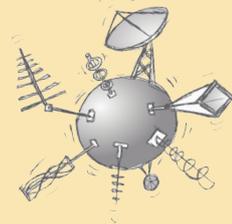


Newsletter 2017.0

February 2017



Antenna Magus Version 2017.0 released!

Version 2017.0 sees a number of extensions to Antenna Magus features as well as the addition of new antennas. The newsletter highlights some of these additions. More information on these can be found on the [Antenna Magus website](#) and in the full release notes.

New Features and Extensions

64-bit Antenna Magus

The 2017.0 release of Antenna Magus will be exclusively available in native 64-bit architecture. This also applies to the Floating License Manager.

CST Licensing

For licensed users of CST STUDIO SUITE® it is now possible to license Antenna Magus using the CST License Manager. This can simplify the license administration considerably and users who are interested in this feature should please contact their Support channels to find out more.

Arrays

A number of extensions have been made to the Array Tools. Most notably - the relative spacing and distance between array elements may now also be specified in physical distances (e.g. meters or inches) where previously only wavelength values could be used.

Workflow

The Specification based workflow (introduced in version 2016) remains the recommended workflow. In order to keep improving on this feature a few changes have been implemented:

- Keyword changes / additions in Find Mode are now maintained, even when temporarily navigating away from Find Mode or closing Antenna Magus
- The Smart Design information popup no longer shows automatically when a Reference Design is updated
- New Settings have been added to allow the Quick Start page and Automatic Performance Estimation to be activated/deactivated by the user. The Automatic Estimated Performance will now be disabled by default, but can be re-enabled in the Settings dialogue.

Performance

Various performance improvements have been made to Antenna Magus, impacting specifically on Find Mode and responsiveness when switching between Designs and Prototypes. The loading of state information and Backups from older versions of Antenna Magus is more reliable. In addition, the Performance Estimation of many antennas have been accelerated and more flexible Design and Tweaking options added.

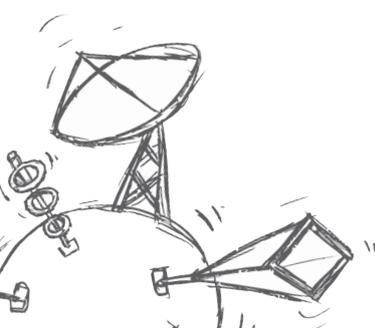
New Antennas

13 new antennas have been added to Antenna Magus since the Version 2016 release - many of them in response to specific requests from our users. All of these antennas are described in more detail in the 2016 update newsletters or on the Antenna Magus website.

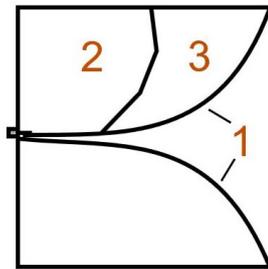
Horn Antennas

A number of specialised new horn antennas were added, including the **Smooth Spline Profiled Pyramidal Horn**, which aims to improve aperture efficiency without an increase in size when compared to a standard gain horn. The **4 Waveguide-fed Dual Polarised Pyramidal Horn Antenna** aims to achieve dual orthogonal polarisation, while being

relatively simple and inexpensive to manufacture. The main feature of the **Waveguide-fed Pyramidal Horn Array** is that it achieves a lower side lobe level than a conventional horn antenna using a shorter overall length.



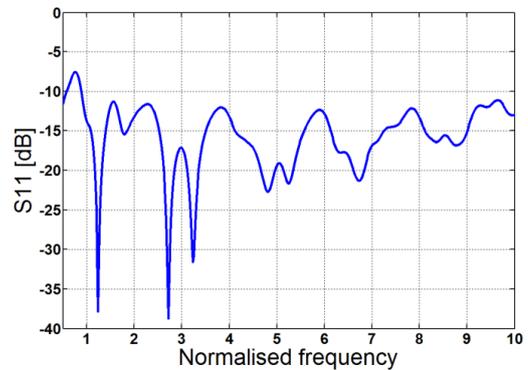
The most recent horn addition - a **TEM Horn with Magnetic Dipoles** often called the 'Koshelev' horn or 'K-antenna' - has been specifically



Horn topology with 3 numbered radiators.

designed for UWB applications. This horn antenna can be considered a combined antenna - where an existing antenna type (the TEM horn) has been modified by adding extra physical components to optimise the performance for a certain application. In this case, a metallic casing and a shorting plate has been added to the structure to improve wideband performance. As shown in the diagram above, these additions result in 3 distinct radiator mechanisms: an electric type radiator in the

form of a TEM horn (1), an active magnetic dipole type radiator (2), and a passive magnetic dipole radiator (3). These modifications reduce the lower frequency of the performance band by approximately 45% when compared to a TEM horn antenna without the shorting plate. The horn achieves a -10dB reflection response over a 11:1 bandwidth as shown below.



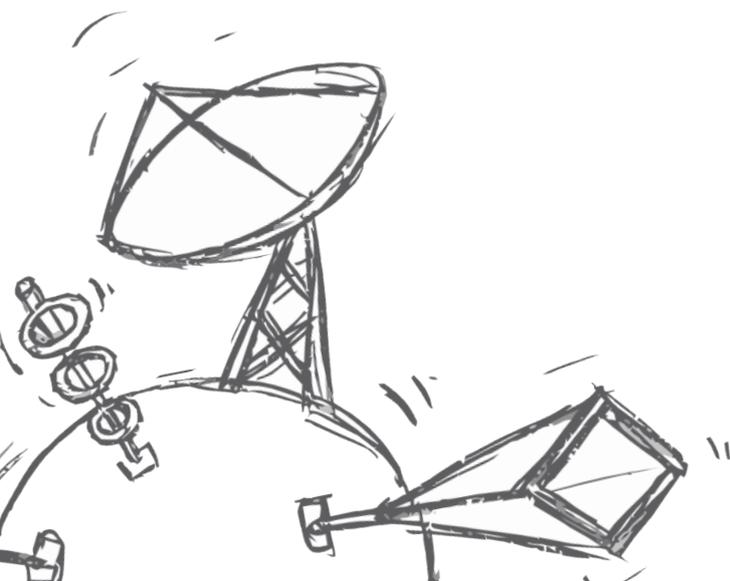
Typical reflection coefficient

Antennas Commonly used in RF Application Notes and Reference Designs

Antennas, such as the two IFA's, the **Meandering Monopole**, the **Helix** and the **Yagi-Uda**, are similar to reference antennas provided by RF component manufacturers (e.g. the Antenna Development Kit (ADK) antennas from Texas Instruments - www.ti.com). These antennas are typically suited for integration into a PCB layout (using the same substrate as the electronics) and are therefore extremely useful to circuit designers requiring a 'plug-and-play' antenna for testing during product development. By avoiding the intricacies of antenna design in the early stages of product development, numerous delays and frustrations can be avoided.

The reference designs provided by RF component manufacturers are useful when they can be used without modification. Adjusting these designs for different frequencies or substrate parameters is not always a simple task. With these antennas in Antenna Magus, however, this becomes trivial! In addition to the design flexibility, Antenna Magus provides parametric export models including a physical microstrip feed line, lumped element matching network and coaxial ports (where applicable).

Printed meandering monopole	Compact Printed inverted-F antenna (l...	Printed meandered inverted-F antenna (l...	Printed Microstrip-fed Yagi-Uda Dipole Array	Substrate mounted normal mode helix



Antennas with Special Properties and Applications

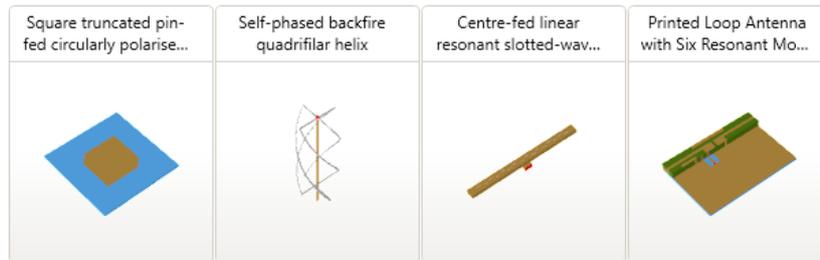
Other antennas added to Antenna Magus include the **Square Truncated Capacitively-pin-fed Circularly Polarised Patch** with an increased impedance bandwidth which ensures a good match at the optimal axial ratio.

The **Self-phased Backfire Quadrifilar Helix** is similar in structure to the standard self-phased QHA already in Antenna Magus, but is designed to achieve a backfire radiation pattern.

The **Centre-fed Linear Resonant Waveguide Slot Array with Longitudinal Broad-wall Slots** is a variation of the end-fed resonant waveguide slot array. The antenna produces a fan beam in the plane of

the waveguide cross-section, with a maximum at broadside. The centre-feed is a popular feeding approach for planar slot arrays. Such arrays can be realised by stacking centre-fed linear slot arrays alongside each other and using a feed guide below the stacked radiating guides to excite each sub-array.

The **Six Mode Loop Antenna** is an integrated antenna used to cover various bands like GSM/LTE, WiFi, GPS etc. It operates at six modes - four of the modes are due to the loop antenna itself, while the other two modes are from the two parasitic elements forming part of the overall structure. Various techniques are employed to increase the bandwidths at the various bands.



Conclusion

2017 sees many 'behind the scenes' changes starting to become visible in Antenna Magus. With new antennas, extended functionality and improved performance we hope that 2017 will be a successful and productive year for you and for Antenna Magus.

