

Don Lancaster's

RESOURCE BIN

number seventy four

Shaking down some seismic and earthquake info.

Our usual reminder here that the *Resource Bin* is now a two-way column. You can get tech help, consultant referrals and off-the-wall networking on nearly any electronic, *tinaja* questing, personal publishing, money machine, or computer topic by calling me at (520) 428-4073 weekdays 8-5 Mountain Standard Time.

I'm now in the process of setting up my new *Guru's Lair* web site you will find at (where else?) www.tinaja.com This is the place you'll go for instant tech answers. Among the many files in our library, you will find complete reprint sets for all of the *Resource Bin* and other columns. Plus a brand new **Research InfoPack Service**.

You will get the best results if you have both *Netscape Communicator* and *Acrobat Reader 3.0* installed.

Seismography & Earthquakes

An *earthquake* is the sudden release of the stress that was previously built up across subsurface terrestrial plates. These subsonic or *seismic* waves can be extremely destructive. There are two types of waves involved, called the P wave and the S wave. When you measure their different properties, the exact location and the strength of an earthquake can be determined.

Seismography seems to be one of the few sciences in which amateurs are strongly encouraged. You can be of help in monitoring, networking, and in emergency preparedness. And the thinking is that there is a remote chance that you may eventually play a role in earthquake prediction.

A *seismometer* is the standard way you measure earthquake waves. This is basically a mass that is resonant at somewhat under one Hertz or so. By measuring the relative motion of the earth to the mass, a *seismic history* can be plotted and analyzed.

Sometimes "fake" earthquakes are intentionally created for geophysical

exploration. This might get done by dropping a truck a few feet or setting off some dynamite. Slightly different sensors called *geophones* are used for this task. Their resonant frequencies are somewhat higher. Other methods for earthquake sensing might include long distance lasers, ultra sensitive pressure sensors, or microphones.

A *seismograph* is a special type of seismometer that does its own paper chart recording. They are now largely being replaced by newer models that allow full computer networking and manipulation of data.

Seismometers

Some traditional manufacturers of seismometers include...

Bison Instruments
Dascor
EG&G
Engdahl Enterprises
Geometrics
LaCoste & Romberg
Shaw Industries
Sprengnether Instruments
Streckeisen STS
Teledyne
Terra Technology
Western Atlas International

Of these, the name brand "best of breed" appears to be various models offered by Streckeisen.

NEXT MONTH: Don finds some illusions involving the virtual reality scene.

Here are some low end instrument sources favored by amateurs...

Amateur Seismologist
R.T. Clark
GEOsense
GeoTool
Vernier

Seismic Associations

The *Seismological Society of America* from El Cerrito, California publishes their *BSSA* bulletin. They call it the premier English language journal of research for earthquake seismology and related disciplines since 1911.

They also publish their *Seismological Research Letters*, intended as a general forum for informal comm between seismologists and non-specialists. The same site has lots of links for sources of general earthquake information, lots of preparedness stuff, and other resources for seismologists.

Of particular interest is their great *Seismology Resources for Teachers*, that you'll find at www.geo.purdue.edu/seismology_resources.html. This is a major seismic access point.

The fine *International Association of Seismology and Physics of the Earth's Interior*, or *IASPEI* for short, gets into earthquakes and seismo in a big way.

The *IRIS Consortium* is a group of *Incorporated Research Institutions for Seismology*. They focus on exploring the interior of the Earth through the collection of seismic data.

AGU, or that *American Geophysical Union*, form an international scientific society dedicated to advancing the understanding of the Earth and its environment.

The *IRIS PASSCAL Instrument Center* gets hosted by Stanford University's School of Earth Sciences. They have fleets of portable digital seismographs and associated equipment. This lets them conduct their ongoing seismic research programs. Their website is macpasscal.stanford.edu

The feds run the *USGS*, short for *U.S. Geological Survey*. You'll find their home page at usgs.gov/body.html They also operate the National Earthquake Information Center for Seismology by way the wwwneic.cr.usgs.gov web site. And a *USNSN United States National*

Seismograph Network home page at gl-dss7.cr.usgs.gov/neis/usnsn_home.html

A pair of mailing lists are offered: QEDPOST is their daily earthquake summary while BIGQUAKE sends out messages should a large earthquake release be issued. Their subscription sites are qedpost-request@neis.cr.usgs.gov & bigquake-request@neis.cr.usgs.gov.

Another handy service of the USGS which has nothing at all to do with earthquakes is their "live" real time stream monitors. These are useful to find which rivers you can and can not 4WD drive across, and monitor floods as they move through the valley. I've linked some interesting examples at www.tinaja.com/beewb01.html

Magazines & Journals

Let's look at a few more periodical resources...

Seismo-Watch Newsletter– Which is basically a series of maps that show you all of the world wide earthquake activity on a week-by-week basis. No predictions or forecasting. Just those actual events as they happen. Subs are \$27 for six months.

Geo-Monitor– A newsletter dedicated to earthquake prediction, to amateur geophysical monitoring, and to earth mysteries. Monthly at \$15 per year.

Seismograph Report– An association newsletter hosted by West Virginia University School of Journalism that covers the earthquake times, phases, locations, and depths. Semi-annual.

Shock & Vibration– Scholarly journal from Wiley covering shock, vibration, acoustics, structural dynamics, and earthquake engineering.

The Abstract Journal in Earthquake Engineering– A scholarly pub which summarizes world literature relevant to mitigation of earthquake hazards. At \$100 per copy.

EERC News– From the University of California at the Berkeley Earthquake Engineering Research center. Includes publications, computer applications software, and other activities. Also publishes *EERC Reports*

Earthquakes and Volcanoes– Useful consumer oriented journal provides current information on earthquakes, volcanoes, and ongoing seismological activities. \$11 per year, bimonthly.

Bulletin of Seismographic Stations– By the University of California Earth Sciences department. Primarily about

Northern California earthquake lists and the phase readings for worldwide earthquakes. \$10 copy.

ACT Seismologica Sinica– Expensive journal from Elsevier on research in seismology, theories of geophysics, seismo-tectonics, and on earthquake engineering. \$265 per year.

The Bulletin of the Global Volcanism Network– This newsletter describes current volcanic activities and major earthquakes. Monthly at \$18 per year.

Bell Jar– While primarily an amateur journal on high vacuum techniques, Steve Hansen sometimes does get into microbarographs and other seismic related topics.

Journal of Geological Education– By the National Association of Geology Teachers. Their goal is improving the teaching of earth sciences.

The Review of Scientific Instruments– Original papers on new developments in scientific instrumentation, on their application, and use. In particular, do check the seismic laser interferometer on pages 1337-1346 of their May 93 issue, vol 64 number 5.

Books

One all-time classic book is the 1958 *Elementary Seismology* by C.F. Richter. Two more recent choices are *Modern Global Seismology* by Lay and Wallace. And *Earthquakes & Geological Discovery* by Bruce Bolt.

Here are a few more book titles of possible interest...

Acquiring Better Seismic Data
Anatomy of Seismograms
Designing Seismic Surveys
Digital Seismology and Lithosphere Modeling
Earthquakes
Earthquake Forecasting & Warning
Earthquake Prediction & Seismicity Patterns
Earthquake Public Information Materials
Earthquake Survival Manual
Earth Soundings Analysis
Encyclopedia of Earthquakes & Volcanoes
Exploration Seismology
Geology of Earthquakes
How to build Earthquake monitors
Seismology
Seismology and Plate Tectonics
Why the Earth Quakes

Many of these titles are available by way of the [Amazon Books](http://www.amazon.com) link I have

new from DON LANCASTER

ACTIVE FILTER COOKBOOK

The sixteenth (!) printing of Don's bible on analog op-amp lowpass, bandpass, and highpass active filters. De-mystified instant designs. **\$28.50**

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Millions of copies in print worldwide. THE two books for digital integrated circuit fundamentals. About as hands-on as you can get. **\$28.50** each.

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Updated 2nd edition of Don's classic on setting up your own technical or craft venture. **\$18.50**

LANCASTER CLASSICS LIBRARY

Don's best early stuff at a bargain price. Includes the CMOS Cookbook, The TTL Cookbook, Active Filter Cookbook, PostScript video, Case Against Patents, Incredible Secret Money Machine II, and Hardware Hacker II reprints. **\$119.50**

LOTS OF OTHER GOODIES

Tech Musings V or VI	\$24.50
Ask the Guru I or II or III	\$24.50
Hardware Hacker II, III or IV	\$24.50
Micro Cookbook I	\$19.50
PostScript Beginner Stuff	\$29.50
PostScript Show and Tell	\$29.50
Intro to PostScript Video	\$29.50
PostScript Reference II	\$34.50
PostScript Tutorial/Cookbook	\$22.50
PostScript by Example	\$32.50
Understanding PS Programming	\$29.50
PostScript: A Visual Approach	\$22.50
PostScript Program Design	\$24.50
Thinking in PostScript	\$22.50
LaserWriter Reference	\$19.50
Type 1 Font Format	\$16.50
Acrobat Reference	\$24.50
Whole works (all PostScript)	\$380.00
Technical Insider Secrets	FREE

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Ongoing details on Book-on-demand publishing, a new method of producing books only when and as ordered. Reprints, sources, samples. **\$39.50**

THE CASE AGAINST PATENTS

For most individuals, patents are virtually certain to result in a net loss of sanity, energy, time, and money. This reprint set shows you Don's tested and proven real-world alternatives. **28.50**

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The reprints from all Don's Midnight Engineering columns. Includes a broad range of real world, proven coverage on small scale technical startup ventures. Stuff you can use right now. **\$24.50**

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A complete collection of all Don's Nuts & Volts columns to date, including a new index and his master names and numbers list. **\$24.50**

FREE SAMPLES

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FREE US VOICE HELPLINE VISA/MC

SYNERGETICS
Box 809-NV
Tatcher, AZ 85552
(520) 428-4073

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SOME SEISMIC AND EARTHQUAKE RESOURCES

Abst Jnl Earthquake Eng
Earthquake Eng Univ CA
Berkeley CA
(510) 231-9413

Acta Seismologica
Box 945
New York NY 10159
(212) 633-7300

Am Geophysical Union
2000 Florida Ave NW
Washington DC 20009
(800) 966-2481

Amateur Seismologist
2155 Verdugo Blvd #528
Montrose CA 91020
(818) 249-1759

Bell Jar
35 Windsor Dr
Amherst NH 03031
(603) 429-0948

Bison Instruments
5610-T Rowland Rd
Minneapolis MN 55343
(612) 931-0051

Bull Global Volcanism
Smithsonian Institution
Washington DC 20560
(202) 357-1511

RT Clark
PO Box 20957
Oklahoma City OK 73156
(405) 672-9400

Dascor
1125 Camino Del Mar, #G
Del Mar CA 92014
(800) 739-9182

Earthquakes & Volcanos
Sup of Documents
Washington DC 20402
(202) 783-3238

Earthwatch
680 Mt Auburn St
Watertown MA 02272
(800) 776-0188

EERC News
Earthquake Eng Univ CA
Berkeley CA
(510) 231-9413

EG&G Marine Insts
217 Middlesex Tpk
Burlington MA 01803
(781) 270-9100

Engdahl Enterprises
2930 E Grace Ln
Costa Mesa CA 92626
(714) 540-0398

Geometrics
395 Java Drive
Sunnyvale CA 94089
(408) 734-4616

GEOSense
115 W California #304
Pasadena CA 91105
(818) 388-2826

GeoTool
455 Vista Roma
Newport Beach CA 92660
(714) 759-3166

Geo-Monitor
65 Washington St #400
Santa Clara CA 95050
(408) 749-6770

Geoscience Books
319 Mineral Ave
Libby MT 59923
(406) 293-2982

IASPEI
Box 25046, Mail Stop 967
Denver CO 80225
(303) 273-8422

IRIS Consortium
1200 New York NW #800
Washington DC 20005
(202) 682-2220

LaCoste & Romberg
4807 Spicewood Spr Rd B2
Austin TX 78759
(512) 346-0077

PASSCAL Instrument Ctr
Stanford U, Mitchell Rm A05
Stanford CA 94305
(415) 723-9325

Review of Sci Insts
500 Sunnyside Blvd
Woodbury NY 11797
(800) 344-6902

Seismological Soc of Am
201 Plaza Prof Bldg
El Cerrito CA 94530
(510) 525-5474

Seismo-Watch Newsletter
PO Box 18012
Reno NV 89511
(800) 852-2960

Seismograph Report
WVU School of Journalism
Morgantown WV
(304) 293-5603

Shock & Vibration
605 3rd Ave Fl 5
New York NY 10158
(212) 850-6000

Soc Amateur Scientists
1549 El Prado
San Diego CA 92101
(800) 873-8767

Sprengnether
4150 Laclede Ave
St Louis MO 63108
(314) 535-1682

Teledyne/Hastings
PO Box 1436
Hampton VA 23661
(757) 723-6531

Terra Technology
3854 148th Ave NE
Redmond WA 98052
(425) 883-7300

USGS
Denver Federal Center
Denver CO 80225
(303) 273-8422

Vernier Software
8565 SW Bv-Hd Hwy
Portland OR 97225
(503) 297-5317

Western Atlas Intl
10205 Westheimer Rd
Houston TX 77042
(713) 266-5700

set up at www.tinaja.com/amlink01.html
There is also *GeoScience Books* who do specialize in a 35,000 title selection of hard-to-find geological texts.

Amateur Seismologist

You can easily build up your own seismometer. One fairly simple AS-1 vertical design can be found at Jeff Batten's *Amateur Seismologist* website at www1.primenet.com/~seismo This device is simply a suspended mass on a sprung support. A strong magnet at the end interacts with a sensing coil to generate motional data. Sensed data is 12-bit A/D converter and routed to a personal computer for plotting and further processing.

While simple and easy to build, it supposedly can record 3.5 magnitude quakes at a distance of one hundred miles or more. The magnet and the sensing coil are offered at \$25 each by way of seismo@primenet.com

A second do-it-yourself instrument is known as a *Lehman Seismometer* and ran in the July 1979 *Scientific American*. More details can be found through psn.quake.net/lehman.html Kits and key parts are available. Word has it the AS-1 is more sensitive.

A laser seismograph project can be found in www.ece.orst.edu/~ee482/laser/ee48894/lesfin.htm And a *Build Your*

Own Seismograph project is found at www.cea.berkeley.edu/Education/lessons/indiv/davis/Seismograph.html

Another homebrew seismometer appeared in *Science Teacher* magazine in a G.E. Averill story titled *Build your own Seismograph*. See vol 62 #3 pages 48-52 for March of 1995

Several frequently asked questions on homebuild seismographs appear at psn.quake.net/info/homefaq.txt

Association of Amateur Scientists

This is an organization headed up by Shawn Carlson. Who is now the *Amateur Scientist* editor of *Scientific American*. This includes Forest Mims and many other name brand science writers and popularizers as members. The website is web2.thesphere.com/SAS

One of their many offerings is the *Amateur Seismology Network*, reachable through seismo@sas.org.

EarthWatch

This one is a "rent an expedition" service that lets you participate as a serious amateur in worldwide science research, seismic and otherwise. For the price of a regular vacation, you become a grunt on a research team. Years ago, Bee and I went on a fuzzy elephant hunt with them on down in Wyoming's Natural Trap Cave.

The Web

I found a really impressive "links to links" site up at www.uio.no/~hansjb/earthqu.htm that's got many hundreds of active seismo and earthquake links. One shorter listing that seems to lead you to all the biggies real quick like is found at epsc.swustl.edu/seismology/links.html Check this out.

This site also stocks recent abstracts and papers from the Department of Earth and Planetary Sciences from the Washington University in St. Louis.

Steve Malone's *Surfing the Internet for Earthquake Data* also offers many hundreds of active links, all arranged geographically

HomeRisk is found at, of all places, www.homerisk.com. This is an internet resource for assessing your home's seismic risk factors.

All of the usual search engines are also helpful. I found *Inference Find* to generate a few well arranged links. Access to these search services can be reached by way of my hot buttons at www.tinaja.com/webwb01.html

Newsletters & Newsgroups

The leading newsletter and forum on earthquakes appears to be Larry Cochrane's *Public Seismic Network* that you'll find at psn.quake.net. You'll find

many hundreds of pages of "them that's doin" ongoing projects.

Both amateur and professional.

Actually, there are several different Public Seismic Networks. This one is in Redwood City, California. Links to other networks are found here which lead you to the Fairbanks, Memphis, Dunedin, Pasadena, Kalamunda, and San Jose locales. A dozen "additional earthquake information" site links are also provided.

Disaster Research is a free electronic newsletter you might reach by way of adder.colorado.edu/~hazctr.Home.html and hosted by the Natural Hazards Information Center.

Lots more where these came from.

A QUAKE-L mailing list is available at LISTSERV@VM1.NODAK.EDU They advise you of recent earthquakes and include discussions from people in the field of seismology.

A collection of the more popular newsgroups include...

[alt.disasters.earthquake](#)
[ca.earthquakes](#)
[ca.environment.earthquakes](#)
[sci.geo.earthquakes](#)
[sci.geo.geology](#)
[seismic](#)
[seismic.general](#)

Except that those last two do not seem very active at present.

This Month's Contest

I live in a seismically quiet part of the country, so earthquakes are not that big a deal around here. Which leaves me with the hollow feeling that I might have missed a few obvious biggies in this short survey. So, tell me about any seismic or earthquake resources that I may have missed.

There should be a largish pile of my new *Incredible Secret Money Machine II* books going to the dozen or so better entries, plus an all-expense-paid (FOB Thatcher, AZ) *tinaja quest* for two that

will go to the very best of all.

Send all your *written* entries to me here at *Synergetics*, rather than to *Nuts & Volts* editorial.

Let's hear from you. There's some exciting new opportunities here. ♦

Microcomputer pioneer and guru Don Lancaster is the author of 35 books and countless tech articles. Don maintains his no-charge US tech helpline found at (520) 428-4073, besides offering all of his own books, reprints, and consulting services. Don also offers a free catalog full of his unique products and resource secrets. The best calling times are 8-5 on weekdays, Mountain Standard Time.

Don is the webmaster of his Guru's Lair found at <http://www.tinaja.com>

Full reprints and preprints of all Don's columns and ongoing tech support appear here. You can reach Don at Synergetics, Box 809, Thatcher, AZ 85552. Or send any messages to his US Internet address of don@tinaja.com

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