Upper Pinellas Amateur Radio Club

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ARRL Registered Instructor
ARRL Technical Specialist

- Introduction to NanoVNA – Vector Network Analyzer
- Simple Antenna Analyzer Use
  - Device orientation
  - Charging
  - Connections
  - Connectors
  - Traces
  - Limits
  - Calibration
  - SWR vs. Frequency measurement
  - Scale adjustment

- Device orientation

Charging

- USB-C 5 volt Charging
- Blue LED flashes

- Connections

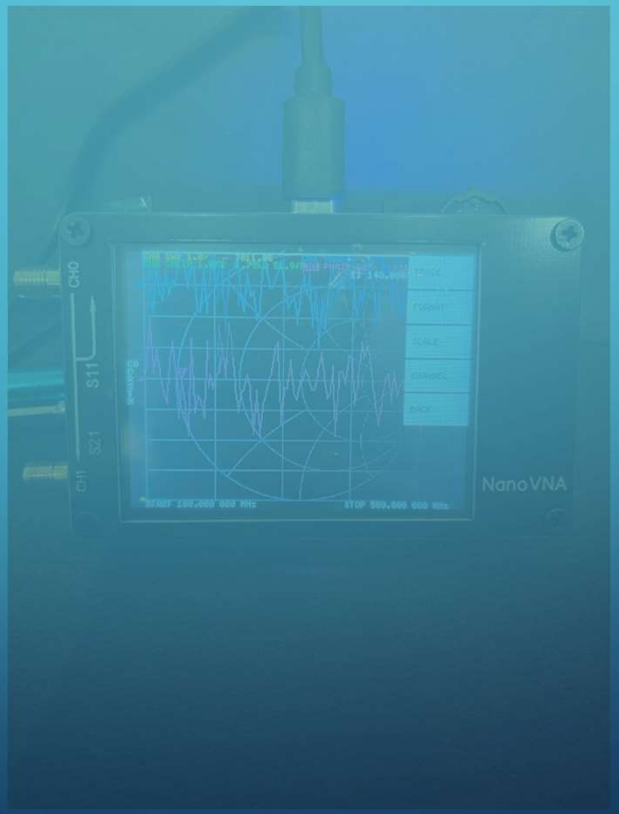
CH1:
No connection

- Connectors
  - Open, Short and Load

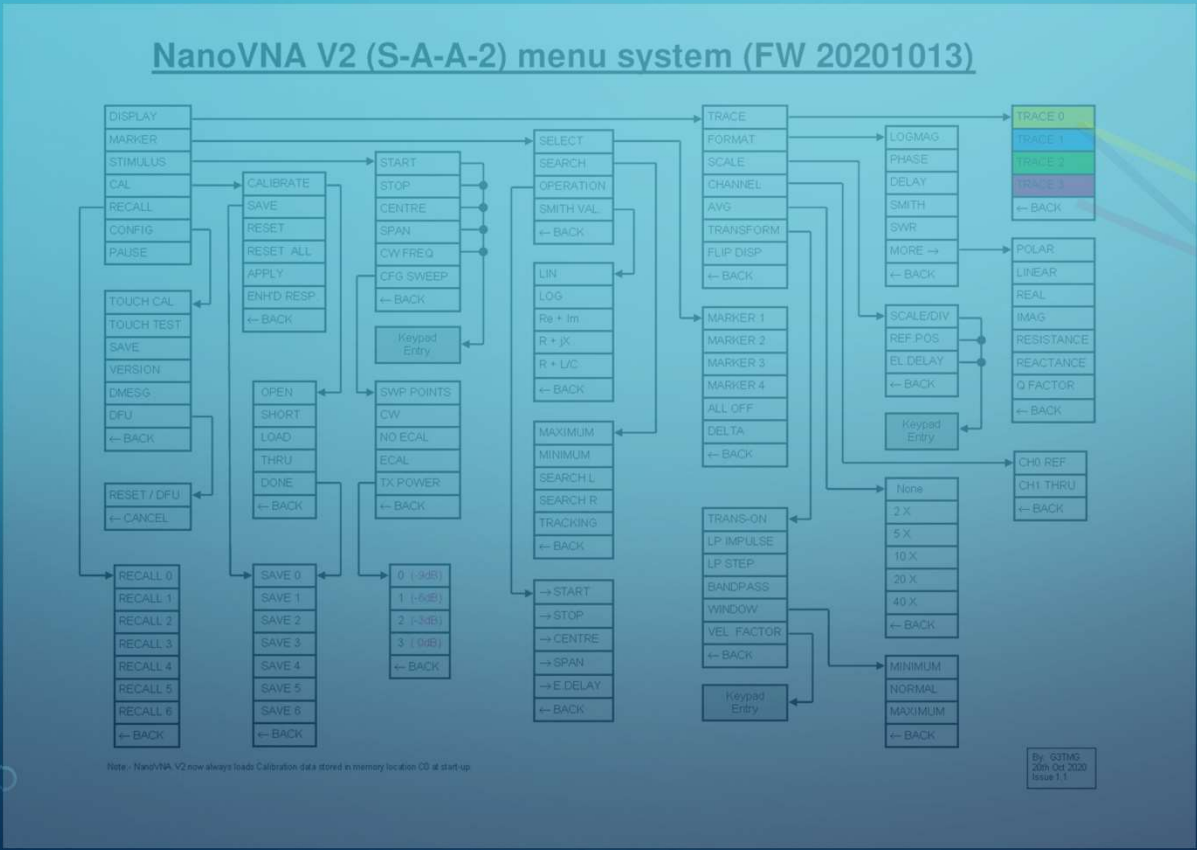
Traces

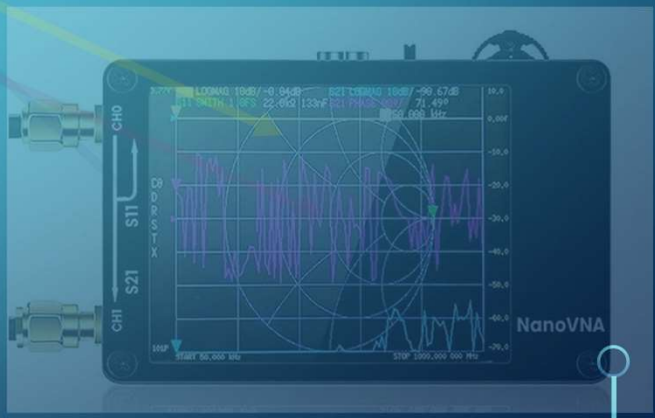
Very scary looking screen!

- Menu System
- Touch Screen

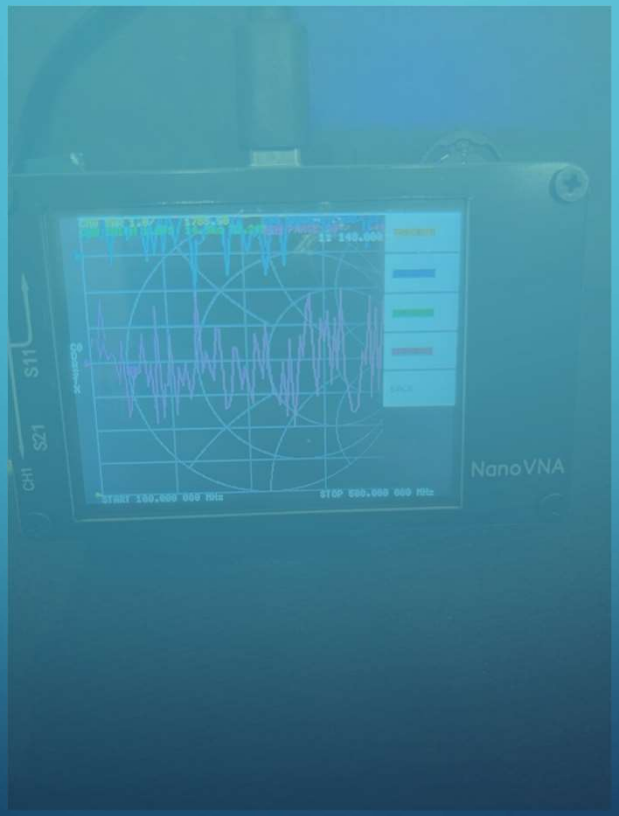


- Menu System


NanoVNA V2 (S-A-A-2) menu system (FW 20201013)
DISPLAY
MARKER
STIMULUS
CAL
RECALL
CONFIG
PAUSE
TOUCH CAL
TOUCH TEST
SAVE
VERSION
DMESG
DFU
← BACK
RESET / DFU
← CANCEL
CALIBRATE
SAVE
RESET
RESET ALL
APPLY
ENHD RESP
← BACK
OPEN
SHORT
LOAD
THRU
DONE
← BACK
START
STOP
CENTRE
SPAN
CW FREQ
CFG SWEEP
← BACK
Keypad Entry
SWP POINTS
CW
NO ECAL
ECAL
TX POWER
← BACK
SELECT
SEARCH
OPERATION
SMITH VAL
← BACK
LIN
LOG
Re + Im
R + jX
R + L/C
← BACK
MAXIMUM
MINIMUM
SEARCH L
SEARCH R
TRACKING
← BACK
→START
→STOP
→CENTRE
→SPAN
→E.DELAY
← BACK
TRACE
FORMAT
SCALE
CHANNEL
AVG
TRANSFORM
FLIP DISP
← BACK
MARKER 1
MARKER 2
MARKER 3
MARKER 4
ALL OFF
DELTA
← BACK
TRANS-ON
LP IMPULSE
LP STEP
BANDPASS
WINDOW
VEL. FACTOR
← BACK
Keypad Entry
LOGMAG
PHASE
DELAY
SMITH
SWR
MORE →
← BACK
SCALE/DIV
REF.POS
EL.DELAY
← BACK
Keypad Entry
None
2 X
5 X
10 X
20 X
40 X
← BACK
MINIMUM
NORMAL
MAXIMUM
← BACK
TRACE 0
TRACE 1
TRACE 2
TRACE 3
← BACK
POLAR
LINEAR
REAL
IMAG
RESISTANCE
REACTANCE
Q FACTOR
← BACK
CH0 REF
CH1 THRU
← BACK
RECALL 0
RECALL 1
RECALL 2
RECALL 3
RECALL 4
RECALL 5
RECALL 6
← BACK
SAVE 0
SAVE 1
SAVE 2
SAVE 3
SAVE 4
SAVE 5
SAVE 6
← BACK
0 (-9dB)
1 (-6dB)
2 (-3dB)
3 (0dB)
← BACK
Note:- NanoVNA V2 now always loads Calibration data stored in memory location C0 at start-up
By: G3TMG
20th Oct 2020
Issue 1.1

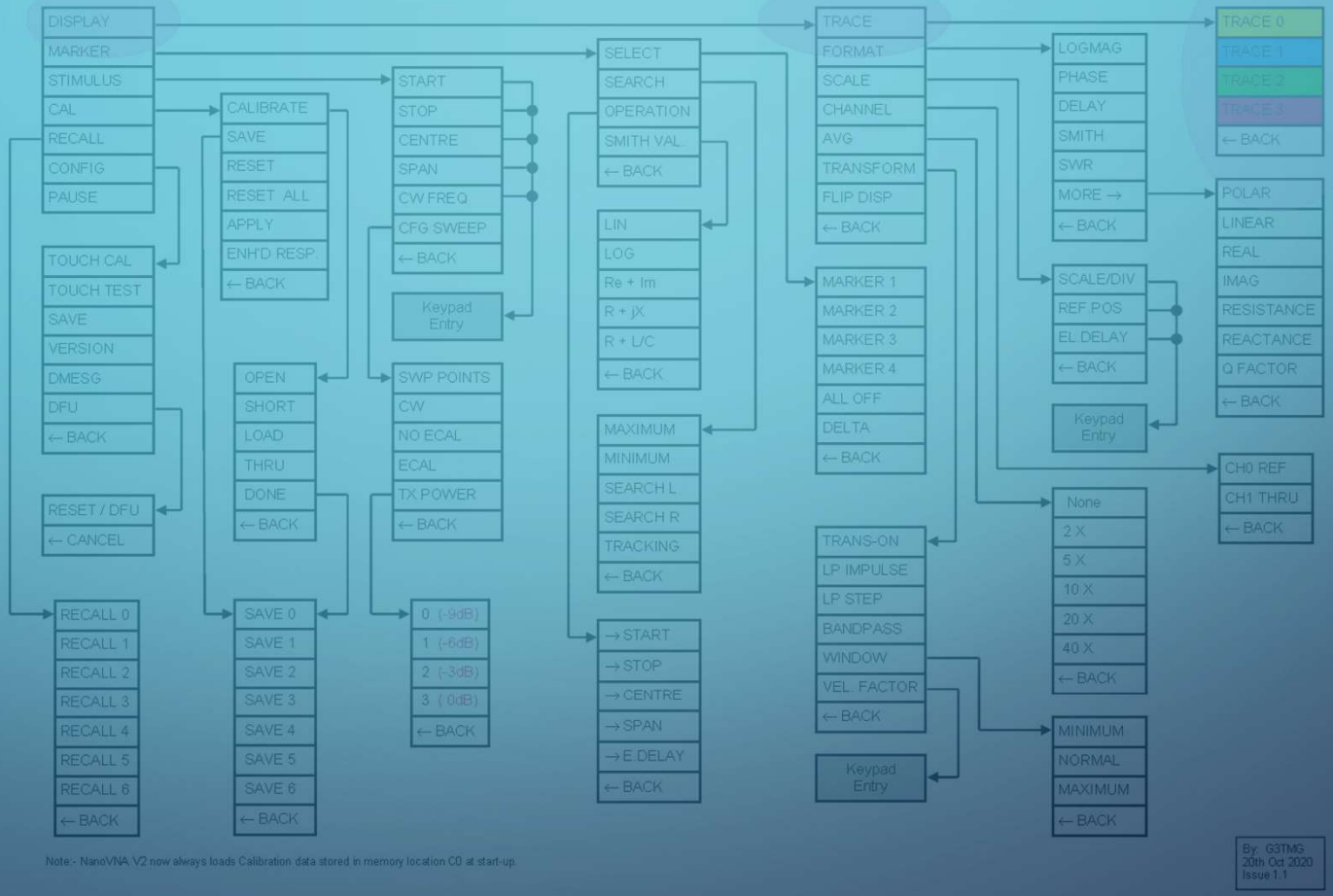

CH0
CH1
S11
S21
NanoVNA

Too many traces!
Turn them off!



Display →
Trace →
Tap on Trace
Tap on Off
Leave only Trace0

NanoVNA V2 (S-A-A-2) menu system (FW 20201013)



Single Trace

The trace is at the top of the display

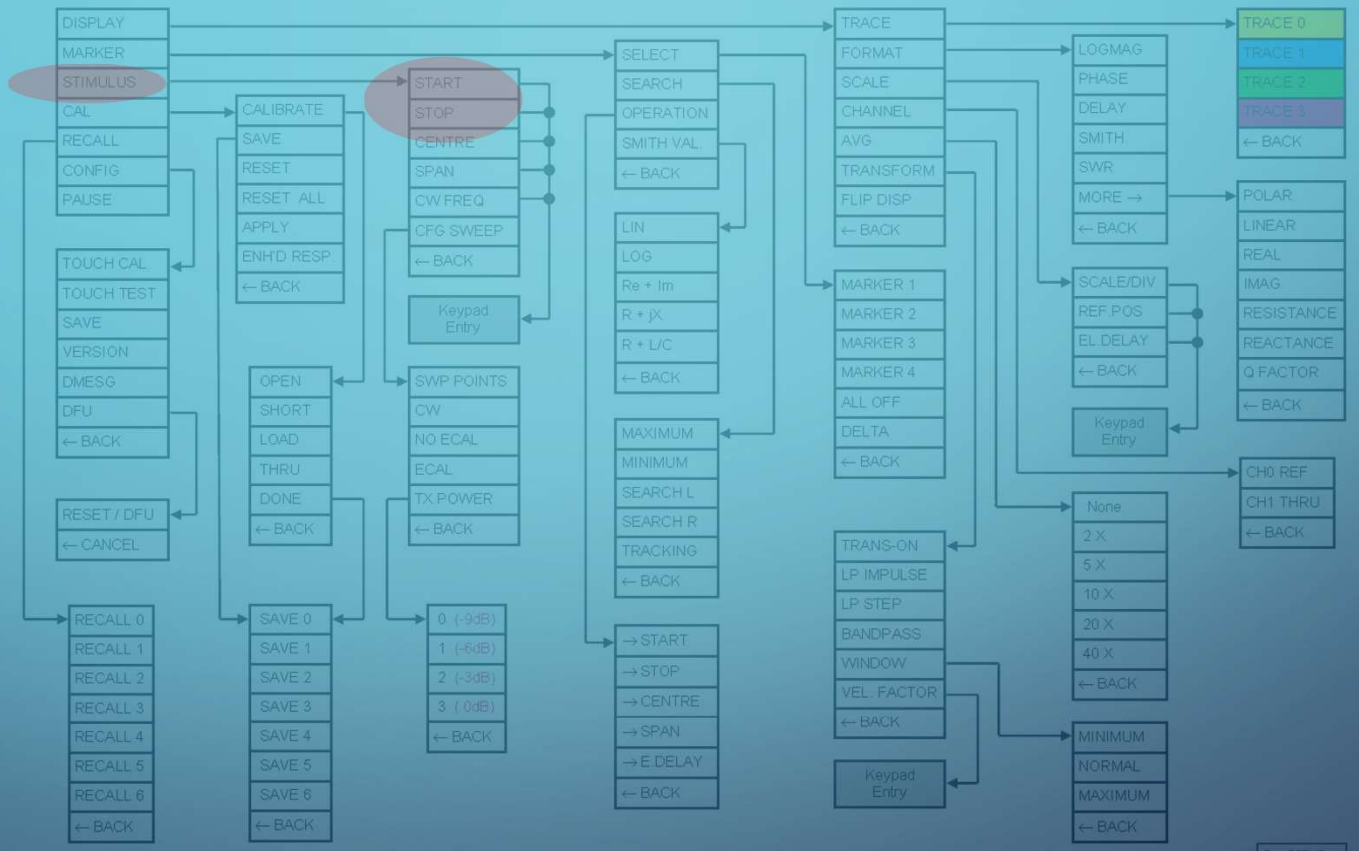
Why?

Frequency Limits
Range is 50kHz-1.5GHz

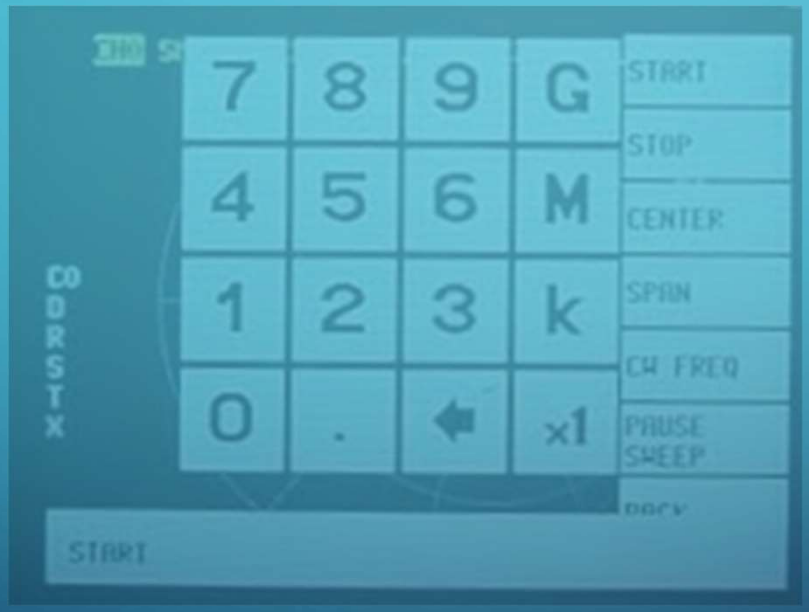
Way too wide for our use!

A reasonable range is 100MHz to 500MHz to start.

NanoVNA V2 (S-A-A-2) menu system (FW 20201013)



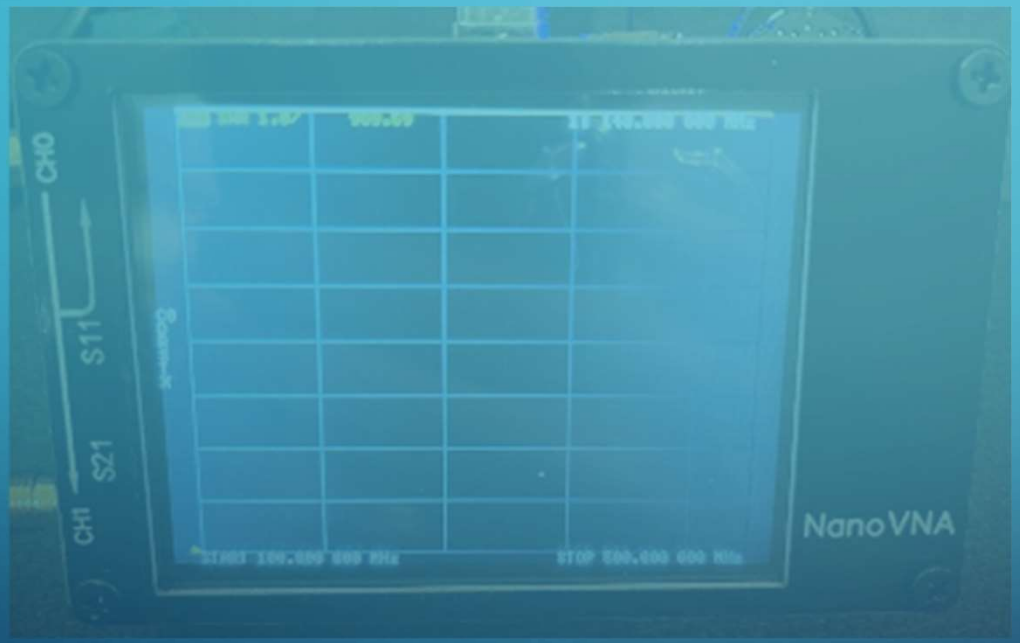
Range Entry



Tap:
Start
1-0-0-M

Tap:
Stop
5-0-0-M

Range Entry

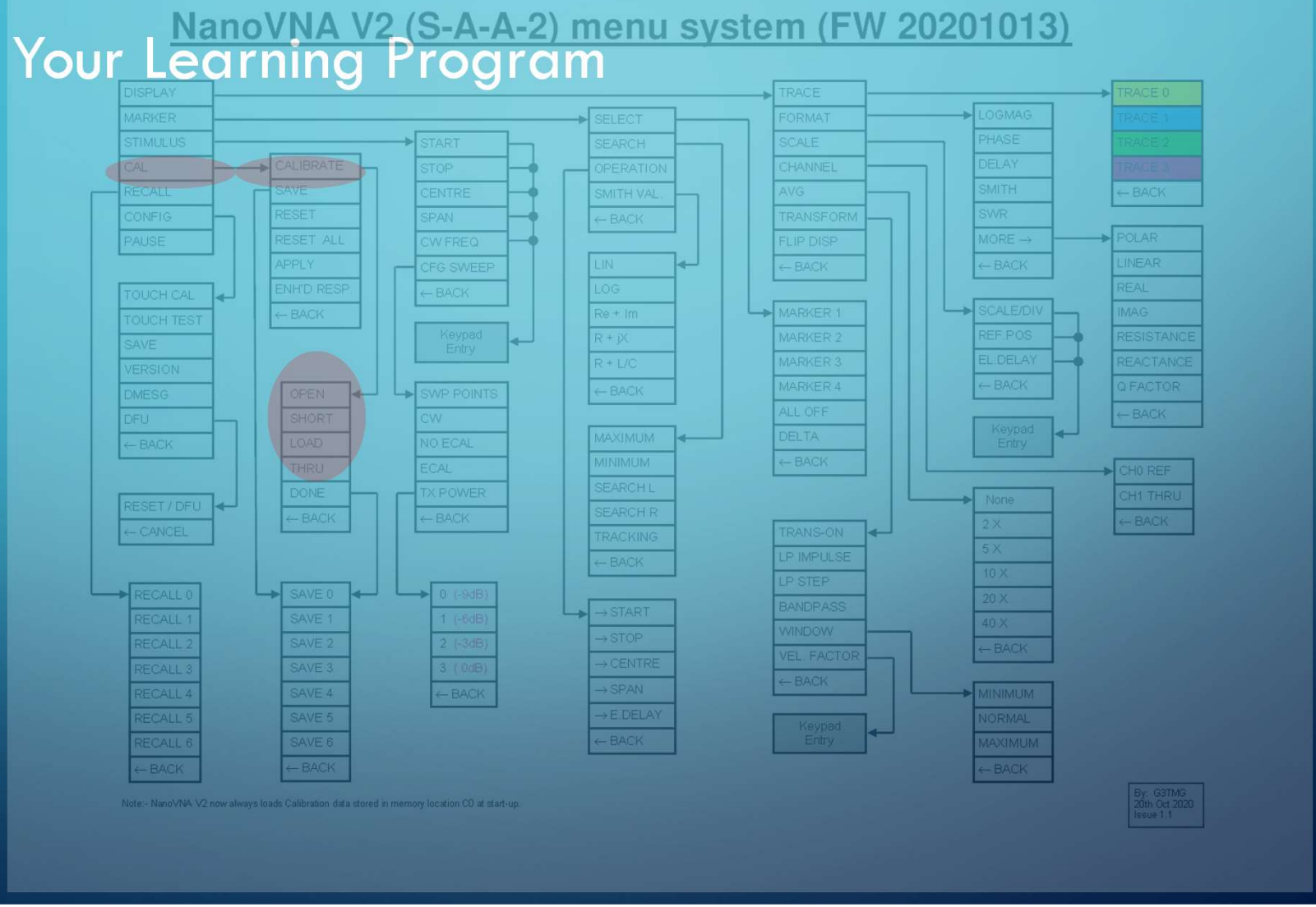


Range now indicated at bottom of display

Calibration: Really easy!

- Remember these guys?

Your Learning Program



- Calibration:
- 1. Connect Open to CH0
- 2. Tap CAL → Calibrate → Open
- 3. Remove Open and connect Short
- 4. Tap CAL → Calibrate → Short
- 5. Remove Short and connect Load
- 6. Tap CAL → Calibrate → Short

Calibration Menu

Analyze!

- We are interested in analyzing antennas
- X-Axis is Frequency
- Y-Axis is SWR

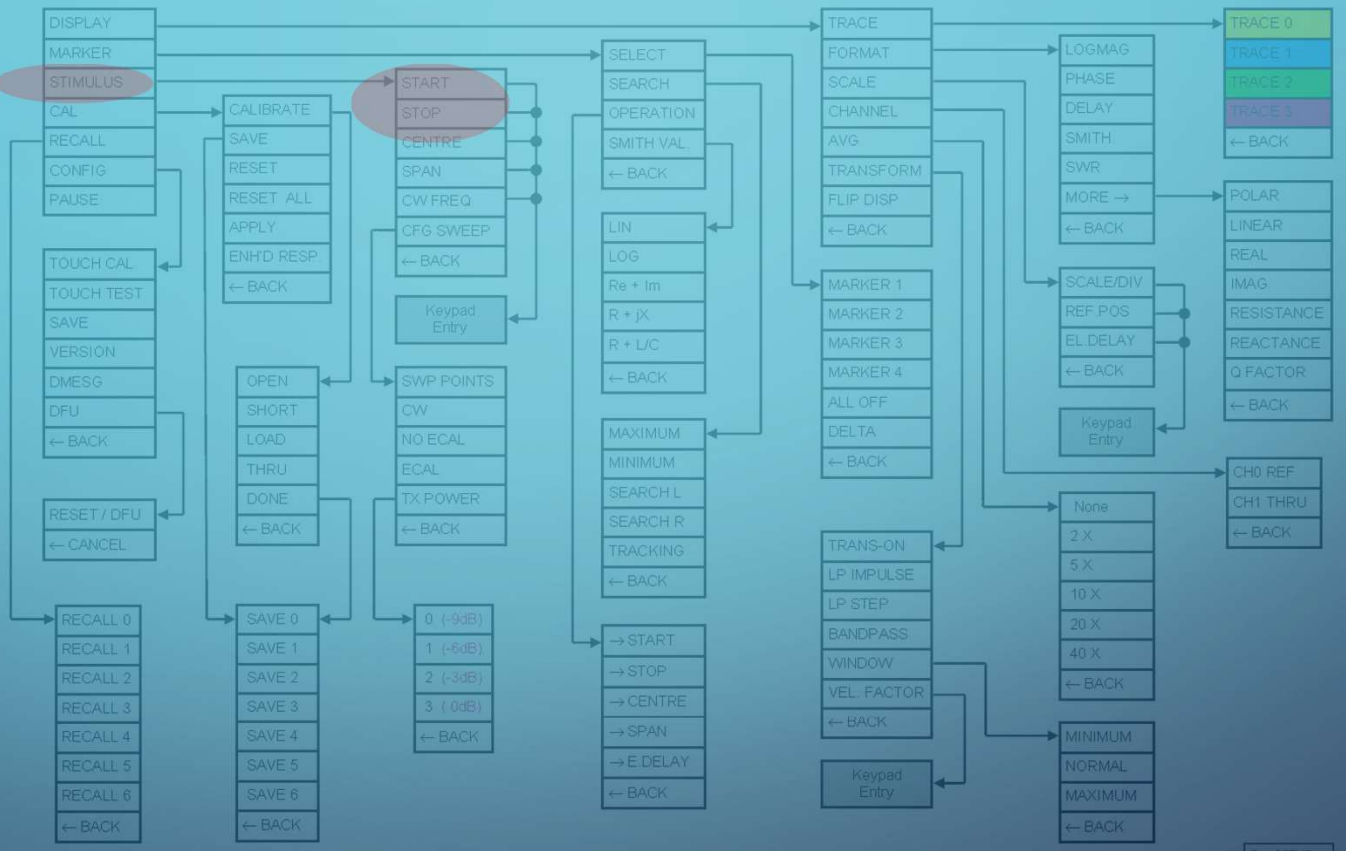
Connect Antenna Adapter necessary

Adjust Range

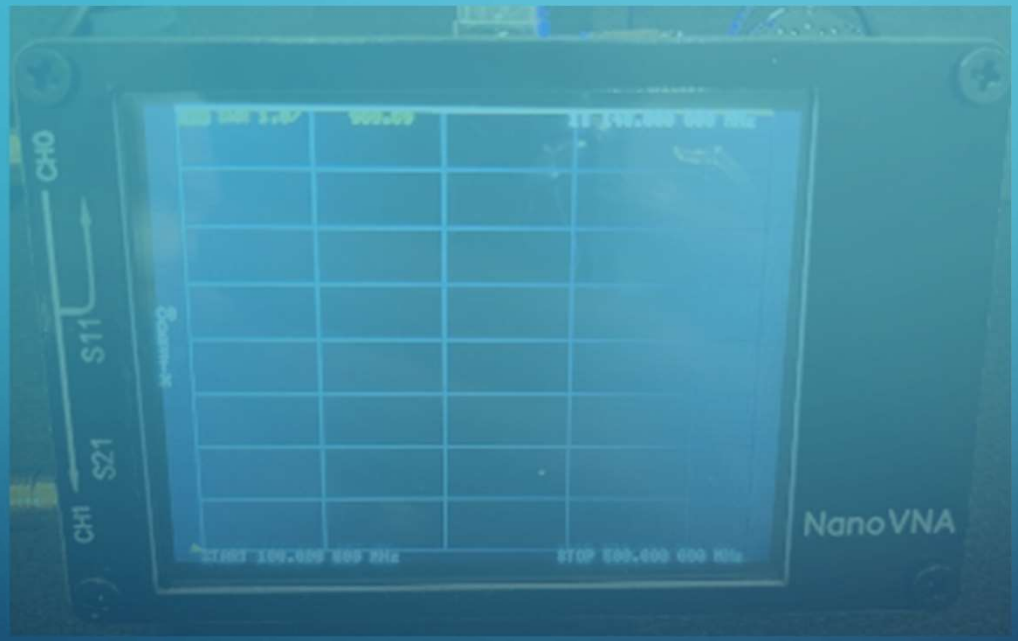
For example, for 2 meter band:

1. Stimulus → Start → 1-4-4-M
2. Stimulus → Stop → 1-4-8-M

NanoVNA V2 (S-A-A-2) menu system (FW 20201013)

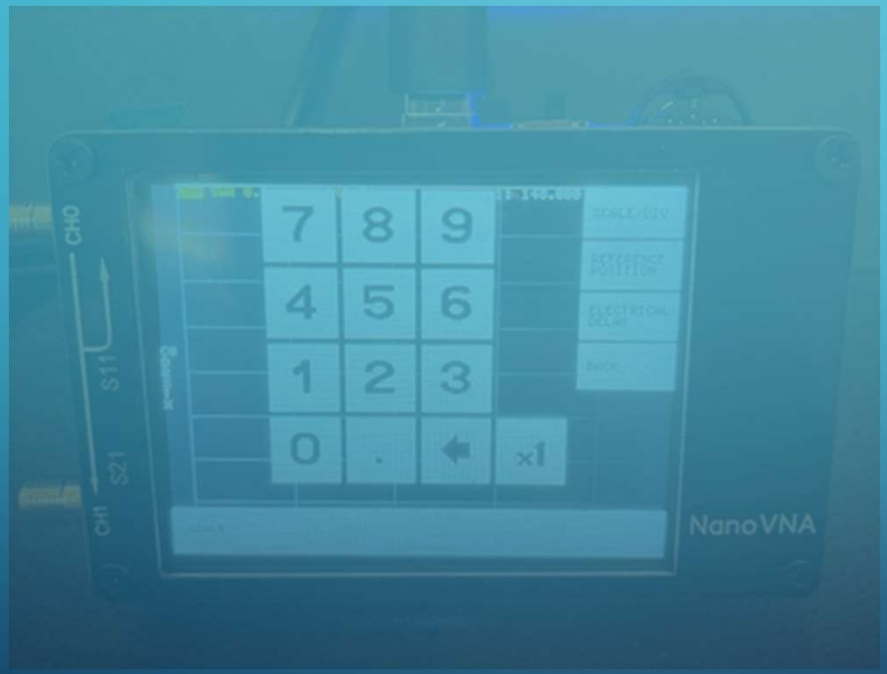


Scale



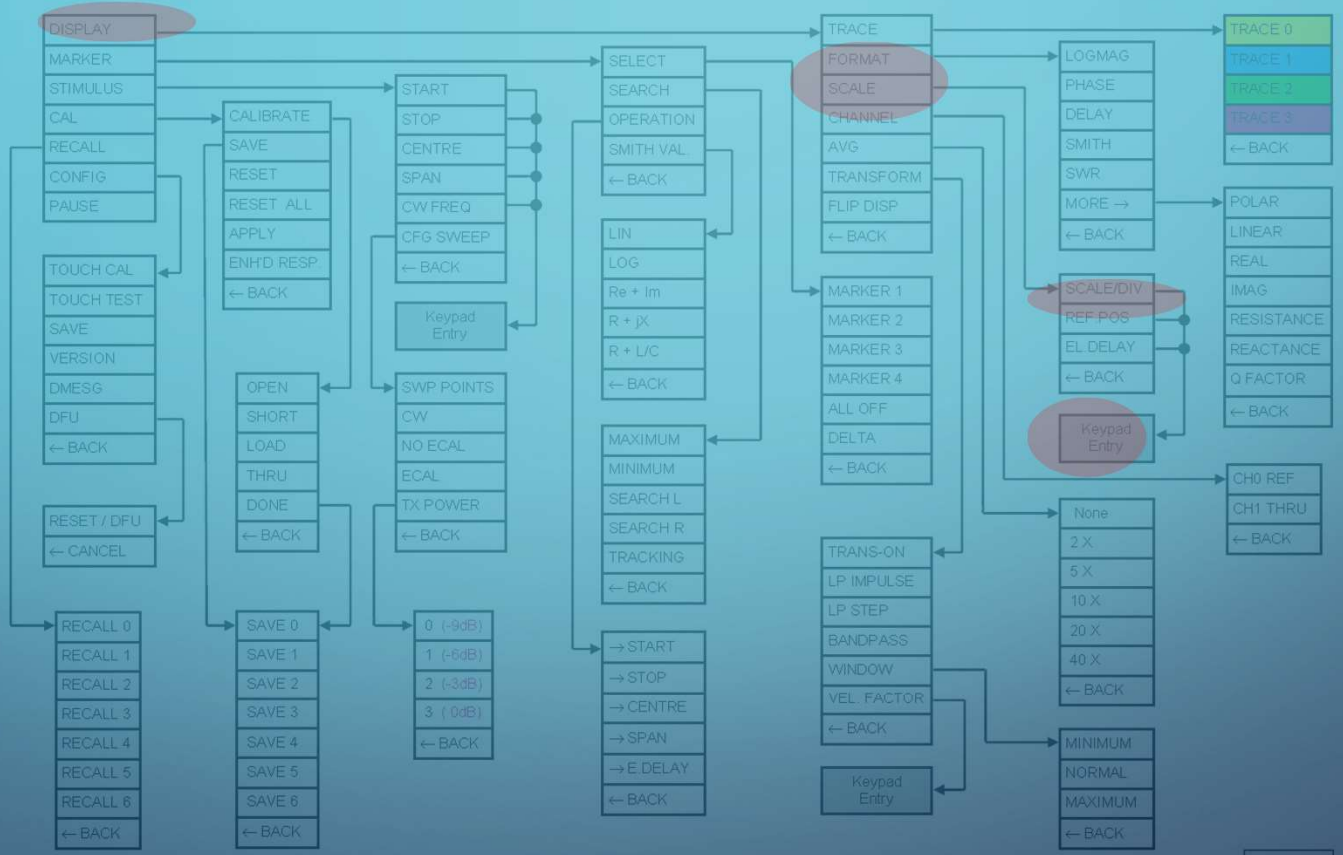
Set Y-Axis to .25
For practical measurement

- Scale

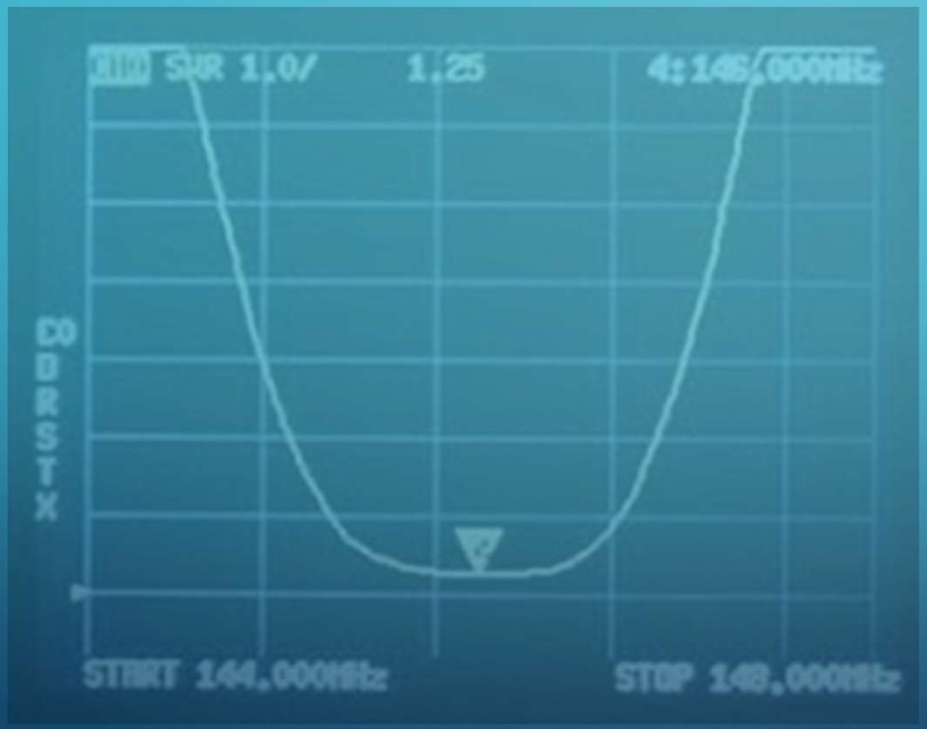


Set Y-Axis to .25:
Display → Scale
→ Scale/Div
Tap
. - 2 – 5 - x1

NanoVNA V2 (S-A-A-2) menu system (FW 20201013)



2 Meter SWR vs. Frequency



Moving the indicator

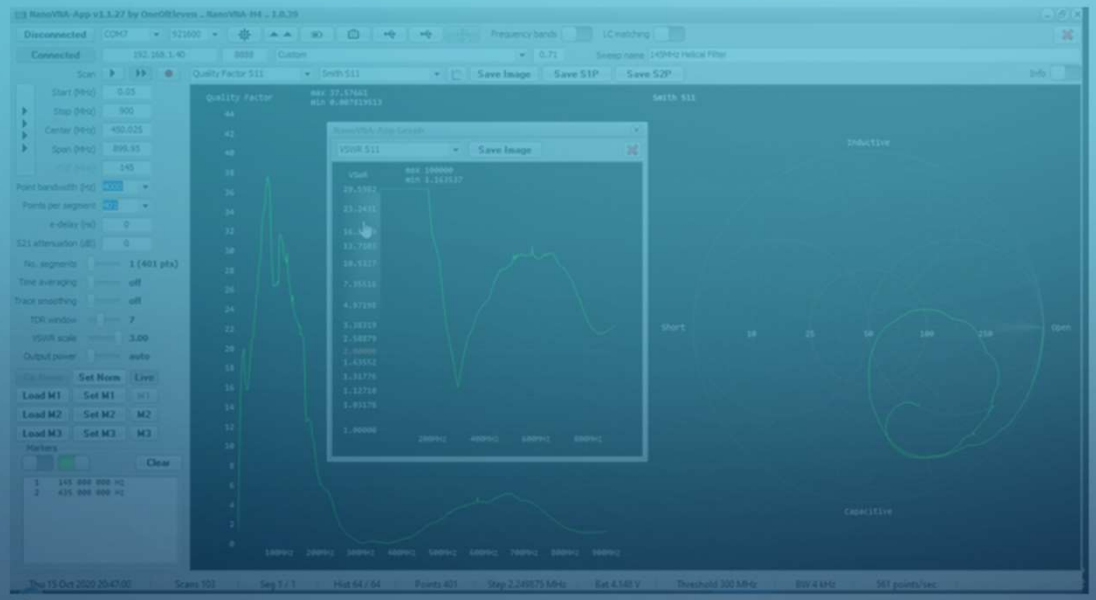
- OR -

NanoVNA Application

NanoVNA-App

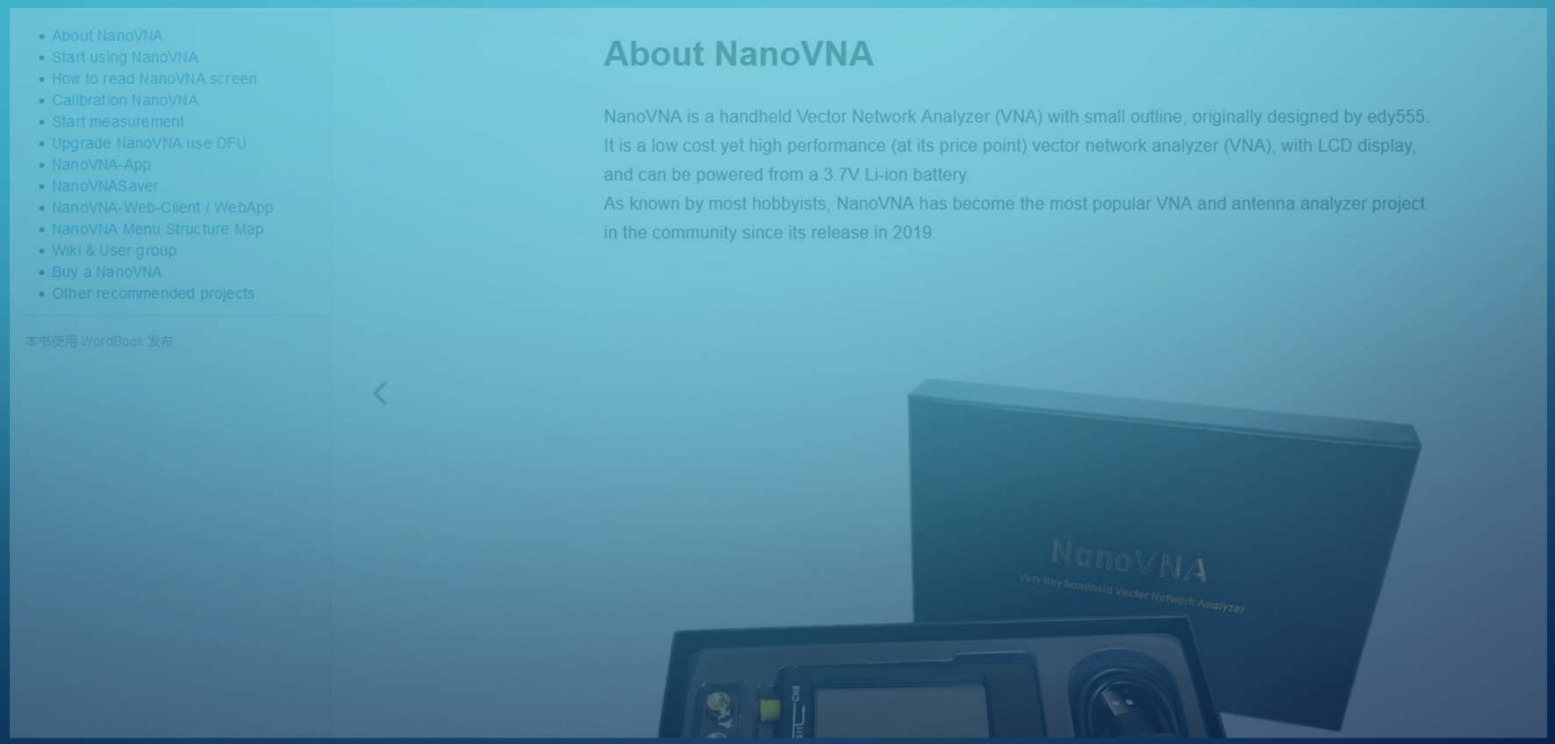
NanoVNA-App is the very powerful windows software developed by OneOfEleven for NanoVNA and LibreVNA.

You can download the pre-compiled software here.

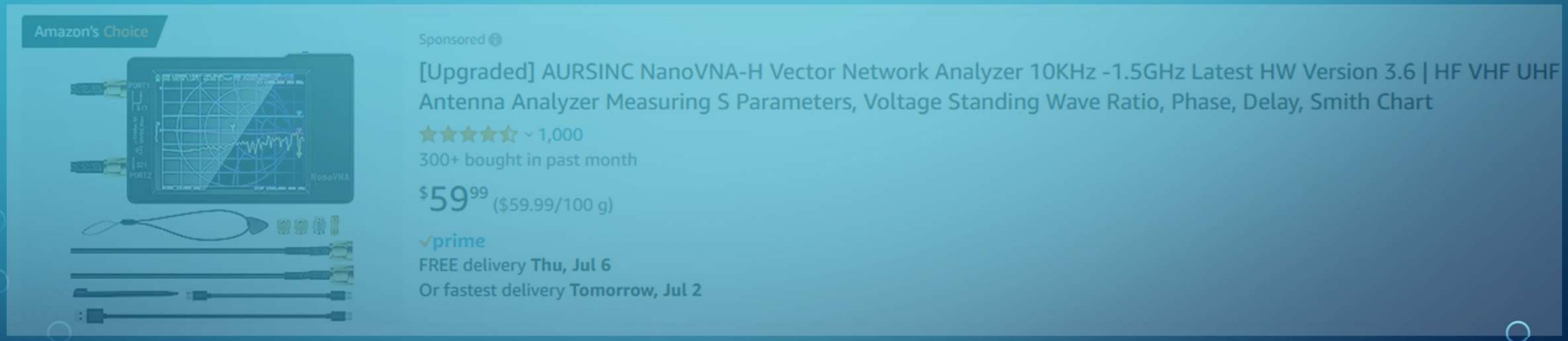


If you wish to participate in the development, you can access the source code here.

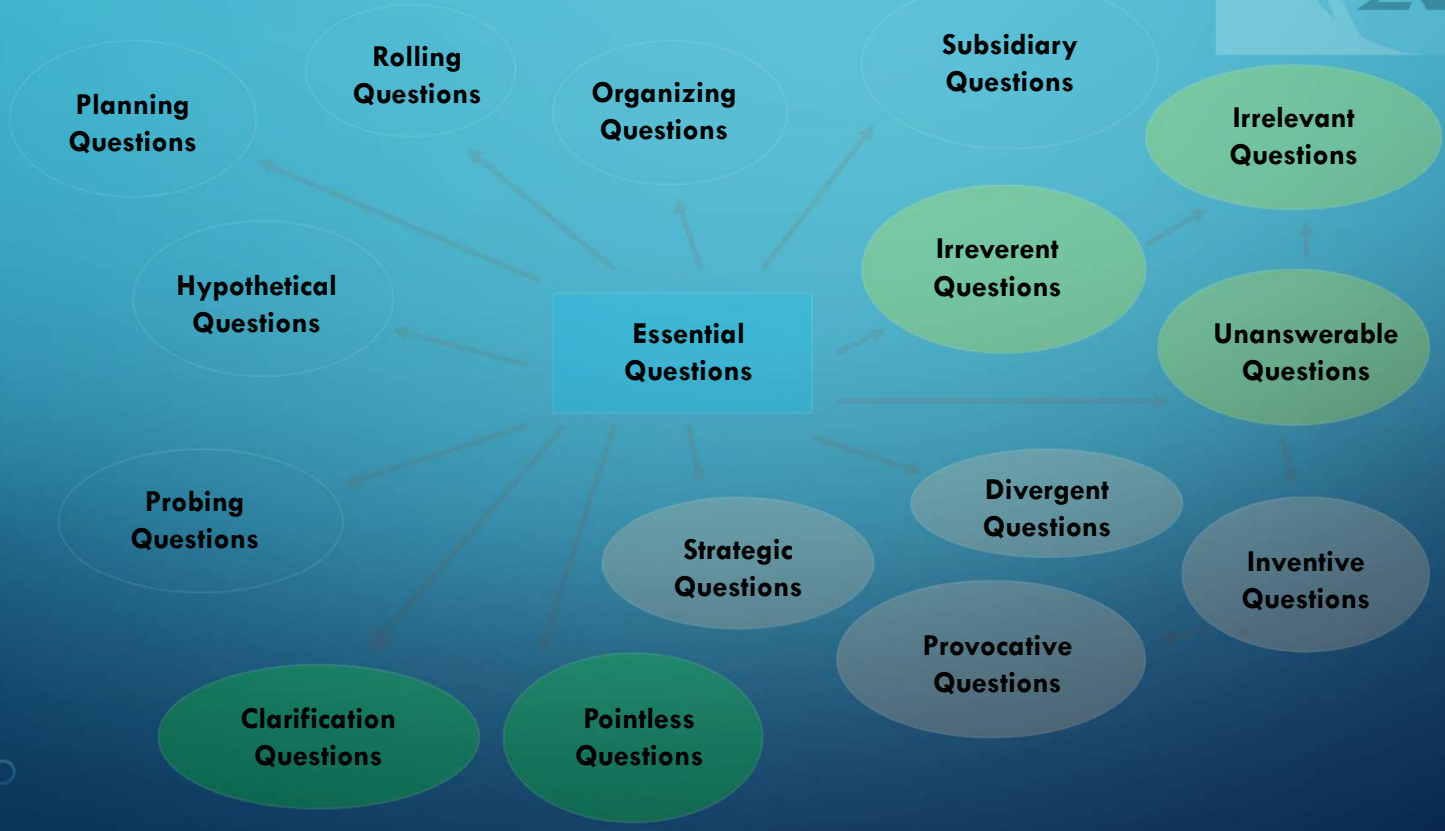
Website: nanovna.com



Purchase:


Amazon's Choice
Sponsored
[Upgraded] AURSINC NanoVNA-H Vector Network Analyzer 10KHz -1.5GHz Latest HW Version 3.6 | HF VHF UHF Antenna Analyzer Measuring S Parameters, Voltage Standing Wave Ratio, Phase, Delay, Smith Chart
1,000
300+ bought in past month
$59.99 ($59.99/100 g)
prime
FREE delivery Thu, Jul 6
Or fastest delivery Tomorrow, Jul 2

Questions?


Planning Questions
Rolling Questions
Organizing Questions
Subsidiary Questions
Irrelevant Questions
Hypothetical Questions
Irreverent Questions
Essential Questions
Unanswerable Questions
Probing Questions
Strategic Questions
Divergent Questions
Inventive Questions
Provocative Questions
Clarification Questions
Pointless Questions

73 de N4FOY Steve!

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