

SELECTING A GENERATOR

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There are a variety of back-up power sources available for amateur radio stations to use during emergency communication situations such as: deep cycle batteries, solar panels, generator, etc. Of these a generator is likely the most versatile and longest lasting if properly cared for. There are a variety of generator types and sizes available.

Permanent Installation

Permanent installation generators are designed for your home or business. These are powered by an internal combustion engine and are either fueled by diesel oil, natural gas, or propane. The starting output power for this type is around 5KW and going up to whatever your application may demand and you can afford. Consideration of the type of fuel is important as well as your ability to acquire more in an emergency situation. Diesel oil does not store very well long term and large quantities may not be allowed in your neighborhood. Likewise large quantities of propane may not be feasible or acceptable. Natural gas delivered by pipeline to your home is the best option if available. This type of generator usually comes in an enclosure to protect it from the weather and to reduce operating noise.

Permanent installation generators usually cannot be connected in parallel with the commercial power feed. A transfer switch is installed to transfer power to a selected number of circuits in your home or to all of the circuits depending on the size of the generator and the power demand. These generators can be set up to detect loss of commercial power feed and automatically startup to supply your needs.

Trailer-mounted Generators

Generators large enough to run a small business, a fair, a festival, construction site or emergency service agency are typically trailer mounted and are fueled by diesel oil. They are designed for temporary power requirements. These tend to be rated at higher power and are quite expensive and likely out of the price range for most amateur radio emergency communicators. However, you might encounter one if an agency you are working with owns or rents one.

Portable Generators

The portable generators have a capacity of between 1-18KW. Of course they become less portable as they get larger. This type of generator also uses an internal combustion engine and is fueled most often by gasoline. Some are tri-fuel compatible. If the generator is not tri-fuel compatible when you purchase it, it can easily be converted to use gasoline, natural gas, or propane. These generators consume gasoline very quickly. For example a 5KW unit will consume about 1 gallon of gas per hour. A 20lb bottle of propane is equivalent to about 5 gallons of gasoline. These generators are designed for use in vehicles such as motor homes. Vehicle-application generators seem to be relatively expensive.

For amateur radio emergency communicators you will most likely use a portable generator. Some of these generators have wheels so they can be moved around relatively easily but are quite heavy and require two or more people to lift into a vehicle. A typical 5KW generator weighs 150 lbs. and includes an engine in the 9 HP range.

Some generators have electric start but you have the starter battery charged and good quality portable generators are easy to start with a pull rope.

The portable generators are typically open-frame so they are quite noisy and are not protected from the weather.

Conventional portable generators use single-phase alternators which directly produce alternating-current power without additional power conditioning. These alternators must spin at a constant speed to provide a relatively constant frequency for use by motor-driven appliances. As a result, the engine is always running at a constant, high speed and making a lot of noise even when the load on the generator is small. Various voltage regulation schemes are available but most control the output voltage by trying to maintain a constant rotational speed.

Small Portable Generators

In the last several years portable generators that use an advanced alternator design and an inverter have become available. They are fueled by gasoline and are not easy to convert to natural gas or propane. This design provides a generator that is very quiet, small and lightweight compared to ordinary generators of the same capacity. The inverter type generator is ideal for amateur radio emergency and public service communications.

The inverter-based generators use an alternator to produce a high-voltage, high-frequency AC output. The output is fed to an inverter which provides near-sine-wave AC at a stable frequency and voltage. This is independent of the rotational speed of the alternator. Since the alternator operates at a relatively high frequency, it need not be as large or heavy as an alternator of equivalent output power operating at 60 Hz. Because the inverter output frequency and voltage is independent of the alternator rotational speed, the engine can be throttled down to save fuel and reduce noise when the generator is not required to provide high output. As a result of the output waveform being synthesized, the output of 2 or more generators can be synchronized, permitting the generators to be operated in parallel to increase the capacity. These generators are usually enclosed and have effective mufflers so they are fairly quiet. They are also fuel efficient.

The best time to purchase a generator is between November and June. The prices tend to be lower because of lower demand and higher inventory after a quiet hurricane season. You may even be able to pick up a good generator at a pawn shop or even better at a generator repair shop. Many times when people find out the cost for the repair they just leave the generator at the shop.

A word of caution: you do get what you pay for when you purchase a generator. My advice is to purchase a well-known engine manufacture. If you are interested in an inverter type generator, check the back pages of the QST magazine. There is a company that gives discounts to amateur radio operators.