

Portable Imaging UWB Radar System with Two-Element Receiving Array

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We present our developed UWB radar (UWBR) imaging technology based on several advanced solutions in EM, circuit and signal processing. The UWBR functional diagram and a picture are in Fig. 1a-b, correspondingly. The system includes three packaged modules of the same overall size, i.e. two receiving modules, at the left and right, and one transmitting module, at the centre. Each module contains EM, RF and circuit parts. Additionally, the transmitting module holds the system control electronics, interface to computer and power supply. All the modules have the same antennas based on novel antenna geometry (reported separately to AMEREM'06). The system is tested for a number of operational scenarios including imaging of scattered scenes, Fig. 1c, through-wall seeing, etc. A sample of through-wall imaging is shown in Fig. 2 including an illustration on used scene imaging algorithm through by-pixel mapping, Fig. 2a, synthesized, Fig. 2b and measured images of a target.

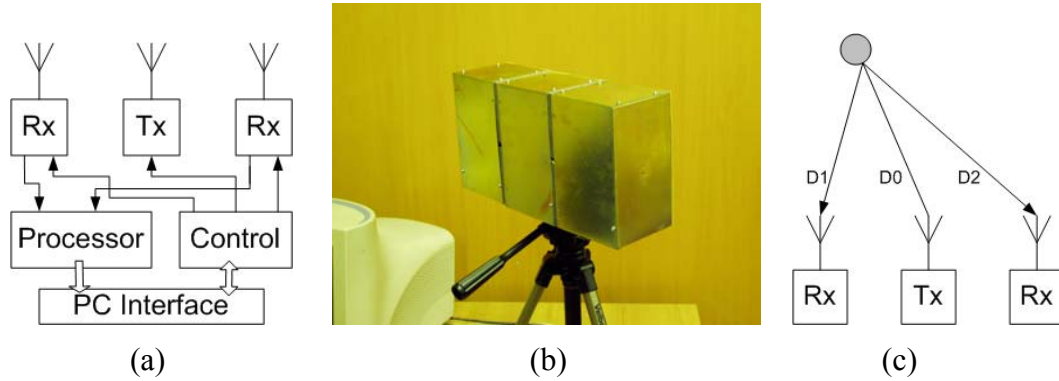


Fig. 1. (a) UWBR radar functional diagram. (b) Prototype picture with three antenna units. (c) Image focusing for target with receive array.

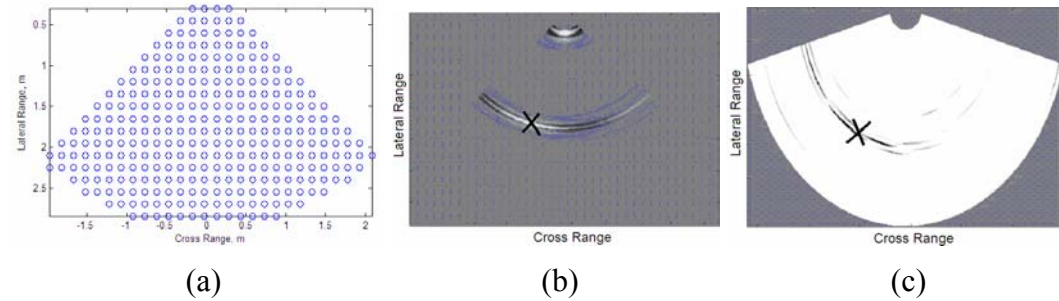


Fig. 2. (a) Radar field of view scene as a numerical map of pixels. (b) Synthesized radar image. (c) Measured and computed radar image.