



# AARC OVER

Keeping Austin Wireless  
for Over 91 Years!

Bulletin of Austin Amateur Radio Clubs

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September 2012

Issue 9-2012

## STATION & HOME GENERATOR EMERGENCY POWER

By Lewis Thompson, W5IFQ  
1 Aug. 2012

### Load Sizing:

AC generators are rated in watts rather than the ampere hours units that were used for computing battery storage requirements. The radio equipment of a typical amateur radio station will have its power requirements given in a mix of DC current (at 13.8 Volts) and AC watts. To compute the required generator capacity, all power required should be converted to AC watts at 120 Volts and then added together. To compute watts for DC powered devices, multiply the rated current by 13.8 volts. The maximum required power for transmitters is used since generators cannot "store" power as can batteries.

The following components of a typical voice/digital amateur radio station should be considered when computing the total energy storage requirements:

1. 100 Watt Transceiver – ICOM IC-756ProIII	=	327.6 W
2. HF Pactor Modem – SCS PTCIIPro	=	2.5 W
3. Computer, Dell ATG Laptop	=	31.5 W
4. Auto-Tuner – SGC SG-235	=	8.8 W
5. Florescent Shop Light	=	26.0 W
6. Printer Canon PIXMA 90 (standby current)	=	3.8 W

*(Continued on page 6)*

### Periodic Events

Sun	7:30 p.m.	Travis ARES net	147.36 MHz + (131.8)
Sun	8:00 p.m.	Travis ARES Packet	145.73 MHz -
Sun	8:00 p.m.	Williamson ARES net	146.64 MHz - (162.2)
Sun	9:00 p.m.	ARO Swapnet	146.94 MHz -
Sun	(After Swapnet)	Newsline	146.94 MHz -
Mon.	7:30 p.m.	STX ARES Net	3.873 MHz
Tues.	7:30 p.m.	Hays ARES net	444.150 + (114.8)
Tues.	8:00 p.m.	Bastrop ARES Net	443.750 + (114.8)
Wed	11:30 a.m.	Ham Social Luncheon, Jim's	146.94 MHz -
Thu	9:00 p.m.	2m SSB Net	144.250 (USB)
Thu	11:00 a.m.	Lunch, Pokey Joe's 183&Great Hills	444.1 MHz+
Fri	8:00 p.m.	6m SSB Net	50.230(texasvhf.org/)
Sat	7:00 - 8:30a.m.	Breakfast @ Waterloo Ice House	444.1 MHz +
Sat	9:00 a.m.	Chapter 67 QCWA QSO Net.	3.920 MHz LSB
Daily	6:30 p.m.	Central Texas Traffic Net	147.14MHz+

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# Ham Radio Exams Results

The following are the results of the ARRL VE Test Session held on August 4th at AUSTIN SUMMERFEST, the ARRL Texas State Convention:

## Technician Class Licenses Processed

Shaun E. Cranston KF5RNW	Robert A. Crawley KF5RNT	Allen E. Francom KF5RNX
Randy D. Goode KF5RNR	Eraldo M. Kopp KF5RNV	David J. Longoria KF5RNY
Steven W. Mayo KF5RNS	James O. Munger KF5RNU	

## General Class Licenses Processed

John D. Fisher KF5RDZ	James L. Hayden KF5ROA	Stephanie K. Hayden KF5RNZ
Steven R. Scott KB5RSV	Jon B. Wells KF5RPX	

## Extra Class Licenses Processed

Ronald E. Bass KF5RIF	Michael S. Carter KF5CQB	Ronald W. Stubblefield K5RPM
Patrick J. Worsham WA5VRO		

## Examiners Participating in this Test Session

Scott Bryan W5TS	Russ Cook KK5E	Mark Esslinger W5MAE
Larry Gunter WB5BEK	Bruce Harrell KJ5LW	Joe Jelinski KC2KG
Joe Makeever W5HS	Malcolm Robertson W5RME	Roy Walker WA5YZD
Jeff Whisnant AE5VA		

## Next ARRL VE Test Sessions

September 1st - Bethany United Methodist Church, Disciple Bldg. Room 203/204  
October 13th - Bethany United Methodist Church, Disciple Bldg. Room 203/204

TNX ES 73 DE W5HS  
Joe

8-21-2012

The South Austin W5YI VE team heartily congratulates the following persons who earned their new or upgraded amateur radio licenses at our August 18<sup>th</sup> session:

## Extra Class –

Tommy E. Hodges, KF5RHD	Douglas H. Riffey, Jr., KF5RII	Martin L. Ringuette, W5KVA
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## General Class –

Patrick W. Garner –new-	James W. Dowe, KF5REA	Roger U. Hammonds, KF5RHX
Andrew J. Lomonaco, KD0RSU	Steven W. Peters, KF5NXZ	Patrick F. Reynolds –new-
Joe B. Taylor, N5XJT		

## Technician Class - (new)

Donald A. Bzdon	Eric W. Connor	Shane M. Connor
-----------------	----------------	-----------------

Our administering volunteer examiners were:

Craig Bean, AC5KW Jim Greenwood, AB5EK Hugh Brown, NT5O Sam Mihalik, KM5MY Gary Popp, AE5JR

Our next two sessions are set for September 15<sup>th</sup> and October 20<sup>th</sup>  
in Fleck Hall room 118 on the campus of St. Edward's University.  
All sessions are walk-in and the exam fee is \$14.

For additional information regarding our amateur radio examination sessions,  
please contact Jim, AB5EK at (512) 327-6184 or by e-mail to  
hamradioexams@hotmail.com or visit our web page at hamradioexams@hotmail.com or visit our web page at [http://  
texashams.org/w5yi-austin/](http://texashams.org/w5yi-austin/)

President	Mitch London	KD5HCV	368-2566	president@austinhams.org
Vice President	Lori Schmidt	KM5MQ	632-6789	vice-president@austinhams.org
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TC ARES PIO	Steven Polunsky	W5SMP		tcares-pio@gmail.net

Please contact a club officer, attend a meeting, mail us to join the organization, you can also join or renew online.

**The Austin Amateur Radio Club, Inc. (AARC)** has annual membership dues of \$20.00 per person or \$30.00 per family. AARC maintains the following repeaters:

FREQUENCY	AUTOPATCH	USE
146.780	No	
146.880	Yes	General
146.940 107.2 PL Tone	No	Most popular, WX, Swapnet & Newslite
224.800	No	
444.100	No	
440.650 +5	No	70cm D-Star Repeater [W5KA]
146.480/+1.0	No	2m D-Star Repeater [W5KA C]
1293.200/-20	No	23cm D-Star Repeater[W5KA A]
1248.200	No	23cm D-Star DD (data, simplex/reversible) [W5KA A]

Persons using the repeaters are asked to join the club to help support these valuable resources. To use the autopatch, announce your call sign, press \* and dial the phone number then release the PTT. When finished, press # to hang up the phone. Dial 911 (no \* needed) for emergency services.

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Members and other readers are encouraged to submit material for publication. Call Mitch London, if mailed submissions are required. Electronic files are encouraged! Submissions may be edited for publication. **Deadline is the 20th of the month.** Material may be used in a later issue. Unless otherwise noted, permission is granted to reprint AARCOVER articles, provided you credit the author and the AARCOVER.

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**For Changes in your ADDRESS, PHONE NUMBER or CALL SIGN:**

See Jay Hoffman, KA5OST

ka5ost@arrl.net

**Jay handles all changes for membership information .**

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### Over the WWWaves...

A Collection of Various Websites sent in your friendly neighborhood hams...

Austin Ionosonde is functional!

1. The new Austin, TX Ionosonde is functional 2. Its output can be found at:

<http://car.uml.edu/common/DIDBYearListForStation?ursiCode=AU930>

Select the Year (2012), Month, Date and then time of day (ZULU).

3. NOTE: That this Ionosonde is reporting every 5 minutes.

Lew W5IFQ

Miniature fume extractor for soldering and it's in an Altoids tin!

<http://www.youtube.com/watch?v=kiTfk6L7o6o> Forwarded by Mike Dow

For any shortwave or AM broadcast DXers who remember this publication:

[http://www.americanradiohistory.com/Whites\\_Master\\_Page.htm](http://www.americanradiohistory.com/Whites_Master_Page.htm)

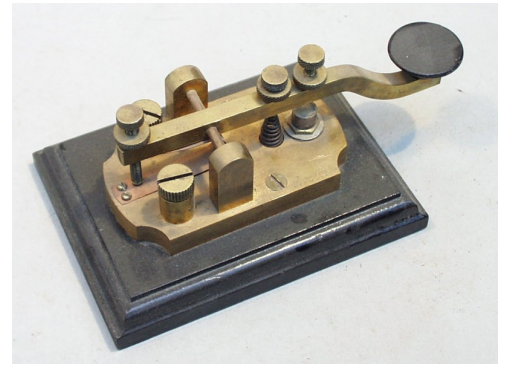
Forwarded by Rick Herndon, K5FNI

## Winlink Founder SK

Forwarded by Stuart Rohre, K5KVH

It is with much sorrow that I announce the passing of the founder of the Winlink 2000 radio e-mail system. As a 99.9 percent CW operator in the early 80's, I met Vic Poor during a presentation of his pre-windows, DOS version "ApLink"

(Amtor/Packet Link) that he used to bridge local VHF Packet communities while sailing on the high Seas. A year later, it was all over the ham bands and from that moment on, was instrumental in assisting the maritime Amateur, and as some may recall, our own Military in the first Kuwait War (three part, 30 minute CBS Documentary is on the Winlink WEB site.) His most recent creation, Winlink 2000, has saved many lives and much property, and is still in the enhancement stage as it moves to meet the demands of its users, both on the ham bands and elsewhere. See <http://www.winlink.org/node/1>



Vic was a self-educated genius, who was responsible for the generation of the single chip microprocessor, RTTY advancements, and many other aspects of digital communication well beyond what we do in Amateur radio. He was involved with the beginning of "over-the-phone lines, non-IBM, networking with the first Point-of-sale inventory replenishment system for a major International multiple unit wholesaler, involved with the first Cell phone technology and much more. With the advancement from DOS to Windows, Vic was one of the first to come up with Winlink Classic, which ran on the new Windows 3.1 operating system, and I can still remember seeing that first demonstration at Dayton years ago.

I worked with Vic just about every day, as did many of us on the Winlink Development Team, and after a very short period, understood the power of his ability to create. He was a very practical visionary and with every conversation, well ahead of the current technology curve. Much of his work is contained in his interview with the Computer History Museum, articles in Business Week, and other such publications (<http://www.winlink.org/node/1>).

Vic did not actively participate with our more recent developments, but was always there to provide encouragement and advice. We will all miss our mentor,

Steve, k4cjsx, aaa9ac  
For the Winlink Development Team



## **AARC Meeting Minutes: August 7, 2012**

**Meeting called to order:** 7:04pm by President Mitch London, KD5HCV.

Meeting started with a welcome to all.

We had 40 in attendance, 2 visitors, 2 new members, and 1 call sign change. No upgrades were reported.

**Minutes:** July's minutes approved as written in AARCOVER.

**Past Events:** Tech Class finished; Texas City Hamfest; and Austin Summerfest (the club sold some equipment at the event).

**Upcoming Events/Announcements:** General Exam Class (8/11 thru 9/8); a cubesat type satellite design to flash Morse Code is schedule to be launched from the ISS Sept. 6th; CERT class (9/11 thru 10/30); South Texas Balloon Launch (9/18) in Wharton, Tx.; Cap10K Packet Stuffing (3/9/13); Olympic Special Event Stations, 2O12L & 2O12W, now on the air; QCWC will be trying out an on-air meeting Thursday mornings on the .94 repeater; this month's officers' meeting will be at Super Nacho's in north Austin; and Ham Radio Cruise (2/10-17) over half booked and the group rate deadline is Sept. 15th. These items, other upcoming events, and scheduled presentations are listed in the AARC Swapnet newsletter, at [www.austinhams.org](http://www.austinhams.org), and on the Yahoo user group.

### **REPORTS**

**President:** none.

**Vice-President:** none.

**Treasurer:** reported 259 members, total in each fund and account, and we're doing okay. Everyone start thinking about helping with and/or attending the Christmas Party. We are looking at being at Cannoli Joe's again and inviting the "Sweet Adelines."

**Editor:** send articles; bring old newsletters for archiving if you find any.

**Tech Committee:** still discussing solutions to the 146.94 repeater blockage into Cedar Park, including the addition of extra antennas on the other side of the tower.

**ARES:** reminder of the ARES Hospital Drill Saturday morning Oct. 7th.

**SIG/Other:** none.

**Space Wx:** SC24 still well below other cycles. Solar Flux is medium. Low sunspot count with quiet activity. A CME is currently hitting Earth. Solar X-Ray Flux & Geomagnetic Field are quiet. Low Solar Winds with low density. Forecast is quiet to unsettled. Elements that affect propagation discussed with another look at how they affected Field Day 2012. Visit the Texas Army/MARS and other solar weather websites for more info.

**Old Business:** none.

**New Business:** The Outlaw 100 event wants to borrow some of the club's APRS trackers, along with volunteers. The San Antonio Ride to the River event is scheduled for the same weekend and already asked to use the trackers. It is believed that we probably have enough to outfit both events, hopefully. A motion was made and passed to loan the trackers to the Outlaw 100 event if it does not cause a conflict with the Ride to the River.

**Ham of the Month:** Mark Thompson, N5UMT, & Scott Swearingin, WB8DDE.

**Door Prizes:** Tom McCarthy, KF5FFN – electronic road hazard light; Della Torres, no call – plastic water bottle; Lew Thompson, W5IFQ – stainless steel water bottle.

Special thanks to Della Torres, Peggy Fenrich, Alura Lee for their help at Summerfest.

**Meeting Adjourned:** 8:04pm.

**Presentation:** "Preliminary Results: Field Day 2012" by Stuart Rohre, K5KVH, & Jeff Schmidt, N5MNV.

7. VHF Transceiver ICOM IC-2720	=	30.2 W
Total	=	430.4 W
70% Efficiency Total	=	614.9 W

The efficiency of the AC power supply should be estimated to account for transformer eddy current, and switching transistor losses. A conservative estimate of 70% should be used, but this estimate is highly dependent on the design of the AC to DC power supply.

For a more accurate estimate of required generating power, an AC Amp-Clamp, shown in Figure 1, can be used to measure the AC current. This meter is clamped around only one wire of the AC supply and the AC current measured. If you plan on providing emergency power to inductive loads like motors (refrigeration, blower, etc.), you must include load Power Factor. The easiest way to do this is to measure the actual current drawn and then multiple by the voltage (120 or 240) to compute the watts of required generator power. Some generator manufacturers do include the maximum current output of their product and this can be compared with your current measurement.



**Figure 1: Amp Clamp**

#### Types of Generators by Application:

**Portable Generator for Emergency Power** – These generators go from 1 KW to a practical weight limit of about 5 KW. Typical fuel is either gasoline or diesel.

**Residential Standby Systems** – These generators can be wired to automatically start within 20 seconds of a commercial power grid failure. These all-weather generators are installed outside the home and are wired through an automatic transfer switch to the main electrical panel. They are typically fueled by either natural gas or propane.

**Commercial Standby Systems** – These systems are similar to the Residential Standby System but have more capacity and may have a large propane fuel tank.

**RV Generators** – These generators are mounted within the RV frame and fueled by the same fuel as the RV (gasoline or diesel). They are typically very quiet and can carry the full RV electrical load.

**PTO and Belt-Driven Generators** – A generator that can be attached to the power take off of a tractor or construction equipment.

#### Types of Portable Generators by Regulation Method:

All portable AC generators must create alternating current at a frequency of approximately 60 Hz and a RMS voltage of 120 or 240 volts. The peak to peak excursion of the 120 Vrms alternating voltage is 339 volts. Most all appliances and radio equipment expect this voltage to be sinusoidal and free of high voltage spikes and current dropouts.

**Mechanical Frequency Regulation** – This traditional class of generator creates 60 Hz AC current by spinning the armature at 3600 RPM or 60 revolutions per second. Special armatures are used by diesel generators that spin at 1800 RPM. A mechanical regulator on the motor throttle maintains a constant RPM as the generator delivers varying amounts of power. Note that this type of regulation has a finite response time and does not handle pulsating loads well.

**DC Inverter** – This type of generator produces high voltage, multiphase AC that is rectified to DC similar to an automobile alternator. The DC power is then converted back to a clean, constant frequency and amplitude AC power using a solid state inverter. The motor speed will vary with load since a constant motor RPM is

no longer necessary to maintain constant frequency output. The fuel economy of this class of generator is considerably better than a traditional generator for a varying load like an amateur radio station, since the motor will slow when the load is low. Further, these generators can be connected in parallel to provide more power.

An excellent article, comparing four popular inverter generators, can be found in the June 2012 QST, page 49 – 53. An issue, discovered by the author Mark Wilson K1RO, was radio noise from the generator's solid state inverter. All four generators were evaluated for both Conducted Emission and Radiated Emission noise. Conducted Emission is noise injected into the generator power output cable and can be reduced by using a line filter as discussed in the text. Radiated Emission noise is emitted directly from the generator unit and can be reduced by increasing the distance of the generator to the HF antenna. The magazine article found that in all categories, the Honda EU2000i scored best and was compatible with amateur radio emergency power use.

### Generator Specifications and Desirable Features

Manufacturers will have slightly different feature names for their products but to follow is typical of what you will find:

Surge Watts – Peak power available to handle the starting current of motors (locked rotor current) and switching power supplies.

Continuous or Rated Watts – The power output for long periods of time.

Fuel type - Fuels such as gasoline, diesel, propane or natural gas. Some generators are rated as tri-fuel (gasoline, natural gas or propane).

Fuel Capacity (gal) – The liquid capacity of the fuel tank

Run Time – The amount of time the generator will run on one tank of fuel at one-half rated output.

Starter Type – Either recoil (pull start) or electric start (starter motor).

Engine Brand Name – Desirable are Honda, Briggs & Stratton, Tecumseh, Yamaha and McCulloch.

Engine Displacement (cc)

Engine HP – It takes about 1 HP per 500 watts of electrical power output.

Engine Type – A desirable type is the OHV (Overhead valve).

Receptacles (quantity) - Number of electrical plugs. This is usually further broken out in voltage (120V/240V) and type (locking). All 120V plugs should have GFI (ground fault interrupt) protection.

Noise Level (dB) – The noise produced by running generator as follows:

120 dB – Diesel engine room

110 dB – Close to a railroad train

100 dB – Wood saw

90 dB – Truck without muffler

80 dB – Car noise at high speed

70 dB – Normal street noise

60 dB – Normal conversation

50 dB – Normal office noise

40 dB – Residential area without traffic

30 dB – quiet conversation

Low Oil Shutdown - A desirable feature that will protect the engine.

Battery required – Typical only of electric start generators of 10 KW and up.

Battery included – May have to purchase a battery separately for above.

Dimensions – L x W x H inches

Weight – shipping weight in pounds.

Manufacturer Warranty – typically 12 months parts and labor

### Generator fuels

Gasoline – The most easily available fuel, but is explosive and not easily stored for long periods of time. Stabilizers like STA-BIL can be added to keep gasoline “fresh” for about 12 months. Gasoline should be re-

moved from the carburetor and fuel tank of a generator before storage. I empty the generator fuel tank and then run the generator “dry” before storage.

Diesel – Is less explosive, can be stored for longer periods of time than gasoline and stabilizers are available to extend the storage life. A diesel generator will require a battery starter and typically is more expensive than a gasoline generator.

Natural Gas – This fuel is clean burning and is plumbed into many homes but cannot be easily transported. Texas Gas Company informed me that their delivery pumps are not dependent on local electrical utilities and unless there is a major pipe line break, natural gas should continue to be available during extended electrical utility outage. Careful calculations of gas flow and pipe size must be conducted because large generators require significant gas flow.

Propane Gas – This fuel has unlimited storage life, is clean burning and can be transported with some difficulty in small pressure tanks. I was able to get a permit for a 100 gal propane tank at my residence within the city limits of Austin.

Fuel example: 10 KW generator at rated load.

Gasoline – 1.25 gal/hr

Liquid Propane – 2.2 gal/hr

Natural Gas – 150 cu ft/hr

### Fuel Conservation

During emergency situations where generator fuel is difficult to obtain, certain procedures can be implemented to maximize fuel conservation. Generators operate at maximum efficiency when loaded to about 80% of capacity. The generator can be run periodically with storage batteries carrying the average load. All needed appliances and battery charger(s) should be connected to the generator so that it is loaded to about 80%. Once the refrigerator is cooled down, food cooked and batteries charged, the generator can be turned off.

### Whole House Generator and Resident Transfer Switch

If you intend to connect a generator to your house wiring during a power outage, you should install a permanent residential transfer switch. This switch transfers your generator output to the house and disconnect the house from the commercial power grid. A transfer switch is simply a large DPDT (Break-Before-Make) switch that selectively connects the house to either the commercial power grid or your 220 VAC generator. This will prevent back-feeding the power grid, a real hazard for power line service personnel, and possible damage to your home and generator when power is restored. See: <http://www.smps.us/transferswitch.html> for an excellent introduction to transfer switches.

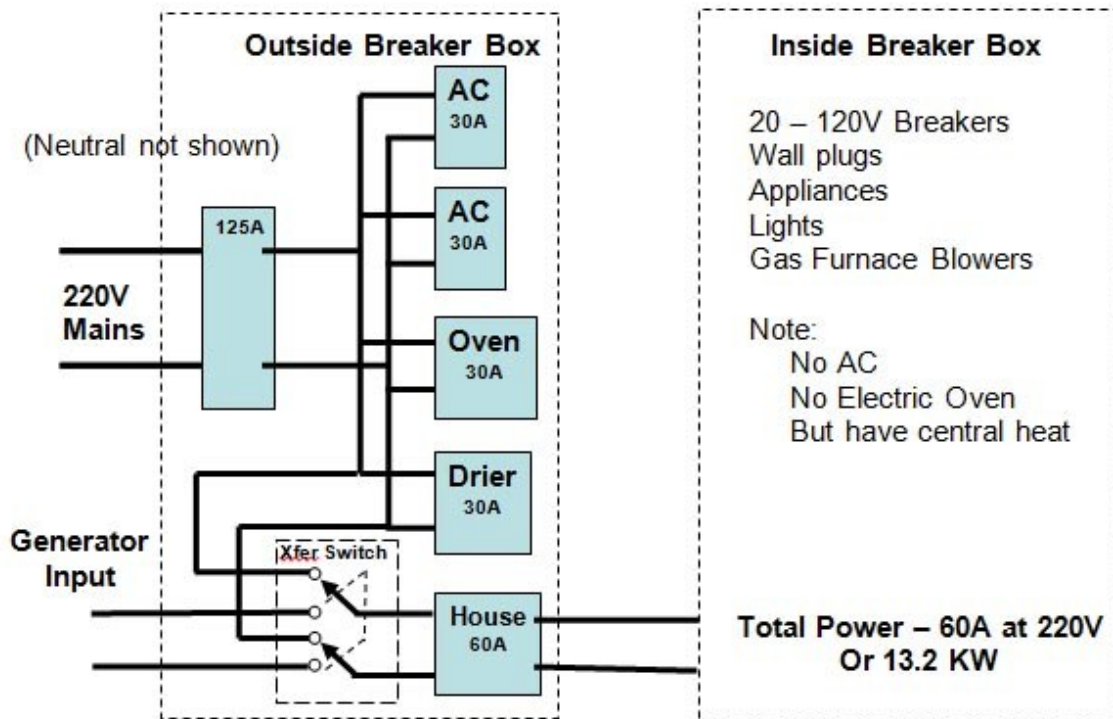
Two types of transfer switches are in common use, manual and automatic. A manual transfer switch, that was installed on my personal residence, is shown in Figures 2 and 3. The large power cable carried the output of a 10 KW tri-fuel generator to the transfer box when emergency power was required. All major appliances except for air conditioning and kitchen oven were power by this generator.

Figure 2: 10 KW  
Manual Transfer  
Switch





**Figure 3: DPDT Manual Transfer Switch with Cover Open**  
 A schematic diagram, Figure 4, shows the connection of this manual residential transfer switch to my house wiring.



**Figure 4: Manual Transfer Switch House Installation**

A whole house generator system with an automatic transfer switch is shown in Figures 5 through 7. Figure 5 is an automatic transfer switch that along with the smart generator, shown in Figure 7 will sense the loss of utility power, start automatically and then transfer the house load to the generator. The reverse occurs when the utility power returns. A simplified schematic diagram of the transfer switch integration into the house wiring is shown in Figure 6. Note that in both residential transfer switch examples, the generator is isolated from the utility power lines, so that accidental back feed is not possible.



Figure 5:200A Automatic Transfer Switch

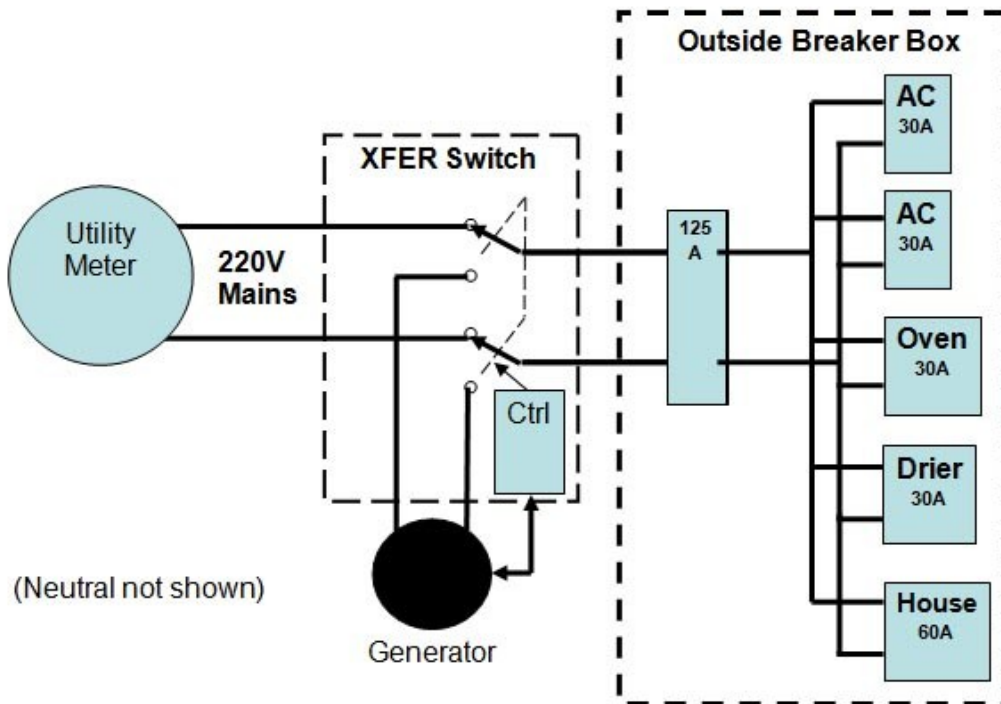


Figure 6: Automatic Transfer Switch Wiring



**Figure 7: Residential 20KW Natural Gas/Propane Generator**

**Safety:**

A generator creates dangerous voltages, heat, hazardous fumes and contains explosive fuel. Follow the following safety rules when using a generator:

1. Never run a generator indoors and make sure there is proper ventilation around the unit outside.
2. Never add fuel to a running generator and avoid spilling fuel on hot engine parts.
3. Use heavy duty extensions cords and avoid overloading any extension cord.
4. Earth ground a generator at its location if possible.
5. Have a fully charged, approved extinguisher near the generator.
6. Store additional fuel away from the immediate vicinity of the generator.

**APPENDIX: Generator Examples**



**Example 1: Honda Inverter Generator: Honda EU2000i (\$899)**

<b>EU2000i</b>	<b>Specifications</b>
Engine	Honda GX100
Displacement	98.5cc
AC Output	120V 2000W max. (16.7A) 1600W rated (13.3A)
Receptacles	20A 125V Duplex
DC Output	12V, 96W (8A)
Starting System	Recoil
Fuel Tank Capacity	1.1 gal
Run Time per Tankful	4hrs. @ rated load, 9.6 hrs. @ 1/4 load
Dimensions (L x W x H)	20.1" x 11.4" x 16.7"
Noise Level	59 dB @ rated load 53dB @ 1/4 load
Dry Weight	46.3 lbs.
Residential Warranty	3 Years
Commercial Warranty	3 Years

## Example 2: Mechanical Frequency Regulation Generator – Generac GP 1800 (\$400)



# GP1800



# GENERAC®

GP SERIES  
Commercial/Residential  
Portable Generators

GP1800

1 of 2

A/C Rated Output Watts: 1800

A/C Maximum Output Watts: 2050

Model 5723-0

UPC Number: 696471057232

Emissions Certification: 49/CSA



## GP1800

### specifications

Product Series	GP1800
Model	5723-0
Configuration/Emissions	49/CSA
A/C Rated Output Watts:	1800
A/C Maximum Output Watts:	2050
A/C Voltage	120VAC
A/C Frequency	60 Hz
Rated 120/240 VAC Amperage	15A @ 120 VAC
Max 120/240 VAC Amperage	17.1A @ 120VAC
Engine Displacement	163cc
Engine Type	OHV
Engine RPM	3600
Recommended Oil	5W30
Lubrication Method	Splash Sump
Choke Type	Manual Lever
Fuel Shut Off	Manual Lever
Idle Control	Full Speed
Starting Method	Manual
Battery	N/A
Battery Size	N/A
Low Oil Shutdown Method	Low Level

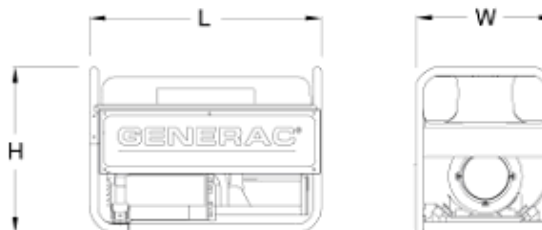
Start Switch Type	On/Off Toggle
Switch Location	On Control Panel
Single-Point Lifting Eye	N/A
Fuel Gauge	Built-in Tank
Fuel Tank Capacity (Gal)	4.00
Fuel Tank Capacity (Litrs)	15.14
Run Time at 50% (Hours)	14.50
Cord Set	N/A
Handle Style	N/A
Wheel type	N/A
Maintenance Kit	Sold Separately
Warranty - Residential	2 Year
Warranty - Commercial	1 Year

GP1800

2 of 2

### dimensions and weights

Length (L)	23.5
Width (W)	17.0
Height (H)	17.5
Extended Length (EL)	23.5
Canon Length	24.3
Canon Width	18.0
Canon Height	18.3
Unit Weight (lbs)	79.0
Shipping Weight (lbs)	90.5



## **AARC Meeting Info.**

### **Waterloo Icehouse**

**8600 Burnet Rd. South of 183  
(Come early and have dinner!)**

### **Business Meeting 7:00 pm**

**September 4th**—High Speed Multimedia (HSMM) networking...what good is it? Find out with Jim Kinter, K5KTF, plus exciting news about Solar weather with Lew Thompson, W5IFQ.

### **\*\*\*Officers Meeting 7:00 pm\*\*\***

**September 18th - Come by and watch the officers at work!**

## **2012 Upcoming Amateur Exams**

**ARRL VEC— September 1st & October 13th** 9a.m. at Bethany United Methodist Church. Contact Joe Makeever, W5HS (345-0800) or Joe Thiel, N5SMN (832-0450) for info. \$15 fee.

**W5YI VEC- September 15th & October 20th** 2p.m. in **room 207**, Fleck Hall, St. Edwards Univ. Contact Jim Greenwood, AB5EK @arrl.net, (327-6184) for more info.

<http://texashams.org/w5yi-austin>

## **2012 Calendar of Events**

**Sept 9 *Ada Hamfest*** Ada, Oklahoma

**Oct 6 *Belton Hamfest***  
[www.tarc.org/hamexpo/](http://www.tarc.org/hamexpo/)  
[www.beltonhamexpo.org/](http://www.beltonhamexpo.org/)

**Oct 13 *Outlaw 100***  
KD4HNX mylastname@yahoo.com

**Oct 13-14 *Ride to the River***  
Charlie KC5NKK charlesdland@gmail.com

**Oct 20 *Lufkin Hamfest***  
[www.lufkinhamfest.com](http://www.lufkinhamfest.com)

**Oct 26-27 *Texoma Hamarama***  
Ardmore, OK  
[texomahamarama.org](http://texomahamarama.org)

**Oct 27 *TCARES Drill and Statewide SET***  
TCARES local drill - Hospital/ARCHES intensive exercise  
[www.tcares.org](http://www.tcares.org)  
Fall SET Exercise - another statewide exercise  
[www.wc-ares.org/](http://www.wc-ares.org/)

## **Upcoming Meetings...**

<b>Sept.</b>	<b>Oct.</b>	<b>Austin Meetings/Happenings</b>	<b>Time</b>	<b>Address</b>
4	2	AARC Meeting Waterloo Ice House*	7:00 p.m.	8600 Burnet Rd.
8	13	Austin QRP, Alvin's Sandwich Shop	11:00 a.m.	12200 Research Blvd.
18	15	ATV Club Meeting Mangia's Pizza	7:00 p.m.	12001 Burnet Rd.
15	20	QCWA IHOP 183 Near Duval	1:30 p.m.	11654 Research Blvd.
26	24	Digital Wednesday at Red Cross	7:00 p.m.	2218 Pershing
24	22	Travis Co. REACT Jim's 183 & Burnet	7:30 p.m.	9091 Research Blvd.
27	25	Travis County A.R.E.S., ARL Auditorium	7:00 p.m.	10000 Burnet Rd.
27	25	CERT Meeting CTECC	6:30 p.m.	5010 Old Manor Rd.

*\*AARC Business Meeting is at Waterloo Ice House Come early and grab dinner before the meeting.*