



GARS
Glenn Amateur Radio Society

KJ6HCG



Prez Says

The GARS Repeater

October 2024

Salutations from the lair of KF6OBI! – Life is full of surprises and last month was no exception. Marlene and I had a wonderful vacation out with the RV. We got to visit with some friends and had a mostly enjoyable time just taking it easy. Since the weather changes over the last couple of weeks I have been getting ready for winter. Fall is here at our doorstep, even though we are having some short hot spells. I was not able to get ready for winter last year which meant many projects suffered. I promised myself that this year all would be different. So far I am about 50 percent ready for what ever is thrown at us weather wise.

This month is going to be a busy month with tentative plans to make several trips to the Saint John site. Gary, W6GRC, and myself are going to be working on finishing the GARS/GEARS solar plant relocation. The work here is to shift the 4 lower solar panels that were relocated last month, 5 inches to the west. Then we will be installing 4 more panels to the two top rails.

Two of these panels are already on site and ready for installation. Two more solar panels have been ordered bring the total panel count to 8 for a total of 2600 watts of solar. We should take receipt of these two new panels this first week of October.

Now, all we need to do is get the new solar panels to the site and get them installed. This will require the use of a man-lift. Gary and I are hoping that we will be able to get Jeramie's, W6LND, man-lift to the site and in postilion to facilitate the workflow.

This planned work is to happen within the next 10 days. Work on the GMRS antennas is still on going. This new quad-yagi array should be installed and in operation by the end of October. Of course there are several other jobs in queue that need to be accomplished as time and weather permit.

On the EMI/RFI issues that GARS members discovered last Winter Field Day and also at the last ARRL Field Day, well the research/investigations and testing are still on going. What has been discovered is that it is difficult to duplicate the exact conditions. So a large step back in the process is now in motion. I am having to design a full test regiment and testing site to facilitate these studies/investigations to come up with a mitigation plan. To accomplish this and involve the membership, if they wish to be included, is to start a test design sequence to show how we can setup and perform such testing. This, I plan, to start during the membership meeting this month.

As a membership we will start by describing the two problem EMI/RFI scenarios. Then outline and start a test plan. This then will determine the test setup requirements. It looks like both scenarios can be tested in the same manor and should produce the same rough outcome, therefore the treatments should be the same?

Once the plan is in motion and testing completed we then can apply treatments to the GARS portable generator and any DC to AC inverters used at our Amateur Radio outings and events. We should like to have this done by our next Winter Field day!

Up and coming events are: –See notices are on the GARS Website <<https://www.garshamradio.org/>>; Redding Hamfest 12 October 2024 [fliers are attached]; GEARS annual equipment auction is coming up on Sunday October 13th at Noon time.

This months membership meeting will be on the second Friday, the 11th of October, at the Lutheran Fellowship Hall, 565 Main Street, Artois CA, at 7:00pm. Late arrivals and guests are always welcome. Also remember that one does not have to be a member of the club to participate in our membership meetings and activities. Be safe in all you do and may you all have many blessings in the days and months ahead!

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What is an EMI Filter/RFI Filter?

Electro Magnetic Interference (EMI) and Radio Frequency Interference (RFI) is the radiation or conduction of radio frequency energy (or unwanted electronic noise) produced by electrical and electronic devices at levels that interfere with operation of adjacent equipment. Frequency ranges of most concern are 10kHz to 30MHz (conducted) and 30MHz to 1GHz (radiated).

Sources of EMI include:

- Motors
- Fans
- Electronics
- Household Appliances
- Switching Power Supplies
- Lightning
- Relays/Switches
- Computers
- Wi-Fi Devices
- ARC Welders
- Other Power Sources

Victims of Electrical Noise Include:

- Computers
- Medical Equipment
- TV's
- Radios
- Electronic Control Equipment
- Telephone/Telecom/Data Equipment
- Any Electrical Circuit

What Causes EMI/RFI?

The most common sources include components such as switching power supplies, relays, motors and triacs. These devices are found in a wide variety of equipment used in industrial, medical, white goods, and building HVAC equipment.

What are the Types of EMI/RFI?

An Electrical or Electronic Device Emits RFI in Two Ways:

- Radiated RFI is emitted directly into the environment from the equipment itself.
- Conducted RFI is released from components and equipment through the power line cord into the AC power line network. This conducted RFI can affect the performance of other devices on the same network.

How can EMI be Controlled?

- Radiated RFI is usually controlled by providing proper shielding in the enclosure of the equipment.
- Conducted RFI can be attenuated to satisfactory levels by including a [power line filter](#) in the system.

- The filter suppresses conducted noise leaving the unit, reducing RFI to acceptable levels. It also helps to lower the susceptibility of the equipment to incoming power line noise that can affect its performance.

- **How do EMI Filters/RFI Noise Filters Work?**

- Consisting of a multiple-port network of passive components arranged as a dual low-pass filter, the RFI filter attenuates radio frequency energy to acceptable levels, while permitting the power frequency current to pass through with little or no attenuation. Their function, essentially, is to trap noise and to prevent it from entering or leaving your equipment.
- Selection of the most suitable [RFI power line filter](#) can best be based on the type of power supply or input impedance of the equipment and the mode of the offending RFI noise.

- **What are Power Line Noise Modes?**

- RFI is conducted through a power line in two modes. Asymmetric or common mode noise occurs between the line and ground. Symmetric or differential mode is measured from line to line.
- **Common Mode:** Also known as line-to-ground noise measured between the power line and ground potential.

Differential Mode: Also known as line-to-line noise measured between the two (line and neutral) power conductors. Power line filters are designed to attenuate either one or both modes of noise. The need for one design over another will depend on the magnitude of each noise type present. The attenuation is measured in dB (decibels) at over a wide band of signal frequencies.

- **What are the Circuit Configurations of EMI Filters/RFI Power Line Filters?**

- Typical types of [EMI/RFI power line filters](#) are designed for a specific type of signal and the devices in which they will be installed. The wide variation in devices and equipment that benefit from EMI filtering necessitate a range of standard solutions, as well as an expanse of customization capabilities. The following are a few types of EMI/RFI Power Line Filters.

- **Single-Phase Filters**

- A single-phase EMI/RFI power line filter is designed for AC or DC power lines with a positive or negative, or dual, signal/power path. This type of filter is installed in-line with the power/signal lines, allowing DC and AC signals to pass without attenuation, while heavily attenuating signals from 10kHz to 30MHz. These types of filters are used in single-phase motor drives, power supplies, office equipment, and test and measurement equipment, among other applications. Some single-phase filters are optimized for specific applications, such as their DC performance, medical equipment requirements, industrial safety requirements and other standards.

- **Three-Phase Filters**

- Three-phase filters are similar to single-phase filters except that the filter is designed to filter three signal/power lines for three-phase power and motor systems. There are some [three-phase filters](#) that also include filtering on the neutral line for applications that require it. Three-phase filters are useful as main input filters for industrial equipment, machine tools, machinery and automation systems. Depending on the leakage performance of a filter, they may even be used with some medical devices and equipment.

- **DC Filters**

- DC filters are designed specifically for filtering DC power and control lines. This could be for protecting solar panels, photovoltaic charging/converting systems, battery charging and conditioning systems, DC

motor drives and inverter/converters. Though similar to AC EMI/RFI filters, [DC EMI/RFI filters](#) are optimized for passing only DC signals and are typically rated for higher DC voltages and currents. These filters are useful in preventing premature aging and protection of solar panels due to conducted emissions, such as HF stray and leakage currents.

- EMI/RFI suppression and mitigation technologies are essential for meeting today’s rigorous compliance standards and regulations. Of the available EMI/RFI suppression technologies, EMI/RFI filters are a versatile and effective solution for a wide range of applications, which can be readily customized to target specific EMI/RFI suppression requirements during the design or troubleshooting phase of product development. There are many factors to consider when selecting an ideal EMI/RFI suppression solution, and leveraging the experience of Curtis Industries can help optimize the product development and integration process.

GARS Officers: (Board of Directors)

President Michael A. Ellithorp, KF6OBI
Vice President Bob Wirth, KC6UIS
Secretary Jeramie Finch, W6LAD
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Webmaster / Social Media — Mike “Smitty” Smith, WB1G
Radio Officer Phil Zabell, KI6SMN
Emcomm Officer Vacant

Board Meeting, 2nd Wednesday of each month, meetings starting at 6:30 PM via Google Meets
General Membership Meeting, 2nd Friday of each month, meetings starting at 7:00 PM

GARS Meeting locations: Main site is the Lutheran Fellowship Hall, 565 Main Street, Artois CA, our alternate meeting site is the Willows Seventh-Day Adventist Church, 543 1st Avenue, Willows, CA.

GARS Net: Mondays, 8:00 PM **Primary**: 147.105 (N6YCK) (+) 110.9 PL; **Secondary**: 145.170 (AF6OA) (-) 110.9 PL

GEARS Club Net: Tuesday, 7:30 PM 146.850 MHz-PL 110.9

Sacramento Valley Traffic Net: Nightly 9:00 PM 146.850 MHz-PL 110.9

ARES Nets:

Butte Mondays 20:00 146.850 MHz-PL 110.9
Yuba Sutter Thursdays 19:00 146.085+MHz PL 127.3

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