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### EVALUATION OF COMBINED GROUND PENETRATING AND THROUGH-THE-WALL SURVEILLANCE UWB TECHNOLOGY

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**Abstract**  
This work investigates the possible implementation of underground targets using UWB ground-penetrating technology in the frequency range of around 100 MHz. For this test, the site was chosen where surface penetration elements were buried previously. Depth, location, shape, and material of buried objects were known before the experiment. In addition, the same results with unknown material for the penetrating part were tested at a 7500 m distance. Forward movement behind a brick wall was tested.

**Principles and Performance Characteristics of the Device**  
**Technical Data:**  
Antenna Frequency: 100 MHz  
Frequency Range: up to 120 MHz  
Maximum Range: up to 1000 m  
Power: 100 mW  
Resolution: 10 cm  
Accuracy: 10 cm  
Range: 1000 m  
Resolution: 10 cm  
Accuracy: 10 cm  
Range: 1000 m  
Resolution: 10 cm  
Accuracy: 10 cm

**Results of GPR Function Implementation**  
Fig. 1. GPR and brick wall. Fig. 2. Ground-penetrating radar. Fig. 3. GPR image of the wall. Fig. 4. GPR image of the wall. Fig. 5. GPR image of the wall. Fig. 6. GPR image of the wall. Fig. 7. GPR image of the wall. Fig. 8. GPR image of the wall. Fig. 9. GPR image of the wall. Fig. 10. GPR image of the wall.

**Conclusion**  
The results of the experiment are presented in the paper. It is shown that the proposed method is effective for the detection of underground targets. The proposed method is simple and easy to implement. The proposed method is suitable for the detection of underground targets. The proposed method is suitable for the detection of underground targets.

**References**  
1. V. E. Evoshchuk, V. P. Prokhorov, A. A. Pirozhov, P. J. Yemchuk, "Evaluation of Combined Ground Penetrating and Through-the-Wall Surveillance UWB Technology," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 55, no. 1, pp. 1-10, 2017.

