# W2AEW Videos (Mar 8, 2025)

**Topics Listed Numerically** (all videos from 137 on are with HD camera)


#1: QRP Check-in to NorCars net from RVRC Hamfest June 19, 2010
#2: Tektronix delayed timebase operation
#3: TenTec 1254 Receiver Signal Path walkthrough
#4: Oscilloscope view of TenTec 1254 IF and detected output on Shortwave signal
#5: My ESR Meter project from 2006
#6: Infrequent Glitch capture on an Oscilloscope
#7: Monitor your Ham Radio transmitter with an oscilloscope
#8: Two-tone test of SSB transmitter output
#9: Basic 1X and 10X Oscilloscope Probe tutorial
#10: AC / DC Coupling on an Oscilloscope
#11: Tektronix Oscilloscope Triggering controls and their usage
#12: Use Real-Time Spectrum Analysis to Characterize a transmitter key-up
#13: D-104 Microphone amplifier / Equalizer for Ham Radio
#14: Tektronix MDO4000 Spectrum Analyzer quick comparison to entry level analyzer
#15: Ham radio Band-scope pan-adapter using Tek MDO4000 as a spectrum analyzer
#16: How to use the Oscilloscope to accurate capture 2 signals of different frequencies
#17: Using Analog scope to view two signals of wildly different frequencies
#18: Use Oscilloscope with delayed time base to measure a RF Power detector
#19: How to get a stable scope display with two signals very close in frequency
#20: Quick 5 minute Tektronix Mixed Domain Oscilloscope MDO4000 Demo
#21: Using MDO4000 to capture 802.11 traffic and export for analysis using RSAVu
#22: Spectrum Analyzer Basics / Tutorial, and the Tektronix 1401A
#23: Tektronix 1401A Spectrum Analyzer quick demo
#24: Transient EMI Debug using Tektronix MDO4000 Mixed Domain Oscilloscope
#25: Analog Oscilloscope bandwidth considerations
#26: Answering viewer questions, and Digital Oscilloscope Considerations
#27: Board level EMI Debug with a Real Time Spectrum Analyzer
#28: My QRP "go kit" backpack with IC-703+ ham radio
#29: Adding a S-meter to TenTec 1254 Shortwave Receiver
#30: Part II: Finishing the S-Meter on the Ten Tec 1254 Shortwave Receiver
#31: Analog oscilloscope ALT, CHOP, ADD, INVERT vertical controls
#32: Quick test of completed DDS-60 from AMQRP/NJQRP
#33: Oscilloscope AUTO Triggering explained
#34: Installation of upgraded microcontroller in the TenTec 1254 Receiver
#35: Using the ADD/INVERT mode on an analog scope to view differential voltages
#36: Function Generator issues appearing as a triggering problem
#37: Use a scope to measure the length and impedance of coax
#38: Analyze Hot Wheel Radar gun with a Real Time Spectrum Analyzer
#39: Function Generator debug and repair - Leader LG-1311
#40: Analog Oscillocope's rear panel auxiliary inputs and outputs
#41: Use Oscilloscope Z-axis input to create "marker" on waveform
#42: Composite Video on an Analog Oscilloscope using XYZ - Lab tour...
#43: Analog Oscilloscope Basics: Making a Frequency Measurement
#44: Frequency measurement using Delaying Timebase on Analog Oscilloscope
#45: Sweep Generator Basics and Receiver Alignment
#46: Basics of amplitude and distortion measurements on a scope and spectrum analyzer
#47: Basics of Zero-Span operation of a Spectrum Analyzer
#48: Basics of Lissajous Patterns on an Oscilloscope
#49: Simple Component Tester using Oscilloscope - Octopus Curve Tracer
#50: QRP SSB contact on 40m from Hamfest of RVRC, June 2012
#51: Basic Spectrum Analyzer Do's and Dont's...
#52: Tutorial / Basics of a Dip Meter
#53: Real Time Spectrum Analysis of low frequency/audio signals
#54: Back to Basics Tutorial: Voltage / Current in capacitors and inductors
#55: Back to Basics: Tutorial on LC Resonant Circuits
#56: Basics of Capacitor & Inductor self-resonance, parasitics, etc. – Tutorial
#57: Setting up variable double-pulse using Tek AFG
#58: How to zero-beat WWV to check or adjust a Frequency Counter's accuracy

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#59: Basics of a Square Wave signal's harmonic content
#60: Basics of Phase Locked Loop Circuits and Frequency Synthesis
#61: Basics of RF Samplers, Sampling-Tees, RF-taps, etc.
#62: Basics of Tracking Generators and 1/4 wavelength coaxial stub filters
#63: JOTA: Jamboree on the Air at OMARC/InfoAge October 2012
#64: How to measure speed with a counter/timer
#65: Basics of using FFT on an oscilloscope
#66: How to make a rise-time measurement on an oscilloscope
#67: Basics of Common Emitter Amplifier Gain and Frequency Response with Measurements
#68: Oscilloscope Probe Ground lead length affects on signal quality
#69: Basics of Analog Oscilloscope Bandwidth
#70: Digital Oscilloscope Bandwidth Measurement - direct and using risetime
#71: Proper PSK31 Audio Level setup with a scope, RF power meter, and ALC indicator
#72: Simple Station Monitor for Ham Radio using an Oscilloscope
#73: 70's Vintage Function / Sweep Generator review / teardown
#74: Basics of Differential Probes for Oscilloscopes and their applications: a tutorial
#75: Basics of Opamp circuits - a tutorial on how to understand most Opamp circuits
#76: Debug Transient EMI signal with a Mixed Domain Oscilloscope MDO4000 Tektronix
#77: Op Amp Peak Detector Tutorial, with peak detector basics
#78: Use an Arduino to draw pictures on an oscilloscope using XY mode
#79: Op Amp Power Supply Considerations: split, single, virtual ground, etc. - a tutorial
#80: MFJ Cub 40m QRP CW Transceiver circuit walk-thru and review, plus bandsweep, ham radio MFJ-9340
#81:Heathkit HW-9 QRP CW Transceiver Circuit Walk-Through - Ham Amateur Radio Schematic
#82: How to use a Diode as a Switch / Diodes as Switches / Basics of Diode Switches
#83: Basics of RF Mixers in Radio Receivers / Mixer Tutorial / Frequency Conversion
#84: Basics of Ferrite Beads: Filters, EMI Suppression, Parasitic oscillation suppression / Tutorial
#85: Basics of R2R Resistor Networks Digital Analog Conversion, Tutorial DAC Thevenin Superposition
#86: Improved NTSC video to Oscilloscope converter circuit / scope video monitor hack
#87: Schmitt Trigger Oscillator / Tutorial / 74AC14 Inverter / squarewave generator
#88: Cheap and simple TDR using an oscilloscope and 74AC14 Schmitt Trigger Inverter
#89: Video Tour of my Lab and Workbench - Oscilloscopes and meters and power supplies, oh my!
#90: Measure Capacitors and Inductors with an Oscilloscope and some basic parts
#91: Basic RF Attenuators - Design, Construction, Testing - PI and T style - A Tutorial
#92: Cool Product: The Moteino - an Arduino clone + RFM12B wireless interface - low cost
#93: RS232 and SPI bus waveforms, bus decodes and RF activity on the Moteino using Tek MDO4000
#94: RMS Voltage for Sine and square waves, and why your DMM might not work right!
#95: W2AEW Channel Trailer video
#96: Tutorial on Digital Oscilloscope sample rate, record length and data processing
#97: Low Power (QRP) Ham Radio contact at the 2013 RVRC Hamfest in NJ
#98: Surface mount IC soldering demonstration with SO-8 packaged device
#99: Drag Soldering of an SSOP IC Package demonstration
#100: Capacitor self-resonance measured with an oscilloscope and signal generator - how to tutorial
#101: How to measure FM Frequency Deviation without special equipment using Carrier / Bessel Null
#102: How to desolder or unsolder components using solder wick and vacuum tools
#103: Ham Radio on vacation - Long Beach Island with Icom IC-703+ NJ (NA-111), 10mo after Sandy
#104: Circuit tutorial: sawtooth generator w/ current sources, diode switches, hysteresis comparator
#105: More Circuit Fun: Simple 3 transistor sawtooth generator / oscillator
#106: Measuring low-pass filters in a Ham Radio HF Packer Amp for Amateur HF Bands
#107: Adjusting the MOSFET drain current in the HF Packer V4 Amplifier (ham radio)
#108: Adding a CW-SSB Mode switch to the HF Packer V4 Amplifier (ham radio)
#109: How to: Fluke 87 Multimeter fuse replacement, DMM True RMS
#110: Circuit Fun: Flexible Ramp Generator to create frequency sweeps using 555 timer and op amps
#111: How to make a high performance oscilloscope probe socket
#112: Use an Oscilloscope and Signal Generator help tune an HF Antenna, measure complex impedance
#113: Basics of Transistor bias point and the class of amplifier operation
#114: Tutorial: Common Emitter, Common Collector, and Common Base Transistor amplifiers
#115: How to replace the meter movement in a Simpson 260 multimeter VOM
#116: Repair Log, Part 1: Yaesu FT-7800 Dual Band FM Transceiver, no VHF output
#117: Repair Log, Part 2: Yaesu FT-7800 Dual Band FM Transceiver, fixed 2m tx problem
#118: Basics of PIN diodes and their use in RF switch applications

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#119: Basics of Resolution Bandwidth and Video Bandwidth in a Spectrum Analyzer (RBW VBW)
#120: How to Install Anderson Powerpole connectors
#121: Basics of SCRs and some circuit fun - device and circuit tutorial
#122: Electronic Circuit Construction Techniques: review of some prototype circuit building methods
#123: Build a crystal oscillator from schematic thru prototype construction and testing – DIY
#124: How to install an RJ45 connector on a CAT5 Ethernet network Patch Cable - DIY Repair
#125: Tektronix MDO4000B Enhancements - RF specs, Signal Analysis and WLAN WiFi Example
#126: Repair Log, Part 1: Icom IC-706MkIIG Damage assessment and connector repair – DIY
#127: Repair Log, Part 2: Icom IC-706MkIIG flex circuit replacement - DIY repair
#128: How to install optional filters in an Icom IC706MkIIG and measure them with an FFT
#129: How to cut circuit board PCB material - a couple of favorite methods I use...
#130: PIN Diode 3rd order Intermodulation Distortion (IMD) vs. bias current - how to measure
#131: How to test transistors - NPN and PNP bipolar junction transistors, BJTs
#132: How to test MOSFETs with a DMM - a few methods...
#133: Ham Radio call sign history, and my QSL card quest - W2AEW and 2AEW
#134: Teardown of failed power supply - bad capacitor
#135: Measure Capacitor ESR with an Oscilloscope and Function Generator
#136: What is a dB, dBm, dBu, dBc, etc. on a Spectrum Analyzer?
#137: Why your Function Generator's output voltage reading can be wrong
#138: How to Measure Output Impedance
#139: How to make a WLAN Channel Power Meas on a Tektronix MDO4000
#140: Basics of an Op Amp Summing Amplifier
#141: What is an Eye Pattern on an Oscilloscope - A Tutorial
#142: Basics of High Voltage Probes and how to use them
#143: Transmission Line Terminations for Digital and RF signals - Intro/Tutorial
#144: Use Arduino Uno to create spinning XY graphic on an Oscilloscope
#145: Unboxing the Tektronix MDO3000 Oscilloscope
#146: 10X Probe Compensation on a Tektronix MDO3000 Oscilloscope
#147: Basics of Varactor Diodes | Voltage Controlled Oscillator VCO Example
#148: Software Defined Radio kit | Tutorial | Build | Test | Softrock Lite II
#149: How to solder a leadless ceramic surface mount package | LCC | CLCC
#150: How to measure an HF Bandpass filter response with the MDO3000
#151: How to wind a toroid inductor | A quick tutorial
#152: Completed Softrock Ensemble II SDR Receiver kit | On air checkout
#153: How to tune up a Kenwood TS-830S hybrid rig / transceiver | TS-520 TS-530 TS-820
#154: Softrock Ensemble II SDR Rx circuit review | description | test
#155: Circuit Fun: Auto-ranging Analog Voltmeter for a variable power supply
#156: Hamfest! Highlights of the 2014 RVRC Hamfest in Piscataway NJ
#157: Circuit fun: Automatic audio leveling circuit | audio compressor | for scanning receiver
#158: Directional Coupler Basics & how to sweep SWR of an antenna | Return Loss | VSWR
#159: How to measure FM frequency deviation with a spectrum analyzer
#160: Oscilloscope Basics, and how they can be used in the hamshack | tutorial
#161: Circuit Fun: a simple RF detector / demodulator probe for DMM or scope
#162: How to measure coax velocity factor VF and impedance Z
#163: Automatic Volume Level Control circuit demonstration | scanner
#164: More XY Oscilloscope graphics, VintageTEK and how projects evolve
#165: Why RF circuits need shielding - or how NOT to build a Theremin! (tnx 4 the title Ben!)
#166: How to wind a trifilar toroid transformer for a diode ring mixer
#167: How a Diode Ring Mixer works | Mixer operation theory and measurement
#168: How to coil coax, wire, rope, etc. to be free of kinks, twists and knots
#169: Embedded WLAN module testing with the MDO4000B and SignalVu-PC
#170: Basics of IQ Signals and IQ modulation & demodulation - A tutorial
#171: IQ Signals Part II: AM and FM phasor diagrams, SSB phasing method
#172: Basics of Op Amp Gain Bandwidth Product and Slew Rate Limit
#173: Introduction to RTL-SDR low cost software defined radio receivers
#174: Using a mixer to listen to HF, shortwave, ham, etc. on RTL-SDR dongle
#175: Filter functions in an HF Upconverter used with RTL-SDR Dongle Receiver
#176: Uniden / President HR2510 10m transceiver repair - won't transmit
#177: Kenwood Dual-Band TM-D710 repair, bad filter, design issue
#178: Build, test, use the RF Noise Source on the Ham-It-Up RTL-SDR Upconverter

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#179: How to make a peak to peak voltage measurement on a scope
#180: How to assemble of the Elecraft PX3 Panadapter kit
#181: Basics of an RF Comb Generator - a tutorial
#182: VHF Transmitter key-up analysis with a Tektronix RSA306
#183: Why diodes are used around relay coils: Back to Basics on flyback or snubber diodes
#184: How to calibrate an analog oscilloscope
#185: Back to Basics: Bipolar Transistor bias circuits and Beta dependence
#186: Circuit Fun: Control an RC Servo with an adjustable DC voltage
#187: Circuit Walkthrough: A single cell LED light supporting Ears to Our World
#188: Mini review / demo: GP-5/SSB Shortwave, AM/FM and SSB portable receiver
#189: Programming & using memories in the GP-5/SSB shortwave receiver
#190: Back to Basics: Transistor Current Sources and Mirrors
#191: Beware of test equipment loading effects!! Learn from my error!
#192: Preview of next Back to Basics video on the diff-amp, long-tailed pair
#193: Back to Basics: the differential amplifier, aka long-tailed pair, diff-pair
#194: What is ammeter burden voltage, and why you should care
#195: RF Diplexer Basics: Tutorial, construction and tuning
#196: How a Directional Coupler in an SWR meter works
#197: Simple V-I curve tracer using an oscilloscope and function generator
#198: Basics of a Vbe Multiplier: what it is, how it works & where it is used
#199: Measuring coil inductance and IF transformer resonant frequency
#200: T/R Switch w/ PIN Diodes and Lumped Element Quarter-wavelength transmission line
#201: Basics of Reverse Recovery Time in a Diode
#202: Basics of using FFT on a Tektronix TDS2000 Oscilloscope
#203: Schmitt Trigger Oscillator revisited | TDR | Measure Capacitors and Inductors
#204: Basics of Tunnel Diodes and their applications
#205: Amateur Radio Field Day 2015 at Guglielmo Marconi Memorial Park
#206: Importance of 10X Probe Compensation with your Oscilloscope
#207: Basics of a Cascode Amplifier and the Miller Effect
#208: Visualizing RF Standing Waves on Transmission Lines
#209: Basics of Phase Dots on Transformer Windings
#210: Drake 2B Introduction and visual assessment
#211: TSG4106A RF signal generator unboxing and mini feature review
#212: Re-capping the Drake 2B Receiver
#213: Drake 2B final repairs, bench test, on-air listening
#214: Drake 2B Alignment
#215: Basics of Crossover Distortion using LM358 op amp as an example
#216: Back to Basics: 555 based monostable multivibrator | 555 tutorial
#217: Hamfest Find: Homemade Pi-Network Antenna Tuner / Transmatch
#218: Hamfest Find: Video Distribution Amplifier - 50 vs. 75 ohm BNC Connectors
#219: Back to Basics: Introduction to Field Effect Transistors JFET MOSFET
#220: Drake 2B Serendipity - with N2CQR - the reason I got the 2B
#221: The Bird 43 Directional Wattmeter: Overview and how-to use
#222: Installing a Peak Reading kit into a Bird 43 Wattmeter
#223: Basics of the Gilbert Cell | Analog Multiplier | Mixer | Modulator
#224: AM & DSB-SC Modulation with a Gilbert Cell
#225: Introduction to the Project Diana 70th Anniversary Special Event
#226: Project Diana 70th Anniversary Special Event | Moonbounce | EME
#227: Vintage Tech: Fluke 881A Differential Voltmeter Introduction
#228: Radio Fun: Michigan Mighty Mite CW transmitter and a low pass filter
#229: American Morse Equipment KK1 morse code key assembly
#230: How to install a BNC connector on RG-58 coax
#231: Circuit Fun: Stairstep generator using 555 and op amps
#232: More Circuit Fun: Simple transistor curve tracer using Stairstep generator circuit
#233: Back to Basics: How to use the 3 terminals of a lab power supply | split supply | floating supplies
#234: Basics of Near Field RF Probes | E-Field & H-Field | How-to use
#235: Basics of Analog Panel Meters | Analog Meter Movements
#236: Using a Current Shunt with a Panel Meter / Ammeter scale change
#237: 4 Wire Resistance Measurement | Kelvin connection
#238: Oscilloscope Vertical Position and Offset explained

# W2AEW Videos (Mar 8, 2025)

#239: Repair of Kenwood TH-F6A radio's Push to Talk switch
#240: Repair of Yaesu FT-817 with SSB CW AM Transmit Problem
#241: Field Day 2016 - Low Power operating from a historic Marconi site
#242: How to use an oscilloscope on antique radios | NJARC
#243: Mini-review & test of a variable audio bandpass filter from SOTABeams
#244: Short vacation video: beach, bay, family, dog, ham radio
#245: Old Tech: The Wadley Loop Superhet Receiver - Yaesu FRG-7 Example
#246: How to operate / tune the Yaesu FRG-7 Frog-7 Receiver
#247: Circuit Fun: 5 Transistor ESR Meter circuit by EEVBlog user Jay_Diddy_B
#248: Tune Bandpass Cavity Filter using Return Loss w Directional Coupler
#249: Using DeOxit to clean/restore dirty switch contacts in a Kenwood SM-220
#250: Kenwood SM-220 Station Monitor Demo / Overview
#251: Using RSA306 to capture & analyze frequency hopping signals | Bluetooth example
#252: Acquisition & Analysis control in a Real-Time Spectrum Analyzer
#253: How to capture & analyze WiFi WLAN signals off-the-air with an RSA | RSA306B 802.11
#254: Review: Iso-Tip SolderPro 90 Butane Soldering Iron and hot-air rework / reflow tool
#255: Vintage Tech: Book review "ABC of Electricity" from 1889 endorsed by Edison
#256: Capacitor types, characteristics, and applications
#257: Power Supply Decoupling & FIltering: why we use multiple caps in different locations
#258: Repair Log: Yaesu FT-736R re-cap of internal power supply | replace electrolytic capacitors
#259 Repair Log: Yaesu FT-736R S-meter backlight bulb replacement
#260: RF Diode Mixer LO Drive Level & Conversion Loss | 1dB Compression | Distortion
#261: Status Update | Frequently Asked Questions | Thanks!
#262: IQ Modulator Basics: Operation, measurements, impairments
#263: Using a VNA to sweep an RF Dummy Load | Tektronix TTR506A Vector Network Analyzer
#264: RF Fun: Visualize antenna tuner operation on Smith Chart, SWR & more with VNA
#265: Vintage Tech: Checking out an RF Millivoltmeter - Boonton 92C
#266: Repair Log: Tektronix 465B Trigger control repair / replacement | oscilloscope repair
#267: Quick Tip: Making IC & Transistor part numbers easy to read
#268: How to operate a ZM-2 Z-Match Antenna Tuner kit by Emtech
#269: Repair Log: Yaesu FT-1000D Receiver Repair | dead rx, loss of sensitivity
#270: Tune a Duplexer with a Spectrum Analyzer + Tracking Gen or VNA
#271: Ham Radio Quickie: Yaesu FT-817 PowerPole Adapter
#272: Vintage Tech: Sencore TC162 Tube Tester: How to use, tips and peek inside
#273: Common Emitter Amplifier Design Tips & Shortcuts
#274: Smith Chart Basics: Impedance and Admittance curves and conversion
#275: Smith Chart: Z, VSWR, Reflection Coef and Transmission Line Effects
#276: Smith Chart: Design an L-Network - Impedance Matching Circuit
#277: Code Practice Oscillator kit build - for radio club event at mini Maker Fair
#278: Smith Charts: Use SimSmith to design L Matching Networks
#279: Ham Radio: WSPRlite review plus DXplorer and view of 4-FSK transmission
#280: Review of RigExpert AA-55 ZOOM Antenna and Cable Analyzer
#281: Bipolar Transistor Switching Time Measurement
#282: Part 1: How to measure complex impedance with MFJ-259B | determine sign of X
#283: Part 2: Measuring Complex Impedance with MFJ-259B | Crossing the real axis...
#284: Basics of RF Bias Tees including applications and examples
#285: Amateur Radio Field Day 2018 - my 5 watt setup with on-air contacts from Marconi Park
#286: Basics of, and How To Use an Oscilloscope | FairLawn Amateur Radio Club talk
#287: How to use the Delayed B-Sweep Timebase on Tektronix 2465 2445 2455 2467 Oscilloscopes
#288: Comparing XY Mode on Analog and Digital Oscilloscopes
#289: Back to Basics: Zener Diodes - How to Use | Applications | not all created equal
#290: Vintage Tech: Tektronix 576 Curve Tracer
#291: Oscilloscopes use in the Ham Radio Shack | FLARC Club talk, part 2
#292: QRP-Guys Multi-Z Antenna Tuner for low power on 40m-10m (7-30MHz)
#293: The 2019 ARRL Handbook for Radio Communications - Boxed Set - brief intro/review
#294: Delay / Skew Measurement, and a "trick" to separate device and cable delays
#295: What is SINAD & Overview / How to Use the Sinadder 3 for FM receiver alignment
#296: SSB & AM RF Envelopes, Peak Envelope Power (PEP), Average Power and more
#297: Presentation - Basics of the Smith Chart - Intro, impedance, VSWR, transmission lines, matching
#298: Electronic Project / Experimenters Kits - Then and Now

# W2AEW Videos (Mar 8, 2025)

#299: How to build an Open - Short - Load (OSL) Calibration kit for HF Antenna Analyzer
#300: Ham Basics: Sending Morse Code / CW - straight key, paddles and iambic keying
#301: How to install and adjust the SO-3 TCXO in the Kenwood TS-590
#302: How to match diodes -- measurement setups to find diodes that are matched
#303: What is a Pulse Counting FM Demodulator | Detector | Discriminator?
#304: Ham Radio: My QRP setup on vacation at the beach house on Long Beach Is. NJ.
#305: Measuring Total Harmonic Distortion THD using an FFT on an oscilloscope
#306: American Morse Equip MS2 Miniature Key - Assembly and mini review / demonstration
#307: Back to Basics: Potentiometers - Controls and trimmers / trimpots - WARNING!
#308: Back to Basics: Diodes - guide to operation, characteristics, types and specifications
#309: Radio Repair: Kenwood TS-940S Battery Replacement
#310: 3rd order Intermodulation Distortion (IMD) and their effect in radio receivers
#311: Top 5 Reasons your oscilloscope voltage readings might be wrong
#312: Back to Basics: What is a VNA / Vector Network Analyzer
#313: Why a VNA needs to be calibrated | how to calibrate a nanoVNA
#314: How to use the NanoVNA to sweep / measure an antenna system's SWR and optimize its tuning
#315: How to use the NanoVNA to measure a low-pass filter
#316: Use NanoVNA to measure coax length - BONUS Transmission Lines and Smith Charts,  SWR and more
#317: NanoVNA Port Extension using the Electrical Delay setting
#318: NanoVNA comparison measuring a duplexer - NanoVNA-H4 and SAA-2N
#319: Measuring Crystals with NanoVNA and other tools
#320: How to update the NanoVNA-H4 firmware using Windows 10 and .DFU file
#321: Vintage Tech: The Simpson 260 VOM Volt-Ohm-Milliammeter family
#322: Followup: Simpson 260 Series 7 & 8 Reversed Banana Lead solutions
#323: Measure length of coax, etc. with your scope, a battery and a resistor - simple TDR
#324: How to "calibrate" the Simpson 260 VOM - BONUS: 50 microamp current source
#325: Use NanoVNA and Smith Chart to show effect of adding transmission line length
#326: How to Measure the impedance of "unknown" coax using a NanoVNA
#327: Bipolar Transistor Current Mirror output impedance, Early Effect, Wilson Current Mirror
#328: Circuit Fun: Op Amp Signal Conditioning - a Practical Example
#329: Presentation recording: Intro to the VNA and NanoVNA for BayCon 2021
#330: HamCram: US Amateur Radio Technician Class material review - Trenton Computer Festival 2021
#331: Ham Tips: Operating "Split" on HF - info, tips & tricks for operating split or Duplex on HF
#332: Happy Morse Code Day - April 27th - from W2AEW
#333: Installation and test of Narrow CW filter in Icom IC-703 - Filter: Inrad #116
#334: How to tune a duplexer with a NanoVNA V2plus4 | is it possible?
#335: My Saturday: Early AM hamfest and some interesting cars
#336: NJARC Presentation on the Simpson 260, including basic VOM and DMM information
#337: Use a NanoVNA to measure input impedance and gain of a small-signal RF amplifier
#338: Probe Tips: Beware of capacitive loading of oscilloscope probes on your circuit operation
#339: Basics of a Super-heterodyne Receiver - how it works, and a peek at the signals
#341: Ham tip: Safely using a coax switch to connect multiple rigs to a single antenna system.
#342: Mini review: County Comm GP-7 / SSB handheld AM/FM/SW/SSB/CW Receiver
#343: Ham Tip: Using the memory feature on a RigExpert Antenna Analyzer AA-55 ZOOM
#344: ARRL 49:1 End Fed Halfwave UNUN transformer kit from HFKits - Build and quick bench test.
#345: Generating AM and DSB-SC with a Double-Balanced Diode Ring Mixer / Modulator
#346: Basics of Capacitor Leakage / using the Antique Wireless Association DC Leakage Tester
#347: Quick test of the 40m Halfwave End-Fed antenna using a 49:1 transformer / UNUN
#348: Quick Tip: What is a connector saver?
#349: Club Presentation: Smith Charts - the NanoVNA and your antenna - matching network design
#350: Adding AGC (automatic gain control) to my QCX+ CW Transceiver kit
#351: Quick Tip: Cheap source of test sockets wire and for your projects and component test needs
#352: The ULTIMATE Electrical Engineers Toolkit: Analog Designer's Edition
#353: Quick Tips: Using a Transistor Curve Tracer as an Octopus I/V Tracer or Huntron Tracker
#354: Help! Do you have a good suggestion for bench lighting that doesn't have THIS problem?
#355: Radio Review: FX-4C SDR  QRP Transceiver | Review of features and operating controls
#356: Back to Basics: the Emitter Follower, or Common-Collector Amplifier
#357: Ham Radio fun: ARRL Field Day '22 - Antenna raising, rig setup and a bit of operating
#358: Ham radio: How to install the Roofing Filter kit in the Elecraft KX3 Transceiver

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#359: Quick Tip: Selecting 10x passive probes for your oscilloscope - Bandwidth and Compensation...
#360: Mini Review: The BaMaKey TP-III miniature Morse Code paddles/key by BaMaTech
#361: Ham Radio: My first Parks On The Air (POTA) activation! At Barnegat Light, POTA K-1609
#362: Ham Radio: My Elecraft KX2 portable shack kit for Parks On The Air (POTA), SOTA, and more
#363: Ham Radio Review: The Penntek TR-45 Lite 5-Band, 5-Watt CW portable transceiver
#364: Ham Radio quickie: Single Sideband (SSB) receive audio quality on the Penntek TR-45L
#365: Ham Radio: What is your CW straight key sending style?
#366: Back to Basics: Basics of the Bipolar Transistor - NPN and PNP
#367: Characterizing the key-up frequency transient on an Alinco DR-135 Mk III 2m radio with an RSA
#368: Overview of the Peak Atlas DCA Pro Model DCA75 Semiconductor Component Analyzer & Curve Tracer
#369: How to install a crimp-on BNC connector to RG-316, RG-174, etc. coax
#370: FX-4CR Transceiver PCB replacement procedure
#371: Ham Radio Quick Tip: Tuning aid for Adjustable Coil vertical like the MP1 and others
#372: How to install an N-connector, crimp-on type, to LMR-600, RG-217 or similar coax cable
#373: Portable ham radio / POTA: The Spiderbeam 40' (12m) telescoping mast and hitch mounted support
#374: Back to Basics: JFET Current Source / Limiter circuits
#375: Ham Radio Quickie: Ground Radial wires vs. the "Magic Carpet" Faraday cloth
#376: Ham Radio: Build, Tune and Test a QRP End Fed UNUN kit from KM4CFT
#377: How to install a crimp-on BNC connector to RG-8X coax cable
#378: Ham Radio: Measuring CW Keyer speed on the Elecraft KX2 and Penntek TR-45 Lite
#379: How to measure coax loss using a NanoVNA
#380: Circuit Fun: Twin-Tee Oscillator - low distortion op amp sine waves
#381: Circuit Fun Followup: Trimming out distortion on Twin-Tee Oscillator - FFT &THD measurement
#382: Measuring AM modulation depth/percentage with a digital oscilloscope
#383: Measuring AM Modulation Depth using an Analog Oscilloscope (followup from #382)
#384: What is the bandwidth of a CW / Morse code signal? (as a function of speed and rise/fall time)
#385: How to quickly tune the Penntek TR-45L Z-match tuner
#386: Build the Iambic "pressure" paddle from VK3IL
#387: How to build and tune traps for a multi-band End Fed Half Wave (EFHW) antenna
#388: Build, tune and test a trapped 20/30/40m End Fed Half Wave antenna
~~#389 Kit Build: CFT1 5-band CW Field Transceiver - build / adjust / align / test~~
#390 Kit Build: CFT1 5-band CW Field Transceiver - build / adjust / align / test
#391: POTA: First POTA activation with the CFT1 5-Band CW transceiver kit
#392: Schematic Basics: Multi-position switches in Simpson 260 VOM and Realistic DX-160 Receiver
#393: Analysis of the RF characteristics of the Baofeng UV-5R Dual Band HT
#394: Oscilloscope Best Practices - some of the most common issues and tips
#395: Easy to make ground-radial kit for portable radio operations using ribbon cable
#396: Demystifying Oscilloscope Triggering - what it does and how to use it
#397: How to use cursors on Tektronix 2400 series scopes, including some "secret" features

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**Videos Listed by Topic**

**Oscilloscopes**
#2: Tektronix delayed timebase operation
#6: Infrequent Glitch capture on an Oscilloscope
#9: Basic 1X and 10X Oscilloscope Probe tutorial
#10: AC / DC Coupling on an Oscilloscope
#11: Tektronix Oscilloscope Triggering controls and their usage
#16: How to use the Oscilloscope to accurate capture 2 signals of different frequencies
#17: Using Analog scope to view two signals of wildly different frequencies
#18: Use Oscilloscope with delayed time base to measure a RF Power detector
#19: How to get a stable scope display with two signals very close in frequency
#20: Quick 5 minute Tektronix Mixed Domain Oscilloscope MDO4000 Demo
#25: Analog Oscilloscope bandwidth considerations
#26: Answering viewer questions, and Digital Oscilloscope Considerations
#31: Analog oscilloscope ALT, CHOP, ADD, INVERT vertical controls

# W2AEW Videos (Mar 8, 2025)

#33: Oscilloscope AUTO Triggering explained
#35: Using the ADD/INVERT mode on an analog scope to view differential voltages
#36: Function Generator issues appearing as a triggering problem
#40: Analog Oscillocope's rear panel auxiliary inputs and outputs
#41: Use Oscilloscope Z-axis input to create "marker" on waveform
#43: Analog Oscilloscope Basics: Making a Frequency Measurement
#44: Frequency measurement using Delaying Timebase on Analog Oscilloscope
#48: Basics of Lissajous Patterns on an Oscilloscope
#65: Basics of using FFT on an oscilloscope
#66: How to make a rise-time measurement on an oscilloscope
#68: Oscilloscope Probe Ground lead length affects on signal quality
#69: Basics of Analog Oscilloscope Bandwidth
#70: Digital Oscilloscope Bandwidth Measurement - direct and using risetime
#72: Simple Station Monitor for Ham Radio using an Oscilloscope
#74: Basics of Differential Probes for Oscilloscopes and their applications: a tutorial
#76: Debug Transient EMI signal with a Mixed Domain Oscilloscope MDO4000 Tektronix
#90: Measure Capacitors and Inductors with an Oscilloscope and some basic parts
#96: Tutorial on Digital Oscilloscope sample rate, record length and data processing
#111: How to make a high performance oscilloscope probe socket
#160: Oscilloscope Basics, and how they can be used in the hamshack | tutorial
#179: How to make a peak to peak voltage measurement on a scope
#184: How to calibrate an analog oscilloscope
#202: Basics of using FFT on a Tektronix TDS2000 Oscilloscope
#206: Importance of 10X Probe Compensation with your Oscilloscope
#208: Visualizing RF Standing Waves on Transmission Lines
#238: Oscilloscope Vertical Position and Offset explained
#242: How to use an oscilloscope on antique radios | NJARC
#286: Basics of, and How To Use an Oscilloscope | FairLawn Amateur Radio Club talk
#287: How to use the Delayed B-Sweep Timebase on Tektronix 2465 2445 2455 2467 Oscilloscopes
#288: Comparing XY Mode on Analog and Digital Oscilloscopes
#291: Oscilloscopes use in the Ham Radio Shack | FLARC Club talk, part 2
#294: Delay / Skew Measurement, and a "trick" to separate device and cable delays
#305: Measuring Total Harmonic Distortion THD using an FFT on an oscilloscope
#311: Top 5 Reasons your oscilloscope voltage readings might be wrong
#323: Measure length of coax, etc. with your scope, a battery and a resistor - simple TDR
#338: Probe Tips: Beware of capacitive loading of oscilloscope probes on your circuit operation
#359: Quick Tip: Selecting 10x passive probes for your oscilloscope - Bandwidth and Compensation...
#382: Measuring AM modulation depth/percentage with a digital oscilloscope
#383: Measuring AM Modulation Depth using an Analog Oscilloscope (followup from #382)
#394: Oscilloscope Best Practices - some of the most common issues and tips
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#397: How to use cursors on Tektronix 2400 series scopes, including some "secret" features

**Composite Video on Analog Oscilloscopes**
#42: Composite Video on an Analog Oscilloscope using XYZ - Lab tour...
#86: Improved NTSC video to Oscilloscope converter circuit / scope video monitor hack

**MD3000/MD4000**
#125: Tektronix MDO4000B Enhancements - RF specs, Signal Analysis and WLAN WiFi Example
#145: Unboxing the Tektronix MDO3000 Oscilloscope
#146: 10X Probe Compensation on a Tektronix MDO3000 Oscilloscope
#169: Embedded WLAN module testing with the MDO4000B and SignalVu-PC
#206: Importance of 10X Probe Compensation with your Oscilloscope
#396: Demystifying Oscilloscope Triggering - what it does and how to use it

**Spectrum Analyzers**
#12: Use Real-Time Spectrum Analysis to Characterize a transmitter key-up
#14: Tektronix MDO4000 Spectrum Analyzer quick comparison to entry level analyzer
#15: Ham radio Band-scope pan-adapter using Tek MDO4000 as a spectrum analyzer

# W2AEW Videos (Mar 8, 2025)

#21: Using MDO4000 to capture 802.11 traffic and export for analysis using RSAVu
#22: Spectrum Analyzer Basics / Tutorial, and the Tektronix 1401A
#23: Tektronix 1401A Spectrum Analyzer quick demo
#27: Board level EMI Debug with a Real Time Spectrum Analyzer
#38: Analyze Hot Wheel Radar gun with a Real Time Spectrum Analyzer
#47: Basics of Zero-Span operation of a Spectrum Analyzer
#51: Basic Spectrum Analyzer Do's and Dont's...
#62: Basics of Tracking Generators and 1/4 wavelength coaxial stub filters
#119: Basics of Resolution Bandwidth and Video Bandwidth in a Spectrum Analyzer (RBW VBW)
#181: Basics of an RF Comb Generator - a tutorial
#234: Basics of Near Field RF Probes | E-Field & H-Field | How-to use
#248: Tune Bandpass Cavity Filter using Return Loss w Directional Coupler
#251: Using RSA306 to capture & analyze frequency hopping signals | Bluetooth example
#252: Acquisition & Analysis control in a Real-Time Spectrum Analyzer
#253: How to capture & analyze WiFi WLAN signals off-the-air with an RSA | RSA306B 802.11
#270: Tune a Duplexer with a Spectrum Analyzer + Tracking Gen or VNA

**Other Test Equipment**
#5: My ESR Meter project from 2006
#45: Sweep Generator Basics and Receiver Alignment
#49: Simple Component Tester using Oscilloscope - Octopus Curve Tracer
#52: Tutorial / Basics of a Dip Meter
#61: Basics of RF Samplers, Sampling-Tees, RF-taps, etc.
#73: 70's Vintage Function / Sweep Generator review / teardown
#88: Cheap and simple TDR using an oscilloscope and 74AC14 Schmitt Trigger Inverter
#105: More Circuit Fun: Simple 3 transistor sawtooth generator / oscillator
#109: How to: Fluke 87 Multimeter fuse replacement, DMM True RMS
#115: How to replace the meter movement in a Simpson 260 multimeter VOM
#142: Basics of High Voltage Probes and how to use them
#161: Circuit Fun: a simple RF detector / demodulator probe for DMM or scope
#197: Simple V-I curve tracer using an oscilloscope and function generator
#203: Schmitt Trigger Oscillator revisited | TDR | Measure Capacitors and Inductors
#211: TSG4106A RF signal generator unboxing and mini feature review
#221: The Bird 43 Directional Wattmeter: Overview and how-to use
#222: Installing a Peak Reading kit into a Bird 43 Wattmeter
#227: Vintage Tech: Fluke 881A Differential Voltmeter Introduction
#233: Back to Basics: How to use the 3 terminals of a lab power supply | split supply | floating supplies
#235: Basics of Analog Panel Meters | Analog Meter Movements
#236: Using a Current Shunt with a Panel Meter / Ammeter scale change
#237: 4 Wire Resistance Measurement | Kelvin connection
#247: Circuit Fun: 5 Transistor ESR Meter circuit by EEVBlog user Jay_Diddy_B
#263: Using a VNA to sweep an RF Dummy Load | Tektronix TTR506A Vector Network Analyzer
#264: RF Fun: Visualize antenna tuner operation on Smith Chart, SWR & more with VNA
#265: Vintage Tech: Checking out an RF Millivoltmeter - Boonton 92C
#270: Tune a Duplexer with a Spectrum Analyzer + Tracking Gen or VNA
#272: Vintage Tech: Sencore TC162 Tube Tester: How to use, tips and peek inside
#280: Review of RigExpert AA-55 ZOOM Antenna and Cable Analyzer
#282: How to measure complex impedance with MFJ-259B | determine sign of X
#283: Part 2: Measuring Complex Impedance with MFJ-259B | Crossing the real axis...
#284: Basics of RF Bias Tees including applications and examples
#290: Vintage Tech: Tektronix 576 Curve Tracer
#295: What is SINAD & Overview / How to Use the Sinadder 3 for FM receiver alignment
#299: How to build an Open - Short - Load (OSL) Calibration kit for HF Antenna Analyzer
#312: Back to Basics: What is a VNA / Vector Network Analyzer
#313: Why a VNA needs to be calibrated | how to calibrate a nanoVNA
#314: How to use the NanoVNA to sweep / measure an antenna system's SWR and optimize its tuning
#315: How to use the NanoVNA to measure a low-pass filter
#316: Use NanoVNA to measure coax length - BONUS Transmission Lines and Smith Charts, SWR and more
#317: NanoVNA Port Extension using the Electrical Delay setting

# W2AEW Videos (Mar 8, 2025)

#318: NanoVNA comparison measuring a duplexer - NanoVNA-H4 and SAA-2N
#319: Measuring Crystals with NanoVNA and other tools
#320: How to update the NanoVNA-H4 firmware using Windows 10 and .DFU file
#321: Vintage Tech: The Simpson 260 VOM Volt-Ohm-Milliammeter family
#322: Followup: Simpson 260 Series 7 & 8 Reversed Banana Lead solutions
#324: How to "calibrate" the Simpson 260 VOM - BONUS: 50 microamp current source
#325: Use NanoVNA and Smith Chart to show effect of adding transmission line length
#326: How to Measure the impedance of "unknown" coax using a NanoVNA
#329: Presentation recording: Intro to the VNA and NanoVNA for BayCon 2021
#334: How to tune a duplexer with a NanoVNA V2plus4 | is it possible?
#336: NJARC Presentation on the Simpson 260, including basic VOM and DMM information
#337: Use a NanoVNA to measure input impedance and gain of a small-signal RF amplifier
#346: Basics of Capacitor Leakage / using the Antique Wireless Association DC Leakage Tester
#348: Quick Tip: What is a connector saver?
#349: Club Presentation: Smith Charts - the NanoVNA and your antenna - matching network design
#351: Quick Tip: Cheap source of test sockets wire and for your projects and component test needs
#353: Quick Tips: Using a Transistor Curve Tracer as an Octopus I/V Tracer or Huntron Tracker
#368: Overview of the Peak Atlas DCA Pro Model DCA75 Semiconductor Component Analyzer & Curve Tracer
#379: How to measure coax loss using a NanoVNA

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**Test Procedures**
#7: Monitor your Ham Radio transmitter with an oscilloscope
#8: Two-tone test of SSB transmitter output
#24: Transient EMI Debug using Tektronix MDO4000 Mixed Domain Oscilloscope
#37: Use a scope to measure the length and impedance of coax
#46: Basics of amplitude and distortion measurements on a scope and spectrum analyzer
#53: Real Time Spectrum Analysis of low frequency/audio signals
#57: Setting up variable double-pulse using Tek AFG
#58: How to zero-beat WWV to check or adjust a Frequency Counter's accuracy
#64: How to measure speed with a counter/timer
#94: RMS Voltage for Sine and square waves, and why your DMM might not work right!
#101: How to measure FM Frequency Deviation without special equipment using Carrier / Bessel Null
#112: Use an Oscilloscope and Signal Generator help tune an HF Antenna, measure complex impedance
#131: How to test transistors - NPN and PNP bipolar junction transistors, BJTs
#132: How to test MOSFETs with a DMM - a few methods...
#135: Measure Capacitor ESR with an Oscilloscope and Function Generator
#137: Why your Function Generator's output voltage reading can be wrong
#138: How to Measure Output Impedance
#139: How to make a WLAN Channel Power Meas on a Tektronix MDO4000
#141: What is an Eye Pattern on an Oscilloscope - A Tutorial
#150: How to measure an HF Bandpass filter response with the MDO3000
#159: How to measure FM frequency deviation with a spectrum analyzer
#162: How to measure coax velocity factor VF and impedance Z
#182: VHF Transmitter key-up analysis with a Tektronix RSA306
#194: What is ammeter burden voltage, and why you should care
#199: Measuring coil inductance and IF transformer resonant frequency
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#253: How to capture & analyze WiFi WLAN signals off-the-air with an RSA | RSA306B 802.11

# W2AEW Videos (Mar 8, 2025)

#262: IQ Modulator Basics: Operation, measurements, impairments
#263: Using a VNA to sweep an RF Dummy Load | Tektronix TTR506A Vector Network Analyzer
#264: RF Fun: Visualize antenna tuner operation on Smith Chart, SWR & more with VNA
#270: Tune a Duplexer with a Spectrum Analyzer + Tracking Gen or VNA
#275: Smith Chart: Z, VSWR, Reflection Coef and Transmission Line Effects
#276: Smith Chart: Design an L-Network - Impedance Matching Circuit
#278: Smith Charts: Use SimSmith to design L Matching Networks
#280: Review of RigExpert AA-55 ZOOM Antenna and Cable Analyzer
#281: Bipolar Transistor Switching Time Measurement
#282: Part 1: How to measure complex impedance with MFJ-259B | determine sign of X
#283: Part 2: Measuring Complex Impedance with MFJ-259B | Crossing the real axis...
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#353: Quick Tips: Using a Transistor Curve Tracer as an Octopus I/V Tracer or Huntron Tracker
#367: Characterizing the key-up frequency transient on an Alinco DR-135 Mk III 2m radio with an RSA
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#397: How to use cursors on Tektronix 2400 series scopes, including some "secret" features

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**Circuit Construction**
#98: Surface mount IC soldering demonstration with SO-8 packaged device
#99: Drag Soldering of an SSOP IC Package demonstration
#102: How to desolder or unsolder components using solder wick and vacuum tools
#120: How to Install Anderson Powerpole connectors
#122: Electronic Circuit Construction Techniques: review of some prototype circuit building methods
#123: Build a crystal oscillator from schematic thru prototype construction and testing – DIY
#124: How to install an RJ45 connector on a CAT5 Ethernet network Patch Cable - DIY Repair
#129: How to cut circuit board PCB material - a couple of favorite methods I use...
#149: How to solder a leadless ceramic surface mount package | LCC | CLCC
#151: How to wind a toroid inductor | A quick tutorial

# W2AEW Videos (Mar 8, 2025)

#165: Why RF circuits need shielding - or how NOT to build a Theremin! (tnx 4 the title Ben!)
#254: Review: Iso-Tip SolderPro 90 Butane Soldering Iron and hot-air rework / reflow tool
#257: Power Supply Decoupling & FIltering: why we use multiple caps in different locations
#298: Electronic Project / Experimenters Kits - Then and Now
#307: Back to Basics: Potentiometers - Controls and trimmers / trimpots - WARNING!

**Theory**

**Basics**

#54: Back to Basics Tutorial: Voltage / Current in capacitors and inductors
#55: Back to Basics: Tutorial on LC Resonant Circuits
#56: Basics of Capacitor & Inductor self-resonance, parasitics, etc. – Tutorial
#59: Basics of a Square Wave signal's harmonic content
#60: Basics of Phase Locked Loop Circuits and Frequency Synthesis
#83: Basics of RF Mixers in Radio Receivers / Mixer Tutorial / Frequency Conversion
#84: Basics of Ferrite Beads: Filters, EMI Suppression, Parasitic oscillation suppression / Tutorial
#85: Basics of R2R Resistor Networks Digital Analog Conversion, Tutorial DAC Thevenin Superposition
#87: Schmitt Trigger Oscillator / Tutorial / 74AC14 Inverter / squarewave generator
#91: Basic RF Attenuators - Design, Construction, Testing - PI and T style - A Tutorial
#100: Capacitor self-resonance measured with an oscilloscope and signal generator - how to tutorial
#104: Circuit tutorial: sawtooth generator w/ current sources, diode switches, hysteresis comparator
#110: Circuit Fun: Flexible Ramp Generator to create frequency sweeps using 555 timer and op amps
#121: Basics of SCRs and some circuit fun - device and circuit tutorial
#136: What is a dB, dBm, dBu, dBc, etc. on a Spectrum Analyzer?
#143: Transmission Line Terminations for Digital and RF signals - Intro/Tutorial
#183: Why diodes are used around relay coils: Back to Basics on flyback or snubber diodes
#195: RF Diplexer Basics: Tutorial, construction and tuning
#207: Basics of a Cascode Amplifier and the Miller Effect
#208: Visualizing RF Standing Waves on Transmission Lines
#209: Basics of Phase Dots on Transformer Windings
#215: Basics of Crossover Distortion using LM358 op amp as an example
#216: Back to Basics: 555 based monostable multivibrator | 555 tutorial
#219: Back to Basics: Introduction to Field Effect Transistors JFET MOSFET
#223: Basics of the Gilbert Cell | Analog Multiplier | Mixer | Modulator
#224: AM & DSB-SC Modulation with a Gilbert Cell
#256: Capacitor types, characteristics, and applications
#257: Power Supply Decoupling & FIltering: why we use multiple caps in different locations
#260: RF Diode Mixer LO Drive Level & Conversion Loss | 1dB Compression | Distortion
#262: IQ Modulator Basics: Operation, measurements, impairments
#273: Common Emitter Amplifier Design Tips & Shortcuts
#284: Basics of RF Bias Tees including applications and examples
#289: Back to Basics: Zener Diodes - How to Use | Applications | not all created equal
#296: SSB & AM RF Envelopes, Peak Envelope Power (PEP), Average Power and more
#297: Presentation - Basics of the Smith Chart - Intro, impedance, VSWR, transmission lines, matching
#298: Electronic Project / Experimenters Kits - Then and Now
#303: What is a Pulse Counting FM Demodulator | Detector | Discriminator?
#307: Back to Basics: Potentiometers - Controls and trimmers / trimpots - WARNING!
#308: Back to Basics: Diodes - guide to operation, characteristics, types and specifications
#310: 3rd order Intermodulation Distortion (IMD) and their effect in radio receivers
#312: Back to Basics: What is a VNA / Vector Network Analyzer
#327: Bipolar Transistor Current Mirror output impedance, Early Effect, Wilson Current Mirror
#328: Circuit Fun: Op Amp Signal Conditioning - a Practical Example
#339: Basics of a Super-heterodyne Receiver - how it works, and a peek at the signals
#346: Basics of Capacitor Leakage / using the Antique Wireless Association DC Leakage Tester
#356: Back to Basics: the Emitter Follower, or Common-Collector Amplifier
#366: Back to Basics: Basics of the Bipolar Transistor - NPN and PNP
#374: Back to Basics: JFET Current Source / Limiter circuits
#380: Circuit Fun: Twin-Tee Oscillator - low distortion op amp sine waves

# W2AEW Videos (Mar 8, 2025)

#381: Circuit Fun Followup: Trimming out distortion on Twin-Tee Oscillator - FFT &THD measurement

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**Differential Amplifiers**
#192: Preview of next Back to Basics video on the diff-amp, long-tailed pair
#193: Back to Basics: the differential amplifier, aka long-tailed pair, diff-pair

**Diodes**
#82: How to use a Diode as a Switch / Diodes as Switches / Basics of Diode Switches
#147: Basics of Varactor Diodes | Voltage Controlled Oscillator VCO Example
#166: How to wind a trifilar toroid transformer for a diode ring mixer
#167: How a Diode Ring Mixer works | Mixer operation theory and measurement
#201: Basics of Reverse Recovery Time in a Diode
#204: Basics of Tunnel Diodes and their applications
#289: Back to Basics: Zener Diodes - How to Use | Applications | not all created equal
#302: How to match diodes -- measurement setups to find diodes that are matched
#308: Back to Basics: Diodes - guide to operation, characteristics, types and specifications

**PIN Diode RF Switching**
#118: Basics of PIN diodes and their use in RF switch applications
#130: PIN Diode 3rd order Intermodulation Distortion (IMD) vs. bias current - how to measure
#200: T/R Switch w/ PIN Diodes and Lumped Element Quarter-wavelength transmission line

**Directional Couplers**
#158: Directional Coupler Basics & how to sweep SWR of an antenna | Return Loss | VSWR
#196: How a Directional Coupler in an SWR meter works
#208: Visualizing RF Standing Waves on Transmission Lines
#248: Tune Bandpass Cavity Filter using Return Loss w Directional Coupler

**Op-Amps**
#75: Basics of Opamp circuits - a tutorial on how to understand most Opamp circuits
#77: Op Amp Peak Detector Tutorial, with peak detector basics
#79: Op Amp Power Supply Considerations: split, single, virtual ground, etc. - a tutorial
#140: Basics of an Op Amp Summing Amplifier
#172: Basics of Op Amp Gain Bandwidth Product and Slew Rate Limit
#215: Basics of Crossover Distortion using LM358 op amp as an example
#328: Circuit Fun: Op Amp Signal Conditioning - a Practical Example
#380: Circuit Fun: Twin-Tee Oscillator - low distortion op amp sine waves

**Transistors**
#67: Basics of Common Emitter Amplifier Gain and Frequency Response with Measurements
#113: Basics of Transistor bias point and the class of amplifier operation
#114: Tutorial: Common Emitter, Common Collector, and Common Base Transistor amplifiers
#185: Back to Basics: Bipolar Transistor bias circuits and Beta dependence
#190: Back to Basics: Transistor Current Sources and Mirrors
#191: Beware of test equipment loading effects!! Learn from my error!
#198: Basics of a Vbe Multiplier: what it is, how it works & where it is used
#207: Basics of a Cascode Amplifier and the Miller Effect
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**Circuit Analysis**

# W2AEW Videos (Mar 8, 2025)

#155: Circuit Fun: Auto-ranging Analog Voltmeter for a variable power supply
#157: Circuit fun: Automatic audio leveling circuit | audio compressor | for scanning receiver
#163: Automatic Volume Level Control circuit demonstration | scanner
#186: Circuit Fun: Control an RC Servo with an adjustable DC voltage
#187: Circuit Walkthrough: A single cell LED light supporting Ears to Our World
#216: Back to Basics: 555 based monostable multivibrator | 555 tutorial
#223: Basics of the Gilbert Cell | Analog Multiplier | Mixer | Modulator
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#232: More Circuit Fun: Simple transistor curve tracer using Stairstep generator circuit
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#345: Generating AM and DSB-SC with a Double-Balanced Diode Ring Mixer / Modulator
#356: Back to Basics: the Emitter Follower, or Common-Collector Amplifier
#392: Schematic Basics: Multi-position switches in Simpson 260 VOM and Realistic DX-160 Receiver

**Ham Radio operation, Equipment and Radio Repair**
#39: Function Generator debug and repair - Leader LG-1311
#116: Repair Log, Part 1: Yaesu FT-7800 Dual Band FM Transceiver, no VHF output
#117: Repair Log, Part 2: Yaesu FT-7800 Dual Band FM Transceiver, fixed 2m tx problem
#126: Repair Log, Part 1: Icom IC-706MkIIG Damage assessment and connector repair – DIY
#127: Repair Log, Part 2: Icom IC-706MkIIG flex circuit replacement - DIY repair
#134: Teardown of failed power supply - bad capacitor
#177: Kenwood Dual-Band TM-D710 repair, bad filter, design issue
#176: Uniden / President HR2510 10m transceiver repair - won't transmit
#210: Drake 2B Introduction and visual assessment
#212: Re-capping the Drake 2B Receiver
#213: Drake 2B final repairs, bench test, on-air listening
#214: Drake 2B Alignment
#239: Repair of Kenwood TH-F6A radio's Push to Talk switch
#240: Repair of Yaesu FT-817 with SSB CW AM Transmit Problem
#242: How to use an oscilloscope on antique radios | NJARC
#247: Circuit Fun: 5 Transistor ESR Meter circuit by EEVBlog user Jay_Diddy_B
#249: Using DeOxit to clean/restore dirty switch contacts in a Kenwood SM-220
#254: Review: Iso-Tip SolderPro 90 Butane Soldering Iron and hot-air rework / reflow tool
#258: Repair Log: Yaesu FT-736R re-cap of internal power supply | replace electrolytic capacitors
#259 Repair Log: Yaesu FT-736R S-meter backlight bulb replacement
#266: Repair Log: Tektronix 465B Trigger control repair / replacement | oscilloscope repair
#268: How to operate a ZM-2 Z-Match Antenna Tuner kit by Emtech
#269: Repair Log: Yaesu FT-1000D Receiver Repair | dead rx, loss of sensitivity
#270: Tune a Duplexer with a Spectrum Analyzer + Tracking Gen or VNA
#271: Ham Radio Quickie: Yaesu FT-817 PowerPole Adapter
#276: Smith Chart: Design an L-Network - Impedance Matching Circuit
#278: Smith Charts: Use SimSmith to design L Matching Networks
#279: Ham Radio: WSPRlite review plus DXplorer and view of 4-FSK transmission
#280: Review of RigExpert AA-55 ZOOM Antenna and Cable Analyzer
#282: How to measure complex impedance with MFJ-259B | determine sign of X
#283: Part 2: Measuring Complex Impedance with MFJ-259B | Crossing the real axis...
#285: Amateur Radio Field Day 2018 - my 5 watt setup with on-air contacts from Marconi Park
#290: Oscilloscopes use in the Ham Radio Shack | FLARC Club talk, part 2
#292: QRP-Guys Multi-Z Antenna Tuner for low power on 40m-10m (7-30MHz)
#293: The 2019 ARRL Handbook for Radio Communications - Boxed Set - brief intro/review
#295: What is SINAD & Overview / How to Use the Sinadder 3 for FM receiver alignment
#296: SSB & AM RF Envelopes, Peak Envelope Power (PEP), Average Power and more
#297: Presentation - Basics of the Smith Chart - Intro, impedance, VSWR, transmission lines, matching
#299: How to build an Open - Short - Load (OSL) Calibration kit for HF Antenna Analyzer
#300: Ham Basics: Sending Morse Code / CW - straight key, paddles and iambic keying
#301: How to install and adjust the SO-3 TCXO in the Kenwood TS-590
#306: American Morse Equip MS2 Miniature Key - Assembly and mini review / demonstration

# W2AEW Videos (Mar 8, 2025)

#309: Radio Repair: Kenwood TS-940S Battery Replacement
#310: 3rd order Intermodulation Distortion (IMD) and their effect in radio receivers
#314: How to use the NanoVNA to sweep / measure an antenna system's SWR and optimize its tuning
#325: Use NanoVNA and Smith Chart to show effect of adding transmission line length
#326: How to Measure the impedance of "unknown" coax using a NanoVNA
#330: HamCram: US Amateur Radio Technician Class material review - Trenton Computer Festival 2021
#331: Ham Tips: Operating "Split" on HF - info, tips & tricks for operating split or Duplex on HF
#332: Happy Morse Code Day - April 27th - from W2AEW
#333: Installation and test of Narrow CW filter in Icom IC-703 - Filter: Inrad #116
#334: How to tune a duplexer with a NanoVNA V2plus4 | is it possible?
#337: Use a NanoVNA to measure input impedance and gain of a small-signal RF amplifier
#341: Ham tip: Safely using a coax switch to connect multiple rigs to a single antenna system.
#342: Mini review: County Comm GP-7 / SSB handheld AM/FM/SW/SSB/CW Receiver
#343: Ham Tip: Using the memory feature on a RigExpert Antenna Analyzer AA-55 ZOOM
#344: ARRL 49:1 End Fed Halfwave UNUN transformer kit from HFKits - Build and quick bench test.
#347: Quick test of the 40m Halfwave End-Fed antenna using a 49:1 transformer / UNUN
#349: Club Presentation: Smith Charts - the NanoVNA and your antenna - matching network design
#350: Adding AGC (automatic gain control) to my QCX+ CW Transceiver kit
#355: Radio Review: FX-4C SDR  QRP Transceiver | Review of features and operating controls
#357: Ham Radio fun: ARRL Field Day '22 - Antenna raising, rig setup and a bit of operating
#358: Ham radio: How to install the Roofing Filter kit in the Elecraft KX3 Transceiver
#360: Mini Review: The BaMaKey TP-III miniature Morse Code paddles/key by BaMaTech
#361: Ham Radio: My first Parks On The Air (POTA) activation! At Barnegat Light, POTA K-1609
#362: Ham Radio: My Elecraft KX2 portable shack kit for Parks On The Air (POTA), SOTA, and more
#363: Ham Radio Review: The Penntek TR-45 Lite 5-Band, 5-Watt CW portable transceiver
#364: Ham Radio quickie: Single Sideband (SSB) receive audio quality on the Penntek TR-45L
#365: Ham Radio: What is your CW straight key sending style?
#367: Characterizing the key-up frequency transient on an Alinco DR-135 Mk III 2m radio with an RSA
#369: How to install a crimp-on BNC connector to RG-316, RG-174, etc. coax
#370: FX-4CR Transceiver PCB replacement procedure
#371: Ham Radio Quick Tip: Tuning aid for Adjustable Coil vertical like the MP1 and others
#372: How to install an N-connector, crimp-on type, to LMR-600, RG-217 or similar coax cable
#373: Portable ham radio / POTA: The Spiderbeam 40' (12m) telescoping mast and hitch mounted support
#375: Ham Radio Quickie: Ground Radial wires vs. the "Magic Carpet" Faraday cloth
#376: Ham Radio: Build, Tune and Test a QRP End Fed UNUN kit from KM4CFT
#377: How to install a crimp-on BNC connector to RG-8X coax cable
#378: Ham Radio: Measuring CW Keyer speed on the Elecraft KX2 and Penntek TR-45 Lite
#379: How to measure coax loss using a NanoVNA
#382: Measuring AM modulation depth/percentage with a digital oscilloscope
#384: What is the bandwidth of a CW / Morse code signal? (as a function of speed and rise/fall time)
#386: Build the Iambic "pressure" paddle from VK3IL
#387: How to build and tune traps for a multi-band End Fed Half Wave (EFHW) antenna
#388: Build, tune and test a trapped 20/30/40m End Fed Half Wave antenna
~~#389 Kit Build: CFT1 5-band CW Field Transceiver - build / adjust / align / test~~
#390 Kit Build: CFT1 5-band CW Field Transceiver - build / adjust / align / test
#391: POTA: First POTA activation with the CFT1 5-Band CW transceiver kit
#393: Analysis of the RF characteristics of the Baofeng UV-5R Dual Band HT
#395: Easy to make ground-radial kit for portable radio operations using ribbon cable

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**Arduino**
#78: Use an Arduino to draw pictures on an oscilloscope using XY mode
#92: Cool Product: The Moteino - an Arduino clone + RFM12B wireless interface - low cost
#93: RS232 and SPI bus waveforms, bus decodes and RF activity on the Moteino using Tek MDO4000
#144: Use Arduino Uno to create spinning XY graphic on an Oscilloscope
#164: More XY Oscilloscope graphics, VintageTEK and how projects evolve
#298: Electronic Project / Experimenters Kits - Then and Now

# W2AEW Videos (Mar 8, 2025)

**SDR: Software Define Radio Topics**

**I&Q Signals**
#170: Basics of IQ Signals and IQ modulation & demodulation - A tutorial
#171: IQ Signals Part II: AM and FM phasor diagrams, SSB phasing method

**RTL-SDR**
#173: Introduction to RTL-SDR low cost software defined radio receivers
#174: Using a mixer to listen to HF, shortwave, ham, etc. on RTL-SDR dongle
#175: Filter functions in an HF Upconverter used with RTL-SDR Dongle Receiver
#178: Build, test, use the RF Noise Source on the Ham-It-Up RTL-SDR Upconverter

**Softrock SDR**
#148: Software Defined Radio kit | Tutorial | Build | Test | Softrock Lite II
#152: Completed Softrock Ensemble II SDR Receiver kit | On air checkout
#154: Softrock Ensemble II SDR Rx circuit review | description | test

**Radios**

**Baofeng UV-5R**
#393: Analysis of the RF characteristics of the Baofeng UV-5R Dual Band HT

**CFT1: Compact Field Transceiver by KM4CFT**
~~#389 Kit Build: CFT1 5-band CW Field Transceiver - build / adjust / align / test~~
#390 Kit Build: CFT1 5-band CW Field Transceiver - build / adjust / align / test
#391: POTA: First POTA activation with the CFT1 5-Band CW transceiver kit

**Drake 2B**
#210: Drake 2B Introduction and visual assessment
#212: Re-capping the Drake 2B Receiver
#213: Drake 2B final repairs, bench test, on-air listening
#214: Drake 2B Alignment
#220: Drake 2B Serendipity - with N2CQR - the reason I got the 2B

**CountyComm GP-5/SSB and GP-7/SSB**
#188: Mini review / demo: GP-5/SSB Shortwave, AM/FM and SSB portable receiver
#189: Programming & using memories in the GP-5/SSB shortwave receiver
#342: Mini review: County Comm GP-7 / SSB handheld AM/FM/SW/SSB/CW Receiver

**Elecraft**
#180: How to assemble of the Elecraft PX3 Panadapter kit
#358: Ham radio: How to install the Roofing Filter kit in the Elecraft KX3 Transceiver
#378: Ham Radio: Measuring CW Keyer speed on the Elecraft KX2 and Penntek TR-45 Lite

**FX-4C SDR QRP Transceiver**
#355: Radio Review: FX-4C SDR  QRP Transceiver | Review of features and operating controls
#370: FX-4CR Transceiver PCB replacement procedure

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**Heathkit HW-9**
#81:Heathkit HW-9 QRP CW Transceiver Circuit Walk-Through - Ham Amateur Radio Schematic

**HF Packer V4 Amplifier**
#106: Measuring low-pass filters in a Ham Radio HF Packer Amp for Amateur HF Bands
#107: Adjusting the MOSFET drain current in the HF Packer V4 Amplifier (ham radio)
#108: Adding a CW-SSB Mode switch to the HF Packer V4 Amplifier (ham radio)

**Icom IC-703**

# W2AEW Videos (Mar 8, 2025)

#333: Installation and test of Narrow CW filter in Icom IC-703 - Filter: Inrad #116

**Icom IC-706MkIIG**
#126: Repair Log, Part 1: Icom IC-706MkIIG Damage assessment and connector repair – DIY
#127: Repair Log, Part 2: Icom IC-706MkIIG flex circuit replacement - DIY repair
#128: How to install optional filters in an Icom IC706MkIIG and measure them with an FFT

**Kenwood TH-F6A**
#239: Repair of Kenwood TH-F6A radio's Push to Talk switch

**Kenwood TM-D710**
#177: Kenwood Dual-Band TM-D710 repair, bad filter, design issue

**Kenwood TS-590**
#301: How to install and adjust the SO-3 TCXO in the Kenwood TS-590

**Kenwood TS-940**
#309: Radio Repair: Kenwood TS-940S Battery Replacement

**MFJ9340**
#80: MFJ Cub 40m QRP CW Transceiver circuit walk-thru and review, plus bandsweep, ham radio MFJ-9340

**Michigan Mighty Mite**
#228: Radio Fun: Michigan Mighty Mite CW transmitter and a low pass filter

**Penntek TR-45 Lite**
#363: Ham Radio Review: The Penntek TR-45 Lite 5-Band, 5-Watt CW portable transceiver
#364: Ham Radio quickie: Single Sideband (SSB) receive audio quality on the Penntek TR-45L
#378: Ham Radio: Measuring CW Keyer speed on the Elecraft KX2 and Penntek TR-45 Lite
#385: How to quickly tune the Penntek TR-45L Z-match tuner

**QRP-Labs QCX**
#350: Adding AGC (automatic gain control) to my QCX+ CW Transceiver kit

**TenTec 1254**
#3: TenTec 1254 Receiver Signal Path walkthrough
#4: Oscilloscope view of TenTec 1254 IF and detected output on Shortwave signal
#29: Adding a S-meter to TenTec 1254 Shortwave Receiver
#30: Part II: Finishing the S-Meter on the Ten Tec 1254 Shortwave Receiver
#34: Installation of upgraded microcontroller in the TenTec 1254 Receiver

**Uniden**
#176: Uniden / President HR2510 10m transceiver repair - won't transmit

**Yaesu FT-736R**
#258: Repair Log: Yaesu FT-736R re-cap of internal power supply | replace electrolytic capacitors
#259 Repair Log: Yaesu FT-736R S-meter backlight bulb replacement

**Yaesu FT-7800**
#116: Repair Log, Part 1: Yaesu FT-7800 Dual Band FM Transceiver, no VHF output
#117: Repair Log, Part 2: Yaesu FT-7800 Dual Band FM Transceiver, fixed 2m tx problem

**Yaesu FT-817**
#240: Repair of Yaesu FT-817 with SSB CW AM Transmit Problem
#271: Ham Radio Quickie: Yaesu FT-817 PowerPole Adapter

**Yaesu FRG-7**
#245: Old Tech: The Wadley Loop Superhet Receiver - Yaesu FRG-7 Example

# W2AEW Videos (Mar 8, 2025)

#246: How to operate / tune the Yaesu FRG-7 Frog-7 Receiver

**Yaesu FT-1000D**
#269: Repair Log: Yaesu FT-1000D Receiver Repair | dead rx, loss of sensitivity

**Miscellaneous**
#1: QRP Check-in to NorCars net from RVRC Hamfest June 19, 2010
#13: D-104 Microphone amplifier / Equalizer for Ham Radio
#28: My QRP "go kit" backpack with IC-703+ ham radio
#32: Quick test of completed DDS-60 from AMQRP/NJQRP
#50: QRP SSB contact on 40m from Hamfest of RVRC, June 2012
#63: JOTA: Jamboree on the Air at OMARC/InfoAge October 2012
#71: Proper PSK31 Audio Level setup with a scope, RF power meter, and ALC indicator
#89: Video Tour of my Lab and Workbench - Oscilloscopes and meters and power supplies, oh my!
#95: W2AEW Channel Trailer video
#97: Low Power (QRP) Ham Radio contact at the 2013 RVRC Hamfest in NJ
#103: Ham Radio on vacation - Long Beach Island with Icom IC-703+ NJ (NA-111), 10mo after Sandy
#133: Ham Radio call sign history, and my QSL card quest - W2AEW and 2AEW
#153: How to tune up a Kenwood TS-830S hybrid rig / transceiver | TS-520 TS-530 TS-820
#156: Hamfest! Highlights of the 2014 RVRC Hamfest in Piscataway NJ
#168: How to coil coax, wire, rope, etc. to be free of kinks, twists and knots
#205: Amateur Radio Field Day 2015 at Guglielmo Marconi Memorial Park
#217: Hamfest Find: Homemade Pi-Network Antenna Tuner / Transmatch
#218: Hamfest Find: Video Distribution Amplifier - 50 vs. 75 ohm BNC Connectors
#225: Introduction to the Project Diana 70th Anniversary Special Event
#226: Project Diana 70th Anniversary Special Event | Moonbounce | EME
#229: American Morse Equipment KK1 morse code key assembly
#230: How to install a BNC connector on RG-58 coax
#241: Field Day 2016 - Low Power operating from a historic Marconi site
#243: Mini-review & test of a variable audio bandpass filter from SOTABeams
#244: Short vacation video: beach, bay, family, dog, ham radio
#250: Kenwood SM-220 Station Monitor Demo / Overview
#254: Review: Iso-Tip SolderPro 90 Butane Soldering Iron and hot-air rework / reflow tool
#255: Vintage Tech: Book review "ABC of Electricity" from 1889 endorsed by Edison
#261: Status Update | Frequently Asked Questions | Thanks!
#267: Quick Tip: Making IC & Transistor part numbers easy to read
#268: How to operate a ZM-2 Z-Match Antenna Tuner kit by Emtech
#274: Smith Chart Basics: Impedance and Admittance curves and conversion
#275: Smith Chart: Z, VSWR, Reflection Coef and Transmission Line Effects
#276: Smith Chart: Design an L-Network - Impedance Matching Circuit
#277: Code Practice Oscillator kit build - for radio club event at mini Maker Fair
#278: Smith Charts: Use SimSmith to design L Matching Networks
#285: Amateur Radio Field Day 2018 - my 5 watt setup with on-air contacts from Marconi Park
#293: The 2019 ARRL Handbook for Radio Communications - Boxed Set - brief intro/review
#304: Ham Radio: My QRP setup on vacation at the beach house on Long Beach Is. NJ.
#335: My Saturday: Early AM hamfest and some interesting cars
#348: Quick Tip: What is a connector saver?
#351: Quick Tip: Cheap source of test sockets wire and for your projects and component test needs
#352: The ULTIMATE Electrical Engineers Toolkit: Analog Designer's Edition
#354: Help! Do you have a good suggestion for bench lighting that doesn't have THIS problem?
#369: How to install a crimp-on BNC connector to RG-316, RG-174, etc. coax
#372: How to install an N-connector, crimp-on type, to LMR-600, RG-217 or similar coax cable
#392: Schematic Basics: Multi-position switches in Simpson 260 VOM and Realistic DX-160 Receiver

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