УДК 629.396

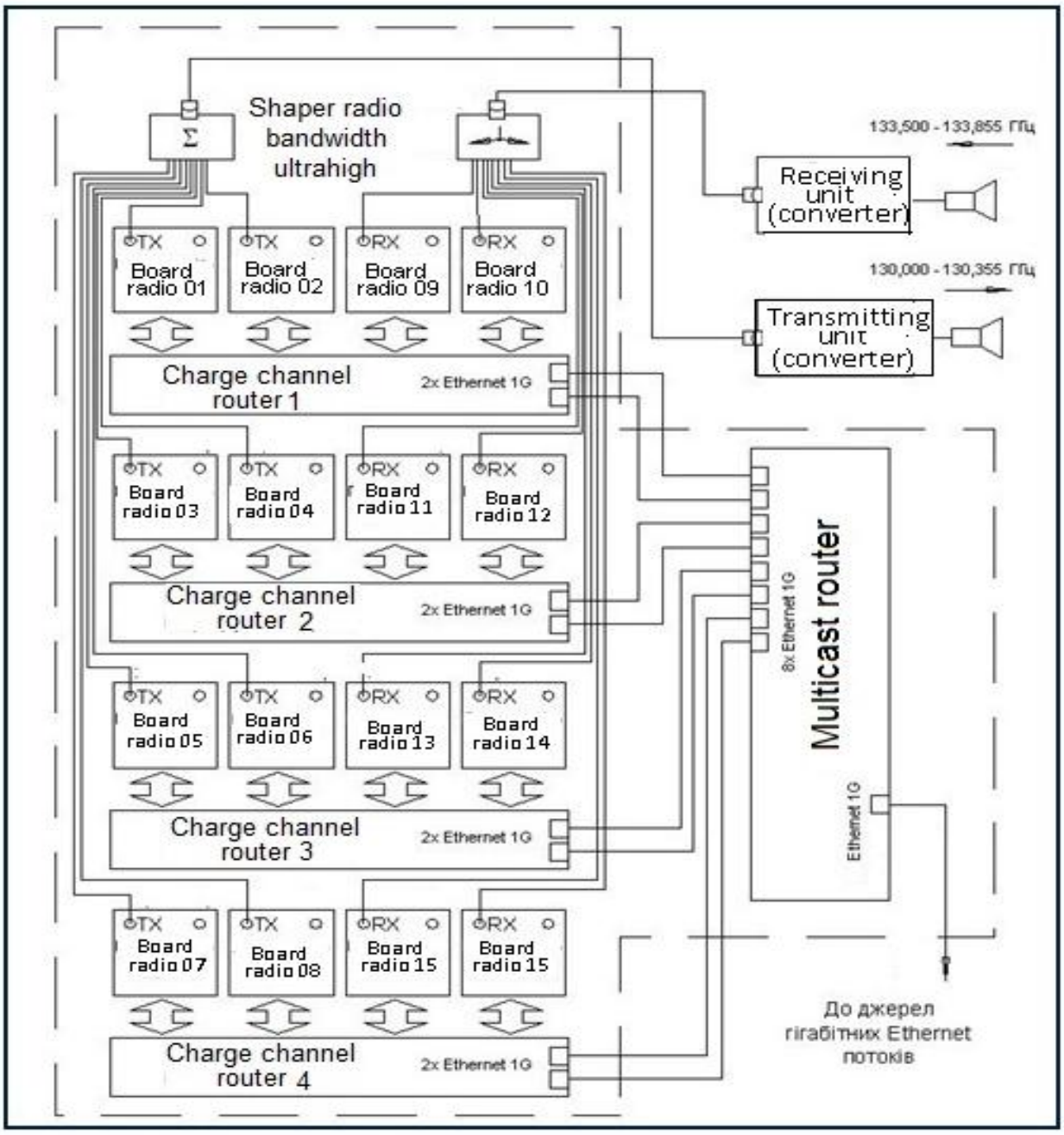
RESEARCH GIGABIT MODEM FOR MICROWAVE LINKS IN THE TERAHERTZ BANDWIDTH

Lyashenko A. V., Narytnik T.N.
Institute of Telecommunication Systems NTUU "KPI"
e-mail: director@mitris.com

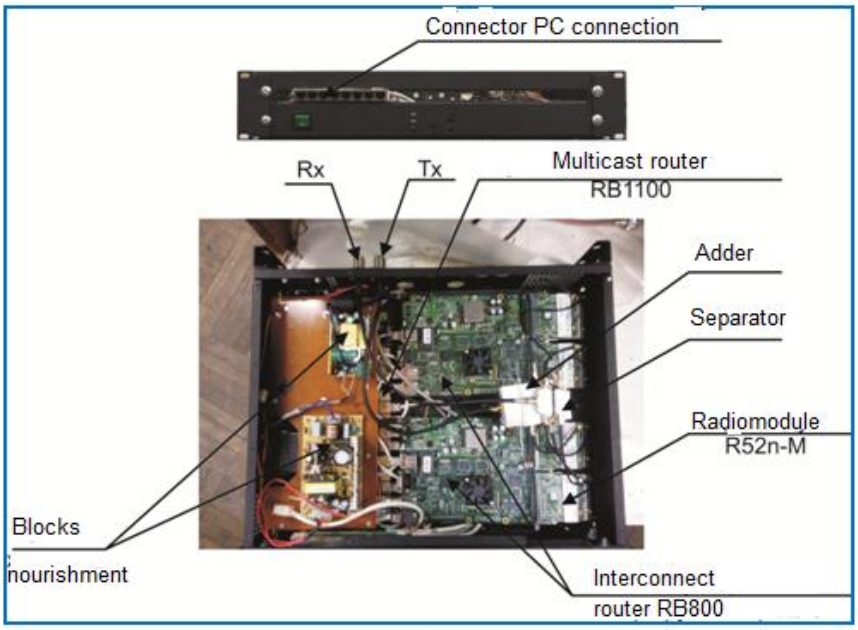
The results of the conducted research and development on this basis of new technical solutions for the creation transceiver driver-modem (the modem) for digital radio-relay systems in the terahertz range, testing and optimization of the settings of two laboratory samples modem for maximum throughput and optimization of high-speed options via created supporting software tools.

The results of the research and development of the basis of a new technical solution for creating gigabit transceiver modem for digital radio relay systems in the terahertz range, test and optimize the settings of the two samples modem for maximum bandwidth and optimize the speed parameters created using assistive software tools. Problem creation based on the latest achievements in communications shaper block with high bandwidth (to 2.4 Gbit/s) and low cost that will use it as a main channel of transmission systems and multiservice access. This problem decided that the block shaper uses multiple frequency few channels so that the total rate was 2.4 Gbit / s. In addition to some channels may have a lower speed, for example, 0.15Hbit / s. Modulation and demodulation software can be reconstructed from BPSK to QAM-64. The band received signal is 40 MHtz. The rate in the communication channel is 150Mbit /s. Increased spectral efficiency is achieved using multi-position modulation (QAM-64).
Expecting results after the ending of the work:

- Creating the laboratory model of digital radio relay system of the Terahertz range 128 – 134 GHz of new generation, that will be able to become the basis for the usage in the modified version of Wi-Fi in the local area computer networks and in the in the sensory systems over high speed data at the speed of 1Gbit/s and more at a value possible bit error BER is not more than 10-6 in the communication range within the 1km.
- developing of the methods of modeling and the appropriate software models the main functional units transmitting-receiving tract radio communication channel of Terahertz range .
- The method of calculation of lines direct visibility microwave links in the frequency range 30-300 GHz.
- Recommendations for usage Terahertz range of frequency in the telecommunications means



Pic.2 To organize duplex channels and improve the efficiency of each channel mode is dual nostrum on equipment Mikrotik, which is used to create a duplex channel two radiomodul R52n-M, one for reception, another for transmission



Pic.2 The tests showed the possibility of building a high-speed modems for microwave transmission systems based on standard 802.11 n and scalability to channel speeds 1,2Hbit / s duplex and above by combining individual channels

Using duplex protocol Mikrotik dual nostrum possible to overcome the limitations of standards Wi-Fi and get practical speed and half-duplex transmission over even half duplex channel in all modes.

Conclusions. Designed for testing purposes allowed accelerate software testing to optimize modem settings and achieve maximum practical speeds in all modes. Practical tests confirmed the use of routers RB450g for aggregation small number of channels (up to 4) and showed a lack of efficiency router Mikrotik RB750 even for testing purposes.

The analysis showed that for the efficient operation of the protocol dual nstreme require high CPU performance, so to improve speed performance need to review hardware. RB800 interconnect routers have to provide two channels using a single-core processor and a common bus PCI, which affects the performance.

References

1. Ільченко М.Ю., Наритник Т.Н., Войтенко А.Г., Казимиренко В.Я., Волков В.В. Приймально-передавальний формувач інформаційного потоку для каналу зв'язку з підвищеною спектральною ефективністю і пропускною здатністю //Матеріали Сьомої Міжнародної науково-технічної конференції «Проблеми телекомунікацій» (ПТ-13) К.: НТУУ «КПІ», 2013, с.16.
2. Нарытник Т.Н. Исследования формирователя цифрового потока для телекоммуникационных систем терагерцового диапазона. Сборник научных трудов первой Международной научно-практической конференции «Проблемы инфокоммуникаций. Наука и технологии».-Харьков , 9 -11 октября 2013.-с.23-26.