

06 april 2021



**SUBJECT / SUJET: Telecommunication Systems – R&D: Li-Fi**

**SOURCES & METHODS INVOLVED / SOURCES ET METHODES EMPLOYEES**

- |   |   |
|---|---|
| <input type="checkbox"/> Investigation / Enquête                      | <input type="checkbox"/> Strategic planning / Planification Stratégique |
| <input type="checkbox"/> Documentary monitoring / Veille documentaire | <input type="checkbox"/> Instruction / Instruction                      |
| <input type="checkbox"/> Lobbying / Action lobbyiste                  | <input type="checkbox"/> Profiling Simulation / Simulation Profilage    |
| <input type="checkbox"/> Field Intervention / Intervention terrain    | <input checked="" type="checkbox"/> R&D / Recherche & Développement     |

**CONFIDENTIALITY LEVEL / NIVEAU DE CONFIDENTIALITE**

- Classified / Classifié
- Declassified / Déclassifié
- Sensitive / Sensible
- Confidential / Confidentiel
- Secret     Top Secret

**STATUS / STATUT**

- |   |  |
|---|--|
| <input type="checkbox"/> Pre-project study / Etude avant-projet | <input type="checkbox"/> Started / Démarré   |
| <input type="checkbox"/> Stand-by / Mise en attente             | <input type="checkbox"/> Adjourned / Ajourné |
| <input checked="" type="checkbox"/> Completed / Finalisé        |  |

**RESULT / RESULTAT**

- Achieved / Atteint
- Partially met / Partiellement atteint : ... %
- Not Achieved / Pas atteint

**AREA / ZONE:** Worldwide



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## 1- CONTEXT

- Extract from the report 5850R\_IRRA003\_UNRE:
  - Conclusion: radio frequency-based telecommunications methods are highly prejudicial to living organisms and obsolete given the significant technological improvements of the past few years.
- As per the aforementioned report, one of the technologies chosen to replace radio frequency-based methods is Li-Fi. Note that the research and development ceased after the initial prototypes.

## 2- OBJECTIVES

- Following the strategic plan in order to replace radio frequency telecommunication systems 5850R\_IRRA004\_PLST: restart the research and development of Li-Fi technologies in Elon Musk's infrastructure by setting up a collaborative team composed of scientists who had previously worked on it and researchers specifically trained by our Owl unit.
- The goal is to make Li-Fi the sixth generation of wireless mobile technologies, referred to as "6G".

## 3- ACTIONS

- Oct. 2015: contact established by Raven units with researchers who worked on the first Li-Fi prototypes.
- Nov. 2015: special Owl unit has been trained on specific Li-Fi technologies, involving the aforementioned researchers (see report 5850R\_IRRA005\_REFO).
- Dec. 2017: Reopening of research and development in Li-Fi technologies has been ordered.
- Jul. 2019: contact has been established by Raven units with Elon Musk to propose cooperation in the development of Li-Fi technologies.
- Mar. 2021: finalisation of the development of Li-Fi technologies.

## 4- RESULTS

- Li-Fi technologies have been significantly improved and are now much more efficient than during the initial trials in 2012:
  - Avoid potential interference with other light sources.
  - Avoid physical interferences: walls and clothing no longer block light waves.
  - Significant increase in the range of Li-Fi transmitters and receivers (up to several kilometres).
  - Substantial improvement in both transmission and reception data rates.
- We are now able to produce:
  - Li-Fi transmitters/receivers able to cover a medium-sized city and can easily be linked to cover a large city.
  - Individual Li-Fi transmitters/receivers in the form of USB adapter fully compatible with existing hardware.



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