzer

Gary Fritz, WB9LIB

Gary Fritz, WB9LIB

- **Electronic Design Engineer 1974 – 2006**
- **Funded 444.675 MHz Repeater 1998**
- **Developed Weatherspotter.net**
- **Emergency Management 2007 – 2020**
 - Currently on staff as volunteer
 - Involved in RACES & Skywarn
 - Maintain the 147.195 MHz Repeater
- **Working with NWS on new products and services**



The Antenna Analyzer



Meter Do
nna Analyzer?



**An SWR meter works
fine for day to day
operation**

**Works OK for
limited antenna
work**

**An antenna analyzer is VERY
helpful when setting up an
antenna**

**SWR METER USES
TRANSMITTER'S SIGNAL**

**ANALYZER USES OWN
LOW POWER SIGNAL**

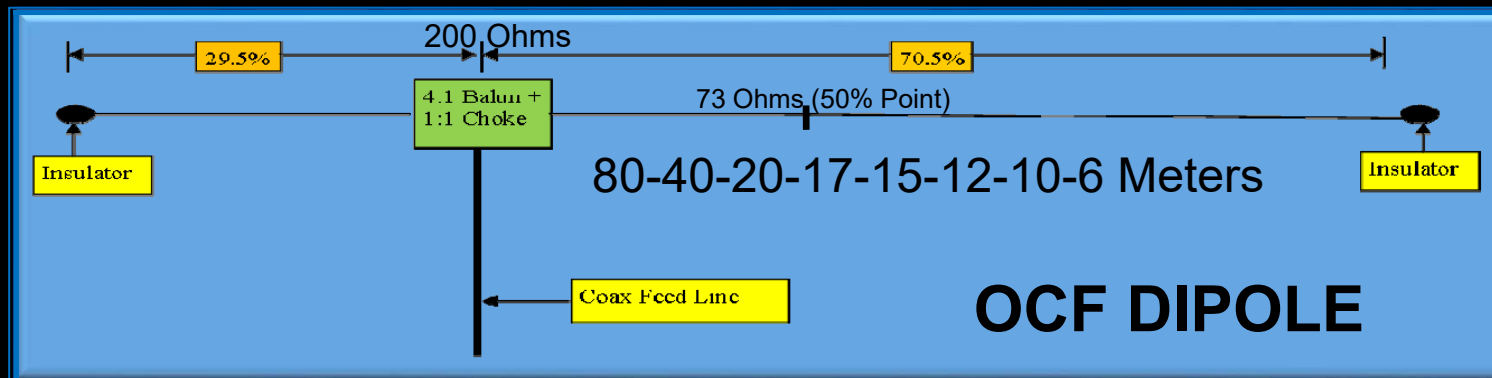
The Antenna Analyzer was Purchased Primarily to Set Up a OCF Dipole Antenna

8 Bands

Coax Fed

Resonant

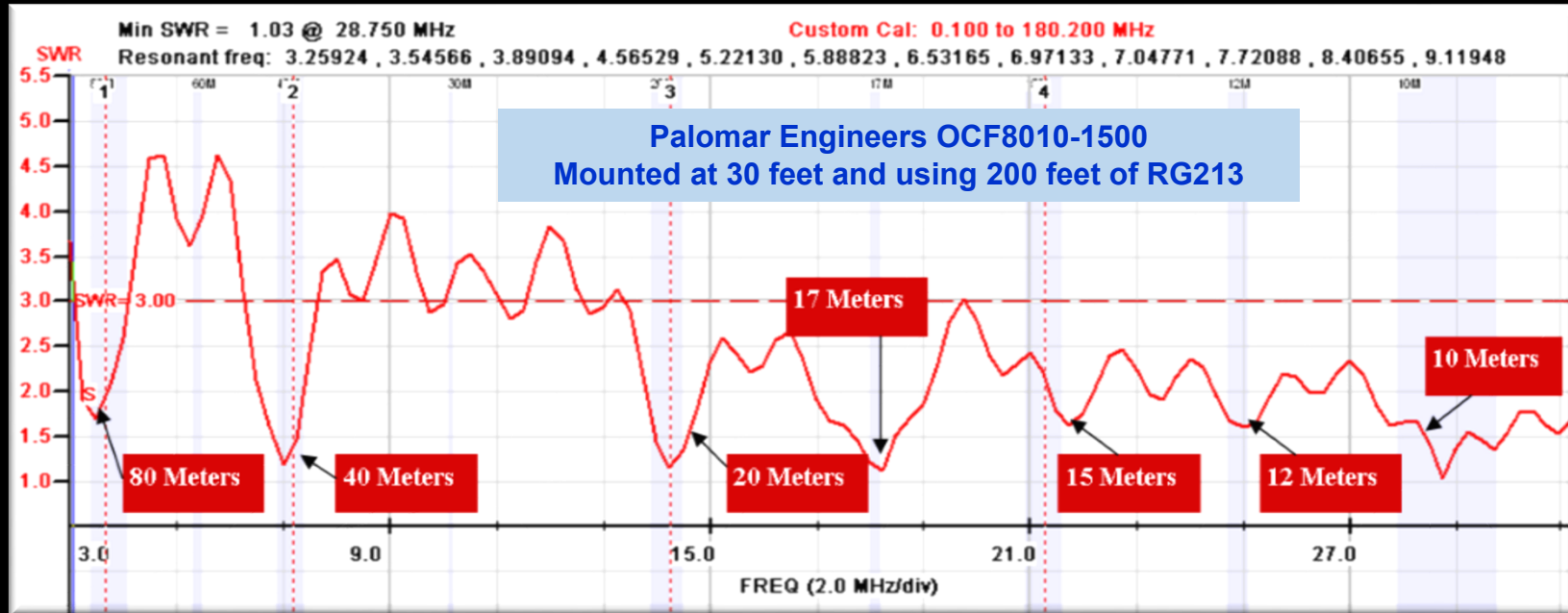
No Tuner



Wanted an effective way to facilitate setting up and adjusting a multiband HF antenna for optimum performance

Note: Most OCF Dipoles are 33%/67% cut (supports operation at even harmonics)
This OCF is 30%/70% (includes WARC & 15M)
Considered G5RV but it is NOT resonant on most bands tuner required

Multiband OCF Dipole Expected Performance



- For best results support center at 30+ feet and ends over 15 feet.
- 120 – 180 degrees total between each side preferred
- Keep antenna “in-the clear” (avoid nearby metal objects)



***Install Feed Point
at Optimum
Location &
Height***



***Orienting Wire
Legs for Best
Performance on
ALL Bands***



***Avoid any
Nearby Metal
Objects***

***Factors
impacting
antenna
performance***



**New
Antenna**

**OPTIMIZING ANTENNA PERFORMANCE
MAY TAKE TIME, PATIENCE, &
EXPERIMENTATION**



Antennas are still “magical”. They are fun to design, setup, and operate



**Most Time &
Effort**



I just want this damn thing to work!



**Least Time &
Effort**

... depending on their design ...

ANTENNAS GENERALLY PERFORM BEST AT RESONANCE

... hitting the sweet spot can be tricky with a multiband antenna ...

What Can Happen if SWR is TOO High

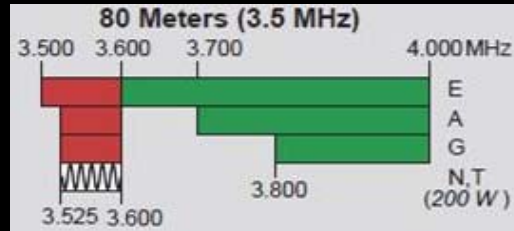


Transmitting too much power with a high SWR can overheat & destroy a balun



Antenna Setup

(Single Band)



- Go inside, transmit, measure and record SWR

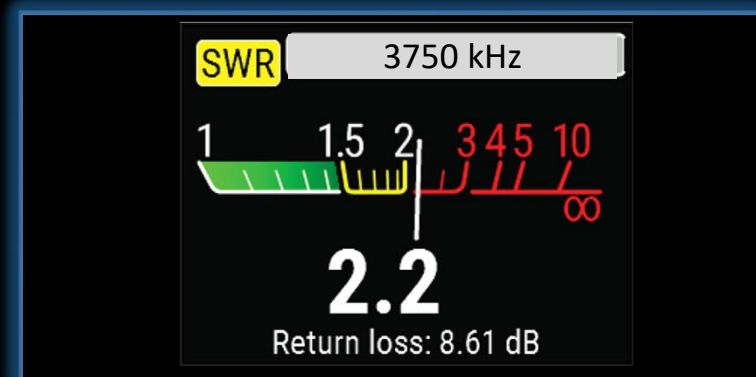


- Change Frequency & re-measure

- *If performance is not optimal:*

*Go outside, adjust antenna,
REPEAT*

- While outside perform SWR sweep
- Adjust antenna until desired performance achieved



Continuously Updated

Antenna Setup

(Multiband Band)

An Antenna Analyzer Can Make
Life **MUCH** easier



MultiSWR

3900 kHz	2.7 (4.1 Initially)
7237 kHz	2.2
14262 kHz	2.7
21362 kHz	2.3
29000 kHz	1.79

..... Where I Ended Up

Tower/Guy Proximity Required **MANY** Adjustments

Compromise Solution – Within Range of Auto-Tuner

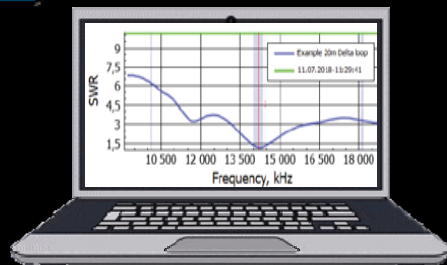
What About the SWR?

The AA-650 Zoom Antenna Analyzer



SPECIFICATIONS

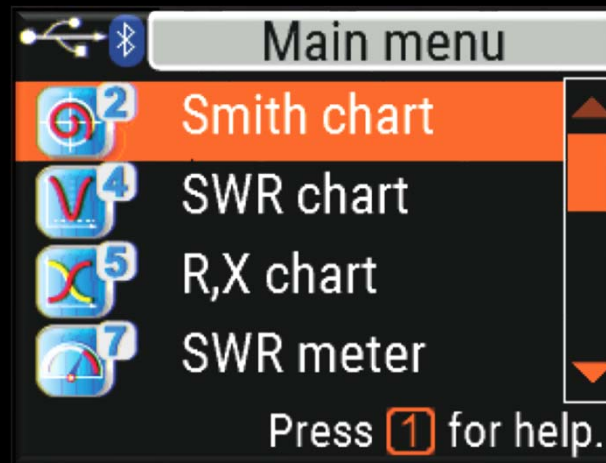
- Frequency range: 0.1 to 650 MHz
- Frequency entry: 1 kHz resolution
- Includes SWR Meter, Multi-SWR, SWR Chart, Smith Chart, R/X Chart
- 100 Memories
- Display ZOOM capability






\$719.95


Was On Sale for \$599.95

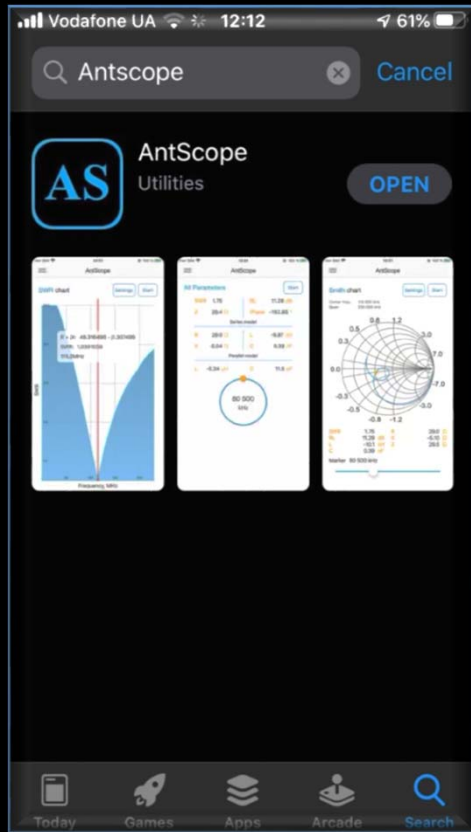
The AA-650 Zoom Antenna Analyzer



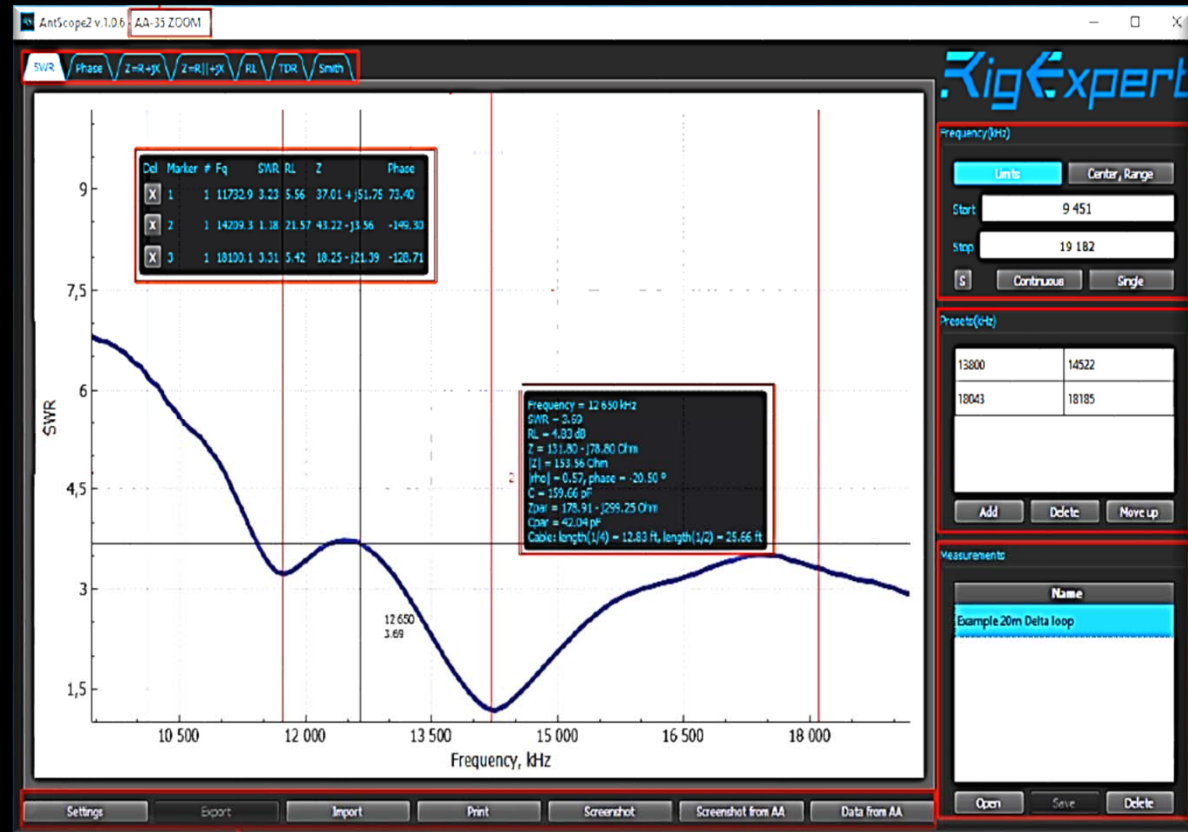
The Main menu acts as a starting point from where different tasks may be launched.

Use  (Cursor up) and  (Cursor down) keys to scroll through the menu, then press  (OK) to select an item. For your convenience, a battery indicator is shown at the top-left corner of the screen. This indicator is replaced with a USB icon when the analyzer is connected to your computer.

You may use hot keys for the quick access to certain tasks. For instance, press the  (SWR chart) button to open the SWR chart screen immediately.



Mobile App
(iOS or Android)



Computer App
(Windows, Max, Ubuntu)

Other Popular Analyzers



RigExpert AA-35
Zoom

60 kHz to 35 MHz

\$268.95

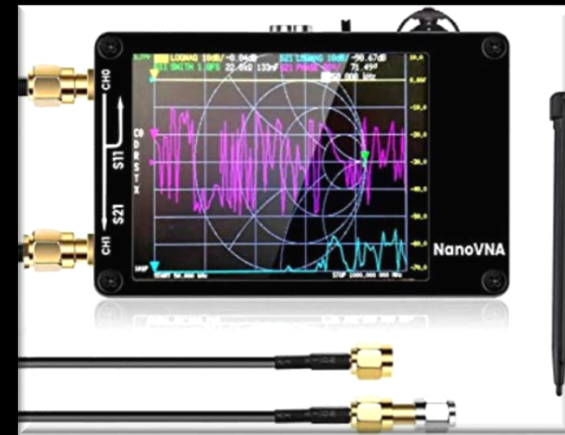
On Sale for \$218.95



MFJ 259-D

280 kHz to 230 MHz

\$289.95



NanoVNA

Very tiny Network Analyzer

10 kHz to 1.5 GHz

\$59.95



THANK YOU