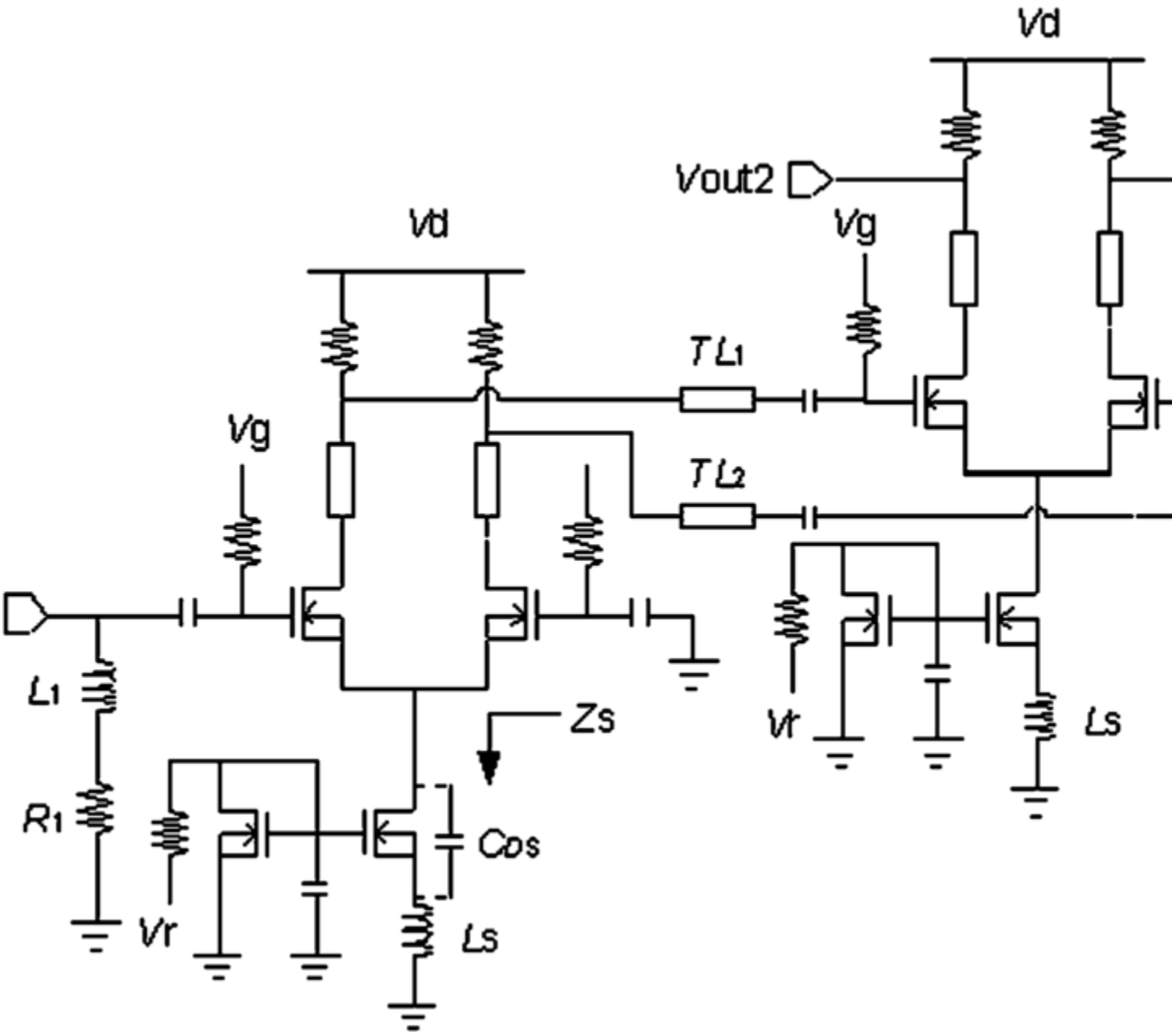
K9TRC –News:



Ok, what's this?

Ham News for Tipton County

The Tipton County Indiana Amateur Radio Club is an exempt organization under Section 501(c) (3) of the Internal Revenue Code.

You are invited to attend the Jan. meeting of the Tipton Indiana Amateur Radio Club which meets the second Saturday of each month . The next meeting is this coming Saturday, Jan. 13, 2024, at 8:30 am, at the Jim Dandy Restaurant on West Jefferson Street in Tipton. Executive Board meets the first Friday of each month Also at Jim Dandy at 8:30 AM. Unless otherwise noted.

Officers: Louie Wolford (k9qcb), President, Paul Kennedy (kd9iqh) Vice President, Larry Crowder, Treasurer(k9lwc), Ron Adamson (WA9YJZ) Secretary, John Ankrom (kg9ja) Trustee

Topics being presented to the group as things of interest.

k9trc.org is on the web. You can locate it at www.k9trc.org comments are welcome.

LOCAL REPEATERS: DELETED DUE TO FORMATING ISSUES.

The beginning of each net starts with an attendance of sorts of the local RACES/ARES membership. Shortly after this our regular "Net Night" begins. This of course is every Monday evening at 8PM. Have you wondered about RACES/ ARES and how to learn more? The ARRL has these courses if you are interested:

EC-001: Introduction to Emergency Communication

EC-016: Public Service and Emergency Communications Management for Radio Amateurs
PR-101: Public Relations 101 for Radio Amateurs

Look into them, they can be helpful.

Notes from the Editor:

If you are interested in the FCC requirement for RF Exposure, the Lake Washington Ham Club.org/resources has an RF exposure calculator online.

Indiana Section ARES® Nets

The Indiana Section ARES® HF net is held on 7.272 +/- during the summer months, every Sunday at 5 PM EDT.

Net Manager: Jim Moehring, KB9WWM. Email: servo300@aol.com

- ***Indiana ARES® HF Net Script***
- ***Indiana Section ARES® HF Net Log***

The Indiana ARES® HF Digital Net is held every Wednesday at 8:30 PM Eastern Time except the second Wednesday of the month on or about 3.583 MHz using Olivia 8/500.

Net Manager: Matthew Becdol, W9SOX

???? Due to the Coronavirus outbreak, please verify with your VE team that the exam session is being held. ????

ARE YOU UPGRADING YOUR LICENSE THIS YEAR?

- EXAM SESSION

  01/20/2024 | NOBLESVILLE IN 46060-1624
  Sponsor: Central Indiana ARA/ HCRACES
  Location: Sheriff's Training Room
  Time: 10:30 AM (No Walk-ins / Register or Call ahead)
  Learn More
- EXAM SESSION

  04/20/2024 | NOBLESVILLE IN 46060-1624
  Sponsor: Central Indiana ARA/ HCRACES
  Location: Sheriff's Training Room
  Time: 10:30 AM (No Walk-ins / Register or Call ahead)
  Learn More
- EXAM SESSION

  07/27/2024 | NOBLESVILLE IN 46060-1624
  Sponsor: Central Indiana ARA/ HCRACES
  Location: Sheriff's Training Room
  Time: 10:30 AM (No Walk-ins / Register or Call ahead)
  Learn More

The Tipton County Indiana Amateur Radio Club is an exempt organization under Section 501(c) (3) of the Internal Revenue Code.

- EXAM SESSION

  10/19/2024 | NOBLESVILLE IN 46060-1624
  Sponsor: Central Indiana ARA/ HCRACES
  Location: Sheriff's Training Room
  Time: 10:30 AM (No Walk-ins / Register or Call ahead)
  Learn More

Updaters Note: HamExam.org Amateur Radio Practice Exams

At: HamExam.org: Free Amateur Radio Practice Tests

Or for Technician Class: Ham Radio Technician Class Practice Test (updated 2020) (mometrix.com)

And General: Ham Radio General Class Practice Test (updated 2020) (mometrix.com)

OR: ON THE ARRL WEB SITE

Amateur Radio Websites that are supposed to be "Handy" From: H. Ward Silver: Part of the Ham Radio for Dummies Cheat Sheet.

ARRL- Many useful regulatory, educational, operating, and technical items and links

AC6V and DX Zone – General-interest websites with many links on all phases of Ham Radio

QRZ.com - Callsign lookup service and general-interest ham radio portal

eHam.net – News, articles, equipment swap and shop, product reviews, and mailing lists

Radiowave Propagation Center - Real-Time information on propagation and solar data

Space Weather Prediction Center - - Real-Time information on space weather and radio communications

TAPR (Information on Digital modes) - Information on Digital modes and software-defined radio (SDR)

AMSAT - Main site for information on amateur satellites

WA7BNM Contest Calendar - Contest calendar and log due dates

YOTA (Youngsters on the Air) – World-wide group for student and young adult hams, based in Europe

DXMAPS.com - Collection of real time maps showing worldwide activity on any amateur band

DXSummit – Worldwide DX spotting network

ARRLTOP OF FOR

SEARCH FOR ARRL HAMFESTS AND CONVENTIONS

No postings yet that I can find … Dec 26, 20223

You may or may not know the ARRL works with several agencies in the public service area. Many of these groups accept volunteers. If you have some free time and would like to be more active in the community here is a partial list of agencies that may need volunteer help.

- **American Red Cross+**
- **Association of Public-Safety Communications Officials-International (APCO-International)+**
- **Boy Scouts of America+**
- **Citizen Corps (Department of Homeland Security)+**
- **Civil Air Patrol (CAP)+**
- **Federal Emergency Management Agency (FEMA)+**
- **National Volunteer Organizations Active in Disaster (NVOAD)+**
- **REACT International Inc.+**
- **Salvation Army & SATERN+**
- **SKYWARN (National Weather Service)+**
- **Society of Broadcast Engineers (SBE)+**
- **United States Power Squadrons+**
- **Quarter Century Wireless Association, Inc.**

Copied from the ARRL website

10 Handy HAM Radio Websites:

ARRL, AC6V, DX Zone, QRZ.com, eHam.com, Radio wave Propagation Center, Space Weather Prediction Center, TAPR(Tuscon Amateur Packet Radio), AMSAT, WA7BNM Contest Calendar, YOTA (Youngsters On The Air)

Do you have a special interest? Do you go into your office and make stuff? In your hobby, do you tinker? Would you like to talk about your doings? This newsletter accepts your volunteer manuscripts for publication. I ask only that you be dealing in truth and facts.

The answer to the December schematic is …. A stereo receiver circuit.

AND, potentially useful trivia. This is 18 pages long; you may not want to print it.

How to Read Capacitor Value Markings

By H. Ward Silver

Part of the Circuitbuilding Do-It-Yourself For Dummies Cheat Sheet

When you're building circuits with capacitors, you'll need to learn to read the value markings, which not only designate values but other parameters as well.

###L (Three numbers and a letter)	Numbers 1 and 2 are value digits.
	Number 3 is a multiplier: 0 = × 1, 1 = × 10, 2 = × 100, 3 = × 1000, 4 = × 10,000.
	Letter denotes tolerance: J = 5%, K = 10%, L = 20%
##p or ##n	Numbers 1 and 2 are value digits.
	p denotes pF, n denotes nF.

Seven Circuit building Secrets

By H. Ward Silver from Circuit building Do-It-Yourself For Dummies

Below are seven bits of wisdom aren't about specific circuit building techniques, but generally apply to everything. They can help make and keep circuit building an enjoyable activity that will continue being enjoyable for years and years.

Be patient and alert

Take your time at the workbench — it's not a race! After a long session bent over the soldering iron, take a walk to clear your head and loosen your muscles. When you're troubleshooting and starting to get a little frustrated, that's the time to take a break. Many a project has been ruined or delayed because of working in a hurry or past the point of being alert.

Spring for quality tools and toolbox

Buy the best quality tools you can afford. Some of your tools might be with you for 40 years or more! Keep them clean and dry, don't abuse them, and store them in a good tool chest or carrying case. Beware of "grocery-store specials!" A high-quality tool will get the job done better and faster, plus it won't wear out as quickly.

Use plenty of light

It's important to be able to see what you're doing! Particularly when working on surface-mount electronics or other miniaturized circuits, good lighting can mean the difference between success and failure. A swing-arm lamp with a high-intensity bulb can put brilliant light exactly where it's needed. A head-mounted LED lamp will also do the job.

Hold on to your junk

Here's one of the best-kept secrets — the junk box full of spare, castoff, and reused items. Entire projects can be built from a well-stocked junk box! Start with one for mechanical hardware (screws, nuts, springs, and so on) and another for electronic parts (transistors, resistors, and knobs). Save the conductive foam and bags that your parts are shipped in; you can use them in your junk box, too!

Buddy up

Get to know other local circuitbuilders. They can be invaluable sources of information and parts. Troubleshooting can also go a lot smoother with a friend around to ask the questions you didn't think of. Have an open house and learn

from each other. Attend local flea markets or conventions together. Keep on the lookout for ham radio, computer, and antique radio flea markets — these are usually treasure troves of electronic bargains.

Test in steps

As you build a project, stop as you complete sections of circuitry to perform simple checks. Did power get connected to everything it should and nothing it shouldn't? Does the amplifier amplify? Does the filter filter? Does the switch switch? These are much easier to test before the entire circuit or system is built. After everything is put together, any bugs in the finished product can be devilishly hard to isolate, so find as many as you can when things are simple.

Take pride in your craft

Last, but not least, take pride in the craft of your workmanship! Not all projects need to be works of art, but paying attention to detail and appearance often pays benefits of fewer failures and easier maintenance. Plus, you'll swell with pride when somebody looks over your work and says, "Nice job!"

- Add a Comment

Circuit building Projects: The Solderless Breadboard

By H. Ward Silver from Circuit building Do-It-Yourself For Dummies

Using a breadboard is one of the basic starting points for the design of many types of circuits and projects. Also known as a *plugboard* or *prototyping board*, this miniature workbench allows you to whip up a circuit or try a new design in just minutes!

You can probably pick one up at your local RadioShack store. Models are available from postage stamp sizes used for trying small circuits inside equipment, all the way to foot-square models on which entire complex circuits can be built. A small one will do just fine as you start out, but it's a good idea to buy one size bigger than you think you need.

A solderless breadboard consists of plastic strips with small holes into which the leads of electronic components are inserted. Brass strips under the holes connect each short row of openings together. Any two leads inserted into the same row of holes will be connected together electrically. The plastic body keeps adjacent strips from shorting together.

Up to four leads can be connected together in this way. If more common connections are required, a short piece of wire can be used to connect two (or more) rows together, creating a common electrical contact between all the holes in those rows. The slot between halves of the plastic strip is an insulating gap between the two sides so that integrated circuits with a DIP (Dual In-line Package) can be inserted with one row of pins on each side of the strip.

Most breadboards have areas for point-to-point circuit wiring and areas for distributing power and ground. These are called *rails*, and they run the length of the breadboard's plastic strips. For analog circuits, these are generally used for

positive and negative power supplies, plus a common ground or return to the power supply. Builders of digital circuits that operate from a single voltage find it easier to "double up" and use the extra rail for a duplicate power supply connection. Breadboards with more than one strip, each with its own set of rails, are easy to use for circuits that have both analog and digital circuitry.

If you are just getting started, you might consider purchasing a breadboard that comes with its own power supplies and possibly even some limited test capabilities. More expensive models even have test meters and test signal generators. Although separate power supplies and test equipment might be more flexible and have additional features, the convenience of always having the test equipment connected and ready will be appreciated.

In keeping with the theme of convenience, breadboards hardly need any special materials to use! You'll need some test equipment to power and measure your circuits, certainly, but aside from the components themselves, here is a short list of things you'll need:

- **Insulated jumpers** (20- to 24-gauge solid, insulated wire in various colors): They don't have to be tinned (coated with solder); bare copper is fine.
- **Bare jumpers** (20- to 24-gauge solid bare wire): These are used to connect adjacent rows of contacts, to create connection points for external equipment, or to make leads for items that don't have suitable leads for insertion into the breadboard sockets. Save the clipped-off pieces of component leads to create a bountiful supply!
- **Leaded components:** It's very difficult, if not impossible, to use surface-mount technology (SMT) components with a breadboard. Make the task easier by purchasing and stocking only leaded components.

That's it! No special tools other than needle-nose pliers and a small pair of wire cutters are needed. You may also want to augment your eyesight by purchasing a pair of head-mounted magnifier glasses from a local craft store.

Circuit building and Resistor Color Codes

By H. Ward Silver

PART OF THE CIRCUITBUILDING DO-IT-YOURSELF FOR DUMMIES CHEAT SHEET

Resistors are common passive electronic parts (meaning they don't need power to run) for circuitbuilding. Resistors control currents and voltages and they're manufactured in a variety of ways. Use this table to read resistor color codes for circuitbuilding:

Color	Value Stripe	Multiplier Stripe	Tolerance Stripe
Black	0	times; 1 (10^0)	

Brown	1	times; 10 (10^1)	1%
Red	2	times; 100 (10^2)	2%
Orange	3	times; 1000 (10^3)	
Yellow	4	times; 10,000 (10^4)	
Green	5	times; 100,000 (10^5)	0.5%
Blue	6	times; 1,000,000 (10^6)	0.25%
Violet	7	times; 10,000,000 (10^7)	0.1%
Gray	8	times; 100,000,000 (10^8)	0.05%
White	9	times; 1,000,000,000 (10^9)	
Gold		times; 0.1	5%
Silver		times; 0.01	10%
No color			20%

Building a Circuit Dead-Bug Style

By H. Ward Silver from Circuitbuilding Do-It-Yourself For Dummies

With *dead-bug style* circuitbuilding, the integrated circuits (ICs) are all mounted upside down on the printed circuit (PC) board with most of their legs sticking up in the air! They look like a lot of . . . dead bugs! Another name for this type of construction is "air circuits" because the components are attached directly to each other over the underlying

PC board. The technique is easy for beginners because it requires no special tools, gadgets, or techniques. Just solder the parts together and to a PC board and go! This is a great method to wire up a simple circuit to see how it really performs.

With dead-bug construction, the PC board surface is usually made to be the circuit's ground. This is sometimes referred to as a *ground plane.* Because the ground is literally everywhere, and because it's such a wide conductor, dead-bug construction works well for sensitive circuits and even at high frequencies. Conversely, this makes routing power supply connections a little more difficult, since everything is exposed.

Dead-bug construction generally becomes impractical once the IC pin count exceeds 20 pins or if there are more than two or three ICs. Complex circuits have so many connections and components that it becomes hard to keep all of the connections straight and separated. Dead-bug style works best with one or two ICs.

If your circuit doesn't have a lot of components that attach to ground, you can use high-value resistors (1 MΩ or higher) as supports for other components. Solder one lead of the resistor to the PC board and stand it upright. Other components can then use the remaining lead as a tie point for connections with other components. Terminal strips (metal solder lugs mounted on an insulating strip) can also be used.

To make the connections, components are mostly soldered directly together, lead to lead. You will have to bend the leads and orient the components to make the circuit work electrically and for mechanical stability. If jumper wires between connections are needed, bare wire can be used for short distances, but insulated #30 wire-wrap wire or #24 or #26 hookup wire can be used. Solid wire is preferred because it will keep its shape, whereas stranded wire is more flexible.

The drawbacks of dead-bug construction

Dead-bug construction is very straightforward and requires no special tools, but it's not suitable for all kinds of circuits and applications. In the spirit of helping you choose the appropriate technique for your circuit, the primary weaknesses of dead bugs are listed here:

- **Not mechanically robust.** Dead-bug circuits, like their namesake, are easy to squash! They are also not suitable for tough environments like in cars or outside. The technique is a good way to build a prototype or experiment.
- **Hard to make major modifications.** While it's easy to change a component like a resistor or capacitor, it's quite difficult to change an IC or redesign a large chunk of the circuitry.

- **Solder blobs.** Dead-bug technique puts a premium on soldering technique. Messy soldering that drips excess solder will create short circuits, usually in places difficult to access. Use the minimum amount of solder and take your time.
- **Hard to duplicate.** When you're done, you will probably have a one-of-a-kind circuit. If that's all you need, great! Don't plan on using this technique on a production line, though.

Circuit building Do-It-Yourself For Dummies

- From Circuitbuilding Do-It-Yourself For Dummies by H. Ward Silver
- If you want to try your hand at building circuits or other electronics, make sure you keep the right tools on hand, know how to read resistor color codes and the value markings for capacitors, and understand the metric system of units and voltage conversions.

Circuit building and Resistor Color Codes

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Gold		times; 0.1	5%

Silver	times; 0.01	10%
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###L (Three numbers and a letter)	Numbers 1 and 2 are value digits. Number 3 is a multiplier: 0 = × 1, 1 = × 10, 2 = × 100, 3 = × 1000, 4 = × 10,000. Letter denotes tolerance: J = 5%, K = 10%, L = 20%
##p or ##n	Numbers 1 and 2 are value digits. p denotes pF, n denotes nF.

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Drill Sizes Commonly Used in Electronics

- Building circuits and other electronics requires a small electric drill, cordless or not. Invest in a small bench-mount drill press if you're installing circuits in project boxes and cabinets so it looks good. This guide shows you drill sizes you'll need:

Size Number	Diameter	Next Largest Fractional Size	Clears Screw Size	For Self-Tapping Screw Size
11	0.191″	13/64″		10
19	0.166″	11/64″	8	
21	0.159″	11/64″		10-32
25	0.149″	5/32″		10-24
28	0.140″	9/64″	6	

29	0.136″	9/64″		8-32
33	0.113″	1/8″	4	
36	0.106″	7/64″		6-32
43	0.089″	3/32″		4-40
44	0.086″	3/32″	2	
50	0.070″	5/64″		2-56

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-

- **Metric System Unit Prefixes**
- For building circuits or other electronics, a system of prefixes is used to make managing and reading metric easier. Use this chart to learn the metric prefix, its symbol, and the decimal value.

Prefix	Symbol	Multiplication Factor
tera-	T	10^{12}
giga-	G	10^{9}
mega-	M	10^{6}
kilo-	k	10^{3}
centi-	c	10^{-2}
milli-	m	10^{-3}
micro-	m	10^{-6}
nano-	n	10^{-9}
pico-	p	10^{-12}

-

- **Voltage Conversions**
- Here are some handy mathematical formulas to help you figure out what those waveforms mean, and how to convert them to other measurements, when you're measuring voltage in your batteries or other electronic devices.

Sine or square wave	$V_{PEAK-TO-PEAK} = 2 \times V_{PEAK}$
Sine wave	$V_{RMS} = 0.707 \times V_{PEAK}$, $V_{PEAK} = 1.414 \times V_{RMS}$
Square wave	$V_{RMS} = V_{PEAK}$
Power to decibels	$dB = 10 \log_{10} (Power\ 1 / Power\ 2)$
Voltage to decibels	$dB = 20 \log_{10} (Voltage\ 1 / Voltage\ 2)$
Decibels to power	$Power\ 1 = Power\ 2 \times antilog_{10} (dB / 10)$
Decibels to voltage	$Voltage\ 1 = Voltage\ 2 \times antilog_{10} (dB / 20)$

Splicing a Power Cord

By H. Ward Silver from Circuitbuilding Do-It-Yourself For Dummies

Power cords get damaged from all sorts of things; over-enthusiastic weed-whacking or hedge-trimming, forgetting that the car's battery warmer was still plugged in, even being chewed up by dogs and rodents! New cords aren't cheap as any hardware store patron knows. This task shows you how to make that cord almost as good as new for the cost of a little time and effort. It demonstrates repairing a 3-wire power cord but the same techniques apply to their smaller 2-wire power cord cousins.

To splice a power cord, you'll need the following tools: a sharp knife, wire cutters, wire strippers, and a soldering iron and solder. You'll also need a 3-wire power cord and heat shrink tubing — 1/4-inch diameter to fit the inner wires and a larger size 50% larger than the diameter of the cord.

This project should take less than an hour:

1. **Trim the separated ends of the cord and remove any frayed, wet, or oxidized wire.**
2. **Cut a 6-inch piece of heat-shrink tubing with a diameter 50% greater than the cord's jacket.**
3. **Trim 4 inches of jacket from each piece of cord. Avoid nicking the inner wires or their insulation by scoring the jacket and flexing the cord until the jacket breaks away cleanly. Untwist and straighten each wire. Remove any string or filler material. Slide the heat shrink tubing over either piece of cord.**
4. **To separate the splices of each individual wire, perform the splice at a different point on each pair of wires. On the left-hand piece of cord, cut the wires as follows: hot — 2 inches from the jacket, neutral — 3 inches from the jacket, ground — do not cut.**

   On the right-hand piece of cord, cut the wires as follows:

- Hot: do not cut
- Neutral: 3 inches from jacket
- Ground: 2 inches from jacket

   Strip each wire 1 inch. Each splice will be 1 inch apart, keeping plenty of insulation between the bare wires.

5. **Cut three 1-1/2-inch pieces of 1⁄4-inch diameter heat shrink tubing. Slip one piece over each wire.**
6. **Starting with the neutral wire (it will be the easiest since both pieces are longer), cross the stripped wires at their midpoint and twist each around the other in opposite directions. This is a "Western Union" splice, originally invented for repairing telegraph lines in the mid-1800s! Continue twisting until the wires are snugly wrapped around each other.**

7. **Solder the wires together, center the heat-shrink tubing over the splice and shrink it.**
8. **Repeat Steps 6 and 7 for the hot and ground wires.**
9. **Center the large piece of heat-shrink tubing over the entire splice and shrink it.**
10. **Wrap the splice with good-quality electrical tape twice, once in each direction, overlapping each successive wrap at least 50%. At the end of the wrap, cut the tape and press it into place.**

Do not pull the tape apart; that causes the top layer to begin to separate. Eventually pulled-apart tape comes completely loose (flagging).

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By H. Ward Silver

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Power to decibels	$dB = 10 \log_{10}$ (Power 1 / Power 2)
Voltage to decibels	$dB = 20 \log_{10}$ (Voltage 1 / Voltage 2)
Decibels to power	Power 1 = Power 2 × antilog_{10} (dB / 10)
Decibels to voltage	Voltage 1 = Voltage 2 × antilog_{10} (dB / 20)

Drill Sizes Commonly Used in Electronics

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44	0.086″	3/32″	2	
50	0.070″	5/64″		2-56

Lastly:

“To earn a lot of money you must know something. If you wait for someone to teach you everything, you are in line with everyone else. Amateur Radio is a way to self-learn calling on “Elmer’s” when needed. This increases your skills, technical knowledge and abilities. You are in charge and you are ahead of the competition.”