

Troubled Times



Information



Click on the icons above to go to your area of interest.



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TOPIC: **Book List**

Suggested reading for those wishing to be prepared for the changes that will be presented by the millennium are:

- Books on [Electrical Energy](#)
- Books on [Communications](#)

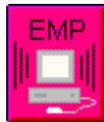
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TOPIC: Radio

Information on [Getting Started](#) in short wave radio can be secured from [ARRL](#), a [Highly Recommended](#) organization, and the rules are now more [Relaxed](#). Information on [Antennas](#), [Home-Made Antennas](#), [Equipment](#) sources, [Inexpensive](#) setups, using [Old Dishes](#), and a [Beginner's Guide](#) is available. Short wave radio is an [International](#) communications vehicle, and the [Best Bet](#) to survive the shift. [Long Distance](#) communication is possible by bouncing off the [Ionosphere](#) or using [Moon Bounce](#) or even [Meteor Trails](#), a [Recommended](#) method, and [Ground Wave](#) techniques work for short distances. [Hams](#) set up for communication via their own satellite could adapt, when satellite disruptions occur due to [Meteor Storms](#) or [Solar Flares](#). Via [Radio Relay](#), a [VHF Internet](#), via [Packet Radio](#) and using [TNC](#) could even exist, but would need to be [Scheduled](#) and there are [Repeater Issues](#) and [Alternatives](#). Moving packets is even possible with [Ham Radio](#). Alternatives would be [Wireless Radio](#) via [Microwave](#) or via [Radar Transmissions](#), but this would not be as [Cost Effective](#), or [GWEN](#), but [Common Use](#) radio such as [CB](#) will most likely be the vehicle. Knowing the primary [Radio Frequencies](#) are essential in communicating with others, and following the [Wilderness Protocol](#) helps. Many websites exist with information on [Emergency Communications](#). A Troubled Times [TEAM](#) has been formed to develop solutions around short wave radio.

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TOPIC: **Electro-Magnetic Pulse**

During the pole shift, [Possible EMP](#) may occur from [Magnetic Fields](#) generated by the churning and shifting core, as the [Defense Dept.](#) is aware. A [Self Test](#) can be done to verify effectiveness. EMP is explained by the [Magnetic Shield Corp.](#), [Viatch](#), the [Army Corps](#) of Engineers, and books on Engineering [Fundamentals](#). [Grounding](#) as protection from [Lightning](#) is not necessary for idle equipment during the pole shift hour. [Shielding](#) using Iron or various metals such as [Copper Mesh](#) or other [Non-Magnetic](#) metals is used in order to protect sensitive technology such as computers. [Other Steps](#) can be taken to safeguard computers, too. Solid state circuitry benefits most from [Mumetal Shields](#), which can be purchased from a number of [Mumetal Sources](#), but to shield from strong magnetic fields, [Iron is Best](#). Iron shielding such as can be achieved using [Ammo Boxes](#).

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TOPIC: Linux

Linux and Amateur Radio go hand in hand, per [Bruce Perens](#). The argument over [Linux vs Windows](#) focuses on issues such as [Ease of Use](#), [Radio Interface](#), and whether [Simple is Best](#). As Linux is [Free](#), and the [Red Hat](#) version inexpensive, one can keep the [Options Open](#), and Linux users report many [Linux Advantages](#), superlative [Features](#), and [Installation](#) ease. [Linux on CD](#) is now available, and supports an [MS Office Clone](#), but [Applications](#) are limited.

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TOPIC: Bearings

The pole shift will disturb every known bearing humans rely upon. A [Stable Anchor](#) will be [Appreciated](#), as the [Sun](#) will rise in a different place, the earth's new tilt will create a [New Latitude](#) for almost all locations, a 24 hour day may not be the result. With a [Team Effort](#), new bearings could be [Established](#). Use of a home made [Sextant](#) or a [Compass](#) and taking note of [Fixed Positions](#) both prior to and after the pole shift will help. [Radio Frequencies](#) can be used as a guide, and short wave radio buffs already have a technique for [Locating the Moon](#). Subtle differences in [Skylight](#), enhanced by using a [Blue Filter](#), can determine relation to the Sun.

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Books on Electrical Energy

[The] The 12 volt Bible and The 12 volt Doctor

How to operate on 12 Volts.

Alternator Secrets

\$4.50 How to modify car alternators to work with windmills.

Back to Basics

by Reader's Digest, shows a methane digester and a storage tank for methane.

Battery Book for Your PV Home

By Fowler Solar Electric for about \$8.00. It's short, concise and well worth the money. There is a really good discussion on batteries in the book.

Brakedrum Windmill Plans 2000

by Hugh Piggott. \$14.95

[The] Complete Battery Book

By Richard A Perez. Published by Tab Books Inc., Blue Ridge Summit, PA 17214. ISBN 0-8306-1757-4 (paperback). 185 pages, illustrated. Written for the layman. Talks about what is a battery, lead acid, ni- cad, edison cells, primary cells, methods and machines to charge, using batteries effectively, inverters, energy management, and new battery technologies (the book was written in 1985), formulae and conversion factors. Will teach you the basics of batteries. Recommended by decastro@netcom.com (Richard A. De Castro), on misc.survivalism.

Die Technik

A German book containing 290 diagrams explaining how everything from an iron to a nuclear reactor works. Where this book is in German and the 608 pages of text may require some translation, it is highly recommended for those who may have to make it work, with or without instruction. Distributed by Langenscheidt Publishers, Inc., 46- 35 54th Rd., Maspeth, NY 11378, \$35, (800) 432-6277.

Direct Current Fundamentals

By Orla E. Loper and Edgar Tdsen. Publisher Delmar Publishers Inc., 2 Computer Drive West, PO Box 15-015, Albany, New York 12212. ISBN #0-8273-4146-6. More of a text book but very needed information. Recommended by decastro@netcom.com (Richard A. De Castro), on misc.survivalism.

[The] Electricians Toolbox Manual

By Rex Miller, 1989, published by ARCOS/Simon and Schuster, distributed by Prentice Hall. ISBN 0-13-247701- 7. A small sized book full of good information on electrical wiring. Seems especially good for do-it-yourselfers who are unsure about the specifics of wiring. Section on tools, NEC, etc. Recommended by decastro@netcom.com (Richard A. De Castro), on misc.survivalism.

From the Fryer to the Fuel Tank, How to Make Cheap, Clean Fuel from Free Vegetable Oil

By Joshua Tickell, from Greanteach publishing of Sarasota, Florida. Step by step instructions. If you are serious about learning all the ins and outs of this alternative energy source, it is very cheap at 19.95, and very well

written for details.

The Homebuilt Dynamo

\$50, from England. A [Diary](#) with photographs, detailed working drawings, and text of how to build a direct current generator.

Home Power Magazine

Magazine and catalogs from renewable energy dealers for energy needs.

How Electronic things work ... and What to do When They Don't

By Robert Goodman. It covers very basic electronics, but also things like TVs, VCRs, radios etc.

How to Build and Operate Your Own Small Hydroelectric Plant

By George Butler. Covers obtaining material, building the dam and laying the pipe, building the powerhouse, the economics of small scale micro-hydro, and examples of small hydros. Appendix of DOE reports and guide to hydropower equipment manufacturers and hardware suppliers.

Hydraulic Ram Pumps - How and Where They Work

(ISBN 0-9631526-2-9). It describes how to design, build, and install a simple, efficient hydraulic ram pump. ...

Independent Energy Guild

Order from *Backwoods Home Magazine* (800) 835-2418, 280 pages, \$22.95. A guide to planning the ideal independent power system for your home, boat, or RV. Covers the basic theory, as well as the nuts and bolts of AC and DC, photovoltaics, wind, water, generators, energy storage, system operation, and more.

Living on 12 Volts with Ample Power

By David Smead and Ruth Ishihaha. Published by RIDES publishing company, 2442 NW Market Street #43, Seattle, Washington 98107, USA. ISBN 87-92194. Recommended by decastro@netcom.com (Richard A. De Castro), on misc.survivalism.com.

More Power To You

How to operate on 12 Volts.

Motors as Generators for Micro-Hydro Power

By Nigel Smith. Available from [Pico Turbine](#) for \$14.95, shipping included. How to convert a 3 phase AC motor to work as a generator. Very informative and easily read, and full of information for home brew hydro power. Illustrated step by step plans for building a 300 to 500 watt wind turbine using junked car and truck. These plans have been used all over the world to build simple but reliable wind machines that stand the test of time and weather extremes.

Pumps as Turbines, a User's Guide

\$13.95 How to take a water pump and turn it into a hydro-electric generator.

Real Goods

Environmentally friendly products and alternative energy. 966 Mazzoni Street, Ukiah, CA 95482-3471, (800) 762-7325, Fax: (707) 468-9486.

[The] Solar Boat Book

How to operate on 12 Volts.

Survival Scrapbook #3 ENERGY

By Stefan A. Szczelkun. ISBN 0-8052-0449-0. This is a good book on basic ways to use/make energy from a variety of sources including sections on solar, wind, fires, water, heat, electricity generation, animal power, and meditation. This book has a very good section on bio-fuels, especially the extraction of methane from wastes.

Recommended by decastro@netcom.com (Richard A. De Castro), on misc.survivalism.

Wind Energy Basics

\$17.95 How to choose and place your windmill. How to build windmills in general.

Wind Energy for Sustainable Development

Published in 1992 by the American Wind Energy Association, Washington D.C.

Wind Power Workshop

By Hugh Piggot. Has information about the construction of horizontal axis wind generators, along with blade construction, hub construction, pitch mechanisms, and much more. Mr. Piggot is a tried and true expert on the construction of home made wind generators.

Windspinners

By M. Hackleman. Mr. Hackleman's *Wind and WindSpinners* is full of the pertinent information one is most likely to need. There are chapters which explain how to construct a rotor from 50 gallon drums cut in half, from top to bottom. This chapter also shows how to place them in a stacked array for better performance and ease in starting. Another chapter shows how to put together a charging system and battery bank for domestic consumption. Highly regarded in the windmill field.

Wiring 12 Volts For Ample Power

How to operate on 12 Volts.

Whole Earth Catalog

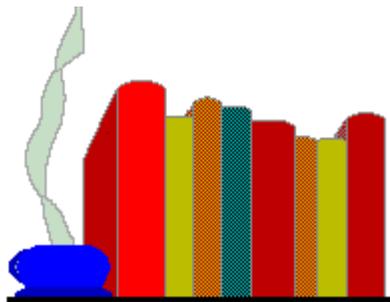
Offers a Catalog full of environmentally friendly tools and supplies. One can order the Catalog in paper form, also.

Wind Power for Home and Business

Order from *Backwoods Home Magazine* (800) 835-2418, 414 pages, \$38. A comprehensive guide to modern wind machines, featuring rugged, low-cost designs suitable for homes, businesses, and ranches, both on and off the grid. It shows how to measure the wind and how to choose, install, and operate your system.

Wind Power Workshop

by Hugh Piggot. \$22.95



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Books on Communications

ARRL Handbook

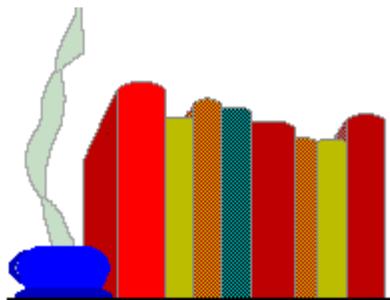
Available from [ARRL](#), the American Radio Relay League. Get the latest handbook.

Now You're Talking

Available from [ARRL](#), the American Radio Relay League. Get this book at a minimum to learn about short wave and other radio communication avenues.

Technician No-Code Plus

By Gordon West WB6NOA, published by Master Publishing, Inc. and available at Radio Shack for FCC license preparation for Novice and Technician classes, contains all the test questions in an easy to study format



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Getting Started

From the [ARRL's Web](#) page

How to Get Started in Amateur Radio

The ARRL Educational Activities Department (EAD) distributes a **New Ham Package** that is sent at no cost to you. The material describes **Amateur Radio**, popular ARRL study guides, and includes a list of your local ham radio clubs, ham radio classes and volunteer examiners in your area. To serve you best, we'd like to know the following when you request an New Ham Package:

- Your First Name, Middle Initial, Last Name
- Call Sign (optional)
- Date of Birth, MM/DD/YY
- Street Address
- City, State, Zip, Country
- Phone 1 (day), Phone 2 (evening)

Contact ARRL today for an New Ham Package by any of the following methods:

Telephone Toll-Free: 1-800-32-NEW HAM (our New Ham "Hot Line")
1-800-326-3942

Mail: ARRL EAD, 225 Main St,
Newington, CT 06111-1494 USA

Telephone: (860) 594-0301

FAX: (860) 594-0259

ARRL BBS: (860) 594-0306

e-mail: newham@arrl.org

CompuServe 70007,3373

Prodigy PTYS02A

America Online HQARRL1

GENIE ARRL

WWWeb <http://www.arrl.org/>

(Make sure to include a specific request for the New Ham Package and include your postal address because there is too much material to send via e-mail or fax.)



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ARRL

The American Radio Relay League (ARRL) addresses such subjects as

- amateur, ham, and short wave radio
- emergency communication, and telecommunication
- repeaters, microwave, and radio design
- DXCC, HF, NCJ, QEX, QSL, QST, SAREX, UHF, VHF, W1AW
- regulations and the FCC

The ARRL home page on the web at <http://www.arrl.org/> states:

Ham radio spoken here: Welcome to ARRLWeb, the American Radio Relay League's home on the World Wide Web! The League (email hq@arrl.org, telephone 860-594-0200, fax 860-594-0259), a membership service organization headquartered at 225 Main St, Newington, CT 06111, USA, serves the over 600,000 Amateur Radio operators, enthusiasts, experimenters and hobbyists in the United States, its territories and possessions.



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Highly Recommended

As a lifetime member of the ARRL and having participated in almost 100 emergency and disaster relief operations, I highly recommend and encourage everyone to spend some time looking at this site. In addition, it would seem highly appropriate to include a topic within Troubled Times devoted to specific ham radio related topics as this will become the foundation of any pole shift inter-community communications, including implementation of a new Internet post pole shift.

Offered by [Ron](#).

[WB5KAN](#) - General Class



Troubled Times



Relaxed

I just learned of extensive and exciting changes to the FCC Laws relating to Ham Radio in the US. In summary, the current 6 classes of licenses are being reduced to 3; and the requirements to send and receive Morse Code are being reduced from 20 and 13 to 5 words per minute across the board. This means that the vast majority of Troubled Times members will be able to obtain a Ham Radio license with a minimum of effort - especially with the most difficult part, Morse Code.

Offered by [Ron](#).



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Antennas

If you want to try a wire line, use a coil and a specific length for your specific frequency. The best and most annoying transmitting antennas for your neighbor's TV reception is the wire square running around the house rooftop as the ground-plane and four wires running down from the center of the roof-tip but lifted up above the square. This is one of the most omnidirectional antennas you can make. It can also be made internal to the roofing. You may cause interference to others or you may not, but you can do some serious Dxing.

Steven, [3328-5642](tel:3328-5642) or [015579751](tel:015579751)

Write to The **CBC (Canadian Broadcasting Corporation)**, They will send you a free **Antenna Handbook**. It's an 18 page, 14 chapter book. Describes many antennas and how to construct them. Discusses Whip antennas, Vertical, Marconi Inverted "L" antennas, Windom, Half-wave dipole, folded dipole, triple dipole, vertical dipole, fan vertical antenna, long wire, "V" beam, rhombic antenna and antenna accessories. Very complete book. Available free in english and french versions. Write:

Radio Canada International

C.P. 6000

Montreal, Canada

H3C 3A8



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Home-Made Antennas

Since I just built an electric fence to control my escape artist goats, I have a roll of wire that is actually like string with braided wire in it. It is very convenient. It is no harder to work with than a roll of string. The reason I bring this up is maybe we can do some experiments with it for ham radio antennas. 600 meters per roll is one big antenna. Maybe it could be strung between trees or on posts some how. I'm not that knowledgeable about radios and antennas yet, but I have two rolls of this wire already. My electric fence charger is also 12 volt powered. Very effective. Ask my goats.

Offered by [Clipper](#).

Since I grew up in a home with my dad always on the Ham radio as opposed to playing catch with me, I can tell you that the conventional way is a tall, tall tower. But just as that is the conventional way, I also know you can use your house wiring to make an antenna. I'm guessing that if you strung that wire in a circle with a 100 foot circumference, you'd do all right.

Offered by [John](#).



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Inexpensive

There's a web site that tells you how to **Build Your Own** short wave radio. Another place, **Tweak & Peak**, states they sell the world's most advanced communications equipment.

We carry a complete line of Ham Radios & Accessories, C.B. Radios & Accessories, Computers & Peripherals, Car Audio Systems, and other Electronics. Here at Tweak & Peek quality is first and profit is last. We sell quality equipment at pennies above cost. Call us for price info. We will be happy to serve you! We are dedicated to providing the best value for our customers. If we wouldn't own it ourselves, we won't sell it. Give us a call today!

Tweak & Peak

RR 4 Box 1912 Rt. 7 South
Middlebury, Vermont 05753
General Email: Info@TweakNPeek.com
Support Email: Support@TweakNPeek.com

Phone: 802-388-0635
Fax: 802-388-8984
Pager: 802-290-0860

General information

Grundig, Sony, and Sangean (from Taiwan) make the most popular brands. Look for a radio with digital, phase-lock-loop, direct-access tuning; full-spectrum, continuous-frequency coverage; at least 40 station presets; and LCD display panel. The Grundig Yacht Boy 400 sells for under \$200 and is the size of a VCR cassette. If you prefer news in smaller bites, try the Sony ICF-SW100S for about \$475. It's the size of an audio cassette.

Offered by [Peter](#).



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Old Dishes

Is there any use my Primestar receiver and dish? I upgraded to DSS and Primestar left the receiver and dish at my house.

Offered by [Ted](#).

Yes, use it for accurate navigational location of your site after the pole shift. I am not familiar with the exactness of this particular unit. However, in general one would:

- Save the Low noise amp (LNB) and the dish.
- Purchase an approximately \$40 in line signal finder or use the receiver if it has a signal strength meter or indicator.
- Use a 12-Volt gel cell for the powering the Low nose amp if needed. If using the receiver it will supply the power for the low nose amp.
- Rig up an equatorial mount (like a telescope) out of pipefittings or an old telescope.

After the pole shift you can use this to find the sun behind clouds to a high degree of precision usually less than one degree. When aimed directly at the sun you get a strong nose signal. By lining up the equatorial axis (over several days) with the earth's rotation one will find no motion in declination. Measurements will be needed though out the day to find the sun. This means you only move the time axis to find the sun. This will give you the direction of north rotational pole very accurately. The angle this makes with a perpendicular to the surface of the earth will give your current latitude. By measuring declination over a 6-month period you can determine your seasons accurately. You will also be able to determine accurately your latitude, which is related to average expected temperatures.

I made such a unit over a year ago and have taken lots of readings. At times of the year I can see the sun through the house ceiling and in cloudy conditions. At other times there is too many reflections in the parts of the ceiling of the house. If I take it outside, there has never been a time I couldn't see though a cloud cover.

Offered by [Mike](#).

I am collecting these various sized dishes, largest is 12 feet, to use for moon bounce Ham Radio communications.

Offered by [Ron](#).



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International

There are international agreements that regulate the radio frequencies and modes of operation (voice, digital, Morse code, etc.) that may be utilized by different classes of license holders; although there are some differences in different countries. For the most part, one must hold a class of license that includes the ability to transmit and receive Morse code at a certain speed before being allowed to operate at frequencies less than 30 MHz. It is these lower (or HF, i.e. short wave) frequencies that are able to be propagated around the world (because they bounce off the upper layers of the atmosphere).

The code less license is usually limited to above 30 MHz (VHF & UHF). These frequencies are usually limited in range to just beyond the horizon. To extend the range, repeaters are often placed into operation by local hams. In addition, there are many satellites used by hams at VHF and UHF frequencies that allow for global communications; but schedules must be coordinated so that communications between any two locations can occur; and the time that these communications can take place is quite short due to the movement of the satellite.

So, given the proper license, equipment (HF), antenna system (usually tower with large antenna atop it), and propagation (affected by ionization of the upper atmosphere), you and I could chit chat for hours. We can even do that now, using Internet phone or IRC software.

Offered by [Ron](#).

WB5KAN - General Class



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Best Bet

I think it is significant, that the means of communications offered to the National Guard, for ALL emergencies, is of course H.F. radio, something I have advocated from the beginning as the best frequency area for comms in the worst case situations. Of all the frequencies available, if I had to choose only one after any major EMP disturbance it would be in the low HF, i.e. ham short-wave area.

1. Because these frequencies are not dependent only on skip from the ionosphere, in fact they have an excellent ground wave ability, which should remain in place even during ionosphere disturbances.
2. There is by far the best chance of finding others to talk to on ham frequencies due to hams having the ability to jury rig an antenna, or fire up a transmitter from raided parts from an old TV set. I once made a series of transmissions around the world with a H.F. transmitter connected to a tree, certain trees are better than others, but most will do it! Almost anyone can do it. I can provide a full article if need be.
3. A lot of hams still know Morse code. A Morse transmitter is even easier to build from an old TV set than a voice modulated transmitter. A one valve A.M. transmitter operating in the low end of HF, say 80 meters, should be built now. As I have done, it will transmit around the world, and needs no shielding from EMP as valves are not particularly sensitive to EMP. That is why all soviet and Chinese fighter aircraft had valve devices instead of solid state. Plus if you are worried about EMP then you can easily unplug a valve, and store that in protection (or store a spare) rather than the whole radio.
4. Contact with the ham fraternity in your area would be a good idea, these people are usually very resourceful, and in the main will freely give time to helping others and helping in emergencies.

Offered by [Darryl](#).



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Long Distance

HF radio may well be useful, using either voice, cw, or digital in the last year or months before the pole shift if there is disruption of the Internet. Post pole shift HF radio will probably be useless for long distance communication due to the changes caused by changes to the upper atmosphere by the 12th's passing. Who knows how long it will take before things up there settle down to the extent that HF propagation as we know it will be able to again exist. Along the same line, our satellites will no longer exist, so no long distance VHF/UHF communication that way either.

Offered by [Ron](#).

WB5KAN - General Class



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Ionosphere

The upper atmosphere and most probably the Ionosphere will be disrupted and swept away at the time of the passage of the 12th planet. However, the Ionosphere will be rebuilt in a matter of days to weeks. To the best of my knowledge X-rays and other ionizing radiation from the sun are constantly rebuilding the ionosphere. After the pole shift the ionosphere may be closer to the ground than it is now but I see no indication that it will not come back. Even if it is disrupted for a month or two I don't consider this a problem to the use of conventional short wave. Since this is a critical assumption we may want to confirm this with the Zeta's.

Offered by [Mike](#).

Disruption of *all* communications occurs for some weeks shortly after the pole shift, due to the turmoil the Earth has undergone on all levels. By the time radios are working again, and by this we mean are not just delivering static, the ionosphere will indeed be rebuilt.

ZetaTalk

I have no idea of how long it would take to rebuild the ionosphere, although I would expect that it would be rebuilt. As you state, it would probably be closer to ground level and thus would not support as long a distance communication path as it does now; although there is such a thing as multi-skip where the signal travels from the transmitter, is refracted back to earth by the ionosphere (1st), is bounced from the earth back to the ionosphere, and is refracted back to earth again where it could be received at a much further distance than any single skip. In fact, during the peak of an 11 year sunspot (storms on the sun surface) cycle, it is not unknown to be able to transmit a signal, and then after a short wait, be able to hear that same signal after it has traveled completely around the globe in this manner.

Offered by [Ron](#).

WB5KAN - General Class



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Moon Bounce

The only long distance communication mode that I see possible post pole shift that is currently practiced by a few well equipped hams is moon bounce. It works exactly like it sounds. You transmit your signal at high power (2000 watts) using a very high gain and narrow beam width antenna system at the moon. The signal travels to the moon, bounces back, and is received by anyone else that can also see the moon. Of course, the receiving station requires the same sort of equipment as described before. This is pretty exotic stuff compared to your normal, everyday ham setup; but it can and is being done every day by the few that are into it.

You can get a good idea of the [State of the Art](#) in moon bounce, but note that this web site isn't quite up to par as the initial links that are inside the main page don't seem to work, but just keep scrolling and you'll find some really interesting stuff, including pictures of the required antenna systems and recordings of actual moon bounce signals. All the signals I've listened to so far use CW (Morse code) and are very weak compared to the noise level, but the time domain signal analysis photos indicate that the signals are quite strong enough for digital modes.



You will also find that there are a tremendous number of hams actually using moon bounce on a regular basis. They seem to be sticking to the mode of CW, which is, by the way, the *best* mode for any type of weak signal work. The mind is still the best computer.

Offered by [Ron](#).
[WB5KAN](#) - General Class



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Meteor Trails

Meteor Trails Are Being Used As Cheap Alternative To Satellite Systems

From *New Scientist*, by Barry Fox, 15th August 98, page 17

A communications system developed to keep the US military talking after a nuclear war is now helping a private ambulance company monitor the movements of its vehicles. During the Cold War, the US military developed a method of sending data by bouncing radio signals off meteor trails. Every day more than a million specks of dust enter the Earth's atmosphere from deep space and burn up, leaving trails of particles. Amateur radio operators had noticed in the 1920s that they could bounce signals off these trails. Although the trails last only a few tenths of a second, there are so many that at any given time there are usually enough for a ground-based transmitter to work with.

The high cost of developing the "Meteor Burst" system meant that the project was cancelled when the Cold War ended. The scientists who worked on the system left to set up a Seattle-based company called **StarCom Technologies**, which has developed a civilian version as a cheap alternative to satellite systems. StarCom transmitters continually send probe signals to test for reliable reflections. When a return signal is sensed, the transmitter sends out a rapid burst of digital data at frequencies between 40 and 50 megahertz that can be picked up over a wide area. The data transfer rates are low, up to 20 kilobits per second, and transmission time is limited to a few hundred milliseconds per meteor, but this is sufficient for uses such as monitoring vehicles' positions.

This is the purpose for which the system has been tested by a private ambulance company, **American Medical Response** (AMR), which ferries patients all over Washington State and Oregon. After successful tests of prototypes over the past six months, the company this week began fitting StarCom transceivers to a quarter of the 80 vehicles it uses to serve Seattle and the surrounding area. All the ambulances are fitted with a global positioning satellite receiver as well as a StarCom transceiver, allowing them to continually report their position back to AMR's Seattle control room. The system enables the company to keep track of where an ambulance is and whether it has a patient on board. "We crosschecked the StarCom data with our own computer mapping and feel pretty confident that it is hitting the mark," says Greg Sim of AMR.

StarCom now wants to hide transmitters in vehicles that will automatically send out a signal if the vehicle is stolen. The system could also be used to interrogate measuring instruments in remote areas. "We are using the satellites which nature provides for free," says Guy Rosbrook, StarCom's chief executive and a former Meteor Burst scientist. "There are so many meteors that you can regard the sky as a wide-area cracked mirror."



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Recommended

As far as meteor trail propagation goes, I personally have a good bit of experience. Yes, they work *great*; especially around 50MHz (6 mtrs). This mode of propagation has been utilized by Hams for many many years. The only problem in a survival situation is: *when will you know the meteors will be there?* Without them there is only background noise. Today, we know because major meteor showers are known well in advance and even announced on WWV; but in the Aftertime it would be an effort in frustration.

However, it does occur to me that during the time period of the 12th's passing, when most other propagation will probably be disrupted, the debris (meteors) that tag along with the 12th planet will probably be bombarding the earth's atmosphere at a never before recorded rate. Meteor scatter propagation would then be fantastic! The thing to remember is that this mode works best from 50Mhz through around 146MHz. With the intensity that I would anticipate, one could probably even use the 10 meter band (~28MHz) and even the CB channels - 11 meter band.

From a broader context, the system made by StarCom has *not* been explored extensively by HAM radio; although *all* the components of such a system are in common use every day. A 6 mtr (50MHz) transceiver connected to a packet system and computer could very easily mimic the system marketed by StarCom. The computer could be set up to key the transmitter, say once a second, then listen for an echo. When the echo is heard, the computer would cause a packet to be transmitted and then listen for an acknowledgement from other systems. This would continue until all systems on the network had received the packet correctly. Then the next packet in the queue would be up for the next opportunity. Such a system would be EXTREMELY slow; but for high priority messages could be very reliable and have an extremely large range of coverage, even around the world! I consider this to be a fantastic concept!

I think that this is a good example of you good people continuing to plug away at the problems and suddenly a solution pops forth. Great work! Check out the Amateur Radio Handbook for a most comprehensive discussion of this mode of propagation. Hams have undoubtedly made hundreds of times more radio contacts via this mode of propagation than all other entities combined.

Offered by [Ron](#)
WB5KAN



Troubled Times



Ground Wave

So far, we have talked about using packet, VHF/UHF frequencies and utilizing repeaters to communicate between communities that are relatively close to one another. There is a simpler and less expensive alternative that would not require elaborate antenna systems and repeater systems that could be utilized for communities, say, two or three times the distance of the horizon (horizon distance is about 20 miles).

That is to use HF transceivers at low frequencies of 1.5 to 4 MHz. At these frequencies there is almost always a secondary propagation called ground wave. That is, the signal follows the curvature of the earth for some distance. These signals could also be voice, CW, or digital.

The primary disadvantage of this mode is that interference and noise is frequently caused by lightening from thunderstorms. Today, pre pole shift, this noise can be extreme because a thunderstorm hundreds of miles away causes noise signals that are propagated via the upper atmosphere. Post pole shift, that mode of propagation would probably be gone, at least for quite a while, and we would only be interfered with by local thunderstorms (lightening). In any case, using modern radios with DSP (digital signal processing) to filter out the noise, and by using digital (Internet-like) communication modes that keep repeating the packet until it is received properly and acknowledged, this relatively close intercommunication would be quite reliable.

Offered by [Ron](#).

[WB5KAN](#) - General Class



Troubled Times



Hams

This is a web sight that we were refered to from the class I recently attended. Tons of info on communications and Ham radio. [AC6V](#): *Amateur Radio and DX Reference Guide*, Communications World Wide, featuring 88 pages and over 3,000 links to DX and Ham Radio.

Offered by [Clipper](#).



Troubled Times



Meteor Storms

Satellites to be "Sandblasted" by Leonid Storm

The Aerospace Corporation, El Segundo, California

June 8, 1998

Dr. William H. "Bill" Ailor of The Aerospace Corporation told a congressional subcommittee in Washington May 21 that the estimated 500 satellites on orbit "will be sandblasted" by the Leonid meteoroid storm due November 17. But he said the effects on spacecraft are expected to be minimal, despite the fact the storm "will be the largest such threat ever experienced by our critical orbiting satellite constellations." Ailor, director of the Center for Orbital and Reentry Debris Studies established last year at The Aerospace Corporation, presented his testimony during a hearing titled "Asteroids: Perils and Opportunities." He was invited to appear before the Subcommittee on Space and Aeronautics, a panel of the House Committee on Science, by U.S. Rep. Dana Rohrabacher (R-Calif.), subcommittee chair.

"It is possible," Ailor told the subcommittee, "that some satellites will be damaged, but the most likely source of damage will not be from a rock blasting a hole in a satellite, but rather, from the creation of a plasma, or free electric charge on the spacecraft. The charge could cause damage to computers and other sensitive electronic circuits on board the spacecraft, and ultimately cause the spacecraft to fail. For example," Ailor said, "during the 1993 Perseid meteor shower, it was determined that the Olympus communications satellite was damaged by a meteor strike and went off the air shortly thereafter as a result of an electrical failure." Ailor pointed out that, "The latest information on the coming Leonid meteoroid storm was presented at the Leonid Meteoroid Storm and Satellite Threat Conference sponsored by Aerospace and the American Institute of Aeronautics and Astronautics in Manhattan Beach, California, on April 27 and 28.

"The primary recommendations from the conference," Ailor reported, "were that, while it is very unlikely that the storm will have any major effect on satellites, the 'A-team' of controllers should be on duty during the ... storm, and operators should check the state of health of their satellites frequently, looking primarily for electrical anomalies and glitches. It was also recommended that, if possible, satellites be oriented so that sensitive components are shielded from the oncoming stream of particles, and that recovery plans be in place should there be a spacecraft system failure during the storm." Ailor said Aerospace collected information on spacecraft anomalies experienced during the 1997 Leonid shower and will be collecting similar information for the 1998 and 1999 events. "This information will help us plan for the 1999 Leonid and future meteoroid storms. It may also help us to understand whether additional safeguards against the meteoroid impact threat should be included in future spacecraft designs," Ailor said.



Troubled Times



Solar Flares

Loss of Contact with the SOHO Spacecraft

(adapted from *SOHO-News*), 26 June 1998.

During routine maintenance operations, ground controllers lost contact with the SOHO (Solar and Heliospheric Observatory) spacecraft and the satellite went into Emergency Sun Reacquisition (ESR) mode. The ESR mode is activated when an anomaly occurs and the spacecraft loses its orientation towards the Sun. When this happens, the spacecraft automatically tries to point itself towards the Sun again by firing its attitude control thrusters under the guidance of an onboard Sun sensor. Efforts to re-establish nominal operations did not succeed and telemetry was lost. Subsequent attempts using the full NASA Deep Space Network capabilities have so far been unsuccessful.

ESA and NASA engineers are continuing with the task of re-establishing contact with the spacecraft. The SOHO mission is a joint undertaking of ESA and NASA. The spacecraft was launched aboard an Atlas II rocket from Florida on 2 December 1995 from the Cape Canaveral Air Station. Mission operations are directed from the control center at NASA Goddard Space Flight Center in Maryland, USA. In April 1998 SOHO successfully completed its nominal two-year mission to study the Sun's atmosphere, surface and interior. Major science highlights include:

- the detection of rivers of plasma beneath the surface of the Sun;
- the discovery of a magnetic 'carpet' on the solar surface that seems to account for a substantial part of the energy that is needed to cause the very high temperatures of the corona, the Sun's outermost layer;
- the first detection of flare-induced solar quakes;
- the discovery of more than 50 sungrazing comets;
- the most detailed view to date of the solar atmosphere;
- spectacular images and movies of Coronal Mass Ejections, which are being used to improve the ability to forecast space weather.

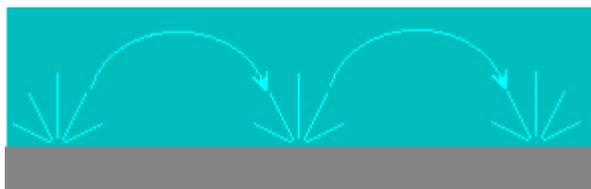


Troubled Times



Radio Relay

By utilizing such a setup, *both* communities relatively close, and those too far separated for use of other modes could communicate. We could actually construct a *real* Internet, web pages and all, using this mode if strategic sites are set up to mirror one another. They would exchange web updates, e-mail, etc. with other far distant sites (when the moon is just above the horizon for both sites for a short period of time). They could then forward this information to closer sites that couldn't make contact with the original station.



This sort of thing is from which the ARRL originally was named - **American Radio Relay League**. Stations that cannot communicate directly communicate via one or more relaying stations, where only two stations along the path can communicate at any given time.

This has been done (for messages like telegrams) on a formal basis every day since WWII by the NTS (**National Traffic System**) within the US, and similar organizations of volunteers in practically every other country. This existing system of hams relay messages around the world completing two cycles each day of the year. The NTS and it's cousins in other countries is able to accomplish this today because of the number of participating hams, and the current ability to communicate across the oceans using propagation that now exists so there is no need to resort to something like satellites or moon bounce.

Post pole shift, none of these essential factors will exist - not many hams and no long distance propagation. But the moon will still be there, and with that resource I think it can be done.

Offered by [Ron](#).
WB5KAN - General Class



Troubled Times



VHF Internet

There is no doubt the ham community can set up internet type links especially via VHF, packet radio and repeaters, ie *no* satellites, *no* land lines, *no* cable and in very short time. The infrastructure is in place in Australia, known as WICEN, and this organisation regularly provides emergency communications when everything else is down. A link with this community is a must for Troubled Times, and with the purpose fully explained expect real support and some amazing knowhow, especially with the "Heath Robinson" emergency makeshift gear.

It is possible to build a packet radio to patch into a VHF transmitter and computer. Via ham repeaters "free" computer links and bulletin boards were in regular use long before anyone had heard of the internet. Today hams have taken this to an art form worthy of better understanding. A survival site should have a tower and a good VHF antenna that can work many stations simplex and many more via repeater. Web sites such as [Iphone](#) are available with pertinent information.

The way radio frequency propagation works is that with HF (high frequency, i.e. from 1 meg to 30 meg) most long distance short wave ham radio takes advantage of bouncing such radio frequencies off the Ionosphere. This is used for best long distance results, and a great favorite of hams, but these frequencies would not be useful with upper atmosphere interference. But VHF and UHF are much higher frequencies and do not bounce off the ionosphere - they go straight through it! Thus they are not so affected by disturbances in the upper atmosphere. My best guess is there might be some problems, but VHF would get through and UHF is even better.

A packet terminal node connector sits between the transmitter and the computer, and does not know what frequencies the operator is using any way. It is being used right now world wide with great results by tens of thousands of hams.

Authored by [Darryl](#).



Troubled Times



Packet Radio

Packet radio is easy to use as a means to communicate from computer to computer via VHF (a very popular ham radio medium, with low cost readily available transmitters of considerable power ie 100 watts).



Legally you need a ham ticket in all countries to own and operate a packet station, but that is not too hard to get especially as a limited ticket with out morse code will allow you to operate VHF ham radio. In the Aftertime there will not be too many radio inspectors running around. It is all plug and play stuff, i.e. a 2 metre VHF (or UHF or HF) radio transmitter, a TNC interface between the transmitter and the computer, some simple software readily available, your computer, and you are on the air.

As ham radio VHF repeaters are able to link packet stations, range is way beyond typical line of sight and distances of thousands of kilometres are available with absolute reliability. Plus of course with this medium it is all free, i.e. no service provider needed, no one controlling the transmission, and the way the software works is that each station is in fact a repeater and can function as a repeater for others. While you are in communication with other parties all that is needed is to know a path, type in the call signs and the soft ware makes all the connections.

I built up a packet TNC in 1984. Even then we were using computers to communicate all over Australia via ham VHF. It is a much more sophisticated network now and completely independent of satellites and telephone lines or cable. Visit a local ham for a demo or check it out at a ham radio store and you will find "packets" of info flying over the radio waves in a big way.

Authored by [Darryl](#).



Troubled Times



TNC

I communicate digitally using short wave and Windows 95 quite regularly. The ability to communicate digitally by radio transmission is *not* linked to the particular operating system used by the computer. It *is* linked to the possession on a device called a TNC (terminal node controller), which is a relatively inexpensive addition to the radio itself which connects the PC to the radio. One can even use a dumb terminal connected to the TNC to communicate digitally. What *is* relevant to the operating system is software that makes it easy to utilize the TNC and format/store the digital communication. Every manufacturer of modern TNCs has software available for the PC and usually the MAC. I'm not familiar with any manufacturer offered software for UNIX. There are, however, many software packages, either free or shareware, for *all* operating systems, including UNIX.

TNC stands for Terminal Node Controller. They are sold wherever Amateur Radio equipment is sold. There are hundreds of retail outlets across the country and many different companies that manufacture them. Here is an example; there are several other manufactures:

MFJ-1276 - HF/VHF TNC - 139.95
MFJ-1278B - DSP, 10 digital modes, GPS compatible - \$379.95
from
MFJ Enterprises, Inc.
Box 494
Miss. State, MS 39762

The largest retail outlet for all Ham Radio equipment is:

Ham Radio Outlet (with 12 locations, all of which do mail order)
933 N. Euclid St.
Anaheim, CA 92801
(800) 854-6046

Offered by [Ron](#).



Troubled Times



Scheduled

Schedules would have to be a necessary part of any moon bounce system, especially for very distant contacts; both parties have to have line-of-sight to the moon. It's also just plain convenient, you don't have to be listening all the time; although when using digital modes, most TNCs (Terminal Node Controller, the interface between the radio and the computer) have an e-mail box feature so you can connect to that station, give it e-mail, and disconnect. In addition, while a station could listen all the time, transmission would impose a very large drain on the site's power system so you don't want to be transmitting much.

An encryption scheme may also be useful as the government types will probably be using the same mode for their own intercommunication. Any practice prior to the pole shift would have to be tested off line as encryption is now illegal for ham radio operations.

Offered by [Ron](#).

[WB5KAN](#) - General Class



Troubled Times



Repeater Issues

Repeater nodes using VHF have several drawbacks:

1. Their associated towers must be built and will be easily detected by undesirables; accept in the case where one is close to the mountains where short towers would work just fine.
2. The repeater equipment must be maintained, thus necessitating trips from the settlement to the repeater site - another opportunity for running into undesirables.
3. The repeater must be powered by some means. Of course, it will run directly from batteries; but there must also be some means for recharging the batteries. That means either another wind generator, hydroelectric generator, or photovoltaic arrangement, if there is enough light energy.

For VHF communications, it may be much better to set up a very good antenna system that can be rotated to point to the desired receiving settlement, and transceivers at the settlements so that direct settlement to settlement communications would take place. Add to that a message relay protocol (manual) and longer distance communications could be effected. No matter how you look at it though, any settlement is limited to radio communications with other relatively closely located settlements. At this point, in my mind, only moon bounce still holds out something of a promise for really long range (and short range) communications.

Offered by [Ron](#).

[WB5KAN](#) - General Class



Troubled Times



Alternatives

Short wave communication using digital techniques is *not* necessary for simple communication; voice and CW (Morse code) work just fine. Where digital communications becomes the best (or only practical) solution is when one site has in it's possession, say, a medical textbook. Large amounts of text or graphics cannot be transmitted in any other way. I could list many more examples. In my opinion, attempting to reconstruct something like the internet isn't necessary, nor is it practical for many years after the post office.

I think communities will form a system something like the old telegraph office, where an individual wishing to communicate with, say, a loved one in another community will go to the "telegraph (radio)" office and fill out a form indicating what they wish to say. If voice communications can be established between the sites, a system could be worked out much like the current MARS (Military Affiliate Radio System) system that allows service personnel to talk on a radio at their end while a ham radio operator stateside connects his radio to a telephone (using a device called a "phone patch") and calls the stateside phone number collect. This allows individuals to schedule a time when they can actually speak to someone at another site.

PC to PC communications using HF radio is *slow* (digital HF communication is limited to 300 baud, VHF to 9600 baud, UHF can have very high baud rates, all constrained by bandwidth considerations) compared to what we are used to on the internet. As I stated above, I do not envision this as an internet substitute where everyone has a PC and radio; but as a community resource just like the power generation station.

Offered by [Ron](#).



Troubled Times



Ham Gateway

Internet/Packet Radio BBS Gateway
from the **Ham Radio Club** under Lifestyles on **America Online**

Q: Are there any gateways for mail or news between Internet and Amateur Packet radio?

A: **Jim Durham, W2XO**, maintains a gateway between Internet and the Packet radio BBS system.

TO MAIL FROM INTERNET TO A PACKET STATION:

1. Get the complete packet address of the station to which you wish to mail.
2. Replace the "@" in the packet address with "%".
3. Mail to the resulting address, adding "@w2xo.pgh.pa.us"

For Example:

Packet address to be mailed to:
W2XXX@W2YYY.LI.USA.NOAM

Mail to:
W2XXX%W2YYY.LI.USA.NOAM@w2xo.pgh.pa.us

TO MAIL FROM PACKET TO INTERNET

1. I have to have a callsign or alias in my database for this to work.
2. Mail to that callsign or alias at the internet host "w2xo.pgh.pa.us"

For Example:

If W3AAA is in my database as "bromley@fudd.com".
Mail to: W3AAA@W2XO.#SWPA.PA.USA.NOAM

(The mail will be forwarded to "bromley@fudd.com".)

(NON-HAMS get "3rd Party Aliases" like "3PTY01", which will fit in the 6 character space of a ham packet header. These are used just like calls. If you are a non-ham, please ask for a 3rd party alias and I'll give you one.)

NOTE: ***VERY IMPORTANT*****!**

E-mail from non-hams to hams, or E-mail from ham to ham through the gateway, where the message enters the packet radio network at W2XO, from a country that does not have a 3RD PARTY TRAFFIC AGREEMENT with the US is illegal and could put my amateur radio license in jeopardy. A list of countries with 3rd party agreements with the US follows. Please don't ask to use the gateway if you are not either in the US or on this list. I regret this policy, but it is US Radio law.

Countries that share third-party traffic agreements:

V2	Antigua/Barbuda	V6	Federated States	HP	Panama
LU	Argentina of			ZP	Paraguay
VK	Australia	C5	Gambia	OA	Peru
V3	Belize	9G	Ghana	DU	Philippines
CP	Bolivia	J3	Grenada	V4	St. Christopher/Nevis
PY	Brazil	TG	Guatemala	J6	St. Lucia
VE	Canada	8R	Guyana	J8	St. Vincent
CE	Chile	HH	Haiti	9L	Sierra Leone
HK	Colombia	HR	Honduras	3DA	Swaziland
D6	Comoros	4X	Israel	9Y	Trinidad/Tobago
TI	Costa Rica	6Y	Jamaica	GB	United Kingdom *
CO	Cuba	JY	Jordan	CX	Uruguay
HI	Dominican Republic	EL	Liberia	YV	Venezuela
J7	Dominica	V7	Marshall Islands**	4U1ITU	- ITU Geneva
HC	Ecuador	XE	Mexico	4U1VIC	- VIC Vienna
YS	El Salvador	YN	Nicaragua		

*

Limited to special-event stations with callsign prefix GB (GB3 excluded) and informally to stations number on Pitcairn Island (VR6).

**

The Marshall Islands are independent, but the FCC currently honors the previous agreement until a formal agreement can be made.

The gateway can't be used to or from a country not on the above list.

Happy Gatewaying!

Jim, W2XO

Transmitted: 5/1/96 3:15 PM (HRC0066)



Troubled Times



Wireless Modems

Wireless plug and play modems that can be used up to 20-30 miles (30-50 KM) now exist on the market. These will only get better and cheaper as we approach the pole shift. There may even be better ways that show up before the pole shift. Operation is in the 900 MHz and 2.4 GHz ISM Band. Data rates of 56-2048 kbps. Cost is \$2-\$6,000 / modem. Higher speeds up to 10 Mb at 7 Miles with a cost of \$17,000 are possible. Modem names include - BreeseLINK, LATNET-Radio Data Links, AirLink Wireless Modems, and Open Minds. But it would take a lot of us to make an Internet world wide. I don't know how these things will hold up under the EMP (electro-magnetic pulses) and other noises during and after the pole shift.

Some interesting components are available now and will be evolving in the next few years that could be used to put together a private wireless network whether it be only for local communities or possibly to connect larger areas. Time will tell the extent of the usefulness of these components.

Offered by [Mike](#).

The Faster Web

PC Magazine (Vol. 18 No. 8 April 20 1999)

Terrestrial microwave, will hit its stride in the next few years. Companies such as Teligent and WavePath already use microwave transmissions from small antennas to provide local Internet access, but the availability of this technology is very limited. These companies aim primarily at small and growing businesses that need flexibility and low investment costs. Many offer packages that include remote access, virtual private networks, and telephone service.

Service providers include Advanced Radio Telecom, NextLink Communications, Teligen, WavePath Communications. Installation cost negotiated according to services used. Speeds vary up to 4 Mbps, generally up to 1.555 Mbps. Requires no phone line or any other wires. Voice phone service can be chosen while the line is in use with data communications. Requires an out-side antenna.

Broadband Wireless - The Dawn of a New Era

Factors affecting a system's performance include rain fading, line-of-sight requirements, and free-space path loss. Fading due to rain and snow in the so-called millimeter-wave frequencies dictates that the cell radius is a maximum of three to five kilometers. A second factor affecting performance is the line-of-sight requirement for broadband wireless systems. Note: This technology will not replace the need for Ham radios only supplement it with additional possibilities.



Troubled Times



Microwave

Wireless [Microwave Internet](#) Access Coming Soon

Boston Globe, Dec 2, 1999

Microwaves, best known for their use in the kitchen, are poised to become the latest wireless technology for beaming Internet and phone service into homes and small businesses. In a briefing for reporters yesterday, **Cisco Systems Inc.** of San Jose outlined what it says will be the next generation in Internet and phone access, which it will debut next year. Using low-frequency microwaves, Cisco executives say their equipment can deliver high-speed Internet connection, teleconferencing, or telephone service - without wires or cables. All that is needed by the user is a special antenna and a box the size of a large notebook with multiple jacks to plug in computers and phones. The services would be transmitted via base stations installed throughout a city or neighborhood.

Such access offers several advantages over current options, such as cable modems, telephone dial-up access, or digital subscriber lines, or DSL, analysts say. It moves consumers away from cumbersome wires, and it's less expensive to install than cable or fiber. "It's cheap, and it's fast," said Howard Anderson, chairman of the Yankee Group in Boston. "I don't have to dig up your street to lay down cables. All I need are a couple of transmission towers. That's why this technology is being used." In addition, wireless broadband access has two to 10 times the range of DSL, which can only be installed within three or so miles of a central station. With wireless broadband frequencies, service can be provided as far as away as 30 miles if the line of sight between the user's antenna and the base station is unobstructed.

If obstructed by objects such as trees or buildings, the range drops to six miles, according to Greg Raleigh, a director of engineering at Cisco, and the scientist who helped develop the technology through a company called Clarity Wireless of Belmont, Calif. Cisco purchased Clarity in 1998 for \$157 million. Because of its reach, broadband wireless technology can beam high-speed connections via microwave bands to places where wires would be difficult or uneconomical to install, such as across rivers or canyons. That potentially opens the Internet gates to millions of new users, said Donald Listwin, executive vice president of Cisco. As of July, 37.4 percent of the US population had Internet access, according to Nielsen Net Ratings, leaving more than 160 million Americans who have yet to sign up for Internet access. Of those who have Internet access, few have high-speed "live" connections that are always on, like telephone dial tones. That leaves the vast majority of Americans as potential subscribers to Cisco's nimbler wireless alternative. "Wireless is hot this year," said Chris Stix, managing director of SG Cowen Securities Corp. in Boston.

Cisco, generally known as a supplier of Internet equipment, will not be in the business of selling Internet or phone access. Instead, starting next week, Cisco will sell the technology to companies that want to provide the service, from large telecommunications firms to niche entrepreneurs. Because the use of these microwave bands does not currently require licenses from the Federal Communications Commission, small companies can more easily jump into the business of providing Internet access by simply purchasing and installing Cisco equipment, which starts at \$150,000 for a base unit that can support up to 3,000 simultaneous, active Net users. Though it has yet to receive orders for its new product, Cisco is predicting it will sell more than \$3 billion in wireless equipment next year. Though that amount is just a fraction of Cisco's annual revenue of \$12.2 billion in fiscal 1999, sales of its broadband wireless equipment are expected to grow rapidly, topping \$7 billion in 2003, said Steve Smith, a director of marketing for Cisco.



Troubled Times



Radar Transmission

There are some promising possibilities using moon bounce that are not widely practiced today by ham operators. I'm thinking of a system I thought of almost 30 years ago that makes use of radar equipment for transmission/ reception/ antenna; but allows much more radiated power than conventional CW equipment. I ran across one internet site operated by a university that was doing experimentation with just such a system, but haven't had a chance to do much more than recognize what they were working on - more on that to come.

Offered by [Ron](#).

[WB5KAN](#) - General Class



Troubled Times



Cost Effective

In my opinion, use of wireless modems would be very much too expensive and much less effective than what has already been proposed. The equivalent VHF/UHF total setup can be produced for less than \$1000 and be *much* more effective because the transmission power for wireless modems is very low and there is virtually no antenna or antenna height; whereas the ham radio setup could use from 100 to 1000 watts transmission power, and a high gain antenna system placed atop a tower - all of which would increase the distance for communication.

The VHF/UHF solution, however, is still limited to communities in close proximity and is useless for distant communities; except for the case of moon bounce.

To produce a complete station for around \$1000, would involve the use of used equipment that can be picked up at any of the many hundreds of ham fests that occurs around the country every year, most in the summer months. The most important component of any moon bounce system, the antenna, would be built by hand.

Offered by [Ron](#).

[WB5KAN](#) - General Class



Troubled Times



GWEN

The military starting in about 1985 implementing a low frequency (approximately 174kHz) ground wave emergency network (GWEN). This is currently managed by TG-2 Minimum Essential Emergency Communications (MEECN) with about 58 towers completed to date (240 planned). The initial stated purpose was to be used in case of high-altitude detonation of a nuclear device. About \$500 million has been currently spent. "Airforce I" is reported to have an antenna for use of GWEN. A 180 page study was completed in 1993 at the request of US Air Force, and Congress, that sells for \$33.00. This is an assessment of the potential [Health Effects](#), or lack of effects, associated with the deployment of the GWEN system. The public began to strongly resist and construction stopped for a while in the early 1990s. The following is some Internet references.

Summary: With the military considering GWEN as minimum essential communications what does that tell you. What do you bet GWEN is not used during and after the pole shift by some one. I suspect an emergency ham network could be developed along these lines using a more optimum (for us) frequency. Not quite so low.

Offered by [Mike](#).



Troubled Times



Common Use

The Zetas were asked their opinion:

Certainly in the Aftertime there won't be any satellites in the sky, and even with the occasional satellite that a determined leftover from the great powers might put up into the sky, this will *not* be enough to support communications as today. Many satellites, with a network on Earth working in concert, is needed.

Short wave has the advantage of being much in use and in the common man's hands, inexpensive, and easy to understand. Thus, a network based on this technique would have a head start in that there would be no weak links, but rather more than enough links. Short wave, used as extensively as it is worldwide, is a vehicle that will win the race over the next 5 years in preparing for global communications during and after the cataclysms. It is well known that during disasters *now* that those using short wave frequently locate the distressed, get the message to the authorities, and keep communications open *more* than the avenues officially espoused. The reason for this is thus:

1. short wave is open to be used by amateurs,
2. the equipment is not expensive,
3. the know-how to use the equipment is not beyond the reach of the common man,
4. short wave, by whatever name called, has propagated worldwide.

The Moon has not left your skies during past severe pole shifts, nor will it leave this time. A well orchestrated Moon Bounce will leave the world pulling in transmission in an Internet fashion during certain hours, rather than on a 24 hour availability mode. This is workable, but beyond this, this is what will win the race.

Technology such as VLF, where just as feasible, has drawbacks on all these fronts, and this situation is not likely to change over the next few precious years. Nor is there any other technology that mankind currently has in their possession that would rival short wave for scope, familiarity, and workability. Microsoft's satellite system or VLF or whatever other mechanism is planned or offered up will *not* replace a working system that is used by tens of thousands and is quite frankly held in affection by those who have come to realize its vast reach and reliability.

ZetaTalk



Troubled Times



CB

Instead of complicated stuff, what about the ol' citizen's band radio or CB? Everybody has one of those. I have three. Good for local anyway. And 12 volt. Very inexpensive.

Offered by [Clip](#).

I think it would be a very good thing to have. Although they only pick up stuff at relatively close range, any roving groups will surely be using scavenged radio equipment. CB and police equipment would be the most commonly used by such groups I would expect.

Offered by [Ron](#).

WB5KAN - General Class



Troubled Times



Radio Frequencies

After a pole shift radio could be the only method of communication. Knowing what frequencies to use becomes vital. If one listens or calls on a frequency that other are not using then no contact will result. It becomes desirable to predict what frequencies to use after a PS. The frequencies in most use today could be the best to use after a Pole Shift. So the question becomes what are the emergency and most commonly used calling frequencies today? This report details the primary frequencies on all bands that could be usefully after a Pole Shift.

Frequency MHz Commonly used and Emergency Calling Frequencies

1.8100	Ham HF QRP CW Calling (QRP = Low Power Transmitter 5 watts or less output)
1.9100	Ham HF QRP SSB Calling (HF = High Frequency)
2.1820	Ham HF International Maritime Distress Frequency
3.5600	Ham HF QRP CW Calling
3.5800	Ham HF QRP CW Calling
3.8850	Ham HF AM Calling
3.9850	Ham HF QRP SSB Calling
7.0300	Ham HF QRP DX CW Calling
7.0400	Ham HF QRP CW Calling
7.2850	Ham HF QRP SSB Calling
7.2900	Ham HF AM Calling
10.1060	Ham HF QRP CW Calling
14.0250	Ham HF CW DX Calling
14.0600	Ham HF QRP CW Calling
14.1950	Ham HF DX Calling
14.2850	Ham HF QRP SSB Calling
14.2860	Ham HF AM Calling
21.0600	Ham HF QRP CW Calling
21.2950	Ham HF DX Calling
21.3850	Ham HF QRP SSB Calling
27.0650	CB AM Ch-9 Emergency Channel
27.1850	CB AM Ch-19 Unofficial Highway Channel
27.3850	CB AM Ch-38 LSB, National calling frequency
28.0600	Ham HF QRP CW Calling
28.3850	Ham HF QRP SSB Calling
28.4000	Ham HF CW Calling
29.0000	Ham HF AM Calling
29.6000	Ham HF FM simplex
34.9000	Used nationwide by the National Guard during emergencies.
39.4600	Used for inter-department emergency communications by local and state police forces.

47.4200	Used across the United States by the Red Cross for relief operations.
50.1100	Ham 6 Meter DX Calling
50.1250	Ham 6 Meter SSB Calling
50.4000	Ham 6 Meter AM Calling
52.5250	Ham 6 Meter FM Calling
121.5000	International Aviation Emergency Frequency
138.2250	Prime disaster relief operations channel used by the Federal Emergency Management Agency
144.0500	Ham 2 Meter DX CW (Europe)
144.2000	Ham 2 Meter CW and SSB common Calling
144.3000	Ham 2 Meter DX CW/SSB (Europe)
144.5000	Ham 2 Meter FM Calling (Europe)
146.5200	Ham 2 Meter Ham FM General calling and emergency and wilderness protocol
146.5500	Ham 2 Meter Ham FM Simplex National Emergency Frequency
151.6250	Used by "itinerant" businesses, or those that travel about the country.
154.2800	Used for inter-department emergency communications by local fire departments; 154.265 and 154.295 also used.
154.5700	Used itinerant business channel. Circuses, exhibitions, trade shows, sports teams. 154.600 also used.
155.1600	Used for inter-department emergency communications by local and state agencies during search and rescue operations.
155.4750	Used for inter-department emergency communications by local and state police forces.
156.4500	Ch-9 The boater calling channel.
156.8000	Ch-16 International maritime distress, calling, and safety channel. Heavily used on rivers, lakes also.
162.4000	Used for NOAA weather broadcasts and bulletins.
162.4250	Used for NOAA weather broadcasts and bulletins.
162.4500	Used for NOAA weather broadcasts and bulletins.
162.4750	Used for NOAA weather broadcasts and bulletins.
162.5000	Used for NOAA weather broadcasts and bulletins.
162.5250	Used for NOAA weather broadcasts and bulletins.
162.5500	Used for NOAA weather broadcasts and bulletins.
163.2750	Used for NOAA weather broadcasts and bulletins.
163.4875	Used nationwide by the National Guard during emergencies.
163.5125	The national disaster preparedness frequency used jointly by the armed forces.
168.5500	The national channel used by civilian agencies of the federal government for communications during emergencies and disasters.
222.1000	Ham CW and SSB USA Calling
223.5000	Ham FM USA Calling
243.0000	Used during military aviation emergencies.
259.7000	Used by the Space Shuttle during re-entry and landing.
296.8000	Used by the Space Shuttle during re-entry and landing.
311.0000	An active in-flight channel used by the U.S. Air Force.
317.7000	An active channel used by U.S. Coast Guard aviation.
317.8000	An active channel used by U.S. Coast Guard aviation.
319.4000	An active in-flight channel used by the U.S. Air Force.

340.2000	An active channel used by U.S. Navy aviators.
409.6250	National communications channel for the Department of State.
432.1000	Ham CW and SSB USA Calling
446.0000	Ham FM Simplex USA Calling
462.5625	Citizens FRS/GMRS Ch-1 commonly used Calling Frequency
462.6750	Citizens GMRS Ch-20 Emergency Communications and Traveler Assistance
902.1000	Ham SSB USA Calling (weak-signal)
1294.5000	Ham FM USA Calling
1296.1000	Ham SSB USA Calling
2304.1000	Ham USA calling
2305.2000	Ham FM Simplex USA calling

Some of these frequencies will be more valuable before a Pole Shift and would be dead after a Pole Shift. Some you might listen to but not want to transmit on. The lower the frequency the longer the distance it can be heard. Use whatever frequencies your radio equipment is capable of. A low cost, low-power radio-scanner can be programmed with these frequencies to do the monitoring. It also may be prudent to scan other frequencies once one knows what the locals are using. Program a scanner, test, and get familiar with your equipment before the Pole Shift. Before the Pole Shift once the call is established, a good operating practice is to move off keeping the calling channel clear. After the Pole Shift with very scarce contacts one may wish to stay on the calling frequency so that others have the possibility of hearing and joining in. One other suggestion for an emergency frequency is to have the person monitoring key the mic and say so every 10 minutes - "This is station XXX listening".

Offered by [Mike](#).



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Wilderness Protocol

The Wilderness protocol (see page 101, August 1995 QST) calls for wilderness hams to announce their presence on, and to monitor, the national calling frequencies for five minutes beginning at the top of the hour, every three hours from 7 AM to 7 PM while in the back country. A ham in a remote location may be able to relay emergency information through another wilderness ham who has better access to a repeater. Calling Frequencies: 52.525, 146.52, 223.50, 446.00, 1294.50 MHz.

Some scaled down version of this may work after the Pole Shift. Say include HF Calling frequencies and call only during mid day.

Offered by [Mike](#).



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Emergency Communications

References for further information on emergency communication:

Nat. EMERGENCY Frequency needed

<http://www.eham.net/articles/868>

Two meters from **Wikipedia**, the free encyclopedia

http://en.wikipedia.org/wiki/2_meters

National Frequencies Commonly used

<http://www.smlec.com/scanner/national.htm>

ARRL Band Plans

<http://www.arrl.org/FandES/field/regulations/bandplan.html>

Amateur Radio Band Plan Layout (Good to print. Print this Frequency List out and keep it with your radio equipment to use as a reference.)

<http://www.dxzone.com:80/cgi-bin/dir/jump2.cgi?ID=11733>

Amateur Radio Emergency Service ARES Field Resources Manual

<http://www.arrl.org/FandES/field/aresman.pdf>

The Town of Babylon Amateur Radio Emergency Services

<http://www.tobares.org/>

<http://www.tobares.org/training.html>

Offered by [Mike](#).



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Possible EMP

Somehow I don't expect the passing of the 12th's magnetic field's impact on the earth's core and the core's abrupt movement will have much if any impact as it will be *relatively* slow; but EMP is another matter. EMP, should it occur, would do a number on all matter of electronics inside the computer and, I expect, magnetic media as EMP is very strong and is a *short* burst. Where did all the talk about EMP come from anyway? I suspect from expectations of detonation of nuclear warheads during the pole shift; however, a ground burst *does not* produce EMP (at least over a wide area). It is produced by high altitude bursts.

Offered by [Ron](#).

One thing to keep in mind if the pole shift happens quickly enough or a strong electromagnetic pulse from the sun occurs (Gordon Michael Scallion), any electrical object with an inductive load, among other things, could be destroyed by the magnetic pulse creating strong electrical current. Depending upon how well computers survive, it would not take much to at least wipe out your hard drive, diskettes, *and* any backups you might have.

Offered by [Steve](#).



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Magnetic Fields

Magnetic fields either emanate out from a permanent magnetic source, such as a permanent magnet or they are momentarily created by raising or falling electric fields. The 60 Hz A/C electricity coming into your house on wires or the 600 Kilo Hz radio signal coming into your AM radio through the atmosphere, are being propagated as electromagnetic waves. Waves penetrate things that they are able to pass through and are deflected or absorbed from things that they can't pass through. Here shielding can be useful.

Offered by [Educate-Yourself](#).



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Defense Dept.

If you think the Government isn't preparing for the pole shift, then check this out.

Offered by [Clipper](#).

Technology to Counter ElectroMagnetic Threats to the Civilian Infrastructure

July 7, 1999

The Defense Threat Reduction Agency (DTRA) proposes to acquire through full and open competition, services (a) to evaluate and apply network modeling tools to specific infrastructure sectors supporting critical DOD functions, to determine the operational impact when exposed to various nuclear and non-nuclear electromagnetic (EM) environments, and (b) to develop a methodology for mitigating or reducing the impact and a plan for restoring and reconstituting the civilian infrastructure. The specific objectives of this two phase effort are to apply the network modeling tools, functional models, threat-relatable EM scenarios, EM effects models, impact methodology and restoration plan developed in Phases 1 and 2 to a case study on a specific city, metropolitan region, or geographical area in the US, selected by the government. It is expected that the security standard will be Secret. The contract will be for a base period of three years, with three additional options (presently not funded) to run for a total of two additional years.



Troubled Times



Self Test

Here are two experiments you could try out for yourself, one with a permeant magnet and a floppy the other with a bulk cassette tape eraser. Not everyone will have a bulk cassette tape eraser.

- The easiest test is to use a readable formatted floppy with some files copied to it. Find a large strong enough permeant magnet, so as to make the floppy un-readable when doing a preliminary air test. Place a piece of cardboard the same thickness as your steel, or copper plate (or best conductor being tested) between the floppy, and the magnet. This will insure a constant distance. Move the magnet around at between 1-10 cycles/second. Check for readability, if you can still read it, go find a stronger magnet. Once you have a strong enough magnet, then, test each shielding material checking the readability of the floppy after each test. This test can be done by anyone wanting to test the effectiveness of their shielding.
- The bulk tape eraser test gives a shielding comparison of different materials at one test ELF of 60 cycles/sec. This indicates a trend that says Iron-steel is many times better than Aluminum at this frequency. A Fourier series analysis of any given "asymmetric pulse" to find the amplitude and frequency of all of the harmonic components that make up the pulse would give the fact that: The lowest frequency component would have the highest amplitude. If we shield for that low frequency, then the other higher frequency components with the much lower amplitudes will not be an issue, being easily shielded using the same material.

Offered by [Mike](#).



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Magnetic Shield

The following has been quoted from *Frequently Asked Questions about Magnetic Shielding*

Provided by: **Magnetic Shield Corporation**

740 North Thomas Drive

Bensenville, Illinois 60106

Telephone: 630-766-7800

What is ELF?

ELF stands for Extremely Low Frequency and usually refers to magnetic fields at 0.5 to 100 Hertz. This range includes the 60 Hertz power line frequency commonly used in the United States. In other countries, the power line frequency might be 50 Hertz.

What is the difference between RF and Magnetic shielding?

Radio frequency (or RF) shielding is required when it is necessary to block high frequency - 100 kilohertz and above - interference fields. These shields typically use copper, aluminum, galvanized steel, or conductive rubber, plastic or paints. These materials work at high frequencies by means of their high conductivity, and little or no magnetic permeability. Magnetic shields use their high permeability to attract magnetic fields and divert them through themselves. Magnetic shielding alloys have the ability to become broadband shields, performing shielding of both frequency ranges, when properly constructed." Note well, this last sentence answers your request for confirmation.

Offered by [Mike](#).



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Viatech

For basic considerations and formulas about shielding at low intensity field levels can be studied at: **EMF Fundamentals** Copyright (c)1995 VitaTech Engineering, Inc. Written by Lou Vitale, President & Chief Engineer. Lou has an interesting statement:

After assembling a prototype, the design engineer measures the shielding factor (SF) and modifies the design (adds materials, additional layers, anneals bends, etc.) to achieve the maximum shielding requirements. This is a very iterative design process, from concept to final product. Shielding is more of an art than a science, especially when shielding very large areas and rooms from multiple, high-level, magnetic field sources. At this time there are no reliable design formulas or EMF simulation programs that offer design engineers practical guidelines for shielding large exposed areas from multiple, high-level, magnetic field sources.

Offered by [Mike](#).



Troubled Times



Army Corps

From *Chapter 9 EMP and Tempest Protection Concepts* of Pamphlet No. 1110-3-2 31 December 1990

U.S. [Army Corps](#) of Engineers, Publication Department,
2803 52nd Avenue, Hyattsville, MD 20781-1102.

For free copy of 469-page paper pamphlet, fax request to: (301) 394-0084

1. Purpose. This pamphlet provides unclassified engineering and design information about protecting fixed ground facilities against the effects of an electromagnetic pulse (EMP) produced by a nuclear explosion. It also provides unclassified engineering and design information about satisfying TEMPEST requirements.

b. Facility shielding. This method is by far the most common for high-level HEMP and TEMPEST protection. It maximizes flexibility since any standard equipment can be used inside the shielded facility. Facility shielding may be low-level or high-level (50- or 100-decibel) attenuation. HEMP shielding (100-decibel) consists of at least 3/16-inch welded steel (12-gauge walls and 10-gauge floors are recommended). TEMPEST shielding (50-decibel) consists of at least 22 to 26 gauge steel walls, floors, and ceiling with clamped joints.

Note: The lower the gauge number, the thicker the plate. The Ammo can is thicker yet at 21 gauge (.033"). 22 gauge is (.030") and 26 gauge is (.018"). So according to this we should achieve TEMPEST level of protection. They also have more information on how to build a [Shielded Room](#).

Offered by [Mike](#).



Troubled Times



Fundamentals

The following is taken from page 9-26 of *Handbook of Engineering Fundamentals* by Eshbach second edition.

Ferromagnetic substances including iron, steel, nickel, cobalt, and magnetic alloys, have relative permeabilities greatly in excess of unity. Under certain conditions the relative permeability of steel may exceed 2000.

All the other elements air included are close to a permeability of 1. Thus, at frequency of zero the comparison of the magnetic conductivity is over 2000 times that of other elements. What this means is the lines of magnetic force will try and stay within the ferromagnetic substance and not go back into the air unless it can help it. Thus, the easiest magnetic path from one side of box to the other is through the outer shell. This reduces the internal field strength thus the shielding effect. This does not happen with non-ferromagnetic substances like copper, brass, aluminum, lead and etc.

As the frequency rises eddy currents start gradually to take effect and the electrical conductivity properties begins to take over. By using a ferromagnetic substance that is a good conductor you have the best of both worlds some shielding at both high and low frequencies ELF.

Offered by [Mike](#).



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Grounding

For static discharge, the usually mode of protection is to connect together and ground all the electronic equipment, so that there's no opportunity or place for static voltages to build up. Anyways, to summarize: Use shielding to protect against wave generated magnetic fields and use grounding to protect from static discharge magnetic fields.

Offered by [Educate-Yourself](#).

Grounding is used when you want to keep the unit in operation. If you store it in a magnetic conductive and electrical conductive box then you have shielding for both electrical and magnetic damage to its contents.

Offered by [Mike](#).



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Lightning

The static discharges of lightning produce static interference on a AM radio that will overwhelm the reception of a station on a simple radio receiver. This is propagated electromagnetic waves from the lightning, stronger at the lower frequencies. Less amplitude at the higher frequencies. For big discharges near by - a low frequency electromagnetic pulse (EMP) is generated that could produce some large changing magnetic fields - this induces a strong current in any conductor present (the longer the conductor the higher the voltage) and in the past could potentially harm sensitive receivers and electronics equipment. This is not so much the case these days with the tougher hardened electronics available. However, to be safe some shielding could be used. So if sensitive equipment is hidden away in a highly magnetic and electrical conductive box then no current will be induced - thus the protection. This is just a bonus not the main thing we are trying to shield for.

Offered by [Mike](#).



Troubled Times



Shielding

At high frequencies "best conductors" are "best shielding". However, **Iron and steel** should not be underestimated they are not that bad a conductor compared to air. The electrical conductivity of iron is much much closer to Copper than air. So the shielding at high frequencies is not that bad for Iron. If you look into your TV or Radio you will often see iron or steel used as shielding for the RF frequencies. Note the tin plated iron box around the RF tuner section. Why, because it's cheaper and easier to use and works almost as well at high frequencies for the same thickness.

Note: **Copper and brass** screens are used in laboratories to build **Faraday's cages** to shield for electromagnetic noise. Why is this used? Usually the main interest is in shielding the higher frequencies and budget and availability are not an issue. Why use a screen over a solid plate - this is so the room can be made small and the lab technician doesn't get claustrophobia inside it. A thicker iron screen or plate would work just as well. Any conductor would work at higher frequencies as long as you adjusted the thickness to simulate what a good conductor like gold, silver, and copper can do.

Shielding results of testing **Aluminum compared to Iron** at 60 Hz:

I used a "bulk cassette tape eraser" that puts out a strong 60 cycle/sec electromagnetic field as a source transmitter. I took a coil from a transformer and hooked it to a volt meter as a receiver. Cardboard and several .2" thick plastic sheets were used as spacers on both sides of the test sample (centered) so that the distance from the source to receiver was the same (.5") for all tests. The voltage was measured for each test shielding material. The positioning of the receiver was adjusted for maximum voltage for each test. This turned out to be the centered on the source.

Measured voltage for each sample:

Air (cardboard) - measured 19.4 Volts AC

Aluminum (.100" thick) - measured 16.5 Volts AC

Iron ammo box (.032" thick) - measured 6.5 Volts AC

Note: The higher the voltage the more the amount of electromagnetic field that got through the sample.

Analysis of results: The **Aluminum** being 3 times thicker than iron only dropped the electromagnetic field by 2.9 volts as compared to iron dropping it 12.9 volts. This gives a net result of $(12.9/2.9) * 3 = 13.3$ times thicker aluminum would be needed to shield the same amount as the Iron (or steel) ammo box material. I didn't have any copper or brass available to test, however the result should be somewhat similar. Summary: Conservatively speaking, **Iron** is more than 10 times more effective shielding than Aluminum at 60 cycles/sec. This will get even better at lower frequencies.

The point is, the lower the frequency the better the shielding properties of **Iron** as compared to other non-ferrous conductors. At low frequencies magnetic shielding is more effective. At high frequencies electrical conductive shielding is more effective. The audio industry for years used iron shielding over tubes when needed. A further test will confirm this for you if you take a permeant magnet and wave it (1-10 cycles/sec) close to a iron plate with a floppy on the other side. Then do the same test with **Gold, Silver, Copper, Brass, or Aluminum** plate of the same thickness using another floppy. Then try and read each floppy. During core movement, possibly generating strong localized magnetic fields, I believe the lower frequencies are what needs to be shielded against. I believe the bigger the event, the stronger the field, and the lower the frequency. We should experience lots of random noise spikes getting stronger and stronger as one goes below 10 and even 1 cycle/sec.

Now with all factors taken into account a good solution needs to be cost effective, available to all, and technologically sound. I believe **Iron or steel** satisfies all these conditions much better than the alternatives. Annealed cold rolled Iron plate would work slightly better than steel but not enough to worry about. The only thing I don't know for sure is how thick does it need to be to effectively work for us in all cases. I suspect one box thickness of .032" will be enough to knock the edge off any strong electromagnetic bursts, however, if you really want to be safe use one box within another for those really critical magnetic medium. If one has a Iron or steel safe or lock box that would work also. Just make sure it is fully covered with Iron or steel the thicker the better.

Offered by [Mike](#).



Troubled Times



Copper Mesh

Usenet posting from **Weird Science** by cipher@mindspring.com

In the late 60's/early 70's I did a little radar work for the USAF. Mode 4 IFF on F-4 aircraft among other things. Next door in the radio shop they had a special room within in a room that blocked out all EM. They did this to test equipment and had a need for *zero* non-nuclear radiation entering the test area. EMP is non-nuclear.

The room was amazingly simple, constructed of wood, 2x4s and such. The entire thing was latticed with thick copper screen, triple thick. Air could just barely get in through the screen. The exterior shell of the room was essentially a huge diffuser, anything hitting it was spread out and attenuated over the grid, the grid was tied to ground. I, on the other hand, worked in a special steel reinforced concrete bunker designed to be blast proof. Blast proof from the inside - the mode 4 boxes had an explosive device inside, if Charlie tried to open the box, from a downed Phantom, without special tools and key equipment, boom!

There are hyperlinks to industrial suppliers that have such a copper mesh product. For example:

Sale Offer: CLOTH, GRILL & NET OF COPPER WIRE

An internet search using the keywords "copper cloth" produced several suppliers that have such in various materials. This is the first I've heard of such a project to shield from EMP.

Offered by [Al](#).



Troubled Times



Non-Magnetic

The best way of protecting electronic equipment from electromagnetic impact is to use brass or some other non-magnetic metal, as this will prevent the radiation to get to the sensitive chips. Make a brass box and put the PC inside. (Fill your brother's trumpet or tuba with your floppy diskettes and seal it off, hehe!)

Offered by [Oystein](#).



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Other Steps

For any computer data, along with EMF shielded containers, other alternatives should be considered. Off-site as well as on-site backup facilities should be examined. I advise that onsite backups and offsite backups, as well as storing backups in a shielded safe be employed. Also making CD-ROMs of data, particularly any imaging data, is good protection, so that if the magnetic media ever gets corrupt there will be one form of a non-erasable copy of the data. CD-ROM recorder / rewriteable drives can be purchased for less than \$300. Media to store 650MB is about 1.50 a piece. EMP can cause power surges which can bypass any shielding you have in place if plugged into the wall. Battery backups are vital. Hardware problems can be cut in half all components (except for printers) have battery backups. They are much cheaper to replace, if blown, than the computers they keep up.

Offered by [Steve](#).



Troubled Times



Mumetal Shields

The best way for delicate electronic equipment, such as computers and transmitters to survive expected heavy electromagnetic pulses from a pole shift, would be.

- First of all not be connected at such times to any form of power supply.
- To be turned off.
- To be in a box made of Mumetal

Mumetal is an unusual alloy that provides the only known method of shielding from electromagnetic radiation. [Mumetal](#) is the only truly mechanical shield from electromagnetic radiation, and has an usually a high Nickel content alloy. Mumetal is used in industry today for this purpose to form shielding for components, instruments, and in some instances to protect people from electromagnetic radiation Even a single sheet placed between the instrument or person to be protected and the source/direction of the radiation will greatly reduce the effect. It is especially good in 50/60hz type applications where all else fails. Mumetal can be used to eliminate radiation from the back and side of a monitor in work stations. Two bands made from Mumetal curved around the back of the cathode tube on your monitor will knock out almost all electromagnetic radiation. Mumetal works, unlike the fake monitor screens that do zero with electromagnetic radiation. Try a Milligauss meter in front of those screens and you will soon discover that they do nothing despite their claims.

Of course lead shields protect from ionizing radiation sources such as Gamma and Beta types but only Mumetal can work effectively on the lower non ionizing frequencies that may present by far the greatest threat to electronic equipment in any violent electromagnetic storms. One might protect a computer by building a Faraday cage, but even better is a lead-lined Mumetal box to slip the computer into in times of high electromagnetic radiation.

Authored by [Darryl](#).



Troubled Times



Mumetal Sources

Another idea to protect computers or any sensitive electronic equipment you may want to EMF protect is mumetal shielding. It is a metal compound composed of 80% nickel, 20% iron. Companies such as:

[MuShield](#)

5 Springfield Rd.
P.O. Box 439
Goffstown, New Hampshire 03045
888-669-3539 (toll-free)

[VitaTech Engineering](#)

15414 Beachview Dr.
Montclair, VA 22026
Office: (703)670-8981
FAX: (703)670-4974

[Ad-Vance Magnetics](#)

625 Monroe Street
Rochester, Indiana 46975
219-223-3158 (tel)
219-223-2524 (fax)

[Less EMF, Inc](#)

809 Madison Ave
Albany NY 12208
tel: 518-432-1550

are a couple of sources for shielding products you might want to consider. They each have done work for the US government and military. They also carry standard enclosures for CRT monitors etc. Advance in particular has some pre-made enclosures for tape backup storage. Both companies can and do manufacture custom enclosures to customer specifications. For increased shielding, two or more concentric shields separated by at least the thickness of the material can be used. In such cases, medium permeability material should be used for one layer and a high permeability material for the other layer. The lower permeability material should be located closest to the field source. Thus the medium permeability shielding acts as a buffer that sufficiently diverts the magnetic field to enable the lower reluctance (high permeability) material to attain the required attenuation.

They also sell low and high permeability foils that you can cut and shape yourself. On the large side, Advance and Mushield can outfit an entire room to be shielded. Obviously, nuclear power plants are heavily radiation shielded with lead and lead compounds, but that offers little EMP protection. Radiation shielding is not the same as EMP shielding, though I wouldn't be surprised if it was taken into account in the design of the plant. Obviously, checking with the onsite engineers as to which areas offer what protection is important. There are a lot of websites that have basic info on EMP and EMF shielding. I have found most of them to be fluff. Get the manufacturers catalogs, which contain some pretty useful articles and discussions, as well as talk to their engineers.

Offered by [Steve](#).

And from Clipper's correspondence:

Hello Clipper, thanks for your E-Mail of 21 May 97

In response to your question. We want to shield our computers from the magnetic variances that a pole shift would bring.

[Clip](#).

We have Mumetal cans 72 x 55 x45 mm which we sell at UKL 35 each. This is our largest so if you need something larger suggest you try [Mushield](#). Generally Mumetal is good for shielding in low intensity fields. It will "suck" away any magnetic field from the air because it is 50,000 times more "permeable" to

magnetic fields. It does however saturate in high ambient fields so if you have very strong fields you will be better off with an outer shield of soft (annealed) iron which is also much cheaper. Hope this helps.

Best regards

[Brian Sowter](#)

[SOWTER Audio Transformers](#) (E A Sowter Ltd)

Winchester, England

Tel: +44(0)1962 620135



Troubled Times



Iron is Best

Mumetal when compared to iron at low magnetic field strengths can be up to 3-4 times more effective for the same thickness. However, at 3 times stronger fields then iron is 3-4 times more effective in shielding. Mumetal cost is high and availability is low. Mumetal is usually used where field strength is low, weight is a factor and the size is small. Since we wish to shield for strong magnetic fields then I recommend use of soft (annealed) iron instead of Mumetal. Our application does not warrant the cost of Mumetal.

Offered by [Mike](#).



Troubled Times



Ammo Boxes

I recommend the use of only iron shielding such as is found in surplus used ammunition sealed containers. Iron or steel works for low and high frequency electromagnetic fields and for static magnetic fields. EMP from lightning would also be shielded. Conductors like copper, aluminum, Brass, etc. do not magnetically shield well at low electromagnetic frequencies and not at all for static magnetic fields.

Of prime importance floppies, hard disks, backup tapes, and other magnetic medium to include music, training, cassette tapes, etc. would be best kept in one of these water tight iron-steel ammunition boxes. These boxes are made in different sizes some big enough to put a PC CPU in along with other sensitive electronics. A typical small ammunition box is 7" high by 11" wide by 5.5" deep with a hinged top, weight of 6 lb. and typically sells for \$2.50 to \$5.00. The **Northern Pro** catalogue has across ammo boxes, offering 4 different types. Prices range from \$ 5.00,6.00,9.00 and 22.00 for a large 25"lx6 in height. Their number is 800-533-5545.

Offered by [Mike](#).

I already bought some of these at a property disposal (Army) the small ones were \$5 each, the next size up were \$10 each (about 2 feet long, 1 1/2 feet high, about a foot wide). I bought mine for 22 shells (for hunting and protection). But a darn good idea for the other stuff on technology.

Offered by [Clipper](#).



Troubled Times



Bruce Perens

Some excerpts about *Linux and Amateur Radio* by Bruce Perens AB6YM

Linus Torvalds, a Finnish graduate student, wrote a clone of the 25-year-old Unix operating system "kernel" a few years ago. Linus and others combined the kernel with utility programs that had been written at U.C. Berkeley and others that had been contributed to the Free Software Foundation's GNU project, and the result was an entire operating system, compatible with Unix, that could be distributed for free, with all of the source code included.

Unix and Linux are the most comfortable platforms for the development of sophisticated software that communicates, controls hardware, does complicated math. What I'm trying to say is that it's the best platform for developing the kinds of software that Radio Amateurs need.

If you're an applications programmer, or a hardware engineer, you might want to learn how to become an operating systems programmer. Linux is very good for that, because you can turn a cheap PC into a full-fledged Unix workstation and make all of your mistakes on it at home where your boss can't see.

Well, on most systems you run a Packet program to communicate via packet. Under Linux, packet radio is part of the "kernel", which is the central part of the operating system. In fact, the packet radio functionality uses the same software interface as the Internet communications component of the system. The result of this is that any program on the system that can communicate on the Internet is also a packet radio program.

If you want to write software, there are compilers for C, C++, Objective C, SmallTalk, and Fortran. All of these come with Linux - they aren't expensive extras as they would be on a Microsoft system. There are interpreters for the languages Python, Perl and AWK.

You can download Linux from the net. I'd only suggest this if you have a way to download hundreds of megabytes without going broke - otherwise, you can get Linux on an inexpensive CD-ROM. If you'd like to download the entire system, start with the World Wide Web site www.debian.org . That site is the home of the Debian Linux Distribution, which I recommend because I helped write it. You can also buy a CD-ROM containing Slackware or Debian for as little as \$15 - you'll find one of those at the "Computer Nut" table out in the hall.



Troubled Times



Linux vs Windows

I recently read that around 80% of all current web servers are still running some form of UNIX; and that is because it is cheap. RedHat Linux comes with X-Windows already integrated, installed, and working which makes the user interface icon driven and presents a friendly interface for the casual user. Last, RedHat Linux out benchmarks Windows NT 4.0 by a margin of 4 to 1 if I remember correctly.

Offered by [Ron.](#)
WB5KAN



Troubled Times



Ease of Use

Linux is for *programmers*; with lots of time on their hands. Yes, there is tons of software available for Linux; but it is usually very buggy, poorly documented, and takes lots of expertise and time to make work. The web page by Bruce Perens says:

[Linux gives you something that you simply can't get from Microsoft, Apple, SGI, etc.](#)

Well, yes and no. The part about cost and source code is sure true; but the use of UNIX or Linux or any of the many other UNIX spinoffs for software development, I very strongly disagree with. You can develop unlimited complexity applications on a Windows 95 or NT platform using any programming language with practically no knowledge of the operating system. That stuff is provided with the language implementation on these platforms (MFC - Microsoft Foundation Classes), etc. With UNIX or Linux you have to use someone else's buggy code or be smart enough to do it yourself. To use UNIX, you have to be a UNIX Programmer; to use Windows 95 or NT you can limit yourself to being an applications programmer.

Offered by [Ron](#).
WB5KAN



Troubled Times



Radio Interface

Linux of course has full radio modem support (AX.25 its called) so after the pole shift we can get an internet working again without having to run hundreds of miles of new fiber. Great!

Offered by [Rob](#).

To quote from the web page by Bruce Perens:

But, why use an operating system that only a nerd could love? ... it's the best platform for developing the kinds of software that Radio Amateurs need.

I certainly agree, but I disagree with the statement: "it's the best platform for developing the kinds of software that Radio Amateurs need." The two main things going for it are that it's cheap (or free) and there is all sorts of software for it, especially for various aspects of the internet.

As far as ham radio goes, everything the article says about Linux is also true for any other software platform for the internet. The key is that ham radio uses virtually the same packet communications protocol as does the internet (ham radio's AX2.5, commercial X2.5, and TCP/IP are virtually the same thing). In other words, I believe that a Windows NT WWW server can be configured to use the AX.25 protocol (and has probably already been so modified and those modifications are available free from ham web sites). The internet is already available over the air and has been for several years. You just have to find it with some web surfing.

Offered by [Ron](#).
WB5KAN



Troubled Times



Simple is Best

It used to be like this when I was a kid: They used to make home computers cheap. Our parents could afford us a computer because you could go to K-Mart and buy a [Commodore-64](#) for \$150. This particular computer was a mean machine at the time. It ran at 1 mhz, had 16 colors, and had many cool graphics modes to play with. It came with Basic. The computer didn't have to boot, you just turned it on and it was there. We used to write our own programs, it was easy, educational, and fun.

The Commodore-64 outperformed a \$2000 IBM PC in many ways including bang for buck and graphics performance. The C64's sound system was incredible for the time. In short, there was very little advantage in the hardware of a IBM to that of a C64. People laughed because of the small footprint and TV. connectivity, but when the incredible games started coming out showing off the capabilities, you can see why Commodore peaked out at manufacturing 9000 units a day. That's a *lot*, even by today's standards. They cranked out about 9 million C64's total.

Commodore later came out with the [Amiga](#), a computer that pretty much smoked everything. The Amiga in 1985 did what PC's didn't really do until 1995:

- true multitasking
- very good graphics/sound
- multiple, simultaneous resolutions on the same monitor (something PC's still can't do.)
- very efficient use of hardware and memory. Can smoothly multitask programs on a measly 7 mhz machine with 256k of memory.

Now, there are no more cool computers like the C64 or Amiga, you have to pay \$2000 for a computer of decent power, when it entirely possible to make them very cheap yet powerful just like in the early 80's. Even worse, with the home computer operating systems being developed by [Microsoft](#) almost exclusively, people don't understand how the computers work whatsoever and therefore are buying Microsoft's temporary solutions time after time. They design their products to be difficult to work with so they can sell new fixes and features under the guise of future operating systems. All the problems with Windows could have been eliminated before now, had they intended to do anything right in the first place. They seem to care nothing about improving the quality of life. Microsoft's goal is to make as many people rely on them for software as possible. This includes:

- Developing the OS based on closed-standards, or standards that Microsoft has access to first. This means Microsoft can make programs that run better or faster before anyone else, since they design the stuff in the first place.
- Modifying their products to be incompatible with rival solutions. For example, they put code into Windows 3.1 that won't let it run under anything but MS-DOS, even though there were 100% compatible DOS's being sold by other companies at the time as a cheaper alternative. They are being sued for this right now.
- They purport to release software and never doing it, to keep companies from buying rival products and wait for the Microsoft one.

Offered by [Joe](#).



Troubled Times



Free

There is a page at the **LinuxBerg** site on where to download small versions of linux.

Offered by [Gerard](#).



Troubled Times



Red Hat

As far as I know there is a good version of Linux, with x-windows etc. Linux **Redhat**. I thought about buying it sometime ago. The price in US dollars is \$49.95. That's cheaper than windows in my eyes.

Offered by [Gerard](#).

RedHat 6.0, issued mid-1999, has a number of improvements on functions that had to be manually added/replaced to the 5.x distribution, now making it really workable and easy to use.

Offered by [John](#).

I had the opportunity to install and play with a modern version of Linux (**RedHat**) and was very impressed. The only problem I ran into is that I have a WINModem and it couldn't work with it. But the release notes said so, so I didn't have to spend a lot of time finding that out the hard way.

Offered by [Ron](#).



Troubled Times



Options Open

I do think we need to keep track of how the Linux-radio software develops for ham radio use. If a lot of hams pick it up and use it then we may want to have a copy of the source code just in case. If after the pole shift and we have time on our hands and need flexibility for special operating systems - applications we may want to keep a copy of this around for modification or to be compatible with some other hams. Like you said this can all be done in NT without getting into programming the operating system. NT will be my preference anyway. However a lot depends on which way the majority of the Hams go in the next few years with respect to using or not using this software. If it gets used a lot then we may want a copy just in case a backup alternative method is needed.

Offered by [Mike](#).



Troubled Times



Linux Advantages

Linux has a great OS that I use daily for non-programming tasks, although I do program a little. It's not that hard to setup or use, it's just not Microsoft making you believe you have to buy everything to do anything. Most of the normal software, including the OS itself has been very stable for me. Netscape 4 blows away the Win95 version in the stability department, and is only lacking in Java speed. (No JIT as far as I can tell.) It *rarely* dumps out on me, whereas the Win95 version always crashes. Linux itself has *never* crashed a *single* time since I installed it.

As time goes on, Linux is becoming increasingly more user-friendly and the performance is top-notch. Linux will win out over Microsoft in the long run because of good design and a more mature attitude of working together to make something without the money factor being mandatory. And letting you do whatever you want with it. I really admire the people who make Linux and all the GNU stuff. Of course since most computers are unfortunately DOS-based, one would need software written for DOS. But there are programs made on Linux then ported to DOS, it doesn't really matter. A few off hand:

- [UAE](#) (Amiga computer emulator), developed on Linux, ported very nicely to Win32, DOS, BeBox, and even Amiga
- [XaoS](#) (real time fractal zoomer), made on Linux, ported nicely to many platforms.
- [Quake](#) (game) Made with GCC for DOS, ported back to Linux because it's using the exact same compiler.
- [Stella](#) (atari emulator), made on Linux, ported to others.

Other more useful programs I use much, that blow away the Win95 counterparts:

- [xterm](#) (so much better than the 80x25 dos-box)
- [tp](#) - yes the command-line ftp is just as good as having all the buttons.
- [telnet](#) - you just can't find a telnet program that works right on Win95.
- [Netscape](#) (yeah)
- [GCC](#) (The other people in my C programming class bought \$200 compilers. Did I? No! And I can port straight to DOS, or use some free DOS graphics/sound libs. Once the graphics library I use gets ported to Linux, I'll basically be able to write programs that run on either with hardly any modification. It's already being ported to Win32-DirectX.
- A [command-line](#) that makes *sense*! Not DOS, limited to 120 or so characters, with backward path slashes \\ \
- [printer support](#) is poor on Linux though.

What is the mentality that Linux is so hard? Or buggy? I don't see it at all. I think it's a lot easier to deal with than Win95. It's not as big or complicated as you think. Linux seems to be developed with a mentality that you can do something right, for the sake of doing so. NT seems to be developed with the attitude of making money. It's not feature-rich, stable or anything else. OS wars aside, I think it would be important to write code with some sort of portability in mind, because not everyone wants to run NT. This means don't *require* Microsoft foundation API's to port code, leave that as a front end option, similar to how those emulators I previously mentioned are all straight C or C++, with the graphics drivers and GUI extra. Radio software should be as generic and portable as possible, I would think, although I don't know much about it.

I trust more in the things people make with the intention of doing it right. It might seem hard or bad right now, but in the long run it's going to pay off in a *big* way. It's already paying off on my own computer, and many others I know as

well. I get one of the most technologically advanced OS's as a price for being alive - because some nice people made it so.

Offered by [Joe](#).



Troubled Times



Features

Linux is a free operating system anyone can use or modify, with free high-performance compilers and development kits available for just about any language for free. Features:

- true **multitasking**, multiuser (unlike Win95 or NT) People can log into your computer from over the internet and run programs on your computer, or do other things.
- virtual consoles, run many **video modes** simultaneously and flip between them.
- memory / **crash protection** that actually works. Linux only crashes under extremely rare instances.
- very **fast file system**, networking, etc.
- full set of standard **internet tools** - telnet, ftp, etc.
- very **high performance**. You don't get faster than Linux on a PC.
- ultra-**configurable**. With a little effort, you can make Linux look however you want, and work how you want to work. That little effort pays off in big ways.
- **secure**. Linux is pretty secure, meaning your kids or neighbors can't log on to your computer and look at all your stuff if you don't want them too.
- **easy** to use, once you force yourself to think differently about what a home computer is all about. Is it about paying out a lot of money for an overly complex system, or about enjoying the freedom of doing whatever you want to your own computer? You decide.

Just like when I was a kid, the days of power computing are coming back. People are ditching Microsoft and building and improving a better, faster, free mass of computer software. I use Linux everyday and love it. Take the time to learn this stuff and it will pay off in big ways. You'll get a personal satisfaction of figuring out how to do something yourself, and using something people made as a improvement to society. You can even buy inexpensive Linux packages from the stores now, which are easy to set up and get started on. If you learn how to use free, standardized, publicly available operating systems and software you will be more likely to really understand computers better and be able to use them when today's software companies go under. Since Linux is not developed by one software company there is no risk involved with using it. It won't go away, and it will always be supported since the public supports it.

Here are some good Linux links, or use the net search engines.

<http://www.redhat.com>

<http://www.sco.com/>

Offered by [Joe](#).



Troubled Times



Installation

Linux is the fastest OS, and easy to install.

- DOS 6.22 overwrites the Master Boot Record and will only install on drive C:. No OS should care what drive it is being installed on. This is a monopolistic act in itself, and while Microsoft might think it's k001 to play stupid tricks, I find it extremely annoying.
- Win95 is similar, but worse because re-installing Windows means re-installing most of your programs too.

Linux tells you exactly what's going on all the time, and will [install on any kind of drive](#). You can put it on:

- CD
- Zip disk
- hard drive
- floppy disk
- anything your computer thinks is a drive.

This is a *real* OS. For \$0 I can:

- Use hundreds of [consistent commands](#), that can do all kinds of stuff. You won't use all of it, but its *there* if you need it, and directions if you need it. You type "man command" for a manual page on a command.
- [Telnet](#)
- [IRC](#), either graphical or text.
- [Netscape](#), they even make the new one for Linux, mail, page composer, etc. also.
- Run 132x60 [text mode](#) on text screens, something DOS doesn't allow without problems. This helps you maximize your screen's ability, and you can pick other modes, like 132x25 or 80x60 depending on your gfx card.
- Color-highlighted directories and files, you can pick the colors it uses too.
- [Windowing](#) interface that can look and work exactly like you want it too.
- Lots of other stuff like [Photoshop clone](#), programming languages and tools, etc., that you don't have to pay for.

You get all the source code too, so if you want to change it to your liking and know how to program you can. You can also run web servers and almost any other internet app for free. It won't crash whatsoever under normal circumstances. It's not *perfect*, but it's more perfect than Win95, especially if you don't need to run Win95-only programs. Usually to install a program you type:

```
make all  
make install
```

and to uninstall you type:

```
make uninstall
```

This is ideal, but it's *not* usually hard to get things working if you read the directions.

Offered by [Joe](#).



Troubled Times



Linux on CD

The cheapest place to buy Linux distribution CD's is [CheapBytes](#).

Offered by [John](#).



Troubled Times



MS Office Clone

There is a program called StarOffice 5.0 for Linux which is #1- 100% *free* (A 60 meg download though) and it is a complete *clone* of MS Office, with Word, Powerpoint, Excel and Access clones. You can even open and convert Office documents. There are a bunch of other Office clones in the works out there in the Linux world. I highly recommend you get a version of linux and install it alongside your windows system, then you have the choice to dual boot the computer if you trash linux or don't like it you can just reboot back into windows. I found however that after 2 or 3 months I don't even boot the windows system anymore.

Offered by [Rob](#).



Troubled Times



Applications

Most of your windows software will not run in Linux. Depending on what you need to do you may be able to use different software to accomplish the same things. If you have enough hard drive space try using both OS with dual boot, or you may be able to run Win95 from within Linux using VMware. Right now I dual boot because my machine isn't beefy enough to run both OS's at the same time. I haven't actually used VMware, but I've heard lots of good things about it. In any case, I think you should check it out, but get ready for a formidable learning curve. I would recommend joining a user group so you have someone of whom to ask questions.

I would recommend going to [Cheap Bytes](#) as they have Linux distributions cheap.

Offered by [John](#).



Troubled Times



Stable Anchor

The most accurate watches to use are the non-mechanical LCD type. For accuracy of time keeping through the pole shift and for the near term after, I believe the LCD sports watches to be the best. The mechanical (moving hands) quartz watches are less accurate than the LCD. This is due to variations of friction with time and temperature. The LCD have no moving parts and will last much longer. Stock up on enough appropriate watch batteries to last 10-20 years. Use a water proof sports watch if you plan to use it after pole shift with all the rain going on.

Some people will use these as a stable anchor point through all the confusion of planet stopping and starting. Just as current calendars will most likely continue to be used. Some watches will be used to synchronize wide spread events. Some will be used to determine location and distance. For example some one tells you to walk for 10.5 hr. north and 5 hr. north west 16 degrees to get to your destination. With it being dark most of the time, how are you going to measure this without a watch you can trust.

Offered by [Mike](#).



Troubled Times



Appreciated

Many will not need bearings, such as watches, after the pole shift. Some will use watches for orientation. After a pole shift I expect everyone will be disorientated and dazed. I see evidence that time was not kept well during the last pole shift, because one could not see the sun or the moon and survival became tough. I think some will gain comfort from knowing how much time passes as they see that, for year, every day is the same. If someone keeps track of time until the sun and moon come back into view, then maybe our history will record when to look for the next close passage of the 12th Planet some 3657 years later. There are some navigational uses of clocks that become quite useful, keeping track of time while moving in a particular direction.

If after the pole shift one measures the length of daylight in the day and uses a table one can determine Latitude. The longest days are when one is closest to the equator. One would measure first light to last light. Knowing ones Latitude one can determine average temperature from another table. If the days are getting longer then one is headed for warmer times. If days are getting shorter then one is headed for colder times. If one were to measure the length of daylight once a week over 6-8 months, then one could determine the new angle the Earth's rotational axis makes with the Earth's orbital plane. This angle is at present 23.4 degrees. This should be different after the pole shift and is expected to be less this time around. I plan to make or find the above two simple tables.

Offered by [Mike](#).



Troubled Times



Sun

It seems to me there would be some level of [Radio Emissions](#) due to solar activity at all times. It might be possible to build or find a directional antenna and use existing available radio equipment (microwave or possibly old AM-FM tuners) to locate the sun behind the thick clouds after the pole shift. If we can locate the sun fairly accurately say within one to several degrees at different times of the day then we can determine many things. Where the new rotational axis of earth is. What latitude we are at. From latitude we can determine estimated seasonal temperature range. Over time 6 months to a year we can determine the new precession value or what the 23.4 degrees has now become. We can determine when the seasons (summer and winter) occur.

Possibly short wave moon bounce equipment would work in reception mode. One would find the noisiest spot in the sky and measure it's angle several times/day for several days. If this followed a sun rise sun set pattern over several days, then one would track it for 6 months to a year, say once a week or once every several weeks. From a pre-built excel spread sheet one would calculate the above needed information from the angles and time of day found.

The following is some quotes on some preliminary research on this subject.

1942 : J.S. Hey Detects Solar Radio Waves

One of the pleasures of radio science is its ability to reveal just what modest additions to the human sensory apparatus are needed to extend perception into entirely new realms of experience. As discussed in part 1, serious research can be conducted with a length of wire, a crystal earpiece or headphones, a tent pole, a hammer, a patch of earth, your ears, and a notebook. Similarly, given enough luck or patience, it's possible to detect some form of radio emission from the sun with virtually any radio receiver.

In 1942 British Army physicist James (Stanley) Hey was asked to investigate huge rushing noises thought to be hostile jamming of British radar stations. Hey sourced these mysterious signals not from the German Army, but from the sun, observing a strong correlation between radio emission and sunspot activity. In March my first attempt to renew the search, prompted by the highly scientific observation that it was a nice sunny day, was immediately rewarded by a huge swathe of solar noise roaring into the Lafayette at 13.8MHz: accompanied by the parallel 2nd harmonic - characteristic of a Type II emission [4] [8] - at 7.29MHz.

Offered by [Mike](#).



Troubled Times



New Latitude

The following table is the kind of data I think will be useful to have after the pole shift. So far I can think of 4 ways that one can measure approximate latitude after the pole shift under thick cloud cover. These are dip needle, average temperature, use of an amateur radio telescope to track the sun, and length of daylight (twilight to twilight). The most useful is to find average expected temperature by measuring latitude first by using one of the other three approaches. Information on weather and average temperature that one can expect at different Latitudes is available.

I plan to present this sort of data graphically, that is if we can not find it already done. To do a good job I think we need more data points. If anyone has a good reference that might help please share it. I found the concept of latitude versus temperature to be popular for 5-12 grade school projects. There is a lot of description on what to do but not much on what has been done or found as a result. So for me the bottom line is, it's back to a 5th grade project to learn what I didn't learn when I went through school.

Offered by [Mike](#).



Troubled Times



Team Effort

The new latitude should be easy if we can determine the polar star and measure its angle. If the ham radio system is up and can broadcast a time hack at its local solar noon, the rest of us could then back into our own relative longitude by measuring that portion of a days rotation to our local solar noon. Obviously we'll also need to check to see if we still have 24 'hours' in a day after we resume rotation. I think we have to assume *everything* will be perturbed.

Probably wouldn't hurt to make a startup scenario for redefining our world after the pole switch. How could we get a digitized map of the new world assembled? The ham radio net could be very helpful in determining data points and centralizing them. A good supply of cheap plastic sextants would help in determining local solar noon and maybe the pole star elevation.

We may also abruptly switch seasons. Tracking the sun's path will allow determination of the new equinoxes and solstices. Critical for planting and growing.

Offered by [Jack](#).



Troubled Times



Established

After the pole shift it would be desirable to easily determine with common items your Latitude, predict average seasonal temperatures, and measure the cloud density-clearing rate. It may be that one has lost track of days and now wishes to know what the earth is telling us the seasons are. Assume for now there are no dip needles available and one does not know how to make one (a subject for another time). All of this can be determined by measuring the length of daylight for the longest and/or shortest day or any two days of the year. The longest days will occur when the earth is tilted such that you are closest to the equator and will tell you the first day of summer 21 Jun. The shortest days occur when the earth is tilted away from the equator and give the first day of winter 21 Dec. The readings can be taken with a normal watch, or clock (described later) or can be taken semi-automatically by building a simple circuit. Once the readings are taken one need only use some simple graphs to calculate Latitude, predict seasonal temperatures, and if needed determine what season of the year one is currently at. I have been working this project for a number years and it will take seven separate posting to fully explain it. I have attempted to make it as simple to use as I can. Print it out and use it as an after pole shift reference document. You may want to build the circuit below before the pole shift and test it out.

The following future posts on Light Measurement (LM) will make up this subject:

LM-1: Introduction

LM-2: Photocell measurements

LM-3: Results of measurements part1

LM-4: Results of measurements part2 Graphs to use

LM-5: Results of measurements part3 Formula to use

LM-6: Light meter construction and use

LM-7: Temperature, precipitation versus latitude

Offered by [Mike](#).



Troubled Times



Sextant

I think one can make a serviceable sextant based upon the common grade school protractor.

- Glue one of those "bubble" things, that contractors connect to a string to make sure the string is level, to the bottom straight edge.
- Mount the protractor on a tripod or perpendicular post in the ground. That way you don't need any optics that allow you to see both the bubble and elevation indicator at the same time.
- Under the clear base of the protractor glue a compass so the azimuth can be determined as you turn the protractor on it's axis.
- At the junction of the two straight sides of the protractor, drill a small hole, through which you insert the end of a straight wire, bent 90 degrees such that the long part of the wire lays along the side of the protractor.
- To use the device, swivel the whole device and sight along the wire to point to the landmark of interest. Read the azimuth from the compass and elevation from where the wire crosses the protractor angle marks.

What have I missed? What improvements should be made? This we can construct/perfect today.

Offered by [Ron](#).



Troubled Times



Compass

You will find a number of compasses at any sporting goods store. I like the type that is liquid damped and mounted on clear plastic so it can be laid on a map and you can still see the map through it. That way, you can take the bearing of a landmark that won't change during the pole shift, then after the pole shift record the new bearing. Then you will be able to re-orient your map post pole shift and still be able to use your compass and map as a guide.

Offered by [Ron](#).



Troubled Times



Fixed Positions

Another method may be to use surveyors instruments before the pole shift to note the relative position of many landmarks from some fixed position, and then, if possible, note them after they again become measurable and determine the new geography in that way.

Offered by [Ron](#).



Troubled Times



Radio Frequency

Here in the Great Lakes we have lighthouses, some of which, besides emitting light, also transmit a radio signal with a certain dedicated frequency, and when one has a radio receiver and tunes to this frequency, one can use it for a homing device in a foggy situation. Would this be a practical homing device after the pole shift, as all these lighthouses might not be in service anymore?

Offered by [Tian](#).

Good question and a good idea that may have limited use at times. My current thoughts on this subject are: light, sound and radio signals all can be used to make a homing device. Of the three possibilities, radio signals use less power and travel a longer distance and thus in general are more practical. I currently believe any radio transmitter and tuned receiver could work. Perhaps the higher frequency would work better due to antenna being more sensitive to direction. Including the possible use of otherwise useless AM-FM radios. One caution: People who use this will be possibly exposing their position to uninvited guests.

Offered by [Mike](#).



Troubled Times



Locating the Moon

First, there is software readily available for tracking the moon, even control the two rotors to control azimuth and elevation of the antenna array based upon known moon orbital parameters. Problem is to find those new parameters. It turns out not to be all that hard.

A system designed for moon bounce is working with such small signals that when working with signal to noise ratio, noise is measured in degrees kelvin instead of the usual micro volts. The noise comes from a number of sources, among them the receiver itself, feed line, antenna generated noise, noise originating with the sun and reflected off water vapor in the air, etc. When calibrating such a system, one points the antenna at the cool earth and notes the noise, then the sun, noting the noise, then clear sky, noting the noise, etc. When the antenna points at the moon there is a clearly detectable noise (all this being white noise). Some of these tracking software actually use algorithms similar to military aircraft weapon search patterns, there are a number of them. Anyway, using a search pattern, the moon can be readily found, even on an overcast evening. By plotting a number of points found in this way, the new orbital parameters of the moon can be calculated.

It also occurs to me that we should be able to use the difference between the current orbit parameters of the moon and the new ones we get by finding its new ones, we could calculate the actual change that occurs during the pole shift. That is, if the moon's orbit isn't perturbed by the 12th's passing, which it seems that it would.

Offered by [Ron](#).



Troubled Times



Skylight

Legend has it that the Vikings navigated in cloudy northern seas by using a crystal of cordierite (aka iolite). Even though the sun is obscured, the skylight is polarized. The polarization is maximum at right angles to the direction of the sun. One could use a transit or theodolite with a high-quality linear polarizer to find the direction of maximum polarization. However, you would probably need a photoelectric amplifying system to detect the min and max polarization since the eye isn't sensitive enough to locate the null position to within 1 degree.

Clyde

Testing results, using a digital light meter with one and/or two 55mm camera polarizes. Measuring the light intensity in LUX I found in light cloud cover where one could feel the heat of the infrared and barely see a shadow that if one used two polarizes adjusted at an angle to let a little light through that one could get about 10-15% change in light intensity from max to min (rotated 90 degrees). I tested various angles made with a tangent to the earth's surface. If there is no shadow at all and no blue sky then the effect is below the random fluctuation of light intensity of the sun below 1% to 2% and I was unable to measure it. I think this might work if there is a blue sky but definitely not in heavy rain cloud conditions, but then one won't need it if one can see a shadow.

If one wants to look into this more. I would recommend using a differential amplifier and measuring the light level using two identical sensors both rotated 90 degrees (polarization filter) with each other. The circuit would be set up to filter out the overall light fluctuation due to thickness changes of cloud cover. It would be designed to measure differences in intensity between the two sensors. Such a circuit could be built based on modifying one of the two circuits found in *Radio Shacks Engineer's Mini-Notebook* (Cat No. 62-5019), page 48 *Electronic Sunshine Recorder*, or (cat No. 62-5012) page 23 *Ultra-Sensitive* light meter.

Bottom line Summary: I currently don't believe this concept of measurement could be developed to become a viable method for determining the direction of the sun, under heavy cloud cover, after a pole shift. From what I can measure a simple compass would be more reliable and more accurate. As the cloud cover gets more dense as one would expect after the pole shift, I think it will be even harder to measure. I note my findings done over several weeks, so others do not repeat the same research efforts.

Offered by [Mike](#).



Troubled Times



Blue Filter

Bees are reputed to be able to navigate on cloudy days. I don't know whether they are seeing the sun directly through the clouds, or whether it is because the blue end of the spectrum (incidentally, one of the dichroic colors of corderite is blue) is more strongly scattered and polarized. In any event, bees are able to see UV. So, I would suggest that you put a blue filter on your apparatus and repeat the experiment and if that doesn't help, then move into the UV region and experiment.

Clyde

Used a digital light intensity meter (Lux) with two 55mm camera linear light polarizes (one would have worked), a Blue cobalt glass filter, and different lengths of cardboard tubes to limit the field of view and amount of side light interference.

Test result analysis. Under ideal clear skies when one samples the sky at about 30-130 degrees from the sun's position, one can get an average of about 18% light intensity change using a polarizer and a blue cobalt glass filter, while shielding of side light, using a tube length of 2.5 times diameter. For a tube length of about 1.1 times diameter, using a polarizer and no blue filter I was able to measure an average of about 12% light intensity change when the polarizer was rotated 90 degrees. I estimate, one could measure the sun's direction as a projection on the earth's surface, to within 10-15 degrees using this method on a clear day.

Light level results were measured during relatively thin white uniform cloudy conditions with different rotations of the polarizer. The difference in light intensity due to polarization was measured to be below the noise level of about 1% to 2% with occasional fluctuation up to as much as 4%. The intensity of light from clouds is constantly changing due to the clouds becoming thicker and thinner as they move. This causes a constant fluctuation of overall light intensity of about 1% to 5% over a short time interval making it difficult to measure small changes when the polarizer is rotated 90 degrees. Filtering for blue and ultraviolet does help but not enough to make a difference. It was observed the direction of maximum polarization is random with a slightly higher frequency of occurrence of polarization being perpendicular or parallel to the direction of the sun. However, the effect is small, well below reliable measurements with the current setup.

Offered by [Mike](#).

