

## SOTOS - Silent Operating Theatre Optimisation System

Operating theatres are complex sophisticated noisy work places, due to an increasing number of technical devices and procedures. With the rise of noise the stress of the surgical team increases. This results in an impairment of their concentration levels and the communication between the operating staff, thus increasing the mistakes rate.

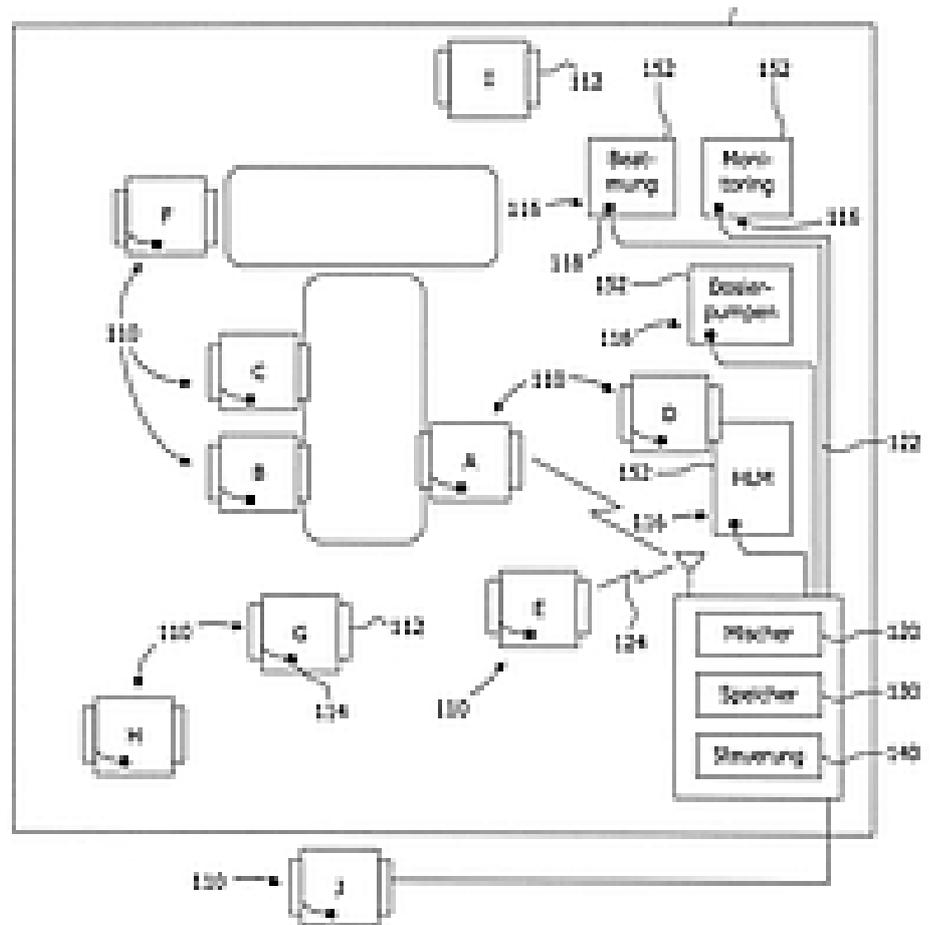
To reduce the noise levels at the operating theatre and thus minimize acoustic stress and concomitant mistakes rate, we developed and offer the Silent Operating Theatre Optimisation System called "SOTOS". It is an controlled and targeted communication management system which minimizes acoustic stress. The sterile-to-use control panel to set various SOTOS functions allows an ad hoc control of the system intraoperatively.

### Challenge

Operating theater are complex sophisticated noisy work places, averaging noise levels over 70 decibels SPL (louder than a highway or than on a factory floor). This results from the increasing number of technical devices and activities, e.g. the heart-lung machine, aspirator and tearing open of supply packages. Cognition, concentration levels and communication between operating staff (surgeon, assistants, physicians, nurses, anaesthesists..) can be impaired by high noise levels. These are known to be harmful stress.

### Our Solution

Our solution is the innovative operating communication system called SOTOS - Silent Operating Theatre Optimization System. SOTOS is a controlled & targeted/directed communication management system for the operating theatre during interventional procedures, which minimizes acoustic stress. It is composed of multiple wireless headsets (in ear, or on ear) with incorporated wireless speakers and a control unit to manage a structured communication matrix. The sterile-to-use control panel to set various SOTOS functions allows an ad hoc control of the system intraoperatively. The matrix design reduces echo path and transmits speech in a highly efficient manner. It further allows playing music from a variety of sources, like e.g. flash drive, USB-device, smart phone, compact discs, etc.. SOTOS avoids latencies and the need for talk-listen switching, thus enabling a conversation without interruptions. Different team members in an operating theatre (e.g. surgeons vs. anaesthesists) communicate only among themselves, not disturbing other teams. However, the leading surgeon is able to communicate with all of them. In case of an emergency an "all-in-modus" can be used. Pictures: View of an operating theatre incl. heart-lung-machine, artificial ventilation machine, and of operating staff; the team includes surgeon, assistants, nurses, anaesthesists..





*(source: [www.rhp.eu](http://www.rhp.eu))*

## Advantages

- Reduction of the stress for the operating staff thanks to suppression of noise & management of meaningful communication.
- Improves the cognitive performance, teamwork and communication of the staff at the operating room.
- Individually focused communication based on procedural steps.
- Easy to use and to adapt.
- Pleasant working atmosphere.
- Use of background music.
- Interruption-/gap-free conversations.
- Reduction of operating mistakes and complications.
- Higher patient safety.

## Applications

To be used at operating theatres in clinics and hospitals. Acquisition costs for hospitals should be insignificant compared to costs of a current high-tech operating theatre.

## Developmental Status

Functional prototyp developed, currently being tested.

## Patent Status

We filed a German (DE) patent application in the name of University of Göttingen, Medical Center, and we are looking for a partner for commercial exploitation.

## References

[www.psych.uni-goettingen.de/de/communication/forschung/sotos](http://www.psych.uni-goettingen.de/de/communication/forschung/sotos)

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