

Physics of Ultrasound

Eight lecture

Transducers for Real-Time Imaging

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1. Transducer design

- Transducers for real-time imaging may be classified broadly into two categories:
- mechanical transducers and electronic transducers.
- mechanical transducers, the beam sweep is achieved through physical movement of some part of the transducer, usually the crystal element(s).
- electronic transducers the beam is swept by electronic activation of crystal elements, without causing the transducer to move physically.

2. Mechanical transducers

- ✚ Mechanical transducers are made using either a single piezoelectric crystal or a small group of crystals.
- ✚ A single crystal element may be rocked to perform pendulum motion through a suitable angle.
- ✚ The motion is effected using an electric motor. The angle of swing will define the field of view.
- ✚ The image is triangular in shape and is referred to as a sector scan.
- ✚ Each swing of the crystal produces one image frame, and the frame rate is equal to the number of swings per second.

