Northern BC Amateur Radio News
Issue 1 November 2000

Introduction

Last fall, I talked to several Hams about publishing a Northern BC Amateur Radio newsletter. Several clubs in the area have published newsletters for varying lengths of time but the Amateur population base isn't large enough to maintain the momentum. It is hoped that by combining our efforts, we can sustain a regional newsletter instead of several short-lived local ones. The plan is to publish 2 or 3 times a year on the Internet. An amateur in each club or community is requested to print copies for local Amateurs who don't have Internet access.

A team of three Prince George Amateurs has agreed to take on the task. All Amateurs are encouraged to submit information to be published in the newsletter. The subject matter does not have to strictly about radio but it should be of special interest to Radio Amateurs. **We also need someone from each club or area to act as a reporter to feed us the material**. This is your opportunity to publicize club events and activities in your community. You can send it to ve7eap@rac.ca, fax it to 250-560-5679, or mail it to PGARC, Box 835, Prince George, BC V2L 4T7.

New Web Sites On Line

The Prince George Amateur Radio Club has launched its' new web site at **www.pgarc.org**. The site is designed and maintained by Frank Vanderzande (VE7AV) and is hosted by Andy Townsley (VE7EQU). Among many other things, you will find this newsletter, coming events, repeater maps, emergency plans, and club business. We hope it will become a focus point for Northern BC Amateurs.

Frank has launched **www.hamstudy.com**. This site provides a resource for anyone wishing to either obtain his or her Amateur qualifications or upgrade to Advanced status. You may also wish to check out Frank's other site, **www.av.bc.ca**.

PERCS
Graig Pearen, VE7EAP
____

PERCS is the *Provincial Emergency Radio Communication Service*. It is a joint venture between Radio Amateurs of Canada, the Provincial Emergency Program Radio Advisory Committee, ARES, and all the HF nets and some of the VHF nets in British Columbia. PERCS was officially formed on April 30, 2000 at the Radio Advisory Committee meeting in Victoria. More information can be obtained from your Regional Amateur Radio Representative. The PERCS web site should be operating soon at **www.percs.bc.ca**.

The PERCS web site, which is still under development, will cater to BC Amateurs. It will host all the Radio Advisory Committee documentation, including training material, sample plans, meeting summaries, regional Amateur Radio emergency plans, etc. There will be information about the nets, upcoming events, and links to related sites such as RAC and PEP, and various club sites.

New terminology

AS a result of the new provincial government emergency plan (BCERMS), there are a couple new terms that you may encounter. **PEOC** is the *Provincial Emergency Operations Centre*. It is the EOC in the Provincial Emergency Program headquarters building in Victoria.

PREOC is the *Provincial Regional Emergency Operations Centre*. This name replaces PFRC. These are the temporary field headquarters of the provincial government agencies involved in the disaster management and recovery. The PREOC in Prince George is a permanent facility located at the PEP regional office. A PREOC is tentatively scheduled to be built in Terrace next year.

Radio Direction Finding
Kim Olfert, VE7DZV
____

In basic terms, Radio Direction Finding (RDF) is finding the location of a transmitter involving techniques considered by many as either an art or an unproved science. Although very sophisticated and complex equipment is available for commercial or government applications, the radio amateur can enjoy RDF with the most basic of radio equipment.

RDF has proven effective in locating downed aircraft, strained marine vessels, jammers of repeaters and traffic nets, and for recreation and training during 'fox-hunt' activities.

Simple systems involve nothing more than a portable radio and a directive antenna. As the system is improved upon, the use of signal-strength meters, stepped received signal attenuators and elaborate high-gain directional antenna come into play.

The most critical component of any RDF system is the antennae. Antennae for RDF are generally not the types used for normal two-way communications. Directivity is the primary RDF requirement. Directivity in this case does not mean an antenna pattern with high-gain on a single main lobe. This type of antenna is useful in obtaining course measurements, but can prove difficult to obtain accurate or precise bearings. This inaccuracy is

due to the spread of a few degrees at the 'nose' of the main lobe, where a shift of antenna position may not produce a detectable change in signal strength. To obtain an accurate bearing an antenna exhibiting a null in its pattern is desired. A null can be very sharp in directivity, often to within one-half a degree!

As most radio amateurs are familiar with the operation of their radio equipment, and have a good understanding of signal strength and attenuation, let us explore the various antennae used in RDF.

A simple loop antenna tuned to resonance with a capacitor and balanced electrostatically (with respect to ground), exhibits two nulls that are 180 degrees apart. Maximum response is in the plane of the loop, with nulls observed at right angles to that plane. The size of the loop should be less than 0.08 wavelength long. For example, at 28 MHz the length is less than 34 inches resulting in a loop diameter of approximately 10 inches!

By de-tuning the loop to shift the phasing characteristics, the receive pattern can be made non-symmetrical and not effect the null, this is required because a single null reading from the loop will not indicate the exact direction of the transmitter. With refined de-tuning the loop can be made to function as a unidirectional antenna. Without these tuning and de-tuning considerations, the loop antenna may exhibit the undesirable response of acting as merely as a mass of metal connected to your receiver.

A ferrite-rod antenna called a loop stick may be used to greatly improve portable RDF for frequencies below 150 MHz. The magnetic core made of high permeability material is employed with windings functioning like a transformer to increase the 'sensitivity' of the loop stick. The true loop stick responds to the magnetic field of the radio wave, and not the electrical field. Therefore, the voltage delivered by the loop is proportional to the amount of magnetic flux passing through the coil, and to the number of turns in the coil.

The maximum response of the loop stick is broadside to the axis of the rod, whereas maximum response of the simple loop antenna is in the plane of the loop.

Both the loop and loop stick antennae exhibit two nulls 180 degrees apart, and therefore either one does not indicate the true direction of the received signal. By the process of triangulation, with two or more bearings, the location of the received signal can be obtained. However, it is much more desirable to have a RDF antenna with only one null so there would be no question as to from which direction the signal is originating. A loop or loop stick antenna can be made to have a single null with the addition of another 'sensing' element. This second 'sensing' element must be omni-directional such

as a short vertical antenna. When the signals from the two antennae are combined with a 90 degree phase sift between the two, a cardioid pattern results. For the best null in the composite pattern, the signals obtained from the two antennae must be of the same strength. The required phase shift is accomplished by feeding each antenna to opposing inputs to an RF transformer, and then feeding the resultant received signal into the receiver input. (If you've made it thus far, I've got your creative muscles working!)

Phased arrays, although larger and sometimes bulky, can also be used for RDF purposes. The two basic types are end-fire or broadside yagi configurations. The antenna lobes exhibited depend on the phasing and spacing of the elements. The broadside arrays are inherently bi-directional with at least two nulls in the pattern, and therefore seldom used in RDF applications. The end-fire exhibits a greater single null if several elements are employed, and therefore the yagi of choice. The response of the end-fire is maximum off the other end of the axis, in the opposite direction from the null. A familiar arrangement is two elements spaced ¼ wavelength apart and fed 90 degrees out of phase, the resultant pattern is a cardioid with the null in the direction of the leading element.

The 'Adcock' array is the most popular end-feed array used in amateur RDF applications. This antenna consists of two vertical elements fed 180 degrees apart, mounted in such a way as to permit rotation to vary the received signal strength. The element spacing in not critical, nor is the length of each receiving element. However, the two elements must be exactly the same length regardless of the intended receive frequency.

The antenna pattern of the 'adcock' exhibits nulls broadside to the axis of the array, and they become sharper with greater element spacing. However, with spacing greater than ¾ wavelength, the pattern begins to deteriorate with additional nulls in different directions.
It is important to note that for spacing greater than ¾ wavelength this array becomes unsuitable for RDF applications.

In closing, for the radio amateur wanting to get more enjoyment from RDF activities, the recommended antenna for ease of construction and use is the 'adcock' array. The fact that this array will produce two nulls is overlooked in many RDF situations due to the likelihood of there being more than one receiving system involved in the 'hunt'

For those that thought QRP is entertaining, try RDF, it can be technically challenging!

Accept the fact that some days you're the pigeon, and some days you're the statue.

Renewable Energy - Wind Power

© 1997 Graig Pearen
gpearen@telus.net
_____

For some of us, wind energy is a plentiful and cost effective source of renewable energy. With any renewable energy system, you must realize that you are paying up-front for years of electrical energy. The capital investment in a complete home power system can be equal to the cost of a new vehicle.

Many wind generators from the 1930s are still reliably generating power 60 years later! A wind turbine is a mechanical device that is subjected to all the stress that Mother Nature can throw at it. They are not maintenance free and yet with some tender loving care (TLC), a wind power system will keep on going, and going, and…

Weather Statistics

The weather statistics that are available are virtually useless in determining the feasibility of using wind power. The strength of the wind varies considerably between locations that are only a few miles apart, and changes dramatically with height. The problem with the statistics is that the measurements are almost always taken at an airport. As far as wind is concerned, airports are primarily interested in the safe landing and takeoff of aircraft. For this reason, wind speed measurements are taken near ground level.

A True Wind Story

One beautiful summer day, I had a solar panel leaning against my shop, charging a battery. I left it there while my wife and I walked over to visit a neighbor. While we were there, a windstorm came through the area so we headed home to rescue the solar panel. The wind was strong enough to break two of the neighbor's 50-foot trees. The flag on the top of my 80-foot tower was snapping so violently that we could hear it over the roar of the wind. Closer to the ground, my hair was being blown gently and the cat walked by and her 2-inch long fur wasn't even moving! I've told you this little story to illustrate the importance of height in wind strength and the uselessness of airport wind speed measurements.

Blowing in the Wind

So you're wondering why I would erect an 80-foot tower for a flagpole. Well, the poor thing looked naked so I had to put something up there for a decoration until the wind generator is ready to go up! This area has a reputation for low wind. If you mention a wind generator here, people will laugh at you. However, in the first two months that the tower was up, there were only two days that the flag wasn't <u>fully</u> extended for a significant part of the day. During this period, the airport reported calm winds and only a very slight air movement could be felt on one's face. All the wind power books say that it takes a 7 to 8 mile per hour wind to extend a flag and this is also the speed at which wind generators start to produce power.

Turbulence

I'm sure you've seen flags flapping in all directions in gusts of wind. The wind blows in one direction at a time. It is turbulence that causes the apparent changes of direction. The turbulence is caused by objects on the ground such as buildings, trees, and hills. For a wind generator to function, the turbine (propeller) must face into the wind at all times. This is impossible when the wind keeps changing direction! There is only one solution. The wind generator has to be above the turbulence and this means at least 30 feet above all buildings, trees, or other objects within about 150 yards of the generator.

Terrain is another problem. That 80-foot tower that I told you about is approximately 100 yards from the edge of a small valley. When the wind blows towards the valley, the wind turbine holds steady. When the wind is blowing across the valley or at an angle to it, the turbine is constantly yawing to try to face the wind. This is a particularly severe problem on mountaintops. I know of wind turbines that have failed due to worn out the yaw bearings and furling bearings.

The Power in the Wind

The power that is produced by a wind turbine is proportional to the cube of the wind speed. This means that if the wind speed doubles, the power goes up by eight times. For example, if a wind turbine were producing 500 watts in an 8 MPH wind, it would produce 4,000 watts at only 16 MPH wind speed! Since the wind speed increases with height, the higher the tower, the better!

Home Power Magazine

These topics have been explained in much greater detail in *Home Power Magazine*. Everyone interested in generating his or her own power should have a subscription to *Home Power*. It is billed as "The hands-on Journal of Home-Made Power" The main theme of the magazine is solar, wind, and micro-hydro generation of electricity. They have a regular section on electric vehicles and have begun publishing articles on solar thermal systems. The text files from older back issues are available free on the Internet. All back issues are available in full color with all the diagrams and photographs on their *Solar* series of CD-ROMs . Home Power can be reached at:

Home Power Magazine
PO Box 520
Ashland, OR 97520 USA
800-707-6585 or 530-475-0830
www.homepower.com

Northern BC Amateur Radio News
Issue 1 November 2000

Radio Advisory September Meeting

Graig Pearen, VE7EAP

The Radio Advisory Committee met in Richmond on September 22 – 24. New member Ernie Davidson (VE7BGB) from Williams Lake joined us for the first time. Ernie is the NE Assistant Regional Amateur Radio Rep. Our request for a representative from SAR was approved by PEP and a SAR member joined us on Saturday. SAR will be selecting a person to fill this post on a permanent basis. Doug McLeod from BC Hydro met with us on Friday evening. Through him, BC Hydro has funded the creation of the PERCS logo and the design of our new web site. A summary of the minutes will be published soon.

After the Radio Advisory Committee meeting, Kim, Ernie and Graig had an opportunity to have an informal "northern regions" meeting. We decided to combine the North East and North West Amateur Radio emergency plans into one document. We have the same geography and logistic problems and share both the HF and VHF networks so the two plans said basically the same things using different words.

The appendix contains all the private and changeable information followed by 2 pages (one sheet) for each community. The intent here is two-fold. By having a single document instead of going through the entire exercise for each community, the amount of work required of each MAC is minimized. A major benefit is that all the pertinent information is then made available to the Amateurs in the surrounding communities to enable them to assist if required (mutual aid). There is one disadvantage though, Kim and I have more work to do to maintain the document!

North East Region Y2K Radio Report

Graig Pearen
NE Regional Amateur Radio Rep.
gpearen@telus.net
——

Introduction
Arrangements had been made for the NE PREOC (Provincial Regional Emergency Operating Centre) radio station to provide a backup communications channel between the RCMP, Prince George Regional Hospital EOC, City of Prince George EOC and the Loomis Armored Car EOC. Inspector Barry Clark of the RCMP was in the PREOC with his radio equipment to provide the RCMP radio link. We were also prepared to provide communications for the PEP-Air Zone Commander and his deputy.

Radio Operations
The Regional Amateur Radio Rep arrived at the PREOC at 14:30. The radio staff arrived on schedule at 18:00 so from that time forward, we had two radio operators for each of the three stations that we were running. We operated the net control stations for the regional VHF net and the Prince George VHF net from the PREOC and participated in the PEP HF net on 3735 KHz.

Three Amateur Radio Stations were relaying messages for us. The club station, VE7ZZZ, was running on a diesel power plant, VE7EOJ was operating on a large solar charged battery bank, and VE7HRC was operating on grid power with battery backup.

Equipment Failures
The power supply from the Daniels commercial HF radio was being used to run two VHF radios. This power supply had been repaired about 2 years ago and not used since. It lasted for 4 short transmissions before it went up in smoke again at 18:48. Don Fraser, VE7PGR, made a quick trip to the radio shop where he works and returned with a new power supply and we were back on the air at 19:00.

At 19:07, one of the VHF radios failed, putting us off the air again and once again, Don came to our rescue by removing the mobile radio from his vehicle and lending it to us for the duration of the event. During both the equipment failures, we used hand held radios to monitor the repeater frequency involved. A new radio and power supply have been purchased to replace the failed equipment.

PEP HF Net
The noise level on 3735 KHz was S9 and most of the signals were at about the same signal strength, making HF operations from our location very difficult much of the time. We discovered that Alberta, Manitoba and Ontario were also using this frequency. The Radio Advisory Committee should take the initiative to coordinate HF frequency use with all the emergency preparedness participants in Canada.

Legal Requirements
Working with the other participants such as the Forrest Service employees gave us the opportunity to learn from their experience. One thing that must be addressed by PEP and all the volunteer groups is the legality of log books and forms. To be admissible in court, all logs must be kept in bound binders with no blank lines between entries. It is preferable that all pages be numbered.

This requirement by the courts means that all the radio log forms and message forms that we have been promoting for many years are of no use what so ever if they are required as evidence.

Miscellaneous

The entire crew enjoyed participating in the event. The staff was treated to an ample supply of excellent food that was supplied by one of the catering companies. Ben Guilliamse, the PEP-AIR Zone Commander, loaned a couch to the PREOC for use in the rest area. The operation was shut down at 01:30 following the "stand down" orders from headquarters.

Northern Emergency Net

Graig Pearen, VE7EAP

——

There was some discussion and controversy about the preamble that was used on the Northern Emergency Net during the Y2K transition period. I am the guilty party so I will explain how this came about.

The NE and NW regions of the province are big in area but small in the number of communities. We require an HF net to cover the area so I proposed that we solicit the assistance of the experienced Northern Net control station operators to run a joint NE/NW regional HF net. My proposal was accepted by Kim (VE7DZV), who is the NW Regional Amateur Radio Rep and by the four Net Control Station operators.

Following the exercise on December 4th, numerous Radio Amateurs who participated in the exercise recommended that we use a preamble and periodic announcements to explain what was taking place on the frequency. To fill that need, I wrote both the preamble and the net frequency holding announcement.

The controversy was over the sentence "This net is sponsored by the Provincial Emergency Program in support of our communities". Although the same net control stations were used, this was not the normal Northern Net. The Northern Emergency Net is a special purpose net held only during emergencies for the purpose of coordinating disaster recovery activities between our communities.

This net was organized by me in my volunteer roll as the PEP Regional Amateur Radio Rep and member of the PEP Radio Advisory Committee. After consulting with the net controllers, I used e-mail, snail-mail, radio, and telephone to arrange participation in the Northern Emergency Net by Amateurs in each community in the NE region and PEP paid the bills to do this.

The two nets are distinctly separate. Contrary to the impression voiced that evening, the "sponsored by PEP" statement was intended to give credit where credit is due and in no way was it intended to slight the Northern Net or the net control station operators!

Radio Advisory Committee

Kim Olfert, VE7DZV

——

The PEP *Radio Advisory Committee* was established to provide co-ordination of both Amateur Radio and commercial emergency communications services in support of the PEP. All committee members are **volunteer** amateur radio representatives with the exception of the PEP Telecommunications Officer and their assistant. Currently, both these PEP staff people are advanced Radio Amateurs.

The committee also facilitates and encourages Amateurs and Amateur groups throughout the province to actively and effectively participate in their local[1] emergency programs. This is accomplished through the establishment of policies, procedures, standards and training that are intended to result in an effective communications response to any emergency that may arise.

The Committee is composed of the Regional Amateur Radio Representatives, plus one representative from the Provincial Emergency Program (PEP), one from Provincial Emergency Social Services (PESS), one from Amateur Radio Emergency Services (ARES), and one from Search And Rescue (SAR). Guest representatives from Industry Canada and others organizations are frequently invited to participate.

One of the committee members is elected by the membership to be their chairperson. The chairperson also serves as the Provincial Amateur Radio Coordinator, who reports to the PEP Telecommunications Officer.

If you would like to know more about this volunteer committee, please contact your Regional Amateur Radio Rep (RARR).

[1] See *PEP And The Radio Amateur*

Radio Advisory Committee Minutes
Summary Of The April 28 – 30, 2000 Meeting

Friday, April 28
1. Opening remarks & introductions
2. Approval & adoption of agenda
3. Approval and adoption of the previous minutes
4. Business arising from the previous minutes
    - 4.1 JIBC Telecommunications course
    - 4.2 Volunteer database development & software demonstration
    - 4.3 Amateur Radio Guide amendments
    - 4.4 Message handling seminar development – tabled until next meeting

4.5 Skeletal Municipal Amateur Radio Communications Plan check list – Tabled until next meeting

4.6 VE7PEP station staffing & operational concerns

4.7 Emergency message handling exercise package – Tabled, see item 3.5

4.8 Printing & distribution costs for message forms

4.9 PEP Amateur Radio Power Point presentation update

5. Status of our recommendations to the PEP staff

99-025: Radio Advisory Committee web page – accepted

99-026: Training for Amateur Radio volunteers – accepted

99-027: Radio Amateur Emergency Communications Guide amendments – approved

99-028: Volunteer information pamphlet – amended & approved

99-029: Amateur HF frequency coordination & net functions – approved

99-030: PEP Amateur Radio Power Point® presentation

00-032: Motion to Increase of Radio Advisory Committee membership

00-033: Motion to request that a representative from SAR become a full member of our group

6. Sub-committee Reports

6.1 Surplus radio equipment (David)

6.2 HF Frequency coordination, net function & HF traffic handling (Fred)

6.3 Amateur VHF frequency coordination for the southwest region (John)

6.4 Commercial VHF frequency coordination for the southwest region (John)

6.5 Packet radio software development & BCEP software demonstration (Bryan)

7. New Business

7.1 Amateur Radio communications volunteer groups merger

7.2 PEP Amateur Radio corporate sponsorship (BC Hydro)

7.3 Evening session in the VE7PEP radio room

7.4

Saturday April 29

8. PEP Director's report (general assembly 08:00-10:00)

9. New business continued

9.1 Amateur Radio volunteer groups merger – continued

9.2 Corporate sponsorship – continued

Motion: That the new name of the group coordinating emergency radio communications on behalf of the Provincial Emergency Program be changed, and called hereafter the *Provincial Emergency Radio Communication Service* (**PERCS**), and that registration of www.percs.bc.ca

be obtained by the PEP for use by the Radio Advisory Committee. (Recommendation 00-034)

9.3 PEP Amateur Radio strategic plan development (Kim)

9.4 PEP controlled province wide VHF frequency coordination (Industry Canada)

9.5 Special events task application (Lorne)

9.6 Emergency Alert (broadcast) System Power Point® presentation (Graig)

Sunday April 30

10. Regional / Provincial representatives meetings

11. Summary of recommendations

12. Summary of appointments & actions

ESS Solution-Focused Meeting

Graig Pearen
NE Regional Amateur Radio Rep.
gpearen@telus.net
____

The Emergency Social services people have also recognized that the same issues affect the whole northern area of the province. This echoes what we have done by combining our northeast and northwest Amateur Radio plans and VHF and HF nets.

On Friday October 27th, Emergency Social Services (ESS) held a combined northeast and northwest "solution-focused" meeting in Prince George. I attended as the Amateur Radio representative.

As part of the morning session, each person wrote one item that they would like to discuss in detail on a piece of paper. These were sorted and grouped together by Andy Beasley, the facilitator and agreed to by the attendees. Focus groups were formed accordingly.

The afternoon was spent working together in the focus groups then a member from each group presented the results to everyone in attendance. I of course, chose the communications group and made the presentation. This gave me the opportunity to address several telecommunication and radio issues with the ESS members.

I spoke to them about the fragility of the public switched telephone network (PSTN) including cellular and 911 services. I gave them specific examples of how external events such as the public reaction to emergencies, or perceived emergencies, can overload and disrupt service. I explained where Amateur Radio fit into the picture as a communication resource for them to use.

Politicians stubbornly navigate into the future by looking in their rear-view mirrors.

Dear Tech Support,

I am writing this letter as a last resort. Last year I upgraded from Girlfriend 7.0 to Wife 1.0 and noticed that the new program began unexpected child processing that took up a lot of space and valuable resources. No mention of this phenomenon was included in the product brochure. In addition, Wife 1.0 installs itself into all other programs and launches during system initialization, where it monitors all other system activity.
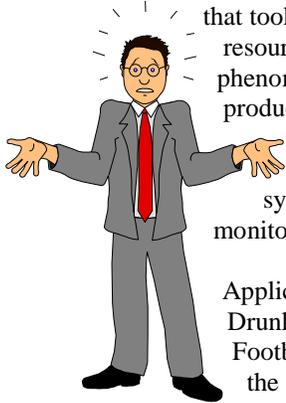
Applications such as Pokernight 10.3, Drunken Boys Night 2.5 and Saturday Football 5.0 no longer run, crashing the system whenever selected. I cannot seem to keep Wife 1.0 in the background while attempting to run some of my other favorite applications.

I am thinking about going back to Girlfriend 7.0, but uninstall does not work on this program. Can you help me, **please**!!!

Thanks,
Joe

Dear Joe:

This is a very common problem that men complain about but it is mostly due to a primary misconception. Many people upgrade from Girlfriend 7.0 to Wife 1.0 with the idea that Wife 1.0 is merely a "utilities & entertainment" program.

Wife 1.0 is an <u>operating system</u> and designed by its creator to run everything. It is unlikely you would be able to purge Wife 1.0 and still convert back to Girlfriend 7.0. Hidden operating files within your system would cause Girlfriend 7.0 to emulate Wife 1.0 so nothing is gained. It is impossible to uninstall, delete, or purge the program files from the system once installed.

You cannot go back to Girlfriend 7.0 because Wife 1.0 is not designed to do this. Some have tried to install Girlfriend 8.0 or Wife 2.0 but end up with more problems than the original system. Look in your manual under "Warnings - Alimony/Child Support."

I recommend you keep Wife 1.0 and just deal with the situation. Having Wife 1.0 installed myself, I might also suggest you read the entire section regarding General Partnership Faults (GPFs). You must assume all responsibility for faults and problems that might occur, regardless of their cause. The best course of action will be to enter the command C:\APOLOGIZE.

In any case avoid excessive use of the "Esc" key because ultimately you will have to give the APOLOGIES command before the operating system will return to normal. The system will run smoothly as long as you take the blame for all the GPFs.

Wife 1.0 is a great program, but very high maintenance. Consider buying additional software to improve the performance of Wife 1.0. I recommend Flowers 2.1 and Chocolates 5.0. Do not, under any circumstances, install Secretary-With-Short-Skirt 3.3. This is not a supported application for Wife 1.0 and is likely to cause irreversible damage to the operating system.

Best of luck,
Tech Support.