



TCSET'2012

**MODERN PROBLEMS OF RADIO
ENGINEERING, TELECOMMUNICATIONS
AND COMPUTER SCIENCE**

**Proceedings
of the XIth International Conference
TCSET'2012
Dedicated to the 60th anniversary of the Radio Department
at the Lviv Polytechnic National University**

**Lviv – Slavske, Ukraine
February 21–24, 2012**

**Ministry of Education and Science, Youth and Sport of Ukraine
Lviv Polytechnic National University**

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**СУЧАСНІ ПРОБЛЕМИ
РАДІОЕЛЕКТРОНІКИ,
ТЕЛЕКОМУНІКАЦІЙ,
КОМП'ЮТЕРНОЇ ІНЖЕНЕРІЇ**

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у Львівській політехніці**

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An Italian Period on The History of Radio Engineering's Term "Antenna"

Slyusar V.I.

Abstract – In this article are analyzed a results of research about an italian period on the history radio engineering's term "antenna".

Keywords - antenna, Felice Pasetti, Angelo Banti.

I. INTRODUCTION

Publications [1] have displaced conditional date of official origin of radio engineering term "antenna" for January, 30th, 1898 - date of the publication of article of Lucien Poincaré confirming a priority of Marconi in the use of the term "antenna" for needs of radiotelegraphy [2]. The statement of soviets authors that the term "antenna" is offered Blondel in his letter to Popov, is erroneous.

II. MAIN TEXT

For achievement of full clearness in this history it was necessary to study publications on a time interval, since Marconi's first experiments and finishing on January, 30th, 1898 (Lucien Poincaré's article [2]). Search of such documentary certificates has led to the Italian editions of the corresponding period and has allowed to find out article of captain Felice Pasetti in magazine "Rivista di artiglieria e genio" [3], dated on July, 20th, 1897. Specified article has been written on motives of theses of the report of W.H. Preece repeatedly duplicated at that time by various editions in which Marconi's experiences were described. Translating into Italian the maintenance of theses of W.H. Preece, Felice Pasetti on p. 179 [3] writes that in a case, "so far as concerns signalling between two remote stations ..., it is necessary to apply antenna, kites or balloons" (... ma e necessario impiegare antenne, cervi volanti o palloni). Comparison of the text of Felice Pasetti to the original of the message W.H. Preece published in English and French languages allows to draw a conclusion that in the pledged context the word antenna is used in sense "a mast, a pole".

Thus, after publications [1], at the moment of preparation of given article work of Felice Pasetti [3] was earliest of known documentary texts where there is a word "antenna" at the description of a principle of a radio communication as a whole and Marconi's experiments - in particular.

The important role in the Italian period of formation of the radio engineering's term "antenna" has played the book [4] other Italian authors - Angelo Banti (1859 - 1939) which left not later than August 1897 of release of magazine *l'Elettricista* about what there are instructions in the text of the book. Its author - the founder and the permanent editor-in-chief of Italian magazine *l'Elettricista*. Angelo Banti was present on the Roma demonstrations of system Marconi in June, 1897 where in details with it has familiarised that has. In the book of Angelo Banti used a word "antenna" of 11 times in various transcriptions: un'antenna; dall'antenna; nell'antenna; dell'antenna; dell'antenna metallica; quell'antenna; quest'antenna; l'antenna metallica. Thus, unlike article to Felice Pasetti essential in [4] the instructions on use of the metal antenna (a mast) that became the important step on a way of an identification of its functions with functions of a vertical wire are. Moreover, in the book, for example, is

specified that as a part of the transmitter and Marconi's receiver can be used either the metal antenna, or a vertical metal wire ("Al trasmettitore Marconi è unito - come abbiamo detto - un'antenna metallica od un filo metallico verticale"), and this in itself already is direct instructions on equivalence of their functional purpose.

In the same edition of Angelo Banti draw schemes of the Marconi's transmitter and receiver which used as a prototype in Lucien Poincaré's article [2] later. Obvious correlation of block diagrams in works of Angelo Banti and Lucien Poincaré nevertheless does not allow to draw an unequivocal conclusion on direct loan of illustrations by the last. It seems that in this process, probably, there were still any intermediaries. As in A. Banti's book a word "antenna" is applied only in sense of a mast including metal, instead of it is used directly at the description of designations in drawings and as the name of a vertical wire. Besides, Lucien Poincaré in [2] writes that Marconi named a wire the antenna whereas at Angelo Banti of such statement is not present. As a result of the analysis [4] quite naturally there are questions: "Whence Angelo Banti could take illustrations for the book? These are Marconi's drawings or someone's interpretation?"

Answers to these and other questions can be received during the further studying of the Italian period in the course of formation of the radio engineering term "antenna". In particular, prime attention deserves the book of Augusto Tarchi [5], left in the same 1897, and also much publications of the Italian press (*Italia Marinara*, August release of 1897 of magazine *l'Elettricista*, etc.) about Marconi's experiments.

III. CONCLUSION

In end of short digression in history of an origin of the radio engineering term "antenna" it is necessary to underline that the given theme is far enough from the exhaustion and deserves continuation of researches.

REFERENCES

1. Slyusar V. I. To history of radio engineering's term "antenna". // VIII Intern. Conf. on Antenna Theory and Techniques (ICATT'11). - Kyiv, Ukraine. - National Technical University of Ukraine "KPI". - September 20 - 23, 2011. - Pp. 83 - 85.
2. Lucien Poincaré. Le probleme de la transmission de l'energie a distance par les milieux naturels, a propos des recents essais de telegraphie sans fil.// *Revue générale des sciences pures et appliquées*. - № 2. - 30 Janvier, 1898. - Pp. 53 - 59. - <http://gallica.bnf.fr>.
3. Felice Pasetti. La telegrafia elettrica senza fili. // *Rivista di artiglieria e genio*, Vol. III. 1897, 20 luglio, p. 165-180.
4. Angelo Banti. Il telegrafo senza fili, sistema Marconi: con incisioni e con ritratto del Marconi. - Roma: Gli editori dell'Elettricista, 1897.
5. Augusto Tarchi. Il telegrafo senza fili di Guglielmo Marconi. - Firenze: Libreria Editrice S.Raffaele, 1897.

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