



Use of Redtacton Device for Transferring Data in Under Water Laboratory

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Abstract— There is new concept of “REDTACTON” which makes the human body as a communication network by name HAN (Human Area Network). Nippon Telegraph and Telephone Corporation (NTT) lab from Japan is currently testing & developing this revolutionary technology. RedTacton is the major requirement and advantage for people. RedTacton uses the minute electric field generated by human body as medium for transmitting the data. The chips which will be embedded in various devices contain transmitter and receiver built to send and accept data in digital format. As electronic devices become smaller, lower in power requirements, and less expensive, we have begun to adorn our bodies with personal information and communication appliances. RedTacton is a break-through technology that, uses the surface of the human body as a safe, high speed network transmission path. So we are going to explain the unique new functional features and enormous potential of RedTacton as a Human Area Networking technology considering the underwater communication and its implementation.

Keywords— HAN – Human Area Network, NTT – Nippon Telegraph and Telephone Corporation, RFID-Radio Frequency ID System, IrDA – Infrared Communication, PDAs – Personal Digital Assistance.

I. INTRODUCTION

In this era we are moving towards an electronic future where the information will be accessible at our fingertips, whenever and wherever needed. The computation and communication equipment required to provide the friendly and immediate access to information will be integrated into our attire. Just as a quick look at today’s wristwatch saves a trip to the nearest clock, a glance at tomorrow’s wristwatch will replace finding a terminal to check e-mail. Nowadays people can communicate anytime, anywhere and with anyone over a mobile phone network. In addition to this the internet let’s people download enormous quantities of data from remotely located servers to their personal computers.

RedTacton is a new Human Area Networking technology introduced by Nippon telegraph and Telephone Corporation (NTT’s). RedTacton is a step forward technology that, for the first time, enables reliable high-speed HAN. Formerly, radio frequency ID systems (RFID), Bluetooth, infrared communications (IrDA) and other technologies have been planned to solve the "Last Meter" connectivity problem. Somehow, they have number of elementary and technological drawbacks that restrict their usage. Meanwhile, all kinds of electronic devices including personal digital assistants (PDAs), pocket video games, and digital cameras are becoming smaller, so people can carry around or even wear various personal information and communication appliances during their everyday activities. Limited wireless communication systems such as Bluetooth and wireless local area networks have some problems. Throughput is reduced by packet collisions in crowded spaces such as meeting rooms and auditoriums filled with people. Communication is insecure because signals can be stopped. The principle drawback of infrared communications (IrDA) is the tight directionality of beams between terminals needed for the system to be effective. The ultimate solution to all these limitations of usual technologies is the “**Intra-body**” communication that is human area networking. The transmission medium is human body. This would be an ideal way of implementing HAN as it would solve all the problems including throughput high network setup costs, reduction and low security. Wired connections between electronic devices in human area networks are cumbersome and can easily become entangled. Short-range wireless communication systems such as Bluetooth and wireless local area networks (IEEE 802.11b, and so on.) have some problems. Throughput is reduced by packet collisions in crowded spaces such as meeting rooms and auditoriums filled with people and communication is not secure because signals can be intercepted.



Figure. 1 Redtacton Device

II. CONCEPTS OF REDTACTON

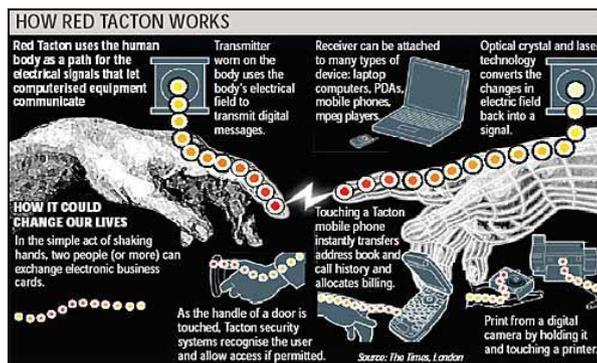


Figure 2 Concept of Redtacton

RedTacton is a break-through technology that, for the first time, enables reliable high-speed HAN. In the past, Bluetooth, infrared communications (IrDA), radio frequency ID systems (RFID), and other technologies have been proposed to solve the "last meter" connectivity problem. However, they each have various fundamental technical limitations that constrain their usage, such as the precipitous fall-off in transmission speed in multi-user environments producing network congestion

1. RedTacton uses the minute electric field emitted on the surface of the human body. Technically, it is completely distinct from wireless and infrared.
2. A transmission path is formed at the moment when a part of the human body comes in contact with a RedTacton transceiver. Physically separating ends the contact and thus ends the communication.
3. Using RedTacton, communication starts when terminals carried by the user or embedded in devices are linked in various combinations according to the user's natural, physical movements.
4. Communication is possible using any body surfaces, such as the hands, fingers, arms, feet, face and legs. RedTacton works through shoes and clothing as well.

III. WORKING OF REDTACTON

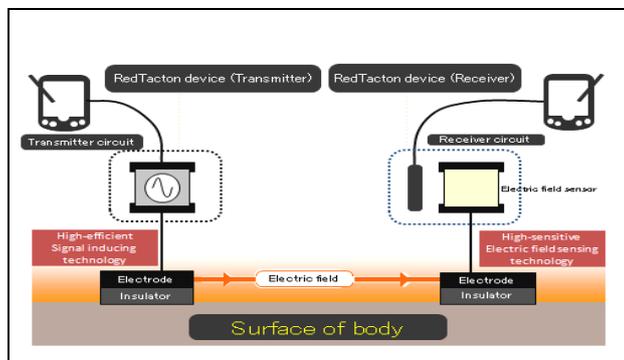


Figure 3. Working of Redtacton

- 1) Transmitter sends data
- 2) Transmitting transceiver creates a change in the field
- 3) Field from human body dissipates into earth
- 4) Electric field is received using sensing technology
- 5) Receiving transceiver recognizes the change in the electric field
- 6) Sensing technology measures the weak electric fields induced.
- 7) Electro-optical crystal uses laser to convert and read the signal

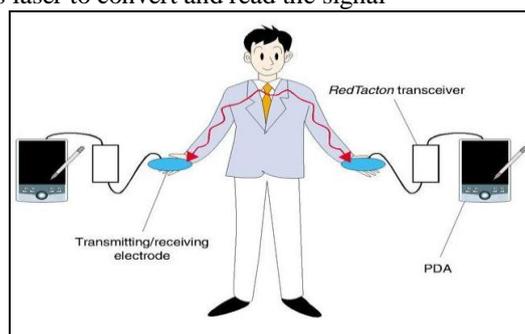


FIGURE 4 MECHANISM OF REDTACTON

IV. MECHANISM OF REDTACTON

Data is received using a photonic electric field sensor that combines an electro-optic crystal and a laser light to detect fluctuations in the minute electric field. The naturally occurring electric field induced on the surface of the human body dissipates into the earth. Therefore, this electric field is exceptionally faint and unstable. The photonic electric field sensor developed by NTT enables weak electric fields to be measured by detecting changes in the optical properties of an electro-optic crystal with a laser beam.

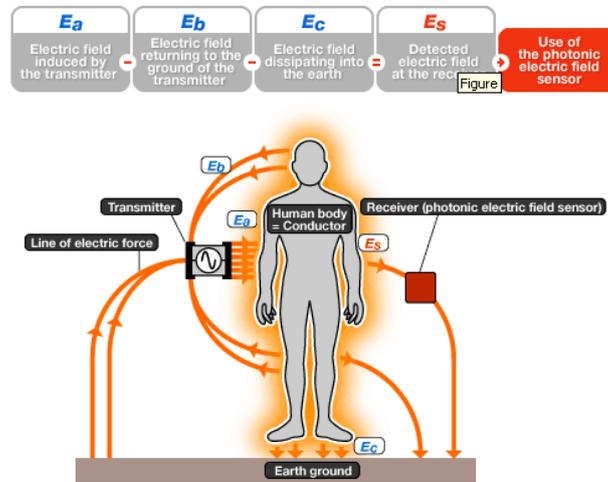


Figure 5 Mechanism of Redtacton for HAN

[Electric fields on the surface of our body induced by the REDTACTON device. Only a portion of the induced electric field is sensed by the receiving REDTACTON device. The remaining electric fields are dissipated to the ground.]

V. DEVICES OF TRANSMISSION

- 1) PC Card Transceiver
 - Communication speed: 10 Mbps
 - Protocols: TCP/IP
 - Communication method: Half-duplex
 - Interface:



Figure 6

- 2) Embedded Transceiver
 - Communication speed: 10 Mbps
 - Protocols: TCP/IP
 - Communication method: Half-duplex
 - Interface: 10BASE-T



Figure 7

- 3) RedTacton device (USB type)
 - Communication, speed has not been determined yet. (The device is under testing stage).



Figure 8

VI. UNDERWATER COMMUNICATION

RedTacton allows communication in outer space and in water where the speech constraints are very high and thus enables a highly efficient means of expression of speech which is beyond the purvey of human beings.



Under Water Communication Communication inside body

Figure 9

With the help of RedTacton technology, communication between computers is initiated automatically by forming transmission paths when people come into contact with other things. In this way people can connect to the networks without experiencing any degree of complexity simply by performing natural actions such as touching, sitting or stepping on other objects. So far NTT Laboratories have made a prototype system for the many applications. Thus by reasoning that home and office security are ideal and initial fields for the applications for this technology, they have made progress in the development of custom LSI chips, card type transmitters, and receivers that can be embedded in the part of environment such as floors and doors. Using our own protocol, we are able to transmit data at 230 Kbit/s between a card type transmitter and an embedded receiver, and embedded receiver can be connected to a host computer over an Ethernet or serial interface. In the future, with a view to incorporating this technology into mobile phones, PCs and PDAs, we intend to make a concerted effort to develop this technology to make it operate faster consume less power and implement bidirectional communication. The performance of RedTacton is better as compared to other technologies and best to connect network within remote distances. There is no any type of problem of hackers or say threat as our body itself is the transmission media. These days the main issue is speed. It is solved by RedTacton. It provides very high speed of 10 Mbps within very short distances. The evolution of RedTacton technology is a big achievement and which will likely be targeted for use in applications such as wireless headset, security applications, medical application and wireless transmission by applying different actions. This could get as simple as two people equipped with RedTacton devices being able to exchange data such as text files as well as business cards just by shaking hands. Communication between electronic devices on the human body (wearable computers) and ones embedded in our everyday environments can be possible. Wired connection can be replaced. In the crowded areas such as meeting room due to many users throughput can be reduced by packet collision in case of Bluetooth and wireless LAN using REDTACTON this problem can be solved.

VII. CONCLUSIONS

RedTacton is an exciting new technology for human area networking. In our research we have used a transceiver that uses the human body as a data transmission medium based on an electric-field sensor that uses an electro-optic crystal and laser light. NTT is committed to using its comprehensive commercialization functions to push this research out to the market place as quickly as possible while moving ahead with tests and trials in collaboration with commercial partners as necessary. RedTacton technology is expected to dominate Bluetooth technology in the future. RedTacton technology could put the use of cables to an end. The problem faced by the RedTacton technology is the cost of development. This technology brings a new dimension of communication which effectively links the user to anyone he wants to communicate. Since it provides high speed communication, it can provide seamless service wherever, whenever and whoever uses it. In our research we found out that how this technology works. Not only this, also we researched about the implementation underwater. As per our research, we would conclude that there is not much difference between the transfer of data when compared on earth surface or under water. What makes the things vary is the speed of the

transmission. On earth surface we can see that the speed of transmission is low. So to overcome this we hereby discuss that we need to develop certain protocol for it. So we can achieve a faster transmission speed.

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