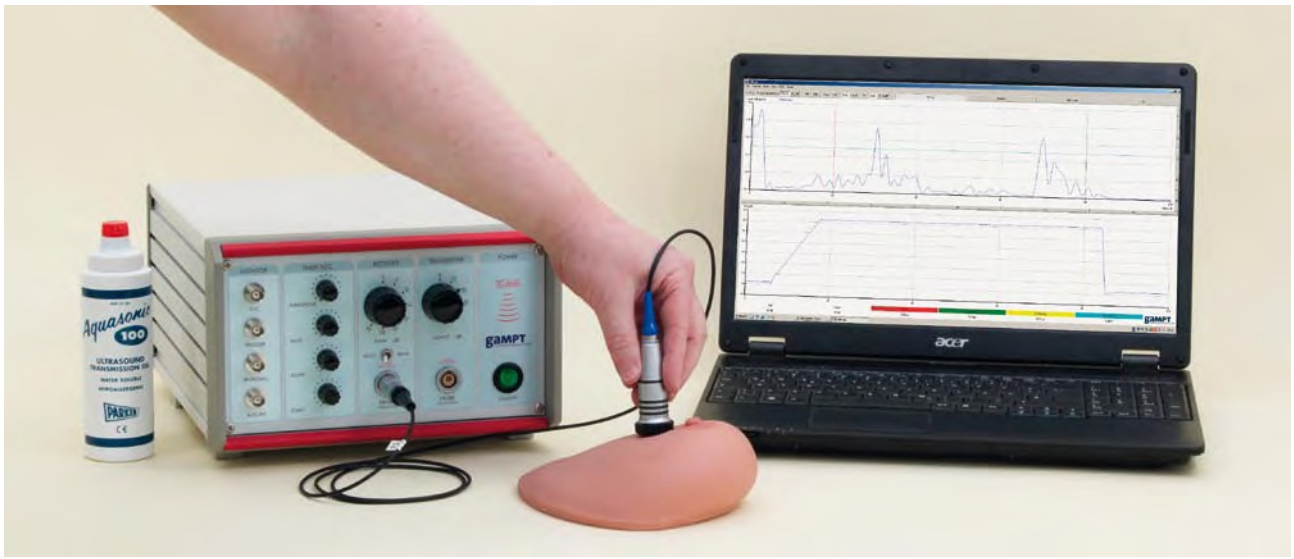
MED02 Ultrasonic imaging at breast phantom (mammasonography)

The examination of a realistic breast phantom with tumours and their localisation and the estimation of their size in the B-Scan method demonstrate a typical application of ultrasound in medical diagnostics.



Related topics

Reflection, scattering, ultrasonic imaging methods, pulse echo method, A-Scan, B-Scan, mammasonography, tumour size

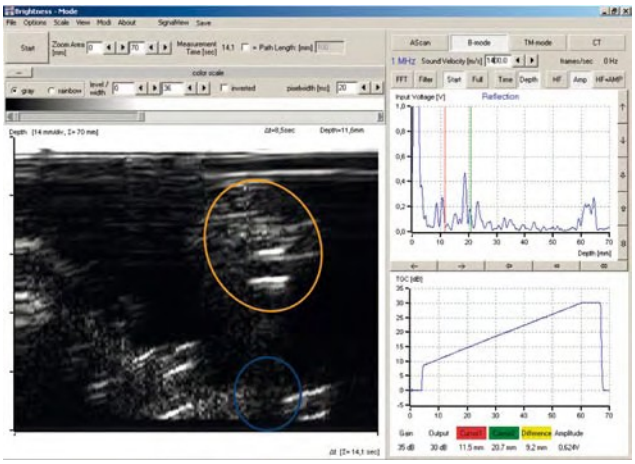
Mammasonography - the ultrasonic examination of the breast - is, together with mammography (X-ray examination) the most important imaging method for the diagnosis of benign and malignant changes in the breast tissue. It is used in the early detection of breast cancer. The strength of sonography lies in particular in the distinguishing of changes consisting of solid tissue and cavities filled with liquids (cysts). This method can be used, for example, to guide a biopsy from the breast. Immediately before an operation, the ultrasonic examination can show the exact location of the findings and thus make it possible for the physician to make a targeted intervention. In the experiment, a realistic breast model is first of all examined for any pathological changes by palpating with the fingers. The two tumours included are found during this and their approximate location is determined. The found areas are then examined with the ultrasonic probe in the A-Scan mode, suitable device parameters and a suitable orientation of the ultrasonic probe are set. Using the settings found, a B-Scan image of the breast model is recorded and analysed along a selected line.

Equipment

Ultrasonic echoscope GS200	10400
Ultrasonic probe 1 MHz	10151
Breast phantom	10221
Ultrasonicgel	70200

Results

The ultrasonic B-Scan image recorded with the measurement software shows the tumours with an oval shape and slightly inclined axis. The attenuation in the tumour tissue is increased, causing a sound shadow on the back wall of the breast phantom.



Related experiments

PHY01 Basics of pulse echo method (A-Scan)
PHY08 Ultrasonic B-Scan
MED04 Biometry at the eye phantom