China Geophysical

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China Geophysical

Vibrator | Node | Cable

China Factory

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www.zfgeo.com

COMPANY INTRODUCTION

Established in 2001, Zhaofeng Sensor Equipment Co., Ltd. has been committed to manufacturing high-quality geophones, seismic cables, and accessories for branded seismic instruments, supporting oil & gas, mineral, and geotechnical exploration activities.

Since 2017, Zhaofeng has expanded its business scope by establishing a node design center and a vibrator factory, offering a full range of seismic survey equipment. To further meet client requirements, we also supply spare parts for USA and France branded vibrators, ensuring reliable performance and efficient operations in seismic surveys.

Our traditional products have been tested and verified in 65 countries, including Kazakhstan, Germany, Algeria, Russia, Indonesia, Pakistan, India, Brazil, and Mexico, with even broader adoption across numerous cities. We are now implementing innovative marketing strategies to introduce our Node and Vibrator products to more clients worldwide.

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Node YOUNG

RINO-30

Vibrating System

Peak force	276 kN (62,000 lbf)
Hold down weight (max)	280 kN（64,100 lbf）
Frequency limits	1 Hz to 250 Hz, full drive 4.3 Hz
Lift stroke	160 mm (6.3 in)
Mass weight	5,320 kg (11,700 lb)
Baseplate weight	1,880 kg (4,140 lbs)
Servo valve	Atlas 240H
Pilot	MOOG 760C928A
Mass centering method	Air spring (2)

Hydraulic System

Vibrating pump	145cc (2)	
Pump drive	125cc (2)	
Motor drive	280cc (2)	
Accumulator	System 13 L, 2; Mass 1 L, 2	
Reservoir	350 L	
Oil filter	H.P. filter	5 μ
	L.P. filter	5 μ
	Servo filter	3 μ
	Suction filter	20 μ

Chassis

Chassis	Articulated, hydraulic drive chassis
Drving model	4X4
Steering	Hydraulic
Wheel base	5,250 mm
Tire	Standard 66X43-25, "human character" pattern Optional 66X44-25, "Water Wave" pattern
Turning radius	11,000 mm
Front axle load	15,200 kg
Rear axle load	16,800 kg
Horizontal swing angle	±15 °
Max gradability	60%(30 °)
Pump drive	Two-Pump
Speed	23 km/h

Engine

Mode	Cummins，QSX15
Type	Inline 6-cylinder, supercharged water-cooled diesel engine
Rated power	450 BHP / 2100 rpm
Working speed	1850 rpm
Diesel tank	1000 L

Eletricity

Vehicle system	24 V
Electronic system	12 V
Illumination	Front headlights, rear lamps, turning lights, working lights, parking brake lights, emergency alarm lights, lighting lights on the front and rear lights, interior lights in the cab

Cabin

Metal structure, double door, air conditioning, warm air, air spring shock reduction main auxiliary seat, three -point seat belt, LCD panel

Dimension

Length* width*height	10,000mm*3,350mm*3,500mm
Vibrator weight	32,000 kg
Body color	White

RINO-26

Vibrating System

Peak force	276 kN (62,000 lbf)
Hold down weight (max)	280 kN (64,100 lbf)
Frequency limits	1 Hz to 250 Hz, full drive 4.5 Hz
Lift stroke	152.4 mm (6 in)
Mass weight	5,250 kg (11,575 lb)
Baseplate weight	1,665 kg (3,670 lbs)
Servo valve	Pilot MOOG 760C928A Atlas 240H
Mass displacement	4000 HR
Lifting cylinder	Diameter 100 mm, stroke 850 mm
Mass centering method	Air spring (2)

Hydraulic System

Vibrating pump	290cc
Pump drive	Two unit, front & gear
Motor drive	Two unit, front & gear
Accumulator	25 L
Reservoir	350 L
Oil filter	H.P. filter 5 μ L.P. filter 5 μ Servo filter 3 μ Suction filter 25 μ Drive pump filter 10 μ

Chassis

Chassis	Articulated, hydraulic drive chassis
Drving model	4X4
Steering	Hydraulic
Wheel base	4,800 mm
Tire	Standard 66X43-25, "human character" pattern, 24 floors Optional 66X44-25, "Water Wave" pattern, 24 floors
Turning radius	＜12 mm
Front axle load	15,250 kg
Rear axle load	14,850 kg
Horizontal swing angle	±15 °
Max gradability	60%
Pump drive	3 pump
Speed	4-25 km/h

Engine

Mode	Cummins，QSX15
Type	Inline 6-cylinder, supercharged water-cooled diesel engine
Rated power	450 BHP / 2100 rpm
Working speed	1800 rpm
Diesel tank	900 L

Eletricity

Vehicle system	24 V
Electronic system	12 V
Illumination	Front headlights, rear lamps, turning lights, working lights, parking brake lights, emergency alarm lights, lighting lights on the front and rear lights, interior lights in the cab

Cabin

Metal structure, double door, air conditioning, warm air, air spring shock reduction main auxiliary seat, three -point seat belt, LCD panel

Pneumatic system

System pressure	8 bar

Dimension

Length* width*height	10,500mm*3,350mm*3,600mm
Vibrator weight	32,000 kg
Body color	White
Working temperature	-50°C to 50°C

Optional Item

Hydraulic winch	100 kN
-40ºC extreme cold area work heating and insulation device	Fuel heating device, hot air system, oil preheating, cold-proof shed
Track	Rubber triangle track (4)

RINO-15

Vibrator Characteristic

The high-strength, low-center-of-gravity carrier chassis adapts to work under various complex surface conditions. Cabin with wide view and low noise, provides comfortable and safe operating environment for operator. Higher-precision signal can be motivated with mechanical prestressed piston rod loading and precise vibration guidance of the double-column hammer body. Power system with low noise and radiation is suitable for operation in urban, villages and special areas. It can integrate VE464, F3, HD and other vibrator control systems to provide better operation control, synchronization accuracy, quality control and low distortion output. 4X4 articulated & hydraulic drive chassis to make vibrator more maneuverable and flexible.

Vibrating System

Peak force	P wave, 147 kN (33,070 lbf)
Hold down weight	150 kN (33,740 lbf)
Limits frequency	1 to 250 Hz (200H)/1-500 Hz (60FC)
Mass weight	2,000 kg (4,400 lb)
Baseplate weight	725 kg (1,600 lb)
Mass stroke	12.7 cm (5 in)
Servo valve	Atlas 200H, 60FC
Pilot valve	Moog 760C928A

Hydraulic System

Vibrating pump	119 cc
Accumulator	System 10 L, 1 HP, 1 LP Hammer 1 L, 1 HP, 1 LP
Oil filter	H.P. filte 3 μ, L.P. filter 3 μ Suction filter 20 μ, Servo filter 10 μ
Hydraulic tank	250 L, integrated oil suction filter, servo filter, respirator, observer, etc.
Operating pressure	H.P., 220 bar (3200 Psi) L.P., 16 bar (230 Psi)
Cooling method	Low pressure oil return type oil return cooling
Hydraulic line	ETN

Chassis

Chassis	Articulated, hydraulic drive chassis
Drving model	4X4
Front axle oscillating angle	±16 °
Minimum turning diameter	16 m
Max gradability	60% (28 °)
Drive axle	Rigid axle, hydraulic wet service brake and parking brake
Three pump boxes	Triple pump boxes, high elastic coupling
Pump drive	1 front drive and 1 rear drive
Motor drive	1 front drive and 1 rear drive
Tire	460/70R24 herringbone pattern
Wheelbase	3,600 mm
Load front axle	7,200 kg (15,870 lb)
Load rear axle	8,300 kg (18,300 lb)
Driving speed	4-25 km/h (gear 5)

Engine

Mode	PERKINS,1106D-E70TA
Emission	Europe, America and China Phase III
Type	Electronically controlled high-pressure common rail, in-line 6-cylinder, 4-stroke upercharged water-cooled
Displacement	7.01 L
Rated power	151 KW/2200 rpm
Max torque	922 N.m/1400 rpm
Generator	24 V / 85 A
Air pump	225 cc, 8 bar
Diesel tank	500 L

Cabin

Metal sheet metal structure, noise reduction and thermal insulation interior, air damping main and auxiliary seats, air conditioning

Eletricity

System control	CAN bus control, digital sensor, 12" LCD display
Illumination	24 V, headlights, taillights, work lights
Electronic system	12 V

Dimension

Length* width* height	7350*2400*2800 mm
Vibrator weight	15,500 kg (34,170 lb)

RINO MINI

Jungle/City Area

Technical specification for actuator:

Peak force	19.6 kN(4400lbf)
Mass piston area	about 12 sqrt.cm
Mass weight	about 400kg
Mass stroke	about 15.2cm
Baseplate weight	about 300kg
Baseplate area	about 5000 sqrt.cm
Frequency	1 to 120Hz*
***MD frequency**	3.5Hz 75% output
Servo valve	Atlas 60FC+Moog 760

Hydraulic system:

Vibrator pump flow	about 84L/min
System pressure	3000psi
Filtration	3-micron absolute servo filter
Accumulator	2X10L for HP and LP
Hold-down weight	5000lb

Power unit:

Engine	YANMAR 47.8kW, 224N.m/ 1600rpm (or CUMMINS)

Chassis:

Fuel capacity	110L
Drive pump	Sauer-Danfossr
Drive motors	2X
Drive type	controller w/o cable

Tire:

28×9-15 & 6.5-10

Servo Valve:

Flow rate 60 gallons per minute

Physical specifications:

Dimension(mm)	2000*1500*1760
Max. speed	4.4km/h (can be more quick, need client confirm how far it will be required)
Gradeability	≥20°
GVW	about 4000kg

Control and Navigation System

- Real time QC for each sweep
- Time and distance calibration for mass vibrators' operation
- Centimeter location monitoring
- Abnormal sweep notification and automatic sweep replenishment
- Monitor TB and sweep signal status

- Visual-assist guiding and sweeping
- Single vibrator, vibrator fleet and mass vibrator fleet operation mode
- Remote task dispatch and real-time QCmonitor ability
- Highly integration and less size
- Industrial design with shockproof, dust-proof and wide temperature environment
- Easy to install and maintenance.

- Remote task schedule and progress feedback
- Auto-nearest source point and design route guiding mode
- Centimeter source point guiding and direction guiding
- Dynamic available source point analyzing
- Provide all kinds of map layers
- Provide map browsing and guiding viewports
- Real-time source point task feedback
- Provide single vibrator, single vibrator fleet and mass-vibrator fleet operation mode
- Provide forbidden zone entrance alarming
- Provide unsafe distance alarm with other vibrator
- Provide emergency event broadcasting ability

ZF-915S

Protect land is one of the features of this device, and it was designed with internationally advanced high-speed rubber track, which can greatly improve the pass ability and traction capacity for large vehicles under soft, muddy soil, and snow conditions.

Characteristics

Easy installation, smooth walking, flexible steering and strong passability.

Technical Parameters

Length*width*height (mm)	2891*1313*1733	**Track pitch (mm)**	152.4
Weight (kg)	2*2788	**Track width (mm)**	915
Supporting power (kw)	≥220	**Grounding area (m²)**	2*2.1
Number of track sections	45	**Outer diameter of drive wheel (mm)**	1080

GEOPHONE

Specifications of Geophone Element

Type	ZF-4.5HS	ZF-5	ZF-24HP	ZF-32CT	ZF-10	ZF-20DX-10Hz
Natural frequency (Hz)	4.5 ±7.5%	5 ±7.5%	10 ±2.5%	10 ±2.5%	10 ±2.5%	10 ±5%
Coil resistance (Ω)	2500 ±5%	1850 ±5%	375 ±2.5%	395 ±2.5%	350 ±3.5%	395 ±5%
Resistance with shunt 1KΩ resistor (Ω)	/	/	273 ±2.5%	283 ±2.5%	/	283 ±5%
Sensitivity(V/m/s)	100 ±5%	80 ±5%	28.8 ±2.5%	27.5 ±2.5%	22.8 ±2.5%	28 ±5%
Sensitivity with shunt 1KΩ resistor （V/m/s）	/	/	20.9 ±2.5%	19.7 ±2.5%	/	20.1 ±5%
Open damping	0.52 ±7.5%	0.6 ±7.5%	0.25	0.316	0.68 ±5%	0.3
Damping with shunt 1kΩ resistor	/	/	0.686(+0%/+5%)	0.698 ±2.5%	/	0.707 ±5%
Distortion(@12Hz&0.7 in/s)	≤0.1%	≤0.1%	≤0.1%	≤0.1%	≤0.075%	≤0.2%
Typical spurious frequency (Hz)	≥160	≥240	≥240Hz	≥250Hz	≥240	≥200
Moving mass(g)	24	22.7	11	11.2	8.4	11
Coil travel peak-peak (mm)	3	3	2	1.5	1.78	1.5
Length(mm)	41.7	41.7	33.3	33.3	27.4	33.5
Diameter (mm)	30.2	27.4	25.4	25.4	30.15	25.4
Weight (g)	139	136	87	89	83	87
Storage temperature (°C)	-40 to +80	-40 to +80	-40 to +100	-40 to +80	-40 to +100	-40 to +80
Limited warranty period (year)	3	3	3	3	3	3

Note:
Except where otherwise noted all electromechanical specifications are valid at 22°C and from 0 to 10 degree tilt.

Specifications of Geophone Element

Type	ZF-2	ZF-4.5	ZF-One	ZF-14	ZF-28	ZF-60HS	ZF-100
Natural frequency (Hz)	2 ±15%	4.5±10%	10 ±3.5%	14±5%	28±5%	60±5%	100±5%
Coil resistance (Ω)	5800 ±5%	375 ±5%	1800 ±3.5%	395 ±5%	395 ±5%	2800 ±5%	570 ±5%
Resistance with shunt 1KΩ resistor (Ω)	/	/	/	283±5%	283±5%	/	/
Sensitivity(V/m/s)	200 ±10%	28.8±7.5%	85.8 ±3.5%	28±2.5%	39±5%	80±5%	23±5%
Sensitivity with shunt 1kΩ resistor (V/m/s)	/	/	/	20.1±5%	28±5%	/	/
Open damping	0.6 ±20%	0.56±10%	0.51 ±7.5%	0.22	0.22	0.55 ±7.5%	0.38±7.5%
Damping with shunt 1kΩ resistor	/	/	/	0.51±5%	0.552±5%	/	/
Distortion(@12Hz&0.7 in/s)	≤0.2%	≤0.2%	≤0.1%	≤0.2%(@14Hz &0.7 in/s)	≤0.2%(@28Hz &0.7 in/s)	≤0.2%(@60Hz &0.7 in/s)	≤0.2%(@100Hz &0.7 in/s)
Typical spurious frequency (Hz)	≥160	≥200Hz	≥240	≥250Hz	≥350Hz	≥500Hz	≥600Hz
Moving mass(g)	60	11.1	14	11	11	15	5
Coil travel peak-peak (mm)	3	4	2.54	1.5	1.5	1	1.5
Length(mm)	47.5	37.3	40	33.5	33.5	41.7	33.3
Diameter (mm)	41.2	25.4	30.2	25.4	27	30.2	27
Weight (g)	267	92	146	87	95	123	93
Storage temperature (°C)	-40 to +80	-40 to +80	-40 to +80	-40 to +80	-40 to +80	-40 to +80	-40 to +80
Limited warranty period (year)	1	2	3	3	3	3	2

Note:
Except where otherwise noted all electromechanical specifications are valid at 22°C and from 0 to 10 degree tilt.

SEISMIC CABLE

Seismic Cable for 428XL

Seismic Cable for 508XT

Type	Seismic Cable for 428XL		Seismic Cable for 508XT
	ST+	WPSR	
Type of field	Dry	Wet	Rain
Tensile strength with connector (N)	700	2500	1500
Conductor type	Stranded	Stranded	Standard
Water blocked	No	Yes	Yes
Stress braid	Kevlar	Kevlar	Kevlar
Double jacket	No	Yes	No
Stress braid	No	Yes	/
Anchoring device	No	Yes	/
Max. operational depth (m)	Rainy	15	5
Outside diameter (mm)	6.5	9.5	6.0
Weight (kg/km)	47	95	43
Operating temperature range (°C)	-45 to +70	-45 to +70	-40 to +70
Storage temperature range (°C)	-45 to +70	-55 to +85	-40 to +70

ZF-25-11A/14A Hydrophone

Type	ZF-25-11A	ZF-25-14A
Electromechanical specification		
Natural frequency(Hz)	10 ± 15%	10 ± 15%
D.C.resistance (Ohms)	160 ± 15%	160 ± 15%
Sensitivity(v/bar)	11 ± 1.5dB	14 ± 1.5dB
Max. working depth (m)	100	100
Operating temperature (℃)	0 to 35	0 to 35
Physical Specifications		
Unite length (mm)	133	133
Unite length with case (mm)	160	160
Unite diameter (mm)	53	53
Unite diameter with case (mm)	64	64
Weight(kg)	0.61	0.61
Lead in length	Under clients' request	Under clients' request

Limited warranty period: 1 yealWarranty excludes damage caused by high-voltage or physicato damage the element case.

ZF-Downhole Hydrophone Array

Only 40 mm (1.3 in) diameter - Fits in any borehole.
Channels: 12, 24, 48 (other counts available).
Hydrophone interval: 1 to 5 m (3 to 15 ft) standard (other intervals available).
Connector: To any seismograph.
Operational depth: Up to 150 m.
Light weight: 24 hydrophones spaced at 1 m with 120 m lead-in weighs about 34 kg.

HYDROPHONE

Sensor type: Proprietary Polymer.
Sensors per group: One.
Frequency response: 1Hz to 10000Hz±1.0db
Preamplifier Type: low noise differential.
Operational depth: up to 500 m.

CABLE

Type: Multi-conductor with polyurethane jacket.
Strength member: Kevlar center core.
Outside diameter: 10.5 mm (0.41 in).
Weight
12 channels: 0.10 kg/m (0.07 lb/ft).
24 channels: 0.12 kg/m (0.08 lb/ft).
Bend radius: ≥8.4 cm (3.3 in).

ACTIVE SECTION

Channels: 12, 24 or 48 standard; other counts available.
Group Interval: 1 to 5 m (3 to 15 ft) standard; other intervals available.
Outside diameter (hydrophone): 40 mm (1.3 in).
Length (hydrophone): 21 cm (8.27 in).
Weight (hydrophone): 0.6 kg (1.32 lb).

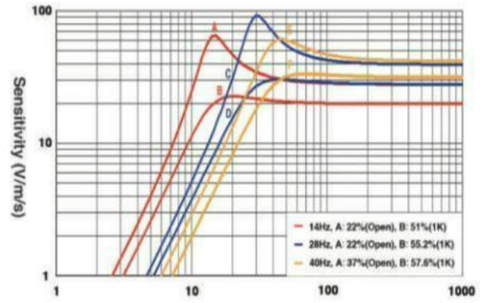
TEMPERATURE

Operating range: -10˚C to +70˚C (+14ºF to +158°F).
Storage range:-40˚C to +70˚C (-40˚F to + 158˚F).

ZF-Downhole Geophone String

Frequency: 14Hz, 28Hz, 40Hz (others on request)
Number of geophones: 12, 24, 48 (others on request)
Borehole diameter: Min. 60 mm

Geophone interval: 1 m (others on request)
Connector: To any seismograph
Operational depth: Up to 100 m



Type	14Hz	28Hz	40Hz
Natural frequency (Hz)	14 ± 5%	28 ± 5%	40 ± 5%
Coil resistance(Ω)	395 ± 5%	395 ± 5%	575 ± 5%
Open Circuit Sensitivity (V/m/s)	28	39	42
Sensitivity with Shunt 1K Resistor (V/m/s)	20.1 ± 5%	28 ± 5%	30.4 ± 5%
Open Circuit Damping	0.22	0.22	0.37
Damping with Shunt 1K Resistor (V/m/s)	0.51 ± 5%	0.552 ± 5%	0.576 ± 10%
Distortion	≤ 0.2%	≤ 0.2%	≤ 0.2%
Spurious Frequency (Hz)	≥ 250	≥ 350	≥ 380
Moving Mass (g)	11	11	8.2
Coil travel Peak-Peak (mm)	1.5	1.5	1.5
Length (mm)	33.5	33.5	33.5
Diameter (mm)	25.4	27	27
Weight (g)	87	95	95
Storage Temperature (°C)	-40 t0 +70		
Operating Temperature (°C)	-40 to +70		

Limited warranty period: 1 year.
Note: Except where otherwise noted all electromechanical specifications are valid at 22 C and from 0 to 10-degree tilt.
Warranty excludes damage caused by high-voltage or physical damage to the sensor pods.

Near Surface Spares

Land Geophone String

Marsh Geophone String

Hydrophone

408ULS Cable

408ULS FDU2S

408ULS LAULS

408UL FDU Lid Assembly

428XL FDU Lid Assembly

Seismic & ERT Cable

Seismic Cable

ERT Cable

Take-out

KCL-1

KCL-2

ERT Take-out

Mueller Clip

408UL Take-out

Single Clip

China Geophysical

Connector

ZF-NK27 Female

ZF-NK27 Male

ZF-24-61S

ZF-24-61P

16-26P

KCL Connector

Mueller Clip

Spring Split

Node YOUNG

To provide better solution for larger scale & higher receiver density requirements in seismic exploration, and reduce cost in seismic projects, ZF has developed YOUNG wireless node system.

- Integrated 5Hz Geophone
- Switchable Internal and External Geophone
- Capable Work with Cable System
- 32Bit AD Low Noise High Gain
- Real-Time QC Theft Guard
- Drone, Vehicle and Human Patro
- Shockproof Waterproof Small Size
- 40 Day Continuous Recording
- Rich Software Support

Physical Specs

Size	148mm*103mm*142mm (without spike)
Operating life@25°C	40 days@1ms continuous 80 days segmented (12 hours ON/12 hours SLEEP)
Weight	865 g(including internal battery and spike)
Waterproof	1 meter water depth, sealed for 48 hours
Operating temperature	-40°C to +70°C
Charging time	＜2 h

Sensor Specs

Distortion	≤0.1%
Natural frequency	5 Hz ± 7.5%
Coil resistance	1850 Ω
Open circuit damping	0.6 ± 5%
Damping with resistor	0.7 ± 5%
Open circuit intrinsic voltage sensitivity	80 V/m/s ± 5%

Channel Performance

Anti-alias filter	206.5 Hz@2ms (82.6% of Nyquist) selectable-linear phase or minimum phase
Equivalent input noise	0.14 μV@2ms@Gain 18 dB (Typical)
Daily inspection settings	1 time/day, 2 times/day, daily inspection time ≤10s
ADC resolution	32 bits
Sample intervals	0.25, 0.5, 1, 2, 4 ms
Preamplifier gain	0 dB, 12 dB, 24 dB
DC blocking filter	0.1 Hz to 10 Hz
GPS time standard	1 ppm
Timing accuracy	±10 us, GPS disciplined
Maximum input signal	±2.5 V peak@Gain 0 dB
Instantaneous dynamic range	＞125 dB@2ms@Gain 0 dB
Total harmonic distortion	<0.0002%@Gain 0 dB
Common mode rejection	＞100 dB
Gain accuracy	<0.5%
System dynamic range	186 dB
Frequency response	0~1652 Hz@0.25ms sample temperature measurement and detection accuracy 0.5°C
Detection range	-40°C to 125°C
Tilt comparison measurement accuracy	<1°
Download speed	25 MB/s
Acquisition mode	Continuous acquisition/timed acquisition

Quality Control Ability

Drone line check	500 m
Car line check	150 m
Manual line check	100 m
Lost search	Support
Real-time QC	Support

Software

- Real-time quality control, massive Young node data download, configuration and management software

Portable Rack

- Same function as 40 slots Type
- For less channels working

Data Harvesting Rack

- Program the node,download & offload the seismic data
- 40 slots, download speed 10000 Mb/s
- Monitor function to view the status charging Function with 2 hours max

Communication Server and Radio

The network RTK server provides a high precision range positioning service for the centimeter level, providing high precision location information services to the shock source vehicle,handbook and other measurement equipment within 100 square kilometers.

Drone QC Unit

- High flexibility, can be combined with manual/vehicle-assisted control means
- High ease of use, visual mission design
- High productivity, more than 50 km/h
- High degree of freedom, flight altitude 300-500(m)
- High recovery rate, up to 99% or more

Smart Backpack

- No pile number test
- Centimeter-level positioning
- Automatic coordinate return
- High-precision TB capture
- 72 hours long battery life
- One-click wire release and patrol

Field Deployment Tool

- The Field Deployment Tool is a hand-held RFID-equipped computer. It is used for scanning the serial numbers of the YOUNG after deployment, in order to log the GPS location (and line and station) where each YOUNG was deployed.