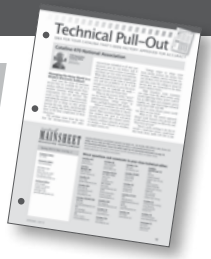
Technical Pull–Out



Q&A FOR YOUR CATALINA THAT'S BEEN FACTORY APPROVED FOR ACCURACY

Catalina 470 National Association

C470 Association Technical Editor
Joe Rocchio
jjr@onward.ws

Managing the Noisy World in a Modern Electronic Sailboat

Each year, the array of electronic devices that are available for use on a modern sailboat expands greatly. Functionality increases while size, power consumption, and cost decrease. The result is that owners are continuously expanding the number of devices (toys?) aboard and in doing so; they greatly increase the ease, safety, and downright fun of sailing. But beware! Hazards lie there in the deep complexities of these electronics.

The problem stems from the fact that the microprocessors and other microcircuits imbedded in all that new electronic gear do not behave well if their power source is noisy or unstable – and boats are very noisy environments. While their internal power supplies can deal with some of the noise, it would be cost and size prohibitive to do it well enough in each device to cover the more severe cases. So tradeoffs are made – and they can bite the boater later.

What are the sources of this "noise" on our boats? There are several types: spikes/transients; voltage surges or drops; and high frequency RF signals.

Spikes or transients can occur when a power source is connected or disconnected. There are many things on a boat that produce this such as activation (turning on and or off) a battery switch, a battery combiner solenoid, an inverter or charger, a bow thruster or windlass, an engine starter, etc.

Voltage surges or drops come from similar sources: the starter, bow thruster, windlass, electric winches, etc. can all draw a lot of current on start up and thus cause the voltage to drop for devices that are connected to the same source (battery bank).

High frequency noise transients can come from the shore power grid, nearby lightning strikes, power controllers in LED lights and computer power supplies, etc. And don't forget onboard radios both VHF and SSB.

So it's a noisy electric power world out there on your boat!

What to do. The ostrich approach doesn't work beyond a few devices and it still ends up costing you $$ in the end. This I have proved!

There's really nothing to do but to install a dedicated power conditioner that feeds clean, stable 12V DC to the

Catalina Mainsheet
MAGAZINE SUPPLEMENT

Catalina Mainsheet is published quarterly by Eagle Ltd., Jim Holder, 830 Willow Lake, Evans, GA 30809 Phone (706) 651-0587 & Fax (706) 651-0533 • cv.jholder@mainsheet.net.
For advertising information, contact Jim Holder, Eagle Ltd. For subscription information see page 48.
Technical articles are the opinion of the authors and not necessarily the advice of Catalina Yachts, Catalina Mainsheet or the National Associations.

Spring 2013 • Vol. 31 • No. 1

Publisher/Editor
Jim Holder

Associate Editor
Carol VandenBerg

830 Willow Lake
Evans, GA
Phone (706) 651-0587
Fax (706) 651-0533
cv.jholder@mainsheet.net

Technical Editor
Gerry Douglas
Designer & Engineer
Catalina Yachts
(818) 884-7700
gerard@catalinayachts.com

Direct questions and comments to your class technical editor.

Catalina 470
Joe Racchio
jjr@onward.ws

Catalina Morgan 440
Mike Simpson
mike@3-sheets.com

Catalina 42
Gene Fuller
gefuller42@comcast.net

Catalina 400
Brian Mistrot
brian@pbmfirm.com
Olav Pederson
olavnp@gmail.com

Catalina 380/387/390
380/390
Tim Porter
serendipity380@gmail.com
387
Tom Brantigan
Tbrantigan@verizon.net
385
Chuck Couture
Clcouture@ymail.com

Catalina 38
Steve Smolinske
ssmolinske@rainierrubber.com

Catalina 36/375
Pre MK II Hulls
Steve Frost
sfrost@corpairtech.com
MK II Hulls
Bud Street
bstreet@teksavvy.com
C375
Francois Desrochers
Ontario, Canada
meteor64@yahoo.ca

Catalina 350
Bill Templeton
pbtemp6816@verizon.net

Catalina 34
John M. Nixon
jmnpe@flash.net

Catalina 320
Chris Burti
clburti@gmail.com

Catalina 310
Bill Lewis
wol1@yahoo.com

Catalina 30/309
Max Munger
catalina30@verizon.net

Catalina 28
Dick Barnes
dickbarnes@earthlink.net

Catalina 27/270
C27
Judy Blumhorst
judy@hydesailsUSA.com
C270
Phil Agur
pjagur@sbcglobal.net

Catalina 26
Art Harden
artstree@aol.com

Catalina 25/250/Capri 25
C25
Paul Zell
catalina25tech@catalina-capri-25s.org
C250
David Gonsalves
catalina250tech@catalina-capri-25s.org
Capri 25
John Schramm
capri25tech@catalina-capri-25s.org

Catalina 22
Technical Editor-Cruising
Louis Plaisance
LouisPlaisance@hotmail.com

Catalina 18
Erik Van Renselaar
esvanr@sbcglobal.net

Coronado 15
Paul Vance
drpaulvance@comcast.net

zoo of electronic devices aboard. The good news is that all those electronics do not use very much current so a moderate size and cost power conditioner will do the job.

After tolerating intermittent power stability problems aboard *Onward* for years, I finally decided to fix the problem when the network communication module of the autopilot died (in rough seas, of course) forcing me to buy a new course computer. While I didn't have hard evidence that the failure was due to power problems, there was a large body of circumstantial evidence that I had built up over the years that made me loath to expose an expensive new course computer and the rest of *Onward's* electronics to the same power environment.

A bit of research led me to purchase and install a power conditioner and backup system. There are several on the market. I chose a unit based on performance specs and reasonable cost. The NavPac Navigation Power Conditioner Model NP-12 by Newmar has filters that protect against voltage spikes, transients and noise that combines this with an integral 12V battery to provide continuous stable 12V power during short term power drops or outages. It has a current capacity of 20 amps.

Performance Specifications for NP-12 Power Stabilizer

Model: NP-12

Output: 20 amps Max. @ 12 Volt

Back-Up Power:
7 Amps for fifteen (15) minutes
10 Amps for eight (8) minutes
15 Amps for two (2) minutes
20 Amps for one (1) minute

Battery: Sealed Rechargeable 5.0 Amp-Hour, 5-7 years typical life, can be replaced. Low-voltage disconnect circuit protects battery from total discharge. Certified by DOT and IATA for shipment by air. Replacement battery P/N: 591-0412-0

Noise Filtering: Audio through 200 MHZ
Voltage Spike Protection: Transient energy capability; 100 Joules, 4,000 amps Max (8 x 20 micro seconds)

Basic installation of the power conditioner is fairly straightforward: connect a source of 12V power (+, Ground) to the unit as input then connect the power lines to the systems that you want to protect to the output side. Noisy unstable unreliable power goes in, clean stable power comes out. Neat.

Now implementing this took a tad of doing. One of the things I love about the C470 is the beautiful job Catalina and Seaward did in designing and building the DC power distribution panel. I think it is functionally elegant, logically laid out and well executed. However, the circuits whose power I wanted to stabilize on *Onward* were all in the Nav/Comm section: VHF Radio, Nav Instruments, Autopilot, Radar, Signal Amp (used for 12 V receptacles to power portable electronic items on Onward), Aux 10 (my Sirius Weather module), Aux 11 (my AIS) are located in three different vertical columns of circuit breakers that are powered from three different interconnected bus bars.

I chose to cut the three bus bars and install appropriate jumper cables so that the circuits whose power I wanted to stabilize could all be fed by the NP-12 while the remaining circuits would continue to be fed as in the original design. Labeling the circuit breaker columns A to D (left to right) and the circuit breakers 1 to 10 (top to bottom in each column), I chose to stabilize circuits A6, A7, A8, B6, C6, C7, C8. With a bit of care and patience this was readily done.

I attached the NP-12 to the headliner at the top rear center of the upper AC distribution panel compartment where there was sufficient space and easy cable runs to and from the unit and the DC distribution panel.

I ran 12V DC (+, Ground) feeds from the same source that feeds the DC circuit breaker panel to the input terminals of the NP-12. Then I connected the NP-12 output terminals to the interconnected mini-bus bars that feed the instrumentation circuits. Voilà! Clean power. No more strange behavior of instruments when the engine is started or bow thruster used or when the windlass hits a bit of tough hauling.