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# 1 Special issue on Yokosuka Radio Communications Research Center

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With the aim to become an international center of the research and development of wireless communications technologies, Yokosuka Research Park (YRP) was established October 1997 in Hikarinooka, in Yokosuka City, following more than 10 years of preparatory efforts by the former Ministry of Posts and Telecommunications, the Yokosuka City municipality, and related organizations. Following a review of its framework for research on mobile communications technologies, the Communications Research Laboratory has launched the Yokosuka Radio Communications Research Center, in parallel with the YRP's founding. The Yokosuka Radio Communications Research Center was established in July 1997, with research activities beginning at the YRP in February 1998, following a half-year run-up period. Since April 2001, when CRL was transformed from a national research institution into an independent administrative institution, this research center has been positioned as a research wing for terrestrial-based wireless communications belonging to CRL's wireless communications division, which is responsible for R&D of both space and terrestrial wireless communications technologies. This special issue introduces the research activities of the Yokosuka Radio Communications Research Center for the period of about three and half years since its founding at YRP; it also discusses future research plans.

Yokosuka Research Park, home to Yokosuka Radio Communications Research Center, is a research park of unique characteristics; such research centers are rare in other countries. Some 40 research institutes, mainly pri-

vate corporations, have converged at the park, where a few thousand scientists and engineers are currently at work investigating mobile communications and wireless communications technologies. Yokosuka Radio Communications Research Center has carried out R&D activities under these conditions since its founding at YRP. Its guidelines – which assume the primary goal of promoting collaboration among industry, academia, and government – are set forth below:

- (1) To serve a central function in collaborations with industry, academia, and government at the YRP, with the goal of establishing a flourishing international research center for wireless communications technology.
- (2) To undertake strategic R&D from international viewpoints, seeking global standards and user-oriented applications.
- (3) To promote international collaboration, particularly among Asian countries, by functioning as an Asia-Pacific center for research and human resource development, with the goal of gearing up for competitive and cooperative efforts with the U.S. and Europe.

In recent years, significant attention has focused on collaborations involving industry, academia, and government. Since its founding, the Yokosuka Radio Communications Research Center has been in the forefront of this movement.

The Yokosuka Radio Communications Research Center has actively engaged in cooperative research projects organized by the YRP R&D Committee for joint research with

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private corporations and other entities, taking full advantage of its location at YRP. CRL's projects related to applications of mobile communications technology to the ITS (Intelligent Transport System) are currently underway in close alliance with the YRP-organized cooperative research group. Another joint R&D project that was carried out was one on millimeter-wave video transmission systems, which has already led to concrete results, including contributions to the standards issued by the Association of Radio Industries and Businesses. To develop a radio-relay system using stratospheric platforms, Yokosuka Radio Communications Research Center has partnered with the Telecommunications Advancement Organization of Japan and other organizations to research and develop mission equipments. The Center has also contributed to activities on standardization in ITU, including international frequency allocation for such stratospheric platforms, and has taken part in research on millimeter-wave device technologies that are expected to be core technologies for future radio wave applications. The Center has also been undertaking research on the electromagnetic environment issues for increased safety and harmonized use of radio waves.

As underscored in the national e-Japan strategy, the implementation of high-speed mobile communications will form an essential part of the IT revolution in Japan. In June 2001, the Telecommunications Technology Council of the Ministry of Public Management, Home Affairs, Post and Telecommunications completed a report entitled "Outlook for Future Mobile Communication Systems," in which basic concepts were clarified for the next-generation mobile communications system to follow the third-generation mobile communications systems. The resulting system is expected to provide downlink data transfer capacities of up to 100 Mbps across cellular links, and beyond 100 Mbps – several hundred Mbps – at hot spots and indoors through high-speed wireless access. The

report also discusses high-speed access to the IPv6 network and seamless use of mobile communications systems and digital broadcasting services.

Along with these individual advanced mobile communication systems, another R&D subject whose importance is expected to increase rapidly is the seamless integration of heterogeneous wireless communications systems. The Yokosuka Radio Communications Research Center has been promoting R&D efforts to realize the next-generation mobile communications system, with an emphasis on the subject of seamless integration of heterogeneous wireless communication systems. The importance of industry, academic, and government collaboration in these areas is expected to grow year by year.

In addition to the conventional goal of "anytime, anywhere, with anyone," a goal which is nearly realized at this point, the attainment of the new goal – "any information source with any device" – will pose one of the major challenges in the development of the future mobile communications and wireless communications technologies, particularly a next-generation mobile communications system. Due to the necessity of a wide range of advanced R&D efforts, success in this area will require intensive collaboration among industry, academia, and government. The Yokosuka Radio Communications Research Center is promoting and organizing research projects as mentioned above in cooperation with the different sectors.

The purpose of this special issue is to communicate the R&D activities of Yokosuka Radio Communications Research Center to a wider audience. It is my hope that this special issue will help facilitate and accelerate the pace of collaboration among industry, academia, and government across a broad range of research subjects.



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