

The Parkinson project (1965-1970)

**The first biomedical Engineering project of the University of Twente,
at that time the THT.**

Dr. G.J. van Hoytema settled as the first neurosurgeon in both hospitals of Enschede in 1953. He founded a neurosurgical center after some years, focusing on the development of depth measurements and stimulations of deep brain nuclei. As such, he started the stereotactic treatments of extrapyramidal movement disorders of Parkinson patients in the early 1960s, together with Dr. J. van Manen, a neurologist of the academic hospital in Groningen. They developed their own stereotactic frame for deep brain surgery, in collaboration with the technical workshop of the company Holland Signaal in Hengelo.

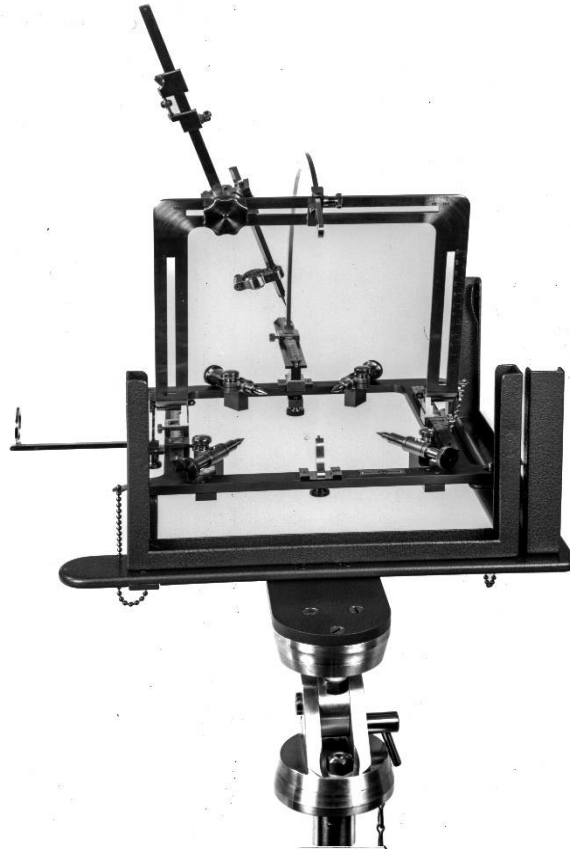


Dr.G.J.van Hoytema

In 1964, the third Technical University of the Netherlands was opened in Enschede, called the “Technische Hogeschool Twente (THT), later on called the University of Twente (UT).

Dr. van Hoytema realized that he could probably as one of the first medical doctors in Enschede profit from the opportunity to cooperate with the newly founded university. He wrote a letter to the board of the university, asking for help with his stereotactic surgery project. His idea was that a specific measurement in the brains of a patient could help him to locate in more detail the place where afterwards the surgery should take place. His request was picked up by the chair Medical Electronics, headed by

Prof.Ir. M.P. Breedveld, in practice by the staff members Drs. Jan Holsheimer for the development of a suitable measurement electrode, Ir. Piet Bergveld for the actual measurements of brain activity and hand tremor and Ir. Peter Löhnberg for the information processing.



The van Hoytema-van Manen frame for stereotactic surgery

The electrode consisted of a glass tube, containing a shielded wire with a Platinum tip of 50 μm . Because field-effect transistors with a high input resistance were not yet commercially available at that time, Piet decided to make use of a nuvistor for the input stage of an amplifier, because of its extremely high input resistance. For the tremor sensor he used a silicon strain gauge as base for an acceleration sensor. An 8-channel Ampex tape recorder

was used for the registration of the brain activity, the tremor and the EEG leads for later data analysis.



Jan Holsheimer



Piet Bergveld



Peter Löhnberg

Unfortunately, Dr. van Hoytema passed away in March 1966. His place in the Parkinson project was taken over by Dr. J. Oostrom, the neurosurgeon who had already been the assistant of Dr. van Hoytema since 1959 and had become his associate since 1965.

Ultimately the stereotactic surgery has been made obsolete by the introduction of the drug L-DOPA and therefore this first common project of the hospitals in Enschede and the university was stopped. It was however the base of further research in the field of biomedical engineering in Twente with many medical projects. Jan Holsheimer specialized in brain stimulation as intervention in neurological disorders and Piet Bergveld started many activities in the field of Biosensors, among others the development of the Ion-Sensitive Field-Effect Transistor (ISFET), originally meant for electrophysiological measurements, such as carried out in the Parkinson project.