HYDROTERRA TECHNOLOGIES, LLC
LAND SURVEY AND HYDROGRAPHIC SOLUTIONS

SURVEY PLAN METHODOLOGY REPORT

January 22, 2015

STATE OF LOUISIANA
COASTAL PROTECTION AND RESTORATION AUTHORITY (CPRA)

COLE'S BAYOU MARSH RESTORATION (TV-63)
AMENDMENT 2

VERMILION PARISH, LA

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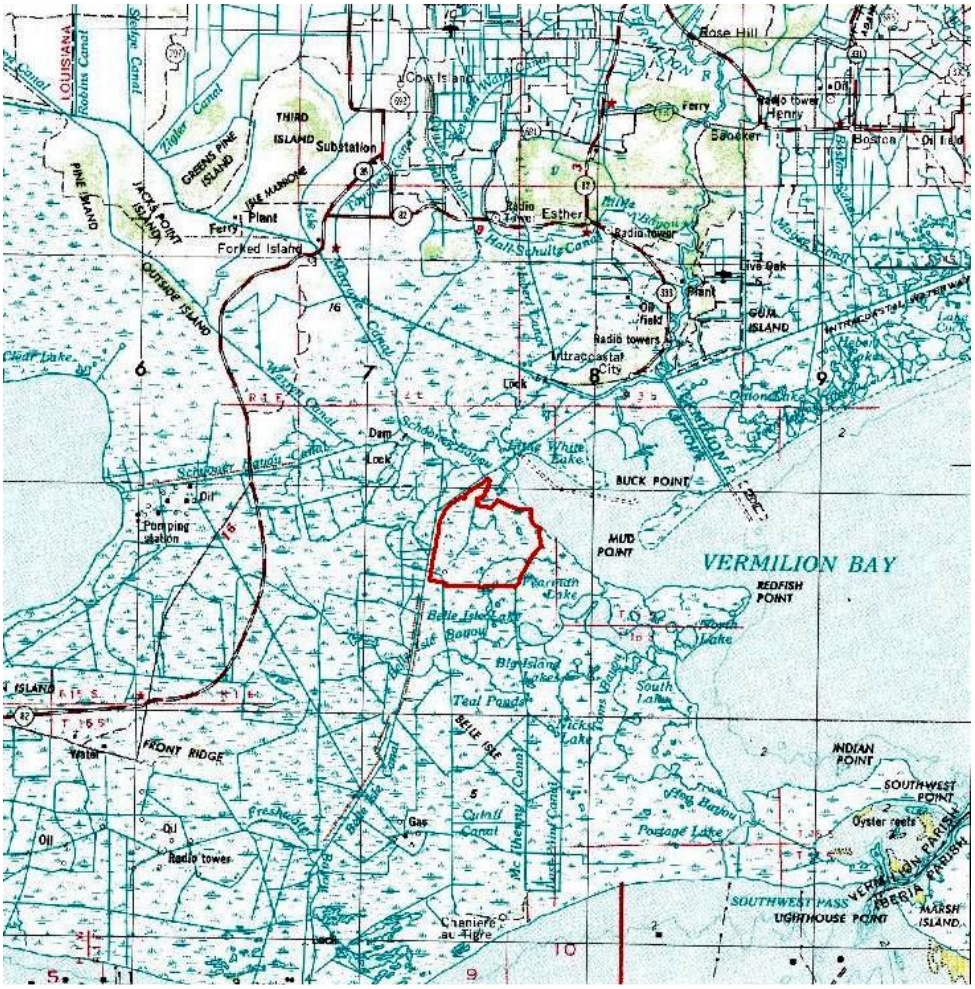
Section 1: General Project Description

Project Overview

The scope of this project was to perform topographic, bathymetric, and magnetometer surveys in the area of Cole's Bayou utilizing a combination of Real Time Kinematic GPS (RTK), electronic echo-sounding equipment and methodologies, and metal locators for the design purpose of creating and nourishing a determined amount of brackish marsh.

Vicinity Map



Note: Identified project survey areas are outlined in Red.

Section 2: Project Planning

Reference Systems and Project Control

Horizontal Datum (Epoch): NAD 83 (CORS) Louisiana South Zone (LA-1702) US feet.
Vertical Datum (Epoch): GPS derived NAVD 88 (GEOID12A – Epoch 2010.00) US feet.

All surveys performed were adjusted and calibrated to the specified secondary monuments listed in the specifications as "TV12-SM-01" and "CRMSTV-SM-06" (See Appendix A) using industry accepted RTK GPS equipment and methodologies as outlined in this document.

Preparation of Survey Transects

All survey transects described in the "Scope" were converted using AutoCAD Civil 3D© and HYPACK© to a digital format that is compatible with the surveyor(s) task-specific data collection equipment for the use of navigation and preparation.

Section 3: Equipment Access Route Survey (EA-1 thru EA-15)

Equipment

Equipment utilized during survey:

- One (1) Trimble GNSS R8 System (Including Receiver and Base)
- One (1) Odom MKIII Depth Sounder with Dual Frequency Transducer. (200khz/24kHz frequencies to be used during survey)
- One (1) YSI Cast Away CTD Probe (Velocimeter)
- One (1) Desktop Computer with Hypack© Navigation Software.
- One (1) Closed Cabin Survey Vessel.

The manufacturer's specification sheets for each item can be found in **Appendix B** at the end of this document.

Methodology

Survey Control

The survey began with the location and verification of the project secondary monuments TV12-SM-01 and CRMSTV-SM-06. Once the project monuments was located, visually inspected for integrity, and deemed undisturbed and suitable for use, a base receiver was then set on the monument.

Equipment Calibration for Bathymetric Surveys

Once the survey control was verified, the RTK system and the echo sounder transducer was hard mounted to the survey vessel using specially designed mounts welded to the hull on the bow or stern of the vessel.

The RTK antenna and transducer positional offsets were then measured and entered into the Hypack© Navigation Software for the tide and draft corrections to be applied (Fig. 1).

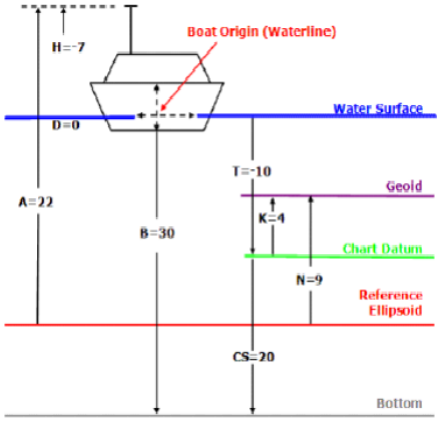


Fig. 1

A "Bar Check" of this system was then performed. A velocity probe was lowered into the water within the project site down to the sea floor to obtain velocities throughout the water column and determine an average. The average water velocity was then entered into the echo sounder and set. Then, a 2' x 2' stainless steel plate was lowered below the transducer at 5' increments down to the deepest survey depth to obtain the correct draft and index of the transducer and to calibrate the water velocities at each five foot increment. The "Bar Check" was recorded both on the thermal paper scroll on the echo sounder and electronically in the Odom E-chart Software.

Data Acquisition

Survey transects were provided digitally to the field surveyor for acquisition of data. Transects were spaced every 1000', as shown on the survey layout drawing provided by the client. In addition to the transects a profile line was surveyed along the centerline of the proposed route. Position, elevation, and water depth were recorded every 50' along each transect or where elevation changes of greater than 0.5' occur.

Section 4: Pipeline Corridor Surveys (Includes PL-1 to PL-11, PL-12, PL-18, PL-23 and PL-27)

Equipment

Equipment utilized during survey:

- One (1) Trimble GNSS R8 System (Including Receiver and Base)
- One (1) Odom MKIII Depth Sounder with Dual Frequency Transducer. (200khz/24kHz frequencies to be used during survey)
- One (1) YSI Cast Away CTD Probe (Velocimeter)
- One (1) Desktop Computer with Hypack© Navigation Software.
- One (1) Closed Cabin Survey Vessel
- One (1) Airboat
- One (1) Fixed Height Aluminum Rod (8' or 10' in length) with a 6" diameter metal plate as the base of the rod

The manufacturer's specification sheets for each item can be found in **Appendix B** at the end of this document.

Methodology

Survey Control

The survey began with the location and verification of the project secondary monuments TV12-SM-01 and CRMSTV-SM-06. Once the project monuments were located, visually inspected for integrity, and deemed undisturbed and suitable for use, a base receiver was then set on the monument.

Equipment Calibration for Bathymetric Surveys

Once the survey control was verified, the RTK system and the echo sounder transducer was hard mounted to the survey vessel using specially designed mounts welded to the hull on the bow or stern of the vessel.

The RTK antenna and transducer positional offsets were then measured and entered into the Hypack© Navigation Software for the tide and draft corrections to be applied (Fig. 1).

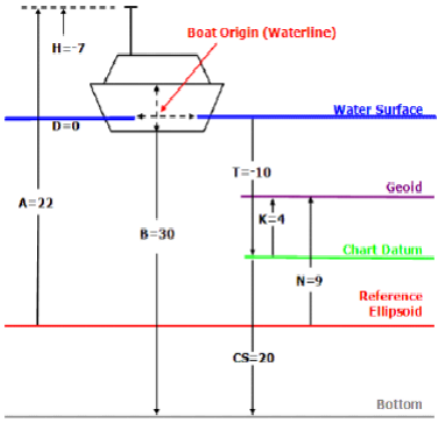


Fig. 1

A "Bar Check" of this system was then performed. A velocity probe was lowered into the water within the project site down to the sea floor to obtain velocities throughout the water column and determine an average. The average water velocity was then entered into the echo sounder and set. Then, a 2' x 2' stainless steel plate was lowered below the transducer at 5' increments down to the deepest survey depth to obtain the correct draft and index of the transducer and to calibrate the water velocities at each five foot increment. The "Bar Check" was recorded both on the thermal paper scroll on the echo sounder and electronically in the Odom E-chart Software.

Data Acquisition

Survey transects were provided digitally to field surveyor for acquisition of data. Transects were spaced every 1000', as shown on the survey layout drawing provided by the client. In addition to the transects a profile line was surveyed along the centerline of the proposed routes. Position, elevation, and water depth were recorded every 50' along each transect or where elevation changes of greater than 0.5' occur. Topographic and bathymetric survey methods were used as applicable to obtain all transects. The topographic portions of all transects was merge with the bathymetric portion of all transects at the land/water interface. The topographic and bathymetric portion of the surveys was separated by no more than 50'. Side shots, as necessary, were taken to pick up variations in topographic features (highs and lows) such as trenasses, meandering channels, broken marsh areas, or any other existing features such as utility lines, well heads, warning signs, and bridge openings which may affect project design implementation. The use of a Fixed Height Aluminum Rod (8' or 10' in length) with a 6" diameter metal plate as the base of the rod to prevent the rod from sinking was utilized to collect topographic data where the use of bathymetric equipment is of no use.

Section 5: Culvert Locations Survey

Equipment

Equipment utilized during survey:

- One (1) Trimble GNSS R8 System (Including Receiver and Base)
- One (1) Odom MKIII Depth Sounder with Dual Frequency Transducer (200khz/24kHz frequencies to be used during survey)
- One (1) YSI Cast Away CTD Probe (Velocimeter)
- One (1) Desktop Computer with Hypack© Navigation Software
- One (1) Closed Cabin Survey Vessel
- One (1) Airboat
- One (1) Fixed Height Aluminum Rod (8' or 10' in length) with a 6" diameter metal plate as the base of the rod.

The manufacturer's specification sheets for each item can be found in **Appendix B** at the end of this document.

Methodology

Survey Control

The survey began with the location and verification of the project secondary monuments TV12-SM-01 and CRMSTV-SM-06. Once the project monuments were located, visually inspected for integrity, and deemed undisturbed and suitable for use, a base receiver was then set on the monument.

Equipment Calibration for Bathymetric Surveys

Once the survey control was verified, the RTK system and the echo sounder transducer was hard mounted to the survey vessel using specially designed mounts welded to the hull on the bow or stern of the vessel.

The RTK antenna and transducer positional offsets were then measured and entered into the Hypack© Navigation Software for the tide and draft corrections to be applied (Fig. 1).

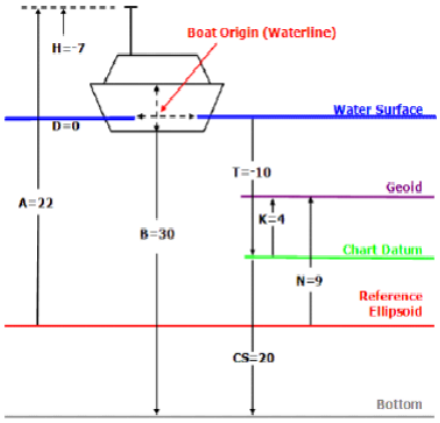


Fig. 1

A "Bar Check" of this system was then performed. A velocity probe was lowered into the water within the project site down to the sea floor to obtain velocities throughout the water column and determine an average. The average water velocity was then entered into the echo sounder and set. Then, a 2' x 2' stainless steel plate was lowered below the transducer at 5' increments down to the deepest survey depth to obtain the correct draft and index of the transducer and to calibrate the water velocities at each five foot increment. The "Bar Check" was recorded both on the thermal paper scroll on the echo sounder and electronically in the Odom E-chart Software.

Data Acquisition

Survey transects were provided digitally to field surveyor for acquisition of data. Dike Culverts had three (3) 400' long profiles with the center profile line positioned along the containment dike centerline and the two other profile lines offset 50' on either side of the centerline, and three (3) 200' long and perpendicular transects spaced at 100' intervals. Position, elevation, and water depth will be recorded every 25' along each transect or where elevation changes of greater than 0.5' occur.

Breach Culverts had three (3) 400' long profiles with the center profile line positioned along the centerline of the breach and the two other profile lines positioned on the outer banks of the breach, and three (3) 200' long and perpendicular transects spaced at 100' intervals. Position, elevation, and water depth will be recorded every 25' along each transect or where elevation changes of greater than 0.5' occur.

Topographic and bathymetric survey methods were used as applicable to obtain all transects. The topographic portions of all transects was merge with the bathymetric portion of all transects at the land/water interface. The use of a Fixed Height Aluminum Rod (8' or 10' in length) with a 6" diameter metal plate as the base of the rod to prevent the rod from sinking was utilized to collect topographic data where the use of bathymetric equipment is of no use.

Section 6: Borrow Area Survey

Equipment

Equipment planned to be utilized during survey:

- One (1) Trimble GNSS R8 System (Including Receiver and Base)
- One (1) Odom MKIII Depth Sounder with Dual Frequency Transducer (200khz/24kHz frequencies to be used during survey)
- One (1) YSI Cast Away CTD Probe (Velocimeter)
- One (1) Desktop Computer with Hypack© Navigation Software.
- One (1) Closed Cabin Survey Vessel

The manufacturer's specification sheets for each item can be found in **Appendix B** at the end of this document.

Methodology

Survey Control

The survey began with the location and verification of the project secondary monuments TV12-SM-01 and CRMSTV-SM-06. Once the project monuments were located, visually inspected for integrity, and deemed undisturbed and suitable for use, a base receiver was then set on the monument.

Equipment Calibration for Bathymetric Surveys

Once the survey control was verified, the RTK system and the echo sounder transducer were hard mounted to the survey vessel using specially designed mounts welded to the hull on the bow or stern of the vessel.

The RTK antenna and transducer positional offsets were than measured and entered into the Hypack© Navigation Software for the tide and draft corrections to be applied (Fig. 1).

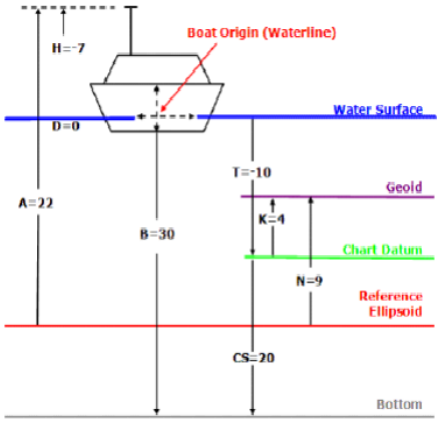


Fig. 1

A "Bar Check" of this system was then performed. First, the velocity probe will be lowered into the water within the project site down to the sea floor to obtain velocities throughout the water column and determine an average. The average water velocity will be entered into the echo sounder and set. Then, a 2' x 2' stainless steel plate will be lowered below the transducer at 5' increments down to the deepest survey depth to obtain the correct draft and index of the transducer and to calibrate the water velocities at each five foot increment. The "Bar Check" will be recorded both on the thermal paper scroll on the echo sounder and electronically in the Odom E-chart Software.

Bar checks will be performed twice a day, prior to commencement and upon completion of each days surveys.

Data Acquisition

HydroTerra performed a bathymetric survey for the borrow area in the form of parallel transects. Survey transects were spaced at approximately 250' and extended 50' beyond the boundary of the borrow area. The water surface elevation was recorded at a minimum of 3 times per day. Bathymetry was recorded every 50' along each transect. Additionally, HydroTerra identified any protruding structures above mean water level, or otherwise noted during the course of the work performed, within the limits of the project areas such as, but not limited to, wellheads, warning signs, crab traps, and abandoned boats or any object that may prevent or hinder dredging operations.

Section 7: Magnetometer Survey

Equipment

Equipment planned to be utilized during survey:

- One (1) Trimble GNSS R8 System (Including Receiver and Base)
- One (1) Desktop Computer with Hypack© Navigation Software.
- One (1) Closed Cabin Survey Vessel
- One (1) Geometrics G-882 Cesium Magnetometer
- One (1) Subsurface Instruments MUL-1 (Underwater Magnetic Locator)
- One (1) Airboat
- One (1) Probe Rod

The manufacturer's specification sheets for each item can be found in **Appendix B** at the end of this document.

Methodology

Survey Control

The survey began with the location and verification of the project secondary monuments TV12-SM-01 and CRMSTV-SM-06. Once the project monuments were located, visually inspected for integrity, and deemed undisturbed and suitable for use, a base receiver was then set on the monument.

Data Acquisition

The magnetometer utilized a Geometrics 882 cesium magnetometer, or equivalent. It has an accuracy, at a minimum, of 0.1 nanotesla (gammas) and a sensitivity of 0.01 gammas. It was equipped with a digital altimeter accurate to 0.1 meters and a pressure sensor and have a sampling range of 0.1 to 4 hertz (Hz). Magnetometer readings were correlated to a position with RTK GPS and take into account speed and position of the towfish relative to the vessel using the Hypack© Navigation Software package.

HydroTerra performed a magnetometer survey in the Equipment Access Route, Pipeline Corridor (PL-1 thru PL-11), the borrow area, and the possible pipeline that runs through the south west side of the borrow area to locate any pipelines or obstructions in the area. For each magnetic finding, HydroTerra run a closed loop path with the magnetometer. This path completely enclose the original finding location, while maintaining a distance of approximately 25' from that location. (A 25' radius or 25' x 25' rectangular path) HydroTerra determined the source (e.g., pipeline, well, etc.) of each finding. If a pipeline was detected, HydroTerra probed to the pipeline and determine the depth of cover and the elevation of the top of the pipeline.

Section 8: Data Processing

All bathymetric and magnetometer data was processed using the Hypack© 2014 Single Beam Editor software using the methodologies outlined in the project specifications document. Topographic data was processed using Trimble Geomatics Office (TGO) software. All processed data was then represented visually using an AutoCAD Civil 3D software version specified in the Scope for analysis.

Section 9: Deliverables

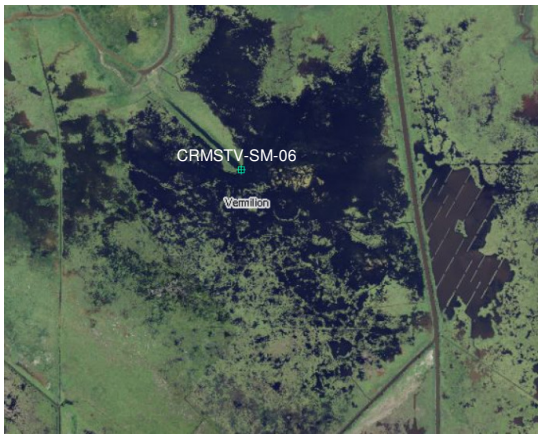
Three (3) copies of a report describing the survey methodology employed in the field, including but not limited to, control, any calibrations, equipment used, etc. The report contains the following:

- A set of half size (11" x 17") drawings including a plan view showing all survey lines run during the magnetometer survey.
- A DVD digital copy of the data sets (file listing is stored in a comma delimited ASCII format):
    1. Baselines, including all stations and P.I.'s
    2. Survey Transects and Profile Lines (by station number), including point number, northing, easting, elevation, and description.
    3. Magnetometer Survey Readings and Source Information with tracklines.
- A copy of the field notebook records.

The drawing files conform to the CPRA AutoCAD Standards and are in AutoCAD *.dwg format. The plan view(s) are overlaid in conformance with Section 4.11 of the Scope and overlaid with the Louisiana State Plane Coordinate System South Zone Grid and include a table with benchmark locations (in State Plane and Geographic coordinates) and elevations (NAVD88 Geoidl2A) on which the survey is based. Three digital copies of the following files (on separate disks):

- Complete survey report describing the survey methodology employed in the field
- Drawing files in AutoCAD 2011 (.dwg) or later format
- All data sets listed in Section 5.1 of the Scope (in .csv and .xls format)

APPENDIX A



VICINITY MAP

Station Name: CRMSTV-SM-06

Monument Location: From the Intracoastal City landing head SW for 1.48 miles to the intersection of Freshwater Bayou Canal, than continue SW along Freshwater Bayou Canal for 9.83 miles to the intersection of Belle Isle Bayou on the left, head east along Belle Isle Bayou for 2.4 miles to the MicKinely Camp. Follow boat trail for 0.88 miles to the monument.

Monument Description: Aluminum cap attached to a ¾" steel rod driven 40 feet to refusal with a 6" PVC sleeve and protective cover set in concrete and stamped CRMSTV-SM-06.

Stamping: CRMSTV-SM-06

Adjustment: Coordinates are derived from OPUS Solution

Monument Recovered and Resurveyed By: HydroTerra Technologies, LLC

NAD 83(2011)(EPOCH:2010.0000)

Latitude 29 39 48.20422
Longitude 92 13 10.59896

STATE PLANE COORDINATES SPC (1702 LA S)

Northing (Y) [US Feet] 424,171.317
Easting (X) [US Feet] 2,999,354.276

Adjusted NAVD Height (Geoid 12A)

EL HGT: -82.328(ft)
ORTHO HGT: 1.973(ft) [NAVD88 (Computed using GEOID12A)]

VICINITY MAP

Station Name: TV12-SM-01

Monument Location: The station is located north of Vermilion Bay in Vermilion Parish Louisiana set in North Buck Point Oil and Gas field south east of Freshwater Bayou.

Monument Description: Aluminum cap attached to a ¾" steel rod driven to refusal with a 6" PVC sleeve and protective cover set in concrete and stamped "BUCK POINT".

Stamping: BUCK POINT

Adjustment: Coordinates are derived from OPUS solution.

Monument Recovered and Resurveyed By: HydroTerra Technologies, LLC

NAD 83(2011)(EPOCH:2010.0000)

Latitude 29 45 13.19165
Longitude 92 12 6.07517

STATE PLANE COORDINATES SPC (1702 LA S)

Northing (Y) [US Feet] 456955.043
Easting (X) [US Feet] 3005295.314

Adjusted NAVD Height (Geoid 12A)
EL HGT: -83.317(ft)
ORTHO HGT: 1.919(ft) [NAVD88 (Computed using GEOID12A)]

APPENDIX B

NEW

The CastAway™-CTD

with profiling and analysis software

CastAway CTD

The CastAway-CTD
Instant, reliable data in the palm of your hand!

Pure Data for a Healthy Planet.®

The YSI CastAway-CTD is a lightweight, easy to use hydrographic instrument designed for quick and accurate conductivity, temperature, and depth profiles. Starting with a unique six-electrode array and a flow-through cell, the CastAway makes use of commercial Bluetooth and GPS technology to make an instrument that is as usable as it is accurate.

The palm-sized CastAway-CTD can easily be deployed by hand. Each cast is referenced with both time and location using its built-in GPS receiver. Latitude and longitude are acquired both before and after each profile. Plots of conductivity, temperature, salinity and sound speed versus depth can be viewed immediately on the CastAway's integrated color LCD screen in the field.

The CastAway is a multi-functional tool that incorporates the most modern technology available - yet is simple to use. It is designed for CTD profiling down to 100 m and is easy to deploy.

Raw data can be easily downloaded via Bluetooth to a Windows computer for detailed analysis and/or export at any time. Rugged, non-corrosive housing, AA battery power and tool-free operation reflect the technician-friendly pedigree of the CastAway-CTD. So do the simple, intuitive features – everything an operator needs to know about deploying the CastAway-CTD, viewing data and downloading the files fits in the lunchbox-sized carrying case.

Best used in:

- Coastal Oceanography
- Hydrology
- Aquaculture/Fisheries

When needed for:

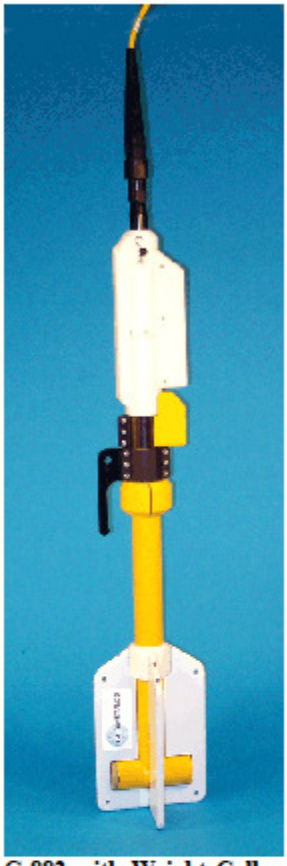
- Saltwater Intrusion
- Surveying/Hydrography
- Sound Velocity Profiles
- Field Sensor Verification
- Estuarine Research

- *GPS position, date and time*
- *Fast sampling and sensor response*
- *Waterproof interface works in and out of the water*
- *Bluetooth wireless communication*
- *No user calibration required*
- *No tools, computers or cables required!*

www.ysi.com/castaway

G-882 MARINE MAGNETOMETER

- ***CESIUM VAPOR HIGH PERFORMANCE – Highest detection range and probability of detecting all sized ferrous targets***
- ***NEW STREAMLINED DESIGN FOR TOW SAFETY – Low probability of fouling in lines or rocks***
- ***NEW QUICK CONVERSION FROM NOSE TOW TO CG TOW – Simply remove an aluminum locking pin, move tow point and reinsert. New built in easy carry handle!***
- ***NEW INTERNAL CM-221 COUNTER MODULE – Provides Flash Memory for storage of default parameters set by user***
- ***NEW ECHOSOUNDER / ALTIMETER OPTION***
- ***NEW DEPTH RATING – 4,000 psi !***
- ***HIGHEST SENSITIVITY IN THE INDUSTRY – 0.004 nT/√Hz RMS with the internal CM-221 Mini-Counter***
- ***EASY PORTABILITY & HANDLING – no winch required, single man operation, only 44 lbs with 200 ft cable (without weights)***
- ***COMBINE TWO SYSTEMS FOR INCREASED COVERAGE – Internal CM-221 Mini-Counter provides multi-sensor data concatenation allowing side by side coverage which maximizes detection of small targets and reduces noise***



G-882 with Weight Collar Depth Option & Altimeter

Very high resolution Cesium Vapor performance is now available in a low cost, small size system for professional surveys in shallow or deep water. High sensitivity and sample rates are maintained for all applications. The well proven Cesium sensor is combined with a unique and new CM-221 Larmor counter and ruggedly packaged for small or large boat operation. Use your computer and standard printer with our MagLogLite™ software to log, display and print GPS position and magnetic field data. The G–882 is the lowest priced high performance full range marine magnetometer system ever offered.

The G-882 offers flexibility for operation from small boat, shallow water surveys as well as deep tow applications (4,000 psi rating, telemetry over steel coax available to 10Km). The G-882 also directly interfaces to all major Side Scan manufacturers for tandem tow configurations. Being small and lightweight (44 lbs net, without weights) it is easily deployed and operated by one person. But add several streamlined weight collars and the system can quickly weigh more than 100 lbs. for deep tow applications. Power may be supplied from a 24 to 30 VDC battery power or the included 110/220 VAC power supply. The tow cable employs high strength Kevlar strain member with a standard length of 200 ft (61 m) and optional cable length up to 500m with no telemetry required.
A rugged fiber-wound fiberglass housing is designed for operation is all parts of the world allowing sensor rotation for work in equatorial regions. The shipboard end of the tow cable is attached to an included junction box or optional on-board cable for quick and simple hookup to power and output of data into any Windows 98, ME, NT, 2000 or XP computer equipped with RS-232 serial ports.

The G-882 Cesium magnetometer provides the same operating sensitivity and sample rates as the larger deep tow model G-880. MagLogLite™ Logging Software is offered with each magnetometer and allows recording and display of data and position with Automatic Anomaly Detection and automatic anomaly printing on Windows™ printer! Additional options include: MagMap2000 plotting and contouring software and post acquisition processing software MagPick™ (free from our website.)

ECHOTRAC™ MKIII

MODEL DF3200

- Interchangeable paper chart or color LCD
- Frequency agile (both channels)
- Internal data storage and playback with color LCD
- Four serial ports and Ethernet interface
- Optional built-in DGPS
- AC/DC power input

TELEDYNE
ODOM HYDROGRAPHIC
A Teledyne Technologies Company

TRIMBLE R8 GNSS SYSTEM

KEY FEATURES

Advanced satellite tracking with Trimble 360 receiver technology

Includes Trimble Maxwell 6 chips with 440 channels

Unmatched GNSS tracking performance

Web user interface and remote configuration

Base and rover communications options to suit any application

THE INDUSTRY LEADING TOTAL GNSS SOLUTION

The Trimble® R8 GNSS system has long set the bar for advanced GNSS surveying systems. Through advanced Trimble 360 tracking technology and a comprehensive set of communication options integrated into a flexible system design, this integrated GNSS system delivers industry-leading performance. For surveyors facing demanding RTK applications, the Trimble R8 is an invaluable GNSS partner.

TRIMBLE 360 RECEIVER TECHNOLOGY

Future-proof your investment

Powerful Trimble 360 receiver technology integrated in the Trimble R8 supports signals from all existing and planned GNSS constellations and augmentation systems providing unmatched GNSS tracking performance. With this leading-edge technology, it is now possible for surveyors to expand the reach of their GNSS rovers into areas that were previously too obscured, such as under trees and in dense urban areas.

With two integrated Trimble Maxwell™ 6 chips, the Trimble R8 offers an unparalleled 440 GNSS channels. Also capable of tracking carrier signals from a wide range of satellite systems, including GPS, GLONASS, Galileo, BeiDou (COMPASS), and QZSS, the Trimble R8 provides a robust solution for surveyors.

The CMRx communications protocol in the Trimble R8 provides unprecedented correction compression for optimized bandwidth and full utilization all of the satellites in view, giving you the most reliable positioning performance.

Designed with the future in mind, Trimble 360 technology is optimized to receive future planned signals as the number of available satellites continues to grow. With Trimble 360 technology, the Trimble R8 delivers business confidence with a sound GNSS investment for today and long into the future.

FLEXIBLE SYSTEM DESIGN

The Trimble R8 combines the most comprehensive feature set into an integrated and flexible system design for demanding surveying applications. Connect directly to the controller, receive RTK network corrections, and connect to the Internet via comprehensive communication options. With a built-in transmit/receive UHF radio, the Trimble R8 enables ultimate flexibility for rover or base operation. As a base station, the internal NTRIP caster provides you customized access[1] to base station corrections via the Internet.

Trimble's exclusive Web UI™ eliminates travel requirements for routine monitoring of base station receivers. Now you can assess the health and status of base receivers and perform remote configurations from the office. Likewise, you can download post-processing data through Web UI and save additional trips out to the field.

AN INDUSTRY LEADING FIELD SOLUTION

If you're seeking the industry leading field solution, pair the Trimble R8 GNSS receiver with one of our powerful Trimble controllers, such as the Trimble TSC3, Trimble CU or Trimble Tablet Rugged PC featuring Trimble Access™ field software. These rugged controllers bring the power of the office to the field through an intuitive Windows-based interface.

Trimble Access field software offers numerous features and capabilities to streamline the flow of everyday surveying work. Streamlined workflows such as Roads, Monitoring, Mines, and Tunnels—guide crews through common project types and allows crews to get the job done faster with less distractions. Survey companies can also implement their unique workflows by taking advantage of the customization capabilities available in the Trimble Access Software Development Kit (SDK).

Need to get data back to the office immediately? Benefit from real-time data sharing via Trimble Access Services, now available with any valid Trimble Access maintenance agreement.

Back in the office, seamlessly transfer your field data using Trimble Business Center. Edit, process, and adjust collected data with confidence.

The Trimble R8 GNSS system—the industry leader for GNSS surveying applications.

1 Cellular modem required.

Trimble

DATASHEET

TRIMBLE R8 GNSS VRS ROVER

KEY FEATURES

Proven GNSS technology from Trimble

Internal GSM/GPRS modem for fast Internet connection and data transfer

Lightweight, ergonomic, and cable free

Designed to optimally support the Trimble GNSS infrastructure solution

The Trimble® R8 GNSS VRS™ Rover is a multi-channel, multi-frequency GNSS (Global Navigation Satellite System) receiver, antenna, and data-link radio combined in one compact unit. The VRS rover combines advanced receiver technology with a proven system design to provide maximum accuracy and productivity.

TRIMBLE R-TRACK TECHNOLOGY FOR COMPREHENSIVE GNSS SUPPORT

Powered by an enhanced RTK engine, Trimble R-Track™ technology in the Trimble R8 GNSS VRS Rover supports the modernized GPS L2C and L5 signals as well as GLONASS L1/L2 signals. This extensive GNSS support is capable of providing surveying professionals with real field benefits.

With the world's GNSS' in constant development, surveying businesses small and large can be confident that investment in a Trimble GNSS system is protected. Trimble, already proven in GPS technology, will continue to lead the industry in GNSS support.

PROVEN SYSTEM DESIGN

From its powerful Trimble field software and controller to the receiver itself, the Trimble R8 GNSS VRS Rover's overall design has been tried, tested, and proven. It's rugged, lightweight and cable free for unsurpassed ergonomics and productivity in the field. Additionally, the Trimble R8 GNSS VRS rover consumes very little power and includes internal memory. These features also assist you in the field, enabling you to work longer without changing batteries or transferring data.

The Trimble R8 GNSS VRS Rover works optimally with Trimble controllers such as the Trimble CU or Trimble® TSC2® controller. Both controllers run industry-standard Microsoft® Windows™ operating systems, which are familiar and easy to use. They are also flexible for running both Trimble field software and other specialized applications.

The VRS rover includes an internal GSM/GPRS cell modem for wireless connection to the Internet via NTRIP (Networked Transport of RTCM via Internet Protocol). Quickly and easily access GNSS data from a Trimble GNSS infrastructure solution over the Internet. No additional cellphone or external modem is required.

AN IMPORTANT COMPONENT OF A TRIMBLE GNSS INFRASTRUCTURE SOLUTION

Trimble® GNSS Infrastructure is the most established and widely used GNSS infrastructure solution available. Additionally, all components of Trimble GNSS infrastructure—including the Trimble R8 GNSS VRS Rover—are designed to work together. This means the solution is scalable; that is, it will grow with you as your business needs change. And the solution is part of Trimble's Connected Site model, where products, techniques, services, and relationships combine to take your business to all-new levels of achievement.

With numerous fully modeled networks all over the world and dedicated GNSS infrastructure engineers on hand to support your unique needs, Trimble GNSS infrastructure solutions are always a wise investment. Surveying professionals like you can rely on Trimble's experience and expertise in this field, and be confident that choosing a Trimble GNSS infrastructure solution is the right decision.

Trimble

Information:
Used in the Survey and Diving industries, this durable detector locates metal immersed in 1,000+ feet of water. Primary application is locating pipelines.

Manufacturer Name :

Subsurface Instruments Inc.

Equipment Name:

MUL-1 (Magnetic Underwater Locator)

Specifics of Equipment:

Dimensions:	Electronics:	16.9 in x 10i n x 6.5 in 42.9 cm x 25.4 cm x 16.5 cm
	Sensor:	1.625 in x 34.375 in 4.13 cm x 87.3 cm
Depth Rating:	1000 ft / 0.3 kg	

Per the Manufacturer:

* Whether you're searching for metal immersed 10 feet or 1,000 feet in water, the MUL is for ideal. No other underwater locator can go to the depths the MUL does, due to it's advanced technology. Sensors are housed inside machined titanium for superior durability and strength to depths of 1,000 ft / 0.3 kg.
* Heavy-duty sensor cable acts as a lanyard. 30 ft, 50 ft, 100 ft / 9.1 m, 15.2 m
* High-quality connectors and "toilet seat" cover over headset jack. "Seacon" connectors available.
* "Zero to null" gradient
* Bull-nose and tapered sensor on BHG; longer sensor on MUL for diver or boat towing.

Accompanying Accessories:

N/A

Optional Accessories :

Ask sales representative for further details and cost.

Ski Buoys