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Italy:

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Introduction

The IPS Advanced Stand Alone Prediction System (ASAPS) allows the prediction of Sky Wave communication conditions in the HF (High Frequency) and low VHF (Very High Frequency) radio spectrum or Short Wave Band (1 to 45 MHz). It is based on an Ionospheric model developed by IPS Radio and Space Services of the Australian Department of Industry, Tourism and Resources, and ITU-R / CCIR models (Rec. ITU-R P.533-8, Rec. ITU-R P.372-8 and CCIR Report 322).

ASAPS V5 is a 32-bit application, designed for Pentium-based Personal Computers with the Microsoft Windows Operating System (Windows 95 or higher). A minimum of 32 MegaBytes of RAM and 50 MegaBytes of hard disk space are necessary, and SVGA video is highly recommended. To run the new Area Predictions, you will need a Pentium 233 or better to provide adequate performance, because of the large number of calculations involved.

What’s New for ASAPS V5?

- ASAPS V5 is a 32-bit application, making it suitable for use on a wider range of Microsoft Operating Systems.

- A geographical map of the world for use in generating predictions - terminals, circuits and areas of interest can now be selected quickly and easily via "point and click".

Using "point and click" to generate predictions
• When running either Field Strength (Point-to-Point) or Area predictions:

1. The option of using an alternative, more complex, Polarisation Coupling Loss algorithm that includes the specification of the actual polarisations of the antennas.

2. The ability to select Prediction Confidence Levels for Signal-to-Noise Ratio predictions, eg lower decile, median or upper decile values, or anything in between.

3. A choice between ITU and CCIR Atmospheric Noise maps

• Frequency Set Selection or Test, allowing you to predict the optimum frequency set for the HF circuits you operate, or to assess the suitability of your current frequency sets for those circuits.

• Surface wave range contour maps for Area predictions, including Multi-Surface SNR contour plots for specific frequencies.

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ASAPS V5 AREA PREDICTION 24 Sep 2003

Area: Darwin - Arafura Sea  Date: February 2004
Tx: Darwin  -12 23. 130 S1.  T-index: 32
FSet: maritime  TxAntenna: Vert. Monopole  RxAntenna: Vert. Monopole
Bandwidth: 3.0kHz  Man Made Noise=-164dBW/Hz  Power:1000 W
Required S/N:0dB  Permittivity=80.00, Conductivity=5.00000 S/m
Surface Wave  UT 20

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Sample surface wave range contour map

• An on-line Tutorial that guides the user through the key features of the program, and how to interpret the many output formats.

• A monthly reminder for the update of ionospheric T indices, with the ability to do this automatically over the web.

• An option to customise the colour palette for easier interpretation of Area Prediction plots.

• The ability to view four-hourly Area Predictions (0 - 3UT, 4 - 7UT, etc) on a single screen.
• **Colour plots of BUF modes** for Area Predictions.

• **Frequency sets** may be entered in either **MHz or KHz**

• The ability to **delete individual circuits from a prediction file** or to **delete the complete prediction file**, together with all other output files that are linked to the deleted file.

• The ability to **specify the top margin when printing** GRAFEX or Field Strength predictions.

• Installation software available exclusively via **CD format**.

• **Upgrades** available from ASAPS V4. New registration details will be needed for Upgrades to ASAPS V5. (**NOTE**: ASAPS V4 GRAFEX Files can be displayed and “Recomputed” by ASAPS V5. However, ASAPS V5 cannot display ASAPS V4 Field Strength or Area Prediction Files because extra data is produced by the ASAPS V5 FPLOS Kernel for the Polarisation Coupling Loss and S/N Ratio confidence levels).
What else does ASAPS V5 offer?

1) On-line User Guide and Tutorial

ASAPS V5 includes a comprehensive on-line User Guide

The on-line Tutorial gives step by step instructions on how to enter the required input data and how to interpret the various output formats. It includes a set of exercises that takes the user through a wide range of program features.
2) Predictions for any HF circuit world-wide

2A) POINT-TO-POINT HF Propagation and Field Strength Predictions

**GRAFEX table**
GRAFEX predictions examine the first two propagation modes via the E and F layers of the ionosphere. They predict, for each hour of the day and each mode,

- Upper Decile Maximum Usable Frequency (UD MUF)
- Median MUF
- Optimum Working Frequency (OWF) (or lower Decile MUF)
- Median E-layer MUF (EMUF)
- Absorption Limiting Frequency (ALF)
- Elevation Angles

The GRAFEX format provides information about the likely performance of every MHz frequency for each hour between 1 and 40 MHz, including the probability of propagation via mixed and complex modes.

**GRAFEX graph**
This is the graphical form of the GRAFEX prediction. Although the same information is presented, this format allows easier comparisons between different modes and circuits.

Users can determine the best frequency for use each hour using the GRAFEX Graph

**Frequency plan**
The Frequency Plan prediction displays frequency schedules. From a user-specified frequency set, ASAPS V5 creates two schedules, one for frequencies with at least a 90% chance of
ionospheric support, the other for 50-90%. The prediction considers the first two modes for both E-layer and F-layer propagation and also shows the corresponding take-off angles.

**Best Usable Frequency (BUF) graph**

This is a graph of the BUF for each hour, selected from the user's frequency set and determined on the basis of ionospheric conditions and the user's specified system details.

![Graph of Best Usable Frequency (BUF)](image)

**Point-to-Point BUF Graph display**

**Field strength output tables**

The following parameters can be calculated:

- All Noise
- Estimated Power Required
- Antenna Gains
- Losses (Pathloss)
- Noise_Pathloss
- Signal-to-Noise
- BUF
- Field Strength
- Reflection Heights
- Noise Field Strength
- Probability
- Take-off Angle

Values are determined for the MUF, OWF and each frequency in the user's specified set. These values are calculated on the basis of the specifications shown at the top of the screen, including the circuit details and system parameters such as transmitting (Tx) and receiving (Rx) antenna, Tx power, Rx site noise, etc.

**2B) POINT-TO AREA Predictions**
Contour Maps
With an Area Prediction, you can display the data for each of the circuits between a base terminal and a grid of terminals in the specified geographical Area of Interest. Data that can be displayed includes:

- All the point-to-point GRAFEX and Field Strength formats for each grid point circuit.
- **Best Usable Frequency (BUF)**. The BUF is defined as the frequency from the specified set with the maximum S/N ratio that also satisfies the specified minimum take-off angle, required S/N ratio and probability level.
- **Maximum Usable Frequency** (MUF) on the BUF propagation mode.
- **Optimum Working Frequency** (OWF) on the BUF propagation mode.
- BUF propagation modes.
- **Signal/Noise** ratios at the BUF, MUF and OWF.
- Noise field strength at the BUF.
- **Percentage probability of ionospheric support** for the BUF.
- Take-off angle for the BUF.
- Surface wave range and frequency-specific Multi-Surface SNR Contour plots.

Sample BUF Chart - one example of the displays available for Point-to-Area predictions

3) Your choice of solar/ionospheric indices

ASAPS V5 HF predictions can be generated based on one of three indices

- IPS ionospheric T-index
- 10.7 cm flux
- sunspot number

A database of monthly ionospheric T-indices is supplied with the software. This can be updated each month, based on information given in the IPS monthly Solar and Geophysical Summary, and may be updated automatically via the web.
4) User-friendly management databases

Using ASAPS V5, you can generate Point-to-Area and Point-to-Point predictions for any HF circuit in the world. Several management databases are included to assist in providing the required input data for these predictions. Some examples are shown below. In each case, ASAPS V5 comes with a standard set of data, which can be added to, or modified, by the user:

**Terminals and Circuits**

![Terminals and Circuits Image]

**Areas of Interest**

Geographical Areas of Interest for base-to-mobile and/or mobile to base communications can be selected from:

1. a standard set available via the Area Predictions menu, or
2. user-specified sets defined via latitude/longitude boundaries and grid resolution entered by the user.

![Selecting a Prediction Area Image]
**Frequency sets**

Frequency sets can be entered in units of either kHz or MHz. The data can be entered manually, or imported from a text file. It can also be exported to a text file.

**2-D and 3-D antenna types**

**Sample 2-D antenna gain pattern – Conical Monopole**

**Sample 3-D antenna gain pattern - Delta**
Ionospheric T indices

The IPS T index database can now be updated automatically via your web browser. It also has been placed in standard spreadsheet format, with row numbers and column letters

Station configurations
5) Command Line Options

Predictions can easily be generated for large numbers of HF circuits by running ASAPS V5 command line options. If started in this mode, ASAPS V5 will read in circuit and (optionally) frequency set details from user-generated files and generate the associated predictions immediately.

Demonstration Software

A free demonstration copy of ASAPS V5 is available via our web-site. To access this, please go to our home page at www.ips.gov.au and follow links as follows:

Products & Services > Software - ASAPS > Download Demo Version

Predictions are restricted to a set date (January of the current year) and level of ionospheric activity (T index = 50), otherwise the user is free to input a range of data, and explore the program's output.

Ordering ASAPS V5

ASAPS V5 is available directly from IPS Head Office or through our distributors. Contact our distributors directly for sales in the Americas or Italy, based on the contact details that follow. For all other sales, you may complete the order form that follows and return it to IPS.

Upgrades to ASAPS V5 are available from ASAPS V4. Please note that a new set of registration details will be required for ASAPS V5 Upgrades.

Distributor sales – Americas and Italy

Americanas:

Prices
- Original: $275 (USD)
- Upgrade: $35 (USD)

Mr Jacques d'Avignon
- Email: monitor@rac.ca
- Phone: +1 613 745 6522
- Fax: +1 613 745 4195

Italy:

Prices
- Original: $200 (EURO)
- Upgrade: $30 (EURO)

Mr Luca Barbi
- Email: luca.barbi@libero.it
- Web: www.lucabarbi.it
- Phone and Fax: +39 0386 467203
IPS ASAPS V5 Order Form

This form is to be used for purchasing directly from IPS Head Office only. For details about sales through our Americas and Italian distributors, check the details on the previous page.

Step 1: Fill in your details

Registered User

Organisation:

Australian Business
Number (Aust. Only):

Postal Address:

Telephone: (   )

Mobile:

Facsimile: (   )

Internet:

Step 2: Select your item

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TOTAL (AUD) $  

* only available from ASAPS V4

Step 3: Fill in your payment details
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