Detail information regarding the OptiBeam Log Yagi design

Usual logarithmic periodic antennas include the following disadvantages:

a. Too small amount of elements.

b. Too short booms.

c. The above two criticisms are the result of a too low design factor (high percentage length difference from one element to the other) and of a too small distance factor (short distance between the elements).

d. All elements are driven, hereby the lowest frequency range and the highest frequency range suffer in performance.

e. Usage of a lossy phase line system (crossed connection between the elements).

OptiBeam Log Yagis eliminate these disadvantages due to the following design parameters:

a. Feeding of all elements -in terms of an effective “log cell”- except one plain parasitic director element.
This parasitic element serves in terms of a combo director for the two highest frequency ranges and even shows some efficiency on the other bands.

b. Usage of a low impedance loss free square tube phase line system for the log cell.

c. The self resonance frequency of the longest element is defined in a way that it acts in terms of a real (though driven) reflector for the lowest frequency range.

d. Based on the longest element the self resonance frequencies of the following driven elements are adjusted in a way that the per centage length difference between the elements becomes as small as possible.

e. Taking into account the required distance of the parasitic director, utilization of the maximum possible boom length for the log cell area.

f. Choice of the resonance frequency of the parasitic director element in a way that it produces the maximum amount of gain/performance for the two highest frequency ranges.

g. In a continuously repeated process each element is optimized regarding its length and its position on the boom with simultaneous consideration of the entire system, which is done so long, until for all band ranges the highest amount of gain, the highest possible front to back ratio and the lowest possible SWR are achieved.
We simply refer to this process as "**S**elective **I**terative **E**lement **O**ptimization = **SIEO**".
This procedure is extremely time consuming, but is rewarded by higher than average performance and excellent radiation patterns with simultaneously low SWR.

h. By all these design features a really large active radiation area is achieved for each band range, hereby the practical general performance is enhanced above the already excellent gain figures in the “value” of about half an element.
Amazingly enough the short parasitic director, then still acting in terms of a current-carrying element, has a positive impact on gain and general performance even on the longer bands, after all, still in the hundredths dBd range.

Due to the parameters described above these designs are definitely no log-periodic antennas, the latter being only based on a strict mathematical logarithm.
As a matter of fact these designs are Log Yagis.

Target of the product category Log Yagi is not to substitute existing multiband Yagis.
The intention is to offer a corresponding alternative.

In comparison to the OptiBeam multiband Yagis though there are even some little advantages:

1) Despite comparatively longer booms no optical “burden” due to the frontwards noticeably shorter becoming elements.
2) Particularly attractive elegant optical appearance.
3) Electrically extremely weather insensitive.
4) Mechanically disproportionately robust.
5) Very stable regarding gain and radiation pattern accross the entire band ranges.
6) Practically enhanced performance above the purely calculated gain values due to the big actice radiation area.