



Capers

May- 2021



The Monthly Newsletter of The Candlewood Amateur Radio Association
P.O. Box 55 – Brookfield CT 06804 - 0055
Visit us on the Web at <http://www.cararadioclub.org>

Next CARA Meeting: Friday, May 14

**This meeting will be conducted via Microsoft TEAMS Video Conferencing
Sign onto TEAMS at 7:00 for socializing and conversation**

Meeting begins at 7:30 p.m.

Teams conference invitation emailed to CARA membership.



Officers of the Nashua Area Radio Society and other members who attended the annual Dayton Hamvention national convention in May, 2019 gathered for a photo after being selected the convention's Club of the Year Award.

Meeting Presentation by:

Fred Kemmerer – AB1OC; President, Nashua Area Radio Society

Subject: "Growing a successful Amateur Radio Club and increasing Youth Involvement".

President's Message – de W1NSK



Hard to believe it's May already!

As our minds begin to wander to outdoor activities with family and friends, it's a good time to start thinking about antenna projects and repairs - now that the weather is warmer. If you get to it quickly enough - especially wire antennas, the leaves won't be out fully, making your task easier.

Some good news on the horizon. There's a reasonable chance to have a Field Day this year as many have been vaccinated, the COVID virus is subsiding, and State guidelines are being loosened for gatherings. The State of CT has made Putnam Park available to us in Redding for no charge that weekend. Some will remember this site from previous years.

Further good news is that the CARA Annual Western CT Hamfest, will most likely be again held at Newtown's Edmond Town Hall in Newtown. Both events will be discussed at the May CARA Meeting, which will be held on the TEAMS platform – Friday, May 14 at 7:00 pm. Check the CARA website for the link.

No news yet on when we may be able to regain use of the Stony Hill Firehouse for our regular monthly and planning meetings.

Our guest Speaker for the May meeting will be Fred Kemmerer, AB1OC, President of the Nashua (NH) Area Radio Society. Fred spoke to us a couple of months ago about communicating with the International Space Station and his experiences conducting programs at various schools.

His topic is: "Growing a successful Amateur Radio Club and increasing Youth Involvement". This is a more in-depth discussion than the snippet presented at the previous meeting. Spread the Word!

See you on the Air!

73, Bud Kozloff - W1NSK, CARA President

May 14 - Meeting Agenda:

7:30 PM - Call to Order

Pledge of Allegiance

Opening remarks and Introduction of Guest Speaker, Fred Kemmerer, AB1OC:

Presentation – “Growing a successful Amateur Radio Club and increasing Youth Involvement”.

Questions of Presenter

Business Meeting:

Acceptance of Minutes as Published in CAPERS

Treasurers Report

Committee Reports:

Repeaters

HamFest

Website

Fundraising

Youth Development

Old Business:

Insurance

Pool Antenna take down

Field Day: Participation? Location?

New Business:

Stony Hill Firehouse

FaceBook Page

Announcements

Meeting adjournment

Vice- President's Message:
de W1JGM



Welcome to May 2021.

I'm looking forward to seeing some new faces at the May meeting since there's been several new hams and interested hobbyists who've expressed interest in our club and the hobby.

This has been a busy month on the air, with several contests and on-the-air events. There seems to be an operating event happening every week.

Many club members participated in the Red Cross exercise or the MARS cross-band exercise, the New England QSO party or several others. Whatever it might be – just get on the air.

As of the May CARA meeting, any member that hasn't fulfilled their annual dues obligation will

lose all club privileges, so - please make it easy on me and take care of your obligation.

It's easy if you use PayPal at (PAYPAL.ME/CARADUES) if you go to the club's website: www.cararadioclub.org you'll find the dues information. Alternatively -make your payment by mail to: "CARA Treasurer, PO Box 55, Brookfield, CT.06804"

Note: If you use PayPal; Don't choose a "payment" tab for a purchase of goods or service. In the NOTE section, include your CALL SIGN! 2021 Rates are \$30/ year with seniors 65 and over: \$15/yr.

We're making progress with our 2021 Western Connecticut Hamfest with preliminary fliers being e-mailed to local hams and clubs. Please print some and hand them out at the local events you attend. If you know of any other organization that might benefit by attending or being a vendor at the hamfest, please have them contact me.

Just a reminder, the club still has four back-up batteries for sale. See information in this Capers newsletter. Don't let them slip away.

If you have any questions or concerns, contact me or any club officer.

Stay safe and get on the radio. The original social distancing!

73, John G. Morelli (W1JGM)

Vice – President, Candlewood Amateur Radio Association (CARA)
Chairman; Western Connecticut Hamfest

April 10 Monthly Meeting Minutes de N1GSA



Meeting called to order at 7:40 by Pres. Bud Kozloff.

The Pledge of Allegiance was recited.

There were 24 people present.

The first order of business was a presentation by Dr. Bob Heil about his start in electronics. He started playing accordion and progressed into playing a Hammond B3 organ. This was his introduction to the ability to LISTEN to various sounds. His first real experience in radio was on 6 meters which he claims was open all the time back then. He then told of starting Ye Olde Music Shop that primarily sold and rented Hammond Organs to homes and finally groups that were starting up. It soon leaked that he knew about repairing amplifiers and other equipment. He began getting calls from theaters to repair sound systems. His meeting with some major groups prompted the name change to Heil Sound. He has worked with names such as Jerry Garcia and the Grateful Dead, ZZ Top, The Who, Joe Walsh and the James Gang and many many others. He

acquired a 40-ft. tractor trailer that he carried sound systems to venues around the country. His presentation traversed from that start in Amateur Radio and love of Hammond organ music thru working with every group on the road circuit and back to solving problems with voice and feedback issues. This program is well worth going back and listening to on our Microsoft Teams site. Anyone with minor interest in Radio and Music will be very pleased. Bob ended with a couple minutes of organ music.

Meeting then progressed to regular business starting with a motion to approve the minutes of the previous meeting as printed in the Capers. Motion was seconded and approved.

Treasurer reported a beginning balance of \$5296.71 and an ending balance was 5016.71 There are currently 41 paid members.

The Repeater Committee reported that preparations are being formed to make some improvements and clean-up to the tower site by the City of Danbury.

The Hamfest looks as though it WILL be a go for this year. With Covid restrictions being relaxed more and more this should be a possibility. John is sending notifications and flyers to area clubs. As this is our main fundraiser for our club, we should do all possible to make this a success.

The Website Committee did not have any news to report. Dan will contact Jennifer to get an update.

Field Day was discussed. Bud has done some investigating concerning regulations. Gatherings are limited by State mandate to 100 inside and 200 outside. The Matrix will not be considered as a location for this year at least. Tarrywile Park seems to be cost prohibitive at this point. Trying to contact any of our State Parks for information,

reservations and restrictions have proven futile. The decision regarding Field Day will be further discussed next month and a final decision will be made in June.

Harlan will check into who the new contact is for Stony Hill Firehouse.

Bud thinks that the antennas at Sander's still need to be taken down. He will contact Jennifer to check on the status. We will schedule a couple dates for this project and move this forward.

Roger has W1AW penciled in to operate the first Sunday of May for the New England QSO Party. This is contingent on the Covid restrictions.

Motion made to pay \$50.00 for the plaque for the NEQP. We have sponsored this event for many years. Motion seconded and passed.

John spoke about recognizing all our speakers and program presenters. Dan has a Word file with numerous Certificates that will be forwarded to the Teams Platform so that it can be used for this purpose.

There is an upcoming Contest University Day of seminars on May 20. Contest University.com is the place to sign up for this free event. These are always very informative and useful.

As there was no further business there was a motion to adjourn which was accepted.

Respectfully Submitted:
Gary S. Adams, N1GSA - Secretary.

April 23 Monthly Planning Meeting
Minutes
de N1GSA

Meeting called to order at 7:35 by Bud Kozloff.

Pledge of Allegiance was recited.

There were 5 people present.

Bud has made contact with Jennifer Pool about the antennas that are still on her roof. Tentatively setup for May 15th, or May 16th. Along with the 22nd or 23rd. We will talk about a work party at the May Meeting.

He has also spoken with folks from Southbury. They have about 15 members along with their own clubhouse. We need to see about getting these members into our club.

As the Governor is lifting Covid restrictions as of the middle of May. Masks will still be required. We will have use of Putnam Park for Field Day. Hopefully everyone participating will have had their vaccination by then.

The NEQP Plaque has been received and already there have been thanks for it. The NEQP is May 1st and 2nd. We usually operate at ARRL Headquarters on Sunday. We need to check if they are going to allow outside participation.

John has sent out the first batch of emails announcing our Hamfest. Bud will get the flyer posted on the YCCC website. Bill Webb has talked to John and stated that he is doing well. He will get to Edmond Town Hall and get the permits for our Hamfest and the food concession.

The use of Stony Hill Firehouse is still a concern. New Fairfield is still not allowing outsiders into the town buildings. Harlan has spoken to Millie and she gave him the name of the new contact person. At this time, it is very costly for the Firehouse to have an outside service come in and sanitize.

We do need to prod our delinquent members into becoming current with their dues. According

to the By-Laws they should be dropped from receiving the Capers newsletter.

Fred is scheduled for a presentation at next month's meeting.

At this time, we have nothing further out. Tim Duffy is a good candidate for upcoming presentations.

Field Day is still a concern with regard to locations, public access, and proper sanitation between operators for equipment and contact surfaces.

Gregory spoke about the upcoming May 8th Red Cross Drill. Rosty is our local Red Cross Coordinator. Much of this drill is to be between shelters and headquarters. There are a few designated Repeaters that will be used as backup. Our CARA Repeater being one of those. There is also emphasis to communicate using Winlink to try this mode. There is a shortage of Winlink Operators for this event.

Respectfully Submitted:
Gary S. Adams - N1GSA, Secretary

Last Month's Meeting presentation: Dr. Bob Heil – K9EID



For concert sound pioneer Bob Heil, the Grateful Dead's "Truckin'" is more than a classic rock favorite. The song, which opened their five-show Fare Thee Well concerts on June 27, tells a personal story.

Heil, as every Deadhead knows, was the audio expert the Grateful Dead turned to after the band was actually "busted down on Bourbon Street," an incident that found them at a subsequent concert stop with neither a soundman nor a sound system.

"They came out on a short Midwest to East Coast tour, and they played that first night in New Orleans and Owsley [Stanley] – their sound guy who owned the sound gear, and did all of the mixing – he was on probation," Heil said during an interview for the Klipsch WPWK Podcast. "He wasn't supposed to be out of the state of California. Well, the DEA found out about it and they, and I think the FBI, they show up at the show and they sat in the back row. They waited until the show was over, and the band comes on to St. Louis for the next show, while Owsley was tearing things down and loading the truck. As he had it all loaded and padlocked the back of his truck, the FBI and the DEA padlocked him."

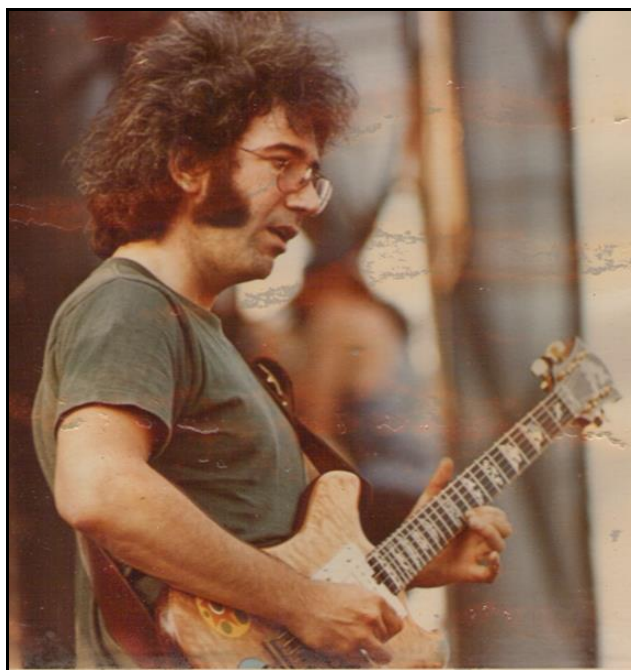
So, the Grateful Dead arrived at the venue the next day at loose ends. That's when Heil stepped in. A former teen organist at the theater where Jerry Garcia and company were slated to play, Heil had since become a local music shop owner. More importantly, he had recently salvaged the venue's former sound system for his own use. That meant Heil was in the right place at the right time to step in and provide sound for the Grateful Dead.

Heil would soon play a big role in creating the Grateful Dead's famous "Wall of Sound" and tour with the band in 1970. Ultimately, Heil helped create the template for modern-rock touring sound systems – and he still credits Paul W. Klipsch as an instrumental figure in his quick development as a sound and radio engineer.

Heil's relationship with Klipsch continues today; he recently appeared as a Klipsch guest at the Consumer Electronics Show. Meanwhile, global streaming of the Grateful Dead's final three Fare Thee Well concerts was made possible by Klipsch Audio via 93.1 WXRT.

Heil, by the way, is also well known in rock circles for his famous **talk box**, used on hit songs by Peter Dinklage and Joe Walsh. He handled sound for the Who and Jeff Beck, too. Heil Sound, which now focuses on manufacturing professional microphones, celebrates its 50th anniversary in 2016.

Source: <https://ultimateclassicrock.com/grateful-dead-truckin-bob-heil/>



Grateful Dead - Summer 1974

DILLON STADIUM

HARTFORD, CT / JULY 31, 1974

SET 1

1. Scarlet Begonias
2. Me And My Uncle
3. Brown Eyed Women
4. Beat It On Down The Line
5. Mississippi Half-Step Uptown Todeloo
6. It Must Have Been The Roses
7. Mexicali Blues
8. Row Jimmy
9. Jack Straw
10. China Cat Sunflower
11. I Know You Rider
12. Around & Around

SET 2

1. Bertha
2. Big River
3. Eyes Of The World
4. China Doll
5. The Promised Land
6. Ship Of Fools
7. Weather Report Suite Prelude
8. Weather Report Suite Part 1
9. Let It Grow

SET 3

1. Seastones
2. El Paso
3. Ramble On Rose
4. Greatest Story Ever Told
5. To Lay Me Down
6. Truckin'
7. Mind Left Body Jam
8. Spanish Jam
9. Wharf Rat
10. U.S. Blues
11. One More Saturday Night

ENCORE

1. Uncle John's Band

CLOSE

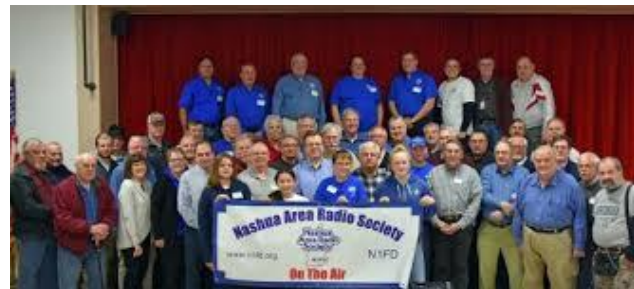
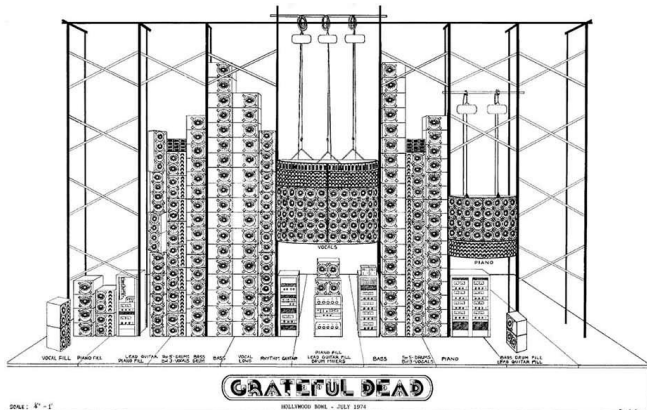
Source: <https://jerrygarcia.com/tour/summer-1974/10490>



Officers of the Nashua Area Radio Society and other members who attended the annual Dayton Hamvention national convention in May gathered for a photo after being selected the convention's Club of the Year Award.

From left are programs chairman Scott Andersen, activities and awards director Jamey Finchum, club president Fred Kemmerer, secretary Brian McCaffrey, membership chair Anita Kemmerer, vice president Dave Merchant, youth member Abby Finchum, and treasurer Charlie Dunn.

<https://livemusicblog.com/news/tracing-the-origins-of-the-grateful-deads-sound-dead-sound-cbs-news-report/>



This Month's Meeting presentation: Fred Kemmerer – AB1OC



Quite a few Nashua Area Radio Society members are headed for the Dayton Hamvention® this week. The theme of Hamvention 2019 is "Mentoring the Next Generation". The Nashua Area Radio Society will be receiving some important recognition for our work to bring new Hams into the Amateur Radio service, for our Amateur Radio related STEM learning programs in local schools, and for our many Ham Mentoring projects. We will be recognized as the [Dayton Hamvention 2019 Club of the Year](#). We will also be sharing The Nashua Area Radio Society Story as a forum presentation at Dayton. You can see our planned presentation at the link below. Source: [The Nashua Area Radio Society Story](#) We are also being [recognized by the ARRL as a Spotlight Club for our Mentoring work](#). The ARRL has dedicated their "ARRL Spotlight on Radio Clubs and Mentoring" forum on Friday, May 17th at 11:50 am in

Forum Room 3 to us so that we can share The Nashua Area Radio Society Story including ideas and programs that have worked well for us. We hope that our readers who will be attending the Dayton Hamvention this year will join us for our Forum Presentation on Friday and will also stop by and see our display in the ARRL Booth at Dayton.

Fred, [AB1OC](#)

de W1QK:

CARA welcomes back Fred Kemmerer – AB1OC, President of the Nashua Area Radio Society to present to CARA at our upcoming May 14 Monthly meeting.

Fred's topic will be: "Growing a successful Amateur Radio Club and increasing Youth Involvement".

As you may recall, NARS won the prestigious 2019 Amateur Radio Club of the Year award sponsored by the Dayton Hamvention.

NASHUA – Its focus on mentoring younger members and creating numerous programs and activities for children and youth have led to national recognition for the Nashua Area Radio Society, the group of local ham radio enthusiasts best known for their annual June field days and helping out during communications emergencies.

Now, as members prepare for their 2019 field day this weekend at Hudson Memorial School, they are still basking in the glow of their selection as the 2019 Club of the Year, an international honor bestowed by the Dayton Amateur Radio Association at its cleverly named "Hamvention" in May.

Organized at the Greene County Fairgrounds in the Dayton suburb of Xenia,

Ohio, "Hamvention" unites amateur radio enthusiasts from across the nation and from around the world each May for camaraderie, workshops, seminars on new developments in the world of amateur radio and award presentations.

It wasn't long after they returned home with their trophy that society members began preparing for the field day.

"Come on out and see for yourself how much fun amateur radio really is," reads a promotional poster inviting the public to the event, which will take place regardless of weather considerations.

"We're really excited about this year's event," society president Fred Kemmerer said this week, noting the radio communications and activities go on non-stop for 24 hours beginning Saturday afternoon. "It's a great time for people to come see what we do," he added.

For times, schedules and more information, see the accompanying information box, at right.

Historically, the term "ham" as it pertains to amateur radio, goes back about 100 years, and is said to have begun as a derogatory term applied to "ham-fisted," or inept, radio operators.

While Nashua's club has been around for about 40 years, its leaders and membership launched, in 2015, a "change and modernization" initiative to not only expand the membership rolls but also to add numerous programs and activities geared in large part toward "STEM learning, education and licensing activities and youth outreach," according to its mission statement.

Membership stood at about 40, meetings averaged 10-15 members and its field day was the only major activity when the club began its growth and expansion initiative four years ago.

Now, the membership base has surpassed 225, and includes a number of younger people, including some who are still in middle school. Meetings now usually draw about 60 members.

Also new and gaining popularity are the club's partnerships with local schools, through which they bring in *"a good mix of classroom education and amateur radio activities,"* such as STEM (science, technology, engineering and math) nights, Morse code competitions and *"school kit builds,"* in which students learn how to build their own mini-Morse code transmitter.

The partnerships started with Hudson Memorial School, which has hosted the field days for a number of years.

The highlight was most likely the day in December the society, in a joint venture with NASA, the American Radio Relay League (ARRL) and other entities, set up a communications station in the school that allowed students to talk with astronauts aboard the International Space Station.

As its partnership with Hudson Memorial continues, the society has brought their programming to other local schools, including Bishop Guertin, Merrimack High School and Nashua-based World Academy, Kemmerer said.

"That's a lot of what we do, getting young people involved," he said, adding that the society has seen a steady increase in younger members who want to get their amateur radio licenses.

Toward that goal, the society hosts seven licensing classes per year, Kemmerer said. Those classes have produced in the neighborhood of 230 new licenses during the past four years.

Source:

Dean Shalhoup may be reached at 594-1256, dshalhoup@nashuatelegraph.com or @Telegraph_DeanS.



CARA has been an ARRL Affiliated Club since 1946



Connecticut Phone Net – CPN

This net starts at 6:00 pm DST Monday through Saturday. Sunday: 10:00 a.m. 3.965 MHz.

CARA Contributions:

Tom Coury, WX1T: CPN manager
Wednesday Net control: Harlan, W1QH



Weekly CARA Sunday club NETS:
 28.490 MHz. USB 7:00 pm – 7:30 pm
 W1QI 2M FM Repeater – 7:30 pm

**Worked All Connecticut Counties Award,
 WACC – Sponsored by CARA:**

<http://www.cararadioclub.org/activities>



**Upcoming Contests, Hamfests &
 Meetings:**

May 14:: CARA Monthly meeting **via Teams**
 May 15: 50 Mhz. Spring Sprint
 May 20: Contest University
 May 22: Goshen Hamfest – Goshen Fairgrounds
 May 22: Hamvention QSO Party
 May 24: CT ARES Region 5 Monthly meeting via
 Teams
 May 28: CARA Monthly Planning meeting **via
 Teams**
 May 28 – 31: CQWW WPX CW Contest
 May 12, 19, 26: CWOps CWT Minitest Regular
 Sessions - 1300Z, 1900Z
 Wednesday, 0300Z Thursday

June 2, June 2021 Capers input deadline

Complete Contest calendar at:

<http://www.hornucopia.com/contestcal/contestcal.html>

New England and other local hamfests:

<http://web.mit.edu/w1gsl/Public/ne-fleas>

Upcoming CARA Calendar:

May 14: CARA April monthly meeting **via Teams**

May 28: CARA April monthly planning meeting
via Teams

June 2: June, 2021 Capers input deadline

**The Annual 13 Colonies On-Air
 Week: July 1-7, 2021**

Want to have some ham radio fun? From July 1-7, the Annual 13-Colonies On-Air event will take place and Pete Chamalian, W1RM, has tentatively agreed to be the net manager in Connecticut. The fun part is this – you get to be on a DXpedition to a very rare and sought-after location, Connecticut, signing K2D. In this event the whole world is looking to work each of the original 13-colonies, and we are one of them! Full details on the event can be found here: <http://www.13colonies.us/>

No matter if you are a seasoned contester or DXpeditioner or if you want to try your hand at being on the receiving end of a pileup, this is a great place to start. The best part is you get to operate from your home station, and you get to set your own hours, bands (160-2) and modes (CW, Phone, Digital).

The only requirement is that you keep the log electronically so contacts can be exported in the ADIF format. It makes no difference which program you use.

If you are interested or would like to volunteer, please contact Pete, W1RM at w1rm@comcast.net

This looks to be an interesting project, and open to lots of Connecticut ham radio operators. Try it!

ARRL Connecticut Section Manager: Charles I Motes Jr, K1DFS k1dfs@arrl.org

2021 Ham Exam Schedule



Goshen CT 06756

05/22/2021

Sponsor: Southern Berkshire ARC

Date: May 22 2021

Time: 9:30 AM (Walk-ins allowed)

Contact: Lawrence S. Polowy
(860) 283-4089

Email: lspolowy@snet.net

VEC: [ARRL/VEC](#)

Location: Goshen Fair Grounds
159 Old Middle St Rte 63
Goshen CT 06756

Upcoming 2021 Amateur radio exams:

Hi everyone,

Hope you are all doing well.

I was informed that the Stony Hill Firehouse in Bethel, CT will not be available to outside groups.

If and when the firehouse becomes available, I will come up with a testing schedule and e-mail it to you.

As an alternative, if there is interest I may periodically offer testing sessions in Woodbury, CT if I can get access to the Woodbury Firehouse (through Glen - W1GHD).

Thanks and 73, Jon - AJ1U

Norwalk CT 06854

05/15/2021

Sponsor: Greater Norwalk Amt Radio Club

Date: May 15 2021

Time: 1:00 PM (No Walk-ins / Register or Call ahead)

Contact: Jon Perelstein
(203) 912-3990

Email: ai1v@arrl.net

VEC: [ARRL/VEC](#)

Location: The Readiness Collective Sono Collection Mall
100 North Water St
Norwalk CT 06854



The Yankee Clipper Contest Club is a special purpose amateur radio club devoted to the pursuit of operating and technical excellence.

More information about the YCCC at:

<http://www.yccc.org/>

Source: YCCC Reflector with credit to all contributors – Editor

13 Colonies Event

From: Pete W1RM

Date: Tue, 27 Apr 2021 15:51:31 EDT

If you aren't familiar with this event, it's a 7-day contest that runs July 1-7. During this event, special calls are provided to each of the original 13 colony states and the world goes after these 13! We in New England are fortunate to have several of the 13.

This year, K2D (Connecticut) will again be activated by as many contesters as we can get. This is a phone, CW, digital event and you can spend as much or as little time as you can. All bands, 160-2 can be used.

I have tentatively volunteered to be the K2D manager which means I have to come up as many ops to put K2D on the air as possible. The beauty of it is you can

operate from your own station or visit one that might be made available to you. The only requirement is all operating has to be in Connecticut.

This is a fantastic opportunity to have some fun and get warmed up for IARU, try out a new antenna or radio, see what it's like to be on a DXpedition without having to leave your home.

If you are interested, please contact me off-line at w1rm@comcast.net

Pete Chamalian, W1RM
W1rm@comcast.net

ICYMI CNET on Headphones

From: Fred Hopengarten

Date: Tue, 27 Apr 2021 16:56:50 EDT

In case you missed it, here's the latest CNET review of headphones:

<https://www.cnet.com/news/best-over-ear-headphones/?ftag=CAD-04-10aac3a>
<<https://www.cnet.com/news/best-over-ear-headphones/?ftag=CAD-04-10aac3a&bhid=21425100529459928429717129596597&mid=13348947&cid=534506376>>
>
<https://www.cnet.com/news/best-over-ear-headphones/?ftag=CAD-04-10aac3a&bhid=21425100529459928429717129596597&mid=13348947&cid=534506376>

-Fred K1VR

Steve Finberg, W1GSL, SK

Posted on [April 26, 2021](#) by [Aaron Addison](#)

It is with deep sadness and regret that I report the passing of Steve Finberg, W1GSL, of Cambridge Massachusetts, **the founder and Benevolent Dictator of the "Swapfest, the Flea at M.I.T."** who became a Silent Key on Friday, April 23rd 2021 just before 7:00 PM.



Steve Finberg, W1GSL

Steve started the famous Massachusetts Institute of Technology electronics flea market in 1985 and ran it up continuously until October 2019. That was 35 years, 8 shows a year, always the third Sunday of the month, April through October. I don't recall it ever being canceled. An outstanding accomplishment!

"The Flea" produced many amazing treasures over the years, things you would find nowhere else. You never know what you will find at "M.I.T.", an event that was highly popular with amateur radio operators and electronics enthusiasts in the Northeast. "Chip" Cohen, W1YW, inventor of the fractal antenna said that he bought all the test equipment and parts he needed at the M.I.T. Swapfest to invent his revolutionary antennas when he was first starting out.

Steve was a long-time analog electronics engineer at Charles Stark "Doc" Draper's lab at MIT and the holder of several patents. He was still working at Draper Labs at the time of his passing.

Steve was an intensely private man and not much is known about his life outside of his work at Draper and M.I.T. I know he would probably not approve of all this attention but the fact that he was so high profile and popular at most amateur radio hamfests and flea markets in the eastern United States makes it necessary.

In addition to his work with The Swapfest, he also compiled and produced the bi-weekly New England Flea Market list for over 30 years. He was a very familiar figure in his signature red sports shirt and straw cowboy hat at hamfests and flea markets for many years all over the east coast and as far south as Orlando FL distributing his famous list along with the Flea at M.I.T. promotional flyers.

Steve was a personal friend for many years and was a knowledgeable source of information on New England hamfests and electronic flea markets. His deep wisdom, advice and wise counsel were invaluable to me when we started the New England Amateur Radio Festival, aka NEAR-Fest at Deerfield NH, in 2007. In 2009, Steve was awarded the NEAR-Fest Lifetime Pass Award for his contribution to the advancement of the hobby in New England.

<https://www.telegram.com/entertainmentlife/20161004/mits-flea-market-specializes-in-rare-obscure-electronics>

Unfortunately, there were no M.I.T. flea markets in 2020 and it doesn't seem there will be very many or possibly none this year as well.

However, the radio clubs at M.I.T. and Harvard University, (the MIT Radio Society, the MIT UHF Repeater Association, the MIT Electronics Research Society and the Harvard Wireless Club) beneficiaries of the "Flea" since the beginning will be resuming the event as soon as conditions allow it. First one is tentatively scheduled for August 15th 2021. The Web site is

<https://w1mx.mit.edu/flea-at-mit/>

Definitely the end of an era. Thank you Steve for all those wonderful fleas and the lists. May he rest in peace.

73, Michael Crestohl, W1RC/VE2XL, "Mister Mike", Benevolent Dictator, New England Amateur Radio Festival, "NEAR-Fest"

Re: FW: [NEWSVHF] Steve Finberg, W1GSL, SK

From: Jim Reisert AD1C

Date: Mon, 26 Apr 2021 16:36:51 EDT

That is sad to hear. I participated in a few volunteer exam sessions in the late 1980s at MIT, led by Steve. And I may have helped out on an MIT Flea or two....

--

Jim Reisert AD1C, <jjreisert@alum.mit.edu>, <https://www.ad1c.us>

Re: FW: [NEWSVHF] Steve Finberg, W1GSL, SK

From: John Allen

Date: Mon, 26 Apr 2021 17:38:52 EDT

He leaves a big hole to fill.

Regards, John

Re: FW: [NEWSVHF] Steve Finberg, W1GSL, SK

From: Dave Pascoe KM3T

Date: Mon, 26 Apr 2021 17:53:39 EDT

Kind of shocked to hear about Steve today. I hadn't seen him in a while...maybe at the last NEARFest. Besides ham radio and EE, Steve and I shared a common bond in that we both grew up in Philly. There wasn't a New England hamfest I didn't see him at, always handing out those Flea at MIT flyers. He was a hell of a guy, a great engineer, a fine human being, and a great ambassador for Amateur Radio.

RIP Steve.

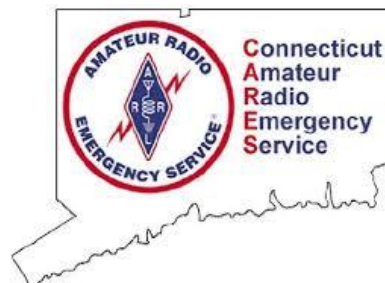
Dave KM3T

Re: FW: [NEWSVHF] Steve Finberg, W1GSL, SK

From: Ed Parish

Date: Mon, 26 Apr 2021 17:58:05 EDT

Yes, Steve will be missed. I remember my first Hamcation hamfest in Orlando a few years ago. As I entered one building, I saw a stack of MIT Flea flyers. I chuckled and remarked that Steve was around here somewhere. Sure enough, I spotted the cowboy hat and ran into him shortly thereafter. RIP Steve.



Latest CT ARES Drill: Saturday, May 8, 2021:

CT Region 5 and American Red Cross Shelters

CARA 2M Repeater used for Region 5 Check-ins.

All CARA members were welcomed and encouraged to participate; ARES Affiliated or not.

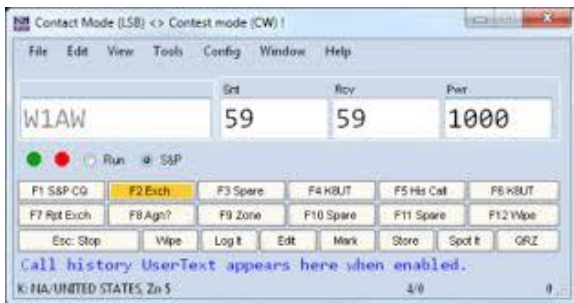
Next CT ARES Winlink Wednesday:

Wednesday, June 2





N1MM Logger is the world's most popular free ham radio contest logging program. For CW, phone and digital modes, its combination of contest-optimized features is unmatched. The program's features are continually changing.



<https://n1mmwp.hamdocs.com/n1mm-features/>

The Amateur's Code The Radio Amateur is:

CONSIDERATE...never knowingly operates in such a way as to lessen the pleasure of others.

LOYAL...offers loyalty, encouragement and support to other amateurs, local clubs, and the American Radio Relay League, through which Amateur Radio in the United States is represented nationally and internationally.

PROGRESSIVE...with knowledge abreast of science, a well-built and efficient station and operation above reproach.

FRIENDLY...slow and patient operating when requested; friendly advice and counsel to the beginner; kindly assistance, cooperation and consideration for the interests of others. These are the hallmarks of the amateur spirit.

BALANCED...radio is an avocation, never

interfering with duties owed to family, job, school or community.

PATRIOTIC...station and skill always ready for service to country and community.

--The original Amateur's Code was written by Paul M. Segal, W9EEA, in 1928.

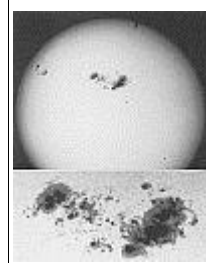


STRAYS...



On 14 Apr of 1956, the first practical commercial black-and-white video recorder was demonstrated at a broadcast convention. The VT-100 by Ampex Corporation of Redwood City was the size of a deep-freeze cabinet and used 14 inch reels of 2" wide magnetic tape to make a one-hour recording.

https://en.wikipedia.org/wiki/Quadruplex_video_tape



On **8 Apr 1947**, a notable sunspot group was observed on the sun's southern hemisphere. Its size was estimated at 7 billion square miles, or an area of 6100 millionths of the Sun's visible hemisphere.

Q: What was notable about this sunspot group?

A: The largest sunspot group ever on record.

Here is a table showing the largest 6 sunspots from the current solar cycle, cycle 24 (SC24.)

Top 6 Largest Sunspots in Solar Cycle 24

Year	Month	Day	Active Region #	Area (MH)	Largest Flare
2014	Oct	22	12192 2410	X1	

2014	Feb	5	11967	1580	M5
2011	Nov	5	11339	1540	X1
2012	Jul	13	11520	1460	X2
2011	Sep	25	11302	1300	X1
2012	Mar	8	11429	1270	X5

A famous giant sunspot is AR9393. On March 29, 2001, the region measured 2440 MH, just slightly bigger than AR12192.

“CW’s Corner”

de W1QK & WA1KRG



CW

Hello Capers readers.

While glancing out at our deck-mounted bird feeder in late April, we noticed a new visitor.



Photo: W1QK

In just a few minutes after sending an inquiry and this photo to our friend, Phil, at Wild Birds Unlimited in Brookfield responded:

That's a male Rose-Breasted Grosbeak, a favorite of many of our customers. They are neotropical migrants, coming up from South and Central America to breed here in the summer. You can read more about them here: https://www.allaboutbirds.org/guide/Rose-breasted_Grosbeak/overview Enjoy! Phil, Wild Birds Unlimited

Find This Bird

A good way to find Rose-breasted Grosbeaks is to listen for them. The song sounds like an American Robin in an unusually good mood—a long sing-songing string of sweet whistles.

Once you hear one, follow the sound until you walk up under his song perch and look for his black, white, and red plumage.

Also pay attention for squeaky chink calls—so sharp-sounding that they're very distinctive. Both males and females frequently give this call. In flight, look for a distinctive pattern of big white spots in their dark wings.

Backyard Tips

Rose-breasted Grosbeaks often visit bird feeders, where they eat sunflower seeds as well as safflower seeds and raw peanuts. Even if you live outside their summer range you may still catch one visiting during spring or fall migration if you keep your feeders stocked.

This bird's sweet, robin-like song has inspired many a bird watcher to pay tribute to it. A couple of early twentieth-century naturalists said it is "so entrancingly beautiful that words cannot describe it," and "it has been compared with the finest efforts of the robin and... the Scarlet Tanager, but it is far superior to either."

Present-day bird watchers have variously suggested it sings like a robin that has had opera training, is drunk, refined, in a hurry, or unusually happy.

Take a listen to the song of the Rose-breasted Grosbeak:

[.https://www.youtube.com/watch?v=ATGSA-nOJhE](https://www.youtube.com/watch?v=ATGSA-nOJhE)

Sunflower Seeds For Grosbeaks



Grosbeaks' big beaks make short work of crushing seed hulls. Here, a Rose-breasted Grosbeak, found in eastern states, takes advantage of a feeder full of sunflower seed. In the west, look out for Black-headed Grosbeaks at your feeders. Photo by [Robin Arnold](#) via [Birdshare](#).

Grosbeaks are one of the best reasons to keep your seed feeders stocked in summer. The males are handsome, decked out in black-and-white formal wear with a pop of color (a red chest patch for Rose-breasted Grosbeaks, warm cinnamon-orange bodies for Black-headed Grosbeaks). Females of both species are drab mottled brown and may be confused with finches or sparrows. Grosbeaks are seed-eating machines. They'll eat millet but their favorite is good ol' black-oil sunflower seeds.

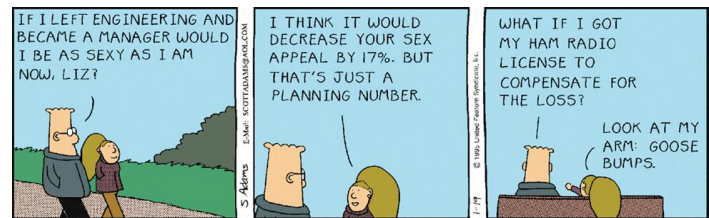
Why are grosbeak beaks so big? The better to eat large seeds with, my dear. Grosbeaks are one of the classic birds with beaks that indicate what they eat—big, sturdy beaks are best for crushing seed hulls. Those beaks are also mighty good at crushing insects and grasshoppers, another primary food source. A female grosbeak's big beak is the first clue that you're not looking at a finch or a sparrow, both of which have decidedly more petite beaks.

CW is for the birds

From: John AJ1DM
Date: Thu, 06 May 2021 09:28:14 EDT

One of my CWA students sent me this:
<https://www.blogto.com/city/2021/05/metrolinx-morse-code-birds-crashing-glass/>
Maybe we can get a few birds to sign up for CW Academy!
73, de John-AJ1DM

Here's a classic Dilbert I hope you enjoy this month – 73, CW



Submit your "Strays" to the CARA Capers.



The CW Operators' Club

cwops.org

The CW Operators' Club, commonly known as CWops, is an international organization, in membership and management, for amateur radio operators who enjoy communicating using Morse Code. Its mission is to foster the use of CW, whether for contesting, DXing, traffic handling, or engaging in conversations

Source: CWops Reflector with credit to all contributors – Editor

Contest Calendar

From: Jim N7US #486
Date: Wed, 07 Apr 2021 14:27:00 EDT

For another tip while we're waiting for 19Z to roll around, if you haven't customized your view of <https://www.contestcalendar.com/>, go to <https://www.contestcalendar.com/index.html> and click on Calendar Customization. It uses cookies on your browser to show only those contests of interest to you. Clicking on CW in the header of <https://www.contestcalendar.com/contestcal.html> will show only CW contests.

If you click on the Preferences link, you can input your email address, call, QTH, club, and comments which will then be remembered so you don't have to enter them for each contest.

Wednesdays are still my favorite day of the week!

73, Jim N7US

From: Pete Smith
Date: Wed, 07 Apr 2021 10:05:15 EDT

I think CWTers should be aware that these frequencies are problematical in the Mid-Atlantic because of digital interference. I'm not 100 percent sure I'm right about 7050, because what I hear there doesn't sound like FT8, but it sure is strong.

--
73, Pete N4ZR

Check out the new Reverse Beacon Network web server at <<http://beta.reversebeacon.net>>. For spots, please use your favorite "retail" DX cluster.

Date: Wed, 07 Apr 2021 10:10:19 EDT
Pete, the whines and drones around 7040 are WSJT, and the 7047-7050 region is used by FT4.

Both were very poor choices for those modes but that's where they plunked down and the users of those modes do not know how to use the VFO knob. But us CW operators know how to use the VFO knob.

Tim N3QE
From: K5AX
Date: Wed, 07 Apr 2021 10:21:23 EDT
There was a lot of weird QSB and Noise from a weather front coming from the west. Deep fading. Signals from the west were weaker than usual. Then AH6KO called and was a real 599 on 40M!

73, Tom K5AX

Re: 7040/7050
From: Skip
Date: Wed, 07 Apr 2021 13:21:06 EDT

Yep. Given the multitude of different sub-bands authorized around the world for different modes, I suppose it's hard to find 3 kHz that works for everyone. They're also not conducive to adjustments of the Big Knob since they're nearly automatic, "Almost No Human Intervention Required." While a single FT8 or FT4 signal is very narrow, the the nature and operation of the Joe Taylor modes consumes close to 3 kHz of spectrum, quite a bit wider than any of the dreaded PACTOR modes. ☺

73, Fred ["Skip"] K6DGW #142
Sparks NV DM09dn

Re: CWT 3-session Venn Diagram
From: Gerry Hull
Date: Thu, 06 May 2021 09:10:15 EDT

As always, very interesting data, Tim!

Overall, the results make perfect sense: 1900z is a convenient time for everyone, so it has the most activity.

When CWT started, no one predicted how popular it would become. Naturally, it has become a quite competitive event. Due to the contest design, especially as an SO1R op, maximizing score, like most sprint-like contests, means that you run, run, run. However, depending on your geographic location, running becomes all but impossible due to time of day or propagation.

So it boils down to this: Are CWTs what CWOps is? I don't think so. We promote CW activity.

CWT is part of a means to an end. Luckily, it has become tremendously popular. However, the fun is limited (considering the entire world) by the three times the test is run on Wednesdays.

There are 24 slots in the day we could run CWT. All the mechanisms are in place to add additional time slots without the huge overhead.

Can someone please explain what the downside is to adding more slots during a weekday? I doubt it would dilute activity!

How about this? Add a couple of time slots as an experiment, and see what the activity is like.

After all, isn't our reason for being to promote activity?

73, Gerry W1VE



About ARRL:

Founded in 1914 by Hiram Percy Maxim, ARRL (American Radio Relay League) is the national association for Amateur Radio in the US. Today, with more than 161,000 members, ARRL is the largest organization of radio amateurs in the world. ARRL's mission is based on five pillars: Public Service, Advocacy, Education, Technology, and Membership.

ARRL -- Your One-Stop Resource for Amateur Radio News and Information

- [Join or Renew Today!](#) Eligible US-based members can elect to receive [QST](#) or [On the Air](#) magazine in print when they join ARRL or when they renew their membership. All members can access digital editions of all four ARRL magazines: *QST*, *On the Air*, *QEX*, and *NCJ*.
- Listen to [ARRL Audio News](#), available every Friday.

Subscribe to...

[NCJ -- National Contest Journal.](#)

Published bimonthly, features articles by top contesters, letters, hints, statistics, scores, NA Sprint, and QSO parties.

- [QEX -- A Forum for Communications Experimenters.](#) Published bimonthly, features technical articles, construction projects, columns, and other items of interest to radio amateurs and communications professionals.

Free of charge to ARRL members...

- [Subscribe](#) to the *ARES Letter* (monthly public service and emergency communications news), the *ARRL Contest Update* (biweekly contest newsletter), Division and Section news alerts -- and much more!
- Find ARRL on [Facebook!](#) [Follow us on Twitter](#) and [Instagram!](#)



Member and Station News:

Your news or story could be included here in the next issue of *CARA Capers*. Contact W1QK, *Capers* editor.

Just snap a pix of your station, antennas, mobile installation, etc. and send it in!

WA1JGA's G5RV dipole was returned to service in May, and he worked Nevada in the NEQP for one of his last needed states for the ARRL WAS Dave only needs Wyoming now for the award. CQ WY de WA1JGA...

CARA members worked by W1QK during the 2021 New England QSO Party (NEQP):

Ron – N1IBQ
Gary – N1GSA
John – W1JGM
Thanks for the QSO's.



For more NEQP information: www.neqp.org

Vincent Tompkins via
CARA <cara@cararadioclub.org>
To:'cara@cararadioclub.org'
Sun, May 9 at 7:57 PM

[CARA Members] I worked a JA on 10m

JR1AQN

Masaaki Maeda
192 Hardscrabble Rd.
Briarcliff Manor, NY 10510

https://cdn-bio.grz.com/n/w2_jr1agn/QSL_card.jpg?p=53b2c10b7607b9435d7c934bb31ea862

Capers: Swap and Shop

CARA Swap & Shop Policies:

CARA assumes no responsibility for transactions made or inaccuracies in ads. You are responsible for checking your ad and notifying us of any corrections. Swap and Shop listings are open to licensed CARA

hams, based on space available. Please submit your list to w1qk@snet.net for placement in the CARA Capers.

Quantity	Item	Price each
1	IC-706 Mk II G	\$600
1	Ameritron SDA-100 Screwdriver Antenna	\$400
1	West Mountain Radio TARGETuner	\$120
1	440 Cushcraft Ringo Ranger	\$50
1	Camp Chair	\$25
1	ICOM IC-756 Pro III Transceiver	\$800

1 Go-Kit with following Equipment \$1,200
ICOM IC-7000 Transceiver, LDG IT-100,
Yaesu FT-8900, Kantronics KPC-3+,
West Mountain Powergate, West Mountain
Rigrunner

Contact: Roger – NG1R; 203- 241-0478 or
roger.mitchell@snet.net



Visit us on the Web at
<http://www.cararadioclub.org>

Executive Board:

President – Bud Kozloff, W1NSK
w1nsk@hotmail.com
Vice President – John Morelli, W1JGM
w1jgm@aol.com
Secretary – Gary Adams, N1GSA
Mrclipper69@yahoo.com
Treasurer – Charles Setaro, KC1IBR
cjset@att.net

Directors:

Harlan Ford, W1QH - hford01@snet.net
Roger Mitchell, NG1R – roger.mitchell@snet.net
David Coelho, WA1JGA – davidcoelho@gmail.com

CARA is an IRS 501(C)3 Organization.
Consider supporting CARA in your estate planning.

CAPERS is the monthly newsletter of the
Candlewood Amateur Radio Association
Editor: Dan Fegley, W1QK
w1qk@snet.net



Courtesy of: The Mahoning Valley Amateur Radio
Association's Award-Winning monthly newsletter:
"Voice Coil" <http://www.mvara.org/News/Current.pdf>

CARA Standing Committees:

*Last Updated: January 3, 2021 by the CARA
Executive Committee*

A brief word from our editor...

CARA CAPERS is the monthly publication of the
Candlewood Amateur Radio Association, Inc.
(CARA) and is intended to present news, issues, and
opinions of interest to CARA members and the
Amateur Radio Community.

We encourage contributions of articles, letters to the
editor, etc. and welcome newsletter exchanges with
other clubs from around the country and around the
world. Permission is granted to reprint material
contained herein as long as proper credit is given to
this newsletter and the author.

Ideas for, and contributions to the CAPERS should be
submitted to: w1qk@snet.net.

Submissions must be received no later than the date
indicated in the preceding month of issue, *unless
otherwise specified*.

Submissions should be in MS Word format or ASCII
text. Photos should be in .jpg format.

Material received after the deadline will be used in the
next month's CAPERS if it's still current and /or
newsworthy.

The CAPERS is published by CARA Capers Editor.
All material contained herein is considered the opinion
of the author and not necessarily that of CARA.

Announcements of events are for informational
purposes and do not necessarily constitute an
endorsement by CARA. No responsibility for accuracy
is assumed by the CARA Capers editor or newsletter
staff.

Just a reminder to all members that these are the
standing committees that help make CARA run
and fun.

Our members and their ideas are our strength.

*Please step forward to serve your club with one of
these committees. You'll notice that several CARA
members serve on multiple committees.*

Talk to any member of the Executive Committee
or Director to volunteer!

*We're hoping to see your name on at least one of
these important committees.*

CARA Repeater and Digital Equipment:

Repeater coordination
Repeater maintenance
Other digital equipment

Chairman: Gregory Davis – WR1Z

Committee Members:

John Morelli – W1JGM

Marcus Swearingen – AB1WV

Vincent Tompkins – N2OHH

Charles Setaro – KC1IBR

Dan Fegley – W1QK

CARA Operating Activities:

Winter Field Day, New England QSO Party,
ARRL Field Day, New Fairfield Day Special
Event Station, Peter Weinberger New Fairfield
Car Show Scholarship Fundraiser Special Event
Station, 2M Fox Hunt (hidden transmitter).

Chairman:

Committee Members:

Annual CARA Hamfest Fund-Raising event:

Chairman: John Morelli – W1JGM

Committee Members:
Marcus Swearingen – AB1WV
Bill Webb – W1AFX
Charles Setaro – KC1IBR

Membership:

Annual dues notification and follow up
Annual new member drive

Chairman: John Morelli – W1JGM

Education and Elmering:

Organize or sponsor class for entry-level license
Organize Elmer support network for new hams
Organize two 3-person ARES deployment teams

Committee Chairman:

Committee Members:

Youth Committee:

Committee Chairman: Keith Iwanicki -W1KRI
Committee Members:

Program and Activities:

Organize and arrange monthly program
Organize activities
Annual Holiday Gathering
Summer Pasta Party
Committee Members:
Bud Kozloff – W1NSK
Marcus Swearingen – AB1WV

Weekly CARA Sunday 7:30 PM Net:

Committee Chairman: David Teagarden – KB1ZAC
Committee Members:
Tom Coury – WX1T
Charles Setaro – KC1IBR

CARA Capers:

Monthly newsletter staff
CARA Capers Editor:
Dan Fegley – W1QK

Development Committee:

Seek and obtain alternative sources of funding for club events and activities

Committee Chairman:

Committee Members:

Website Committee:

Maintain the CARA Website

Committee Chairman:

Committee Members:

Charles Setaro – KC1IBR
John Ahle – W1JMA
Roger Mitchell – NG1R
Dan Fegley – W1QK

Please advise the CARA Executive Committee of any changes to this list.

THE POWER OF TEAMWORK:

Video Motivasi – Kerjasama Team (Team Work)

<https://youtu.be/oqRX02uhicc>



Preliminary CARA 2021 Calendar

May	14 – Monthly meeting via MS Teams Guest speaker: Fred Kemmerer – AB1OC 21 – Monthly planning meeting via MS Teams
June	11 – Monthly meeting 25 – Monthly planning meeting 26-27 ARRL Field Day
July	9 – Monthly meeting 23 – Monthly planning meeting
August	13 – Monthly meeting 27 – Monthly planning meeting 29 - CARA Western CT Hamfest
December	10 - CARA Annual Holiday Party



For Sale: Backup Batteries

Attention Club Members, **4 available immediately** for Pickup in New Fairfield.

Energys 12HX300-FR "DataSafe" HX batteries.

Be ready, winter is coming, and with it comes the loss of power.

Now is the time to support the club. I have some batteries that I have donated to the CARA club for fund raising and backup power for our repeater system on the top of spruce mountain. We are making these available to you.

As we were not able to hold our annual Hamfest. and as everyone knows, the Hamfest is our main source of income and support of our organization.

These are **Energys 12HX300-FR** top terminal, Valve Regulated Lead Acid (VRLA), AGM batteries, these batteries are completely sealed.

Please see the attached specification sheet for more information.

Remember there are other uses for back up batteries than our radio equipment, such as: Pellet stoves with 12Vdc back-up power, Inverters for DC to AC, 12Vdc lighting and many more applications. need 24Vdc: series 2 batteries, need more time and power: parallel two or more.

These are fully tested, used batteries that were removed from a critical data center after **two years on an advertised 10-year operating life.**

The Batteries are available for a **Donation of \$100 each** to the Candlewood Amateur Radio Association (CARA). payment can be made using the clubs PayPal account, (Preferred), check or cash. Payment is expected at time of pickup.

Please feel free to pass this notice on to other clubs or individuals.

Support the club now! - Delivery can be negotiated. - Each battery weights 60 LB.

73,
John G. Morelli (W1JGM)
VP Candlewood Amateur Radio Association (CARA)
Chairman; Western Connecticut Hamfest
www.cararadioclub.org
203-417-0160



data safe[®]
HX

12HX300-FR 12V, 284W/Cell 15 min.
FLAME RETARDANT

Float voltage / Tension de floating
13.6 ± 0.1V at 77°F (25°C)

Connection torque / Couple de serrage
6.8 Nm 60 in lbs

Non-spillable lead-acid battery Made in Mexico

WARNING: Risk of fire, explosion or burns. Do not disassemble, heat above 65°C or incinerate. Ventilate spaces where used or charged.
 WARNING: Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Batteries also contain other chemicals known to the state of California to cause cancer.
 WASH HANDS AFTER HANDLING.

www.enersys.com

6 35241 13941 9

EnerSys.

Link to battery data sheet: www.enersys.com



Sanctioned by ARRL

SAVE THE DATE

AUGUST 29, 2021

Sunday, Doors open 8AM
Candlewood Amateur Radio Association
Annual

Western CT. Hamfest

The **BIGGEST**, little Hamfest in
Western Connecticut

Indoor tables \$20 each, Tailgating \$15 / spot

Includes 1 admission

Admission at the door \$7 (**\$1 discount with flyer**)

Children under 12 Free

See you at the Hamfest "73"

CARA is a 501(c)3 organization

All State COVID-19 regulations will be in place

FALL "ARES" FORUM
10:30 IN THE HALL

DEMONSTRATIONS

MAJOR VENDORS

INDOOR TABLES
OUTDOOR TAILGATING

VE SESSION - 9:30
NO APPOINTMENT REQ.

REFRESHMENTS

RAFFLE
DOOR PRIZES
50/50
GOOD TIMES

TO BE HELD AT

Edmond Town Hall
45 Main St
Newtown, CT

Hamfest.cararadioclub.org

Contact; John Morelli
(W1JGM)

Hamfest@cararadioclub.org

203-417-0160

CURRENT SPACE WEATHER CONDITIONS on NOAA Scales

PREDICTED SUNSPOT NUMBER AND RADIO FLUX

Source: <https://www.swpc.noaa.gov/products/predicted-sunspot-number-and-radio-flux>

Date	Sunspot Number Predicted			Sunspot Number High			Sunspot Number Low 10.7		
	cm Radio Flux Predicted			10.7 cm Radio Flux High			10.7 cm Radio Flux Low		
2020-10	11.4	12.4	10.4	75.1	76.1	74.1			
2020-11	12.1	14.1	10.1	75.3	76.3	74.3			
2020-12	12.9	15.9	9.9	75.5	77.5	73.5			
2021-01	13.6	18.6	8.6	75.8	78.8	72.8			
2021-02	14.4	19.4	9.4	76.1	80.1	72.1			
2021-03	15.6	21.6	9.6	76.5	80.5	72.5			
2021-04	16.7	23.7	9.7	76.8	81.8	71.8			
2021-05	16.6	23.6	9.6	76.3	85.3	67.7			
2021-06	16.3	24.3	8.3	75.5	84.5	67.7			
2021-07	17.2	26.2	8.2	75.3	84.3	67.7			
2021-08	19	28	10	75.8	84.8	67.7			
2021-09	20.6	30.6	10.6	76.4	85.4	67.7			
2021-10	22.5	32.5	12.5	77.2	86.2	68.2			
2021-11	24.7	34.7	14.7	78.3	87.3	69.3			
2021-12	27.1	37.1	17.1	79.5	88.5	70.5			
2022-01	29.6	39.6	19.6	80.8	89.8	71.8			
2022-02	32.1	42.1	22.1	82.1	91.1	73.1			
2022-03	34.8	44.8	24.8	83.5	92.5	74.5			
2022-04	37.4	47.4	27.4	85	94	76			
2022-05	40.2	50.2	30.2	86.5	95.5	77.5			
2022-06	43	53	33	88.1	97.1	79.1			
2022-07	45.9	55.9	35.9	89.8	98.8	80.8			
2022-08	48.7	58.7	38.7	91.5	100.5	82.5			
2022-09	51.6	61.6	41.6	93.2	102.2	84.2			

Transistor Basics: NPN & PNP Using 2N3904, 2N3906, 2N2222, and 2N2907

By John LeDuc

Contributed By Digi-Key Electronics

2017-12-21

Amazingly, the first operational Transistor was declared 70 years ago, on December, 23 1947!¹ The Transistor is probably one of the most revolutionary components ever invented. It led the way for the creation of integrated circuits, microprocessors and computer memory.

In this article, we'll discuss the following areas;

(click the link to skip to any section that suits your needs)

- [What is a transistor?](#)
- [How does a transistor work?](#)
- [Choosing a transistor for your application](#)
- [Transistor circuit examples](#)
- [History Behind the invention of the transistor](#)
- [Reference links for further study](#)

What is a transistor?

A transistor, also known as a BJT (Bipolar Junction Transistor), is a current driven semiconductor device which can be used to control the flow of electric current in which a small amount of current in the Base lead controls a larger current between the Collector and Emitter. They can be used to amplify a weak signal, as an oscillator or as a switch.

They are usually made of silicon crystal where *N* & *P* type semiconductor layers are sandwiched together. See Figure 1 below.

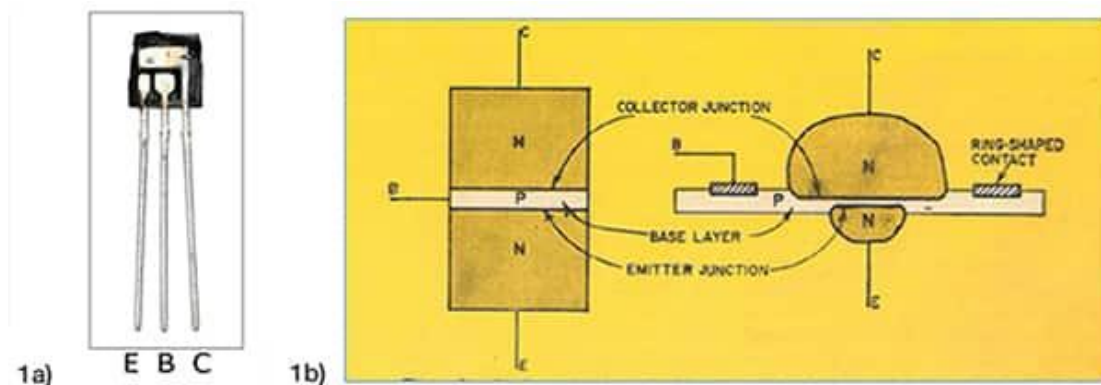


Figure 1: Figure 1a shows a [2N3904 TO-92](#) cut-away revealing E - Emitter, B - Base, and C - Collector leads tied to Silicon. Figure 1b is taken from a May 1958 *Radio-Electronics Magazine*² showing the N & P type layer slices and arrangements (referenced as Germanium material at that time).

Transistors are hermetically sealed and encased in plastic or a metal can with three leads (Figure 2).

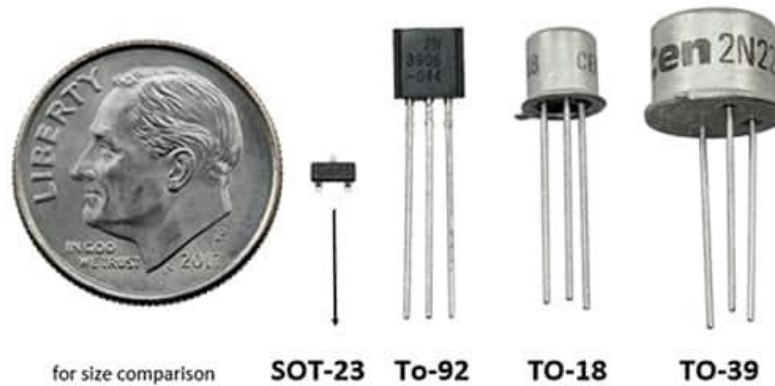


Figure 2: A size comparison and a variety of popular package types.

How does a transistor work?

For an example, we will show how an NPN transistor works. A simple way to view its function as a switch is to think of water flowing through a tube controlled by a Valve. Water pressure represents 'Voltage' and water flowing through a tube represents 'Current' (Figure 3). The large tubes represent the Collector/Emitter junction with a Valve in-between, expressed in the figure as a Gray Oval, like a moveable flap, which is actuated by current from a small tube representing the Base. The valve keeps the water pressure from flowing from Collector to the Emitter. When water flows through the smaller tube (the Base), it opens the valve between the Collector/Emitter junction, allowing water to flow through to the Emitter, and on to Ground (Ground represents the return for all water or Voltage/Current).

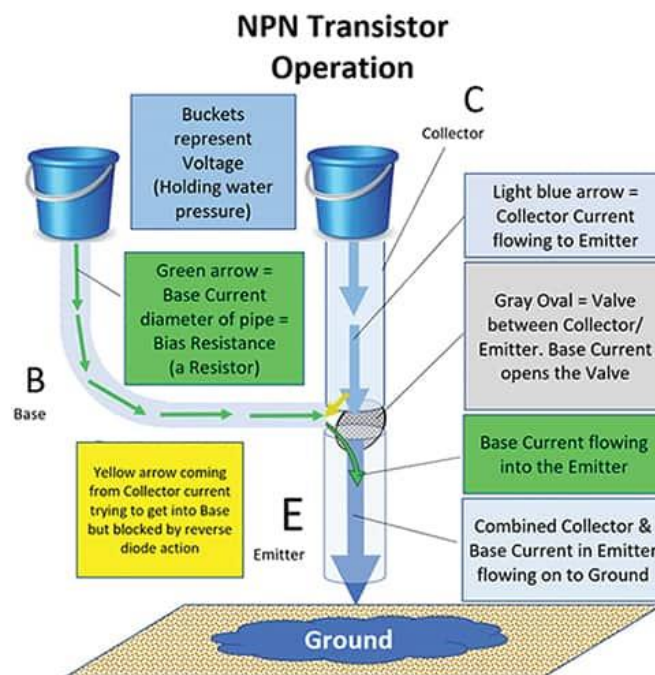


Figure 3: This graphical representation illustrates how a transistor functions. When water flows through the smaller tube (Base), it opens the valve between the Collector/Emitter junction, allowing water to flow through the Emitter to Ground.

Choosing a transistor for your application

If you want to simply turn on a circuit or switch on a load, there are certain things you should consider. Determine if you want to bias or energize your transistor switch with positive or negative current (i.e. NPN or PNP type, respectively). An **NPN** transistor is driven (or turned on) by positive current biased at the base to control the current flow from Collector to Emitter. **PNP** type transistors are driven by a negative current biased at the base to control the flow from Emitter to Collector. (Note that polarity for PNP is reversed from NPN.) See Figure 4 below for more details.

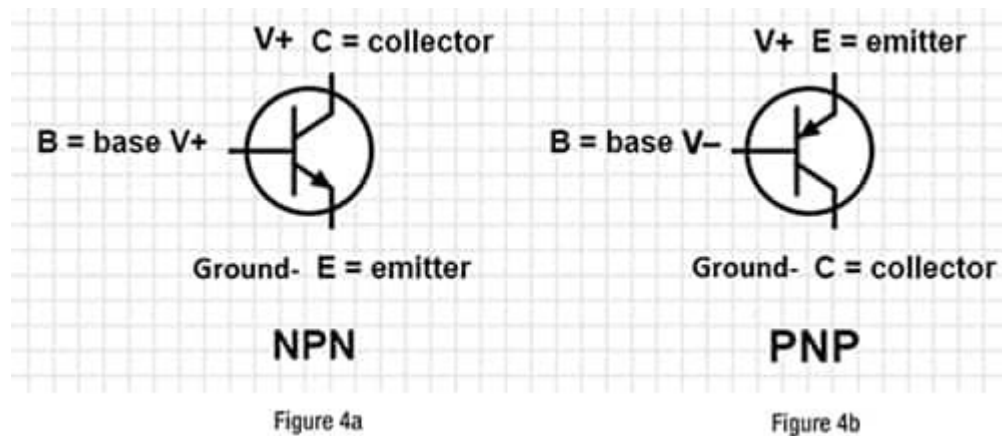
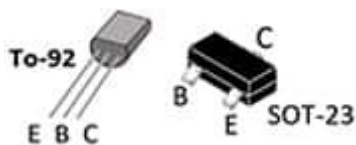


Figure 4: Schematic Symbols for each type of transistor.

After the bias voltage is determined, the next variable that is needed is the amount of voltage and current the load requires to operate. These will be the minimum voltage and current ratings of the transistor. Tables 1 and 2 below show some popular transistors and key specifications including their voltage and current limits.

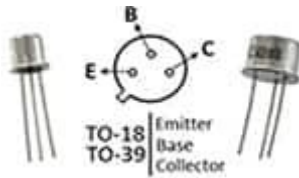


Transistors, NPN and PNP, Leaded and Surface Mount

**For SOT-23 package*

***Specifications may vary - verify details in datasheet*

Table 1. Popular leaded and surface mount NPN and PNP transistors.



Transistors, NPN and PNP, Metal Can Packages

***Specifications may vary - verify details in datasheet*

Table 2. Popular metal can packaged NPN and PNP transistors.

Transistor circuit examples

Figure 5 below shows a circuit example which turns on the Collector-Emitter junction by energizing the Base, or biasing the transistor to turn it on, by bringing 5 volts to the base via a slide switch. This example lights an LED which is the load in this case. The proper use of resistors to prevent overcurrent draw is required when biasing the base. I used leaded parts in a bread board to test my example circuit. Most engineers will use surface mount components (much smaller size than a TO-92 package) when it comes to using transistors in a new product design going to market. Here is a link that shows various package sizes for [3904 transistors](#).

Since the 2N3904 is an NPN transistor, the base needs positive biasing (appropriate voltage levels and resistance) to turn on the collector emitter junction for proper current flow. Use of a load resistor (R1) is also important so there is not too much current being driven through the LED and transistor. For more information on this transistor, see the [2N3904 datasheet](#).

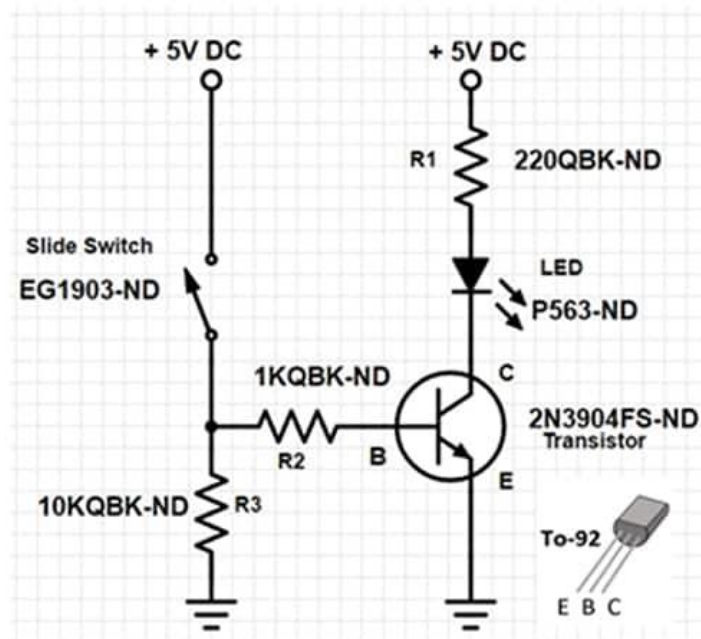


Figure 5: 2N3904 circuit example for lighting an LED with a [EG1218](#) slide switch showing pins C (Collector), E (Emitter), and B (Base) (Image drawn in Scheme-it).

Figure 6 is an example night light circuit using a PNP transistor. To see the details of this circuit, link over to [Digi-Key's engineering wiki site](#) and search PNP Night Light.

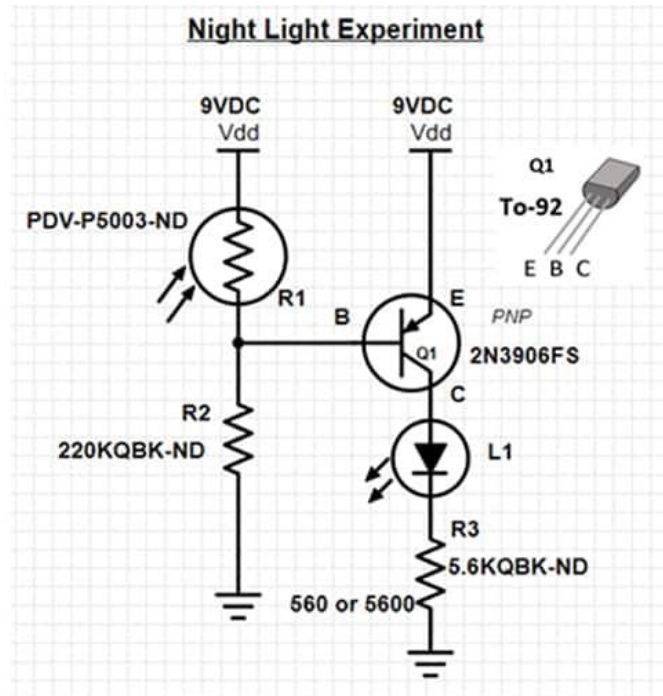


Figure 6: 2N3906 example night light circuit for lighting an LED with a [PDV-P5003](#) photocell (Image drawn in Scheme-it)

Brief history of the invention of the transistor

How did it all start? This rabbit hole goes very deep; however, I'll start with the invention of the telephone. Many would argue who truly invented the first working electrical prototype; however, the first patent was obtained by Alexander Graham Bell on March 7th, 1876³, and he later formed the American Telephone and Telegraph company (aka AT&T). Right around 1894¹ Bell's patent expired. Although AT&T dominated the telephone market up to the early 1900s, other companies formed and were taking customers away from AT&T. Because of this, the company felt the need to continue to dominate and expand their market. In 1909, AT&T President Theodore Vail¹ wanted to transmit phone calls transcontinental (New York to California). But to do this they needed a good amplifier or repeater to boost the signals traveling long distances. Previously in 1906, Lee De Forest had taken an idea created by John A. Fleming (who took work from Thomas Edison, creating a vacuum tube device called the "oscillation valve" used to detect radio waves), modified it to create the Triode – an inefficient 3 terminal vacuum tube that could be used as an amplifier. In 1912 Forest was invited by Harold Arnold of Western Electric Company (AT&T's manufacturer) to show off his invention. Although Forest's Triode worked at low voltages, Arnold needed it to work at higher voltages to make effective repeaters for transmitting voice over long distances. Arnold believed he could make a better Triode and so he hired scientists to understand how the device worked and how he might

improve it. In October 1913, he was successful. Soon after that telephone lines were installed everywhere. The investments that AT&T made hiring top scientists over the years made them realize doing deep research would give them a competitive advantage over their competition and so formed the “Bell Telephone Laboratories” in 1925.

Many thousands of vacuum tubes and relays were needed to keep the telephone lines running. However, vacuum tubes took a lot of power, were large, and burned out frequently. Gaining an understanding from World War 2 technology developments of the crystal rectifier used to enable radar, Mervin Kelly, Bell’s Director of research, had an inkling that semiconductors (solid-state devices) may be the answer to creating a device that could replace the expensive, unreliable vacuum tubes. Kelly sought out one of their brilliant physicists, William Shockley, to explain his vision of improving the components used to transfer voice over wires. Kelly expressed his feelings that he would be glad when noisy mechanical relays and power hungry vacuum tubes would someday be replaced by solid-state electronic devices. This really stuck well with Shockley and became his primary goal. Kelly put Shockley in charge of finding a way to make it happen.

He was a brilliant theorist but not so good at constructing his ideas. Shockley had made several attempts to try proving an idea he had of the field effect transfer of electrons to connect two sides of a semiconductor by energizing a plate above the semiconductors. He was unsuccessful. Frustrated, he turned to two other physicists at Bell labs, John Bardeen (brilliant with electron theory in semiconductors) and Walter Brattain (great with prototype & use of lab equipment). They became part of his team. Shockley allowed the dual team to work on their own. Over the years, many attempts were made trying to get the field effect work but it never did. They went over their calculations and in theory it should have worked. Thinking out of the box, Bardeen and Brattain experimented with thin slices of silicon and germanium trying to get the field effect to work. In the fall of 1947 there was a sign of progress as Brattain was having trouble with condensation of water settling on the surface of the semiconductor. Rather than drying it out he placed a drop of water on top of the silicon, energized the plate above it, and noticed an amplifying effect. The water drop helped overcome the surface barrier which helped create the electron flow, but it was sluggish and not able to cleanly amplify voice signals that would be needed to successfully transmit voice.

In December of 1947 (noted as the Miracle Month) they thought of eliminating the gap of field effect, removing the water and creating a gold contact to touch the semiconductor. They switched to germanium, which was easier to work with at that time, and isolated it with a thin oxide film which naturally forms on germanium. Many tests were done with no success. Then in mid-December, apparently by accident, Walter Brattain had inadvertently washed off the oxide coating, making the gold contact direct to the germanium! Bingo!!! He had discovered good amplification and the Transistor was functional. Instead of electrons being pulled to the surface of the semiconductor as theorized by Shockley’s field effect idea, Brattain/Bardeen had discovered that by contacting the semiconductor with a gold contact, they were injecting holes into the semiconductor, enabling the electricity to flow. Around mid-December 1947, without Shockley’s knowledge they began creating an operational prototype. Brattain put together an apparatus in the shape of a plastic triangle with gold foil along the slanted edges and made a razor thin slit at the triangle point. It was an extremely crude prototype. They used a paper clip made into a spring to press the triangle into the thin germanium semiconductor, on top of a thin copper plate, where there were two leads – one on each end of the triangle. The copper plate under the germanium slice served as the 3rd lead, if you will (Figure 7). It ended up being called the Point Contact Transistor.

Brattain and Bardeen called Shockley to let him know the good news. What I've researched says Shockley had mixed emotions, glad that it was functional but disappointed that he did not directly create it. The demonstration to Shockley's bosses came a week after they discovered it on December 23rd, 1947 (it was publicly announced on June 30, 1948). Later, a picture was taken at that time for history (Figure 8). Shockley knew the fragile point contact transistor would not be easy to manufacture and he was consumed by trying to make it better (by himself). Shockley worked feverishly to try to solve the problem his way... documenting his thoughts of trying to make it more integrated by layering the semiconductor materials together. Much more research was involved to complete the theory for filing a patent for the junction transistor (filed June 25th, 1948). A functional n-p-n junction transistor was demonstrated on April 20th, 1950 (enabled by the work of Gordon Teal and Morgan Sparks). The details around all of this goes much deeper than you can imagine⁴.

The Nobel prize for the invention of the Transistor effect was given to William Shockley, John Bardeen, and Walter Brattain on December 10, 1956.



Figure 7: The Point Contact Transistor (Reused with permission of Nokia Corporation)



Figure 8: John Bardeen, left, William Shockley, middle, and Walter Brattain, right. (Reused with permission of Nokia Corporation)

References

1. Riordan, Michael and Lillian Hoddeson. 1997. *Crystal Fire: The Invention of the Transistor and the Birth of the Information Age*. New York, NY: W.W. Norton & Company, Inc.
2. Ryder, R.M. 1958. "Ten years of Transistors", *Radio-Electronics Magazine*, May, page 35.
3. Houghton Mifflin Harcourt Publishing Company. 1991. "[ALEXANDER GRAHAM BELL](#)". Retrieved Dec. 19, 2017.
4. Riordan, Michael, Lillian Hoddeson, and Conyers Herring. 1999. "The Invention of the Transistor", *Modern Physics*, Vol 71, No. 2: Centenary.

Additional information can be found at: <http://www.pbs.org/transistor/>



Masaru Ibuka

Masaru Ibuka could well be the person who turned Japan's electronics industry into what it is today. He was co-founder of a tiny recording company that grew into the giant Sony Corporation. But perhaps more importantly, he led the Japanese charge to make their own innovative electronic products instead of simply copying what was being done in the West.

He brought transistor technology to Japan, and Sony built the first Japanese transistor radio and the world's first transistorized television set. Ibuka was born in 1908 in Nikko City, Japan. He attended the School of Science and Engineering at Waseda University where he earned the nickname "genius inventor." When he graduated in 1933 he began working at Photo-Chemical Laboratory which recorded and processed movie film.

In 1945, after World War II, Ibuka left to start a radio repair shop in a bombed-out building in Tokyo. The next year he was joined by his colleague Akio Morita, and they founded a company called Tokyo Tsushin Kogyo K.K., which translates in English to Tokyo Telecommunications Engineering Corporation. The company built Japan's first tape recorder called the Type-G.

In the early 1950s, Ibuka was traveling in the United States and heard about Bell's invention of the transistor. He convinced Bell to license the transistor technology to his Japanese company (this is a testament both to Ibuka's persistence and scientists' openness to sharing information even so soon after the war).

While most American companies researched the transistor for its military applications, Ibuka envisioned using it for communications. While Regency and Texas Instruments in the US may have built a transistor radio first, it was the Tokyo company that really invested the radio as a viable commercial product.

Ibuka's company -- now named Sony, a combination of the Latin word for sound "sonus" and the chic Japanese boys of the time nicknamed "sonny" -- quickly took over the market.

Ibuka led Sony in directions that were unusual for a Japanese company at the time, as they tried to create more of their own products instead of simply modifying Western technology.

In 1976, Ibuka stepped down as chairman of Sony, though he retained close connections with company as an advisor until he died of heart failure on December 19, 1997.

Source: <https://www.pbs.org/transistor/album1/addlbios/ibuka.html>



*Masaru
Ibuka, left,
with Akio
Morita*

What was the first transistor radio?

Regency TR-1

Following the invention of the transistor the first commercial transistor radio, the **Regency TR-1**, was released in 1954.



IT'S THE NEW POCKET-SIZE Regency

THE FIRST TRANSISTOR RADIO EVER BUILT!

We're pioneering again with another first in radio design. Tiny transistors have replaced bulky vacuum tubes, will last indefinitely. This Regency operates on a single hearing-aid battery at less than 6¢ an hour playing time . . . cheaper than larger, more expensive units! Attractively styled in choice of madarin red, ebony, cloud grey or bone white. Come in tomorrow and test it at Goodman Jewelers.

\$49⁹⁵
Battery \$1.15

**ONLY \$1.00 DOWN DELIVERS
ONLY \$1.00 WEEKLY**

Transistor . . .
This miniature miracle replaces bulky vacuum tubes. 50 million engineers say it could be used in any radio.

ACTUAL SIZE

START PAYING IN 1955

Wherever you go—music, news, entertainment to relax, refresh and stimulate. Here is that "Something Different" for a Christmas Gift.

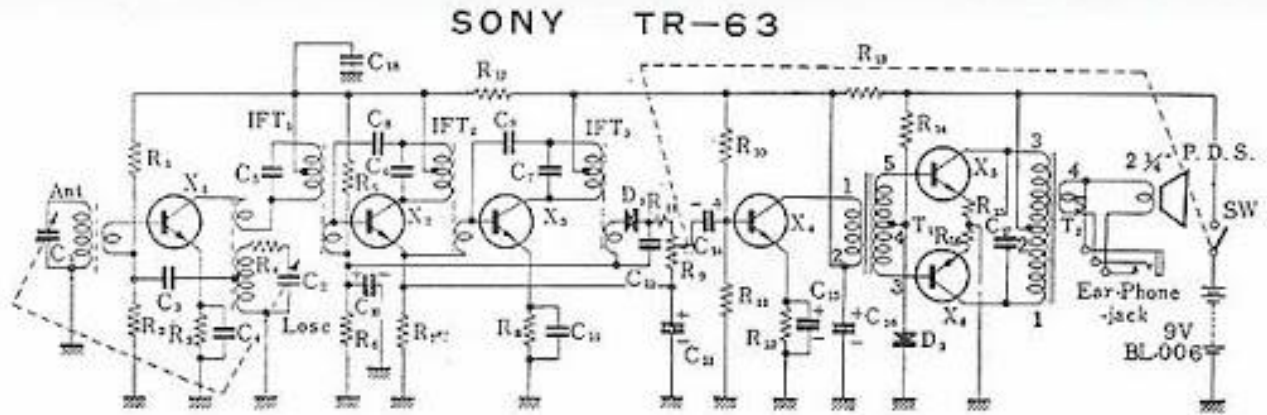
GOODMAN Jewelers
SINCE 1907

King of Diamonds

The mass-market success of the smaller and cheaper Sony TR-63, released in 1957, led to the transistor radio becoming the most popular electronic communication device of the 1960s and 1970s.

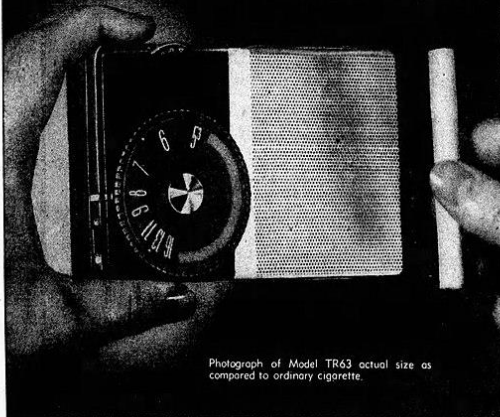


1957 Sony TR-63



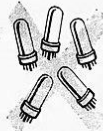
R ₁	56kΩ	20% 1/4W	R ₁₂	1.5kΩ	20% 1/4W	C ₄	0.02μF	Disk Ceramic	C ₁₅	30μF 6V	Electrolytic	X ₁	Conv.
R ₂	10kΩ	"	R ₁₃	220Ω	"	C ₅	200pF	Silvered Mica	C ₁₆	12μF 15V	"	X ₂	IF ₁
R ₃	1.5kΩ	"	R ₁₄	42kΩ	"	C ₆	200pF	Silvered Mica	C ₁₇	0.02μF	Disk Ceramic	X ₃	IF ₂
R ₄	10Ω	"	R ₁₅	42Ω	10% 1/4W	C ₇	200pF	Silvered Mica	C ₁₈	0.005μF	"	X ₄	Driver
R ₅	56kΩ	"	R ₁₆	42Ω	"	C ₈	2pF	Silvered Mica				X ₅	Power Amp.
R ₆	27kΩ	"	R ₁₇	220Ω	20% 1/4W	C ₉	2pF	Silvered Mica				X ₆	
R ₇	3.3kΩ	"	R ₁₈	220Ω	"	C ₁₀	30μF 6V	Electrolytic	Ant	LA-461-6E		T ₁	Input Trans.
R ₈	1.5kΩ	"				C ₁₁	0.02μF	Disk Ceramic	Loc	103-7M		T ₂	Output Trans.
R ₉	5kΩ	V.R	C ₁	V.C.	Ant.	C ₁₂	0.01μF	"	IFT ₁	A	455kc	D ₁	Detector
R ₁₀	27kΩ	20% 1/4W	C ₂	V.C.	Osc.	C ₁₃	30μF 6V	Electrolytic	IFT ₂	B	"	D ₂	Varistor
R ₁₁	7.5kΩ	"	C ₃	0.02μF	Disk Ceramic	C ₁₄	3μF 6V	"	IFT ₃	C	"		

INTRODUCING...the world's smallest radio!



Photograph of Model TR-63 actual size as compared to ordinary cigarette.

THE NEW GENDIS *TRANSISTOR* SENSATION!



NO MORE TUBES

The miraculous TRANSISTOR — the most fascinating miracle of today's Electronic Communications that has completely revolutionized modern radio reception!

No more fragile, bulky vacuum tubes to take up space and get out of kilter so often! — the tiny transistor replaces them — makes tubes obsolete! No more heavy, cumbersome, expensive batteries — with the magic of the transistor you get finer reception — more selectivity, more sensitivity — with only ordinary, inexpensive flashlight batteries!

NOW brought to you by GENDIS in its most exciting form — a tiny case, so small it fits in your shirt pocket, but ready to bring in "loud and clear" reception of your favorite programs, wherever you may be — in your home, your office, on the street, or in your car!

To introduce this miraculous midget to Vancouver listeners, GENDIS presents it at an unbelievably low price and a price that includes, FREE, a neat leather carrying case, ear-phone attachments and an Eveready Energizer Battery.

Check these modern Advantages of this Transistor Radio Sensation!

- "Shirtpocket" size — 4" x 2 1/2".
- Uses six miracle transistors which last indefinitely under normal conditions, and which eliminate complicated wiring systems.
- Dynamic 2 1/2" Speaker — Clear, Brilliant Tone.
- 200 hours playing time from one Eveready 216 Battery!

GENDIS
sony
TRANSISTOR RADIOS

- No more fragile, bulky vacuum tubes to blow out at inconvenient times.
- Guaranteed for 5 years against factory defects.
- No more heavy, cumbersome expensive batteries.
- Ideal for "on the spot" listening when travelling or on the job.

SEE IT! HEAR IT! TEST IT! AT DEPARTMENT, RADIO, JEWELRY AND FURNITURE STORES.

MODEL TR 63

Special Introductory Offer

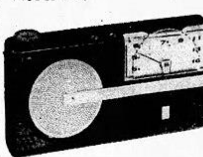
Includes . . .

FREE 69⁵⁰ complete

- Accessories
- Eveready Energizer Battery \$ 2.50
 - Leather Case 5.00
 - Earphone and Case 3.75

\$11.25

MODEL TR 6



OTHER GENDIS TRANSISTOR MODELS

(Priced to \$99.50)

GENDIS "SONY" Deluxe Model (TR 72)

Guaranteed to play 12-15 months on three regular flashlight batteries. Beautiful, ornamental wood cabinet with handy carrying handle. Only 8 1/2" wide, 6" high and 3 1/2" deep, and weighs 4.8 pounds. Seven tiny transistors and three inexpensive flashlight batteries deliver clear, full, powerful reception, and golden tone pours from the 4" x 6" speaker — no hum at any volume!

GENDIS "SONY" Personal Pocket Model (TR 6)

Guaranteed to play 9-12 months on four regular flashlight batteries.

Small enough for your jacket pocket — but powerful enough to fill a room with clear, brilliant sound! Case of durable plastic, it employs six tiny transistors and four ordinary flashlight batteries to deliver clear, "top-of-the-line" reception wherever you carry it. 8 1/2" wide, 4" high, and 1 1/2" deep. Weight less than 2 pounds.

MODEL TR 72



ANOTHER FINE PRODUCT OF GENERAL DISTRIBUTORS LTD.

MONTREAL TORONTO WINNIPEG CALGARY VANCOUVER



Transistor Radios Around the World

1957 Sony TR-63

Shirt pocket radio, thermoplastic cabinet

4 1/2 x 2 13/16 x 1 1/2 inches / 114 x 71 x 38 mm

Six transistors (Sony: 2T64, 2x 2T67, 2T513, 2x 2T520, + 1T43 blue oval varistor, "170" glass diode)

Superheterodyne circuit

One standard 9-volt battery

Manufactured by Tokyo Tsushin Kogyo, Ltd. Japan (Sony)

The first Japanese transistor radio exported to the United States. Of greater historical importance than any other Sony transistor radio, the TR-63 was the beginning of the end of America's dominance in the consumer electronics industry. And this trend was accelerated dramatically with Sony's introduction of the [TR-610](#) the following year, the first truly mass-marketed Japanese pocket transistor radio exported to the US.

6 Big Features of the SONY TR-63

- (1) The smallest and the lightest radio in the world with a dynamic speaker.
- (2) Completely transistorized with 6 world-famous SONY transistors.
- (3) You may renew battery once a month, if you enjoy 3 hours a day.
- (4) Printed circuit guarantees stable and reliable operation.
- (5) Very sensitive, assures outstanding reception with built-in ferrite bar-antenna.
- (6) 2 1/2" dynamic speaker offers high quality and powerful sounds.

Specifications

Circuit: 6-transistor super-heterodyne
 Freq. Range: 535-1605 kc
 Sensitivity: 0.5-1 mV/m (at 5 mW output)
 Power Output: approx. 35 mW maximum
 approx. 25 mW undistorted
 Selectivity: approx. 15 db (at 10 kc aE)
 I. F.: 455 kc
 Antenna: Built-in ferrite bar-antenna
 Speaker: 2 1/2" P.M. dynamic
 Battery: 9 volts, type BL-006
 Power Consumption: (no sig. input) 3.0-3.8 mA
 (at 20 mW peak) 6-7 mA
 Dimension: 1 1/2" x 2 1/2" x 4 1/2"
 Weight: approx. 10 oz.
 Earphone: Magnetic, type ME-4 (1)
 Carrying Bag: Leather (1)



Earphone Jack

Put plug into earphone jack, and you can enjoy peacefully with no interference from or to others.

Tuning Dial

Turn the dial until a desired station is tuned in. Transistor SONY TR-63 covers the entire standard broadcasting band from 535 kc. to 1605 kc.



The figure 6 shows that you are tuning in 600 kc.



The figure 11 shows that you are tuning in 1100 kc.



Replacement of Battery

1. Turn the switch off and open the rear cover with a coin as illustrated.
2. Remove snap-connector from the worn-out battery and fix it to a new BL-006 type battery (9 volts), which can last for more than 50 hours.
3. Eveready type 216 or E-146 may be substituted for a BL-006.

On-Off Switch and Volume Control



Power is off. Be sure the switch is off, when not in use.



Power is on and volume increases as the figures increase.



Loud, but a strong station may cause distortion.



Reprint of Sony TR-63 operating manual