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ELECTRONIC DEVICES FOR SEVERELY DISABLED PERSONS,
ENVIRONMENTAL AND COMMUNICATION CONTROL SYSTEMS

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According to an agreement between the French Ministry of Health and Welfare and the General Administration of the Paris Hospitals (Assistance Publique de Paris) six beds in the adults rehabilitation department of the Raymond Poincaré Hospital (Garches 92380 FRANCE) are equipped with electric devices. The purpose of this report is to describe the functions made possible by the devices; and the results of the reability tests to which both the constituent components and the devices themselves have been submitted.

1. Description of the devices:

Two kinds of systems have been selected. They are produced by two different French companies, namely Proteor, and Renix.

The Proteor system was developed in collaboration with the Universty of Marseille (Department of Computing and Mathematical Science: Professeur Roux and Doctor Sambuc) and the rehabilitation center of Marseille-Valmante (Cotor Benezet).

The Renix system has been developed by the biomedical research department of Renix***, the INSERM department of biomechanical research and the Propara rehabilitation center of Montpellier (Professor Rabishong). With the Renix system, the **feasibility tests** indicate that the frequency of dysfunctionment is as low as one break-down every ten years. The study takes into account both electronic components and passive resistance.

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1.1. Functions provided by the two systems:

- call signal,
- command of electrical switches,
- command of electrical turning of pages,
- operating dialing telephone: call by spelling the corresponding number and the correspondent's name (this number having been memorized by the system). The input to and the output from the telephone line being, of course, controlled by vocal command,
- television channel selector,
- bed control,
- environmental control (door, window, fan),
- bureautic facilities.

The theoretical diagram of the system is shown in figure 1.

1.2. Operating modes-systems choices:

The disabled persons have a choice between two possibilities and can operate the controls either by voice or switch control. It has been necessary provide two kinds of commands so as to take into account respiratory problems, in particular tracheotomy.

For voice control, the input appliance in both systems is RMI 50 vocal card of VECSYS compagny (Orsay University)* logical commands and relays operate at low power. Servo motors operate at about 250 watts. The input of each disabled person's voice is the first step to access to environmental control by vocal command. The patients have to read once a few words wich appear on the monitor. When the system is fitted to one person's voice, other voices have no effect on it. Disabled persons can speak freely when the system is off. They have just to whistle once to start the appliance working and the new appears.

CONCLUSION

The aim of this study is:

To enable the patients to regain their every day activities in the hospital as soon as possible and to overcome their

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isolation. This is especially important in patients who have tracheotomy, as the electronic devices help them to communicate with nurses and members of their family. We have been

long aware of the disastrous consequences arising from the isolation of severely motor disabled patients which may bring about intellectual regression, demotivation and psychosocial isolation**. All these consequences could, despite good health care, destroy the quality of life of such persons.

One of the goals of this experiment is to use electronic devices for the purpose of preparing severely disabled patients to return to their homes and try to recover some of their professional skills. Using electronic equipment they can be left alone a certain number of hours during the day which will diminish the work of their relatives or others who take care of them. It also gives them an opportunity to start working at home in one of the branches of modern technology such as bureaucratic and telematics.

The expected results of these experiments will be the subject of a further report.

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