DETERMINE AMPERAGE NEEDS

BATTERY CAPACITY

The third remaining issue to be considered when upgrading your charging system is the electrical load requirements of your vessel, and the capacity of the batteries required to support those energy loads. Under most boating conditions, the amp-hour capacity of the batteries supporting house electrical loads should be equal to triple the vessel's daily electrical requirements. In cruising vessels, where shorepower charging opportunities may be few and far between, many experts recommend doubling that amount of battery capacity.

To determine your vessel's battery requirements, it's necessary to determine the draw and duration of your vessel's electrical equipment, including navigation, communications, lighting, inverter and heating/air conditioning loads. The chart at right provides a basic overview of typical DC marine electrical loads. Accurate load calculations require accurate measurement of your vessel's equipment. Refer to equipment manuals for actual load ratings, or consult with a qualified marine electrician to determine your actual needs.

Once your vessel's battery requirements are determined, the amperage output required for optimal charging can be calculated. The general rule-of-thumb for alternator output to battery size ratio is 4:1. In other words, if your anticipated ideal battery capacity is 400 amp-hours, your alternator's rated output should be 100 amps or greater.

Typical DC Electrical Loads (Shown In Amps Per Hour)	
VHF Receive	1.5
VHF Transmit	5.0
CB Receive	1.0
CB Transmit	5.0
SSB Receive	1.5
SSB Transmit	25.0
Depth Finder	1.0
GPS	.50
Radar	4.0
Video Sounder	4.0
Weather Fax	2.5
Laptop Computer	6.0
Auto Pilot	4.0
Knot Meter	.10
Wind Speed	.10
Anchor Light	1.0
Steaming Light	1.0
Running Light	3.0
Strobe	.75
Tricolor	2.0
Bilge Pump	5.0
Head	50.0
Wash Down Pump	10.0
Refrigerator	5-10
Hand Spotlight	10.0
Spreader Light	8.0
Small TV	8.0
Large TV	25.0
DVD Player	8.0
Satellite Receiver	12.0

BELT SIZE LIMITATIONS

Unfortunately, the size and type of belt driving the alternator may limit the rated output of the alternator you choose. If your battery capacity is substantially larger than the output allowed based on belt size, it may be necessary to reduce loads in order to lessen the required battery capacity, or it may be necessary to modify the engine pulley system to allow the use of a larger belt, or multiple belts to drive the alternator.

Recently, the practice of adding a second alternator to an engine has become increasingly commonplace, and a growing number of companies are developing brackets and pulley sets to support the addition of a second alternator. Balmar's 12-volt and 24-volt Max Charge voltage regulators have been designed to provide sufficient field current to control two alternators at once. Balmar's MC-612-DUAL voltage regulator, available in the last half of 2009, will provide two separate field output terminals and alternator temperature sensing for two alternators, making it the perfect charge control solution for single-engine, dual-alternator applications. See our website (www.balmar.net) for more information and a list of bracket suppliers.

In twin engine applications, Balmar's Centerfielder provides an excellent solution for balanced charge control over dual alternators. By monitoring port and starboard alternators and regulators, and controlling field output to both alternators, the Centerfielder makes it possible to direct the combined output from both alternators to charge a central house battery bank.