



Geoscanners AB®



GCB-200

The ground coupled bowtied antenna GCB-200 is a light weighted, small size ground penetrating antenna for geotechnical and environmental applications. The antenna is fully shielded and the front to back ratio is very high making it an ideal choice for noisy environments. This antenna is fully compatible with all Geoscanners ground penetrating systems as well as with all SIR® from GSSI. The fastening points are standard for all Geoscanners products making it possible to use the same accessories in several antennas providing a great deal of integration in larger systems.

Area of applications:

- Geotechnical and environmental.
- Utility detection, UST and void detection.
- Archaeological investigations.
- Forensics

Mechanical specifications:

| | |
|--|-----------------------------|
| Dimensions L x W x D (mm/inches) | 360x330x157 / 14.2x13.0x6.2 |
| Weight (kg/pounds) | 3.5 / 7.71 |
| Distance between the TX and RX (mm/inches) | 06/17/57 |
| Fastening Points L x W (mm/inches) | 210x160 / 8.26x6.30 |
| Ingress Protection | IP65 |

Electrical specifications:

| | |
|--|---------------------------|
| Antenna Type | Quarter Wavelength Bowtie |
| Shield Type | Top and Side Shield |
| Absorber Type | AN-79 |
| Feed Point impedance (Ohms) | 347 |
| Transmitted Pulse Amplitude (Volts) | 100 |
| Transmitted Pulse Width (ns) | 4.4 – 4.6 |
| Receiver Sensitivity (uVolts) | 14 |
| Antenna Bandwidth (at -10dB) | 98.00% |
| Antenna Center Frequency (MHz at -10dB BW) | 210 |
| Survey Wheel Output Voltage (Volts) | 5.01 |
| Operating Temperature (°C / °F) | -25 .. +40 / 14 .. 104 |

Akula 9000 or GSSI SIR-3000, SIR-20 radar recommended settings:

| | |
|---|---------------------|
| Pulse Repetition Frequency, PRF (kHz) | 100 or higher |
| Scan Rate, Scans/Second | 100 |
| Range (ns), (depends on soil penetration) | 128 to 256 |
| Low Pass Filter Cut-Off Frequency (MHz) | 70 |
| High Pass Filter Cut-Off Frequency (MHz) | 400 |
| Gain Points and value | Adjust to 75% Swing |



Fig. 1 GCB-200 mounted on U-Explorer cart

Application Hints:

This antenna is perfectly suited for relatively deep utility detection. Depending on the relative dielectric permittivity (RDP) of the area under survey and its electrical conductivity properties it is possible to reach down to 10 meters penetration with this antenna.

The high efficiency of this antenna together with the excellent sensitivity of the receiver electronics allows for very deep surveys with outstanding resolution and clarity of the data.

The data shown in figure 2 depicts the results obtained from surveying a sandy road along high buildings and noisy environment as shown in figure 3.

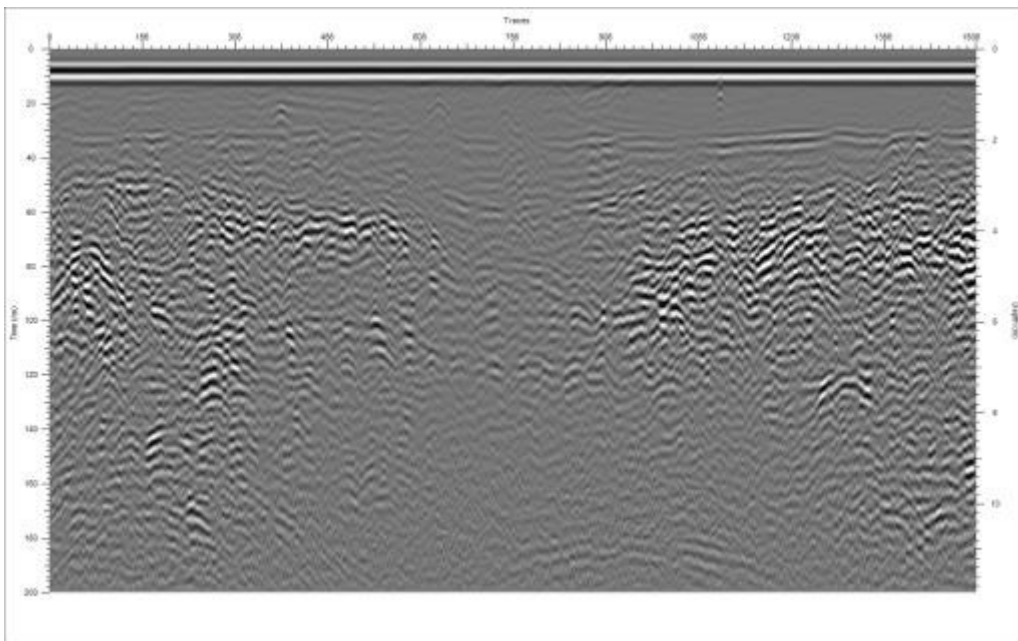


Fig. 2 GCB-200 operated under favorable conditions, penetration is good.



Fig. 3 GCB-200 surveying sandy road with buildings around.

It shows good penetration way beyond the 10 meters depth and excellent resolution of the different layers. The bottom of the road, the frost layer and several pipes are easily detected.

It is important to keep in mind that in areas with high conductivity values of the order of 5 mS and more the penetration can be heavily affected. Setting in these conditions very long ranges and high gains it is not going to improve the situation in any favorable way.

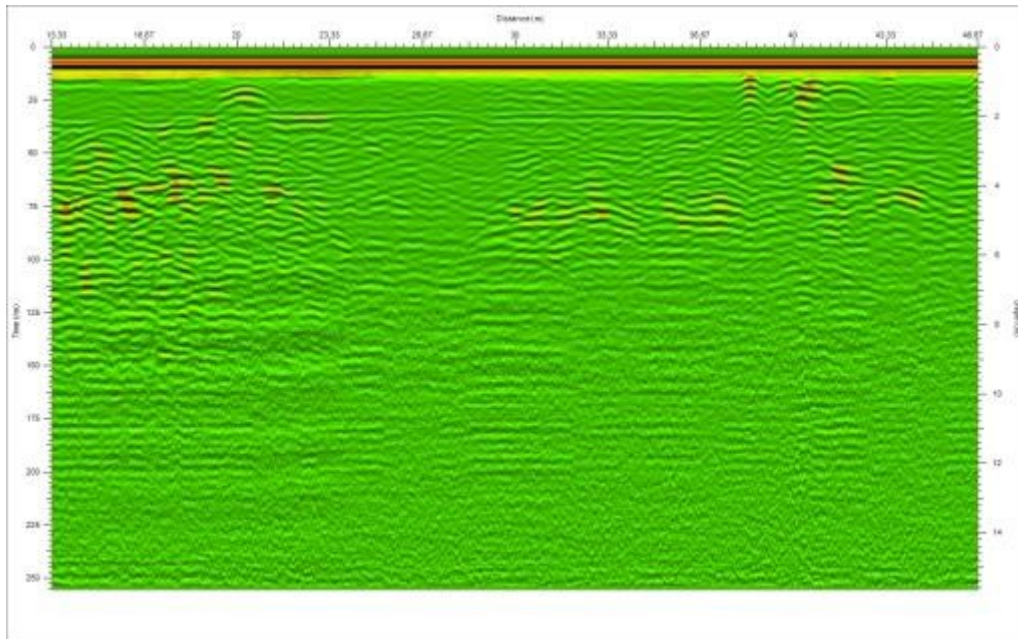


Fig. 4 GCB-200 operated in a heavily conducting soil, penetration is limited.

As shown in figure 3, the penetration of the antenna in this area with a soil conductivity value of 6 mS is limited to 90 ns or approximately 5 meters. It is of no use at all to set in these conditions a range of 256 ns. In these conditions it would be appropriated to use 128 ns range and adjust the gain accordingly. In general it is much better to have 100 ns uncompressed good data rather than 256 ns compressed data with more than half of it being useless.

The GCB-200 is fully compatible with GSSI SIR® ground penetrating radar systems and the quality of the data is not affected by that. Using our Akula 9000 ground penetrating radar system gives however, a few added bonuses and should be considered when buying a new complete system. The GPS integration and the capability to process the data right in place makes the Akula 9000 a perfect choice for this antennas. Figures 4 and 5 show the same section surveyed using the same antenna and the same day with the Akula 9000 vs. the SIR-3000 from GSSI.

Accessories such as the U-Explorer cart or the survey wheel for the tow handle are highly recommended and will prove to be rather useful when using these antennas.

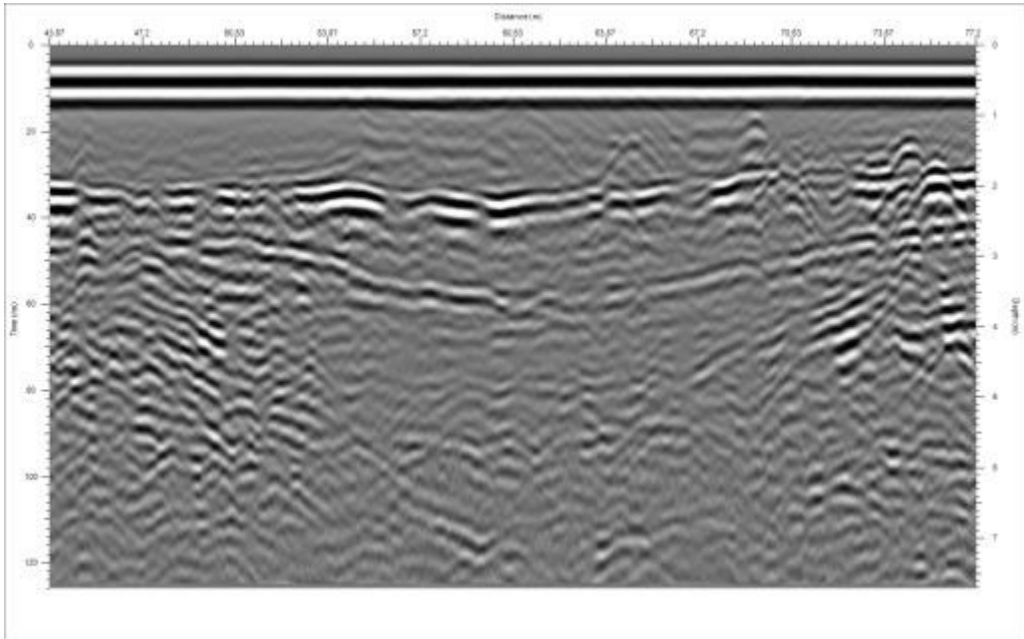


Fig. 4 GCB-200 survey using the Akula 9000 GPR

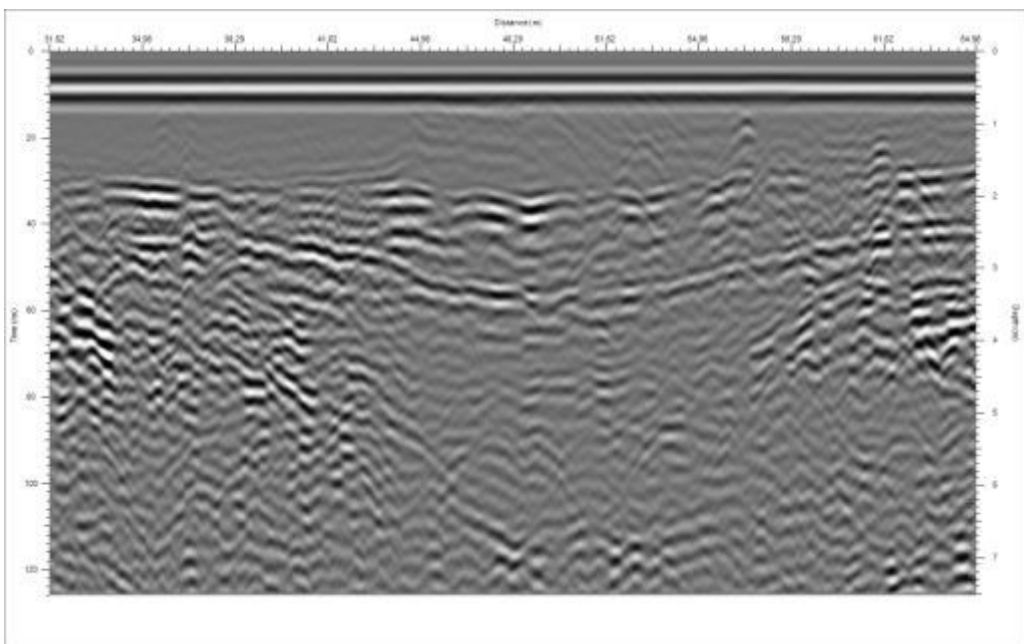


Fig. 5 GCB-200 survey using the SIR-3000 GPR

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