California QSO Party

Operator's Guide to the California QSO Party
For Operators Outside CA

This is a guide for both beginners and experts in the California QSO Party on the following topics:

- Calling CQ vs. Search & Pounce (S&P)
- Operating CW
- Operating SSB
- What frequencies to operate
- When to operate and which bands to operate
- Multipliers
- Assisted vs. Unassisted
- Power level
- Additional tips

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If you have any feedback or proposed additions to this document, please email: cqp.chairman@gmail.com

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Calling CQ vs. Search & Pounce (S&P)

- In most state QSO Parties, it is a combination of mobile stations and fixed stations that will call CQ from inside the state. Stations outside of the state tune the bands looking for them. Calling CQ from outside the state is usually unproductive.

- California is different, which is in your favor.
  - There will be a large number of fixed stations calling CQ on both modes.
  - There will also be a large number of casual, smaller fixed stations in Search & Pounce mode (tuning the bands, answering other stations calling CQ). This will mostly be on SSB.
  - There will be 25+ county expedition stations also calling CQ on both modes.
  - There will be a few mobile stations. At least one will be calling CQ on CW, while others will be on Phone, mostly S&P and some CQing.

- What this means for you:
  - You should primarily S&P on CW. You'll find plenty of CA stations calling CQ on CW to keep you busy for hours.
  - You should alternate between S&P on SSB and calling CQ on SSB. S&P for the large number of loud fixed stations and expeditions. Call CQ for all the smaller fixed stations and the SSB mobiles that are tuning the bands. If you have a strong signal, you'll be pleasantly surprised how many CA stations will answer your CQ on Phone.

Operating CW

- CW activity was at an all-time high in CQP 2020.

- CW QSOs are worth 3 points in CQP, while SSB QSOs are worth 2 points. You should consider staying on CW for this scoring advantage until you run out of new stations. Then QSY to Phone.

- Use computerized CW keying. Connect a CW keyer to the USB port on your computer and configure it with a contest logging software program that supports it. Because the CQP exchange includes a serial number, you will find it extremely useful for your computer to send the CW, as opposed to you keeping track of every serial number and manually sending it with a CW paddle. Some popular options are:
    - K1EL WinKeyer: https://hamcrafters2.com/
    - Mortty CW keyer which emulates Winkeyer protocol: https://hamprojects.info/Mortty/
    - Use the serial port or USB port on your radio to key CW. For information about how you do this for your specific Elecraft, Icom, Kenwood or Yaesu radio, see this impressively detailed presentation by Bob N6TV:
        - "Everything You Need to Know about USB and Serial Interfaces" https://www.kkn.net/~n6tv/Everything%20You%20Need%20to%20Know%20About%20USB%20and%20Serial%20Interfaces%20by%20N6TV.pdf

- Spend time setting up CW messages in the function key definitions of your contest logging program. It is well worth the effort.

- Here is an example of a complete CW QSO with good form in CQP:
    - <from N6DE> CQ CQP N6DE
    - <from K8MR> K8MR
    - <from N6DE> K8MR 1 SCLA
    - <from K8MR> TU 1 OH
    - <from N6DE> TU N6DE

Observations:

- The S&P station (K8MR) only sent his call once and then listened. Do this when you answer someone's CQ. Don't send your callsign twice or more.
- Serial number and QTH were only sent once.
- Both stations did not send "NR" before the number. This is personal preference. There can be a case made to send "NR" before your number. This makes every exchange take longer, but some stations may not be ready to immediately copy the serial number upon your transmission and might have to ask you for the number again, which would waste time. A CQing exchange with NR would be "K8MR NR 1 SCLA" and an S&P exchange with NR would be "TU NR 1 OH".
- Both N6DE and K8MR did not send leading 0s for their serial number. They sent 1 instead of 001. They also did not use "cut numbers." They didn't send TT1. For example, T is a "cut number" for 0 and N is a "cut number" for 9. Don't use "cut numbers" in CQP for your serial number because it will only create confusion.
- In the "Thank you" message, N6DE signed his callsign at the end of the QSO, instead of just sending "TU QRZ?". Send your callsign at the end of every QSO as the CQing station.
- If you are a QRP station, do not send your call as K8MR/QRP. Simply send K8MR.

- How to ask for fills

  - If you're the CQing station or the S&P station, chances are good that sometimes you will need the other station to repeat their callsign, serial number or QTH.
  - For callsign, send "CALL?"
  - For serial number, send "NR?"
  - For county, send "CTY?"
  - If you need the whole exchange again, send "AGN"

- Looking for CA stations calling CQ.

  - Here are the most common ways that CA stations call CQ in CQP:
    - CQ CQP N6DE
    - CQP N6DE
    - (mobile station) CQ CQP K6AQL/GLEN

- Sometimes you'll hear:
  - CQ N6DE N6DE CQP
  - CQ TEST N6DE
  - CQ N6DE N6DE

- Listen carefully for the different types of callsigns you'll hear from CA stations calling CQ:
  - Normal 6-land callsigns you'd expect.
  - About 20 1x1 callsigns active. K6x, N6x, W6x
  - 3 xCQP callsigns active: K6CQP, N6CQP, W6CQP
  - Non 6-land callsigns inside CA signing /6.
    - Examples from CQP 2020: K7JA/6, N3ZZ/6, W8RJL/6, etc.
  - Non 6-land callsigns inside CA only signing their base callsign.
    - Examples from CQP 2020: W7XZ, K0DTJ, N2JNR, etc.
    - It is important to listen to these stations and not tune past them, assuming they are outside of CA.
    - Some may end their CQ message with " /CA" to indicate they are inside CA.
  - Non 6-land callsigns inside CA signing /county to indicate they are located inside CA.
    - Example from CQP 2020: K9JM/NEVA

- Calling CQ CA

  - On occasion, you may consider calling CQ for any CA stations tuning the bands.
  - Make sure to call "CQ CA" instead of "CQ CQP".
  - Taking K9CT as an example, he could call CQ as:
    - CQ CA K9CT
    - CQ CA K9CT CQP
  - If he wants to be sure that everyone knows he is in IL and not CA:
    - CQ CA K9CT K9CT /IL

- Logging mobile stations

    - Let's take K6AQL/M as an example.
    - It is a good idea to log each of your QSOs with K6AQL as:
        - K6AQL/<county abbreviation> (K6AQL/GLEN, K6AQL/COLU, etc.)
    - It is acceptable to CQP log checking, but more confusing to you during the contest, if you log each QSO as:
        - K6AQL
        - K6AQL/M
        - This is because your logging program will first think your QSO is a dupe. You won't know whether it is or not until you type the county in the exchange. You can avoid this confusion upfront by always entering the callsign as K6AQL/<county abbreviation>.

- Logging county line stations

    - You'll probably encounter at least one county line station on CW.
    - If you are using the N1MM+ logger, just enter the QTH as <county1>/<county2> (for example, COLU/LAKE). N1MM+ will automatically create two QSOs in your Cabrillo file, one with COLU and one with LAKE.
    - If you're using another contest logging program, please consult the help file about how you log county line QSOs.

- CW Speed in CQP

    - For information about what CW speeds to expect in CQP, please read:
        - http://cqp.org/files/cqp2020_cw_speeds_rbn.pdf
    - If someone is operating at a speed faster than you can copy, send QRS. They will most likely slow down so that they can make a QSO with you.
    - If you run across slow stations high in the band, don't assume they are non-contesters. They could very well be CQP participants! We suggest slower CW speed stations to call CQ high in the activity window. Don't skip over them, as they could very well provide you with new county multipliers.

- Where to find CW activity in CQP

  - CQP rules suggest 40kHz from bottom of the band on 10M-80M and 1815kHz on 160M.
  - For charts showing where exactly the CW activity was on 20M and 40M in CQP 2020, please read:
    - https://cqp.org/files/cqp2020_frequencies.pdf
  - Notice where K6AQL/M operated on 20M and 40M (high end of the activity window).
  - Make sure you listen across the .020 to .070 windows on 20M and 40M. It will be narrower on the other bands, centered around .040.

- Practice

  - Go to the CQP Audio-Video page at:
    - https://cqp.org/av.html
    - Listen to the two CW audio clips and follow along by looking at the link to the provided Cabrillo log while you're listening. This is a great way to get into the groove for the CQP exchange and for practicing CW.
  - Participate in the CQP practice session on the Friday before CQP. Look for details on https://cqp.org the week before CQP.
  - Participate in other QSO Parties. See them listed the WA7BNM contest calendar page:
    - https://www.contestcalendar.com/stateparties.html

- Want to learn CW or increase your speed?
  - CWOps has a great program called CW Academy. Check it out at:
    - https://cwops.org/cw-academy/cw-academy-options/

Operating SSB

- There will be lots of activity to keep you busy on SSB in CQP. Here are some tips.

- Watch a 2 minute video of W6S (W1SRD op.) calling CQ in CQP 2020. This is an excellent example of good operating technique in CQP, while also showing him logging stations live in the N1MM+ contest logger.

  - https://cqp.org/av.html

- First, S&P to contact all the CA stations calling CQ on Phone. When you run out of new stations, try calling CQ if you think you have a good signal to CA. You'll probably gain more traction by CQing high or low, instead of in the middle of the activity.

- Here is an example of a complete SSB QSO with good form in CQP:
  - \<from N6DE> CQ California QSO Party, November 6 Delta Echo
  - \<from K8MR> Kilo 8 Mike Radio
  - \<from N6DE> Kilo 8 Mike Radio 1 Los Angeles
  - \<from K8MR> Thank you, 1 Ohio
  - \<from N6DE> Thank you, November 6 Delta Echo

- Saying your number

  - You may find that saying the word "number" will help increase the chance of your number being copied the first time:

    - \<from N6DE> Kilo 8 Mike Radio Number 1 Los Angeles

    - \<from K8MR> Thank you, Number 1 Ohio

  - Give your number, one digit at a time, to increase readability.

    - For number 265:

      - Say "Number Two Six Five"

      - Don't say "Number Two Hundred and Sixty Five"

      - "Sixty" and "Fifty" sound very much alike and are often confused.

- Phone operating DO's and DON'Ts

    o DO's

        - Use phonetics.

        - Speak clearly, at your normal pace.

        - Keep reminding yourself during the contest of the phrase "Omit needless words" from *The Elements of Style* by Strunk and White. This mindset will help you in Phone contesting.

        - Ask for repeats on the callsign, serial number or QTH if you didn't get it the first time.

        - Correct the station's callsign in your "Thank you" message if you got it wrong the first time.

            - <from K5TR> CQ California, Kilo 5 Tango Radio

            - <from N6DE> November 6 Delta Echo

            - <from K5TR> November 6 ALPHA Echo 1 Texas

            - <from N6DE> November 6 DELTA Echo, Thank you, 1 Los Angeles

            - <from K5TR> November 6 DELTA Echo, Thanks, Kilo 5 Tango Radio

        - Be patient. If you are calling CQ, you will have many casual CA stations call you. Work dupes instead of giving them a hard time for calling again. Help make their exposure to contesting a positive one.

        - Be mindful that there are non-contest uses of the 20M Phone band by nets, emergency frequencies and maritime channels. There should be enough room in the Phone band to avoid these and spread out.

    o DON'Ts

        - Say "Please Copy." It's not needed.

        - Give signal report. It's not a part of the CQP exchange. If a station asks you for a signal report, give it to them, but otherwise don't give signal reports.

- Repeat back the station's exchange if you don't have questions about it. For example, don't say "Thanks for the number 27 in San Francisco, and good luck in the contest, this is Kilo 5 Tango Radio, QRZ?" Just say, "Thanks. Kilo 5 Tango Radio"

- Say your callsign twice in a row when answering someone. Just give it once and listen.

- Say your exchange twice.

    - Instead of "You're number 2 7, Twenty-Seven, in Texas, Tango Xray, QSL?" just say "Number 2 7, Texas"

- Get in a frequency fight. There will be plenty of other open frequencies available in the Phone band in CQP. Just move to a better frequency and call CQ again.

- Headsets

  - You should use a headset: headphones with a microphone built in. Using a hand mic or desk mic occupies one hand, forcing you to type QSOs in your logging software with the other hand. This will slow you down considerably. Invest in a headset. Popular headsets that contesters use are:
    - Inrad W1
    - Yamaha CM500
    - Radiosport headsets by ARLAN Communications
    - Heil Proset

  - It is not our place to provide a review of each headset. Please do research, read reviews on eham.net, and ask your contest club members for advice.

- VOX vs. Footswitch

  - There are two ways to key PTT on SSB.
    - VOX
    - External footswitch

  - This is personal preference. VOX requires you to adjust settings in your radio, fine tuning them for your particular situation. If VOX settings are not

adjusted well, you will experience problems. Instead, a footswitch is an inexpensive alternative to VOX and is the foolproof way to control PTT for SSB contesting. A majority of competitive SSB contesters use footswitches.

- Mic Gain and Compression Settings

  o Adjust your mic gain and compression settings carefully. A common mistake is to set these too high. It results in poor audio which is difficult to understand.

  o Before CQP, ask someone on the air to listen to your audio and give you suggestions as you adjust mic gain and compression.

  o Please read a great presentation by Jim K9YC on the topic.

    ▪ "Clean, Punchy, Competitive Contest Audio Without Splatter" http://k9yc.com/ContestAudio.pdf

- Voice Keyer

  o Consider using a voice keyer to help you save your voice.

  o Record a CQ message, a "Thank you" message and a message with just your callsign sent once.

  o Some radios may have a voice recording option built in, such as the Icom IC-7610 or the Elecraft K3S with the DVR option. Through a rig control connection between your radio and a logging program which supports a command to transmit your prerecorded messages on your radio (N1MM+, for example), you should be able to configure different function keys to transmit your voice recordings.

  o Another way to do this is to record WAV files on your computer with software like Audacity, trim and adjust each WAV file, connect your computer's sound card to your radio, and configure your logger to transmit certain WAV files associated with defined function keys. Watch a video presentation by Jim K9YC demonstrating this process.

    ▪ http://nccc.cc/misc/RecordingVoiceMessages-K9YC.wmv

- Recommended Reading

  - Finally, you should read pages 53 to 58 of the following tutorial by Jim K9YC. These pages include info about types of microphones, speech frequency content and levels.

    - http://k9yc.com/RFI-Ham.pdf

What Frequencies to Operate

- From CQP rules:

  - **BANDS:** 160, 80, 40, 20, 15, and 10 meters
    Frequencies:
    CW: 40 kHz up from the bottom band edge on 10m-80m; 160m at 1815 kHz
    SSB: 1845 kHz, 3610 & 3750-3820 kHz (avoiding 3790-3800 kHz DX window), 7230 kHz, 14250 kHz, 21300 kHz, 28450 kHz.

- For charts showing exactly where activity was on the busiest bands (20M and 40M) in CQP 2020, please read:

  - https://cqp.org/files/cqp2020_frequencies.pdf

- Conclusions from this analysis

  - If you are a large station that can easily command a frequency, you can see where most of the QSOs were made on 20M and 40M.

  - If you are a small station, spread out from the main activity. Notice that there is 50kHz of space on CW where CQP activity takes place, 180kHz on 20M SSB and the full 175kHz on 40M SSB. Take advantage of that fact and try a spot above or below the main fray so that you can be heard.

  - When you are S&P, make sure to check the full range shown in the analysis for stations.

  - Don't waste time in a frequency fight with a net or another station. There are plenty of available frequencies in CQP. QSY somewhere that you can hear well. Stations will find you.

- For activity on less active bands, it makes sense to congregate closer to the suggested frequency in the rules.

- Make sure to relinquish your frequency for any emergency purposes.

- Don't operate too close to the upper band edge on 20M SSB. The highest you should go is 14347.0kHz.

When to operate and which bands to operate

- In CQP, you are able to contact a CA station on each band and each mode for QSO credit. This means that over the course of a contest, you can make a maximum of 12 QSOs with just one station (CW and SSB, 10M-160M). Use this to your advantage by frequently moving between bands and modes.

- From the CQP rules, if you are a Single-Operator, you can operate a maximum 24 of the 30 hours in CQP. Break times need to be at least 15 minutes long. This is different than other contests, where off-times are either 30 minutes or 60 minutes minimum at a time. If you're a competitive station and trying to operate all 24 hours, you may choose to take all 6 hours in one chunk for sleep, or you may choose to take many short off-times for food breaks with family, short naps, brief walks outside for fresh air, attend to a chore around the house, etc. 15 minute breaks give you the flexibility of being able to take brief off-times when you need them, without being forced to stay off the air for a long time during productive hours.

- Whether you're a casual station or serious station, you should study these charts below. Perhaps even print them and refer to them during the contest to help guide you.
  - CQP 2020 QSO percentage by hour for every band/mode
    - http://cqp.org/files/cqp2020_qso_percentage_by_bandmode.pdf
  - CQP 2020 total QSOs per hour
    - http://cqp.org/files/cqp2020_total_qsos_by_hour.jpg
  - Low sunspot activity: CQP 2020 QSOs per band by hour
    - http://cqp.org/files/cqp2020_band_qsos_by_hour.jpg
  - Medium sunspot activity: CQP 2017 QSOs per band by hour
    - https://cqp.org/images/qsograph-2017.png
  - High sunspot activity: CQP 2013 QSOs per band by hour
    - https://cqp.org/pdf/qsograph2.pdf

- Conclusions from charts

  o 8Z-10Z are the slowest hours. Sleep at this time.

  o For every hour of CQP, there are at least two bands active. During most hours, three bands are active. Use this to your advantage. Your strongest band during any given hour is based on the best propagation to CA and your antennas.

  o Generally it is a good idea to follow the band with the highest activity per hour. However, there can be important exceptions to this:

    ▪ Remember to keep checking 15M and 10M for openings. Don't assume they are dead! When they are open, work them to the fullest extent.

    ▪ If you're in W7, you might be too close to W6 to have success on the high bands. Try 40M during the day, especially Phone. You may be surprised by the number of CA stations that will answer your CQ on 40M Phone.

    ▪ If you are a small station, you might find that you're having trouble breaking pileups on loud CA stations. Instead, you could gain more traction by being on a band with relatively less activity. Your signal will have a better chance to stand out and be heard, instead of always battling it out in pileups on the most active band every hour.

- Be sure to operate during the rally times listed in the CQP rules:

  o Rallies:
  1900Z: Try 10m at 28040 and 28450 kHz
  0300Z and 0600Z: Try 80CW at 3540 kHz and 75PH at 3610 kHz and 3750-3820 kHz (avoiding 3790-3800 kHz DX window)
  0500Z: Try 160CW at 1815 kHz
  0530Z: Try 160PH at 1845 kHz

Multipliers

- As a U.S., VE or DX station, you have 58 possible California counties to contact.

- County multipliers are not per band or per mode. Contact a county once and it counts for the whole contest, regardless of band or mode.

- It is harder to activate all 58 CA counties than you might imagine. There are many rural counties in CA. Wildfires, access restrictions to US Forest Service land, and COVID-19 considerations are making it very difficult to activate all 58 counties in CQP. Nevertheless, we are doing our best to give you an opportunity to achieve a sweep.

- Please review the CQP CountyTracker page at https://cqp.org/tracker.html for the following info:

    o Tracker spreadsheet that shows callsigns that will be active in each county, how active they plan to be, and what mode(s) they plan to be on. https://docs.google.com/spreadsheets/d/1yoCvuNUkUZdbOu7D1nUPgTZdg29K6G5b2GHFSFfsQ5g/edit?usp=sharing
    o Color coded summary list of all 58 counties by mode, based on anticipated activity.
    o Mobile route maps.
    o Analysis of which CA county multipliers have been the rarest between CQP 2018 and CQP 2020: https://cqp.org/pdf/CQP_rare_counties.pdf?usp=sharing

- For the number of multiplier sweeps by US/VE/DX stations in CQP between 2008 and 2020, and the number of CA counties contacted by all US/VE/DX stations in CQP 2017-2020, see this document:
    o https://cqp.org/files/cqp_mult_analysis.pdf

- Track the mobile route maps. In CQP with a lot of fixed station and expedition activity, it can be easy to forget about mobile stations. Mobiles will help you boost your multiplier total.

- If you operate CW only, you will find it rather difficult to contact all 58 counties. Operating mixed-mode gives you the best chance for a multiplier sweep, as some mults tend to only appear on SSB.

- It will highly benefit you to know the abbreviations for the 58 CA counties.

  - Review and print this multiplier list as a cheat sheet during the contest:
    - https://cqp.org/cqp_multipliers.html
  - Set up your logging software so that you can view a window of the abbreviations for each multiplier.
    - In N1MM+ for example, click the "Window" menu, click "Multipliers", and then click "Counties/Other."

- If you are a slow typer, you might have trouble typing the serial number and QTH in your logging program before the station you're contacting decides to be impatient and send you the exchange again. If you find typing to be an impediment to making efficient QSOs in CQP, there is one feature that you may find helpful:

  - In N1MM+, there is the option of specifying a "Call History" file. It is a file that contains callsigns and the QTH logged for each callsign from previous contests. There will be a Call History file specific to CQP, maintained by VE2FK. When you create your new CQP log in N1MM+, go to the "Associated Files" tab, find "Call History Filename" and click "Change." If you have already created your log, you can use the following technique:
    - https://n1mmwp.hamdocs.com/mmfiles/categories/callhistory/
    - Search on qsop_ca.
    - Download the latest CQP call history file.
    - In N1MM+, select the "File", "Import", "Import call history…" option. Select the file you just downloaded.
  - When you contact a callsign listed in this file, N1MM+ will automatically fill in the QTH field with the county. Of course, serial number will still be blank, so you'll need to fill that in.
  - Important note: Do not use this feature with the intention of helping you copy the exchange sent to you on the air. You still need to copy what was sent to you on the air and compare the county you received with the county that was filled in by the Call History file. If it is the same, you will save yourself some keystrokes and you'll be able to quickly move on to the next contact. If it's different, you will need to overwrite the QTH with what you heard on the air and then log the QSO. Several stations may

operate from a different county since last year's contest. Log checking is performed on all logs in CQP. Your score is deducted half a QSO for incorrectly copying one element of the exchange, and you lose credit for the entire QSO if you incorrectly copy two elements of the exchange. It is to your advantage to value accuracy and log what you heard.

Assisted vs. Unassisted

- If you are operating by yourself, you have two class entry options:

  - Single-Operator
  - Single-Operator Assisted

- CQP rules define "Assisted" as:

  - "It is allowed to use RBN, DX packet cluster, county spotting networks, CW Skimmer and other similar alerting arrangements, but self-spotting is prohibited."

- Am I "Assisted" if I have a spectrum scope on my radio, or a P3 panadapter for my Elecraft radio, or a SmartSDR display for my FlexRadio?

  - No. Just observing activity waveforms or waterfalls by themselves does not put you in the S/O Assisted class. Once callsigns are associated with the activity waveforms/waterfalls, it becomes "Assistance." The use of RBN, CW Skimmer, packet clusters and spotting networks make a Single-Op station Assisted because specific callsigns are associated with specific frequencies.

- Ways that Assistance can be used to your advantage

  - Through the use of your logging software's bandmap window, you can quickly locate stations you have not yet contacted on a given band/mode so that you can change frequencies and work them. You can also see which stations are duplicates for you so that you know who not to call.

  - Find holes in the band where other stations are not calling CQ. Go to an open slot in your bandmap and call CQ.

  - Find stations in multipliers that you're missing and contact them.

  - Evaluate whether a band is open by looking at recent spots.

  - Evaluate how well your CW signal is being heard on the West Coast by looking at spots for your callsign on RBN and seeing the SNR readings.

- Presentations by Bob N6TV

  You really should study two great presentations by N6TV on this topic.

    o "The Advantages of Waterfall Displays for DXing and Contesting"

      ▪ https://www.kkn.net/~n6tv/N6TV_Dayton_2019_Using_Waterfall_Displays.pdf

    o "CW and RTTY Skimmer and the Reverse Beacon Network"

      ▪ https://www.kkn.net/~n6tv/CW%20Skimmer%20and%20the%20RBN%20by%20N6TV.pdf

      ▪ YouTube video: https://www.youtube.com/watch?v=C2OopLjT_w0&t=109s&ab_channel=SpokaneDXAssociationwww.youtube.com/watch?v=fEEUpsWUtAA&feature=youtu.be&t=8127

- How Assistance plays out in reality as a US/VE/DX station in CQP:

    o It will be very helpful to quickly find CA stations calling CQ on CW for each band. There will be some stations that you'll still need to find manually by spinning your radio's knob because those stations will be sending CQ in such a way that isn't picked up by CW Skimmers.

    o On SSB, assistance is less helpful because there are few SSB spots. Those require someone to manually enter them to the spotting network. CW spots are prevalent because they are automatically generated by Skimmer stations on the Reverse Beacon Network.

    o Some of the benefits of Assistance can still be obtained in the Single-Op (unassisted) class by using a waterfall display without callsign information.

Power Level

- There are 3 power levels in CQP:
    - High power: More than 100W output.
    - Low Power: 100W or less output.
    - QRP: 5W or less output.

- More important factors
    - There are several other factors that are more important to your success in CQP than power level:
        - Antennas
        - Location
        - Noise
        - Skill

    - Having said that, the difference between 5W output and 1500W output is nearly 25dB (about 4-5 S-units). This is a huge difference, so power level is an important topic to discuss.

- SSB considerations
    - During low sunspot activity, stations usually find it difficult to maintain a good QSO rate on SSB at QRP and Low Power levels.

    - Running high power seems to break through a threshold on SSB and opens new layers of stations that will now hear you, whether you are calling CQ or S&P.

- CW considerations
    - You can be quite successful on CW as a Low Power or QRP station. High power is less important.

- Different levels of high power
    - Several amplifiers are in the 500W-700W output level.
    - Others produce full legal limit of 1500W output.
    - The difference between them is less than 1 S-unit. 3-5dB is still significant to the competitive station and allows another layer of stations with a high

noise level to hear you with 1500W output as opposed to 500W-700W output.

- o But a bigger difference is going from 100W to 500W. This is more than 1 S-unit improvement. Consider this improvement, especially if you are operating SSB.

- QRP considerations

  - o You might be limited to 5W output in CQP for various reasons. Common ones are:

    - RFI problem in your house or your neighbor's house if you transmit more than 5W.

    - Solar powered station where you don't want to deplete your battery power reserves.

  - o If this is the case for you, don't despair. It's still possible to make QSOs in CQP. There were 11 Single-Op/Single-Op Assisted QRP stations outside of CA in CQP 2020 that made over 100 QSOs.

  - o Keys to success:

    - Operate CW. You'll have a much better chance of making QSOs than battling QRP on Phone.
    - Antennas. You will want to take the extra effort to optimize your antenna solution. Putting 5W into a random wire will not get you results.
    - Location. Operating on a mountain top with downsloping terrain will help tremendously. So will operating with a vertical next to salt water.
    - Skill. Be patient. You cannot brute force your way around the bands. Relying on technique, agility and knowledge of band openings will help you maximize your success.

Additional tips

- Preventing fatigue

  - Operator sharpness during a contest is an underrated aspect of success. If you are exhausted, have a splitting headache or have nagging neck pain, it does not matter if you have the best station outside of California. Preventing these problems can be the most important step to your success in the California QSO Party, even if you ignore every other section of this document!

  - Start CQP well rested. This makes all the difference.

  - Pay careful attention to the AF gain (volume) setting. A common mistake is to run the volume too loud. This is a recipe to end up with a splitting headache during the contest. Make sure to keep the volume as low as you can, and temporarily turn it up when you need it.

  - Use the RF gain, attenuator and noise reduction features of your radio. It is especially important on 40M, 80M and 160M to not run RF gain wide open (fully clockwise). Either adjust the knob counterclockwise or crank in some attenuation. If you don't, you will most likely be exhausted on Saturday night and you'll have made fewer QSOs than you could have had by using these techniques on the low bands.

  - Give plenty of attention before the contest to the ergonomics of your computer monitor and your operating chair. If they are not adjusted or positioned properly, you could be twisting, leaning, slouching or squinting during CQP. You probably won't know it until later in the contest when you'll feel neck, shoulder or back pain.

  - During the contest, regularly stand up, move your legs, and take short walks. It is not healthy to sit in a chair all day long. Set a timer for yourself.

  - Exercise in the months prior to CQP. You may think that contesting is not a physical activity, but you may be surprised how important your physical condition is in maintaining your level of alertness and sharpness during your hours on the air.

- Noise

  - Receive noise is a major problem that continues to worsen and affects our ability to make QSOs on HF.

- Sources of noise can be inside your house or external to your house.

- Here are some resources to help you combat noise:

  - "Build Contesting Scores by Killing Receive Noise" by Jim K9YC
    http://k9yc.com/KillingReceiveNoise.pdf

    For more detail, see this slide deck from Jim:
    http://k9yc.com/KillingRXNoiseVisalia.pdf

  - See NK7Z's page about RFI. Read every article on his page at:
    - https://www.nk7z.net/category/info/rfi-mitigation/i-have-rfi-series/
    - Visually see what each source of noise looks like at:
      https://www.nk7z.net/rfi-snapshots/

- Rig control

  - If you haven't already, you really should connect your radio's serial port or USB port to your computer. This will allow your logging software to automatically determine what band and mode you are in, and log each of your QSOs accordingly. It will also give you the ability to quickly change frequencies on your radio from your logging program.

- 2 VFOs, 2 Receivers or 2 Radios

  - Perfecting operating technique with 1 radio and 1 VFO is a goal that most of us are still trying to reach. Once you believe that you have perfected this stage, try some advanced techniques:

  - 2 VFOs: if your radio has 2 VFO knobs, use the 2nd VFO and the A/B swap button for quick band/mode changes.

  - 2 receivers: if your radio has 2 receivers, use the 2nd receiver on a different mode or band to find additional CA stations to contact. Examples:

    - S&P on both 20M CW and 20M PH. The main receiver is on 20M CW and the sub receiver is on 20M PH. Put QSOs in the log quicker when you have two band/modes to scout for new CA stations.

    - CQ on 20M PH and S&P on 15M or 40M. During pauses between calling CQ on 20M PH, you can find new stations to work on 15M or 40M.

- Call CQ on 40M PH and use diversity reception on your radio to listen to stations with your 40M vertical as well as your 40M dipole to improve the chances that you will dig out a weak CA station calling you.

- 2 radios: called SO2R. Most often used as a way of calling CQ on one radio while tuning the other radio for new QSOs by S&P. Interleave CQ and S&P QSOs. This takes a lot of practice and skill to do well, but can be a significant advantage if you can do it.