OUR 26TH YEAR!

EPARA BEACON

VOL. 6, NUMBER 3 THE OFFICIAL NEWSLETTER OF THE EASTERN PENNSYLVANIA AMATEUR RADIO ASSOCIATION MARCH 2022

NEXT CLUB MEETING: MARCH 11TH

Monroe County Public Safety Center, 100 Gypsum Rd Stroudsburg, PA 18360

Welcome to the EPARA Beacon! This newsletter is published monthly and is the official newsletter of the Eastern Pennsylvania Amateur Radio Association. EPARA has served the amateur radio community in the Pocono Mountains for over 25 years. We have been an ARRL affiliated club since 1995. We offer opportunities for learning and the advancement of skills in the radio art for hams and non-hams alike. EPARA supports Monroe County ARES/RACES in their mission of providing emergency communications for served agencies in Monroe County. Feel free to join us at one of our meetings or operating events during the year. The club meets on the second Thursday of every month, at the Monroe County 911 Emergency Control Center. The business meeting starts at 7:30 P.M. Anyone interested is invited to participate in our meetings and activities.

ZOOM Meeting Info: Meetings begin at 7:30PM!

https://us02web.zoom.us/j/85463346031?pwd=bU1KcVZoaVZiVEUvdjRsUXlNNHZkZz09

Meeting ID: 854 6334 6031 Password: 244632

From The President

It is with great sadness that we learn of the passing of Benjamin Deutsch KB3WIZ, Benjamin was Doug KG3I's son, and our hearts go out to Doug and the entire Deutsch family.

As March arrives, we find ourselves preparing for the spring and summer events for EPARA. The confirmation for the use of Big Pocono State Park for Field Day and Elmer/Antenna weekend is complete. We have ordered the M2 antenna for the antenna array needed for our EME project. We have also started the grant process to fund our EMCOMM Trailer replacement. So many of us are quite busy with club projects. MCARES is planning a set for May, and they are working with the Red Cross to setup a fully functional shack at the RED Cross Chapter House with both VHF/UHF and HF capabilities.

Tech classes begin on March 16th with General classes scheduled for this summer. Our VE sessions have been well attended so far this year bringing several new people into the hobby of amateur radio. So, as you can see things are going quite well for our group!

Its election time for EPARA, nominations are open for Board and Officer positions. We have several nominations already and the nominations will remain open into the March meeting. Contested positions will be voted upon by secret ballot at our March meeting. If you are interested in becoming more involved with the running of the club let it be known and I know someone will nominate you!

That's it for now. Our next meeting is on Thursday March 10th, I hope to see you all.

73, Chris AJ3C

CONTACT INFORMATION

President Chris Saunders AJ3C: ajc3@gmx.com	Vice President Bill Carpenter AB3ME: bill47@ptd.net
Secretary Kevin Forest W3KCF: w3kcf@outlook.com	Treasurer Scott Phelan KC3IAO: kc3iao@hobbyguild.com
Member at Large Eric Weis N3SWR: n3swr@ptd.net	ARES EC Charles Borger KB3JUF KB3JUF@gmail.com

Postal Address:	Web Site:	Send dues to:	Newsletter submissions to:
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What's INSIDE this ISSUE

EPARA Net list

Monroe county ARES-RACES – Sunday's 8:30 PM, 146.865 MHz, PL -100 Hz

The Monday Night Pimple Hill repeater 8:30 PM (Repeater freq = 447.275 with a - 5MHz offset) DMR TECH Net on TG314273* Time Slot 2

SPARK Information/Swap Net – Tuesday's 8:30 PM, 147.045 MHz, PL 131.8 Hz

The Wednesday Night EPARA Hot Spot DMR Rag Chew net at 8:30 PM, TG 3149822* Time Slot 2 (N3IS Talk Group)

EPARA Tech Net – Friday's 8:30 PM, 147.045 MHz, PL +131.8 Hz

*TG = Talk Group

Announcements
AND UPCOMING EVENTS

EPARA Club Dues
Club dues were due January 1st and are temporarily extended due to COVID reasons. For those that missed the chance to stay current, there are two (2) methods available to pay to help make this easy for all. Contact Scott KC3IAO via his email: KC3IAO@hobbyguild.com and you can send him a check or pay via PayPal.

VE Sessions
VE sessions have returned. Please contact Chris AJ3C for dates and info should you require a test session.

Amateur radio Classes
Technician classes are scheduled to begin in March, and General classes in Early summer.

Hamfest!
The date for next years hamfest has been decided and it's to be on Sunday, September 18th, 2022.

EPARA Patches: Club patches are in! For those that ordered them please step forward to collect them. We also have extra just in case ...

Rule #1 of Amateur Radio, it is a hobby, unless you figured out a way to fashion a living out of it.
Rule #2 of Amateur Radio, life is not a hobby and typically carries heavy responsibilities of everything that is not a hobby.
Rule #3 of Amateur Radio, never give up a LIFE event for a Ham event. You may make some great memories at the Ham event, but the guilt you may carry missing a LIFE event can be a terribly heavy millstone.
Rule #4 of Amateur Radio, as technology moves forward, so does Ham Radio - do what makes you happiest, experiment with other elements of Ham Radio as LIFE allows.
Rule #5 of Amateur Radio, it is only Ham Radio, when confused always refer to Rule #1 through #4.

EPARA GENERAL MEMBERSHIP MEETING AGENDA

EPARA General Membership Meeting Minutes
February *10th* 2022

General Membership Meeting 7:30Pm

Open meeting:

Meeting called to order at 7:30 pm on February 10, 2022 by Chris AJ3C
Introductions with call signs
Declaration of Quorum.
Total members attending: 17: 7 members at the 911 Center and 10 members on Zoom. Visitors present: 0.

Pledge of Allegiance / Moment of silence:

A moment of silence was observed for the Passing of Benjamin L Deutsch KB3WIZ.

Membership Meeting - Minutes January 13th, 2021:

Secretary - Kevin W3KCF:

Meeting minutes for January 13th, 2021 were emailed to EPARA members. Chris – AJ3C asked members if they had read the minutes from our previous meeting. He then asked if there were any questions or objections to the minutes as they were presented. With no objections, Chris asked for a motion to accept the minutes as presented:

Motion to accept minutes as presented: By RuthAnn – W9FBO 2nd by Alex – KD2FTA Motion Passed

Treasurers report: For the February 2022 EPARA Club Meeting

By Scott Phelan, KC3IAO

Bank Account Statement Opening Balance (1/31/22 statement.): $4214.65
Expenses: None.

Income:
$50.00 Dues; KC3JCE (15), W9FBO (15), AJ3C (20). $0.18 in bank interest.
Closing Balance: $4264.83

Our PayPal Account:
January 31st, 2022 statement opening balance of $56.44
Expenses: None
Income:
$145.00 Dues; NA7L (20), KB3OVB (15), KC3PPB (20), KF6AOH (15), KC3SCJ (20), KC3IAO (20), AB3ME (15), NV3I (20).

Fees: $7.34
Closing balance of $194.10
Treasures report read by Scott, KC3IAO

Motion to accept reports by Charlie-KB3JUF 2½ by Len – KC3OND Motion Passed

Correspondence:
None

New Opportunities for the Technician (See page 4)

EPARA GENERAL MEMBERSHIP MEETING AGENDA

Reports of officers and committee's:

Bill AB3ME – Program Committee:

Bill stated there is no presentation after the meeting tonight, but asked if anyone else was interested in giving a presentation the following month, please contact him or Chris to set things up.

PIO:
Chris asked Ruth Ann W9FBO to fill the vacant Public Information Officer position.

Motion to accept RuthAnn by Chris-AJ3C 2nd by Charlie-KB3JUF Motion Passed

Charlie KB3JUF – ARES/RACES:

Charlie informed us that we're setting up a Winlink station at the Red Cross and are still looking for a computer and printer to use on site. We are going to be installing an HF antenna and feed line to use there and the Red Cross is paying for the equipment. Charlie stated that we'd like to set up a simulated emergency in May and open up two shelters for the exercise. He said we are going to pair up two members for each shelter. In addition, there will be a planning session in March, to work out the details. Please have your Go-Kits in order.

Charlie then emphasized that all member's "Task books" need to be up to date, as they are required for deployment. For those new to ARES, Charlie said he would bring the most current books to our next meeting. Also, he said, get involved and start checking into other ARES Nets to gain experience and see what is going on around the area.

If you are interested, we are still looking for additional members to volunteer for ARES.

Chris AJ3C -- Instruction and Training:

Tech class is scheduled to begin on March 16th, class is listed on the ARRL website.
There is still time to sign up. Anyone who knows someone who would like to join, have them contact Chris AJ3C asap

Chris AJ3C - Website

Site has been updated

Al, KB3OVB: Membership:

Current membership is 69.
AL is doing better and will hopefully return soon.

Eric N3SWR – Newsletter and Communications:

Eric said there was nothing new and asked if anyone had articles, they'd like to share, please send them to him at eparanewsletter@ptd.net.

Sat-Com / EME Group:

Chris asked Bob W3BMM how things were going with the clubs Facebook Page and if he needed any information. Bob said everything was going well. Alex then asked if we could make a motion to purchase a 2nd antenna for the EME moon bounce project. The antenna is a 2m 12 element antenna which would give us a 3db gain.

Charlie asks how much? Chris said currently they are running about $360. A motion was made to budget $450 for the project which would cover all expenses. Alex also stated he was donating the current tripod to the club.

New Opportunities for the Technician (See page 4)

EPARA GENERAL MEMBERSHIP MEETING AGENDA

Motion to accept Antenna purchase for EME by Alex-KD2FTA 2nd by Bob-W3BMM Motion Passed

Old business:

2020 / 2021 audit:

The 2020 budget audit will be conducted along with the 2021 audit in January 2022. Audit team will consist of Edward KC3OLB, Eric N3SWR, and Bill AB3ME (update). Scott said the 2021 books are complete and the 2020 books would be ready soon.

OCF Dipole Repair
Replacement or the antenna rope for the OCF Dipole was postponed due to inclement weather. We need to reschedule this when the weather warms up (Late March).

Winter Field Day:
EPARA did not hold a Winter Field Day outing this year, did any all members participate in WFD using their own call signs. No one in the club participated this year.

Any other old business

New business:

Officer Nominations and Elections:

It is time to hold officer elections, nominations for President, Vice President, Secretary, Treasurer, and the Board Member at Large are now open. We will call for additional nominations and hold elections at the March meeting.

Bill AB3ME after serving two terms as Vice President has decided to not run for a third term, Chris AJ3C thanked Bill for his service on the board and for being instrumental in returning EPARA to a club we can all be proud of.

Chris AJ3C nominated the following:

Scott KC3AIO – Treasurer 2nd by Alex-KD2FTA

Kevin W3KCF – Secretary 2nd by RuthAnn-W9FBO

Eric N3SWR – Board Member at Large 2nd by Charlie-KB3JUF

Chris-AJ3C – President: Nominated by RuthAnn-W9FB and 2nd by Alex-KD2FTA

Chris AJ3C called for additional nominations from the floor.

Alex-KD2FTA and Kevin-W3KCF made a motion and 2nd to nominate Bob-W3BMM as Vice-President. Bob said he would take it under consideration.

Any Other New Business

Votes / New members: None

Announcements:
2022 Dues are due, payment can be made by check or PayPal. Due to the ongoing COVID-19|situation, EPARA

New Opportunities for the Technician (See page 4)

EPARA GENERAL MEMBERSHIP MEETING AGENDA

will accommodate late payments with no effect on membership status until we can resume in-person meetings.

Dues can be submitted either by sending a check to the club's PO Box, or through PayPal by emailing Scott – KC3IAO:

Eastern Pennsylvania Amateur Radio Association
P.O. Box 521, Sciota, PA 18354
KC3IAO@hobbyguild.com

Any Additional Announcements
None

There was no 50/50 raffle this month

Adjournment…

Meeting was adjourned at 8:08 pm. Motion to close by RuthAnn - W9FBO 2nd by Dan-KC3JCE. Motion Passed

Secretary
Kevin Forrest
W3KCF

New Opportunities for the Technician (See page 4)

EPARA MEETING

TEST YOUR KNOWLEDGE!

What can be done to prevent unwanted oscillations in an RF power amplifier?

A. Tune the stage for maximum SWR
B. Tune both the input and output for maximum power
C. Install parasitic suppressors and/or neutralize the stage
D. Use a phase inverter in the output filter

Last month's answer was, C. A roofing filter is placed early in the IF amplifier chain and shields the later IF filter stages from strong signals outside of the filters bandwidth. By blocking strong signals near the receive frequency that could cause overloading and distortion in the following amplifier stages, a narrow-band roofing filter improves a receiver's dynamic range.

DMR
DIGITAL MOBILE RADIO

The EPARA HOT SPOT Wednesday night DMR rag chew is here!

Wednesday evenings at 8:30 PM local, 0:30 UTC!

Tune your DMR radios to Talk Group 3149822 TS2 to join the

N3IS EPARA Hot Spot rag chew DMR net.

Listen to the Tech Net Friday nights on the 147.045 repeater to learn more about joining this net and for upcoming ZOOM meetings announcements to learn more about programing your radios and hot spots!

To: All EPARA Members and Users of the WA3MDP Repeater System

Re: The 147.045 Repeater Malicious Interference

Over the past few years the 147.045 repeater here in Monroe County has been plagued with an increasing amount of deliberate and malicious interference. While some of this interference has been directed at some specific operators the end results has been a wide area large foot print repeater that get little to no use except for a few regularly scheduled nets.

This is not a problem that is special to just the 147.045 system. Nationwide FM repeaters (and HF bands for the matter) are also being interfered with deliberately and the FCC lacks the manpower and ability to search out the people causing the issues.

The ARRL in conjunction with the FCC reorganized the Volunteer Monitor program a while back to assist in tracking down QRM on all of the amateur bands. While some progress has been made there obviously is a lot more to be done.

A small dedicated group has been tracking the QRM locally by various means for over a year. While some of the sources have been narrowed down it is now time to get the rest of the local ham community involved.

What we are asking people to do is when you listen to the 147.045 repeater also listen to the "input" frequency which is 147.645 (no tone is required). If you should hear any of the malicious and deliberate QRM occurring, do the following:

1) DO NOT ENGAGE IN A CONVERSATION WITH THESE INDIVIDUALS.

2) If you hear farting, cat calls, high pitch cartoon voices, music, etc write down the DATE, TIME, YOUR LOCATION and APPROX STRENGTH OF THE QRM STATION. If you have a beam antenna and can provide a heading that would be great too!

3) Send your listening report to the email address LIDSonzero45@gmail.com.

ALL information will be kept confidential and with this added information we hope to narrow down the locations that have already been identified.

In closing let me assure you that the people looking for the sources of the interference are doing so with the blessing of the repeater owners. It is our desire to see the 147.045 repeater system return to the quality repeater that it used to be many years ago.

Thank you in advance for your cooperation.

VE Testing & Classes

Anyone looking to take an exam is encouraged to contact Chris AJ3C to preregister at least one (1) week in advance of the test date. If you have any questions or to register, Chris can be reached via email AJ3C@GMX.COM. VE sessions are being held the 4th Friday of each month at 6pm at the Monroe County 911 training center. Seating is limited for the time being so we can follow the health guidelines set forth by the county and state.

VE sessions are back - contact Chris AJ3C for further information!

AMATEUR RADIO CLASSES

Ham Radio Classes Forming Now!

The Eastern Pennsylvania Amateur Radio Association will be holding a 10 week course where you can learn everything you need to earn your Technician (entry level) FCC **Amateur Radio License**.

The Technician license is your gateway to the world-wide excitement of Amateur Radio and Emergency Communications.
You no longer need to learn Morse code!

Classes begin on March 16th 2022 at 7PM

Location: The Monroe County Public Safety Center
100 Gypsum Rd, Stroudsburg PA

Registration is required.

To join, contact:
Chris Saunders, AJ3C
570-213-4505, or aj3c@gmx.com

ARRL The national association for AMATEUR RADIO®

ARES/RACES meetings are now being held on the fourth Friday of each month at 7PM. The meetings are once again being held at the 911 call center. These meetings will serve as training sessions covering several aspects of amateur radio emergency communications. We will start with traffic handling and the use of Radiograms and the ICS 213 general message form. Future sessions will cover the use of several ICS forms and the setup and use of digital communication modes including Winlink, Packet Radio, APRS, and the FLDIGI software program. Meeting are open to all, you do not need to be an ARES/RACES team member to attend.

Want to Put Your Ham Radio Skills to Good Use? Get Involved in

EmComm!

One of the missions of the Amateur Radio Service is for amateur radio operators to provide public service and emergency communications (EmComm) when needed. We act as a voluntary noncommercial communication service and pitch in to help our communities and first responders.

So, what organizations are out there for community-minded amateur radio operators and what can we do to help?

Join In

One good entry point into public service and emergency communications is to join SkyWarn, a volunteer program run by the National Weather Service (NWS) with more than 290,000 trained severe weather spotters. These volunteers help keep their local communities safe by providing timely and accurate reports of severe weather to the NWS.

Not all of these weather spotters are amateur radio operators, but many are. Amateur radio communications can report severe weather in real time. When severe weather is imminent, SkyWarn spotters are deployed to the areas where severe weather is expected. A net is activated on a local repeater and SkyWarn spotters who are Hams check into that net. The net control advises the spotters when they might expect to see severe weather, and the spotters report conditions such as horizontal winds, large hail, rotating clouds, and even tornadoes.

To become a SkyWarn spotter, you must attend a class that teaches you the basics of severe weather, how to identify potentially severe weather features, and how to report them. The classes are free and typically last about two hours. Check your local NWS website for class schedules.

ARES/RACES/CERT

Another way Hams can become involved in public service and emergency communication is to join an ARES or RACES group. Technically, these are two separate services—the Amateur Radio Emergency Service (ARES) is run by the ARRL, while the Radio Amateur Civil Emergency Service (RACES) is a function of the Federal Emergency Management Agency (FEMA). Amateur radio operators who typically take part in one also take part in the other.

To participate in RACES, you'll need to take some self-study FEMA courses in emergency preparedness and emergency-response protocols. Classes may or may not be required to participate in ARES. These requirements are set by each individual ARES group. To get involved with either ARES or RACES, ask your local club members when they meet. You can also contact the Section Manager or Emergency Coordinator for your ARRL section. To contact them, click here and find the section that you live in.

Amateur radio operators belonging to ARES (and its predecessor, the Amateur Radio Emergency Corps) have responded to local and regional disasters since the 1930s, including the 9/11 attacks, and Hurricane Katrina and Hurricane Michael, among others.

The Community Emergency Response Team (CERT) program trains volunteers—both Hams and non-hams—how to be prepared for disasters that may impact their area. They provide basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. CERT offers a nationwide approach to volunteer training and organization that first responders can rely on during disaster situations, allowing them to focus on more complex tasks.

What Gear Do You Need?

For most local needs, a 5-watt VHF/UHF handheld transceiver is sufficient for utilizing local repeaters to relay messages and report on conditions as they exist. Replacing the radio's stock antenna with a higher gain antenna or connecting it to a magnetic mount on a vehicle will increase range significantly.

Even better is a VHF/UHF mobile radio installed in your vehicle with 25 or more watts output and a good mobile antenna. In the event the repeater loses power, you can talk over a considerably larger area in simplex mode with the extra power and a good mobile antenna.

If you work with an ARES or RACES group, you may be asked to act as a county control station. In this capacity, you'd need both HF and VHF transceivers in a fixed location, such as your house, with a good antenna system and emergency power capabilities like a generator or batteries. This allows you to make contacts within your state and throughout the U.S.

Helping Hams

Ham radio can play a key role in emergency situations. Here are a few examples:

- Ham radio connected firefighters and police departments, Red Cross workers, and other emergency personnel during the 2003 blackout that affected the northeast United States.
- In 2017, fifty amateur radio operators were dispatched to Puerto Rico to provide communications services in the wake of Hurricane Maria.
- Amateur radio operators provided communications in the aftermath of the Boston Marathon bombing when cellphone systems became overloaded.

- During Hurricane Katrina, more than one thousand ARES volunteers assisted in the aftermath and provided communications for the American Red Cross.
- During the devastating Oklahoma tornado outbreak that began in May 1999, amateur radio operators—giving timely ground-truth reports of severe weather—played a critical role in the warning and decision-making processes at the NWS Weather Forecast Office in Norman, Oklahoma.
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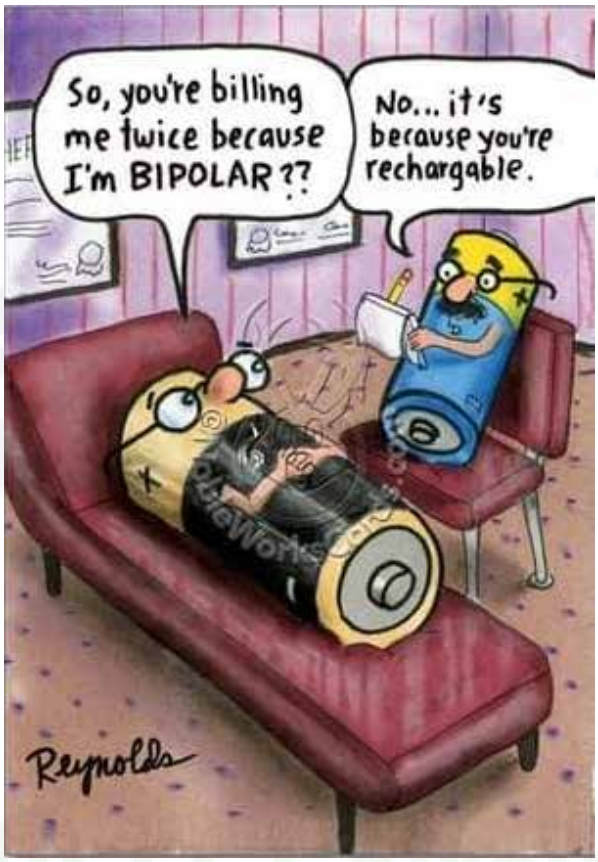
Credit: https://www.onallbands.com/want-to-put-your-ham-radio-skills-to-good-use-get-involved-in-emcomm/

From the Editor

Eric, N3SWR

Well March is finally upon us and Spring is just three weeks away! I'm crossing my fingers as I type this for NO MORE SNOW. There, I said it so now we will get slammed next month :)



I'm amazed just how many "fix-it later" projects ended up being stored in my basement waiting to be looked at on some future date. I have an old Fluke 8400A DMM that needed the polarity indicator nixie tube replaced - yes NIXIE tube! The trouble is they are impossible to find unless you really dig around. An HP 3585A spectrum analyzer for audio work that took me over 5 years to find the proper service manual for this very early serial numbered specimen. HP built some of the best test gear in history! A Swan 350 radio that really needs to be gone through to bring this beast back to life - this should be interesting! Aside from radio I actually do love tube audio and I managed to repair an old DBX 3BX dynamic range expander that decided to quit working last month. Doing all this helped me clear off the repair bench and I haven't seen the top of that ESD mat in years. Hopefully with a bunch of things off my shoulders I can concentrate on fiddling with electronics more often now. It's not all about fixing stuff - ya gotta enjoy it too!

Till next month, 73
Eric N3SWR

Two things are infinite: the universe and human stupidity; and I'm not sure about the universe.
Albert Einstein

Topics of Interest

Have an idea you would like to share with your fellow hams? Interested in one of the new exotic digital modes and would like to get others interested in it too? Found a blog somewhere that you think others would find interesting? Members are encouraged to submit items of interest for publication. Submitted articles (are suggested) to be no more than a page or two in length and may be edited for content and grammar. The EPARA officers and newsletter editor reserve the right to determine which items will be included in The Beacon. The deadline for publication is the 15th of the month. The publication date will be at the end of each month. Copyrights are the property of their respective owners and their use is strictly non-profit/educational and intended to foster the spirit of amateur radio.

If you've taken pictures at an event and would like to submit them for possible inclusion in the newsletter, forward them to the newsletter editor. Please send action shots, if possible. Faces are often preferable over the backs of heads. Many hams may be way too overweight, so please consider using a wide-angled lens.

Disclaimer

The Beacon is not representative of the views or opinions of the whole organization, and such views and opinions expressed herein are of the individual author(s).

Bruce Draper, AA5B, aa5b.corral@gmail.com

Contest Corral

March 2022

Check for updates and a downloadable PDF version online at **www.arrl.org/contest-calendar**.
Refer to the contest websites for full rules, scoring information, operating periods or time limits, and log submission information.

Start - Finish Date-Time				Bands	Contest Name	Mode	Exchange	Sponsor's Website
1	1900	1	2100	3.5	AGCW YL-CW Party	CW	RST, serial, "YL" (if a YL), name	agcw.de/contest/yl-cw-party
2	1300	2	1400	1.8-28	CWops Mini-CWT Test	CW	Name, mbr or SPC	cwops.org/cwops-tests
2	1700	2	2000	144	VHF-UHF FT8 Activity Contest	Dig	4-char grid square	ft8activity.eu/index.php/en
2	1900	2	2000	1.8-28	CWops Mini-CWT Test	CW	Name, mbr or SPC	cwops.org/cwops-tests
2	2000	2	2100	3.5	UKEICC 80-Meter Contest	Ph	6-char grid square	ukeicc.com/80m-rules.php
2	2300	6	2300	3.5-14	AWA Rollins Memorial DX Contest	CW	RST, equipment type and year	antiquewireless.org
3	0000	4	0300	7	Walk for the Bacon QRP Contest	CW	RST, SPC, name, mbr or power	qrpcontest.com/pigwalk40
3	0300	3	0400	1.8-28	CWops Mini-CWT Test	CW	Name, mbr or SPC	cwops.org/cwops-tests
3	0700	3	0800	1.8-28	CWops Mini-CWT Test	CW	Name, mbr or SPC	cwops.org/cwops-tests
3	1800	3	2200	28	NRAU 10-Meter Activity Contest	CW Ph Dig	RS(T), 6-char grid square	nrrlcontest.no
3	2000	3	2200	1.8-50	SKCC Sprint Europe	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
4	0145	4	0215	1.8-21	NCCC RTTY Sprint	Dig	Serial, name, QTH	www.ncccsprint.com
4	0230	4	0300	1.8-21	NCCC Sprint	CW	Serial, name, QTH	www.ncccsprint.com
4	2000	4	2100	1.8-28	K1USN Slow Speed Test	CW	Name, SPC (max 20 WPM)	www.k1usn.com/sst.html
5	0000	6	2359	1.8-28	ARRL International DX Contest, SSB	Ph	W/VE: RS, SP; DX: RS, power	www.arrl.org/arrl-dx
5	0000	13	2359	Novice bands	Novice Rig Roundup	CW	Name, QTH; Optional: Rig	www.novicerigroundup.org
5	0600	5	0800	7, 14	Wake-Up! QRP Sprint	CW	RST, serial, suffix of previous QSO	qrp.ru/contest/wakeup
5	1800	6	1359	1.8-28	Open Ukraine RTTY Championship	Dig	State/province/canton/etc., serial	krs.ho.ua/openrtty
6	0700	6	1100	3.5	UBA Spring Contest, CW	CW	RST, serial, UBA section (if ON)	www.uba.be
6	1200	6	1400	7	SARL 40-Meter Simulated Emergency Test	Ph	RS, serial	www.sarl.org.za
6	1200	6	2200	3.5	NSARA Contest	CW Ph Dig	RS(T), Nova Scotia county or serial	nsara.ve1cfy.net/?page_id=82
6	1800	6	2200	3.5	WAB 3.5 MHz Phone	Ph	RS, serial, WAB square or country	wab.intermip.net/Contests.php
7	0000	7	0100	1.8-28	K1USN Slow Speed Test	CW	Name, SPC (max 20 WPM)	www.k1usn.com/sst.html
7	1630	7	1729	3.5, 7	OK1WC Memorial (MWC)	CW	RST, serial	memorial-ok1wc.cz
7	2000	7	2130	3.5	RSGB 80-Meter Club Championship, Digital	Dig	RST, serial	www.rsgbcc.org/hf
8	0200	8	0400	3.5-28	ARS Spartan Sprint	CW	RST, SPC, power	arsqrp.blogspot.com
12	0000	12	2359	3.5-28	YB DX RTTY Contest	Dig	RST, serial	rtty.ybdxcontest.com
12	1000	13	1000	3.5-28	RSGB Commonwealth Contest	CW	RST, serial	www.rsgbcc.org/hf
12	1200	13	1200	28	South America 10 Meter Contest	CW Ph	RS(T), CQ zone	sa10m.com.ar/wp/rules
12	1200	13	2359	1.8-50	SKCC Weekend Sprintathon	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
12	1400	12	2000	3.5-28	AGCW QRP Contest	CW	RST, serial, pwr class, mbr or "NM"	www.agcw.de/contest/qrp
12	1500	13	1500	1.8	Stew Perry Topband Challenge	CW	4-char grid square	www.kkn.net/stew
12	1500	13	2100	3.5-50	Oklahoma QSO Party	CW Ph	RS(T), OK county or SPC	k5cm.com/okqp.htm
12	1600	13	1600	3.5-28	EA PSK63 Contest	Dig	RSQ, EA province or serial	concursos.ure.es/en/eapsk63
12	1800	13	0559	3.5, 7	TESLA Memorial HF CW Contest	CW	RST, serial, 4-char grid square	www.radiosport.org.rs
12	1900	13	1900	1.8-28	Idaho QSO Party	CW Ph	RS(T), ID county or SPC	pocatelloarc.org/idahoqsoparty
12	2300	13	0300	3.5-14	North American Sprint, RTTY	Dig	Other's call, your call, serial, name, SPC	ncjweb.com
13	0700	13	1100	144	UBA Spring Contest, 2 Meters	CW Ph	RST, serial, UBA section (if ON)	www.uba.be
13	0700	13	1700	3.5-28	FIRAC HF Contest	CW	RST, serial, "F" (if a member)	www.firac.de
13	1800	14	0100	All	Wisconsin QSO Party	Ph	WI county or SPC	www.warac.org/wqp
14	0000	14	0200	1.8-28	4 States QRP Second Sunday Sprint	CW Ph	RS(T), SPC, mbr or power	www.4sqrp.com
14	1630	14	1729	3.5, 7	OK1WC Memorial (MWC)	CW	RST, serial	memorial-ok1wc.cz
15	1700	20	1700	3.5-28	CLARA Chatter Party	CW Ph	RS(T), name, SPC	clarayl.ca/chatter-party
16	2000	16	2130	3.5	RSGB 80-Meter Club Championship, CW	CW	RST, serial	www.rsgbcc.org/hf
17	0000	18	0300	14	Walk for the Bacon QRP Contest	CW	RST, SPC, name, mbr or power	qrpcontest.com/pigwalk20
17	0030	17	0230	3.5-14	NAQCC CW Sprint	CW	RST, SPC, mbr or power	naqcc.info
17	1900	17	2059	3.5	BCC QSO Party	CW Ph Dig	RS(T), T-shirt size	bavarian-contest-club.de/contest
19	0200	21	0159	3.5-28	BARTG HF RTTY Contest	Dig	RST, serial, 4-digit UTC time	www.bartg.org.uk
19	1200	20	1200	1.8-28	Russian DX Contest	CW Ph	RS(T), Oblast or serial	www.rdxc.org
19	1200	20	1200	3.5-144	F9AA Cup, SSB	Ph	RST, serial	www.site.urc.asso.fr
19	1400	19	1800	144, 432	AGCW VHF/UHF Contest	CW	RST, serial, power class, 6-char grid	agcw.de/contest/vhf-uhf
19	1400	20	2359	All	Virginia QSO Party	CW Ph Dig	Serial, VA county or SPC	qsl.net/sterling/VA_QSO_Party
19	2000	19	2159	1.8-28	Feld Hell Sprint	Dig	Mbr, SPC, grid	sites.google.com/site/feldhellclub
20	0700	20	1100	3.5	UBA Spring Contest, SSB	Ph	RS, serial, UBA section (if ON)	www.uba.be
20	2300	21	0100	1.8-28	Run for the Bacon QRP Contest	CW	RST, SPC, mbr or power	qrpcontest.com/pigrun
21	1630	21	1729	3.5, 7	OK1WC Memorial (MWC)	CW	RST, serial	memorial-ok1wc.cz
21	1800	21	2059	3.5, 7	Bucharest Digital Contest	Dig	RST, serial	yo3test201x.blogspot.com
23	0000	23	0200	1.8-50	SKCC Sprint	CW	RST, SPC, name, mbr or "none"	skccgroup.com
24	2000	24	2130	3.5	RSGB 80-Meter Club Championship, SSB	Ph	RS, serial	www.rsgbcc.org/hf
26	0000	26	2359	1.8-VHF	FOC QSO Party	CW	RST, name, mbr (if any)	g4foc.org/qsoparty
26	0000	27	2359	1.8-28	CQ WW WPX Contest, SSB	Ph	RS, serial	cqwpx.com/rules.htm
27	0600	27	1000	50	UBA Spring Contest, 6 Meter	CW Ph	RST, serial, UBA section (if ON)	www.uba.be
28	2000	28	2130	3.5-14	RSGB FT4 Contest	Dig	4-char grid square	www.rsgbcc.org/hf
30	2000	30	2100	3.5	UKEICC 80 Meter Contest	CW	6-char grid square	ukeicc.com/80m-rules.php

There are a number of weekly contests not included in the table above. For more info, visit: **www.qrpfoxhunt.org**, **www.ncccsprint.com**, and **www.cwops.org**. All dates and times refer to UTC and may be different from calendar dates in North America. Contests are not conducted on the 60-, 30-, 17-, or 12-meter bands. Mbr = Membership number. Serial = Sequential number of the contact. SPC = State, Province, DXCC Entity. XE = Mexican state. Listings in blue indicate contests sponsored by ARRL or *NCJ*. The latest time to make a valid contest QSO is the minute listed in the "Finish Time" column. *Data for Contest Corral is maintained on the WA7BNM Contest Calendar at* **www.contestcalendar.com** *and is extracted for publication in QST 2 months prior to the month of the contest. ARRL gratefully acknowledges the support of Bruce Horn, WA7BNM, in providing this service.*

Amateur Radio Special Event Stations!

02/05/2022 | TM9AP in memory of F9AP(SK)

Feb 5-Mar 6, 0900Z-2000Z, TM9AP, PARIS, FRANCE. FIRAC F5KTR. 14.070 14.074 21.074. QSL. Radio Club F5KTR, 9 rue du Chateau Landon, Paris 75010, FRANCE. In memory of Andre F9AP (SK) ARRL life member. the radio club F5KTR/F5RAC/F6RAC will activate TM9AP during the week ends. Modes FT8, PSK, HF SSB le.grac.free.fr

03/01/2022 | 100th Anniversary of WWL 870 AM

Mar 1-Mar 31, 0000Z-2359Z, W5WWL, New Orleans, LA. WWL Amateur Radio Club. 3.900 7.235 14.285 7.025. QSL. WWL ARC, 127 Highway Drive, New Orleans, LA 70121. www.qrz.com/db/w5wwl

03/01/2022 | 80th Anniversary Avro Lancaster - 1st Operational Sortie

Mar 1-Mar 28, 0001Z-2359Z, GB80LAN, Luton, UNITED KINGDOM. Royal Air Force Amateur Radio Society. 14.270 14.055 14.074 3.710. QSL. See website, for QSL information, RAF Waddington, RAF Halton, RAF Cosford, RAF East Kirkby, ENGLAND. The call will be active from four different locations at three Royal Air Force Amateur Radio Club Stations Waddington, Halton, Cosford and ex RAF East Kirkby (home of Lancaster "Just Jane"). Hopefully the call will be active on all bands and modes 160m - 70cms during the event. More info on qrz.com and rafars.org. VK80LAN & VE80LAN are also hoped to be on the air. www.qrz.com/db/gb80lan

03/01/2022 | Battleship Texas Birthday # 108

Mar 1-Mar 15, 0000Z-0000Z, W5T, Cleburne, TX. Club KC5NX. 14.255 14.045 7.240 7.235. QSL. Club KC5NX, 9200 Summit Court West, Cleburne, TX 76033-8212. Club KC5NX will again be on the air the first week of March to celebrate the Birthday of the Battleship Texas.... We have 500 QSL cards on hand now and waiting to say Howdy to Y'All..... come help us celebrate.... see QRZ.COM and or set up a time to work us..... 73 www.qrz.com/db/kc5nx

03/03/2022 | Copper Dog 150 Dog Sled Race

Mar 3-Mar 7, 1200Z-2000Z, K9C, Calumet, MI. Keweenaw County Repeater Association. 7.225 MHz 3.825 MHz. QSL. KCRA, 51950 Boston Road, Hancock, MI 49930. www.qrz.com/db/k9c or https://kcra-mi.net

03/12/2022 | USS Midway Special Event: Launching of USS Midway

Mar 12, 1700Z-2359Z, NI6IW, San Diego, CA. USS MIdway (CV-41) Museum Ship. 14.320 7.250 14.070 (PSK31) DSTAR (Papa Sys Rept). QSL. USS Midway Museum Ship COMEDTRA, 910N Harbor Drive, San Diego, CA 92101. www.qrz.com/db/ni6iw

03/14/2022 | PI Day - David Sarnoff Radio Club, Princeton, NJ

Mar 14, 0000Z-2359Z, N3P, Burlington, NJ. David Sarnoff Radio Club. 14.031 MHz 14.314 MHz 7.031 MHz 7.227 MHz. QSL. Don Corrington, 7 Pinewald Lane, Burlington, NJ 08016-3421. n2re.org

03/18/2022 | HamSCI 2022 Conference

Mar 18-Mar 20, 1400Z-0400Z, NN4SA, Huntsville, AL. HamSCI and NASA Marshall Space Flight Center ARC. 14.245 7.245 14.074 7.074. QSL. NASA MSFC ARC, c/o Matt McDougal, PO Box 12804, Huntsville, AL 35815. HamSCI and NASA MSFC ARC will operate from HamSCI Conference venue near Space and Rocket Center. Will be operating various bands and modes. Check spotting networks for frequencies and modes. Event info at hamsci.org and nn4sa.org. Send SASE for special QSL card. www.qrz.com/db/nn4sa

03/18/2022 | National Viet Nam War Veterans Day

Mar 18, 1800Z-2200Z, N3TAL, Lanham, MD. American Legion Post 275 ART. 7.275mhz +/- 5 khz. QSL. American Legion Post 275 ART, 8201 Martin Luthor King Jr. Hwy, Lanham, MD 20706. wa3dvo@verizon.net

03/19/2022 | Cherry Blossom Special Event Station

Amateur Radio Special Event Stations!

Mar 19, 1400Z-2000Z, W4BKM, Macon, GA. Macon Amateur Radio Club. 14.240 7.225. Certificate. Macon Amateur Radio Club, P.O. Box 4862, Macon, GA 31208-4862. w4bkm.org
03/19/2022 | National Quilting Day

Mar 19-Mar 20, 1400Z-0200Z, N0Q, Parker, CO. Cynthia Smith. 7.200 14.250; SSB and FT8. . QSL. Cynthia Smith, 23612 Glenmoor Dr, Parker, CO 80138-3112. Celebrating the art of quilting. Modes are SSB and FT8. Operating hours are 0800 MDT to 2000 MDT. QSLvia KB2UKM by 31 May with SASE. Msgt_smith_cap@hotmail.com
03/19/2022 | Scouts BSA WHOA weekend

Mar 19, 1400Z-2000Z, W1M, Russell, MA. Western Mass Council, Scouts BSA. 7.190 10.115 14.060 14.290. QSL. Tom Barker, WA1HRH, 329 Faraway Road, Whitefield, NH 03598. Monthly seasonal outdoor activities for Scouts and the general public including "ham radio in the woods." Paper logging. QSL via SASE and eQSL.
03/22/2022 | Honoring World War II Gunners at Buckingham Airfield

Mar 22-Mar 24, 1400Z-2100Z, W4LX, Fort Myers, FL. Fort Myers Amateur Radio Club. 28.360 21.360 14.270 146.685. Certificate & QSL. Ft Myers Amateur Radio Club, P.O. Box 61183, Fort Myers, FL 33906. https://fmarc.net
03/26/2022 | Commemoration of the Battle of Horseshoe Bend

Mar 26, 1400Z-2200Z, K4YWE/N4H, Alexander City, AL. Lake Martin Amateur Radio Club. 7.240 14.240. QSL. Michael Courtney, KK4AUP, 80 Herren Hill Road, Suite F, Tallassee, AL 36078. mikecourtney@charter.net
03/26/2022 | Walk for Water Charleston 2022

Mar 26, 0000Z-2359Z, W4W, Goose Creek, SC. Carolina SideWinders of the Lowcountry. 14.316 7.216 14.074. QSL. Carolina SideWinders, 318 Jennie St., Goose Creek, SC 29445. Around the world, more than 2.2 billion people do not have access to safe water. Water Mission International raises funds and awareness to fight the global water crisis by walking, so others don't have to. km4sw_614@yahoo.com
03/29/2022 | National Vietnam War Veterans Day

Mar 29, 1600Z-2130Z, W5KID, Baton Rouge, LA. Baton Rouge Amateur Radio Club. 7.040 7.250 14.040 14.250. QSL. USS Kidd Amateur Radio Club, 305 S. River Road, Baton Rouge, LA 70802. Operation aboard the USS KIDD (DD-661). WW II Fletcher class destroyer. qrz.com/db/w5kid

What It's Worth: Vacuum tubes worth more than the tube tester

If some of you have home electronic workshops like me or a section of your warehouse where no one's been in years, you probably have older electronic components stashed away on shelves or in boxes you haven't seen in quite some time. I have boxes of resistors, capacitors, transistors, ICs, and vacuum tubes I've picked up over the years in hopes of someday needing them for a repair or a project I never got to. Instead of tossing it out or recycling it all you might want to take a quick look to see what's there.

Recently I opened a box that I grabbed at a garage sale years ago that had around 25 older globe type 4 pin tubes. They all tested good! These 01A tubes were probably pulled form early radios at some point and set aside until a relative found them stashed away in an attic and them put them in a garage sale. The box of 25 old tubes that I had paid $5 for a few years ago is now worth $10 $20 per tube!

Fig.1: Assorted Early Radio Vacuum Tubes

There are usually five types of buyers looking for vacuum tubes: The Radio Collector/Restorer looking to bring old radios back to life or setting it up to display, Tube Collectors (there are actually whole books on collecting vacuum tubes and their original box art), Musicians who still use and love the sound of a classic tube guitar amp, Audiophiles who listen to vinyl played through tube stereos, and of course flippers looking to buy low and sell high on auction sites.

Early tubes

A market still exists for early tubes. Radio restorers are always on the lookout for 01A tubes ($10-$15) used in most 1920s radios. These tubes also used the numbers 201A and 301A depending on the manufacturer. Other early tube numbers to watch out for are 45 ($50-$70), 50 ($200+), 245 ($100+), 250 ($250-$350), WD-11 ($50-$135), and WD-12 ($30-$50). A hard-to-find 1L6 used in some Zenith 1950s portables sells for $40-$50. I have on occasion found pairs of number 45 tubes in old $20 radios at flea markets. There are far too many others to list here. You can check my links page for on-line tube sellers and I suggest you use 50% of their current asking prices as a gauge for what you may easily expect to sell a tube for.

Tube collectors

By far the highest prices paid for tubes are by Tube Collectors. I have seen collector prices triple over the past ten years. The first words I taught my wife to look for when searching through a pile of old tubes was "Western Electric". Some older Western Electric tubes unused or the original box will sometimes sell for over a thousand dollars at auction. Western Electric "Tennis Ball" tubes have glass globes about the size and shape of a tennis ball with a glass tip on the top. These numbers include 101D ($400+) and 205D ($300+). Other WE tubes include VT1 ($200+) and VT-2/205A ($150+). Any early vacuum tube with a "tip" (the little glass nub on the top) and a brass base has some value to

What It's Worth: Vacuum tubes worth more than the tube tester

collectors even if it's just usable for display.

Tubes for musicians and audiophiles

There is a large market today for newer tubes used in vintage music amplifiers and vintage tube stereo equipment. Sought after by Audiophiles, these include the common U.S. made 6L6 ($15-$25) and 12AX7 ($8-$15). If it's a Telefunken brand you can easily double or even triple the price. Some newer Western Electric tubes are also sought after by Audiophiles for use in amplifiers and vintage stereos. A few of the Western Electric numbers to watch for are 274B ($200+), 300B ($500+), and 349A ($400+).

TV tubes – The other end of the scale

Common tubes manufactured in the late 1950s or 1960s used primarily in televisions currently have little or no value. I have trouble selling a box of 100 mixed TV tubes for even $10 at swap meets.

"Firsts"

In collecting circles "Firsts" seem to be held in high regard. I recently came across a 1923 Westinghouse "Aeriotron" WD-11 Vacuum Tube. This was one of the first tubes available for consumer radios. A working early Aeriotron WD-11 can easily sell for up to $130 in today's collectors market. If it's not working it still is a valuable display item to a collector and a $75 to $80 selling price is not uncommon.

Fig. 2: 1923 Aeriotron WD-11 Tube

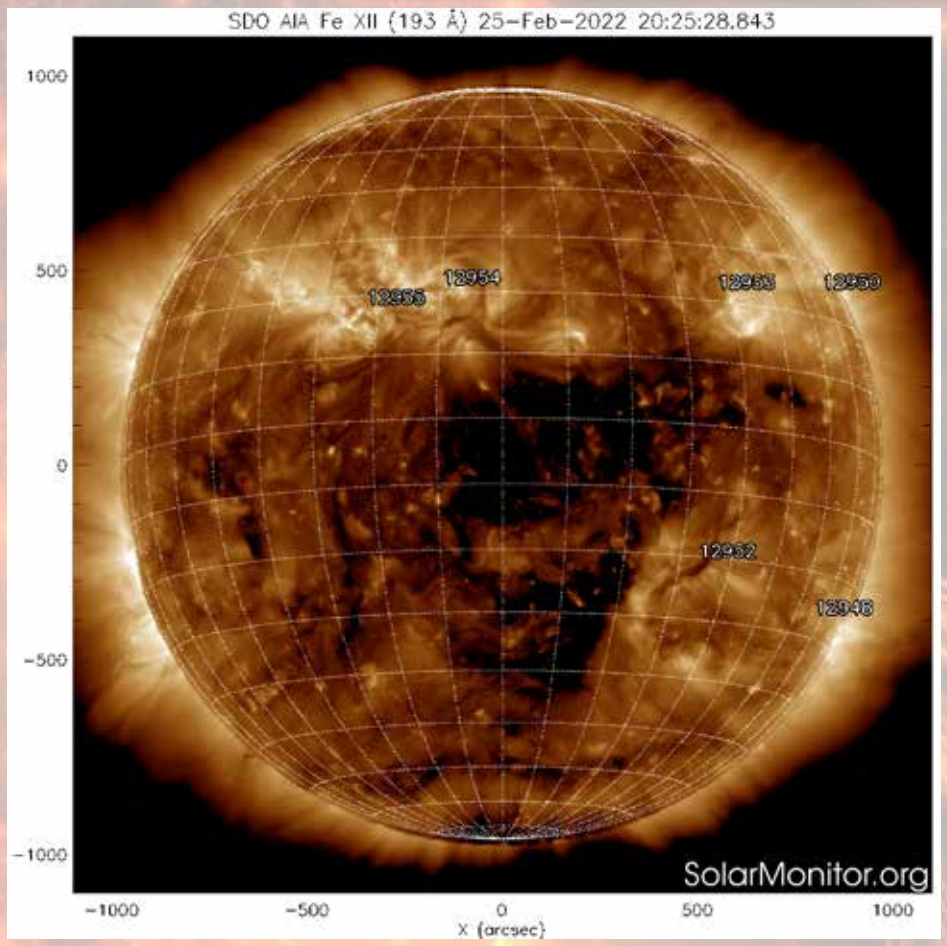
In the early 1950s the transistor appeared. One of the first transistors available to exterminators and hobbyist over the counter was the Raytheon CK722. These quickly became popular and were sold by the thousands. Hundreds of circuits were published over the next few years utilizing the new CK277. Today an original 1950s Raytheon CK722 in its cardboard folder sells for $30-$70. The earlier the date code the higher the collector value. In the CK722 photo the date code 611 represents week 11, 1956.

Fig. 3: Raytheon CK722 Transistor

Whether you are a collector, restorer, experimenter, or musician, the vacuum tube is still a sought after component. I am always surprised at the excitement and bidding an old box of tubes generates at an auction.

Credit: https://www.electronicproducts.com/what-its-worth-vacuum-tubes-worth-more-than-the-tube-tester/#

New sunspot groups appeared on February 17, 19, 20 and 21, but solar activity declined, even though sunspots were seen covering the sun every day.



Average daily sunspot number declined 21 points from 75.3 last week to 54.3 in the current reporting week, February 17-23. Average daily solar flux was down nearly 15 points from 110.1 to 95.4. On Thursday, February 24 the decline in sunspot numbers continued to 23, 31.3 points below the average in the previous seven days.

Average daily planetary A index went from 13 to 9.6, and average daily middle latitude A index was off by one point to 7.3.

Predicted solar flux is 95 on February 25, 100 on February 26-27, 105 on February 28 through March 2, 110 on March 3-4, 108 on March 5-8, 105 on March 9-11, 103 on March 12-13, 100 on March 14, 98 on March 15-16, 102 on March 17-19, 104 on March 20-22, 108 on March 23-26, 110 on March 27, 115 on March 28-29, then 112 and 110 on March 30-31, then 108 on April 1-4.

Predicted planetary A index is 5 and 10 on February 25-26, 8 on February 27 through March 3, 10 on March 4-5, 8 on March 6, 5 on March 7-10, then 15, 12 and 10 on March 11-13, 5 on March 14-18, then 8, 5, 12, 18, 15 and 10 on March 19-24, 5 on March 25-29, then 12, 15, 10 and 8 on March 30 through April 2, and 5 on April 3-6.

Weekly Commentary on the Sun, the Magnetosphere, and the Earth's Ionosphere, February 24, 2022 from OK1HH: "Solar activity gradually declined to very low levels with a slight chance of Class C flares. The solar wind speed and particle density fluctuate irregularly. The geomagnetic field was quiet to minor storm levels. Total solar radiation, accompanied by an irregular occurrence of enhanced geomagnetic activity caused a subsequent gradual decrease to overall below-average shortwave propagation conditions. A slight improvement can be expected in connection with seasonal changes with the approaching spring equinox."

EPARA SSTV Corner

This month's collection of 20 meter images captured throughout the region. Solar indices are improving and so are the images!


W9GS
MMSSTV Ver 1.13
KD2FTA
595
W9GS
KD2FTA
MMSSTV Ver 1.13
W9GS
595
KD2FTA
KD2FTA DE W9GS
Tnx for Qso..Greg
73
W9GS de KD2FTA
73
KD2FTA
KE2W
MMSSTV Ver 1.13
CQSSTV
KE2W
W9PH
MMSSTV Ver 1.13
595
KD2FTA
CQ SSTV
W9PH


W9PH
73
73 de W9PH
CQ
UNITED FEDERATION OF PLANETS
Amateur Radio Station K9ID
K7VEY 595
A CANINE ID FROM
K9ID
NØALJ
Ur Signal is
HOT!
595
in Wisconsin
W1QC
May the God
of solar winds
blow gently
upon you.
73
Mike
NØALJ de W1QC
CQ
Wisconsin
W1QC


KD2FTA 595
73
W1QC
OSHKOSH


KA2RQR
PERHAPS WE'LL
SEE YOU AT
DAYTON IN MAY!
73
KB4KGB


KY0R "Dutch" in Pueblo, CO
KU3RRY
555
KYØR


KB4KGB de W1QC
73 Shawn
from Lake Winnebago, W


KB4KGB 464
73
W1QC


KE4KGB
464
Tavarish
W1QC


Wayne says...
595
WAYNE'S WORLD
73 Bill
KW4HN de W1QC
W9GS
MMSSTV Ver 1.13
KU3RRY
595
W9GS
W9GS
Greg Sparks
New Castle, Indiana
73
KU3RRY de W9GS
W9GS
WA2EWO 595 de W9GS
CQ N9KT


CQ SSTV de KD2FTA


KD2FTA 595
de N9KT
20:07
2022/02/12


NOJLF
CQ CQ CQ


Wayne says...
Excellent!
595
K7ONI
I WOULD LIKE TO APOLOGIZE TO ANYONE I HAVE NOT YET OFFENDED. PLEASE BE PATIENT. I WILL GET TO YOU SHORTLY
NØJLF de W1QC
GO de K7ONI


N3IS de KD2FTA
73


Breaker Finder

Let There Be Light! How an Optocoupler Works.

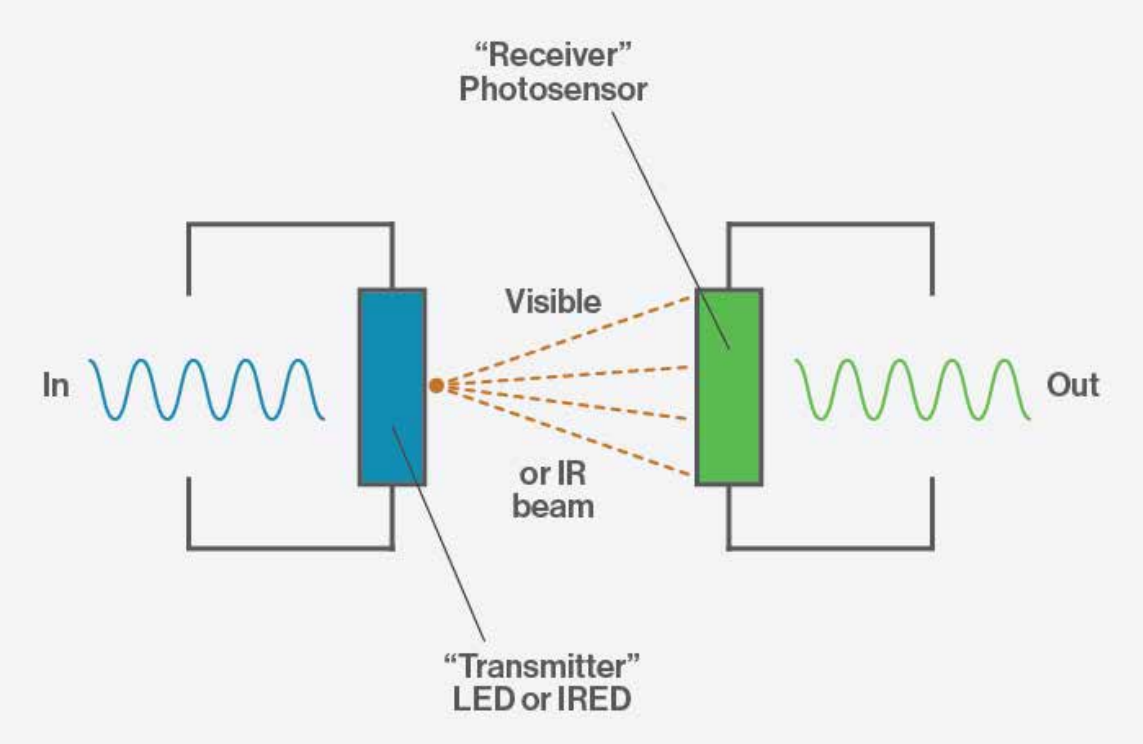
Need to protect sensitive, low-voltage components and isolate circuits on your PCB? An Optocoupler can do the job. Let there be light! This device allows you to transmit an electrical signal between two isolated circuits with two parts: an LED that emits infrared light and a photosensitive device which detects light from the LED. Both of these parts are contained within a traditional black box with a pair of pins for connectivity. At a glance, it's easy to mix up an Optocoupler with an integrated circuit (IC).

This Triac Optocoupler looks like an IC.

How It Works

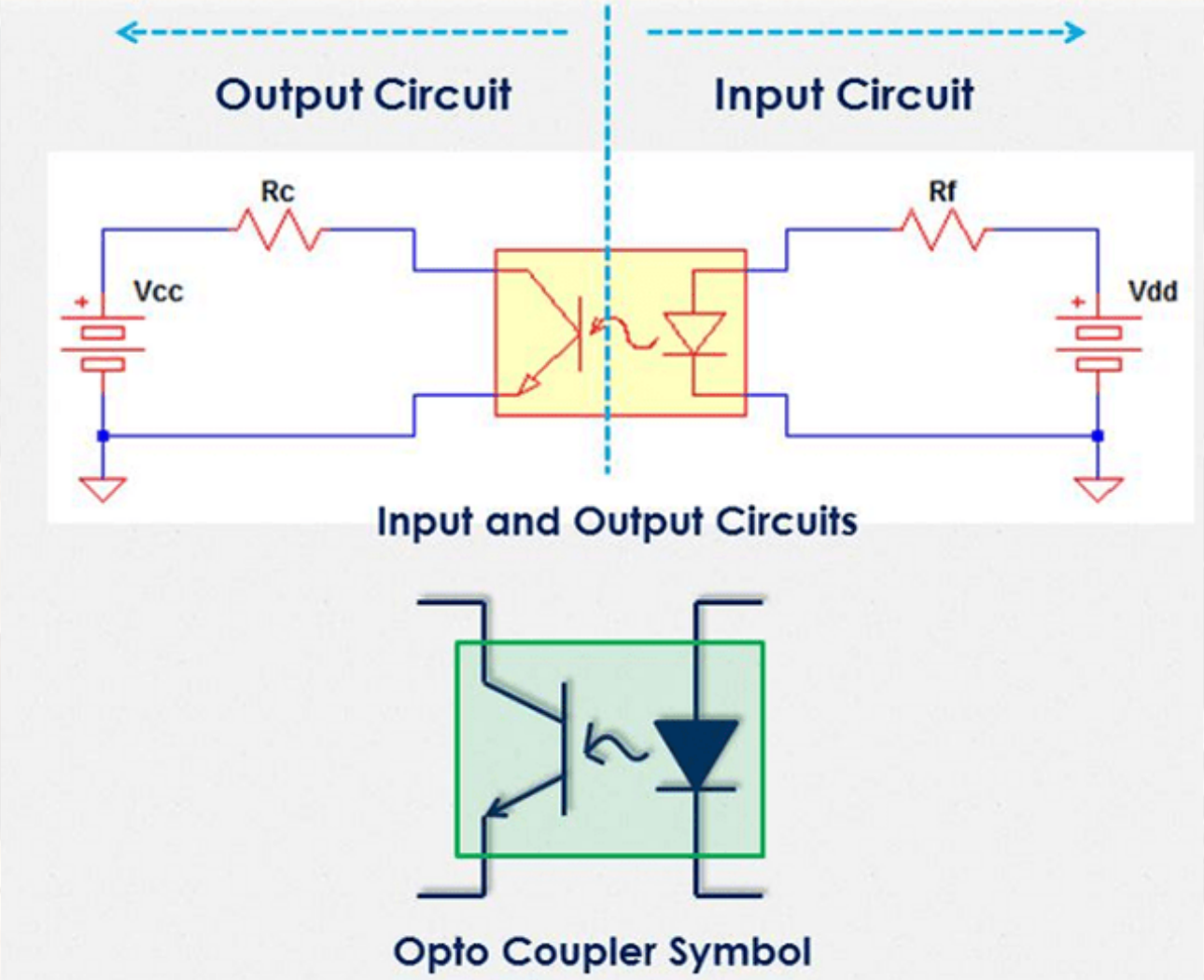
A current is first applied to the Optocoupler, which makes the infrared LED emit a light that's proportional to the current. When the light hits the photosensitive device, it switches on and starts to conduct a current as any ordinary transistor might.

Optocoupler-diagram



The photosensitive device is typically left unconnected by default to provide the highest sensitivity to infrared light. It can also be connected to ground with an external resistor for a higher degree of control over switching sensitivity.

Optocoupler-circuit



An Optocoupler effectively isolates an output and input circuit.

This device basically works like a switch, connecting two isolated circuits on your PCB. When current stops flowing through the LED, the photosensitive device also stops conducting and turns off. All of this switching happens through a void of glass, plastic, or air with no electrical parts between the LED or photosensitive device. It's all about the light.

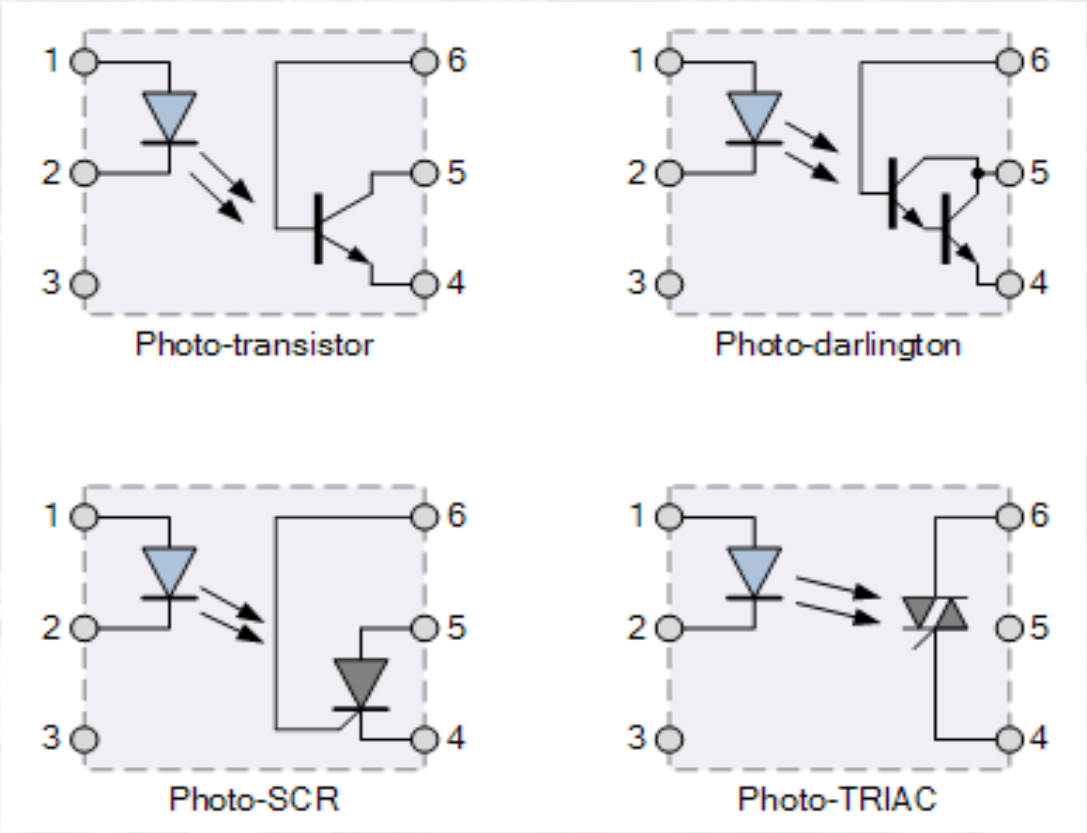
Benefits and Types

If you're designing an electronic device that will be susceptible to voltage surges, lightning strikes, power supply spikes, etc. then you'll need a way to protect low-voltage devices. When used correctly, an Optocoupler can effectively:

- Remove electrical noise from signals
- Isolate low-voltage devices from high-voltage circuits
- Allow you to use small digital signals to control larger AC voltages

Optocouplers come in four configurations. Each configuration shares the same infrared LED with a different photosensitive device. These include:

Photo-Transistor and Photo-Darlington, which are typically used in DC circuits, and Photo-SCR and Photo-TRIAC which are used to control AC circuits.



The four types of Optocouplers.

If you're feeling adventurous, you can even make a homemade Optocoupler with some spare parts. Just combine an LED and phototransistor together inside a reflective plastic tube.

A homemade Optocoupler with only three simple parts.

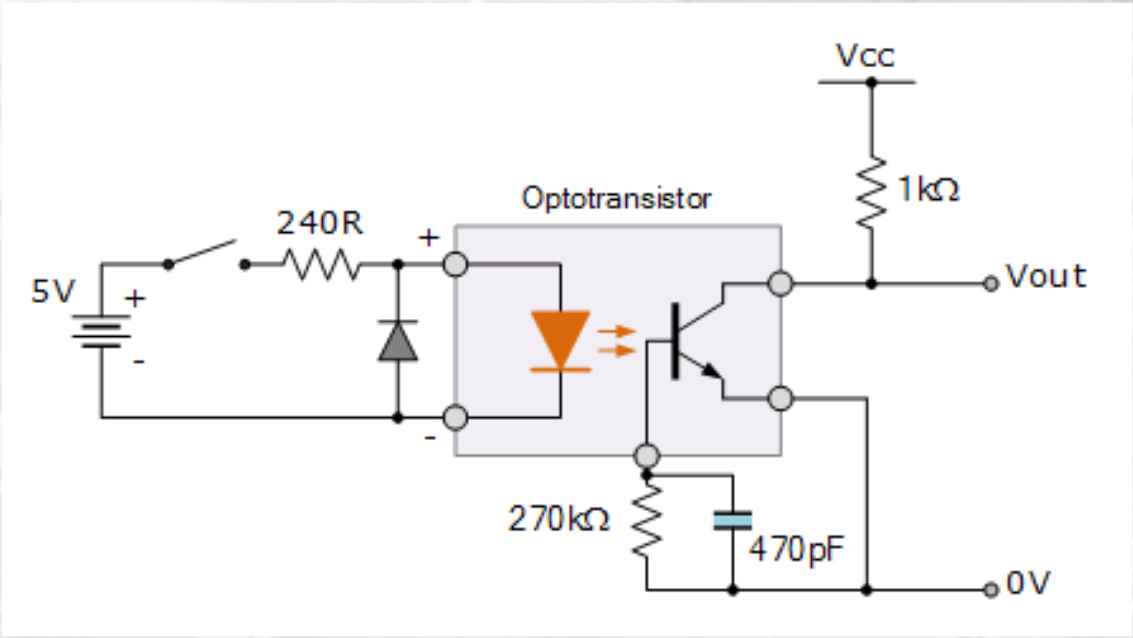
Typical Applications

Optocouplers can either be used on their own as a switching device, or used with other electronic devices to provide isolation between low and high voltage circuits. You'll typically find these devices being used for:

- Microprocessor input/output switching
- DC and AC power control
- Communications equipment protection
- Power supply regulation

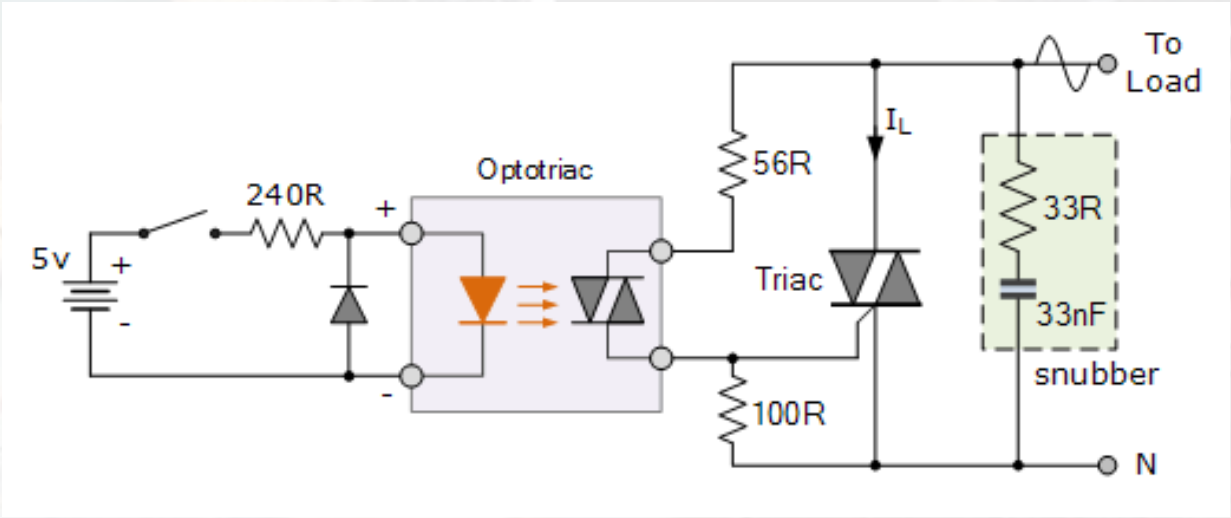
Within these applications, you'll encounter various configurations. Some examples include:
Opto Transistor DC Switch

This configuration will detect DC signals and also allows you to control AC powered equipment. The MOC3020 is perfect for controlling a mains connection or providing a gate pulse to another Photo-Triac with a current limiting resistor.



Triac Optocoupler

This configuration will allow you to control AC powered loads such as motors and lamps. It's also capable of conducting in both halves of an AC cycle with zero-crossing detection. This allows a load to receive full power without any major spikes in current when switching inductive loads.



PCB Layout Guidelines

Before adding an Optocoupler to your PCB layout consider these three guidelines:

- Keep optocoupler ground connections separate

A standard Optocoupler includes two ground pins, one for the LED and another for the photosensitive device. Connecting both of these grounds together will open your sensitive circuitry to any noise from

the external ground. To avoid this, always create two connection points, one for external ground pins, and the other for input ground wires.

- Choose the right current limiting resistor value

Selecting a current limiting resistor that operates at an Optocoupler's minimum value will produce erratic behavior. It's also possible to choose a resistor that provides too much current, which will pop the LED. When selecting a value for your resistor, be sure to find the value of the minimum forward current from the Current Transfer Ratio chart in your Optocoupler's datasheet. Vishay has an excellent guide on how to read an Optocoupler datasheet here.

- Know what kind of Optocoupler you need

Not every Optocoupler is created equal, and you'll need to select the right type for your application. For example, an Opto-Triac is used if you need to control an AC load. Opto-Darlington's are only for small input currents. If all you need is a standard input isolation, then a general PC817 Optocoupler will get the job done. This article from Nuts and Volts is definitely worth a read to understand Optocoupler types and differences.

Credit: https://www.autodesk.com/products/eagle/blog/how-an-optocoupler-works/

Scientists accidentally stumble on ‘holy grail’ of batteries

Scientists have come across an unexpected way to commercialize a breakthrough form of battery technology, opening up the possibilities for a new generation of long-range robots and electric vehicles.

Engineers at Drexel University in Philadelphia accidentally stumbled upon the technique while working on another solution to improve the viability of lithium-sulfur batteries , which are often described as the “holy grail” of batteries due to the vast improvements they offer compared to industry standard lithium-ion batteries.

Lithium-sulfur batteries have three times the potential charge capacity of lithium-ion batteries, which are found in everything from smart-phones to electric cars . Their inherent instability, however, have so far made them unsuitable for commercial applications, with lithium-sulfur batteries undergoing a 78 per cent change in size every charging cycle.

Overcoming this issue would not only radically improve the performance of battery-powered devices, it would also address some of the environment concerns that come with lithium-ion batteries, such as the sourcing and disposal of rare raw materials.

The research team at Drexel were looking at ways to redesign the battery’s cathode in order to prevent the damaging chemical reactions that take place during the charging process, but what they discovered instead was a rare chemical phase of sulfur that prevents the reaction.

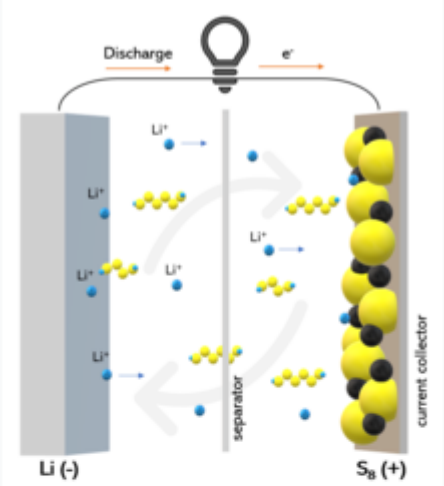
The discovery prevents the formation of a chemical compound known as polysulfides and instead crystallizes the sulfur into something called monoclinic gamma-phase sulfur, which had previously only been achieved at high temperatures in the lab.

“At first it was hard to believe that this is what we were detecting, because in all previous research monoclinic sulfur has been unstable under 95C,” said Rahul Pai, co-author of the research, which was published in the Nature journal Communications Chemistry .

“In the last century, there have only been a handful of studies that produced monoclinic gamma sulfur and it has only been stable for 20-30 minutes at most. But we had created it in a cathode that was undergoing thousands of charge-discharge cycles without diminished performance – and a year later, our examination of it shows that the chemical phase has remained the same.”

After 4,000 charge-discharge cycles over the course of a year, which is equivalent to 10 years of regular use, the

Lithium–sulfur battery



Working principle of lithium-sulfur battery and "shuttle" effect

Specific energy	450 [Wh/kg][1]
Energy density	550 [Wh/L][1]
Charge/discharge efficiency	C/5 nominal
Cycle durability	disputed
Nominal cell voltage	cell voltage varies nonlinearly in the range 2.5–1.7 V during discharge; batteries often packaged for 3 V

sulfur cathode remained stable and had not degraded. As predicted, the battery's capacity was more than three-fold that of a Li-ion battery.

The scientists are now working to fully understand the exact mechanism behind the ground-breaking process, with the hope of eventually commercializing the technology.

"This remains an exciting discovery and one that could open a number of doors for developing more sustainable and affordable battery technology," said Dr Vibha Kalra, from Drexel University's Department of Chemical and Biological Engineering.

"Getting away from a dependence on lithium and other materials that are expensive and difficult to extract from the earth is a vital step for the development of batteries and expanding our ability to use renewable energy sources."

Credit: https://www.newsbreak.com/news/2515736022307/scientists-accidentally-stumble-on-holy-grail-of-batteries-for-electric-vehicles?noAds=1&_f=app_share&s=a7&share_destination_id=MTY1Njg1Mzc5LTE2NDQ5NDc3MzYyODY=

Credit: https://en.wikipedia.org/wiki/Lithium%E2%80%93sulfur_battery

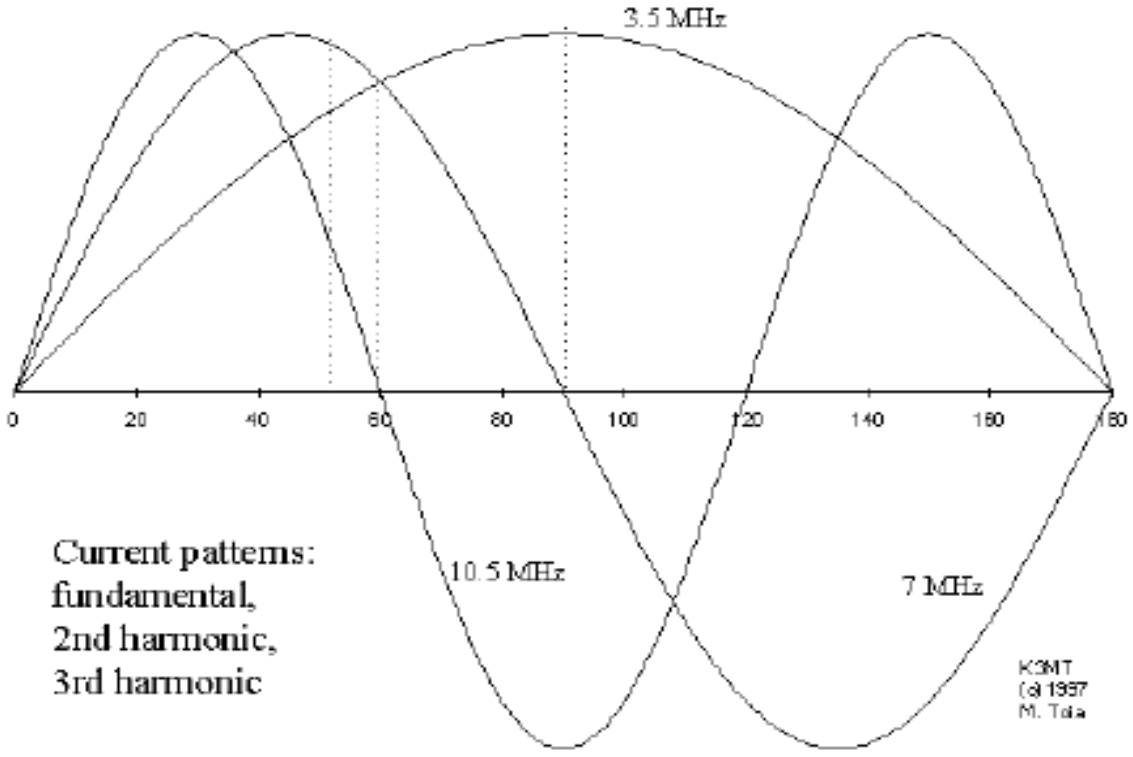
K3MT
presents . . .

A six-band, HF Windom antenna

April, 1997

This Windom antenna was marketed in the late 70's and early 80's as *Smithe's Windom.*
It was designed to cover 80, 40, 20 15, and 10 meters. By serendipity, it also covers the 17 and 2 meter bands.

Now, how was a Windom antenna developed? It began with a center-fed, half-wave dipole. This antenna also works fairly well on all *odd* harmonics, because the center of the antenna has a current maximum, just as a half-wave antenna has. But on *even* harmonics, the center of the antenna has a current *minimum*. It is a high-impedance, center-fed Zepp antenna on even harmonics. This figure shows the current standing wave on a 3.5 MHz half-wave dipole, and the currents on the second and third harmonics (7 and 10.5 MHz.)



Current patterns:
fundamental,
2nd harmonic,
3rd harmonic

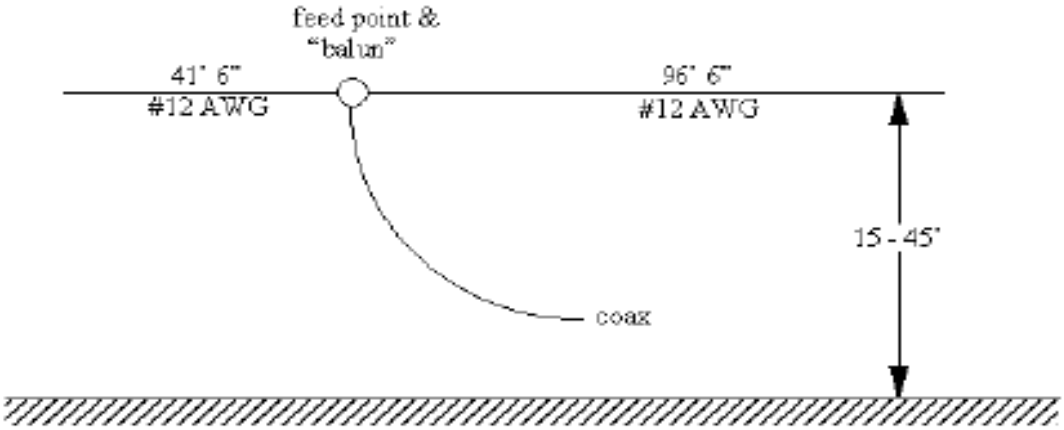
When fed at the center - 90 degrees from one side - a good match to coax occurs on 3.5 MHz. But the match at 7 MHz is bad: the current is a

minimum, so the impedance is very high. So try feeding it 60 degrees from the left end. Since the current at 3.5 MHz is lower than at the center (and the voltage is higher) the feed impedance is higher - over 100 ohms. But the antenna is still resonant, so the *reactance* is low! What you have done is to increase its feed resistance.

Look now at the action on 7 MHz. The feed point is no longer at a current minimum. Therefore, the second harmonic feed impedance is quite a bit lower than it had been earlier, and is in the range of a few hundred ohms. Since the antenna is resonant here, too, it has low reactance.

But now the feed impedance at 10.5 MHz is poor, because the 3rd harmonic current standing wave is now a minimum. So try feeding it at about 52 degrees from the left end. Here the match at 3.5, 7, and 10.5 MHz is fairly good. The impedance at all three is now somewhere around 200 to 400 ohms.

Now you can play these games all day, and if you build this antenna,



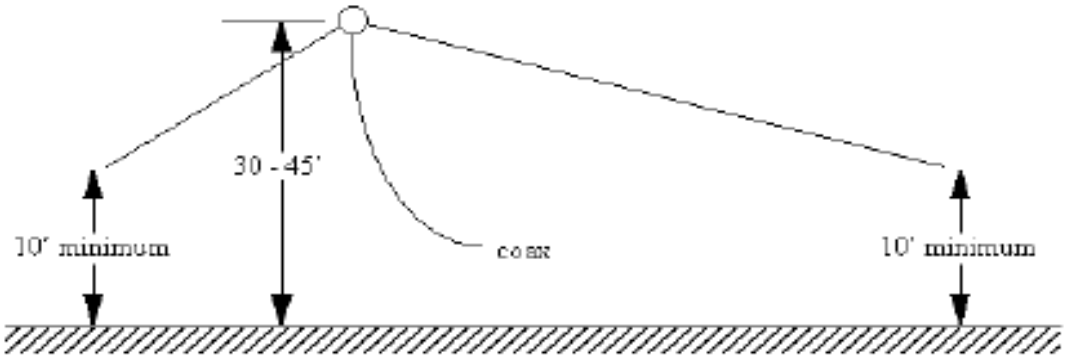
Off-center fed Windom
mounted horizontally

K3MT
(c) 1987
M. Tois

you will find it works well on 80, 40, 20, 17, 15, 12, and 10 meters - plus 2 meters as well, *provided* you pay attention to the balun! To boot, the balun matches 50 ohm coax without an antenna tuner. I admit, that this is a compromise design, and a tuner helps on the low end of 80 meters a bit, and on the high end of ten. But without a tuner, and with a fussy rig - my Drake

TR-7 - a lot of DX has been worked on all bands, from 80 through 10 meters.

I put my windom up a bit differently, as shown here:



Mounting the Windom
as an inverted vee

K3MT
(c) 1997
M. Tola

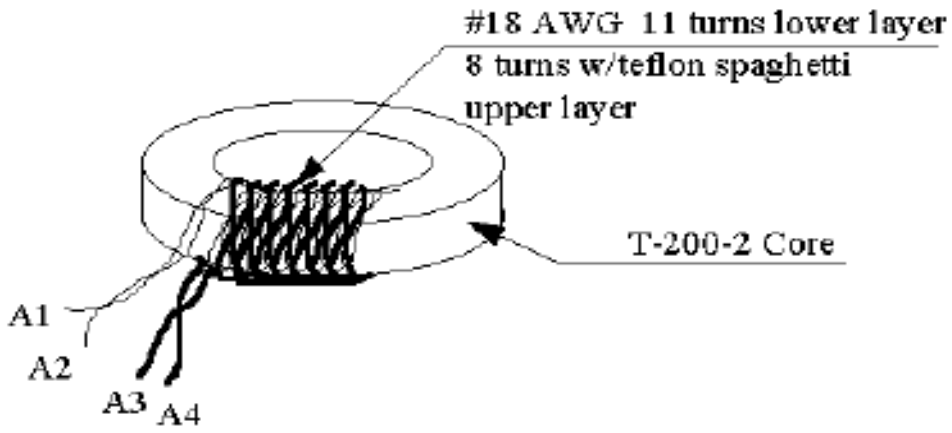
Balun details

What about the balun? The original unit sold with the Smithe Windoms is a Guanella-type (as opposed to a Ruthroff-Sevick design) parallel transmission line balun. Since the design impedance was measured to be between 300 and 600 ohms, a 9:1 down-converting balun with three 150 ohm lines was designed and built.

To build one, obtain an Amidon T-250-2 core, tape it with two layers of black poly electrical tape, and obtain some #18 AWG magnet wire with a bit of #17 AWG teflon spaghetti. Twist the magnet wire to make three twisted pairs - about one twist per inch. Wind 11 turns of one pair on the core, and slip the teflon spaghetti over *each* lead of the remainder (untwist it a bit to do this.) Then wind 8 more turns back overtop the 11 turn winding. Do this with the other two twisted pair lines as well. Space them on the core so no two lines overlap.

This image shows a single winding on the core - make two more windings

like it.



Balun:
One of three windings

K3MT
(c) 1997
M. Tobe

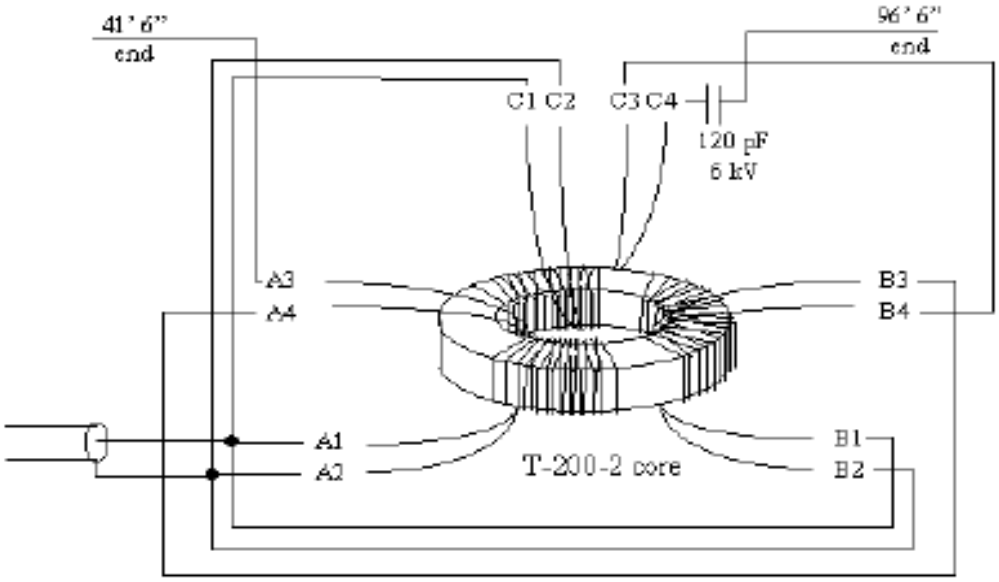
Get an ohmmeter to check continuity. Label the lines A, B, and C, and their ends 1 & 2 where the uninsulated wire starts onto the core, and 3 & 4 where the wire (insulated with the spaghetti) leaves the winding. Pay attention to the wiring detail that follows, and use your ohmmeter to check your work. Label the wires so there is continuity from:

- **A1 to A3**
- **A2 to A4**
- **B1 to B3**
- **B2 to B4**
- **C1 to C3**
- **C2 to C4**

Refer to the next image to guide the balun connections, and wire the balun as follows:

- **Connect A1, B1, and C1 together. These will connect to the center conductor of the coax.**
- **Connect A2, B2, and C2 together. These must connect to the coax braid.**
- **Connect A3 to the *short* end of the windom. *This is important!***

- **Connect A4 to B3, and B4 to C3.**
- **Connect C4 to a 110 pF, 6 kV capacitor.**
- **Connect the other end of this capacitor to the *long* end of the windom.**



Balun Connections

K3MT
(c) 1997
M. Tola

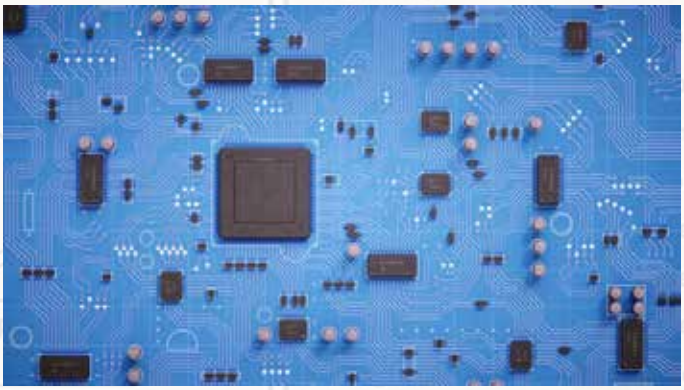
NOTE: if you think the balun is too complicated to build, e-mail us. We can provide one. Ask for pricing. In fact, we will be glad to provide an entire windom, according to this design, if you wish.

You are now ready to install and enjoy your windom. If you have the same luck that K3MT and daughter KF4LGR have, it will have been worth all the trouble!

73
K3MT
KF4LGR

No more transistors: The end of Moore's law

By John Loeffler



There has been a lot of talk about the end of Moore's Law for at least a decade now and what kind of implications this will have on modern society. Since the invention of the computer transistor in 1947, the number of transistors packed onto the silicon chips that power the modern world has steadily grown in density, leading to the exponential growth of computing power over the last 70 years. A transistor is a physical object, however, and being purely physical it is governed by laws of physics like every other physical object. That means there is a physical limit to how small a transistor can be.

Back when Gordon Moore made his famous prediction about the pace of growth in computing power, no one was really thinking about transistors at nanometer scales. But as we enter the third decade of the 21st century, our reliance on packing more transistors into the same amount of silicon is brushing up against the very boundaries of what is physically possible, leading many to worry that the pace of innovation we've become accustomed to might come to a screeching end in the very near future.

A replica of the first transistor on display at the White House in 2000 | Source: White House Archives

History of the Transistor

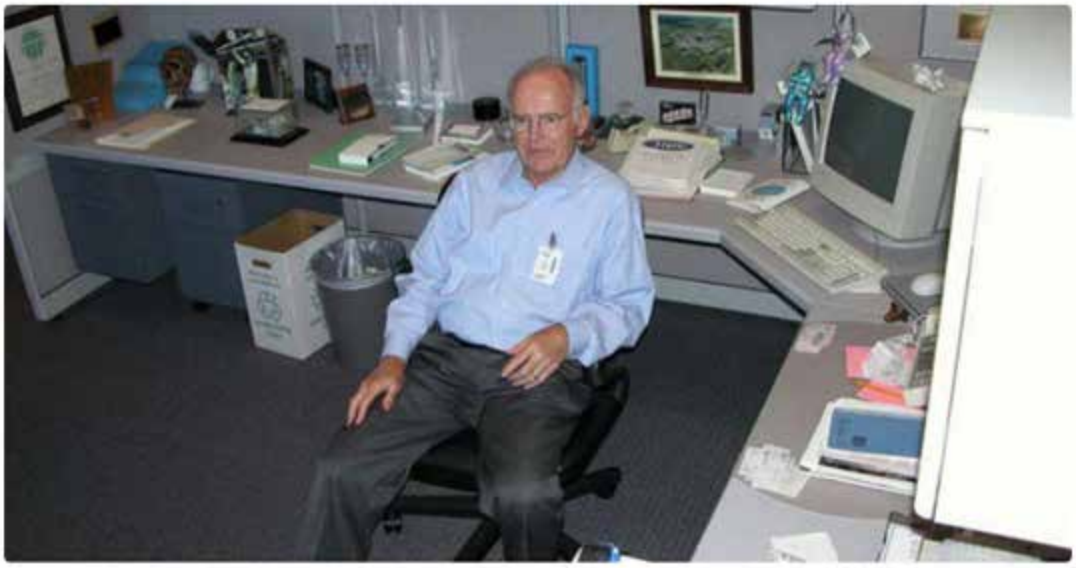
The transistor is a semiconductor that usually has at least three terminals that can connect to an electrical circuit. Generally, one of the terminals is responsible for controlling the flow of current through the other two terminals, which allows for rapid switching in a digital circuit.

Prior to the transistor, this kind of rapid circuit switching was done using a thermionic valve, which is commonly known as the vacuum tube of old. These vacuum tube triodes were significantly larger than a transistor and required considerably more power to operate. They aren't "solid-state" components, unlike transistors, meaning that they can fail during normal operation because they rely on the movement of electrons flowing within the tube to conduct the electronic current. This

meant that vacuum tube-based electronics are large, hot, and expensive to operate as they require regular maintenance to replace tubes that fail for one reason or another, and can thus bring the entire electronic machine to a halt. The transistor was "invented" at AT&T's Bell Labs by John Bardeen and Walter Houser Brattain, under the supervision of William Shockley. Although the transistor existed in concept for about 20 years before that—a working model of a transistor was not built until the work was done at Bell Labs. Shockley improved on the 1947 design with the bipolar junction transistor in 1948, and it is this implementation that first went into mass production in the 1950s.

The next major leap came with silicon surface passivation, which allowed silicon to replace germanium as the semiconducting material for transistors, and later, for integrated circuits.
In November 1959, Mohamed Atalla and Dawon Kahng at Bell Labs invented the metal–oxide–semiconductor field-effect transistor (MOSFET) which used significantly less energy and was much more scalable than Shockley's bipolar junction transistors. MOSFETs are still the dominant transistor in use today and, as a single unit, are the most manufactured device in human history. Because MOSFETs could be made increasingly smaller, more and more transistors could be fabricated into an integrated circuit, enabling increasingly complex logical operations.
By 1973, William C. Hittinger, the Executive Vice President of Research and Engineering for RCA, was boasting of putting "more than 10,000 electronic components on a silicon 'chip' only a few millimeters across." Today's transistor densities far exceed these early advances by orders of magnitude.

Gordon Moore Inadvertently Invents Moore's Law

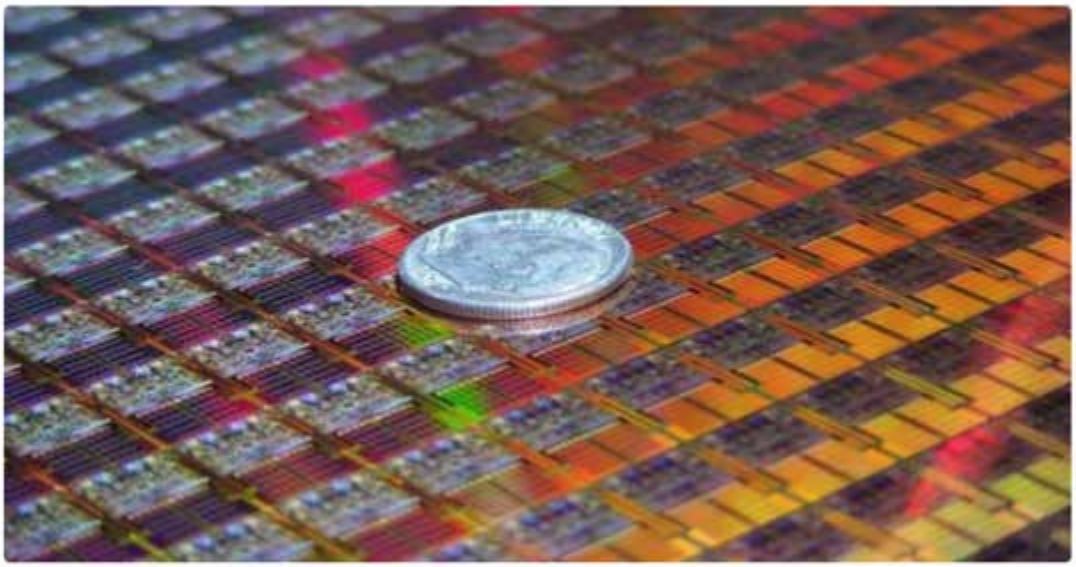


Gordon Moore in his cubicle at the Robert Noyce Building in Santa Clara. Calif. in 2013 | Source: Wikimedia Commons

Gordon Moore isn't a household name, but his handiwork is in nearly every home and office in the industrialized world. Though he would go on to become president of Intel Corporation and eventually its Chairman Emeritus, Moore wasn't nearly that esteemed when he described what we now call Moore's Law in 1965. An electrical engineer, Moore worked in the Shockley Semiconductor Laboratory department of Beckman Instruments, then being headed up by Shockley himself. When several of Shockley's employees, even some of his proteges, became disaffected by Shockley's leadership, they struck out on their own to form Fairchild Semiconductor in 1957, one of the most influential companies in history. As Fairchild Semiconductor's director of R&D, Moore was the natural person to ask about the current state of the industry, and so in 1965 Electronics magazine

asked Moore to predict where the semiconductor industry would be in ten years' time. Looking at the rate of innovation at Fairchild, Moore simply extrapolated forward in time. In the several years since Fairchild began fabricating semiconductors, the cost to produce the components declined and the size of the components themselves was reduced by about half every year. This allowed Fairchild to produce just as many integrated circuits each year, but with twice as many transistors as they had done the year before. "I did not expect much precision in this estimate," Moore wrote in 1995. "I was just trying to get across the idea [that] this was a technology that had a future and that it could be expected to contribute quite a bit in the long run." "I think that this is truly a spectacular accomplishment for the industry. Staying on an exponential like this for 35 years while the density has increased by several thousand is really something that was hard to predict with any confidence," Moore added. Moore's prediction held more or less steady for about a decade, after which Moore revised his estimates to doubling the transistor density once every two years. "I have never been able to see beyond the next couple of generations [of semiconductors] in any detail. Amazingly, though, the generations keep coming one after the other keeping us about on the same slope," Moore wrote. "The current prediction is that this is not going to stop soon either." This might have been true in 1995, but Moore's Law would soon start pushing the bounds of physics before too long, and it would start to face an existential challenge.

Why Is Moore's Law in Trouble?



Source: Intel

The problem with Moore's Law in 2022 is that the size of a transistor is now so small that there just isn't much more we can do to make them smaller. The transistor gate, the part of the transistor through which electrons flow as electric current, is now approaching a width of just 2 nanometers, according to the Taiwan Semiconductor Manufacturing Company's production roadmap for 2024. A silicon atom is 0.2 nanometers wide, which puts the gate length of 2 nanometers at roughly 10 silicon atoms across. At these scales, controlling the flow of electrons becomes increasingly more difficult as all kinds of quantum effects play themselves out within the transistor itself. With larger transistors, a deformation of the crystal on the scale of atoms doesn't affect the overall flow of current, but when you only have about 10 atoms distance to work with, any changes in the underlying atomic structure are going to affect this current through the transistor. Ultimately, the transistor is approaching the point where it is simply as small as we can ever make it and have it still function. The way we've been building and improving silicon chips is coming to its final iteration. There is also another potential pitfall for Moore's Law, and that is simple economics. The cost of shrinking transistors isn't decreasing the way it was in the 1960s. At best, it's decreasing slightly

generation over generation, but diseconomies of scale are starting to weigh fabrication down. When the demand for semiconductor chips was first taking off, the engineering capacity to produce the chips was expensive, but it was at least available. With demand from everything from smartphones to satellites to the Internet of Things skyrocketing, there just isn't enough capacity to meet that demand, which increases prices at every step of the supply chain.

The server room at a Facebook data center | Source: Facebook/Meta

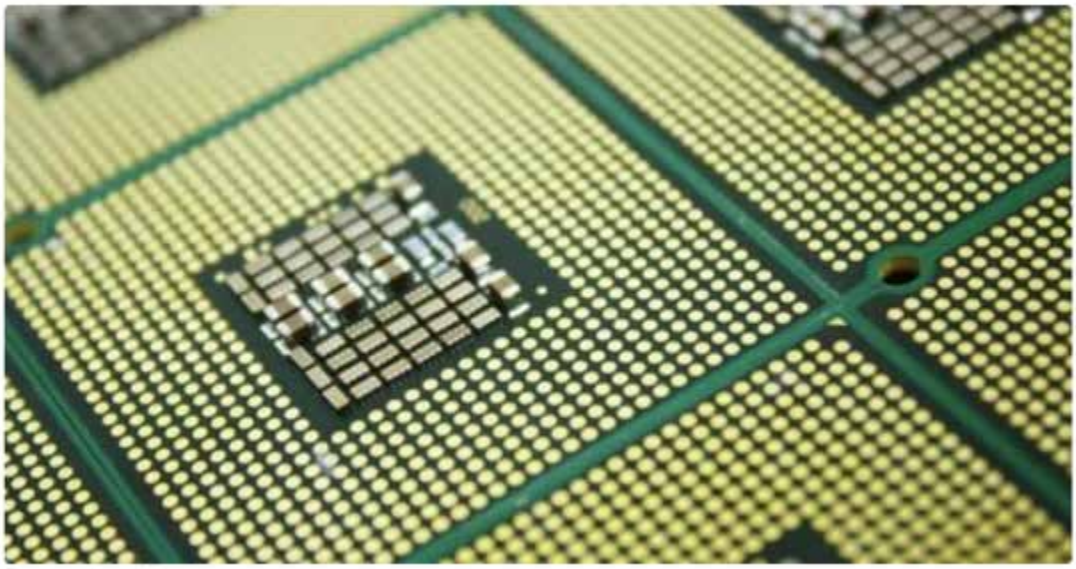
What's more, when the number of transistors doubles, so does the amount of heat they can generate. The cost of cooling large server rooms is getting more and more untenable for many businesses that are the biggest purchasers of the most advanced processing chips. As businesses try to extend the life and performance of their current equipment to save money, chip makers responsible for fulfilling Moore's Law bring in less revenue to devote to R&D—which itself is becoming more expensive. ithout that extra revenue, it becomes much harder to overcome all of the physical impediments to shrinking the transistors even further. So even if the physical challenges don't bring an end to Moore's Law, the lack of demand for smaller transistors almost certainly will.

Ok, So What Are We Doing About It?

Well, that's the trillion-dollar question at this point. We've spent the past 70 years experiencing an unprecedented technological advance so that rapid technological progress is taken as a given by just about every industrialized society at this point. How do you suddenly bring that to a halt? What would that even feel like? What would it mean to have the same iPhone for 30 years? Obviously, we could simply deal with that as a society. There is nothing in our DNA that mandates we have a new iPhone every two to three years and an entirely new computer every five. We've simply become accustomed to that pace of progress, and if that pace changes, we would acclimate ourselves to that as well. After all, humanity has only had computers for less than a century, or about 1/250,000th of the time we've been on this planet as a species. We will certainly find a way to endure such a calamitous hardship. Alternatively, we can look to the end of Moore's Law with excitement and anticipation. Adversity is the mother of invention, after all. We've spent the past 70 years trying to figure out how to shrink the transistor more and more and now that path of innovation is reaching its end. It is absolutely not the only way forward, and if we are no longer putting all our efforts into shrinking transistors, we can put that energy into other areas and discover new breakthroughs that might make the invention of the transistor look banal in comparison. We won't know until we

explore these new avenues of innovation, and the end of Moore's Law might be the signal we need that it's time to start looking for a new engine of progress.

Moore's Law Is Dead! Long Live Moore's Law!

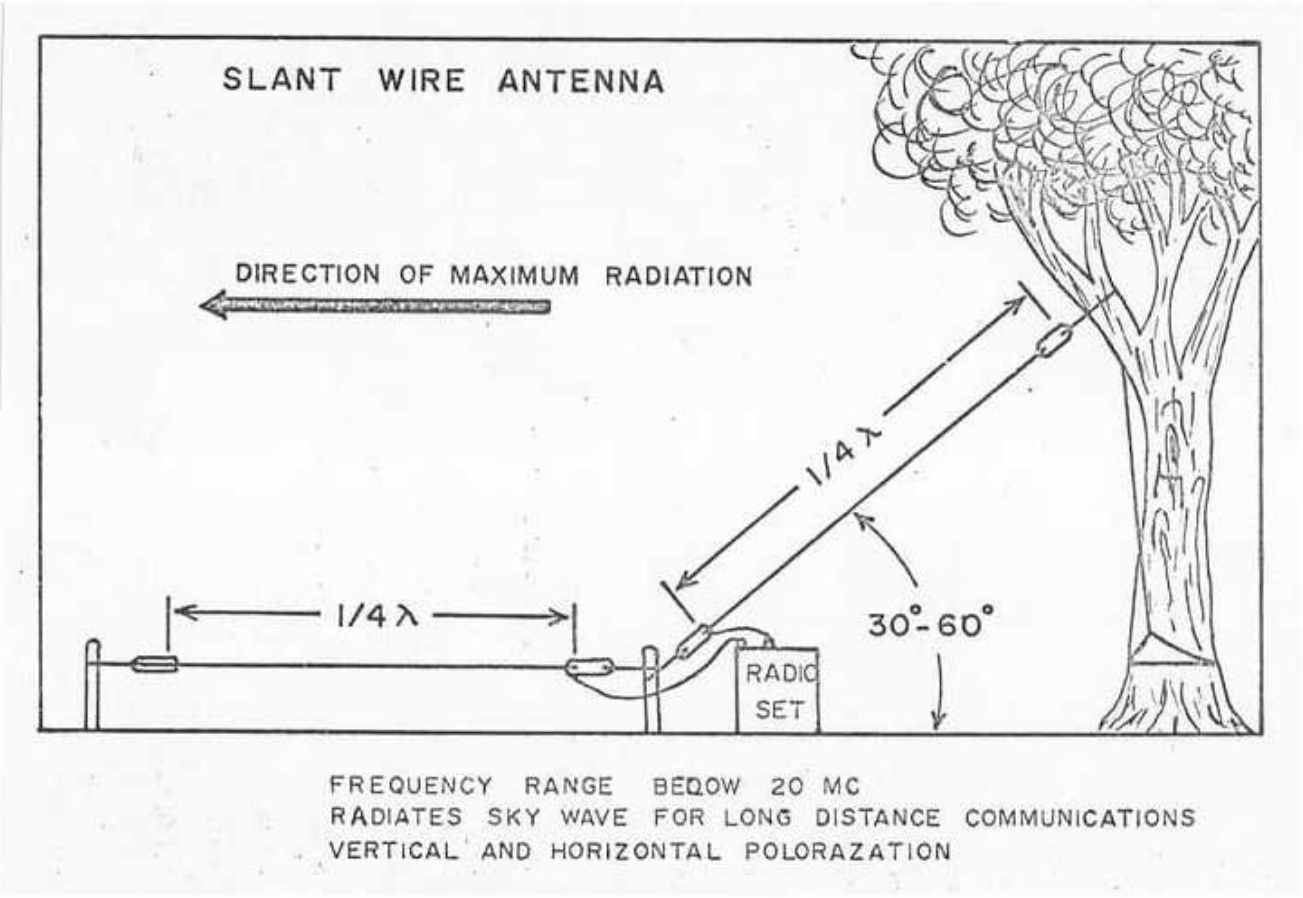


Source: jeuxvideo.com

In the end, Moore's Law was never a "law" to begin with but more of a self-fulfilling aspiration. We expected transistor density to double every year, then every two years, and so we looked for how we could accomplish that task.Whatever the next thing is, whether it's quantum computing, machine learning and artificial intelligence, or even something we don't even have a name for yet, we'll find a new aspiration to drive that innovation forward. Ultimately, our fascination with Moore's Law was never really about the density of the transistors. Most people who've heard of Moore's Law couldn't even begin to explain what transistor densities even mean, much less how interlocking transistors form logical circuits or how the smartphone in their pocket works (or even a 1970s pocket calculator, for that matter). For most of us, Moore's Law was always about our expectations of progress, and that is something that is largely up to us. Moore's Law might be on its last legs, but we'll find a new Moore's Law if we want it badly enough.

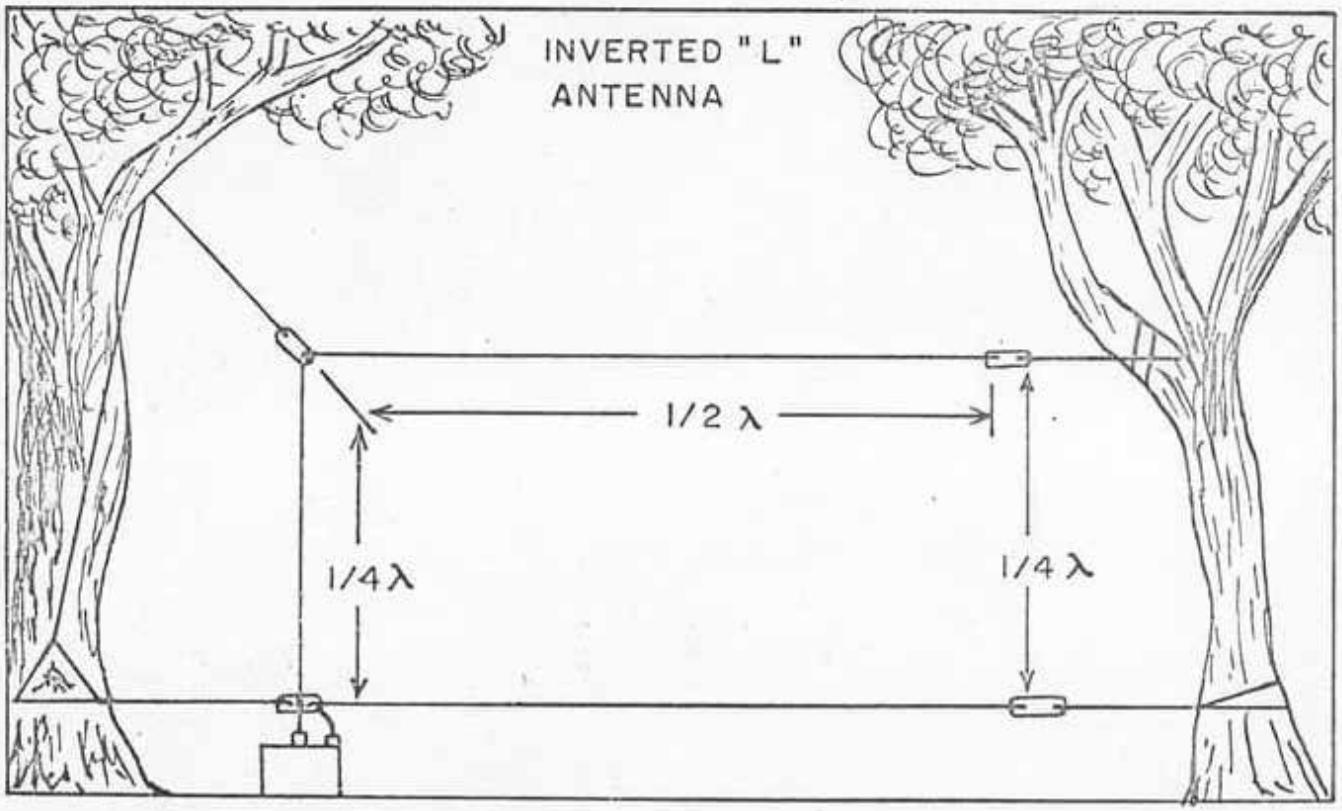
Credit: No more transistors: The end of Moore's law - NewsBreak

73 AMATEUR RADIO ANTENNA ARCHIVES #44

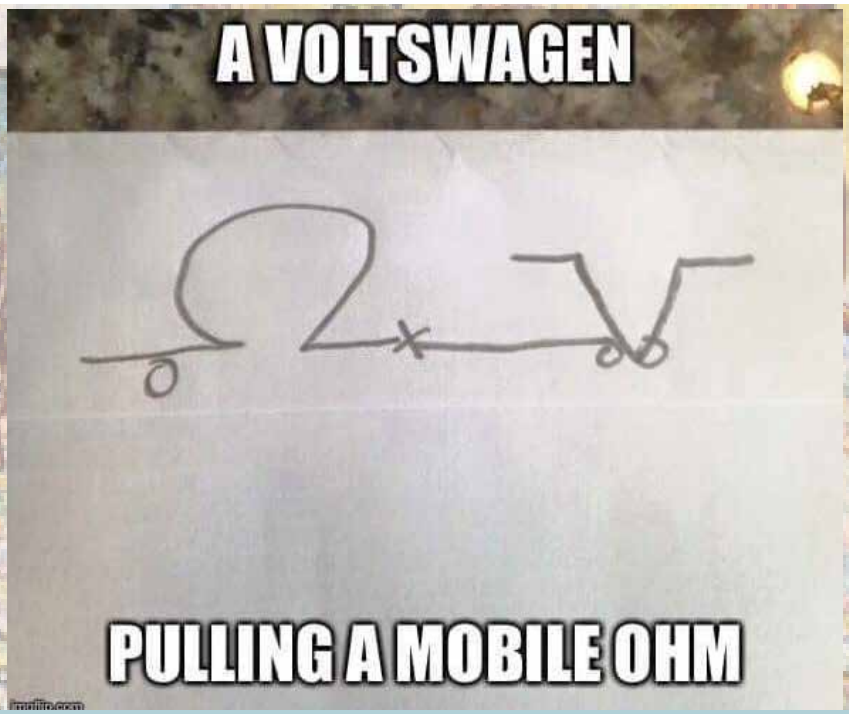


FREQUENCY RANGE BEQOW 20 MC
RADIATES SKY WAVE FOR LONG DISTANCE COMMUNICATIONS
VERTICAL AND HORIZONTAL POLORAZATION

73 AMATEUR RADIO ANTENNA ARCHIVES #44



FREQUENCY RANGE: BELOW 20 MC
DIRECTION OF TRANSMISSION: VERTICAL PORTION OMNIDIRECTIONAL (RADIATES GROUND WAVE)
HORIZONTAL PORTION BIDIRECTIONAL (RADIATES SKY WAVE)



MEMBERSHIP APPLICATION

E P A R A

Eastern Pennsylvania Amateur Radio Association
Address: PO Box 521, Sciota, PA 18354
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Website: www.qsl.net/n3is

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Name: _____ **Callsign** _____

License: Novice Technician General Advanced Extra

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City: _____ **State:** _____ **Zip:** _____

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* **Note:** We do not publicize your phone or email information.

ARRL Member: _____ **Skywarn Spotter:** _____ **ARES/RACES Member:** _____ **VE:** _____

Interests:
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Building Antennas _____ Electronic Repairs _____ Elmering _____ Kit Building _____ EmComm: ____

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How did you get interested in Ham Radio?

_____

Please list any relevant qualifications or assets you have or are willing to share/contribute to the club.

Use reverse side if needed:

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