

Long Path



Volume 22 Issue 5

SEMDXA NEWSLETTER

February, 2005



President's Report

Greetings *SEMDXA* Members!

Last months meeting is going to be hard to top as Dave Collingham, **K3LP**, put on a GREAT presentation. It is especially nice to hear of some of the behind the scenes scenarios. Even though I could stand to loose 40 lbs, as Dave did, I am not sure many of us would be up to it. We need to keep things like that in mind when awaiting the QSL and do our best to keep patient, myself included. Thanks Dave for a great job.

As of this writing I am not sure what the presentation at next months meeting will be but I am looking at a couple of options. I hope to make a choice in time to get it in the newsletter. If not we will try to send out a bulk email with our agenda. If anybody comes up with a suggestion feel free to get in touch with myself or any of our officers.

Hope to see all our you in February. 'Till then 73 and DX if you can find any.

K8SIX, President

VU4/Andaman Islands

If you were fortunate to have QSOed this recent DX-pedition, please forward details to the *Long Path* editor at: **W8GF@comcast.net**. Details to include are time, date, mode and band. Results will be published in the March, 2005 issue of the *Long Path*.

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## January Minutes

Called to order at 7:35 p.m. by President **K8SIX**. Thirty-eight members and guests present. Al passed around an email from **4S7CF** asking for donations of used equipment to be used in Tsunami relief efforts. Al also apologized for the whistle when he talks due to dental work.

**W8LU** tells us that the *SEMDXA* web site has been up and down. Ken also requests members update their band totals. **K8KHZ** asks if the site can be changed from frames to non-frames?

**K8CC** suggests members send Ken and email if they are experiencing problems reading the *Long Path*. **K8SIX** also mentioned a letter he has drafted to the DXCC Desk asking that the **701YGF** operation be credited on the same basis as **P5/4L4FN**.

Treasurer **N8CQA** says we have a balance of \$898.60 in our account. He

will be changing banks due to the high fee structure currently. Secretary's report was printed in the *Long Path*.

**W8PP** reminds us that Dayton room are going fast...it's not too soon to make a reservation. **K8DD** has a block of rooms at the Holiday Inn Fairborn. **NE8I** says the Michigan VHF Club meets tomorrow, January 15th at 8:00 a.m. at the Grove, corner of M-59 and Duck Lake Road. **K8ZX** brought an old spark gap

## SEMDXA CLUB OFFICERS

*President:* Al Bailey, **K8SIX**

*Vice-president:* Ken Schang, **W8LU**

*Treasurer:* Buck Switzer, **N8CQA**

*Secretary:* Stan Arnett, **AC8W**

*Director:* Ted Pauck, **K8NA**

*Web Site Editor:* Ken Schang, **W8LU**

*DXCC Checker:* Bill Jones, **N8KF**

*DXCC Checker:* S.Arnett, **AC8W**

*VUCC Checker:* Al Bailey, **K8SIX**

*CQ Checker:* Mike Rudzki, **N8MR**

*CQ Checker:* Al Bailey, **K8SIX**

*Program Chairman:* Vacant

*LP Publisher:* Gerry Fasse, **W8GF**

transmitter for show and tell...he claims **W8LU** still uses one! The Hazel Park Swap is Sunday, January 16th according to **K8KHZ**.

Tonight's program features Dave Collingham, **K3LP**, who is the veteran of many DX-peditions including **P40DC**, **A61AF**, **A61AN**, **A61AJ**, **A4/K3LP**, **LA9HW**, **J3/K3P**, **J6R**, **M0/K3IP**, **5H3LP**, **VP5LP** and **KH7/K3LP**. **T33C**, Banaba, is the tale for this telling and, as Paul Harvey says, "Now we know the rest of the story".

Dave gave us the inside scoop on what went on behind the scene for this multi-operator - multi-transmitter, multi-national effort. They were on the island April 4 to 16, 2004, but planning began a year or more before that. Frank, **DL4KQ** and Rob, **PA2R** started the idea and later Hrane, **YT1AD**, joined the group. Anyone with an extra \$10K and 30 days to spare could sign on. In many cases there seemed to be too many chiefs and not enough Indians, according to Dave.

Banaba was chosen partly because it is number twenty-six on the Europe most wanted list. Team members gathered on Fiji and flew to Tarawa where their tightly packed container was transferred to the ship that would carry them to Banaba, the **Te Taobe**. The odors from the twenty-eight 50 gallon drums of gasoline combined with the coconut smell of the copra crop on board multiplied by the rolling of the boat on the Pacific swells meant that most of the passengers claimed a favorite spot on the railing. Upon arrival on Banaba, it took ten hours to unload the containers. Everything had to be put onto an aluminum skiff and taken to shore. A good portion of the DXers left to go site seeing, and didn't help with the unloading. Fortunately there was one working truck on the island that only needed gas...and the **T33C** crew had gasoline.

Banaba is one of those islands that was mined for the guano. When the supply ran out, the British left leaving the coral heads standing. Most of their equipment and buildings remain, albeit in broken down, rusting condition. Bulldozers, trucks, powerhouse, hospital and more are slowly rotting away. Lots of kids on the island, but not many men. The population of several hundred have no real livelihood apparently and receive a check yearly as reparation for the ecological damage done to Banaba.

Equipment used included Elecraft K2 transceivers and Acom amplifiers. Antennas were StepR Beams. The operating positions about a third of a mile or so apart were set up...one in the Police Chief's house, one in a chicken coop and one in a dilapidated former guest house. On the air from April 4th through April 16th they logged over 77,000 QSOs. Electric power was supplied by generators and a couple were lost during the operation.

Dave had many amusing tales including the Friday night dance that inevitably ends in a fist fight. He said there were nine fights Friday and seven fights Saturday. A scary tale involved the end of the trip when he lots of cash to pay for loading the container from the **Te Taobe** to the other ship to take the equipment home. Approached by a kid with a gun in his hand, Dave wrestled him to the ground only to find it was a toy gun! Scary! A lesson in bargaining in the South Pacific was also enlightening. A great story teller with nice visuals, this was an excellent program.

Meeting adjourned at 9:05 p.m. to general fellowship.

**AC8W**, Secretary

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DX Prospects

The December 26 Tsunami that occurred in the Indian Ocean area mercifully truncated the Andaman Island DX-pedition as conducted by a group of VU amateurs. Many of them continued to operate but in an emergency communications mode. Also, another VU contingent operated from the Nicobars in a similar manner

Charlie Harpole, **K4VUD** made an appearance early-on but was not permitted to operate which was a pity considering what the VU gang might have learned from him. Overall, this operation gets low marks. Their insistence upon operating in Simplex mode rather than split much of the time slowed progress and frustrated many USA operators. A couple of Cracker Jack CW operators would have helped. Too bad a couple of European, Japanese or USA operators were not permitted to participate otherwise.

The propagation path to the US is generally trans-polar which means signals even at the best of times during this period of minimum solar activity are marginal. Consequently, just about all of the USA QSOs were with the better equipped stations while shutting down second and third tier DXers. Particularly frustrating was their lack of antenna rotating capability. Thus, several decent Long Path openings were missed because their antennas were pointed in a generally Northern direction.

If you happened to have QSOed this group, please forward date, mode, time and band details to the Long Path Editor. The results will be published in the March, 2005 issue of the Long Path. Send to: W8GF@comcast.net

The Peter I DX-expedition (3Y/P)

was scheduled to begin on January 21 and continue through February 4, 2005. However, their ship the Braveheart was delayed with dry dock repairs. The new dates seem to be centered around February 12 through the first week of March.

QSL via **K4YL**. This is an outstanding group of operators. Their stations will be exceptionally well equipped and the average Joe Ham should have no trouble making a few QSOs during this two week period. A special attachment to this issue of the *Long Path* is a propagation study based on the **W6EL** program centered on February 20 and assuming a Solar Flux value of 95 and an average K index of 2. Beam heading from South-eastern Michigan is 183°. Openings on 160 Meters through 15 meters are quite likely. All bets are off on 12 and 10 Meters however. A sudden spurt of solar activity could add or subtract from the above. Hope for the best!

Good luck!

W8GF



Tower Maintenance

Some years back, the IRE Proceedings (now the IEEE) published an article about radio tower maintenance. The primary thrust of this piece was aimed at the effects of rust and corrosion since most towers of

that era were of galvanized steel construction. An incidental part of the article dealt with section-connecting hardware. In most cases this was, and still is for that matter, bolts and nuts. The article also suggested that anchors and other guying material are also vulnerable to the effects of rust and corrosion.

Fast forward about twenty years when one early summer morning I was out in the backyard looking over my small vegetable garden. I noticed a bolt - actually just portion of a bolt - laying on the cement foundation of my 78' tower. Further investigation indicated that it was from one of the self-supporting Heights Aluminum Tower sections. This bolt had actually rusted through and parted. The other half was never located. My tower had an Acme screw fold-over device (since replaced with a motorized version). So it was simple matter to look over all tower hardware.

That same day my brother Richard (then **W8IRY** and now **W8SJ**) and I cranked the tower over and began a close look at all section-connecting bolts. What was found was startling. The three lower sections all had damaged bolts. The photograph included here shows a typical bolt from one of the three lower sections. The wear and tear of 20 years exposure to the Michigan climate was quite evident.

How does this happen was the pertinent question. Corrosion-erosion works this way; moisture and oxygen present in the tower legs causes the bolt to rust on the surface. As the tower works (shakes) in the wind, the built-up rust flecks off followed by a new layer which also flecks and so on. Eventually you get a condition as depicted in the photograph. The bolt diameter will become narrowed to a point where additional tower motion breaks the bolt entirely which is what happened in the incident noted above. The hour-glass-shape is what you would expect given time and the constant working of the tower in even mild winds. In

windy locations, the results occur quicker and often with calamitous results.

All bolts were replaced and the tower was cranked back up and stands to this day. A potential disaster was avoided. Almost no erosion was evident in the upper section bolts. Intuition suggests this of course since there is less stress in the ascendant sections.

Before replacing this hardware, I checked with Darling Bolt of Warren, Michigan about the possibility of using stainless hardware to eliminate this problem. This seems like a good long-term solution but there are some caveats. 1) Stainless hardware is more expensive, almost twice the cost of Class 5 heat-treated steel; 2) Stainless hardware has a tendency to gall if great care is not used during installation; 3) For a given size (diameter), stainless has less capacity to withstand shear and bending moments. In regard to galling, if your stainless hardware should even have the slightest tendency to cross thread, it's hacksaw time! Removing cross-threaded stainless hardware otherwise is near impossible.

Class 5 heat-treated steel was used together with elastic stop nuts to repair my tower. Darling Bolt personnel suggested coating the bolts with a layer of lithium grease before installing. Several years later, one of the bolts was removed for inspection and the lithium seemed to help because very little erosion was evident.

Those of you with older tower installations take note!

W8GF

SEMDXA MQP PLAQUE

The following item printed as received from KØRI.

Just a note of greetings and thank you to all of the **SEMDXA** folks. I was the winner of the MQP Plaque for out-of-state, single operator Mountain/Pacific.

It will be my privilege to display it in my shack and thanks for sponsoring it.

Hope to work you all from J6 during the ARRL DX Phone Contest in March.

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## NE8Z Rides Again!

*Following item received from Dr. Rick Dorsch.*

Here is some information for the **Long Path**. But first, Happy New Year to all **SEMDXA** members.

I will be active as **PJ4/NE8Z** from February 4 through February 13, 2005. Maria will operate as **PJ4/HC1MM**.

QTH: Bonaire, Netherlands Antilles.

Rigs: Kenwood 680S/Ameritron AL84 Amplifier and Yaesu FT857.

Antennas: Cushcraft R-7 Vertical (40 through 10 Meters) and Cushcraft 3-element Yagi on 50 mHz.

Mostly CW & SSB on the WARC bands and 6-Meters.

**QSL via NE8Z**  
**Dr. Rick Dorsch**  
**Post Office Box 616**  
**Hamburg, Michigan 48139**  
**U. S. A.**

# SEMDXA MEMBERSHIP RENEWAL

## South Eastern Michigan DX Association (SEMDXA)

Date: \_\_\_\_\_

Application for new membership \_\_\_\_\_ or Application for renewal \_\_\_\_\_ (check one)

Full membership \_\_\_\_\_ or Associate membership \_\_\_\_\_ (check one) Dues: \$15.00 annually

(See SEMDXA website for membership requirements)

Present Call Sign: \_\_\_\_\_ Previous Call Sign: \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State/Zip Code: \_\_\_\_\_

Telephone: \_\_\_\_\_

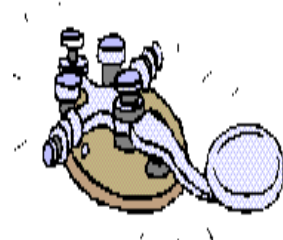
E-mail address: \_\_\_\_\_

***MAKE CHECK PAYABLE TO SEMDXA***

***Make payment at next SEMDXA meeting or mail with remittance to:***


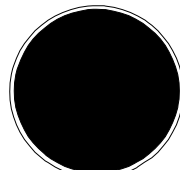


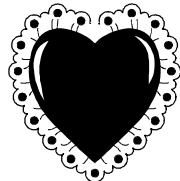




***Leon Switzer, Treasurer  
427 Jeffrey Avenue  
Royal Oak, Michigan 48073***

***NOTE: TO RECEIVE THE CLUB NEWSLETTER "THE LONG PATH" YOU MUST PROVIDE YOUR E-MAIL ADDRESS!***



# February 2005

## SEMDXA Monthly Planner

| Sunday                                 | Monday                                                                                                       | Tuesday                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Wednesday                                                                                                                      | Thursday                                                                                                          | Friday                                                                                                      | Saturday                                                                                                              |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
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| 6<br>NA SSB Sprint                     | 7                                                                                                            | 8<br><br>New Moon                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 9<br><br>Ash Wednesday                        | 10                                                                                                                | 11<br><br>SEMDXA Meeting | 12<br>Asia/Oceania Sprint<br>CQ RTTY WPX<br>FISTS Sprint<br>LA QSO Party<br>RSGB 160 CW Test                          |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 13<br>Livonia ARC Swap<br>NA CW Sprint | 14<br><br>Valentine's Day | 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 16<br><br>West Coast Qualifying Run<br>K6YR | 17<br><br>W1AW Qualifying Run | 18                                                                                                          | 19<br>ARRL CW DX Test                                                                                                 |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 20                                     | 21                                                                                                           | 22<br><br>Washington's Birthday                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 23                                                                                                                             | 24<br><br>Full Moon           | 25                                                                                                          | 26<br>AM QSO Party<br>CQ 160 SSB Test<br>MS QSP Party<br>NA RTTY Party<br>REF SSB Test<br>UBA CW Test<br>VI QSO Party |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 27<br>NC QSO Party                     | 28<br>JMF Birthday                                                                                           | <table border="1" style="margin: auto;"> <thead> <tr> <th colspan="7">January</th> </tr> <tr> <th>S</th><th>M</th><th>T</th><th>W</th><th>T</th><th>F</th><th>S</th> </tr> </thead> <tbody> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td>1</td> </tr> <tr> <td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td> </tr> <tr> <td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td> </tr> <tr> <td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td> </tr> <tr> <td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td> </tr> <tr> <td>30</td><td>31</td><td></td><td></td><td></td><td></td><td></td> </tr> </tbody> </table> <table border="1" style="margin: auto;"> <thead> <tr> <th colspan="7">March</th> </tr> <tr> <th>S</th><th>M</th><th>T</th><th>W</th><th>T</th><th>F</th><th>S</th> </tr> </thead> <tbody> <tr> <td></td><td></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td> </tr> <tr> <td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td> </tr> <tr> <td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td> </tr> <tr> <td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td> </tr> <tr> <td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td></td><td></td> </tr> </tbody> </table> |                                                                                                                                |                                                                                                                   |                                                                                                             |                                                                                                                       | January |  |  |  |  |  |  | S | M | T | W | T | F | S |  |  |  |  |  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |  |  |  |  |  | March |  |  |  |  |  |  | S | M | T | W | T | F | S |  |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |  |  |
| January                                |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                |                                                                                                                   |                                                                                                             |                                                                                                                       |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| S                                      | M                                                                                                            | T                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | W                                                                                                                              | T                                                                                                                 | F                                                                                                           | S                                                                                                                     |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
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| 2                                      | 3                                                                                                            | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 5                                                                                                                              | 6                                                                                                                 | 7                                                                                                           | 8                                                                                                                     |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 9                                      | 10                                                                                                           | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 12                                                                                                                             | 13                                                                                                                | 14                                                                                                          | 15                                                                                                                    |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 16                                     | 17                                                                                                           | 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 19                                                                                                                             | 20                                                                                                                | 21                                                                                                          | 22                                                                                                                    |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 23                                     | 24                                                                                                           | 25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 26                                                                                                                             | 27                                                                                                                | 28                                                                                                          | 29                                                                                                                    |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 30                                     | 31                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                |                                                                                                                   |                                                                                                             |                                                                                                                       |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| March                                  |                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                |                                                                                                                   |                                                                                                             |                                                                                                                       |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| S                                      | M                                                                                                            | T                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | W                                                                                                                              | T                                                                                                                 | F                                                                                                           | S                                                                                                                     |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
|                                        |                                                                                                              | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                                                                                                                              | 3                                                                                                                 | 4                                                                                                           | 5                                                                                                                     |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 6                                      | 7                                                                                                            | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 9                                                                                                                              | 10                                                                                                                | 11                                                                                                          | 12                                                                                                                    |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 13                                     | 14                                                                                                           | 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 16                                                                                                                             | 17                                                                                                                | 18                                                                                                          | 19                                                                                                                    |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 20                                     | 21                                                                                                           | 22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 23                                                                                                                             | 24                                                                                                                | 25                                                                                                          | 26                                                                                                                    |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 27                                     | 28                                                                                                           | 29                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 30                                                                                                                             | 31                                                                                                                |                                                                                                             |                                                                                                                       |         |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |       |  |  |  |  |  |  |   |   |   |   |   |   |   |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |

W6ELProp Short-Path Prediction for 02/20/2005

TERMINAL A: 42.29 N 83.00 W w8gf Sunrise/Set: 1225/2306 UTC Bearing to B: 182.9 deg  
 TERMINAL B: 68.83 S 90.58 W Peter I Island Sunrise/Set: 1019/0213 UTC Bearing to A: 6.0 deg  
 SSN: 38.2 Flux: 95.0 K: 2 Path Length: 12373 km

SIGNAL LEVELS IN dB ABOVE 0.5 µV

| UTC  | MUF  | 3.6 MHz | 7.1 MHz | 14.1 MHz | 21.2 MHz | 28.3 MHz |
|------|------|---------|---------|----------|----------|----------|
| 0000 | 20.0 |         | -1 A    | 23 A     | 22 C     |          |
| 0030 | 18.6 |         | 13 A    | 26 A     | 24 D     |          |
| 0100 | 17.0 | -2 A    | 19 A    | 28 A     | 24 D     |          |
| 0130 | 15.3 | 12 A    | 27 A    | 29 B     | 25 D     |          |
| 0200 | 13.6 | 21 A    | 28 A    | 29 C     |          |          |
| 0230 | 13.7 | 30 A    | 35 A    | 29 C     |          |          |
| 0300 | 13.7 | 36 A    | 36 A    | 29 C     |          |          |
| 0330 | 13.7 | 36 A    | 36 A    | 30 C     |          |          |
| 0400 | 13.6 | 41 A    | 36 A    | 30 C     |          |          |
| 0430 | 13.5 | 41 A    | 36 A    | 30 C     |          |          |
| 0500 | 12.9 | 41 A    | 36 A    | 30 C     |          |          |
| 0530 | 12.9 | 41 A    | 36 A    | 30 C     |          |          |
| 0600 | 12.9 | 41 A    | 36 A    | 30 C     |          |          |
| 0630 | 12.9 | 41 A    | 36 A    | 30 C     |          |          |
| 0700 | 12.7 | 41 A    | 36 A    | 30 D     |          |          |
| 0730 | 11.4 | 41 A    | 36 A    | 30 D     |          |          |
| 0800 | 10.1 | 41 A    | 36 A    |          |          |          |
| 0830 | 9.8  | 41 A    | 36 A    |          |          |          |
| 0900 | 9.8  | 36 B    | 36 A    |          |          |          |
| 0930 | 10.9 | 34 A    | 35 A    | 29 D     |          |          |
| 1000 | 12.0 | 26 A    | 35 A    | 29 D     |          |          |
| 1030 | 12.8 | 26 A    | 33 A    | 29 C     |          |          |
| 1100 | 12.9 | 8 A     | 24 A    | 28 C     |          |          |
| 1130 | 13.1 |         | 12 A    | 26 C     |          |          |
| 1200 | 13.7 |         | 1 A     | 22 C     |          |          |
| 1230 | 16.0 |         |         | 19 A     |          |          |
| 1300 | 18.1 |         |         | 16 A     | 19 D     |          |
| 1330 | 19.9 |         |         | 6 A      | 18 C     |          |
| 1400 | 20.5 |         |         | 3 A      | 16 C     |          |
| 1430 | 21.2 |         |         | 0 A      | 15 C     |          |
| 1500 | 21.6 |         |         | -8 A     | 14 B     |          |
| 1530 | 22.0 |         |         | -10 A    | 13 B     |          |
| 1600 | 22.5 |         |         |          | 12 B     |          |
| 1630 | 22.9 |         |         |          | 12 B     | 14 D     |
| 1700 | 23.3 |         |         |          | 11 A     | 14 D     |
| 1730 | 23.6 |         |         |          | 11 A     | 14 D     |
| 1800 | 23.8 |         |         |          | 11 A     | 14 D     |
| 1830 | 23.9 |         |         |          | 11 A     | 14 D     |
| 1900 | 24.0 |         |         |          | 11 A     | 14 D     |
| 1930 | 24.2 |         |         |          | 12 A     | 14 D     |
| 2000 | 24.2 |         |         |          | 12 A     | 15 D     |
| 2030 | 24.3 |         |         | -9 A     | 13 A     | 15 D     |
| 2100 | 24.2 |         |         | -1 A     | 14 A     | 16 D     |
| 2130 | 24.1 |         |         | 1 A      | 15 A     | 16 D     |
| 2200 | 24.0 |         |         | 4 A      | 17 A     | 17 D     |
| 2230 | 23.7 |         |         | 7 A      | 18 A     | 18 D     |
| 2300 | 22.6 |         |         | 17 A     | 19 B     |          |
| 2330 | 21.5 |         |         | 20 A     | 21 B     |          |

Availabilities A: 75 - 100% B: 50 - 75% C: 25 - 50% D: 1 - 25%  
 Signal levels suppressed if below -10 dB or if predicted availability is zero