Case History

Is *a customized antenna* the right choice for your project?

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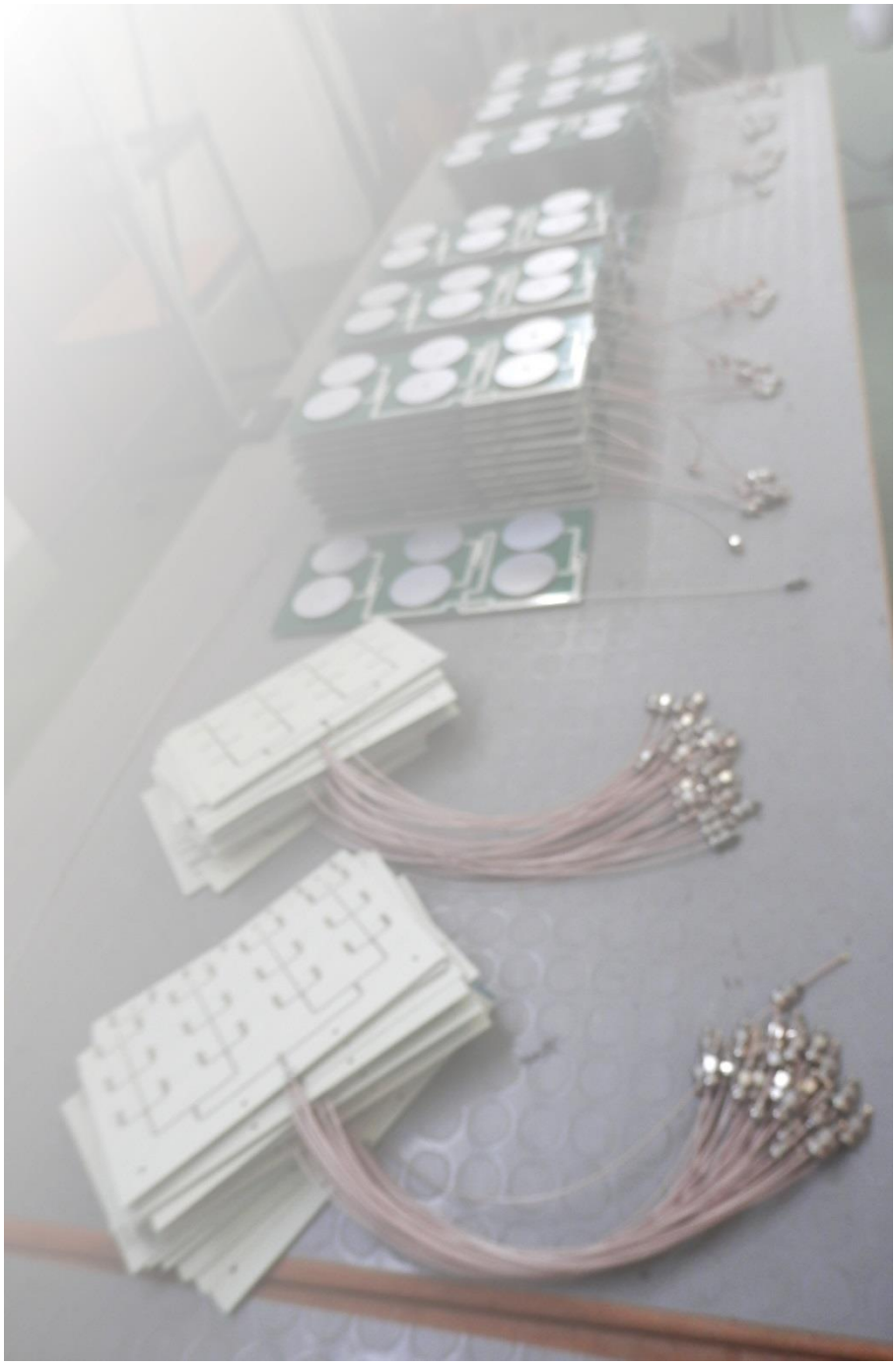
How do you know whether to choose a customized antenna or not?

How can we decide whether it is better to create a tailor-made antenna or opt for a product already on the market?

When is choosing a customized antenna the most cost-effective and best decision?

This article outlines the typical path followed by Customers who have contacted us.

At the end of the article there is also a selection of exclusive and selected *case histories* that outline the needs and reasons behind the final choice, based on real requests received from customers.



ElettroMagnetic Services
SRL

1. *Step 1*: The aim is to make a difference.

We believe it is essential to start from the quintessential trait of our typical Customer: a desire to impress their reference market **by proposing an innovative solution**, offering their Customers benefits that competitors can't.

"the best way to achieve a high profile is to stand out, creating new and innovative products and services"

In today's competitive world, I'm sure you'll agree with me when I say that the best way to achieve a high profile is to **stand out, creating innovative products and services,** able to offer the sector you operate in true **innovation**.

The process starts from defining the **advantages you want to offer your customers**, creating a product that incorporates **all the innovation** needed to achieve your goal.

Bearing this important premise **in mind if you, like us, strive every day to offer your target market benefits and innovation**, you will surely relate to this article, putting yourself in the shoes of our typical customer.

2. *Step 2*: The ideal antenna.

The next step is to define the ***ideal antenna*** that meets the specific needs identified. Everything, including the components and accessories, **must measure up to that goal**.

"The design of a customized antenna must aim to achieve something new, something that does not exist on the market"

Remember, however, that only the benefits your customers perceive as real can be turned into an advantage also for who supplies them. Creating an electric heater that consumes a quarter of all the others on the market might certainly be an innovative product, but if Customers live in the Maldives you are not **offering them any benefit** and you are not gaining **any advantage** for your company.

Once the right solution has been identified, the search begins **among the products present in standard catalogues**: it would be **pointless to design a new antenna with characteristics that are identical** to something that is already available on the market.

This preliminary process may resemble the research of anteriority that's carried out for patenting purposes, but it concerns a product that's still to be created.

Indeed, the design of a *customized antenna* must have the purpose of **creating something new**, something that does not exist on the market, and thus help you **propose something innovative** to customers.

At this point, if the antennas already on the market **do not guarantee the quality standards** you have set yourself, it is essential **to assess to what extent your idea justifies the development of a *customized antenna*.** Not all projects warrant this activity.

Now you know that you have a project that can gain **significant benefits from a *customized antenna***, read on to understand how.

3. *Step 3*: quantifying the benefits.

"design activities must be undertaken with the aim of improving your market position"

This is a **crucial step**: now you need to translate **the benefits** your customers earn from your product/service **into advantages for you**. You have to be **extremely concrete**, estimating the improvement you can achieve in terms **of increased production and profit margins**.

Design activities must be undertaken with the **aim of improving your position on the market**, in terms of *quantity* (more pieces sold), *quality* (customers willing to spend more for your product) and achieved advantage respect to direct competitors. If this is not your goal and you are happy with your current condition, developing a *customized antenna* is not an option for you.

Once you have defined the practical benefits, you then need to **correctly evaluate the offers** you receive.

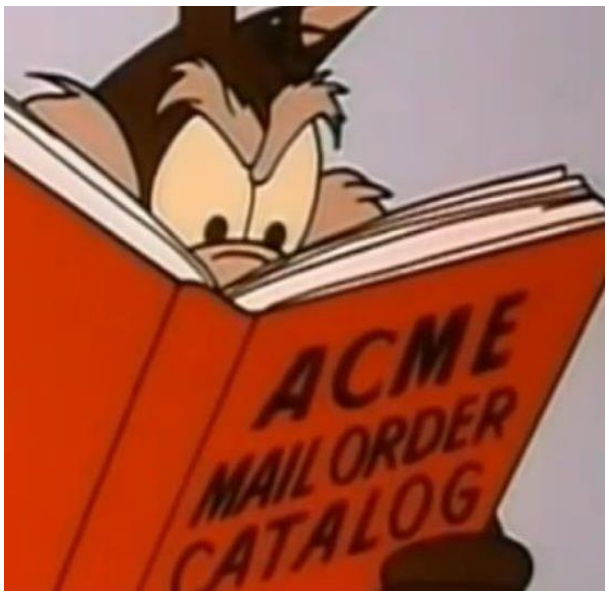
4. *Step 4*: correct evaluation the offer.

"designing an antenna with no tangible innovations at a low cost is never a cost-effective solution"

This is the stage where you can **really make a difference**.

You have **to be able to assess the offer as a whole**.

In the case of a *customized antenna*, like any bespoke product, **it is not merely a question of comparing the price** of two identical objects, like two standard antennas.



The analysis must **also take into consideration the design methods**, based on which the product is made, and which should be described in detail in the offer you receive.

It is therefore necessary to verify which **technical solutions are adopted** in order to **guarantee the characteristics** your antenna will have to have, making a **comparison between the cost of the proposed solution and the actual advantage.**

Remember that **designing a low-cost** antenna that does not have **exclusive and tangible innovations** is never an acceptable solution.

Since the proposals for developing a customized antenna are unlikely to be exactly the same, you **need to be able to spot the differences** between them and decide which is **best for you**.

All this in order to understand whether the **complexity of the proposed project** is proportionate to your aims.

In fact, just as a **low-cost project**, but without guaranteeing the technical solutions required by your application, could lead to **unforeseen costs** in subsequent phases, an **overly expensive** project, because of its unjustified complexity, would lead to an **unjustified increase in costs** without any ensuing benefit. Only by carrying out a technical analysis of this type can you be sure of the choice made.

To make a more detailed analysis, besides a **technical evaluation**, it may be useful to take into consideration **other equally important aspects**, such as the peace of mind that choosing an **experienced and reliable supplier**, able to demonstrate **that he is able to supply** what is requested, with the **necessary equipment and skills**, guaranteeing **delivery times,** offers.

After completing this analysis, all you have to do is complete the final phase; make **the final decision**, bearing in mind one last **decisive factor: the cost/benefit ratio**.

5. *Phase 5*: comparing costs and benefits.

So, we have reached the final phase stage, when you will have **to decide whether you really need** a customized ***antenna***.

"If they offer you a Ferrari instead of an economy car, you have to be willing to pay more, provided that you actually need it"

Bearing in mind the benefits identified in the previous phases and having verified **the costs entailed** in the various offers, it should not be difficult **to make a choice**.

Each offer analyzed will have a **different *value*** for you, and this will help you **decide whether the cost is acceptable or not.**

If they offer you a **Ferrari instead of an economy car**, you have to be willing to **pay more**, provided that you **actually need** it.

Is **the cost-benefit ratio** satisfactory? Are you sure that a ***customized antenna*** will guarantee you the *value* you were looking for**?**

Then go on, do it!

6. Case histories.

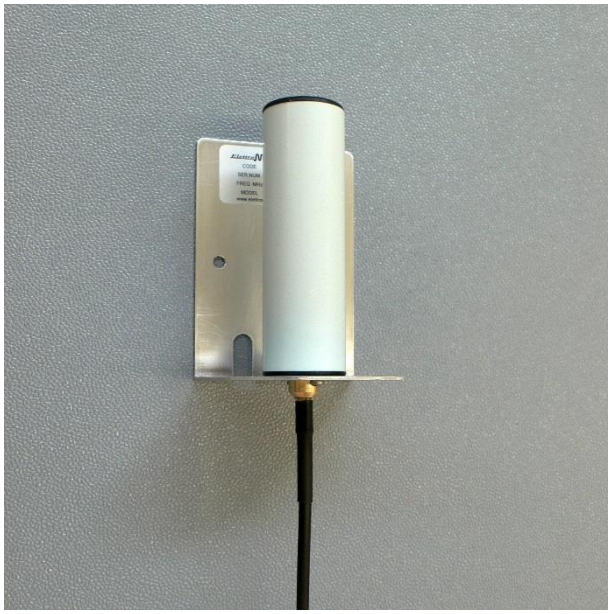
- ***Case 1*: the request.**

"We need an omnidirectional antenna, GSM/UMTS/LTE, 2 dBi gain, SMA-m connector with direct attachment on the telephone control unit. No special requirements as regards mechanical characteristics. Quantity: a few hundred pieces".

♦ ***Case 1*: The answer.**

This antenna is certainly feasible as no technical difficulties would be encountered, but this is exactly why we would not recommend customization. There are already several products on the market that would fully meet the needs expressed and so customization is not justified, either from an economic point of view (project costs would be difficult to recover) or from a technical point of view (it makes no sense to design new antennas that are identical to products already on the market). It would have been a different matter if a particular technical feature (for example a bi-directional radiation beam or a particular fastening system) had to be implemented on all the products to be installed.

The answer is therefore no. We will not go ahead with this request.



Multiband antenna for control units, mod. SD48V

- ***Case 2*: the request.**

"We are installers of Wi-Fi systems. We have a special need regarding a system to be installed in a hotel. Unlike more normal situations, this hotel has long and narrow corridors, so we need to use antennas with a special radiation beam: in this way we will be able to install fewer access points. Quantity Required: 20 pieces".

♦ ***Case 2*: The answer.**

From a technical point of view, the request does not entail any real difficulties. Instead, the problem regards the number of pieces to be made bearing in mind the reason why they have been requested. The cost of the design activities is certainly higher than the savings that would be obtained from the fewer access points installed, so from an economic point of view there is no benefit to be gained. Bespoke design would have been appropriate in the case of a larger number of pieces (with many installations of this type to be made) or if there were no technical alternatives to complete the installation (with the end customer willing to face higher costs in order to have a system that is absolutely necessary for him).

The answer is therefore no. We will not go ahead with this request.

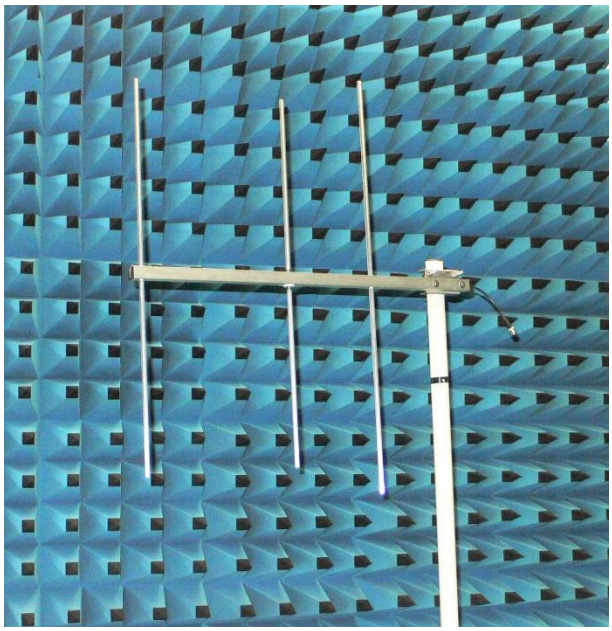
- ***Case 3*: the request.**

"Good morning, one of our activities is the installation of telemetering systems. We are calling to request a Yagi antenna in the 169 MHz band, optimized on our band. We would therefore need a product with the best possible size/performance ratio. Quantity Required: 300-500 pieces/year".

♦ ***Case 3*: The answer.**

The request indicates some features that are perfectly suited to the design of a new antenna. In fact, it is a product that has characteristics that are more suited to the Customer's specific purposes than those already available on the market. Specifically, a new antenna will be designed that is optimized in the specific band required by the Customer (thus avoiding the use of a wider band antenna). Result: higher performance (higher gain) with more favourable mechanical dimensions. The costs incurred will therefore be off-set by a technical benefit. Moreover, the antenna created in this way will be economically more advantageous than the previous one, thus offering an additional benefit, not foreseen by the Customer.

The answer is yes. The benefits outweigh the costs.



169 MHz Yagi antenna, mod. LY177V

- ***Case 4*: the request.**

"Hello, we need an antenna that will be installed on our automatic heading system. To better integrate the antenna, we absolutely need to minimize the weight of the antenna, while obviously guaranteeing the gain specifications we require. Quantity required: at the moment 1 prototype, later we predict a production of 5-10 pieces/year, to be confirmed". [Additional technical details not provided to protect the Customer's privacy].

♦ ***Case 4*: The answer.**

The request undoubtedly has characteristics that are suitable for the development of a customized antenna. First, it is to be incorporated in a proprietary system, so it must have specific mechanical and aesthetic characteristics to achieve correct integration. There is also a clear request regarding the weight, and hence the need to design a highly specific product, to the point of requiring a preliminary feasibility study. Given the specificity of the product, the small number of pieces to be produced is not a problem, also bearing in mind the final price our customer can propose for the entire system and the cost of the project as a whole (feasibility study plus development of the prototype).

The answer is yes. This is certainly a request that warrants the development of a customized antenna. The actual feasibility of the project will then be confirmed by the preliminary study, thus going ahead with the development of the prototype and subsequent production. In general, when an antenna has to be incorporated in a proprietary system, we are talking about projects that are suitable for the development of a customized antenna, regardless of the size. Obviously, every case must be assessed individually, taking into account all its specific features.

- ***Case 5*: the request.**

"The construction of a multi-band panel with the following characteristics is required:

- ***N.4 outputs with female N connector***
- ***Operating frequencies: 2.4 GHz and 5 GHz for each of the 4 outputs***
- ***Dual +/- 45° polarization for each of the 4 outputs***
- ***Each output must have a different squint angle. For the side hosts an angle of 45° to the right and left respectively is required, while for the central hosts an angle of 25° to the right and left respectively is required [a diagram was attached in the email to better specify how to direct the squint angles]***
- ***Maximum size: 800x800x45 mm***
- ***Mechanically robust, for use in a marine environment***
- ***Tiltable bracket that allows both vertical and horizontal installation***

Please communicate the maximum gain obtainable for each of the bands bearing in mind the maximum size required

Quantity Required: 100 pieces".

- ***Case 5*: The answer.**

A request of this type deserves a more in-depth analysis than the previous ones as it indicates a series of specifications that are not simple to implement. It is therefore important to understand, in agreement with the Customer, if all these specifications are strictly necessary, or if some of them can be modified, in order to find the right compromise between project complexity (and therefore cost) and actual practical benefit. A feasibility study is normally the first step to take in these cases.

The answer is neither yes nor no. This case must be carefully assessed.

Would you like to receive an assessment, no strings attached, of the development of *a customized antenna* for your project?

Write to sales@elettromagneticservices.com. *We'll get back to you in no time!*

Thank you for taking the time to read this article.

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