From:	Rodrigo Irazu <rirazu@forsk.com>
Sent:	Thursday, June 27, 2013 10:37 AM
To:	dave.wittwer@galtronics.com
Subject:	Atoll Antenna table format description
Attachments:	Seven Katherin Antennae.txt; Seven Katherin Antennae.csv

Hello David,

Please find bellow an extract from our Admin manual where you can find the format of the DIAGRAM field of the Antennas table in Atoll.

Also I have attached a couple of antenna reference tables -same antennas in CSV and TXT format-. Hope it helps.

9.2 RF 2D Antenna Pattern Format

This section describes the format of the DIAGRAM field of the Antennas table. This field stores the antenna diagrams in a 2D (angle vs. attenuation) format. This is the format of the contents of the DIAGRAM field of the Antennas table when it is copied from, pasted to, imported to (from TXT or CSV files), and exported from (from TXT, CSV, or XLS files) the Antennas table.

Antenna patterns can also be imported in Planet 2D-format antenna files and 3D antenna files. The file format required for 3D antenna file import is described in "Import Format of 3D Antenna Pattern Text Files" on page 111.

The format of 2D antenna patterns containing co-polar diagrams only can be understood from Figure 9.1 on page 109.

Figure 9.1: 2D RF Antenna Pattern Format Containing Co-polar Diagrams Only

The contents of the DIAGRAM field are formatted as follows:

- **Pattern Descriptor 1:** Space-separated list of parameters.
  - **First entry:** The number of co-polar diagrams. For example, 2.
  - **Second entry:** First co-polar diagram type = 0 for azimuth (horizontal) diagram.
  - **Third entry:** The elevation angle of the azimuth diagram.
  - **Fourth entry:** The number of angle-attenuation pairs in the first co-polar diagram. For example, 360.
- **Co-polar Horizontal Diagram:** Horizontal co-polar diagram (the second entry in the preceding descriptor is 0). The format is space-separated *angle attenuation* pairs. For example, 0 0 1 0 2 0.1....
- **Pattern Descriptor 2:** Space-separated list of parameters.
  - **First entry:** Second co-polar diagram type = 1 for elevation (vertical) diagram.
  - **Second entry:** The azimuth angle of the elevation diagram.
  - **Third entry:** The number of angle-attenuation pairs in the second co-polar diagram. For example, 360.
- **Co-polar Vertical Diagram:** Vertical co-polar diagram (the first entry in the preceding descriptor is 1). The format is space-separated *angle attenuation* pairs. For example, 0 0 1 0.1....
- **End:** The number cross-polar diagrams = 0.

The format of 2D antenna patterns containing co-polar and cross-polar diagrams can be understood from Figure 9.2 on page 110.
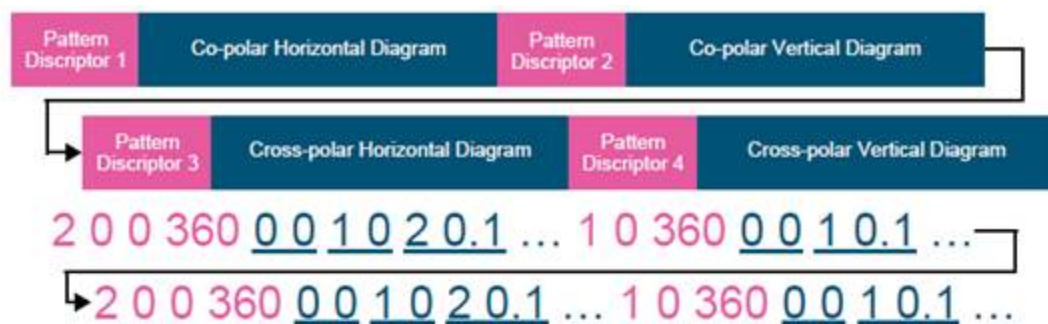
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2

Pattern Discriptor 1	Co-polar Horizontal Diagram	Pattern Discriptor 2	Co-polar Vertical Diagram

Pattern Discriptor 3	Cross-polar Horizontal Diagram	Pattern Discriptor 4	Cross-polar Vertical Diagram

2 0 0 360 0 0 1 0 2 0.1 ... 1 0 360 0 0 1 0.1 ...

2 0 0 360 0 0 1 0 2 0.1 ... 1 0 360 0 0 1 0.1 ...

Figure 9.2: 2D RF Antenna Pattern Format Containing Co-polar and Cross-polar Diagrams

The contents of the DIAGRAM field are formatted as follows:

- **Pattern Descriptor 1:** Space-separated list of parameters.
  - **First entry:** The number of co-polar diagrams. For example, 2.
  - **Second entry:** First co-polar diagram type = 0 for azimuth (horizontal) diagram.
  - **Third entry:** The elevation angle of the azimuth diagram.
  - **Fourth entry:** The number of angle-attenuation pairs in the first co-polar diagram. For example, 360.

- **Co-polar Horizontal Diagram:** Horizontal co-polar diagram (the second entry in the preceding descriptor is 0). The format is space-separated *angle attenuation* pairs. For example, 0 0 1 0 2 0.1....

- **Pattern Descriptor 2:** Space-separated list of parameters.
  - **First entry:** Second co-polar diagram type = 1 for elevation (vertical) diagram.
  - **Second entry:** The azimuth angle of the elevation diagram.
  - **Third entry:** The number of angle-attenuation pairs in the second co-polar diagram. For example, 360.

- **Co-polar Vertical Diagram:** Vertical co-polar diagram (the first entry in the preceding descriptor is 1). The format is space-separated *angle attenuation* pairs. For example, 0 0 1 0.1....

- **Pattern Descriptor 3:** Space-separated list of parameters.
  - **First entry:** The number of cross-polar diagrams. For example, 2.
  - **Second entry:** First cross-polar diagram type = 0 for azimuth (horizontal) diagram.
  - **Third entry:** The elevation angle of the azimuth diagram.
  - **Fourth entry:** The number of angle-attenuation pairs in the first cross-polar diagram. For example, 360.

- **Cross-polar Horizontal Diagram:** Horizontal cross-polar diagram (the second entry in the preceding descriptor is 0). The format is space-separated *angle attenuation* pairs. For example, 0 0 1 0 2 0.1....

- **Pattern Descriptor 4:** Space-separated list of parameters.
  - **First entry:** Second cross-polar diagram type = 1 for elevation (vertical) diagram.
  - **Second entry:** The azimuth angle of the elevation diagram.
  - **Third entry:** The number of angle-attenuation pairs in the second cross-polar diagram. For example, 360.

- **Cross-polar Vertical Diagram:** Vertical cross-polar diagram (the first entry in the preceding descriptor is 1). The format is space-separated *angle attenuation* pairs. For example, 0 0 1 0.1....

You can use a 3rd party software or develop a tool to convert the contents of the DIAGRAM field into binary. In binary, each antenna is described by a header and a list of value pairs.

The header is defined as follows:

- *flag*: (Integer, 32 bits) -1 for omni diagrams, 0 for directional
- *num*: (Short integer, 16 bits) Number of diagrams (0, 1, 2, 3, 4)
- *siz0*: (Short integer, 16 bits) Size of the first diagram (horizontal co-polar section, elevation = 0°)
- *siz1*: (Short integer, 16 bits) Size of the second diagram (vertical co-polar section, azimuth = 0°)
- *siz2*: (Short integer, 16 bits) Size of the third diagram (horizontal cross-polar)
- *siz3*: (Short integer, 16 bits) Size of the fourth diagram (vertical cross-polar)
- *prec*: (Short integer, 16 bits) Precision of the following angle values (100)

Then follows the content of each of the defined diagrams, i.e., the diagrams whose sizes (*siz0*, *siz1*, *siz2*, *siz3*) are not zero. Each diagram consists of a list of value pairs. The number of value pairs in a list depends on the value of the *siz0*, *siz1*, *siz2*, and *siz3* parameters. For example, *siz2* = 5 means there are five value pairs in the third diagram.

The value pairs in each list are:

- *ang*: (Short integer, 16 bits) The first component of the value pair is the angle in degrees multiplied by 100. For example, 577 means 5.77 degrees.
- *loss*: (Short integer, 16 bits) The second component of the value pair is the loss in dB for the given angle *ang*.

All the lists of value pairs are concatenated without a separator.

Best Regards,

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