

# MicroHAMS Digital Conference 2009

## Gonzo Engineering

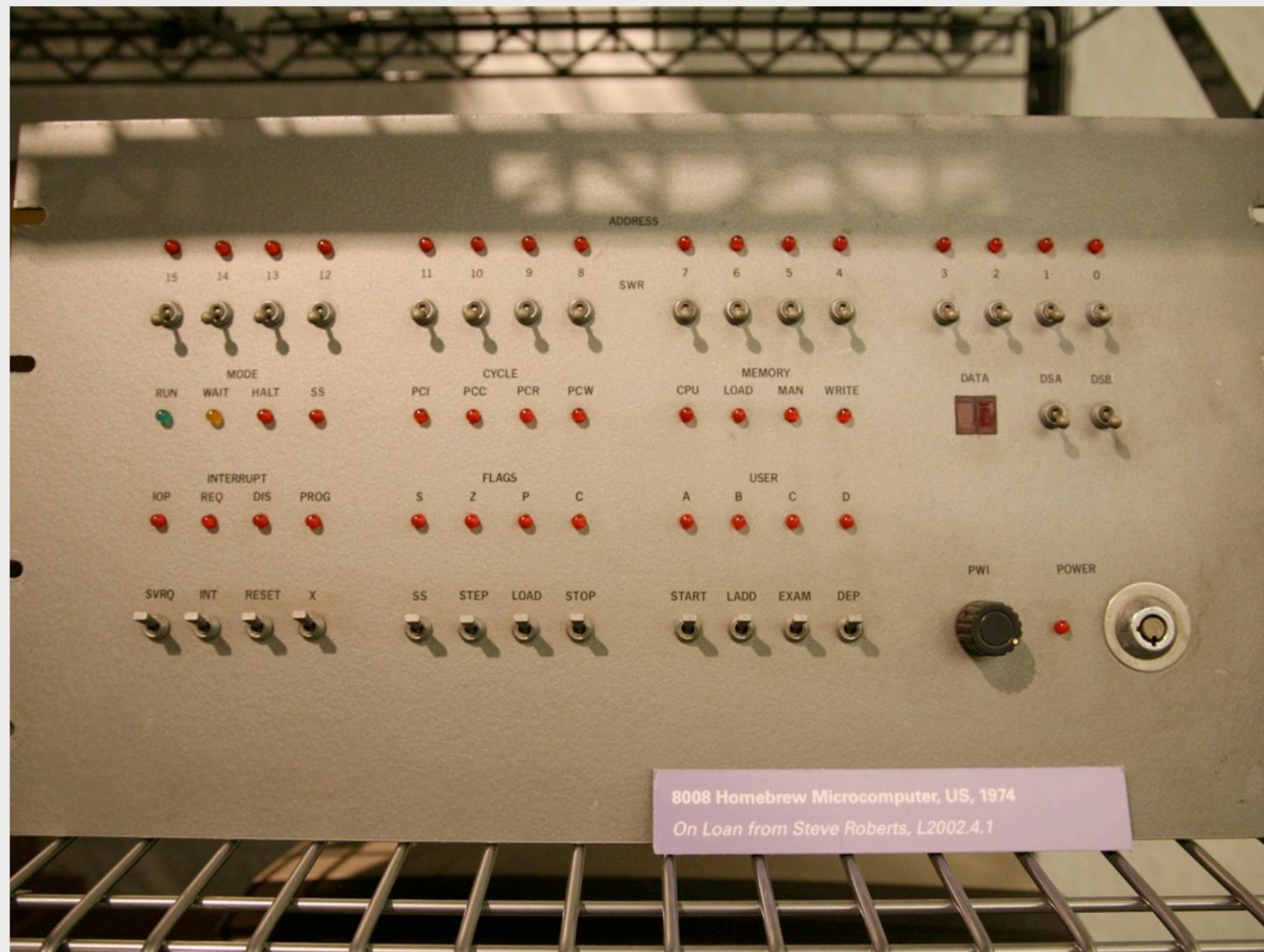
Steven Roberts - N4RVE  
Nomadic Research Labs

# A Life of Gizmology

Playing for a Living (geek-style)







8008 System

1974





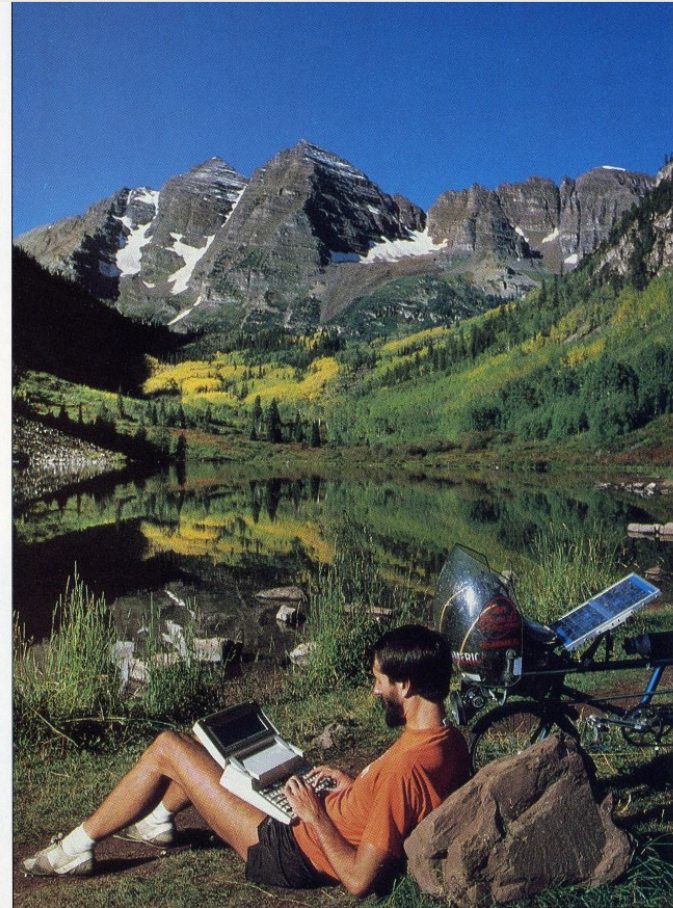
Winnebiko

1983-1985



# Computing Across America

- Custom recumbent
- Model 100, then HP
- CompuServe (modem)
- 5-watt solar, 8 AH NiCd
- 10,000 miles



JEFFREY AARONSON/ASPEN



# Computing across America



## Part I: The technology

For years, it seems, we've all been hearing about the Information Society — computers in every home, the world wired with data communications networks, information on any subject only a few keystrokes away.

This is exciting, of course, but those long-promised liberating effects of the technology have been a while in coming. The truth is that computers simply haven't had much relevance for the general public — those people who aren't particularly enchanted with the machines for their own sake. Wonderful tools, sure, but the kinds made by *Elctronics* have failed to materialize. Treating our minds for latter pursuits, indeed. Most people who work with computers find them every bit as restrictive and demanding as traditional assembly lines.

So, to some extent, do I, even though I would be helpless without them. I make my living with words — and, of course, a word processor is de rigueur in this enlightened age. So are a couple of desks, 10 file drawers, boxes of paper, a photocopier, endless shelves of books, piles of magazines, and other clutter. This is the information society, all right, but the resources necessary to work in it are every bit as cumbersome as were those of the typewriter era.

Or they were anyway.

TODAY readers may recall the "Computing Across America" story by Carole House Gerber that appeared in these pages two months ago. The title of this series is no accident — the journey is now underway. September 28 marked the beginning of my high-tech bicycle odyssey, which is expected to last a year or more and take me 12-14,000 miles in a clockwise loop around the United States.

Not being independently wealthy (at least), I find that such an adventure must somehow be funded. What better way than through the continuation of my writing business? All I have to do is bring the word processor, the file cabinets, the desk, and the rest of it on the back of my bicycle.

No problem.

In this, the kickoff of the "Computing Across America" series, I would like to take you behind the scenes. This adventure wouldn't be possible without the combined capabilities of network communications, CMOS microprocessors, solar power conversion, and the latest in human-powered vehicle design — not to mention a very competent support team.

## Breaking the chains

The attraction and manipulation of words shouldn't require tons of equip-

ment and we don't weigh it all, the poor Shack Mode pound-combination dial.

Unfortunately, it goes very far in being inescapable to screw it on and off of death process to articles and at any new management from trying to already a nu-

Enter Com DAY Writer's matter to get with the Mac phone comes myself enjoy of the many who have of pure but the

That's all right, with a I side the part happens to be That, hope

Continued on





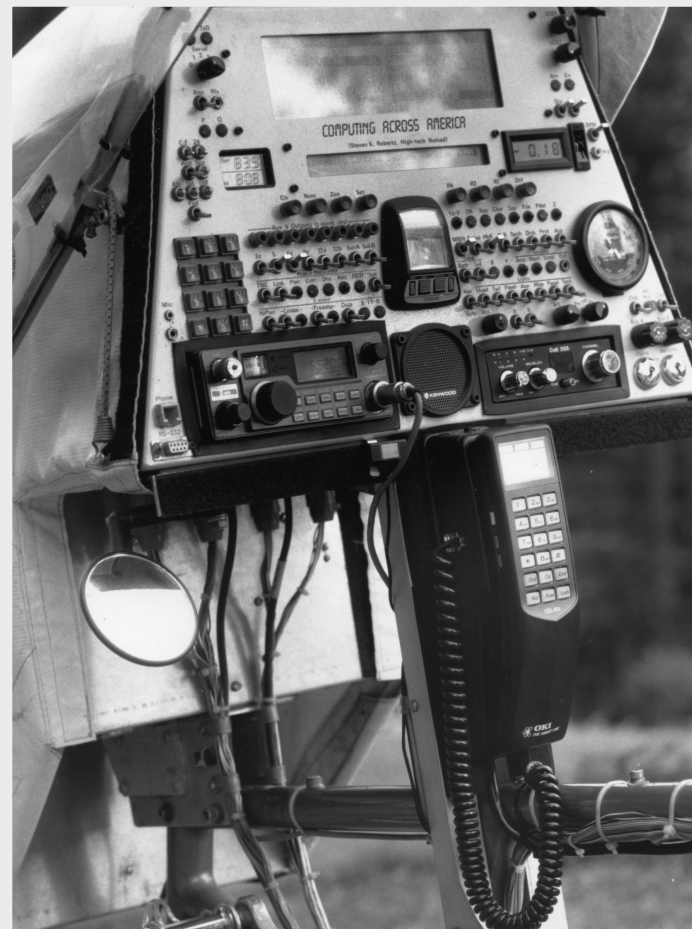
Winnebiko II

1986-1988



# Grand Turing Machine

- Handlebar keyboard
- Packet & Yaesu 290
- 68HC11 and Model 100
- Argonaut 515 for HF
- 20-watt solar, 14 AH batt
- Paleo-celphone, modem, fax, credit-card machine
- 6,000 miles



















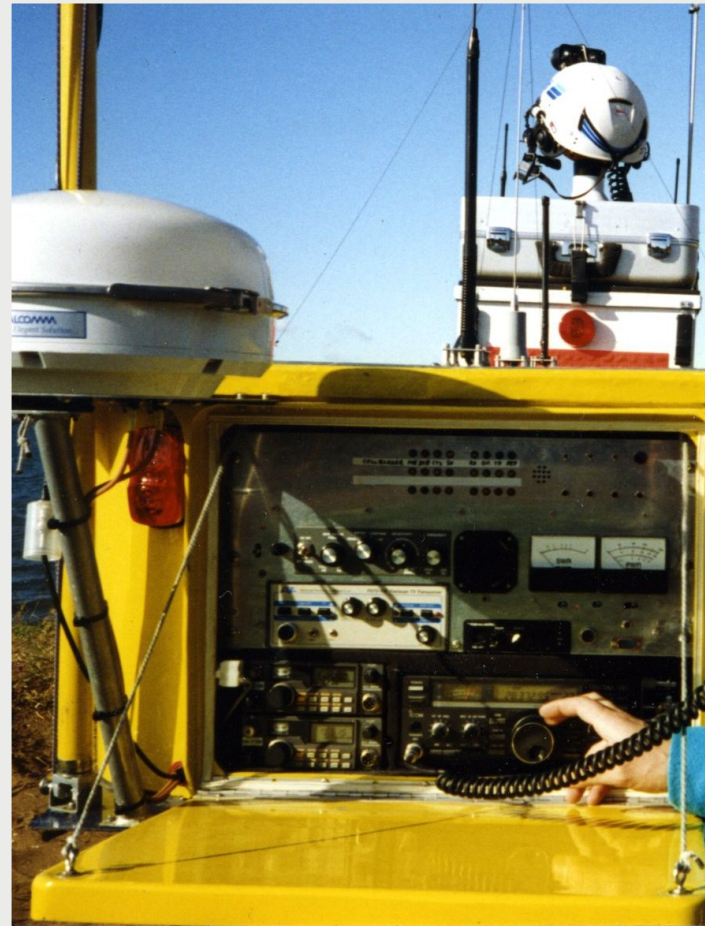
## BEHEMOTH

1990-1993

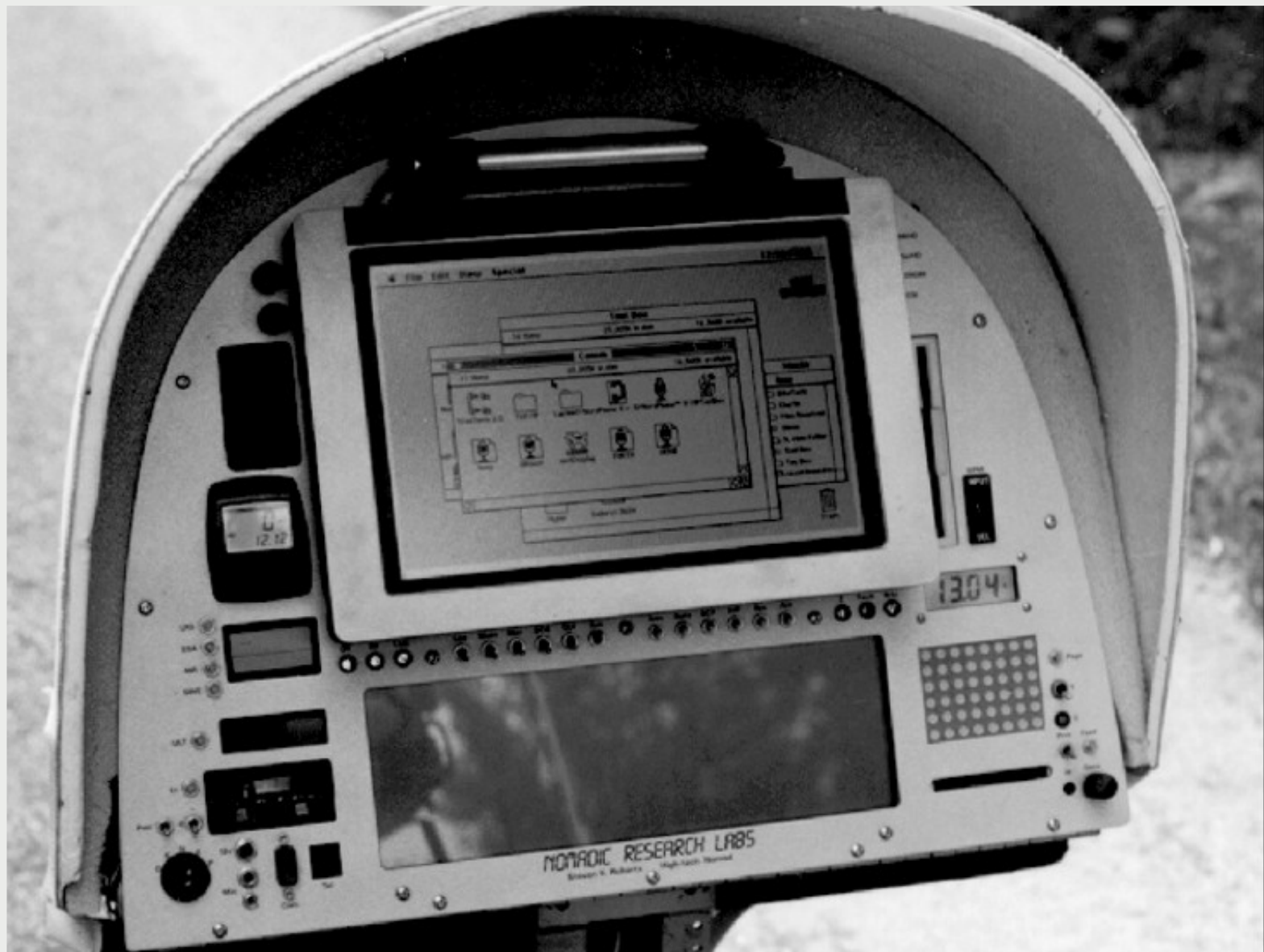


# The Megacycle

- Mac, SPARC, & PC
- 3 FORTH 68HC11 nodes
- Audio & Serial Crossbars
- HF, VHF, UHF, TNC
- Head mouse & HUD
- 72-watt solar, 45 AH
- 1,000 miles
- 105 speeds, disc brakes
- Computer History Museum













# Buzz

~140 corporate sponsors  
~45 volunteers  
~700 articles & TV shows  
~250 speaking gigs

but... after 17,000 miles...

I was burned out on the road. What next?







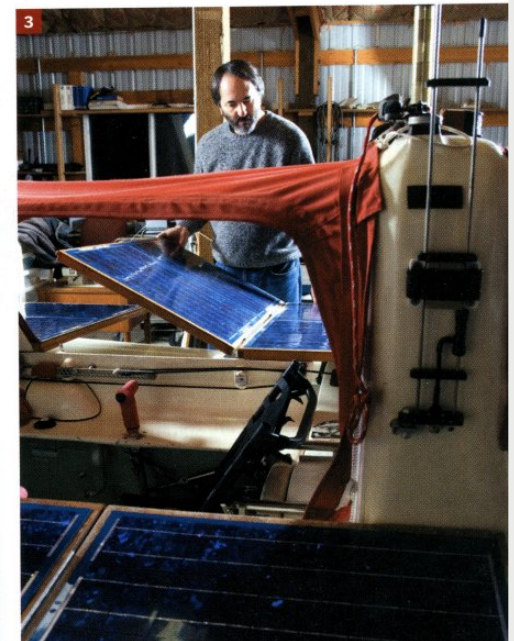
Microship "Wordplay"

1993-2003



# Microship

An amphibian pedal-solar-sail micro-trimaran with deployable landing gear, hydraulic controls, 480 watts of solar panels with MPPT, 93 sqft furling sail, retractible seat, and conversion to road mode... all based on a 19-foot Kevlar canoe.







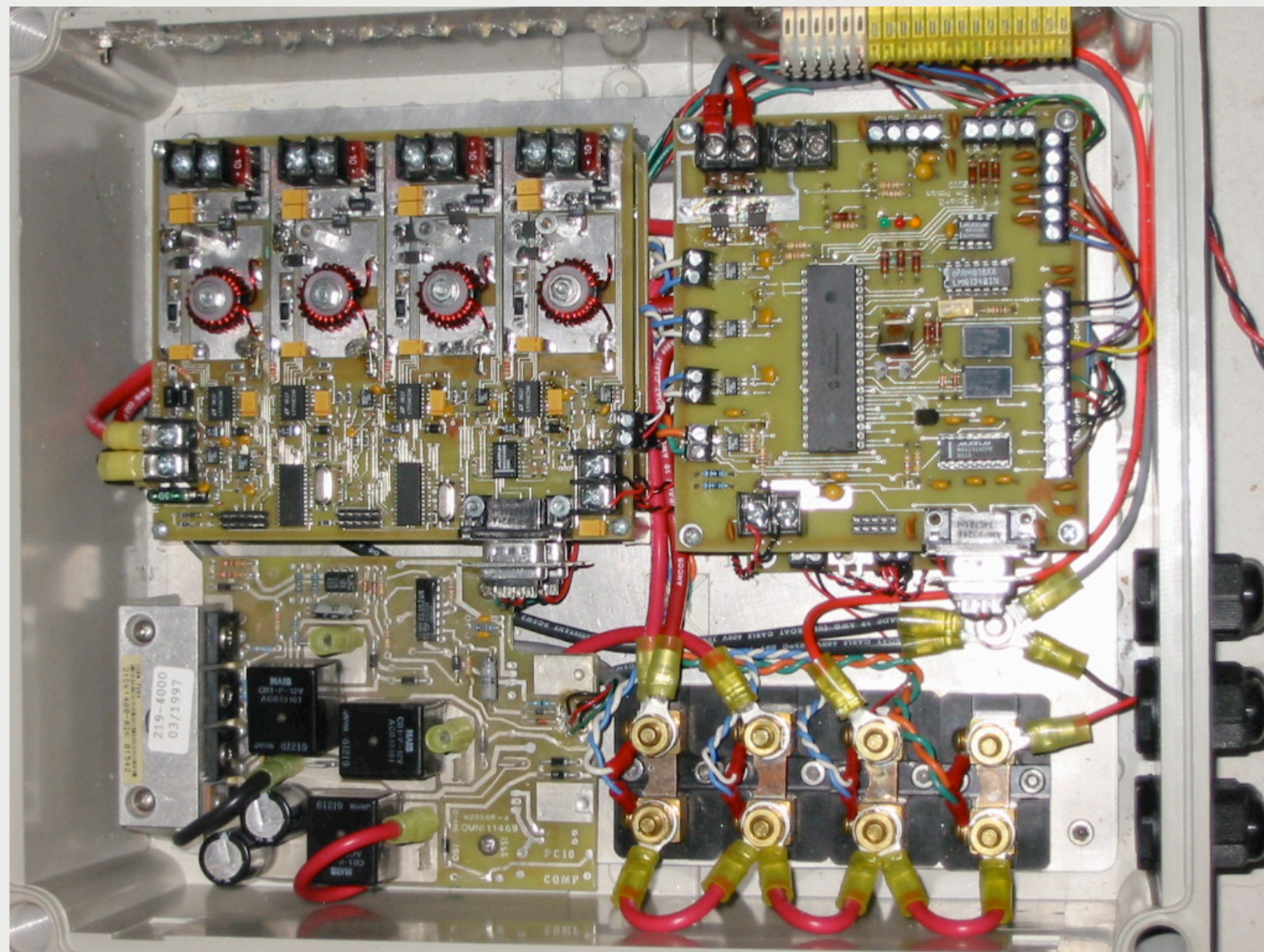
















**Bubba**  
2003-2005





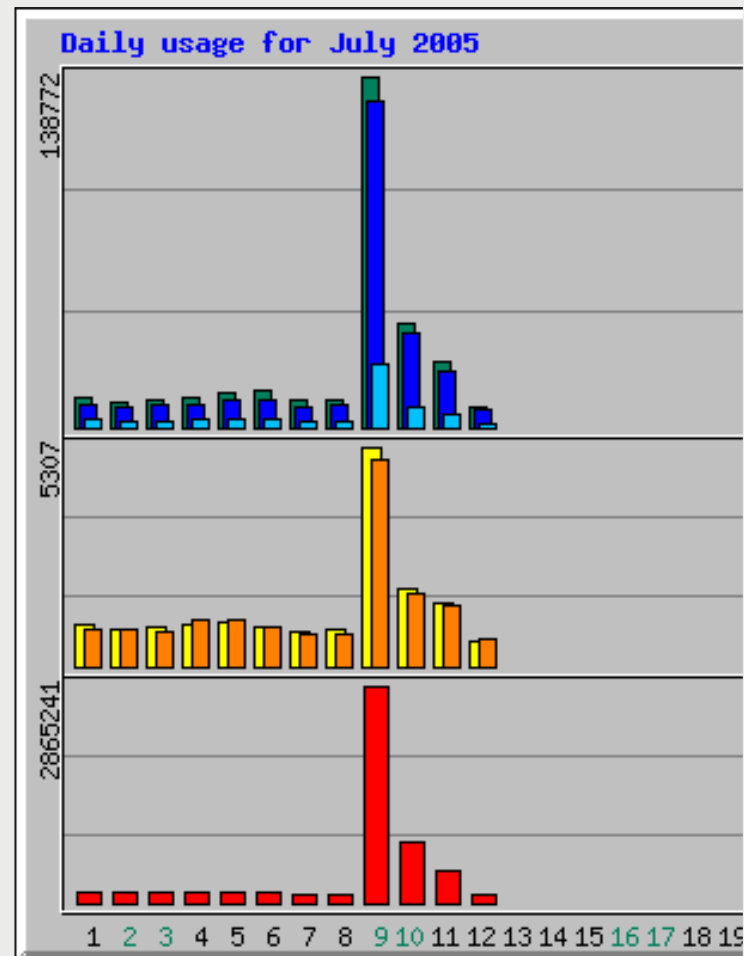
Shacktopus

1995



# Shacktopus Slashdotting

- Yaesu FT817 & T1 tuner
- Local data collection
- Linux server
- Embedded VX-2R
- APRS, cell, bluetooth
- Voice response
- ATmega with SPI chain
- 95WH LiIon, anyverter
- On-the-fly WiFi WET-11
- CW, Voice, packet, PSK
- Buddipole, Arrow, Par
- Rig control via browser
- Tom Bihn soft pack







Madness

2005-2007





**Nomadness**

*2007-???*













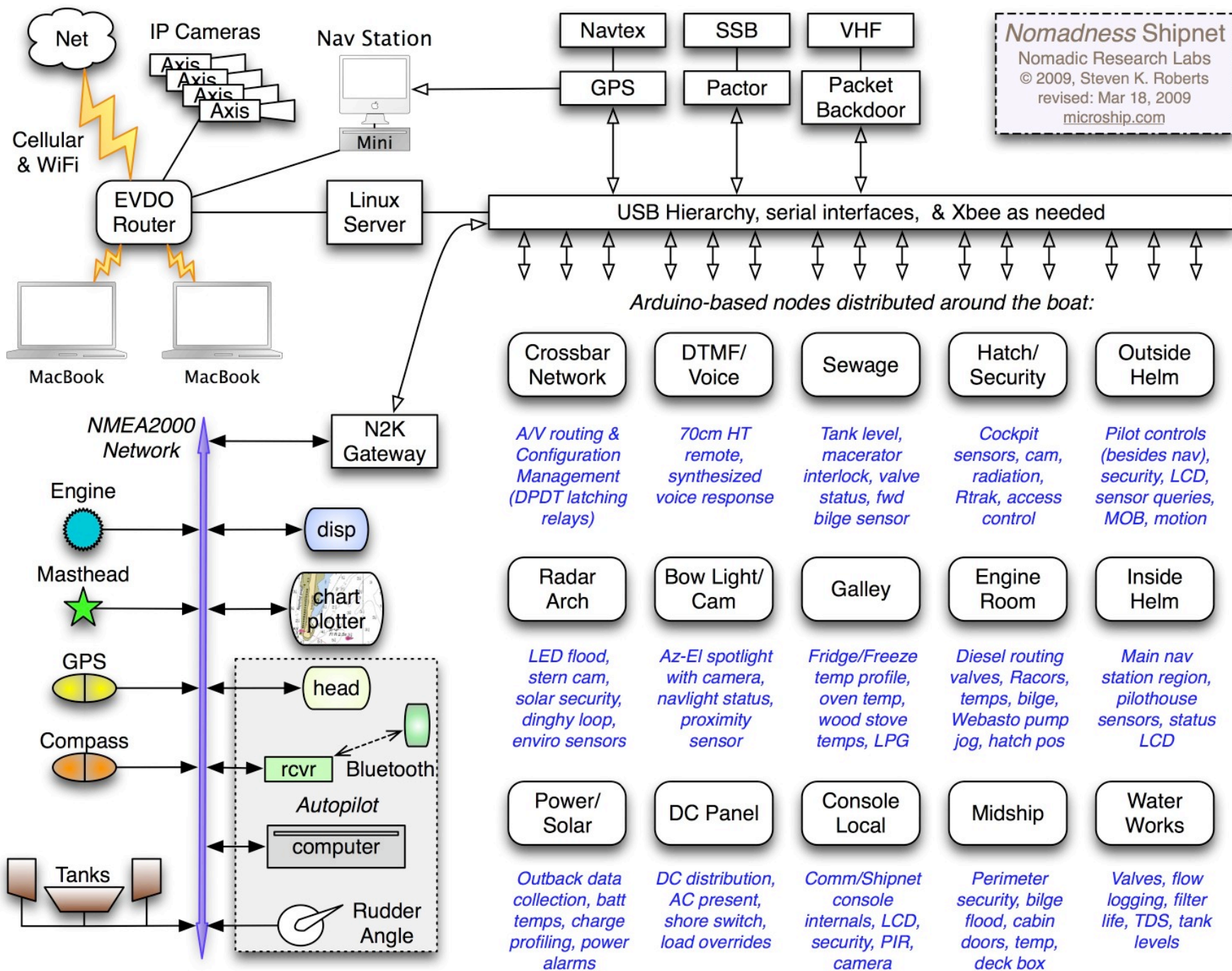


# geeking out the ship

- Always-on Linux hub
- Mac helm & front end
- 15 Arduino nodes
- Datawake server
- Extensive comm/nav
- Field radio pack
- EVDO/WiFi/N2K
- 360-watt solar, MPPT
- Open-ended voyaging
- Survival platform
- Amazon 44 steel PH

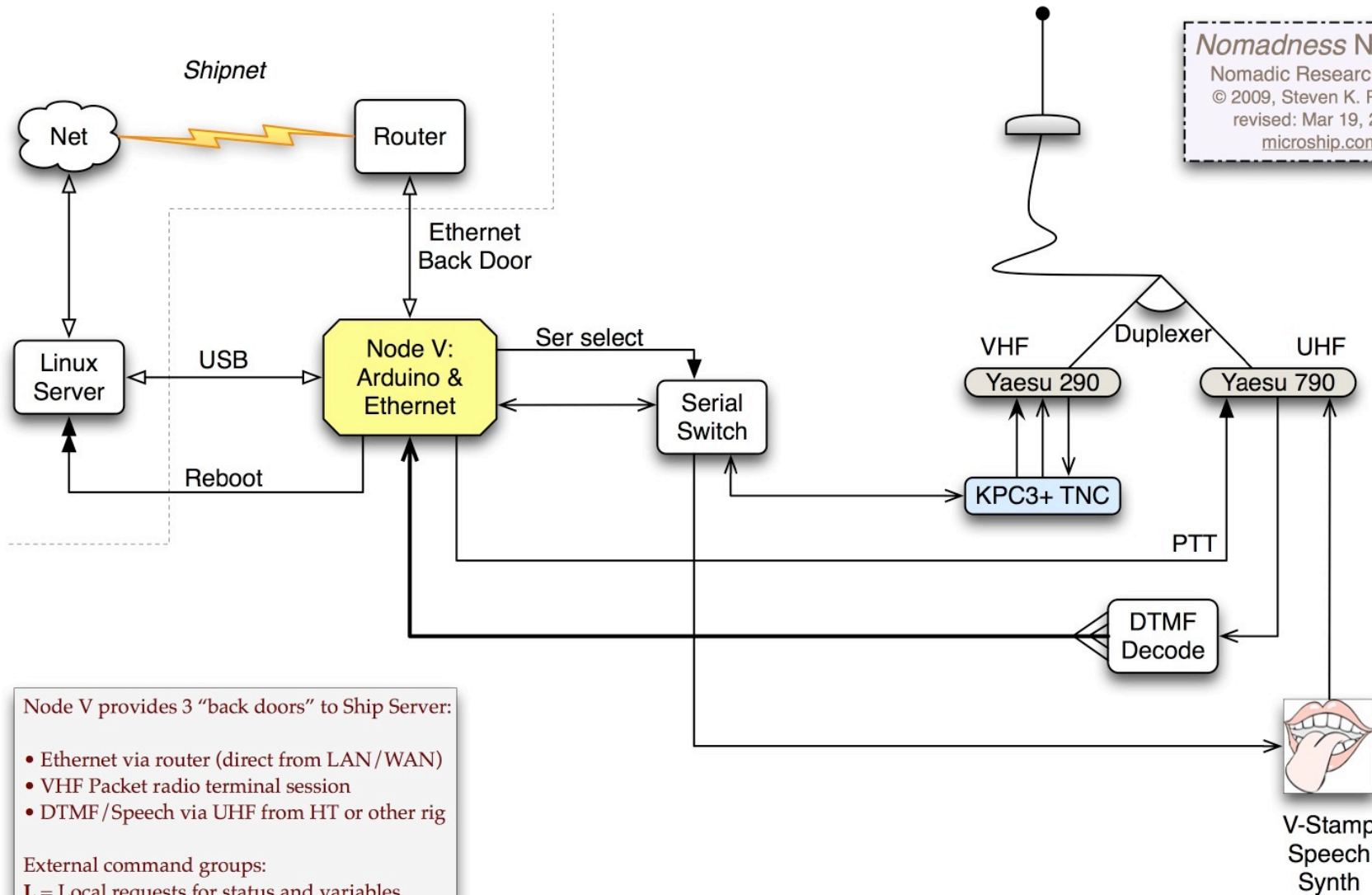








**Nomadness Node V**  
 Nomadic Research Labs  
 © 2009, Steven K. Roberts  
 revised: Mar 19, 2009  
[microship.com](http://microship.com)



Node V provides 3 "back doors" to Ship Server:

- Ethernet via router (direct from LAN / WAN)
- VHF Packet radio terminal session
- DTMF / Speech via UHF from HT or other rig

External command groups:

**L** = Local requests for status and variables  
**G** = Global pass-through commands to Hub  
**D** = Demo stuff  
**T** = Test tools  
**X** = Emergency actions with confirmation code

Reboot line allows power-cycle restart of Server



# Gonzo Engineering

- Business Angle
- Education
- Corporate Sponsorship
- Media Coverage
- Public Presence
- Volunteer Team

## Reaching Escape Velocity

*Lessons in Gonzo Engineering (#1 in a Series)*

A *Grand Vision* is only the beginning. No matter how much passion you bring to bear on the project of your dreams, the odds of actually escaping the "gravity well" are low... unless you find a way to leverage larger forces. This document, derived from 25 years of audacious feats of gonzo engineering, presents the keys to six tools that are *essential* to a large-scale project:

- ☒ A Business Angle
- ☒ Your Own Education
- ☒ Corporate Sponsorship
- ☒ Media Coverage
- ☒ A Public Presence
- ☒ The Team of Volunteers

© 2009 by Steven K Roberts  
Nomadic Research Labs  
wordy@microship.com

Projects: [microship.com](http://microship.com)  
Research Vessel: [nomadness.com](http://nomadness.com)  
Online store: [nomadicresearchlabs.com](http://nomadicresearchlabs.com)



# Contact info

- Steve Roberts, N4RVE
- wordy@microship.com
- 360-387-1440
- QTH - Camano Island
- <http://microship.com> (general)
- <http://nomadness.com> (ship)
  
- *Art without engineering is dreaming;  
Engineering without art is calculating.  
-SKR*

