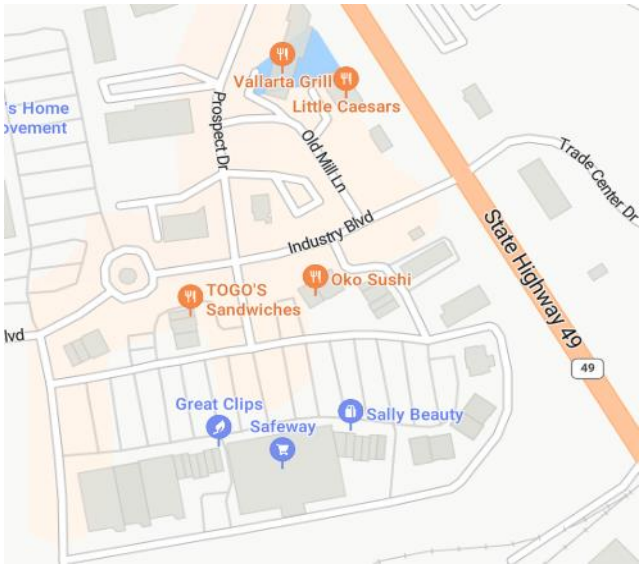
THE NUGGET

Mother Lode DX/Contest Club

The Newsletter of the Mother Lode DX/Contest Club

July 2024 **Volume 29 Number 7**

The July meeting of the MLDXCC will be on July 27 at 11:30 in the Round Table Pizza at 12280 Industry Blvd in Jackson. This is located off HWY 49 between HWY 88 and Ridge Road next to Oko Sushi (Ken and Kay Anderson's favorite sushi joint).



W1SRD will offer a presentation on "FT8 – The view from the fox". If you have specific questions about FT8, you may e-mail him so he can research the issue if necessary. RSVP to W1RH (w1rh@yahoo.com).

Treasurer's Report

MLDXCC Treasurer's Report - June 2024

5/31/2024 Opening Balance $2,509.07

Income $0.00

Expenses $0.00

6/30/2024 Ending Balance $2,509.07

Sue Allred, K6SZQ

DELETED COUNTRIES

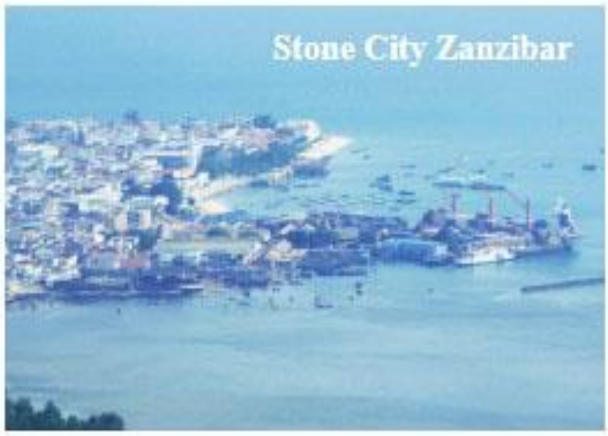
Thanks to the Southern California DX Club Newsletter

Zanzibar

Zanzibar is an archipelago in the Indian Ocean 31 miles from Tanganyika. It united with in 1964 to form the United Republic of Tanzania. The archipelago several small islands and two large ones. Unguja is the main island and is often called Zanzibar. Pemba Island. The capital is Zanzibar City.

The island group was first settled by the Bantu speaking tribe somewhere around the sixth century. Over the centuries it grew as an agricultural and Swahili trade center. This eventually gave way to Muslim Arab traders and the locals acted as intermediaries. European influence began in 1498. Vasco da Gama visited the islands and in 1503 became part of the Portuguese Empire. It was not controlled however and was basically ruled by the local indigenous leaders. It was not a great relationship. The Sultan of Mombasa slaughtered the Portuguese residents in 1631 resulting in the construction of a fort on Pemba Island. The Portuguese then appointed European governors who weakened the local rulers grip by controlling trade. An alliance with the Omani and elites in Mombasa and Zanzibar drove the Europeans out. The islands then came under the rule of the Sultanate of Oman until 1784. It bounced between being independent and under Omani rule until there was a split in the Omani Sultanate in 1864 and the first Sultan of Zanzibar was established. This line of Sultans dealt in the trade of spices and slaves. Zanzibar was known as the spice islands. The region came under British rule in the early 1800's and in the late 1800's they were forced to abandon slave trade. Germany joined with the British to control the region and eliminate slavery. In 1890 Zanzibar formally became a British protectorate. When the pro British sultan died in 1896 war broke out between the British and Zanzibar. It lasted 38 minutes when the Royal Navy destroyed the Sultan's palace, and is still the shortest war in history.

The protectorate status was terminated by the United Kingdom 1963 Zanzibar Act. Zanzibar was fully self-governed. It quickly became the People's Republic of Zanzibar by revolution (of course). Thousands were murdered and many fled. In 1964 Zanzibar merged with Tanganyika and became Tanzania, a contraction of the two names. Zanzibar is still an autonomous region within this new country. The governing body is known as the Revolutionary Government of Zanzibar. It consists of Revolutionary Council and House of Representatives. Today the country is 98% Muslim and a little over 1% Christian. It is still amazing how Marxism and Islam became bed partners. Such is the way with entities struggling for power.

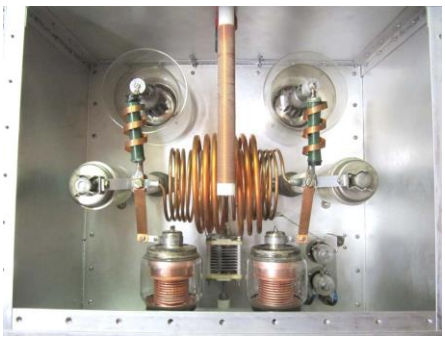


Tube of the Month

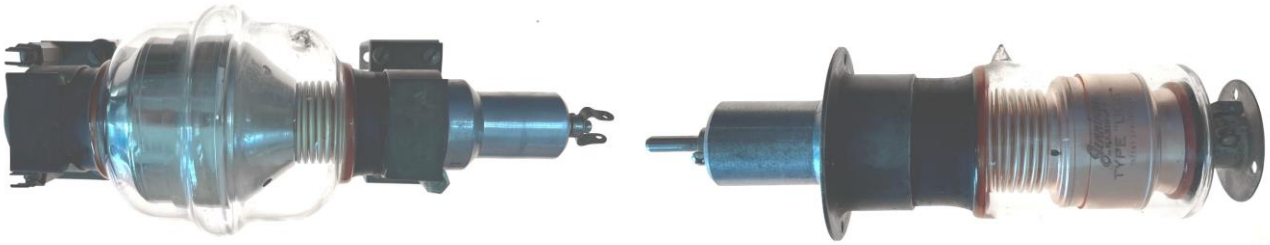
Vacuum Variable Capacitors

The Vacuum Capacitor dates back to about 1896 when Nikola Tesla took out a patent on it. Its practical use started in World War II when the fixed value units became common. The production of variable capacitors seems to date from late in the War, but as to the inventor, I can only speculate based on the research I have done. The capacitor components are similar to the fixed units except one of the plates or cylinders must be mechanically moved in and out to change the capacity. A diaphragm or bellows must seal around the mechanical parts to maintain the vacuum seal. In June 1945, EIMAC issued the experimental number X362 to a vacuum variable capacitor. In January 1946, EIMAC recorded the number X433 for a 250 pf variable using a bellows structure to be made for a specific customer. In June 1946, Jennings Radio advertised vacuum variables that used the bellows system. These guys were known to share ideas. EIMAC didn't market a vacuum variable until 1948 with the VVC 60-20 which is a 10 to 60 pf unit at 20 KV. In 1949, they added the VVC2-60-20 and the VVC4-60-20 which all used the same basic VVC 60s that were mounted in geared assemblies using two or four units. These assemblies could be used in push-pull or all sections in parallel. I found a 2-unit capacitor many years ago and incorporated it in a 40-meter amplifier as seen in the photo. I have never seen another 2 or 4 unit since. All these configurations were also made by Toshiba in Japan in the mid-1950s.

In a push-pull amplifier with plug in coils that were popular in this period, the VVC2-60-20 would have a minimum capacity of 5 pf so would be ideal on 10 meters and still tune down to 40 meters. In my 40-meter amplifier, I padded the capacitors with fixed units to keep the travel at mid-range. Split stator capacitors like the next example, were made by having two connections each supporting half of the stator. These units are rare.



The most popular sizes sought by hams are in the 250 to 300 pf range for use in a pi-network plate circuit used in a band switching amplifier. The clamp mounted capacitor is a Jennings U-250 and is rated at 10 KV. As vacuum seal technology improved the size was reduced as is shown with the Jenning UCS-300 capacitor which is rated at 10 KV. These capacitors are easier to mount with a flange and no special clamps. The price of these older units has increased greatly over the last few years. Modern vacuum capacitors are made of ceramic and are available in many capacity and voltage ranges.



Norm N6JV

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Antenna of the Month

Gary, NA6O

July, 2024

Off-Center Fed Dipole (OCF)

Your Mileage May Vary, they say, and that certainly applies to this type of antenna. One way to access many HF bands on a single wire antenna is to feed a dipole off-center. Depending upon how much space you have, it may be designed to cover most of the bands 80 through 10 or 40 through 10 m with a usable match. You might also get it to work on 6 m. An antenna tuner is almost always a requirement since it will only rarely exhibit a low SWR. Like any horizontally-polarized antenna, it helps to mount it as high as possible and height will also change the impedance, sometimes drastically. There are countless designs on the web as well a commercial ones. In this article, we'll look at a typical design (Fig. 1) and consider some of the challenges associated with this popular antenna.

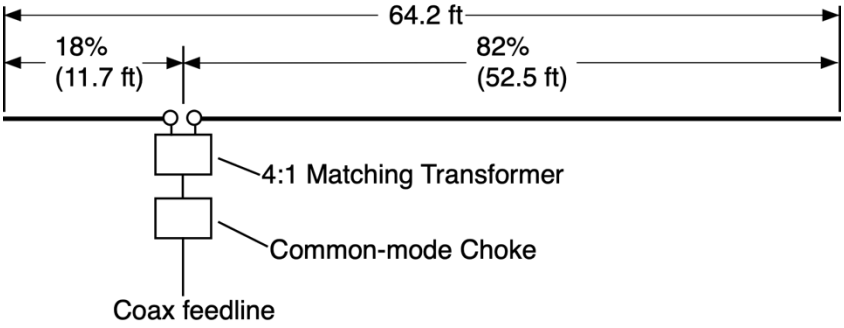

Figure 1. Components of a typical 40 through 10 m OCF dipole.

Recall that any conductor will radiate as long as you can get RF current to flow in it, and where you connect the feedline along a dipole doesn't change the radiation pattern or the gain; it only changes the feedpoint impedance. The only other requirement is that you achieve a decent impedance match at your transmitter in order to transfer maximum power. With the OCF, we adjust both the length and the feed point location until the feed point

impedance is **roughly the same** on most of the bands, starting with the one where the antenna is 1/2 wavelength long.

By "roughly the same," I don't mean 50 ohms, and in fact it's generally around 200 ohms or perhaps higher, and it's not just a pure resistance. So the first thing we need is a wideband matching device at the feedpoint. A 4:1 impedance transformer is the standard choice.

The second thing we need is a robust common-mode choke on the coax. Because the antenna is highly asymmetrical, substantial common-mode current is guaranteed to flow on the outside of the coax. In other words, the coax becomes an additional element of the antenna. This will cause several problems: Antenna tuning becomes less predictable. High RF voltage may appear in your shack, raising all kinds of havoc. And local noise (RFI) riding on the outside of the coax will be conducted to the antenna, increasing your noise floor. All of these problems are mitigated by a common-mode choke (which should be a component of nearly every antenna installation).

What kind of SWR might you see? Figure 2 shows data provided by Palomar Engineers for a 40-10m OCF installed at 30 feet. Assuming you actually get this result, any transceiver with a built-in antenna tuner is likely to match this on all the specified bands. If you're really lucky, it might also match on 80 m, though you may damage the balun/choke if you try to run very high power there. The longer 80 m designs may sacrifice the match on one or more higher bands in exchange for better results on 80. Please note that installation details can affect SWR, sometimes drastically, especially if the wire is close to other objects, near the ground, or bent into arbitrary paths. Adjusting the lengths may improve results. Plan on spending a lot of time with your antenna analyzer.

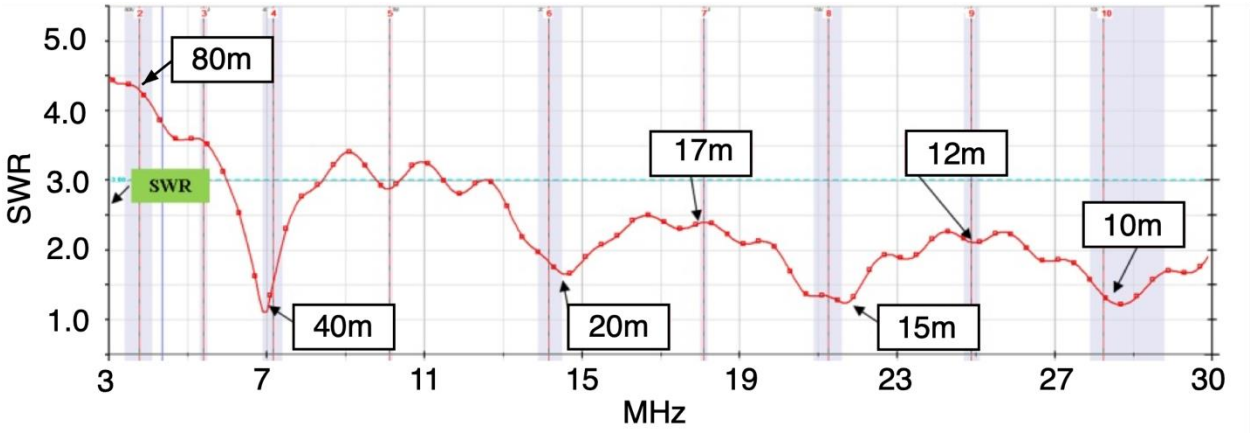

Fig. 2. SWR for a 40-10m OCF. Copied from the Palomar Engineers website and edited for readability. It should also work on 6 m. If you're really lucky, you might be able to use this on 80...

Radiation patterns from these all-band antennas can only be described as chaotic. Every band will have a different pattern with higher frequencies consisting of a great many lobes in various directions. Height will of course change everything and as always, higher is generally better. It's fairly pointless to do a lot of simulations since the results are so dependent upon installation details. This is after all a compromise antenna, not a high-gain death-ray.

Finally there is the choke/balun, a very important component. It needs a 4:1 impedance ratio, which implies a 2:1 turns ratio. It also requires a very high common-mode impedance. This can be achieved with two components, a transformer plus a choke, or with a single component commonly known as a Guanella current balun. When properly designed, it can handle high power and meets all requirements. Figure 3 shows the schematic for this device. It consists of two common-mode chokes that are driven in parallel and then connected in series at the output.

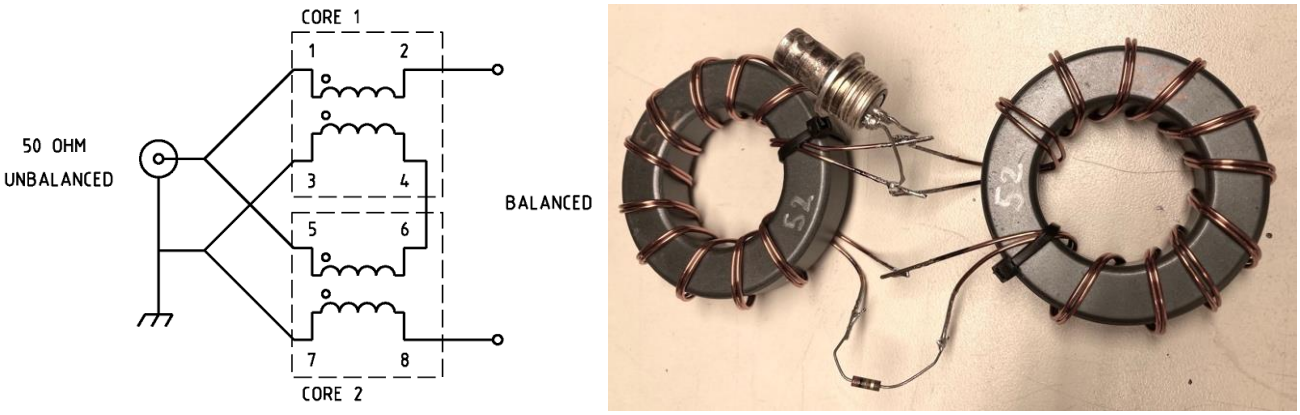

Figure 3. (Left) Schematic of a 4:1 impedance Guanella current balun using two ferrite cores. Copied from the VK6YSF website. (Right) one of my test baluns.

Ferrite core material choice is important. I tested three types (Fair-Rite mixes 52, 43, and 31) and found that the lowest loss (0.20 dB at 30 MHz) was achieved with mix 52. Mix 43 was almost as good and may also be used. All cores are 2.4 inch OD. They may be wound with bifilar magnet wire or PTFE insulated wire, preferably 14 AWG. About 9-11 turns is optimal. The VK6YSF website has some clear fabrication instructions. https://vk6ysf.com/balun_guanella_current_1-4.htm. It should be housed in a weatherproof nonmetallic enclosure, such as a 4x4x4 PVC Cantex box, available at Home Depot.

Some OCF users report problems with RF in the shack on certain bands. This is often because of insufficient choking impedance in the balun. An additional common-mode choke can be added, preferably at the antenna feedpoint but further along the feedline may also be helpful. That may also help avoid the *flaming balun* problem if you attempt to run high power.

To summarize, the OCF is likely to give you access to most of the HF bands with just a single wire. Radiation pattern will be random but certainly adequate for ordinary hamming. SWR may or may not be optimal on all desired bands in your particular installation but with some trimming it may be satisfactory and compatible with your antenna tuner. Hang it as high as you can and don't be afraid to bend it here and there to fit your yard. And always be sure to use a well-designed balun/choke.

Reference: https://palomar-engineers.com/tech-support/tech-topics/antenna-notes/off-center-fed-dipole-notes

Club Log Standings 2024

Overall

1	W1SRD	Steve Dyer	223
2	W6DE	Dave Engle	218
3	NK7I	Rick Bates	217

CW

1	K6YK	John Lee	174
2	W1SRD	Steve Dyer	134
3	W6DR	Dave Ritchie	120

Phone

1	W1SRD	Steve Dyer	121
2	K6YK	John Lee	109
3	K6TQ	Dave Sanders	97

Data

1	NK7I	Rick Bates	210
2	W6DE	Dave Engle	198
3	W1SRD	Steve Dyer	185

Awards Checkers ARRL

Rick Samoian, W6SR

(DXCC, WAS, VUCC, 160M)

MLDXCC Focus Contests

Northern California Contest Club (NCCC) announced their focus contests at their August 2018 meeting. This list can be found in the Aug 2018 NCCC newsletter.

ARRL RTTY RU
CQ WPX RTTY
CQ WPX SSB
CQ WPX CW

The NOAA Solar Update

Click the link below to display the latest NOAA solar predictions.

http://www.swpc.noaa.gov/products/weekly-highlights-and-27-day-forecas

Upcoming Events

The following lists all contests in which MLDXCC would appreciate your efforts.

ARRL SS CW/PH
ARRL DX Phone*
ARRL DX CW*
ARRL 10M*
ARRL 160M*
California QSO Party

For the latest contest info. click on the following link:

http://www.contestcalendar.com/contestcal.html

Upcoming DX and DXpeditions

Click the link below to display upcoming DXpeditions.

http://www.ng3k.com/Misc/adxo.html

MLDXCC Reflector

The MLDXCC reflector is maintained at groups.io. Visit https://groups.io/g/mldxcc

We also maintain a spotting reflector at
https://groups.io/g/MLDXCC-Spots

We are also on Facebook!
https://www.facebook.com

Classifieds

Members are requested to review their classified ads each month for accuracy and to resubmit their ads or confirm their desire to keep it running in the next issue.

Need QSL cards, business cards, club banners?
Contact Vina K6VNA vina@sign-tek.com

W6SR

I have two items for sale/trade.

1. Recently I acquired a Johnson KW tuner (site unseen) from a friend. My plan was to modify it for the remote radio setup at W1RH. However, after I inspected the unit, it is way too nice to modify. It's (IMHO) collector quality, original in and out. It even has the original, working SWR meter, relay, relay power supply and directional coupler cable. But not the directional coupler. Couplers are more available than the KW tuners since they were used on the 250W tuners also. I hate to see a vintage piece of collector quality gear hacked. Anyone interested in one of these? Price, you tell me, best offer takes it.

Contact me at ricksamoian@outlook.com
de Rick, W6SR

K6VVA

Antennas 4 SALE

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ANTENNA ("New-In-Box") – Never Installed
==========
* RAIBEAM – 3el 20M Yagi (NIB) – Price: $300
A "Collector's Item" for some?

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ANTENNAS (USED)
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1. CUSHCRAFT 104CD (4el 10m Yagi) - Price: $300 USD
Mostly New Hardware in bag.

2. 40m 4-SQUARE Antenna Components - Price: $300 USD
Mostly Butternut aluminum sections and base coils (possibly for 80m?).

3. Force 12 Sigma 180S 80m Rotatable Dipole - Price: $300
Supposedly "T-Bar" loading but would need to be verified. Hopefully with all pieces.

This does NOT have large in-line coils, but a heavy-duty boom to mast mounting plate.

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For Pick-Up Only in the Morgan Hill/Gilroy (CA) rural area. Photos available.

4 SALE

U.S. TOWER TX-455 w/base and coax standoffs – Price: $2,000 USD

Antenna support mast w/thrust bearing and large bolts for concrete installation included.

For Pick-Up Only in the Morgan Hill/Gilroy (CA) rural area. Photos available.

email ONLY TO: items4sale@k6vva.com (include your Callsign, Name & Phone Number !!!).

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Area Clubs

Northern California Contest Club - https://www.nccc.cc

Lodi Amateur Radio Club - http://www.lodiarc.org

Stockton Delta Amateur Radio Club - http://www.w6sf.org

Pizza Lovers 259 –

https://www.pl259.org

El Dorado Amateur Radio Club - http://edcarc.net

Sierra Foothills Amateur Radio Club - http://www.w6ek.org

Redwood Empire DX Association - http://www.redxa.com

Calaveras Amateur Radio Society http://calaverasars.org/

Tuolumne County Amateur Radio Electronics Society (TCARES)
https://tcares.net/

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