

4.3 Yagi antenna

Matlab program

In this layer, we present a user's guide to the program for the analysis of Yagi antenna (the programmer's guide can be found in the [layer D](#)). The [program](#) is started by entering `Yagi_Gui_Master` to the command window of Matlab (path is set to folder **Yagi**). Menu items of the main form are of the following meaning:

Wavelength	wavelength of the supplying voltage;
Radius	radius of the wire of antenna elements;
Reflector length	length of the whole reflector;
Reflector-dipole	distance between the reflector and the active dipole;
Number of elements	the number of segments to which the reflector is going to be divided (odd number required);
Difference 1	the number of segments for which the active element is shorter than the reflector;
Difference 2	the number of segments for which the directors are shorter than the reflector;
Input element	index of the feeding segment of the active dipole in the complete current vector (an information item, which cannot be edited);
Number of elements	the total number of antenna elements;
Dipole-director	the distance between the active dipole and the nearest director;
Director-director	the distance between two neighboring directors;
Dipole length	the length of the active dipole (an information item, which cannot be edited);
Director lengths	the length of all the directors (an information item, which cannot be edited).

Pressing the button on the main form, the computation is started. Respective charts (current distribution, directivity pattern) are sequentially displayed in a single form after pressing the key .

Pressing the button on the main form, information items display values of real lengths (recomputed from the number of segments) of the active dipole and directors, and the value of the index of the excitation segment. If needed, the number of segments of antenna elements can be changed before starting the computations.

Pressing the button on the main form, the program is terminated.

When the computations are finished, the actual value of input impedance is printed in the header of the main form. In charts of directivity patterns, the angle 270° corresponds to the direction from the dipole to the directors, the angle 90° corresponds to the direction from the dipole to the reflector.

Since the graphic interface of the program does not support the setting of individual distances among directors, a more general function `Yagi_Antenna` has to be used as a *stand-alone program*. for this purpose. When this m-function is started, parameters `N` and `feed` have to be given (their meaning is explained in the [layer D](#)). The m-function returns the input impedance of the antenna. Further parameters can be changed in the source code of the function. Individual distances among antenna elements are set indirectly changing their coordinates with respect to the active dipole (the positive orientation goes from the dipole to the reflector). Respective charts (current distribution, directivity pattern) are sequentially displayed in a single form after pressing the key .