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## **USING OF PRESENT-DAY EQUIPMENT AND TECHNOLOGY FOR QUADRIPLLEGIC PERSONS**

### *Introduction*

Persons with quadriplegia have partial or full lack of functions under level of injury (neck part of spinal cord). They are mobile by using of wheelchairs. Quadriplegia is often a result of an accident. The hardest fact is that to this person the whole life is fundamentally changed. The range of his or her physical abilities vary from full lack of functions under shoulder zone to lighter forms, when person is able to live his or her everyday life with remaining functions of hands. In their life the vast majority of this population is heavily dependent on assistance of another person. They are mobile by using of wheelchairs independently or by help of someone else. In their everyday life they are using various equipment. However, quantity and quality are inadequate due to insufficient researches. Progress of technology is giving far more possibilities as compared of the possibilities that are offered for an individual to purchase and apply in his or her home.

Such persons, which had full and independent life until recently, “on their own feet”, in one moment are forced to learn again how to live, accept their disability - often with minimal physical potential - and continue to live. In that cases modern technology and equipment is of great importance for organising and improving quality of life of this population.

### *My Personal Example*

By telling my story about my suffering I would like to show how important technology and equipment is to persons with high level of injury. My quadriplegia came as result of a traffic accident in 1992. Even after my physical rehabilitation, my abilities are minimal. I am totally dependent on assistance of another person (personal hygiene, eating, dressing, driving my wheelchair, transferring to bed from wheelchair and vice versa, assisting during my work, administrative obligations or attending to various cultural or social engagements).

Despite my dependence on help of an assistant, after my rehabilitation I continued my study of economy, which I finished successfully. Now, I am working, trying to live as everybody else. To achieve every of these goals, I had great support of my family and friends who supported and follow my needs.

An advantage was also the fact that the building of the Faculty of Economy was up to certain level adapted to needs of disabled persons using wheelchair.

Firstly, we had to adapt my home to become more accessible. When I am going out, I use the service of Z.E.T., which provides accessible transport for disabled persons.

Also, I purchased some equipment - most important it is computer - as well some plastic and wooden extensions for help during my work on computer, typing digits on telephone or turning over pages. Accessible working place is essential to me. With my limited functions of hands and with some equipment, until 1998 I could independently work on my PC. Then, my condition worsens and now I am only able to work - by managing by voice.

At the moment I have at home installed programme called DRAGON NATURALLY SPEAKING. It is a programme that executes command spoken through a microphone. Advantage of this programme is that vocal managing is possible and that it is not expensive. However, disadvantages are that it is not localised (translated into Croatian language), it is sensitive on exact pronunciation and an automation of house is not possible.

### *Needs*

My goal is to automate my home and working space, as much it is possible. There are two reasons: greater independence for myself, and help to those who are assisting or who are with me. If my house becomes automated with a help of present-day modern technology everyday help of another person will be minimised to only this what is essential. Browsing to the Internet I discovered many ways how to improve quality of life of disabled persons. Internet by itself is a window full of equipment and technology serving to “healthy” population. On the other hand development of these technologies is exceptionally important to us, disabled persons. By reading life stories not only about famous individuals, but also about common people I realised that setting such devices in someone’s home is not some prestigious case but something very useful to all people with disabilities. As an example I may mention famous Steven Hawkins and Christopher Reeve. Those persons have completely equipped homes and working spaces with modern technology. Although such technology is expensive and in particular segments unattainable, it is necessary to all of us. On numerous web sites it is shown and sell similar or same products. For an individual, who is not an expert, it is not easy to decide what would be the best to her or him. Through large selection of equipment, yet fair in price, I picked a product, which is, in my opinion, one of possible solutions for those persons who have quadriplegia. It is a system, which manages through a computer and X-10 compatible devices.

#### **HAL 2000/DELUXE PROGRAM (Less expensive variant: HOME VOICE)**

- It is used for vocal managing of PC-controller.
- It works by telephone or by microphone.
- It “learns” vocal commands.
- It has high level of “intelligence”.
  - X-10 standard for managing of devices connected to a power grid, without extra wiring (switches, sockets, cameras, thermostats, locks, opening doors, curtains, etc.).
- PC-controller (connected to a power grid and to a computer; through power grid it manages to other X-10 devices).

- Manageable devices:
  - Telephone.
  - Television set, VCR, stereo (by infra-red remote control).
  - Thermostat.
  - Microphone.
  - Switch (off/on or smothered).
  - Possibility for managing of electric-powered bed.
  
- Advantages:
  - Possibility of modulation: every X-10 device is possible to purchase independently and to integrate into system, even if manufacturer is not the same.
  - Many different X-10 compatible devices of various purposes.
  - Great adaptability due to developed software.
  - To individuals having high level of injury, it gives opportunity to have an independent life, without help of another person.
  
- Disadvantages:
  - It is not adapted to European standard voltage (22V, 50Hz).
  - Price of basic set is 1.000 USD.

### *Conclusion*

Every person shall have full and worthy life, independent of his or her physical abilities. Present-day technology and equipment give possibilities for it. The problem lies in the fact that society does not recognise this needs as necessity and great help to personal assistants. So, efforts - both of individuals and of whole society - should be directed towards law regulation of giving this helping technology and equipment to persons having higher level of disability. For this, an experience of an individual is essential, as well corporation with those scientific institutions, knowing what and in what way this is possible to implement in our circumstances.

**More about the subject: <http://www.automatedliving.com>**