



## RUBIDIUM CLOCKS

*Orolia benefits from over 15 years of expertise in the development of Rubidium clocks.*



Rubidium clocks offer such a high level of precision that their accuracy is almost 100 times better than one-billionth of a second. They also offer similar levels of stability on the short-term scale. Moreover their high precision, rubidium clocks benefit from a quick stabilization after being switched on and are the cheapest ones (the first designs only cost about €1 000).

Several technical steps are needed to maintain their reliability, precision and stability required for critical operations : on the one hand, the distillation of rubidium atoms in thin and strong glass stills (made by subcontractors under Orolia's instructions) ; on the other hand, the incorporation of the glass unit inside a patented excitation system allowing to prepare atoms to produce the useful frequency signal.

Once the clock is built and linked to its electronic circuit, it experiences a long maturation period in incubators before reaching the required stability level. During this period which can last from a few weeks to several months according to the required precision level and stability, clocks are continuously tested with processes allowing to select products which fit in with every specific application.

Thus, Orolia develops several thousands of rubidium clocks a year. The unit price varies from 1 000 to several thousands of euros according to technical specificities.

In addition, Orolia develops about ten spatial clocks a year which cost several hundreds of thousands of euros each.

