EPARA BEACON

Volume 3, Number 3 **The Official Newsletter of The Eastern Pennsylvania Amateur Radio Association** March 2019

How to find us

QSL.NET Connecting Hams Around The World

PARK/EPARA

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March is here, the days are getting longer and spring is just around the corner. As the temps warm up so does EPARA. The Run for the Red Marathon is in May and Charlie (KB3JUF) is preparing for this public service event. I encourage all of you to help out with this. Not only does it serve as good practice of your radio skills, it supports the Red Cross, plus it's a lot of fun. Alex (KD2FTA) has started an amateur radio satellite project, and we will attempt to make contacts via satellites during Field Day in June. If you're interested in being a part of and learning about this please contact Alex at pilotlex@optonline.net. I'm working on an AREDN project and will be installing a node in Big Pocono State Park pointed towards Stroudsburg for testing. RACES/ARES will be adding HF digital capabilities to the radio room starting with Winlink. When the equipment is setup for Winlink, we will also be able to easily run many other digital modes. So, there are many things to look forward to, and I hope you will all find something of interest to be involved in.

Attendance at the February meeting was light but I expected this with the cold weather, a nasty cold virus making its way around, and of course it was the evening of Valentine's Day. We did add three new members to the club at that meeting and I want to welcome Bob KC3MPF, Chris KC3ASJ, and Chris KD4IPJ to EPARA! Also, our VE sessions continue to provide a steady stream of upgrades and new hams into the hobby. The Technician class is going well and wraps up during the first week of March, and the General Class will begin in April. If you wish to attend the General class or help as an instructor please contact Don (WK2RP) ASAP. You can email him at wk2rp@aol.com, catch him on the repeater, or on one of the local nets. That's if for now, hope to see you at the next meeting on March 14th!

73 till next month
Chris AJ3C

WELCOME TO THE EPARA BEACON !

The EPARA Beacon is published monthly and is the official (and only) newsletter of the Eastern Pennsylvania Amateur Radio Association. 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. and visitors ARE ALWAYS welcome to attend!

To join our mailing list or to submit articles for consideration, send an email to: EPARAnewsletter@ptd.net

EPARA NETS:

MONROE COUNTY ARES/RACES – Sunday's 8:30 PM, 146.865 MHz, PL 100.0 Hz
SPARK Information/Swap Net – Tuesday's 8:30 PM, 147.045 MHz, PL 131.8 Hz
EPARA TECH NET – Friday's 8:30 PM, 147.045 MHz, PL 131.8 Hz

Next Meeting: March 14th

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

For More Information Contact:
Eastern Pennsylvania Amateur Radio Association
Postal Address: PO Box 521 Sciota, PA 18354

Send Email to N3IS@qsl.net with Questions, Suggestions or Comments

Congratulations to the following!

Jacob M Woehrle – upgrade to Extra

Stephen J Davis – Technician

Bruce A Heggan – Technician

Kevin C Forrest – upgrade to General

YOUR MEMBERSHIP MATTERS

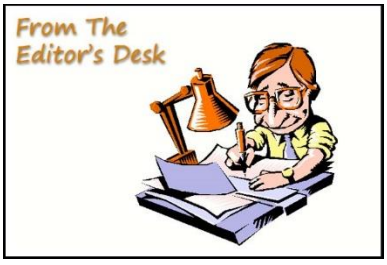
Dues are due January 1st
Yearly membership - $15/yr, Spouse - $5/yr
Full time student - $5/yr
Senior (over 62 yrs old) - $5/yr
Lifetime membership - $150

What's INSIDE this ISSUE

Officers and Committees

President:	**Chris Saunders AJ3C**
Vice President	**Bill Carpenter AB3ME**
Secretary	**Naomi Lepes KC3GVO**
Treasurer	**Scott Phelan KC3IAO**

ARES EC, Charlie KB3JUF
Field Day Coordinator, Chris AJ3C
Quartermaster, Ron N3GGT
Membership Coordinator, Franklin W3OKW
Newsletter Editor, Eric N3SWR
Photographer, Eric N3SWR
Public Information, Don WK3RP
Social Media, Chris AJ3C & Eric N3SWR
Special Event Coordinator, TBD
Technical Program Coordinator, Bill AB3ME
Lead VE, Donald WK2RP
Webmaster, Franklin W3OKW



Greetings to all!

I hope all is well with all our readers and the cabin fever is not taking a toll on like it is for myself. I always have a hard time with that as I'm an outdoor type person. I've been inundated with car repairs and unfinished projects to the point I can't think straight at times. I decided to explore my options for the Tech Corner section and came across what seems to be a get website that is totally electronics oriented and teaches one from the beginning up through the digital aspect of electronics. The best part – it's free to copy and use freely for non-profit and educational purposes. So, in the coming months and probably well over a year, the Tech Corner is covered! This will go well with our Tech / General classes we are teaching. I'd like to thank the folks at learnabout-electronics.org by making this possible. It's not easy finding content to put together a decent newsletter every month. Now I can concentrate my time in other areas like building antennas "From the Workbench".

Eric, N3SWR 73!

Articles and submissions that would be of interest to radio amateurs are most welcome. Cutoff date for submissions is the 25th of every month to allow for editing. 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. For any concerns, please email me at: Editor, eparanewsletter@ptd.net

Anyone looking to take an exam is encouraged to contact Donald WK2RP to preregister at least one (1) week in advance of the test date. If you have any questions or to register, Donald can be reached via email wk2rp@aol.com and/or phone 914-424-6924. Sessions are the second Friday of the month at 7 PM. The following are this month's and next month's testing dates:

March 8th 2019 April 12th 2019

VE exam sessions are held at the Monroe County 911 Emergency Control Center located at 100 Gypsum Rd, Stroudsburg, PA 18360
http://www.monroeco911.com/

From route 33/209, take the Snydersville exit to Manor Dr west. Proceed past the Harley Davidson dealership on your right to Mid Easton Belmont Pike. Turn right and immediately right again onto Gypsum Rd. Follow this to the end and park in the visitor's section.

Amateur Radio Emergency Service

In the United States and Canada, the **Amateur Radio Emergency Service** (**ARES**) is a corps of trained amateur radio operator volunteers organized to assist in public service and emergency communications. It is organized and sponsored by the American Radio Relay League and the Radio Amateurs of Canada.

Radio Amateur Civil Emergency Service

The Radio Amateur Civil Emergency Service (RACES) is a standby radio service provided for in Part 97.407 of the Federal Communications Commission rules and regulations governing amateur radio in the United States. Founded in 1952.

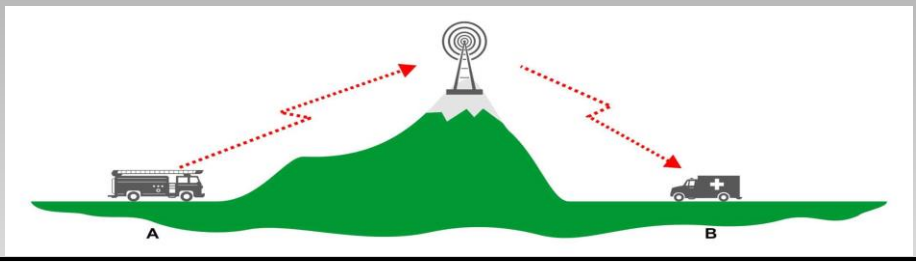
For those that are interested in becoming involved in ARES or RACES or simply have questions feel free to contact Charlie Borger KB3JUF: kb3juf@gmail.com, that's why he's here ☺

Announcements and Upcoming Events

- Breakfast at Perkins! March 30th, 9am – For more info reach out to Doug KG3I
- General License classes beginning April 3rd 7pm at the Monroe County Control Center
- Run for The Red Marathon – Sunday May 19th, 2019
- Field Day! – June 22nd and 23rd, setup is Friday the 21st.
- N3SEI Antenna Weekend! - July 26th – 27th

New Repeater Information

The analog repeater KG3I/R 446.575 Mhz PL 151.4 Hz on Pimple Hill will be linked to the KA3NRJ repeater 444.100 Mhz PL 151.4 Hz in Allentown, PA. The 444.100 repeater has great coverage obviously in the Lehigh Valley but also south down below Lansdale and west well into Berks county and into New Jersey. As always, the repeaters are open for all to use. Thank you Doug,!



In March of 1969 (4 months before the US landed men on the moon) a group of Ham radio enthusiasts formed the Radio Amateur Satellite Corporation known as AMSAT. Long before that however many HAMs were already involved in HAM radio communications with Low Earth Orbit (LEO) satellites like OSCAR (Orbiting Satellite Carrying Amateur Radio). From the AMSAT web site:"AMSAT's goal is to foster Amateur Radio's participation in space research and communication. The Organization was founded to continue the efforts, begun in 1961, by Project OSCAR, a west coast USA-based group which built and launched the very first Amateur Radio satellite, OSCAR, on December 12, 1961, barely four years after the launch of Russia's first Sputnik."

In that same spirit a few of the EPARA club members are planning to get involved with Satellite communications over the next few months and are now planning to make Yagi antenna(s) for satellite QSOs. If you're interested in joining our group of enthusiasts, please contact Alex KD2FTA (pilotlex@optonline.net). Ultimately we'd also like to use this for field day and eventually branch out into another aspect of the hobby….moon bounce or EME (Earth Moon Earth) communications!

73! SK Alex KD2FTA

EPARA General Membership Meeting Agenda

February 14th 2019

General Membership Meeting 7:30Pm

Open meeting:
Meeting called to order at 7:30 pm on February 14th 2019 by Chris AJ3C
There was a Quorum.
Total members attending, **12** Visitors present: **3**

Pledge of Allegiance / Moment of silence, Introduction of all present with call signs

Reading of previous meeting minutes:
Meeting minutes read by Chris (AJ3C) (*Naomi KC3GVO was absent)*
Motion to accept minutes as read: By: Ron (N3GGT) 2nd by Don (WK2RP) Motion Passed

Treasurers report:
Treasures report read by Scott, KC3IAO,
Motion to accept reports by Bob (KE3MX) 2nd by Pete (KB3YKJ) Motion Passed

Correspondence:
None

Reports of officers and committee's:

Charlie KB3JUF – Ares/Races: Races/ARES meetings are held on the 4th Thursday each month, all are invited to attend. We will be setting up Win-link in the radio room. The county has given us a laptop for use in the radio room.

Don WK2RP – PIO, Instruction and Training: Tech class is going well, class will end on Mach 6th. General class will begin on April 3rd 2019, if you can help instruct please contact Don WK2RP.

Ron N3GGT – Quartermaster: Nothing new to report, the new coax and connectors will be added to the inventory list

Eric N3SWR – Newsletter and Communications: Praise continues to be received for the newsletter. Eric stated that he will be adding a "fair use" statement to the newsletter.

Chris AJ3C – Field Day:
Winter Field Day was a success. We increased our number of contacts and score from last year. We made many CW contacts with 3 different cw operators, and caused no interference with the 911 centers radio gear.

Audit committee: The audit committee reports that they have reviewed the club's finances.
All records and books are in order with no discrepancies or concerns.
Motion to accept audit findings, by: Ed (WF3N) 2nd by Dan (KC3JCE)
Motion to accept the audit teams' findings Passed

Old business:
The clubs TA33 "Classic" antenna is still for sale, it will be posted for sale on QRZ, or QTH.

501c3 Update, we need to get a new EIN in order to submit the forms to the state of PA establishing EPARA as a nonprofit corporation. Filing fees are $150

no other old business

New business:

AREDN. We are setting up a committee to test and explore the feasibility of implementation of a AREDN network in the county. Committee chair is Chris AJ3C, any members interested in joining this committee should contact Chris AJ3C

no other new business

Votes / New members: 3 new members voted into the club,
Bob DeYoung KC3MPF (general), Chris Behrens KC3ASJ (tech), Chris Kintz KD4IPJ (tech)

Announcements:
2019 EPARA membership dues due.

Doug, KG3I is setting up another breakfast, all local hams are welcome to come. Contact Doug at KG3I@ptd.net to let him know you will be attending.
Date: March 30, 2019 - **Time**: 9 AM - **Place**: The Library Room at Perkins Family Restaurant 1215 West Main Street Stroudsburg, PA 18360

Adjournment…
Meeting was adjourned at 8:51PM Motion to close by Pete (KB3YKJ) 2nd by Ed (WF3N) Motion Passed

Submitted By
Chris Saunders AJ3C

ARES/RACES Monthly Meeting

Thanks to WT Jones WN3LIF for taking time to explain the inner workings of WinLink

2019 MARCH MONDAY

CALENDAR YEAR CALENDAR MONTH FIRST DAY OF WEEK

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
25	26	27	28	01	02	03
04	05	06	07	08 VE session at the Monroe County Control Center 7pm	09	10
11	12	13	14 EPARA Meeting Monroe County Training Center 7:30pm	15	16	17
18	19	20	21	22	23	24
25	26	27	28 ARES/RACES Meeting Monroe County Training Center 7:30pm	29	30	31
01	02	03	04	05	06	07

February Monthly Meeting

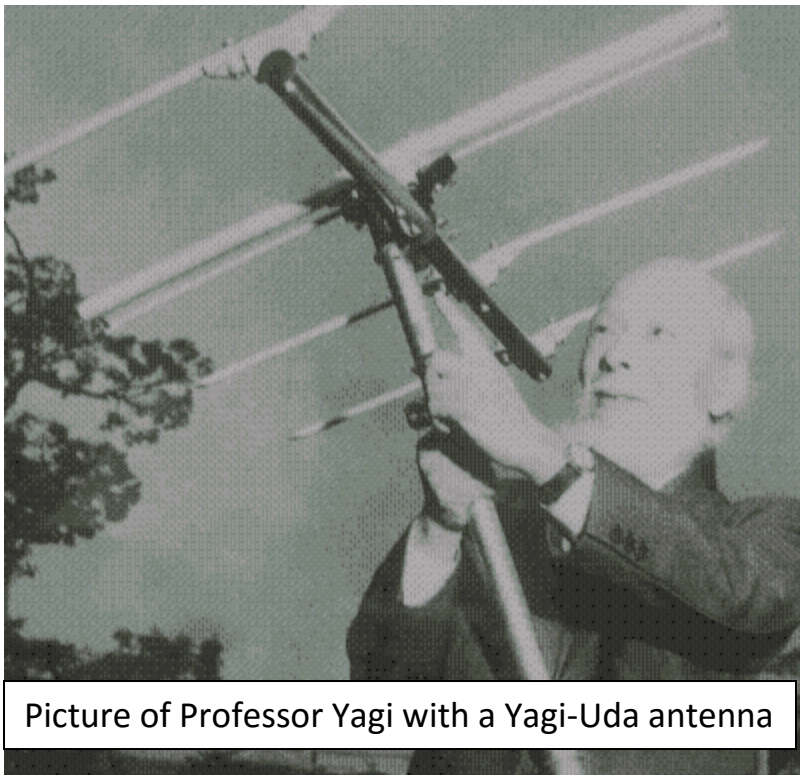

HAM
NEW
RADIO
TODAY
MARCH '83
85p
BUILDING:
a simple HF aerial
WORKING:
Russians
STARTING:
amateur
television
QUESTIONING?:
Icom's latest
2m and 70cm
black boxes
SPECIAL PROJECT:
DIRECT CONVERSION
DSB/CW TRANSCEIVER
By the Publishers of
MECHANIX
ILLUSTRATED
16 PAGE BONUS – Build
Your Own All-Transistor Organ
ELECTRONICS
ILLUSTRATED
What's New For STEREO HI-FI?
MARCH • 35¢
How To:
Use Tube Testers • Learn While You Sleep • Build a CB 2-Way Radio
AUTO-COUPLING—PRACTICAL DETAILS
A FOUR-ADVANTAGE SET WITH AUTO-COUPLING
Amateur Wireless
and Radiovision
Every Thursday 3d
Vol. XVI. No. 405
Saturday, March 22, 1930
H.T.+
G.B.-
AN "A.W." SPECIAL DEVELOPMENT
The AUTO-COUPLER 3
73
March 1961
37¢
AMATEUR RADIO

Knowledge Test

What can cause the voltage across reactance's in series to be larger than the voltage applied to them?
A. Resonance
B. Capacitance
C. Conductance
D. Resistance

Last month's answer was, C.
The frequency at which the capacitive reactance equals the inductive reactance

In an electrical circuit, when the inductive reactance and the capacitive reactance are equal the circuit is resonant. This causes the electrical energy to oscillate between the magnetic field of the inductor and the electric field of the capacitor.



Picture of Professor Yagi with a Yagi-Uda antenna

ARISS/NOTA Slow Scan TV Event

On Feb 2, 2019, ARISS planned another of their popular Slow Scan Television (SSTV) experiment events. Transmissions were scheduled to begin Friday, Feb. 8 at 18:25 UTC and run through Sunday, Feb. 10 at 18:30 UTC. SSTV operations is a process by which images are sent from the International Space Station (ISS) via ham radio and received by ham operators, shortwave listeners and other radio enthusiasts on Earth, similar to pictures shared on cell phones using twitter or Instagram.

During this event, SSTV images were transmitted from the ISS at the frequency of 145.80 MHz using the SSTV mode of PD120 and could be received using ham radio equipment as simple as a 2 meter handheld radio or a common shortwave or scanner receiver that covers the 2 meter ham band. After connecting the audio output of the radio receiver to the audio input of a computer running free software such as MMSSTV, the SSTV images could be displayed.

Transmissions consisted of eight NASA On The Air (NOTA) images (see https://nasaontheair.wordpress.com/). In addition, four ARISS commemorative images will also be included.

Received images were posted and viewed by the public at http://www.spaceflightsoftware.com/ARISS_SSTV/index.php . In addition, you could also receive a special SSTV ARISS Award for posting your image. Further event details can be found at https://ariss.pzk.org.pl/sstv/ .

The event was dependent on other activities, schedules and crew responsibilities on the ISS and were subject to change at any time. So, it was prudent that those interested please check for news and the most current information on the AMSAT.org and ARISS.org websites, the AMSAT-BB@amsat.org, the ARISS Facebook at Amateur Radio On The International Space Station (ARISS) and ARISS twitter @ARISS_status.

Feb ARISS SSTV recap

The first 24 hours or so had very low signal strength from the ISS. The crew was asked to check the setup and nothing appeared out of the ordinary. A reboot of the system yielded no change. The following day a crew member rechecked all the connections and feed lines. Somewhere in that process the signal returned to normal levels. Below is a link to DK3WN's website where he has examples of all 12 images that were sent from the ISS. http://www.dk3wn.info/p/?p=93285

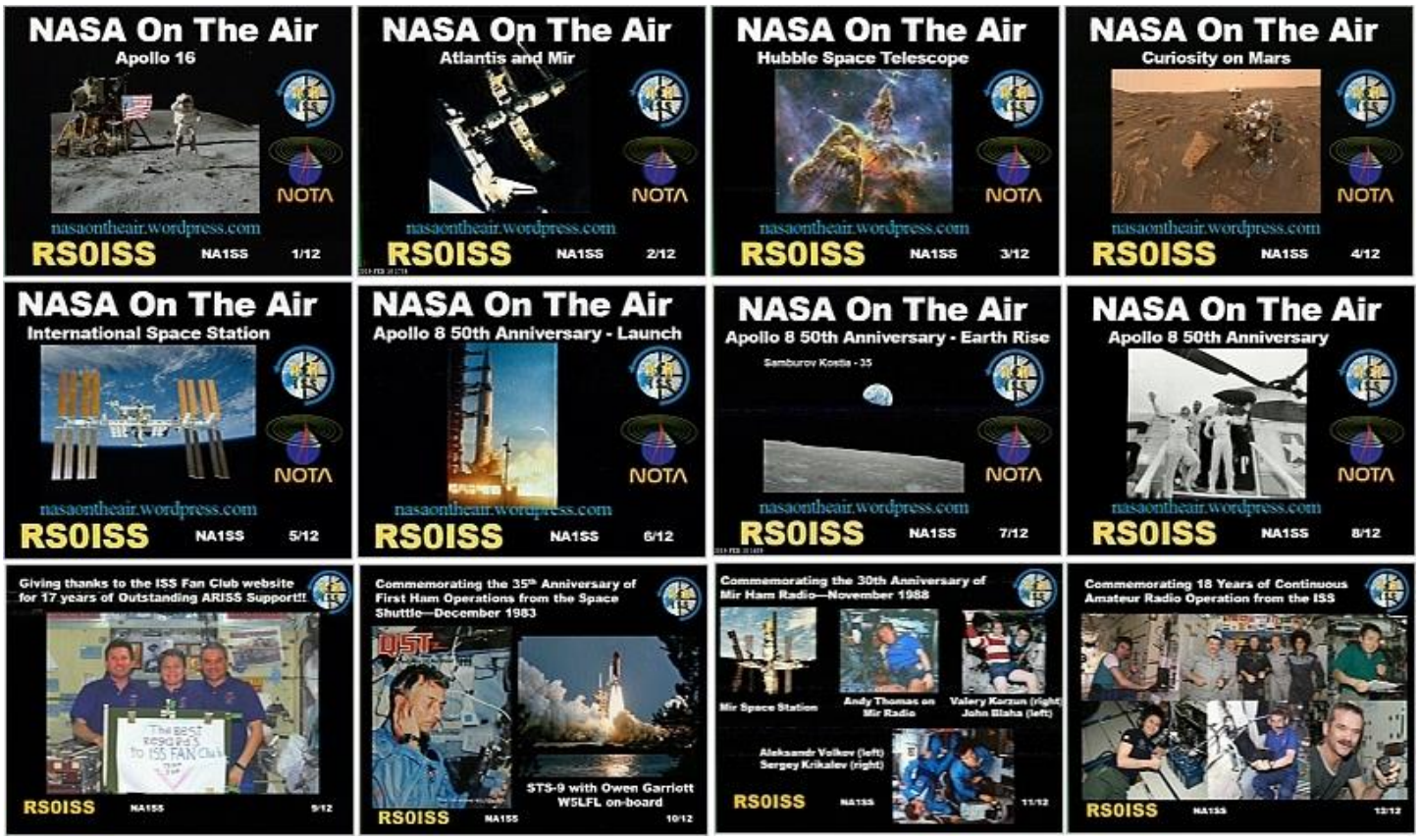
Bonus opportunity!

A second SSTV transmission event occurred from the ISS. ARISS Russia team member Sergey Samburov, RV3DR, worked with the mission control center flight controllers to schedule in ISS crew member time to configure the JVC Kenwood radio to support SSTV operations in the Service Module. SSTV setup was expected to start around 8:45 UTC on February 15 and conclude around 17:25 UTC on February 17. These dates/times were expectations and could vary.

The ARISS team wanted to give the community another opportunity to downlink the SSTV images given the weak signal situation that occurred. For clarity, they were the same 12 images that were downlinked the week prior.

As a reminder, you can get the latest SSTV information on the ARISS SSTV Blog Spot: http://ariss-sstv.blogspot.com/. Once received, Images can be posted and viewed by the public at http://www.spaceflightsoftware.com/ARISS_SSTV/index.php. Remember, you can receive a special SSTV ARISS Award for posting your image. See https://ariss.pzk.org.pl/sstv/. For simplicity, there has been a new tab added for SSTV, under general contacts, on the ARISS web site www.ariss.org.

The ARISS team has stated it is not totally clear what caused the issue last weekend. They believe it may have been either a loose feedline cable or an antenna switch that did not fully engage. Once the crew reset the system and checked the cabling and switches, the radio system started to perform nominally. 73, Frank, KA3HDO



ISS SSTV complete series

About ARISS

Amateur Radio on the International Space Station (ARISS) is a cooperative venture of international amateur radio societies and the space agencies that support the International Space Station (ISS). In the United States, sponsors are the Radio Amateur Satellite Corporation (AMSAT), the American Radio Relay League (ARRL), the Center for the Advancement of Science in space (CASIS) and National Aeronautics and Space Administration (NASA). The primary goal of ARISS is to promote exploration of science, technology, engineering, and mathematics (STEM) topics by organizing scheduled contacts via amateur radio between crew members aboard the ISS and students in classrooms or public forms. Before and during these radio contacts, students, educators, parents, and communities learn about space, space technologies, and amateur radio. For more information, see www.ariss.org.

Credits: http://ariss-sstv.blogspot.com/ , http://www.ariss.org/

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

Contest Corral March 2019

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

Start - Finish Date-Time		Start - Finish Date-Time		Bands	Contest Name	Mode	Exchange	Sponsor's Website
2	0000	3	2359	1.8-28	ARRL International DX Contest, SSB	Ph	W/VE: RS, SP. Non-W/VE: RS, power	www.arrl.org/arrl-dx
2	0000	10	2359	3.5, 7, 21, 28, 144	Novice Rig Roundup	CW	RST, QTH, name, class	novicerigroundup.com
2	0600	2	0800	7-14	Wake-Up! QRP Sprint	CW	RST, serial, suffix of previous QSO	qrp.ru/contest/wakeup
2	1800	3	1359	1.8-28	Open Ukraine RTTY Championship	Dig	2-letter region (state/province/canton), serial	krs.ho.ua/openrtty
3	0700	3	1100	3.5	UBA Spring Contest, CW	CW	RST, serial, UBA section (if any)	www.uba.be/ht/contest-rules
3	1200	3	1400	7	SARL Hamnet 40-Meter Simulated Emergency Contest	Ph	RS, serial	www.sarl.org.za
3	1200	3	2200	3.5	NSARA Contest	CW Ph Dig	RS(T), county (if Nova Scotia)	nsara.ve1cfy.net/?page_id=82
4	2000	4	2130	3.5	RSGB 80-Meter Club Championship, Data	Dig	RST, serial	www.rsgbcc.org/hf
5	0200	5	0400	3.5-28	ARS Spartan Sprint	CW	RST, SPC, power	arsqrp.blogspot.com
5	1900	5	2100	3.5	AGCW YL-CW Party	CW	RST, serial, name	agcw.org/index.php/en
6	2000	6	2100	3.5	UKEICC 80-Meter Contest	Ph	4-char grid square	www.ukeicc.com
7	1800	7	2200	28	NRAU 10-Meter Activity Contest	CW Ph Dig	RS(T), 6-char grid square	nrau.net/activity-contests
7	2000	7	2200	1.8-28	SKCC Sprint Europe	CW	RST, SPC, name, mbr or power	www.skccgroup.com
9	0000	9	2359	3.5-28	YB DX RTTY Contest	Dig	RST, serial	rtty.ybdxcontest.com
9	1000	10	1000	50-1296	SARL VHF/UHF Analogue Contest	CW Ph	RS(T), 6-char grid	www.sarl.org.za
9	1000	10	1000	3.5-28	RSGB Commonwealth Contest	CW	RST, serial	www.rsgbcc.org/hf
9	1200	10	1200	3.5-144	F9AA Cup, SSB	Ph	RST, serial	www.site.urc.asso.fr
9	1200	10	1200	28	South America 10 Meter Contest	CW Ph	RS(T), CQ zone	sa10m.com.ar
9	1200	10	2359	1.8-50	SKCC Weekend Sprintathon	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
9	1400	9	2000	3.5-28	AGCW QRP Contest	CW	RST, serial, class, mbr or "NM"	www.agcw.org
9	1500	10	1500	1.8	Slew Perry Topband Challenge	CW	4-char grid square	www.kkn.net/stew
9	1500	10	2100	3.5-50	Oklahoma QSO Party	CW Ph Dig	RS(T), county or SPC	k5cm.com/okqp.htm
9	1600	10	1600	3.5-28	EA PSK63 Contest	Dig	RSQ, EA province code or serial	concursos.ure.es/en
9	1800	10	0559	3.5	TESLA Memorial HF CW Contest	CW	RST, serial, 4-char grid	www.radiosport.org.rs
9	1800	10	1800	1.8-50	QCWA QSO Party	CW Ph Dig	Year first licensed, name, SPC or chapter	www.qcwa.org
9	1900	10	1900	1.8-28	Idaho QSO Party	CW Ph Dig	RS(T), county or SPC	idahoarrl.info/qsoparty
9	2200	9	2300	1.8-28	QRP ARCI Spring Thaw SSB Shootout	Ph	RS, SPC, mbr or power	www.qrparci.org/contests
10	0000	10	0400	3.5-14	North American Sprint, RTTY	Dig	Other station's call, your call, serial, name, SPC	ncjweb.com
10	0700	10	1100	144	UBA Spring Contest, 2 Meters	CW Ph	RS(T), serial, UBA section (if any)	www.uba.be/ht/contest-rules
10	1800	10	2200	3.5	WAB 3.5 MHz Phone/CW	CW Ph	RS(T) serial, WAB square or country	wab.linternip.net
10	1800	11	0100	All	Wisconsin QSO Party	CW Ph Dig	WI county or SPC	warac.org/wqp/wqp.htm
11	0000	11	0200	1.8-28	4 States QRP Group Second Sunday Sprint	CW Ph	RS(T), SPC, mbr or power	www.4sqrp.com
13	2000	13	2130	3.5	RSGB 80-Meter Club Championship, CW	CW	RST, serial	www.rsgbcc.org/hf
13	2300	17	2300	7-14	AWA John Rollins Memorial DX Contest	CW	RST, equipment type and year	www.antiquewireless.org
16	0200	18	0200	3.5-28	BARTG HF RTTY Contest	Dig	RST, serial, 4-digit UTC time	www.bartg.org.uk
16	1200	17	1200	1.8-28	Russian DX Contest	CW Ph	RS(T), oblast or serial	www.rdxc.org
16	1400	16	1800	144, 432	AGCW VHF/UHF Contest	CW	RST, serial, class, 6-char grid	agcw.org/index.php/en
16	1400	17	0200	1.8-144	Louisiana QSO Party	CW Ph Dig	RS(T), parish or SPC	laqp.loutslanacontestclub.org
16	1400	17	2359	All	Virginia QSO Party	CW Ph Dig	Serial, county or SPC	qsl.net/sterling/VA_QSO_Party
16	2000	16	2159	1.8-28	Feld Hell Sprint	Dig	RST, mbr, SPC, grid	sites.google.com/site/feldhellclub
17	0700	17	1100	3.5	UBA Spring Contest, SSB	Ph	RS, serial, UBA section (if any)	www.uba.be/ht/contest-rules
18	0100	18	0300	1.8-28	Run for the Bacon QRP Contest	CW	RST, SPC, mbr or power	qrpcontest.com/pigrun
18	1800	18	2059	3.5-7	Bucharest Contest	CW Ph Dig	RS(T), serial, county or country	yo3test201x.blogspot.ro/p/blog-page.html
19	1700	24	1700	3.5-144	CLARA Chatter Party	CW Ph	RS(T), name, SPC	www.clarayl.ca
21	0030	21	0230	3.5-14	NAQCC CW Sprint	CW	RST, SPC, mbr or power	naqcc.info
23	0000	23	2359	1.8-VHF	FOC QSO Party	CW	RST, name, mbr (if any)	g4foc.org/qsoparty
23	1200	24	1200	3.5-28	UK/EI DX Contest, CW	CW	RST, serial, district (if UK/EI)	www.ukeicc.com
24	0000	24	0400	3.5-14	North American SSB Sprint Contest	Ph	Other station's call, your call, serial, name, SPC	ssbsprint.com/rules
24	0600	24	1000	50	UBA Spring Contest, 6 Meter	CW Ph	RS(T), serial, UBA section (if any)	www.uba.be/ht/contest-rules
27	0000	27	0200	1.8-28	SKCC Sprint	CW	RST, SPC, name, mbr or power	www.skccgroup.com
27	2000	27	2100	3.5	UKEICC 80-Meter Contest	CW	4-char grid square	www.ukeicc.com
28	2000	28	2130	3.5	RSGB 80-Meter Club Championship, SSB	Ph	RS, serial	www.rsgbcc.org/hf
30	0000	31	2359	1.8-28	CQ WW WPX Contest, SSB	Ph	RS, serial	www.cqwpx.com

All dates 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.*

The Elmer's Notebook

Radio and Electronic Fundamentals

Antenna Efficiency

We have talked about takeoff angles a few months back, and SWR has been stressed, I'd say far too much, from when you studied to get your first ticket. This month I want to talk about a very important property of antennas, efficiency. It's not easy to measure or calculate so it's often overlooked by the new ham, but I'd say it's one of the most important aspects of any antenna system.

The radiation efficiency of an antenna is a measure of the power applied to an antenna compared to the power radiated from an antenna. Low efficiency in an antenna means a lot of the power is lost within the antenna, or reflected away due to impedance mismatch (High SWR). With a high efficiency antenna system, most of the power sent from your transmitter results in radiation of electromagnetic or radio waves. This is why the efficiency of your antenna system is one of the most important parameters to be concerned with.

So what causes antenna inefficiency? Antenna system efficiency losses are typically due to the following, (1) conduction losses from the metal that forms the antenna, (2) dielectric losses from the conductivity of materials near an antenna like trees, buildings and the ground, (3) Reflected power from an impedance mismatch also known as a high SWR, (4) coil losses, an example would be shorted antennas that use loading coils like HT antennas or mobile HF antennas.

One efficient antenna design is the good old half wave Dipole; at its resonant frequency, mounted at least a half wavelength high, and at least a half wavelength from conductive materials is extremely efficient. Full wave loops at least a half wavelength high and at least a half wavelength from conductive materials are even more efficient, when proper impedance matching systems are employed. Verticals can be quite efficient when a proper grounding radial system or ground plane is installed under the antenna. One property of antenna efficiency is that it's the same whether we are using the antenna for transmit or receive; remember you can't work Em' if you can't hear Em'. So, in essence, a poor efficiency antenna is "deaf" compared to a highly efficient antenna.

As said at the beginning of this article antenna system efficiency is difficult to calculate. You need to know what the ground losses are, what the radiation resistance is, feed line losses, and what the coil losses are for any coils in the system. It goes beyond the scope of this article to explain how to calculate these but the internet and the ARRL antenna handbook will give you the information you need to do it. One quick indication of an inefficient antenna is its size in relation to the band it's used on. If it's smaller than a half wave dipole or a quarter wave vertical, it's probability not efficient.

It is said that when it comes to antennas there is no free lunch, and that is a true a statement. I cannot stress enough the importance of proper antenna design and installation. There are times when you must give up efficiency for your installation requirements, but know what you're losing in performance. It would be foolish to use a pair of hamsticks when you have the space to put up a full-size antenna!

73 Till Next Month

Anderson Powerpole®

ARES/RACES Standard DC Power Connector

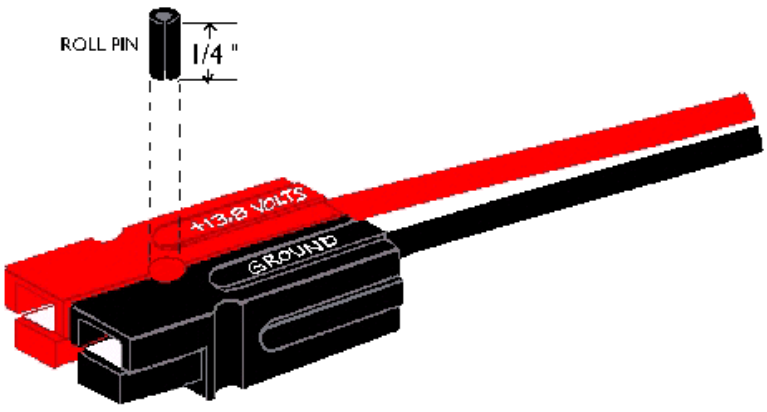
(High Current — 15A/30A/45A)

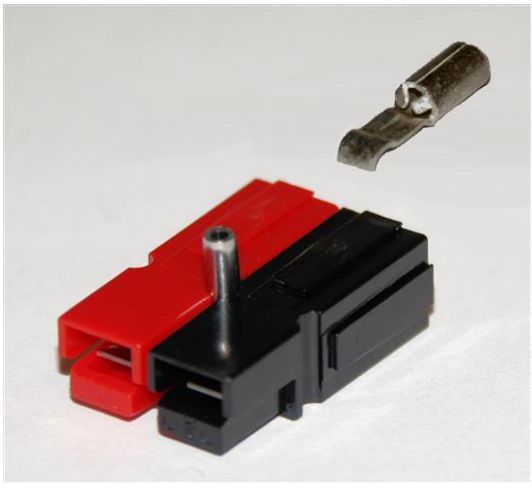
Anderson Powerpole®

For years hams have used "Molex" connectors as a standard to connect their radios and other equipment to power sources. The Molex connector had the drawback of being limited to about 10 amps, and were often used well beyond their ratings.

RACES and ARES organizations have now standardized on the Anderson Powerpole® for DC power connections. They offer the advantage of handling 15, 30 or 45 amps using the same connector (the contact must be matched to the current load). They are also genderless, meaning the supply and load connectors are the same, reducing the number of parts required (but be careful you don't connect two different supplies!).

Either the 15-ampere or 30-ampere sizes may be used, and both sizes mate with each other. The 30A connector is preferred as it is compatible with both. The plastic housings are the same for both sizes. The barrel area (which holds the wire) of the 15-amp silver-plated contact is smaller than that of the 30-amp contact, but the contact area is the same. The connectors dovetail together into a compact unit.





Housings should be mated according to the diagram above, viewing from the contact side (opposite the wire side), tongue down, hood up, RED on the LEFT, BLACK on the RIGHT. Use a 3/32-inch-diameter roll pin, 1/4- inch long, to keep the housings from sliding apart.

Highly conductive silver-plated copper contacts allow minimal contact resistance at high currents. Self-wiping action on make and break keeps conducting surfaces clean. Contact dents

keep connectors mated in high-vibration applications and provide quick-break, snap action upon disconnect.

Non-corrosive stainless-steel leaf springs maintain constant contact pressure — ideal for frequent connect/disconnect cycles and intermittent overloading. Durable, high impact-resistant, polycarbonate housing with UL94V-2 flammability ratings comes in many colors for circuit traceability and coding.

Identical connector halves are genderless, making assembly quick and easy and reducing the number of parts stocked. Molded-in dovetails allow for a customized harness in a variety of configurations. When the connectors are disconnected, no metal parts are exposed.

The 15-ampere contacts are designed for 16-20 AWG wire and the 30-ampere contacts are designed for 12-16 AWG wire. The contacts can be soldered or crimped to wires. An expensive crimping tool is available from Anderson (#1351G1, cost > $150). Inexpensive crimpers (costing about $20 at major home centers or online) can be substituted, however. After a contact has been attached to a wire, it should be installed into the housing so that the housing spring mates with the underside of the contact.

To remove a contact from the housing, use Anderson insertion/extraction tool #111038G2. You may also substitute a very small blade (e.g., a jeweler's screwdriver) to depress the spring, allowing the contact to be removed.

Here are the Anderson part numbers:

Recommended »»

15 A Black Red	**Complete Connector** #1395G1 #1395	**Housing Only** #1327G6 #1327 **Spec Sheet**	**Contact Only** #1332 #1332 **Spec Sheet**
30 A Black Red	**Complete Connector** #1330G4 #1330	**Housing Only** #1327G6 #1327 **Spec Sheet**	**Contact Only** #1331 #1331 **Spec Sheet**

Single pole connector

Kits, as the one shown (Red & Black shells, two contacts, and ¼" roll pin) are available from a number of vendors.

The housings cost less than 50 cents each, and the contacts cost less than 30 cents each (2002 prices, Allied Electronics). Kits can be purchased online, typically priced at $10 for 10, $20 for 25 sets. Make sure your kit comes with the roll pins (used to keep the red and black housings from separating).

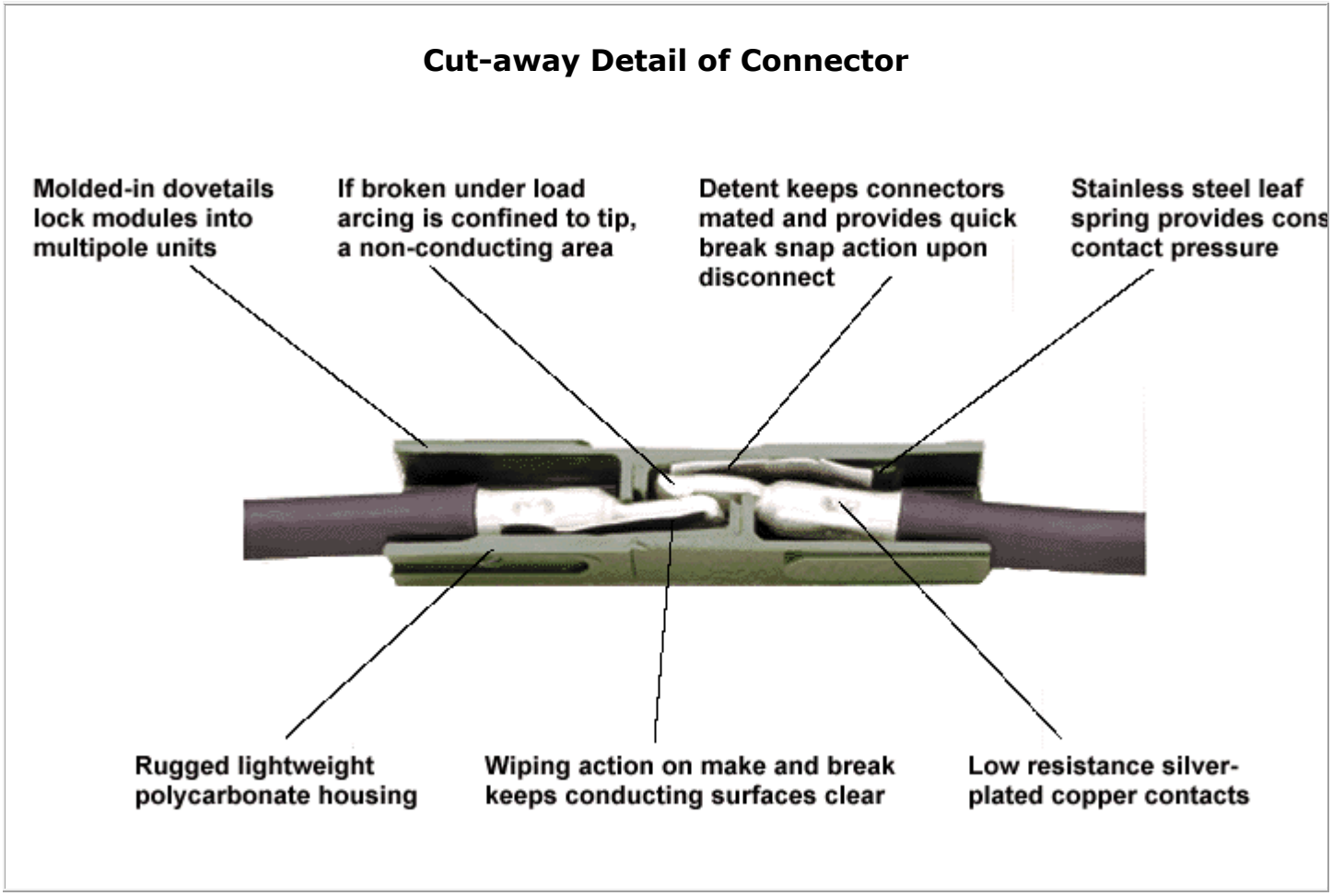
The connectors can be panel mounted with clamp receptacles, consisting of two aluminum plates (Anderson part #1462G1), notched to hold the plastic housings when they are dovetailed together.

The plastic housings come in other colors also. Red and black are suggested for standard DC connectors (red as positive and black as negative). The housings have mating channels on all four sides, permitting 3, 4, or more contacts in one housing.

Anderson Power Products Web Site: http://www.andersonpower.com

(PowerPole® is a registered trademark of Anderson Power Products)
Portions of this page, including the drawing of the assembled connector, courtesy Orange County, CA, RACES (OCRACES)

Assembly instructions (from ARRL web page)



Credits: https://www.qsl.net/w2vtm/powerpole.html

Cable Lacing and How it's Done Properly

Today started out much like any other day in the lab… grab another piece of test gear, setup your equipment and begin the calibration process. I won't say it's boring but after 25 years it's pretty much a common morning for me. That was, until a friend from the maintenance department walked in and handed me a box and said - interested? It was a box of a dozen rolls of lacing tape. Now that made my day! Why you ask? Because lacing is used to tie up cable harnesses and keep things inside electronics equipment nice and organized and for myself, it just looks awesome when it's done right! I was also struggling a bit to come up with this month's Tech Corner article and figured this should trigger a few smiles to those that have ever had to work on radios and electronics equipment from years past. You can even find it in use today on quality equipment. So, with that said, let's take a look into cable harness lacing.

Cable lacing is a method for tying wiring harnesses and cable looms, traditionally used in telecommunication, naval, and aerospace applications. This old cable management technique, taught to generations of linemen, is still used in some modern applications since it does not create obstructions along the length of the cable, avoiding the handling problems of cables groomed by plastic or hook-and-loop cable ties.

Cable lacing uses a thin cord, traditionally made of waxed linen, to bind together a group of cables using a series of running lockstitches. Flat lacing tapes made of modern materials such as nylon, polyester, Teflon, fiberglass, and Nomex are also available with a variety of coatings to improve knot holding. The lacing begins and ends with a whipping or other knot to secure the free ends. Wraps are spaced relative to the overall harness diameter to maintain the wiring in a tight, neat bundle, and the ends are then neatly trimmed. In addition to continuous or running lacing, there are a variety of lacing patterns used in different circumstances. In some cases stand-alone knots called spot ties are also used. For lashing large cables and cable bundles to support structures in telecommunications applications, there are two named cable lacing styles: the "Chicago stitch" and "Kansas City stitch". Some organizations have in-house standards to which cable lacing must conform, for example NASA specifies its cable lacing techniques in chapter 9 of NASA-STD-8739.4.

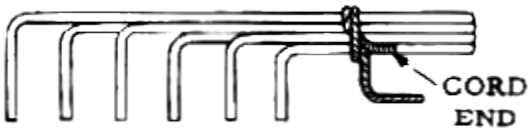
One style of continuous lacing, also called "marline hitching", is based on a series of overhand knots. A series of half-hitches, while visually similar, is not recommended for this application. Spot ties formed with a clove hitch topped by a reef knot made in modern Nomex lacing tape. A surgeon's knot is an acceptable substitute for the reef knot.

String ties on a wire bundle are most acceptable substitutes for nylon tie-wraps Personally, I prefer string ties over tie-wraps for a finished product. Tie-wraps leave a bulky, un-yielding lump on the side of a wire bundle. Depending on how the tie-wrap is cut off, the trimmed end can be sharp. I've offered up many a blood sacrifice to a project after having been bitten by the end of a clipped tie-wrap. Type wraps are third only to metal burrs and exposed ends of safety wire for causing body-leaks.

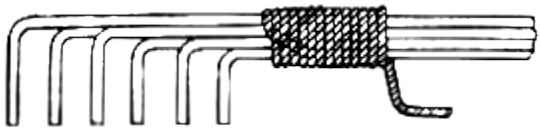
String ties still leave a lump where the knot is but it is less rigid, more rounded and has less tendency to snag. Cut ends of string offer no hazard to contacting body parts. One roll of string can handle ANY bundle tying situation ranging from a few 22AWG wires to a fist full of wires. Further, polyester flat-lace has excellent longevity characteristics while nylon tie-wraps fall victim to ozone, hydrocarbons and ordinary embrittlement due to loss of plasticizers.

String ties do take more time and some skill. One example of quality lacing tape has a wax finish. This wax is just slick enough to let the tape strands slide over each other for uniform tightening and just sticky enough to keep the first tensioning of a knot snug while you throw another knot on top.

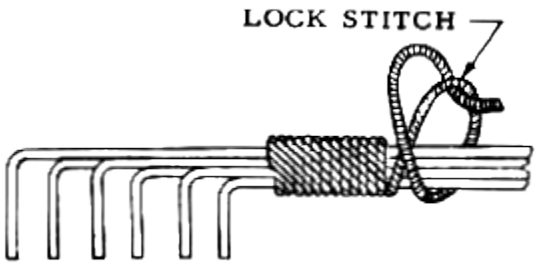
Below are the steps to achieve proper lacing as per "WORKMANSHIP AND DESIGN PRACTICES FOR ELECTRONIC EQUIPMENT", published by the direction of the chief of the BUREAU OF NAVAL WEAPONS, 1 December, 1962. pp. 7-9 -- 7-14.



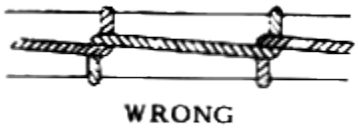
The process of lacing or binding a harness can be started at one end with a *starting tie*. Alternatively, lacing can be started at the center with a *lock stitch*, and a terminating wrap can be used at each end.

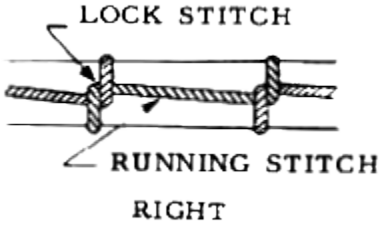


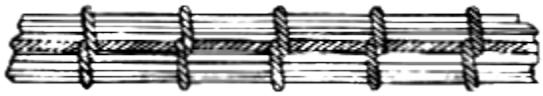
Lacing is started by cutting a length of cord two and one-half times the length of the proposed harness. One end of the cord is laid alongside the principal cable pointing into the harness. The cord end is secured as approximately four turns of cord are wound over it, and wrapping is continued until a total of twelve turns is wound about the principal cable.



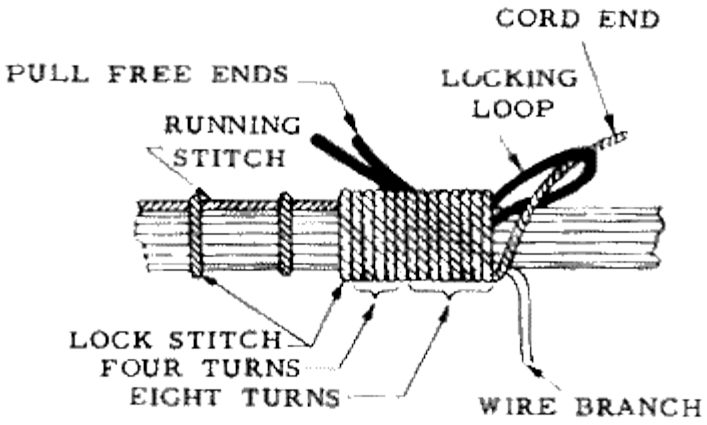
Secure stitches can be formed only by lacing the cord over the loop, never under, to form the so-called *lock stitch*. The cord is thus locked under each loop. Lock stitches at approximately 1/2-inch intervals thereafter secure other loops in the same fashion. The foregoing describes the *regulation cableman's knot*, which is self-locking. As lacing is advanced, the wires should be re-formed to insure a neat and firmly bound cable; conductors should be arranged to lie parallel without crossovers except when twisting is required.

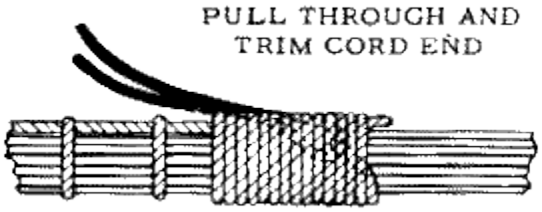




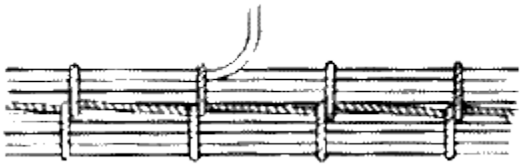


Lacing is terminated by the following procedure. Four turns of cord are wrapped adjacent to the last lock stitch. A separate piece of cord is formed into a 2-inch loop and laid alongside the cable as show. Eight turns of lacing are wrapped about the loop and the end of the lacing cord is then drawn through the loop.



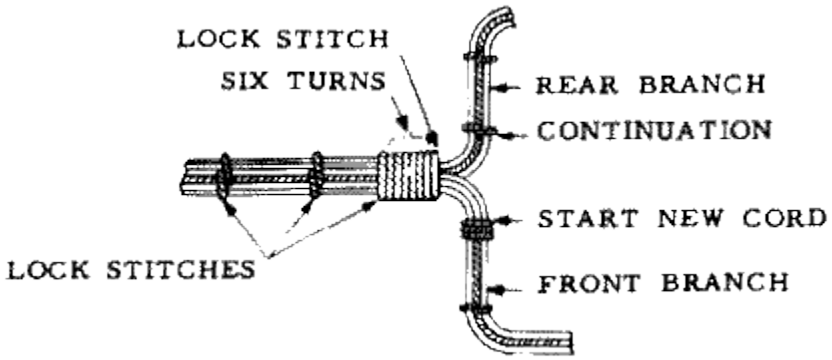


Both ends of the loop are then pulled to carefully draw the cord end underneath and out of the wrap. The cord end is then pulled tight, locking the wrap, and finally the end is cut to approximately 1/8 or 1/4 inch.

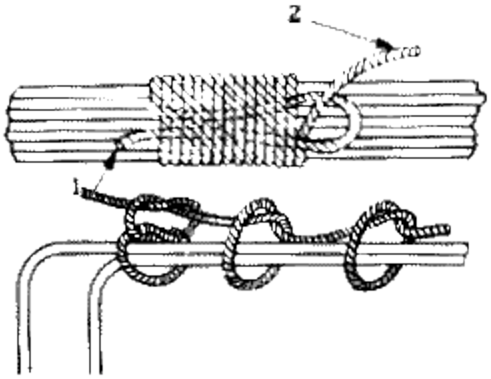


Branches and sub-branches, including single leads, are usually referred to as *breakouts*. Single-lead breakouts should be preceded by a lock stitch without variation in the distance between stitches.

Any breakout of two or more wires should be laced. When a group of wires is branched from a cable, a lock stitch is made; six turns are wrapped firmly about the principle cable adjacent to the new stitch, and finally, another lock stitch is made adjacent to the new turns. After a branch is thus secured, the running stitches are continued along the main cable.



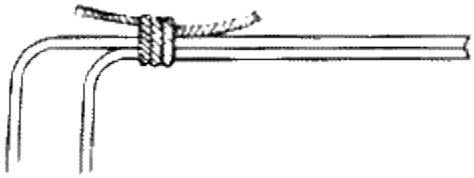
All lacing should follow the top of the harness. All knots, splices, or other irregularities should be hidden from view when the cable is installed in the equipment.



When laced, the cord should be sufficiently tight to minimize slippage but should not cut into the insulation.

Lacing may also be started with a square knot, followed by two lock stitches.

Lacing is performed as previously described, and terminated by a lock stitch and a square knot.

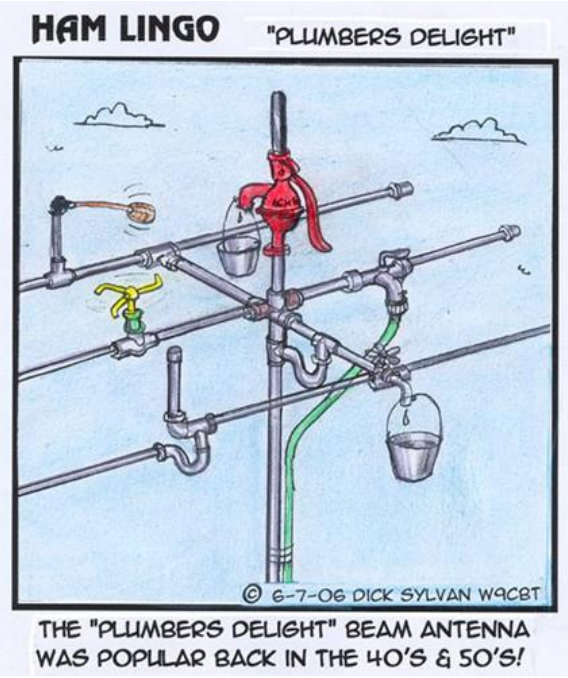


Another procedure for lacing consists of making a series of individually bound wraps at equidistant points along the cable, as required.

Lacing cord, 2 inches longer than the length required to make twelve turns about the harness, is cut. One end of the cord is formed into a 1-inch loop which is placed flat on the harness, parallel to the wiring.

Twelve turns are wound tightly over this loop and, at the last turn, the cord end is pushed through the loop which extends from under the wrap.

Credits: https://makezine.com/2010/06/09/circuit-building-skill-cable-lacing/
http://www.aeroelectric.com/articles/cable_lace/cable_lace.html
https://en.wikipedia.org/wiki/Cable_lacing
http://www.dairiki.org/hammond/cable-lacing-howto/



Can learning ham radio make for better engineers and software developers?

Retired Senior Chief Information System Technician Lee Moburg, a wireless amateur radio (HAM) operator, manned the HAM radio at Naval Hospital Bremerton during a 2016 exercise. Some Navy leaders are turning to ham radios to improve understanding of electronic warfare. (Douglas H Stutz/ U.S. Navy)

When a group of Navy engineers and software developers took time away from their day jobs in December, they spent the time pursuing a task long considered passe: they became licensed amateur radio operators.

Some 23 employees from Naval Air Warfare Center Weapons Division (NAWCWD) took a week-long class in amateur radio at Point Mugu, California culminating with an FCC amateur radio license test. All passed and are certified at the “technician” level for amateur radio operation.

Now, Navy officials say the move may make the workers better at their jobs. The staff gained an understanding of radio frequency (RF) propagation that’s essential to what they do, said Brian Hill, electromagnetic maneuver warfare experimentation lead and collaborative electronic warfare supervisor at NAWCWD.

Hill, who earned his amateur radio license in high school, noticed that while most of his department’s recent hires had degrees in computer science, many had little background in RF theory or operation.

“You can explain antenna patterns and concepts like omni-directional vs directional using Smith charts, but it’s helpful to add a demonstration to really convey the concept,” Hill said. “You can explain modulation as a concept, but for a demo... let them listen to how modulated digital signals with audio frequencies sound... For those who never knew the joy of hearing a 2400 bps modem connect over a telephone line, it was a new concept!”

These concepts are central to electromagnetic maneuver warfare.

“We need to be able to have awareness of all threats and opportunities from [zero frequency] to light within an integrated system,” Hill said. “Our adversaries are looking at the entire spectrum to use against us, and we need to do the same. Having awareness of how the atmosphere changes from daylight to night and how that affects propagation of [high frequency] is important.”

This can be critical for young developers/engineers whose experience is typically limited to the UHF/EHF-based systems now in vogue across communications, guidance and ISR technologies.

When Ian Mann, the division’s target design engineering branch head, heard about Hill’s class, he wanted his team to attend as well. Having earned his own license, when he previously worked at drone-maker Aerovironment, Mann knew the course could help inspire ideas among engineers.

“When I talked to Brian and found out his small class was already on a waiting list, I knew we needed to make the class bigger," he said. "Many of our engineers know their specializations, but rarely does an aeronautical engineer think about how he changes the polarization of the C2 antenna when the airplane banks for a turn. They are not just moving the airplane but the antenna too. This has already started conversations and I hope many more continue.”

Taught by a local amateur radio instructor, students enjoyed the course, he said.

“It was worth the effort and people are already asking to go to the next class offering,” Mann said.

“We are looking at doing a fox hunt soon,” Hill said. “The team will design a directional antenna, actually build it in class, and then use their antennas to find a hidden RF beacon somewhere on base.”

Similar plans for developers to get hands-on experience performing basic electronic warfare support functions are in the works as are potential cross-disciplinary classes in additive manufacturing.

As for a new amateur radio “handle” for the Point Mugu hams, Hill suggested borrowing from history and the term for an expert in electronic warfare. “How about CROW?”

Electronic Warfare

https://www.c4isrnet.com/electronic-warfare/2019/02/06/can-learning-ham-radio-make-for-better-engineers-and-software-developers/

By: Eric Tegler February 6

ANTENNA ARCHIVES #8

Yagi Antenna Theory: Yagi Antenna Basics

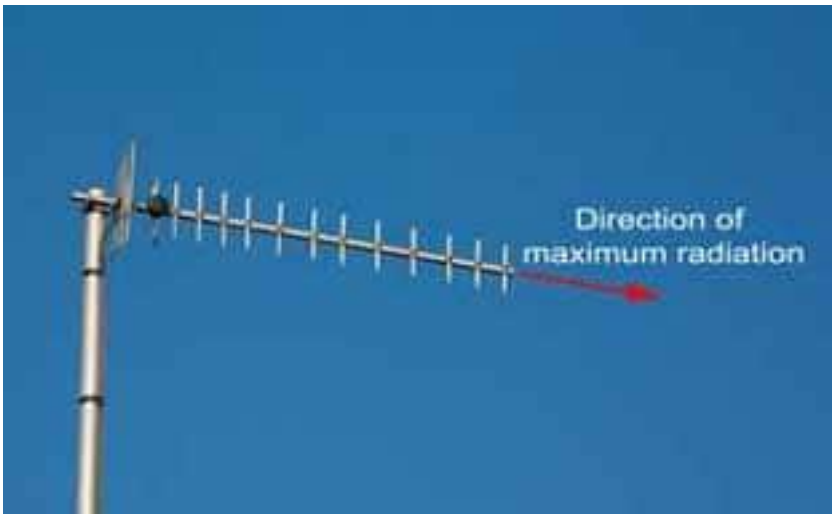
Understanding some of the basics of Yagi antenna theory can help with their use, operation and design.

In depth Yagi antenna theory can be complicated, but a basic understanding of how a Yagi antenna works can provide sufficient insight for many applications and for basic design purposes.

In understanding the basic Yagi antenna theory, the different elements of the Yagi antenna react in a complex and interrelated way.

Yagi Uda antenna showing element types

Yagi antenna theory - the basics



Yagi Uda antenna showing direction of maximum radiation

One of the major keys to understanding Yagi theory is a knowledge of the phases of the currents flowing in the different elements of the antenna.

The parasitic elements of the Yagi antenna operate by re-radiating their signals in a slightly different phase to that of the driven element. In this way the signal is reinforced in some directions and cancelled out in others.

As the additional antenna elements in the Yagi are not directly driven but pick up power from the driven element, these additional elements are referred to as parasitic elements.

One limitation of the design of Yagi antennas is that the power in these additional elements is not directly driven. Accordingly, the amplitude and phase of the induced current cannot be completely controlled. It is dependent upon their length and the spacing between them and the dipole or driven element.

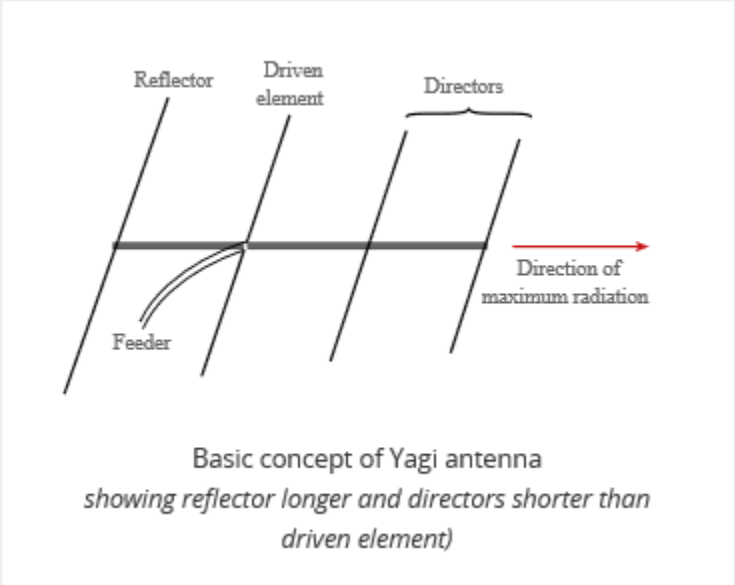
This means that it is not possible to obtain complete cancellation in one direction. Nevertheless, it is still possible to obtain a high degree of reinforcement in one direction and have a high level of gain, and also have a high degree of cancellation in another to provide a good front to back ratio. The Yagi antenna is able to provide very useful levels of gain and front to back ratios.

To obtain the required phase shift an element can be made either inductive or capacitive. Each type of reactance has a different effect.

- ***Inductive:*** If the parasitic element is made inductive it is found that the induced currents are in such a phase that they reflect the power away from the parasitic element. This causes the RF antenna to radiate more power in the opposite direction to this form of parasitic element. An element that does this is called a reflector.

  The element can be made inductive by tuning it below resonance. This can be done by physically adding some inductance in the form of a coil, or more commonly by making it longer than the resonant length. Generally, it is made about 5% longer than the driven element as this saves cost and keeps the element mechanically as one piece which makes it cheaper and stronger.

  Only one reflector is ever used. The addition of further reflectors makes no noticeable difference.

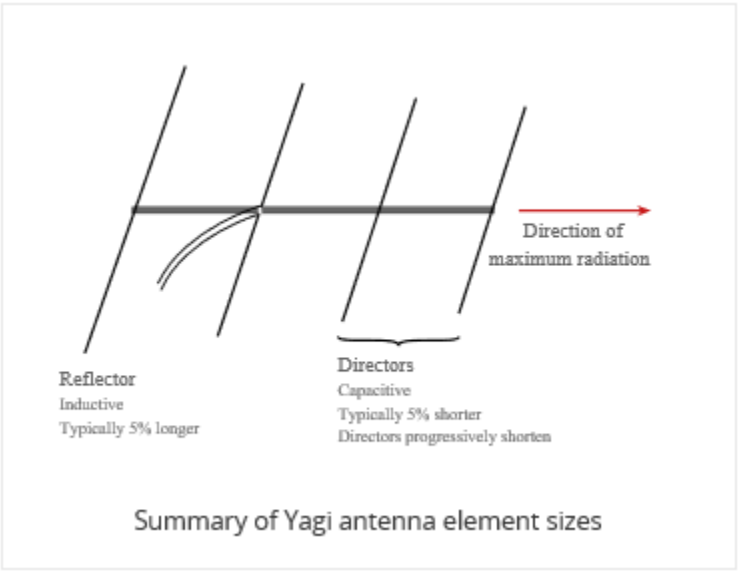


Basic concept of Yagi antenna
showing reflector longer and directors shorter than driven element)

- ***Capacitive:*** If the parasitic element is made capacitive it will be found that the induced currents are in such a phase that they direct the power radiated by the whole antenna in the direction of the parasitic element. An element which does this is called a director. It can be made capacitive tuning it above resonance. This can be done by physically adding some capacitance to the element in the form of a capacitor, or more commonly by making it about 5% shorter than the driven element.

  It is found that the addition of further directors increases the directivity of the antenna, increasing the gain and reducing the beam width. The length of successive directors is reduced slightly.

To summarize the theory behind the directors and reflectors of a Yagi antenna:



Summary of Yagi antenna element sizes

https://www.electronics-notes.com/articles/antennas-propagation/yagi-uda-antenna-aerial/theory.php

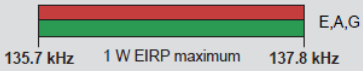
US Amateur Radio Bands

US AMATEUR POWER LIMITS — FCC 97.313 An amateur station must use the minimum transmitter power necessary to carry out the desired communications. (b) No station may transmit with a transmitter power exceeding 1.5 kW PEP.

ARRL The national association for AMATEUR RADIO®

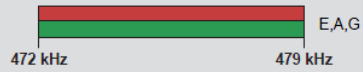
Amateurs wishing to operate on either 2,200 or 630 meters must first register with the Utilities Technology Council online at **https://utc.org/plc-database-amateur-notification-process/.** You need only register once for each band.

2,200 Meters (135 kHz)



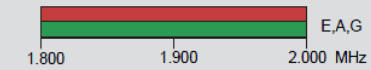
630 Meters (472 kHz)

5 W EIRP maximum, except in Alaska within 496 miles of Russia where the power limit is 1 W EIRP.

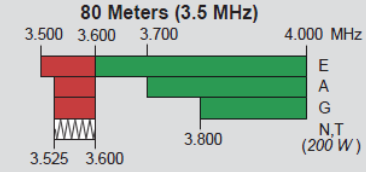


160 Meters (1.8 MHz)

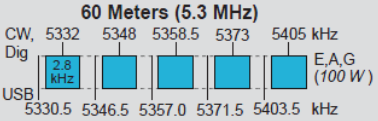
Avoid interference to radiolocation operations from 1.900 to 2.000 MHz



80 Meters (3.5 MHz)

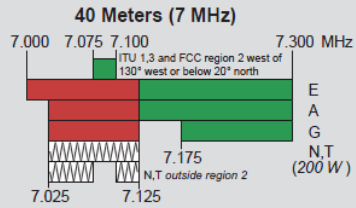


60 Meters (5.3 MHz)



General, Advanced, and Amateur Extra licensees may operate on these five channels on a secondary basis with a maximum effective radiated power (ERP) of 100 W PEP relative to a half-wave dipole. Permitted operating modes include upper sideband voice (USB), CW, RTTY, PSK31 and other digital modes such as PACTOR III. Only one signal at a time is permitted on any channel.

40 Meters (7 MHz)

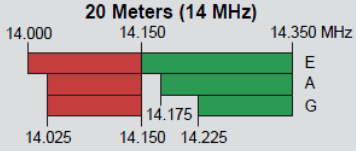


See Sections 97.305(c), 97.307(f)(11) and 97.301(e).These exemptions do not apply to stations in the continental US.

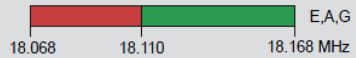
30 Meters (10.1 MHz)

Avoid interference to fixed services outside the US.

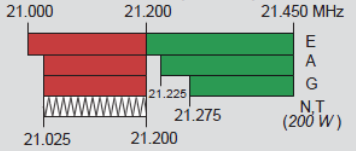
20 Meters (14 MHz)



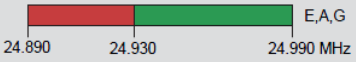
17 Meters (18 MHz)



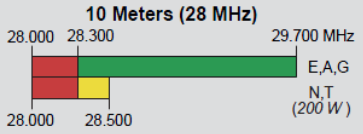
15 Meters (21 MHz)



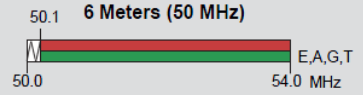
12 Meters (24 MHz)



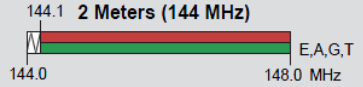
10 Meters (28 MHz)



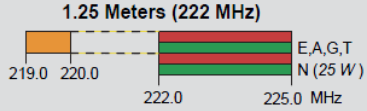
6 Meters (50 MHz)



2 Meters (144 MHz)

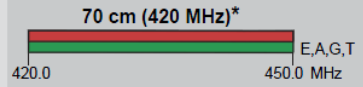


1.25 Meters (222 MHz)

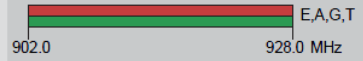


*Geographical and power restrictions may apply to all bands above 420 MHz. See *The ARRL Operating Manual* for information about your area.

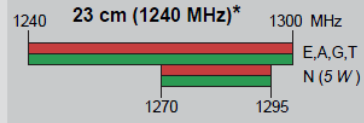
70 cm (420 MHz)*



33 cm (902 MHz)*



23 cm (1240 MHz)*



All licensees except Novices are authorized all modes on the following frequencies:

2300-2310 MHz	10.0-10.5 GHz ‡	122.25-123.0 GHz
2390-2450 MHz	24.0-24.25 GHz	134-141 GHz
3300-3500 MHz	47.0-47.2 GHz	241-250 GHz
5650-5925 MHz	76.0-81.0 GHz	All above 275 GHz

‡ No pulse emissions

KEY

Note:
CW operation is permitted throughout all amateur bands.

MCW is authorized above 50.1 MHz, except for 144.0-144.1 and 219-220 MHz.

Test transmissions are authorized above 51 MHz, except for 219-220 MHz

- = RTTY and data
- = phone and image
- = CW *only*
- = SSB phone
- = USB phone, CW, RTTY, and data
- = Fixed digital message forwarding systems *only*

E = Amateur Extra
A = Advanced
G = General
T = Technician
N = Novice

See *ARRLWeb at www.arrl.org* for detailed band plans.

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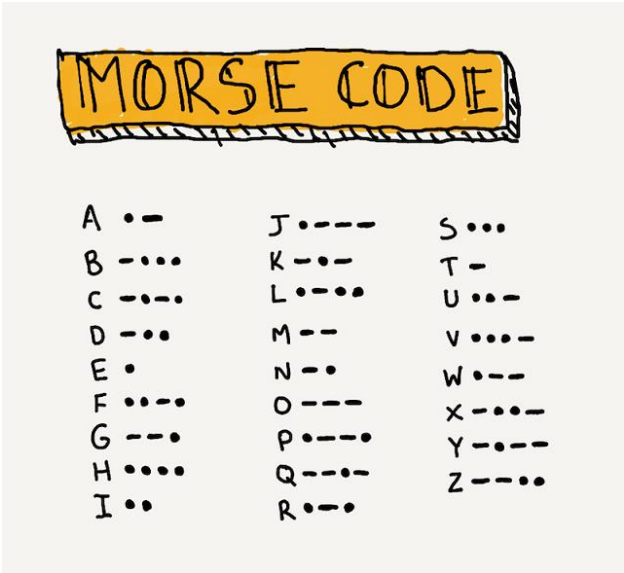
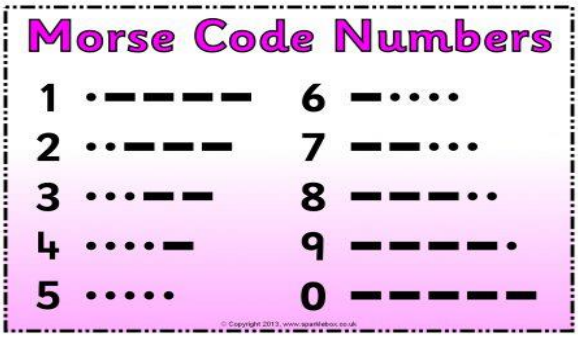
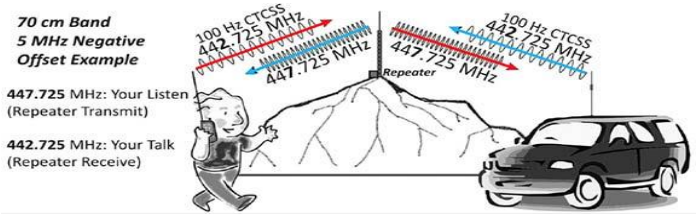




Local Repeater Info



Frequency	Offset	Tone	Call	Location	ST/PR	Use	VOIP	Mi	Dir	
51.8800	-0.5 MHz	131.8	K4MTP	Tannersville, Camelback Mountain	PA	OPEN		12.3	NW	⊕
53.2900	-1.0 MHz		N3MSK	Wind Gap	PA	CLOSED		7.1	S	⊕
53.7900	-1 MHz	131.8	N3KZ	Camelback Mountain	PA	OPEN		7.6	NNW	⊕
53.8300	-1.0 MHz	131.8	KA2QEP	North Bangor	PA	OPEN		5.1	SE	⊗
145.2300	-0.6 MHz	77.0	W3WAN	Tannersville	PA	OPEN	A	6.5	NNW	⊕
146.4450	+1 MHz	131.8	KB3WW	Long Pond	PA	OPEN		12.3	NW	○
146.4750	+1 MHz	110.9	WB2NMI	Columbia, Hainesburg	NJ	OPEN		11.0	ESE	⊕
146.8650	-0.6 MHz	100.0	WX3OES	Tannersville	PA	OPEN		6.5	NNW	⊕
147.0450	+0.6 MHz	131.8	WA3MDP	Bangor	PA	OPEN		10.7	SSE	⊕
224.3400	-1.6 MHz	131.8	KB3WW	Long Pond	PA	OPEN		12.3	NW	⊕
224.6600	-1.6 MHz	71.9	KB3DCM	Tannersville	PA	OPEN		6.5	NNW	○
224.9200	-1.6 MHz	127.3	K4MTP	Long Pond	PA	OPEN		12.3	NW	⊕
442.5000	+5 MHz	131.8	N3KZ	Camelback Mountain	PA	OPEN		7.6	NNW	⊕
443.7000	+5 MHz	151.4	KA3HJW	Wind Gap	PA	OPEN		7.1	S	⊕
444.4500	+5 MHz	131.8	W3BXW	Tannersville, Camelback Mountain	PA	OPEN		7.6	NNW	⊗
445.21875	-5 MHz	CC1	N2DCE	Bangor	PA	OPEN		6.7	SSE	⊕
445.3750	-5 MHz	91.5	K4MTP	Pohopoco Mountain	PA	OPEN		11.7	WNW	⊕
446.2250	-5 MHz	131.8	N3TXG	Ross Township	PA	OPEN		5.9	SSW	⊕
446.5750	-5 MHz	151.4	KG3I	Long Pond, Near the Pocono International Raceway	PA	OPEN		12.3	NW	⊕
446.9750	0 MHz		KB3TEM	East Stroudsburg	PA	OPEN		5.9	NE	○
447.2250	-5 MHz	131.8	N3TXG	Bangor	PA	OPEN		6.7	SSE	⊕
447.2750	-5 MHz	CC0	KG3I	Blakeslee, Pimple Hill	PA	OPEN		13.3	WNW	⊕
447.5750	-5 MHz	131.8	W3BXW	Wind Gap	PA	OPEN		7.1	S	⊕
448.2750	-5 MHz	131.8	N3BUB	Long Pond	PA	OPEN		12.3	NW	○
448.3750	-5 MHz	91.5	N3JNZ	Wooddale	PA	OPEN		10.3	NNE	⊕
448.4750	-5 MHz	123.0	N3VAE	Long Pond	PA	OPEN		12.3	NW	○
448.5250	-5 MHz	131.8	KA2QEP	Little Offset	PA	OPEN		6.8	SSE	○
449.8750	-5 MHz	131.8	KC2IRV	Wind Gap	PA	OPEN	EA	6.5	SSW	⊕

Forecast of Solar and Geomagnetic Activity

Weekly Highlights and Forecasts

Highlights of Solar and Geomagnetic Activity
18 - 24 February 2019

Solar activity was very low. A DSF centered near N19W38 was observed lifting off after 23/2332 UTC. A subsequent CME signature was first observed in LASCO C2 imagery at 24/0125 UTC. However, after forecaster analysis and WSA/Enlil modeling, the CME was determined to be off the Sun-Earth line.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached moderate levels on 18-20 Feb. Normal levels were observed during the rest of the summary period.

Geomagnetic field activity reached active levels on 21 Feb due to CH HSS influences. The remainder of the period was at mostly quiet levels.

Forecast of Solar and Geomagnetic Activity
25 February - 23 March 2019

Solar activity is expected to remain very low for the forecast period.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at moderate to high levels on 25 Feb - 10 Mar, and 13 Mar due to recurrent CH HSS activity. Normal to moderate levels are expected for the remainder of the outlook period.

Geomagnetic field activity is expected to be at G1 (Minor) storm levels on 27-28 Feb due to recurrent CH HSS activity. The remainder of the period is expected to be mostly quiet to unsettled.

National Traffic System & Classroom Training Updates

By Donald Darcy WK2RP

I have re-titled this column to include the instructional class information. The General License Class will begin on Wednesday April 3rd. You must register with me if you plan on taking the class. I need your name, email and a phone number which is used for last minute changes to the class. Anyone interested in helping to teach the class should contact Chris, AJ3C or Donald WK2RP, and we will help you with how to teach. For more information contact either one of us.

The ARRL has finally approved the new EC-001: Introduction to Emergency Communications and should be releasing the new course soon. This course is required to achieve Level II of ARES. Once approved I will be doing another classroom instruction of the course.