# AUGUSTIN MAIOR'S CONTRIBUTIONS IN THE FIELD OF SCIENCE AND TECHNOLOGY OF INFORMATION

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## 1. Introduction

In August 21th 1882 was born in Reghin, **Augustin Sabiniu Maior**, Romanian scientist with remarkable contributions in the world telecommunications development.

His parents were Gheorghe Maior, teacher and director of the Romanian primary school in Reghin and Teresa Maior (born Cornea).

After finishing the high school studies in Targu-Mureș and Budapest, he was registered as student at the Mechanical Faculty of the Polytechnic Institute of Budapest, between years 1900 and 1904.

In the year 1905, Augustin Maior was as a particular student at the University of Gottingen, where the rigorously German school of mathematics strongly influenced him, for the later scientific activity.

On the first of December 1905 he received an engineer position in the electricity laboratory of the experimental Post Station in Budapest, which had an international prestige by important results in the research activity.

In this laboratory Augustin Maior participated at the experiments performed for improving the telephonic transmissions at long distances.

In this period, by applying the alternative current in telephony, Augustin Maior shown that it is experimentally possible to realise the multiple telephonic transmissions at long distances, using as carriers high frequency alternative currents.

## 2. Augustin Maior's priority in the multiple telephony

The beginning Augustin Maior's contributions in the field of multiple telephony were published in the period 1907 – 1909 [1- 4, 7].

The most suggestive presentation of these works is made by Augustin Maior's himself [5, 6, 7].

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*"Already, in 1907 year I published in the journal "Elektrotecknische Zeitschrift", p. 484, a paper: "Über Mehrfach – fernsprechen" in which I have shown the possibility of the simultaneously transmission on a single line of many telephonical conversations with the aid of the high frequency currents. I have shown that I realised then to transmit on the same wire five conversations. In E.T.Z. from 1908 year I published more details on this subject.*

*When in 1908 year the first international conference of the post and telegraph engineers took place in Budapest I have reported that I realised an experimental transmission on a 15 km long line, of a 5 telephonical conversations simultaneously. A referee on that contribution can be found in "Comptes rendus" de la premiere conference des Techniciens des Administrations des Postes et Télégraphes a Budapest, 1908.*

*Later, Mr. M. Weinberg from Washington published in E.T.Z. 1909 p. 150, a study, in which he confirms my publications and, in the same time, he proposed my proceeding as feasible for transatlantic telephony implementation [13]. Later, I have shown in a paper the possibility for simultaneously transmission of 2n conversations by an alternanting current using electrical valves."*

This article, published in E.T.Z. 1909, p. 902 [7], presents the schematic of multiple telephony systems used in alternative current as an important contribution to telephonic systems development.

The invention of *multiple telephony in alternative current* by Augustin Maior determines a high interest of the specialists from France, Germany, England and U.S. The first "Treaty of Theoretical Telephony and Telegraphy", published by Franz Breising mentions Maior's works concerning the application of high frequency alternative current in telephony.

It must be pointed out that in the period of 1909–1917, Augustin Maior continues to publish a series of scientific papers, mainly in "Electrotechnische Zeitschrift" (Berlin) and "The Electrician" (London) in order to develop the theoretical fundamentals of high – frequency alternating current multiplex telephony, as well as the technical solutions in this field [8-14].

In 1921, E.H. Colpitts and B.O. Blackwell, published in the Transactions of AIEE, a synthetic paper which cited six of Augustin Maior's articles, being a recognition of his personality as a precursor in telecommunications development [15].

We must mention that in 1911, the American C.O. Squier patented a system of multiple telephony, for 2 telephonical conversations simultaneously and in the same year, in the British magazine "The Electrician", B.S. Cohon considered that Squier is the inventor of multiple telephony.

As a consequence of a letter of Augustin Maior's which speak about him papers four years before Squier patent, "The Electrician" published that letter and recognised Augustin Maior's priority in this field.

## 3. Complex scientific personality of Augustin Maior's

After The Union of Transylvania with Romania on December 1st 1918, Augustin Maior returns to Sibiu, where he established his domicile.

In 1919 as Central Director of Post Telegraphy and Telephony from Transylvania and Banat he contributed to reorganisation of the PTT service in Transylvania and founded at Sibiu the School of Telegraphy and Telephony.

Also, in 1919 he was invested as professor on theoretical and technological physics, at the Faculty of Science of the University of Cluj-Napoca, as recognition of his remarkable scientific personality. In the same year he became the Director of Technological and Theoretical Institute of Faculty of Science.

As a much appreciated specialist and authority in telecommunications, Augustin Maior received the position of a member in the Technical Committee from General PTT Direction in 1921.

This list of executive and honorary positions of Augustin Maior's is very long and is presented in the references [16 - 25].

As professor of physics Augustin Maior taught the courses" Electricity and Magnetism", and "Acoustic and Optics", organised the physics laboratories, the library and continued to publish scientific papers.

*In 1937, Augustin Maior became a full member of the Academy of Sciences of Romania.*

Among the Romanian personalities which high appreciated Augustin Maior there are: D. Hurmuzescu, Dimitrie Pompei, Gheorghe Țițeica, Grigore Moisil, Simion Stoilow, Gheorghe Vranceanu, and others.

In the "Encyclopedia of technical inventors" published by N.P. Constantinescu in the year 1933, Augustin Maior is considered one of the great inventors in the history of technical sciences [16].

The Augustin Maior's paper, "Champ gravifique and magnétisme" was lectured by Louis de Broglie on a meeting of the French Academy of Sciences in the year 1950.

In the book of C.G. Bedreag, published in 1957, "Biography of the Romanian physics", Augustin Maior is presented like a founder of the physics school in Romania, together with another scientists as Dragomir Hurmuzescu, Eugen Bădărau, Ștefan Procopiu.

Until 1963, when he died, 81 years old, Augustin Maior demonstrated that he is a prominent figure of the national and world science and technique.

## Conclusions

By examining Augustin Maior's works, we can see his priority in the field of multiplex communications, as follow:

- He contributed in comprising the method of multiple transmissions through a single physical channel;
- He was the first man in the world which experimentally proved the multiple operational telephony through a telephonic line;
- He elaborated many theoretical studies on the multiple telephony field where his contributions are internationally recognised;
- As university professor of physics at the Faculty of Sciences of the University of Cluj-Napoca, and as dean of this Faculty he promoted the progress of Romanian physics, with remarkable achievements;
- His election as a full member of the Academy of Science in 1937 was a recognition of his great merits as a scientist and patriot, as well as an important founder of the electronics and telecommunications in Romania.

We are very pleased to dedicate to Augustin Maior's life and opera this issue of the Annals of the Academy of Romanian Scientist, Series of Science and Technology of Information.

We wish also to express our enthusiastic thanks to the academician professor Mihai Drăgănescu, full member of the Academy of Romanian Scientist, as coordinator of the book "*Contributions of Augustin Maior's at the multiple telephony*", published by the Romanian Academy in 1980 (in Romanian), this book being our main source to understand and to promote in this issue, the great personality of the scientist Augustin Maior, in the benefit of the present and next generations of scientists.

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