INTRODUCTION: EZ MAG ULTRA

TRI-AXIAL EARTH MAGNETOMETER

TERRA EXPLORATION GROUP DESIGNED THE **EZ MAG ULTRA TRI-AXIAL EARTH MAGNETOMETER** TO SIMPLIFY AND FUNCTIONALLY COMPETE WITH HIGH END MAGNETOMETERS COSTING UP TO US \$40,000. TERRA'S SOPHISTICATED AND PROPRIETARY ELECTRONICS ARE MOUNTED INSIDE OF VERY STRONG AND WEATHERPROOF OFF-THE-SHELF PARTS TO AVOID THE NECESSITY OF PASSING ON TO THE END USER THE HIGH COSTS OF SPECIAL MOLDS TO FORM THE SHELL HOUSING THE ELECTRONICS. THE **EZ MAG ULTRA** IS PRICED TO BE AFFORDABLE IN A MASS MARKET THAT INCLUDES TREASURE HUNTERS, ARCHAEOLOGISTS, GEOLOGISTS, GEOPHYSICISTS, MINING AND CONSTRUCTION COMPANIES. **TERRA'S** VAST WORLDWIDE 30 YEARS OF GEOPHYSICAL FIELD SURVEY EXPERIENCE HAS INVOLVED USING MANY DIFFERENT, SOMETIMES RENTED, VERY EXPENSIVE DEVICES FOR VARIOUS PROJECTS. ALMOST ALL THE DEVICES WERE VERY COMPLEX TO USE AND DIFFICULT TO INTERPRET RESULTS. THEY WERE GENERALLY NOT RUGGED ENOUGH TO HANDLE VERY DIFFICULT ENVIRONMENTS WHERE THEY COULD BE EASILY DAMAGED. ALTHOUGH CARE IN USAGE IS ENCOURAGED, THE **EZ MAG ULTRA** IS BUILT TO BE BASICALLY "BULLETPROOF" TO SURVIVE ROUGH HANDLING AND THE OCCASIONAL "FALL OFF A CLIFF". THE MOTTO OF **TERRA EXPLORATION GROUP** IS "**NO GIMMICKS, JUST RESULTS".**

EZ MAG ULTRA START-UP

TURN ON THE EZ MAG ULTRA VIA SWITCH AT THE REAR OF THE UNIT. OPEN THE TERRA MAPPER PROGRAM AND SELECT THE EZ MAG BLUETOOTH SENSOR. ALLOW AROUND 30 SECONDS FOR CONNECTION TO COMPLETE AS THE PROGRAM IS VERY LARGE. ONCE CONNECTED, THE X, Y AND Z COMPONENTS WILL BE DISPLAYED ALONG WITH THE TOTAL MAGNETIC FIELD AND THE CURRENT GPS COORDINATES. THE EZ MAG ULTRA IS NOW READY TO BEGIN A SURVEY. ON THE BOTTOM RIGHT, SELECT "BEGIN RECORDING" AND START WALKING YOUR PRE-PLANNED GRID. AT THE END OF THE FIRST LINE OF THE GRID, SELECT "SUSPEND RECORDING" AND MOVE OVER TO THE START OF THE SECOND LINE OF THE GRID, TURN THE EZ MAG ULTRA AROUND SO THAT THE FRONT ARROW IS POINTING IN THE ORIGINAL DIRECTION (E OR W) AND SELECT "RESUME RECORDING" AND START WALKING THE SECOND LINE OF YOUR GRID. REPEAT THIS START-STOP-RESUME PROCESS ALONG WITH MAINTAINING THE SAME COMPASS HEADING FOR THE FRONT ARROW OF THE EZ MAG ULTRA UNTIL THE GRID COVERAGE IS COMPLETE. AT THE END, SELECT "END RECORDING" THEN SELECT "VIEW FILES". FOR THE FIELD IMAGING FUNCTION, OPEN THE MAG MAP PAGE AT TOP LEFT. UNSELECT "RUNNING" AND SELECT "IMPORT DATA". NAVIGATE TO THE DESIRED DATA FILE. SELECT THE DESIRED MAGNETIC FIELD DATA X, Y, Z OR THE TOTAL MAGNETIC FIELD. SELECT THE DESIRED COLOR COMBINATIONS AND THE MAPPING OF YOUR GRID SURVEY IS COMPLETE. YOU CAN TOUCH THE SCREEN AT ANY POINT TO RETRIEVE THE GPS COORDINATES OF THAT POINT. YOU CAN READ THE INTENSITY OF THE MAGNETIC FIELD BY COMPARING THE COLOR AT YOUR SELECTED POINT TO THE COLOR DENSITY SCALE SHOWN ON THE RIGHT-HAND SIDE OF THE MAP TO DETERMINE IF THE ANOMALY IS SIGNIFICANT. AT THE BOTTOM OF THE WEBSITE INTRODUCTION PAGE ARE DOWNLOADS FOR THE COMPLETE USER GUIDE AND A SCREEN-SHOT VERSION OF THE SOFTWARE GUIDE.



EZ MAG ULTRA GRID COVERAGE

THE ILLUSTRATION BELOW SHOWS A RECOMMENDED WALKING PATTERN THAT PROVIDES FOR THE BEST COVERAGE AND DEPENDABLE RESULTS IN A SEARCH AREA. THE SIZE OF THE SEARCH AREA IS BASICALLY UNLIMITED BUT, FOR EASE OF OPERATION, 100 FEET (30M) X 50 FEET (15M) IS PRACTICAL AND EASY TO COVER BY AN OPERATOR IN MOST CASES. TO ENSURE THE BEST RESULTS WITH AN ORDERLY AND COMPLETE COVERAGE OF THE GRID, VISIBLE FLAGS CAN BE PLACED APART AT THE END OF ALTERNATING SCAN LINES. FOR A LARGE OBJECT, SUCH AS A CAVE OR A LONG WIDE TUNNEL, LINE SPACINGS CAN BE ABOUT 10 FEET (3M) APART. FOR SMALL OBJECTS, SEARCH LINE SPACING SHOULD BE REDUCED TO ABOUT 3 FEET (1M) APART. THE OPERATOR WILL WALK IN A STRAIGHT LINE STARTING AT THE BEGINNING OF LINE 1 AND WALK TO THE FIRST FLAG WHERE THE OPERATOR WILL TAP "PAUSE" ON THE TABLET, STEP OVER ONE FLAG SPACING TO LINE UP WITH FLAG 2, TAP "RESUME" ON THE TABLET AND WALK IN THE OPPOSITE DIRECTION TO ARRIVE AT FLAG 2 AND "PAUSE". THE SAME BACK-AND-FORTH PROCEDURE IS FOLLOWED WITH "PAUSE" AND "RESUME" AT ENDS AND BEGINNING OF EACH WALKING LINE. FOR THE BEST RESULTS, WALK IN EAST AND WEST DIRECTIONS. THE ARROW AT THE FRONT OF THE EZ MAG ULTRA SHOULD ALWAYS POINT IN THE SAME DIRECTION (EITHER MAGNETIC EAST OR WEST) --- DO NOT ALTERNATE DIRECTIONS OF THE ARROW. WHEN FOLLOWING AN ORDERLY GRID OR MAINTAINING A CONSTANT DIRECTION IS DIFFICULT OR IMPRACTICAL, LESS CONSISTENT RESULTS CAN BE ACHIEVED BY "WANDERING AROUND" TO COVER THE DESIRED AREA AS WELL AS POSSIBLE.



EZ MAG ULTRA CAVE AND TUNNEL LOCATING

THE UNDISTURBED NATURAL GROUND EVERYWHERE ON EARTH HOLDS THE POSITION AND DIRECTION OF THE MAGNETIC FIELD AT THE TIME THE EARTH WAS FORMING. WHEN WIND AND/OR WATER OR HUMAN OR ANIMAL EXCAVATION OCCURS, SOME OF THE ORIGINAL MAGNETIC GROUND IS REMOVED AND THE MAGNETIC FIELD AT THAT SPOT IS WEAKENED. THE WEAKENED MAGNETIC FIELD AREA IS SHOWN BY EZ MAG ULTRA SOFTWARE IN SHADES OF BLUE. THE GPS POSITION OF ALL INFORMATION FROM EVERY SCAN IS SHOWN. THIS PROVIDES THE ABILITY TO RETURN TO THE EXACT SPOT AND/OR TO OVERLAY THE SCAN RESULTS ON GOOGLE EARTH OR OTHER SUCH MAPING PROGRAMS.



NORMAL UNDISTURBED MAGNETIC FIELD



EZ MAG ULTRA BURIED TREASURE LOCATING

NORMAL UNDISTURBED MAGNETIC FIELD

IN THE PROCESS OF DIGGING A HOLE AND BURYING ANYTHING (INCLUDING TREASURE), THE NATURAL CONDITION OF THE GROUND WILL BE DISTURBED AND THE MAGNETIC FIELD WILL BE WEAKENED. IN THE IMAGE BELOW, A SEPTIC FIELD (IN VARYING SHADES OF BLUE) IS CLEARLY SHOWN EVEN THOUGH THE FIELD WAS CUT INTO THE GROUND AND REFILLED MANY YEARS AGD. WHEN A HOLE IS REFILLED, THE ORIGINAL MAGNETIC SOIL IS REPLACED IN A TOTALLY RANDOM FASHION AND CANCELS OUT SOME OF THE NATURAL MAGNETIC FIELD STRENGTH AND APPEARS IN THE EZ MAG SOFTWARE IN VARYING SHADES OF BLUE. TO BE CLEAR AND NOT MAKE ANY UNREALISTIC CLAIMS, EZ MAG ULTRA CANNOT LOCATE TREASURE PER SE, BUT CAN QUICKLY IDENTIFY GROUND ANOMALIES OF SPOTS OF DISTURBED SOIL THAT SHOULD BE FURTHER INVESTIGATED.





EZ MAG ULTRA BURIED STEEL LOCATING

EVERY STEEL OBJECT HAS POSITIVE AND A NEGATIVE MAGNETIC END AS SHOWN IN THE ILLUSTRATION BELOW. THIS PROPERTY OF STEEL IS VERY USEFUL IN DETECTING AND LOCATING STEEL OBJECTS WITH THE EZ MAG ULTRA TRI-AXIAL EARTH MAGNETOMETER.



STEEL PIPE

BELOW, AN EZ MAG ULTRA SURVEY ALONG A RANCH ROAD SHOWS A DIPOLE ANOMALY VERY TYPICAL OF A STEEL CULVERT RUNNING UNDER THE ROAD WHEREBY THE POSITIVE AND NEGATIVE ENDS (DIPOLE ANOMALY) ARE CLEARLY SHOWN ALONG WITH THE GPS POSITIONING OF EACH END.



EZ MAG ULTRA MINING APPLICATIONS

PRECIOUS METALS

THERE ARE BASICALLY THREE TYPES OF "GOLD": LOW CONCENTRATION DISSEMINATED GOLD IN ORE, PLACER GOLD DEPOSITS AND SOLID GOLD SUCH AS THAT ASSOCIATED WITH TREASURE. THE EZ MAG ULTRA CAN FIND DISSEMINATED GOLD BY ITS ASSOCIATION WITH MINERALIZED ZONES WHICH ALSO CONTAIN MAGNETITE OR OTHER MAGNETIC MINERALS. PLACER GOLD IS THE TYPE FOUND IN BURIED STREAM CHANNELS SUCH AS THE GOLD WHICH SPARKED THE CALIFORNIA GOLD-RUSH IN 1849. GOLD DUST AND MAGNETIC MINERALS HAVE BEEN CONCENTRATED IN RIVERBANKS FOR THOUSANDS OF YEARS. WHERE THERE IS GOLD THERE IS NORMALLY MAGNETITE AND THEREFORE THE MAGNETOMETER CAN BE USED TO LOCATE PLACER GOLD DEPOSITS. GOLD TREASURE IS A DIFFERENT STORY AND BEING NON-MAGNETIC GOLD, SILVER, AND OTHER PRECIOUS MINERALS ARE NOT DIRECTLY DETECTABLE BY THE MAGNETOMETER BUT, IF THE METALS HAVE BEEN BURIED, THE EZ MAG ULTRA CAN DETECT THE DISTURBED SOIL RESULTING FROM THE BURIAL. THE EZ MAG ULTRA CAN ONLY DIRECTLY DETECT FERROUS (IRON OR STEEL) OBJECTS. IF THE GOLD IS STORED IN AN IRON BOX OR HAS IRON MATERIALS NEXT TO THE GOLD (SUCH AS COLONIAL SHIP BALLAST STONES IN THE MARINE ENVIRONMENT), THERE IS THE POSSIBILITY OF DETECTING THE IRON MATERIAL. THIS IS TRUE FOR LAND AND MARINE (SUNKEN GALLEON) GOLD BULLION. MOST TARGET SEARCH SURVEYS ARE PERFORMED ON A GRID IN A "LAWN MOWER" BACK AND FORTH MANNER TO COVER THE AREA OF INTEREST. LANE SPACING IS DEPENDENT ON TARGET SIZE (MAGNETIC MASS). THE EZ MAG ULTRA CAN DETECT LARGE-TONNAGE VMS (VOLCANIC MASSIVE SULFIDE) AND CU-NI-PGM (COPPER-NICKEL-PLATINUM GROUP METALS) ORE BODIES TO GREAT DEPTH BECAUSE OF THE ASSOCIATED FERROUS MATERIAL WITHIN THESE ORE BODIES.

DIAMONDS

GEOPHYSICAL METHODS ARE PARTICULARLY USEFUL IN AREAS WHERE DIRECT DETECTION OF KIMBERLITES IS CHALLENGING DUE TO SIGNIFICANT OVERBURDEN OR WEATHERING. THESE METHODS LEVERAGE PHYSICAL PROPERTY CONTRASTS BETWEEN KIMBERLITE BODIES AND THEIR SURROUNDING HOST ROCKS, ENABLING THE DETECTION OF SUBTLE ANOMALIES INDICATIVE OF POTENTIAL KIMBERLITE DEPOSITS. AIRBORNE AND GROUND SURVEYS, WITH THE **EZ MAG ULTRA** CAN ACQUIRE MAGNETIC FIELD DATA AND ANOMALIES OVER LARGE AREAS EFFICIENTLY. MAGNETIC SURVEYS DETECT VARIATIONS IN THE EARTH'S MAGNETIC FIELD CAUSED BY MAGNETIC MINERALS WITHIN KIMBERLITES, WHICH TYPICALLY EXHIBIT DISTINCT MAGNETIC SIGNATURES COMPARED TO SURROUNDING ROCKS.