



# GUARDIAN EAGLE HELICOPTER IN FLIGHT INTEGRATED WITH GEM 2 ELECTROMAGNETIC SENSOR FOR UNDERGROUND DETECTION



Sensor Targets: Buried pipelines under street



## Guardian Eagle Helicopter Demonstration of electro-magnetic feasibility

Spatial coverage is sparse in places and data is good. Since the gridding process for contouring is essentially a 2-d interpolation Targets show up better at the higher frequencies and in the inphase data. The skin depth is lower at the higher frequencies and the inphase response is consistent stronger for metallic targets as opposed to geology. Collected data:

Line	Sample	X	Y	Mark	Status	GPSSStat	0 Time [ms]	Time [hr]	PowerLn	L_450Hz	Q_450Hz	L_1530Hz	Q_1530Hz	L_5310Hz	Q_5310Hz	L_18330Hz	Q_18330Hz	L_63030Hz	Q_63030Hz	OSum	
0	3	621558	4544411	0	0	2	29.66	78361639	214601.6	221.8	3.95E+03	9.91E+03	1.12E+04	1.23E+04	2.49E+04	1.25E+04	3.05E+04	1.02E+04	3.55E+04	1.46E+04	5.95E+04
0	4	621558	4544411	0	0	2	29.67	78361739	214601.7	227.3	4.25E+03	8.40E+03	9.83E+03	1.28E+04	2.46E+04	1.10E+04	3.10E+04	1.11E+04	4.30E+04	1.92E+04	6.25E+04
0	5	621558	4544411	0	0	2	29.68	78361839	214601.8	252.1	4.72E+03	8.09E+03	8.69E+03	1.41E+04	2.47E+04	1.11E+04	3.36E+04	1.57E+04	4.27E+04	1.73E+04	6.62E+04
0	6	621558.1	4544411	0	0	2	29.69	78361939	214601.9	241	4.38E+03	8.67E+03	9.20E+03	1.41E+04	2.31E+04	1.37E+04	3.59E+04	1.27E+04	3.93E+04	1.49E+04	6.42E+04
0	7	621558.1	4544411	0	0	2	29.7	78362039	214602	252.5	3.81E+03	9.10E+03	9.90E+03	1.33E+04	2.21E+04	1.52E+04	3.49E+04	9.71E+03	3.94E+04	1.96E+04	6.69E+04
0	8	621558.1	4544411	0	0	2	29.7	78362139	214602.1	254.1	4.13E+03	8.38E+03	1.00E+04	1.20E+04	2.32E+04	1.40E+04	3.36E+04	9.23E+03	4.06E+04	2.23E+04	6.59E+04



Onboard Aerial Imaging

### GUARDIAN EAGLE

#### HELICOPTER SPECIFICATIONS:

- Rotor Diameter:** up to 7'
- Speed:** 50 kts
- Weight:** 34 Lbs including sensors
- Sensors:** Electromagnetic, Imaging, CBRN,
- Propulsion:** DC brushless motor little EMI
- Datalink Range:** 3 miles depending on operational environment
- Construction:** High performance carbon fiber composites and aircraft aluminum and fiberglass
- Datalink Communication:** GPS, encrypted Spread Spectrum, COFDM radio
- Batteries:** EaglePicher 40V 10 Ah
- Navigation:** Radio controlled or auto-piloted with object imaging or wavpoint GPS based with INS redundancy and orientation.