

**WORKING GROUP**  
**G1: Ionosonde Network**  
**Advisory Group (INAG)**

Chair: Phil Wilkinson

Vice Chair: Lee-Anne McKinnell

# Agenda

- 1) Election of Officers
  - Chair
  - Vice Chair
- 2) INAG Triennium report
  - Bulletin
  - Mail list
- 3) Digital ionogram formats
- 4) Reports from the Network
- 5) Other business

# Bulletin Contents 2002-2005


## ○ Obituary

- Terry Kelly (15.April.1945 - 22.December.2001)
- Dr Anthony Myron Breed (March 31st 1970 - September 5th 2002)

## ○ Articles

- **Year = 2002** (a good year in all other respects)
- 63 - Rescuing Ionogram Film Archives at World Data Centers for the IRI and Posterity
- 63 - Ionosonde 'fplots', A gift for the International Reference Ionosphere and for Space Weather today, from the 20th century
- 63 - Report on the Studies About the Long-term Ionospheric Behaviour in Antarctica
- 63 - F1.5/F3 Layers in the Equatorial Ionosphere
- 63 - Digisonde 256 data decoding: 16 channel ionograms
- 63 - Working Group Report of INAG to URSI 2002
- 63 - Converting from Film to Digital Ionograms - not as easy as it looks
- **Year = 2003**
- 64 - The need for international support for ionosonde networks
- 64 - The Atmospheric Sounding Station " El Arenosillo "
- 64 - New ionograms observed by satellite radio sounding from below of the F-layer maximum
- **Year = 2004**
- 65 - Ionogram sequence observed by satellite radio sounding from below of the F-layer maximum
- 65 - Ionospheric Observatory Development At Mario Zucchelli Station
- 65 - 20th Century operation of the Tromsø Ionosonde
- 65 - Variations of yearly mean values of effective heights for the ionospheric sporadic E-layer
- 65 - New Ionosonde Site On Line
- **Year = 2005** (a quiet, but important year)
- 66 - A new format for ionospheric characteristics: SAOXML
- 66 - WDC-A Comments on Ionosonde Data Exchange Formats – Draft
- 66 - A New South Pacific Ionosonde Station - Niue

# [www.ips.gov.au/IPSHosted/INAG/](http://www.ips.gov.au/IPSHosted/INAG/)



**INAG - Ionosonde Network Advisory Group Home page**

INAG is Working Group 1 of URSI Commission G and is responsible for:

- collecting together information on the analysis of ionograms,
- maintaining conventions for the reduction of ionograms,
- providing a forum for people interested in obtaining reliable data from ionograms,
- preserving the Global ionospheric climate record.

The INAG Bulletin is one of the more important outputs of INAG. This Web site will become an extension of the Bulletin. In addition, there are a number of other useful reference publications that are reproduced here for wider distribution.

*Publications*

[UAG-104 Table of Contents](#)  
[Past INAG Bulletins currently available on the Web](#)  
[URSI Handbook of Ionogram Interpretation and Reduction](#)  
[Australian Ionogram Scaling Training Material \(~430kB\)](#)

[INAG-66 Web Bulletin 2005](#)

- Bulletin articles continue to trickle in
- Mailing list – risen to 247 quiet but active members
- Agreeing on a suitable data exchange format is the current **major** task confronting INAG.

# Digital ionogram formats

- Two notes to INAG Bulletin
  - A new format for ionospheric characteristics: SAOXML
  - WDC-A Comments on Ionosonde Data Exchange Formats – Draft
- Seven messages to INAG Mail List.
- email messages I received that were not sent to the list:
  - “why change anything, what we have is fine”
  - “we’re now committed to current SAO formats”
  - “Why not use CDF? Why reinvent the wheel?”
  - “best to solicit at least two formats and discuss tradeoffs; not an urgent issue”
  - Those IT people I’ve spoken to like the XML approach
- Summary of discussion to date
  - SAOXML proposal and various discussions about using it
  - WDC-A counter proposal and request to delay any final decision
  - No other feedback sent to list
  - This work will cost time and money, plus valuable coding resources.

# IPS Position

- The adoption of XML for non-binary ionosonde data exchange is timely and logical.
- Key benefits include:
  - Imposing a hierarchical structure on the data format should lead to a logical breakdown of ionosonde data into key elements and sub-elements,
  - a standard naming convention,
  - extensibility while maintaining backwards compatibility with existing XML software,
  - strong typing through schema.
- An IT perspective:
  - Preferable that any data exchange format be vendor neutral (that is, in the public domain),
  - There should be a general consensus on the format.
  - To achieve consensus, a formal body or group should ratify and further develop the format.
- XML allows a top down approach to developing the standard.
  - As a first step, the top level structure needs to be agreed on and nailed down.
  - As long as there is agreement on the basic core structure, future extensions should cause no problems.
- The WDC-A proposal is a good starting point for a standard.
  - The modifications to the SAOXML V5 format add flexibility (greater use of child elements rather than attributes),
  - and there has obviously been a lot of thought put into supporting other ionosonde types.
  - It would be relatively straight-forward to produce a filter to convert the SAO-XML format into the WDC-A format, as most of the differences are structural.
- The adoption of any new format is going to require the dedication of (scarce) coding resources, and so it is worthwhile spending time and effort gaining agreement on the format before rushing into implementation.