

CSP-D Seismic Energy Source



The CSP-D is a seismic energy source for boomer and sparker applications in three variants, the CSP-D700, CSP-D1200 and CSP-D2400. Each unit has the same chassis and 1500J/second HV engine.

The CSP-D incorporates dual-voltage technology that allows the operator to tune the sound source to a particular application for improved data quality.

Key Features

- Incorporates dual-voltage technology for exceptional versatility
- Variable Input Power Circuitry for 'soft start'
- Proprietary pulse shaping circuitry for high resolution data
- Additional safety/protection features
- All settings externally selectable
- LED fault indicators
- High current and voltage solid state (semi-conductor) discharge method
- Meets EC emissions regulations enabling interference-free field use
- Supplied in robust transit case, with HV junction box (HVJ2000), mains lead and HV connector plug

Technical Specification

PHYSICAL

Size	Transit Case (7U) with cover in place and handles flat: 50cm(H) x 58cm(W) x 74cm(D)
Weight	CSP-D700, case and cover: 60.5kg CSP-D1200, case and cover: 61.5kg CSP-D2400, case and cover: 63.5kg

ELECTRICAL SPECIFICATION

Mains Input	240Vac 45-65Hz@3.0kVA single phase. 3 pin connector Variable Input Power Circuitry (AVIP) 'soft start' circuitry
Voltage Output	2500 to 3950Vdc, 4 pin interlocked connector Solid state semi-conductor discharge method

CSP-D Technical Specification continued...

Output Energy	Easy switch selectable in increments	
	CSP-D700	50,100,150,200,250,300,350,400,500,600,700 Joules
	CSP-D1200	50,100,150,200,250,300,350,400,450,500,550,600, 700,800,900,1000,1100,1200 Joules
	CSP-D2400	50,100,150,200,300,400,500,600,700,750,800,900, 1000,1250,1500,1750,2000,2250,2400 Joules
Charging Rate	1500J/second for continuous operation at 0-45°C ambient	
Capacitance	CSP-D700	112µF at 10 ⁸ shot life
	CSP-D1200	208µF at 10 ⁸ shot life
	CSP-D2400	304µF at 10 ⁸ shot life
Trigger	+ve key opto isolated or isolated closure set by front panel switch BNC connector on front panel and remote box (optional)	
Repetition rate	6pps max Limited by charge rate, energy level and sound source rating	
Earth	M8 stainless steel stud on front panel	

SAFETY FEATURES

- Main electronic control circuits and secondary layer of safety circuitry
- Specially designed HV connector with interlock
- High speed dump resistors for high voltage components
- Capacitor bleed resistors
- Open circuit shutdown
- Timer shutdown
- Output current monitor and shutdown
- Over temperature shut-down
- Cover and connector interlocks
- HV fault indicator for internal temperature, low input voltage or capacitor fault
- Remote control available for triggering and operation

The unit's internal design has a modular construction for ease of servicing and capacitor replacement. However, for safety reasons, only Applied Acoustics trained engineers should attempt a repair.

COMPATIBLE SOUND SOURCES

CSP-D700	AA201, AA251, AA301 Boomer plates, Squid 501 Sparker
CSP-D1200	AA201, AA251, AA301 Boomer plates, Squid 501 and Squid 2000 Sparkers
CSP-D2400	AA201, AA251, AA301 Boomer plates, Squid 501, Squid 2000 and Delta Sparkers



Due to continual product improvement, specification information may be subject to change without notice.
CSP-D Seismic Energy Source/June 2015
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Squid 501, Squid 2000 Sparker Seismic Sound



Key Features

- Squid 501 is a compact sound source affixed to high voltage cable
- Squid 2000 capable of significant penetration at 300-2000J range
- Fitted with RMK connectors as standard
- Lightweight, compact and easily deployed
- Field replaceable electrodes

The Squid 501 and Squid 2000 sparker seismic sound sources are used for high resolution applications with low electrical power input. The lightweight Squid 501 is used with direct attachment to a HV cable. The Squid 2000 is deployed from a catamaran, the Cat 200, and is easily configurable for array depth, spacing and power input. Different sparker tips can be used to increase resolution or penetration as required.



Technical Specification

PHYSICAL

	Size	Weight	Connector
Squid 501	800mm (L) x 150mm (dia)	3kg	RMK 1/0
Squid 2000	1250mm (L) x 900mm (W) x 500mm (H)	40kg	RMK 1/0

ELECTRICAL INPUT

Recommended energy	Squid 501	300 – 800J/shot
	Squid 2000	600-2400J/shot
Maximum energy	Squid 501	1200J/shot
	Squid2000	2500J/shot

Squid 501, Squid 2000 Technical Specification continued...

Operating voltage	3000-4000V
Number of tip locations	Squid 501: 4 Squid 2000: 8
Maximum number of tips	Squid 501: 60 (4 x 15, black) or 120 (4 x 30, blue) Squid 2000: 120 (8 x 15, black) or 240 (8 x 30, blue)

SOUND OUTPUT

Source level	Squid 501	Typically 216dB re 1 μ Pa at 1 metre with 500J Squid 2000 Typically 222dB re 1 μ Pa at 1 metre with 1500J
Pulse length	Squid 501	Typically 200 μ s to 300 μ s at 500J Squid 2000 Typically 1ms at 1000J Dependent on tips and power applied

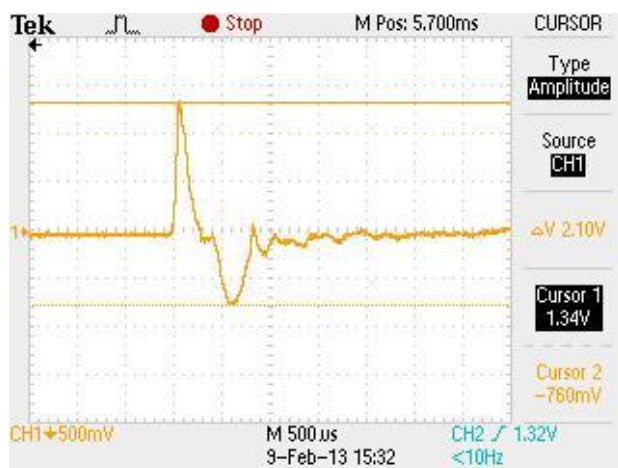
COMPATIBLE ENERGY SOURCES

Squid 501	CSP-P, CSP-D, CSP-S1250, CSP-S4000, CSP-S6000
Squid 2000	CSP-D, CSP-S1250, CSP-S4000, CSP-S6000

COMPATIBLE HV CABLES

Squid 501, Squid 2000	HVC 2000
Standard length	50m
	RMK 1/0 connectors complete with locking collars

TYPICAL PULSE SIGNATURE, SQUID 2000 at 1500J



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 Squid 501, 2000 Seismic Sound Source/ June 2015
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AA251, AA301 Boomer Seismic Sound Source



The **AA251** and **AA301** boomer plates are seismic sound sources that produce a sharp repeatable pulse from a floating position on the sea surface.

The AA251, deployed on either a robust CAT100 or CAT200 catamaran, is ideal for inshore surveys from small craft.

The **AA301** is designed for higher power applications and can also be used as a variable frequency boomer when combined with the CSP-D range of energy sources.

Key Features

- Stable pulse shape clarity with minimum reverberation
- Rugged mechanical design with weight kept to a minimum
- Supplied as individual product, or with a catamaran
- Supplied with RMK connectors and locking collars as standard.
- **AA251** forms part of the Inshore Boomer System, ideal for coastal surveys
- **AA301** ideal for nearshore and shallow water surveys (up to 120m) depending on geology

Technical Specification

PHYSICAL

	Size	Weight air/water	Fixing centres	Connector
AA251 Boomer plate	380 x 380mm	18kg/10kg	315mm ²	RMK 1/0
AA301 Boomer plate	620 x 520mm	25kg/14kg	485mm x 440mm	RMK 1/0

ELECTRICAL INPUT

Recommended energy	AA251	50 – 200J/shot
	AA301	100 – 300J/shot
Maximum energy	AA251	300J/shot
	AA301	350J/shot

AA251, AA301 Technical Specification continued...

Average energy	AA251	600J/second
	AA301	1000J/second

Operating voltage 3600 to 4000Vdc

SOUND OUTPUT

Source level	AA251	Typically 212dB re 1 μ Pa at 1 metre with 200J
	AA301	Typically 215dB re 1 μ Pa at 1 metre with 300J
Pulse length	AA251	120/150/180 μ s at 50/100/200J
	AA301	200 μ s depending on energy setting of CSP
Reverberation	AA251	<10% of initial pulse
	AA301	<10% of initial pulse

COMPATIBLE ENERGY SOURCES

AA251	CSP-L, CSP-P, CSP-D, CSP-N, CSP-S1250, CSP-S4000, CSP-S6000
AA301	CSP-P, CSP-D, CSP-N, CSP-S1250, CSP-S4000, CSP-S6000

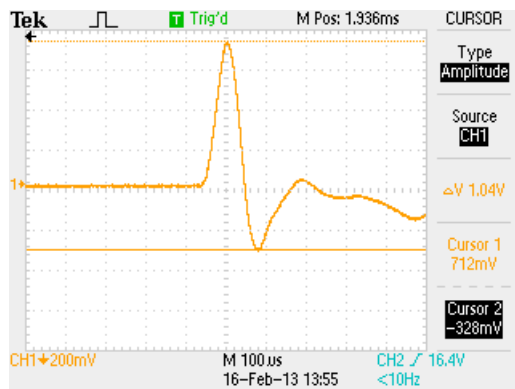
COMPATIBLE CATAMARAN

AA251	CAT 100:	940 (L) x 740 (W) x 500 (H) mm
	CAT 200:	1280 (L) x 915 (W) x 525 (H) mm
AA301	CAT 200:	1280 (L) x 915 (W) x 525 (H) mm
	CAT 300:	1700 (L) x 660 (W) x 490 (H) mm

COMPATIBLE HV CABLE

AA251 and AA301	HVC 2000
	Standard length 50m
	RMK 1/0 connectors complete with locking collars

AA301 TYPICAL PULSE SIGNATURE AT 300J



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AA251, AA301 Boomers/Jan 2015
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Streamer Hydrophones



High quality streamer hydrophones available as 1, 8, 12 or **20 element MF** designs and 24 element LF design. Each is supplied with a pre-amplifier and connectors for standard seismic acquisition systems.

Key Features

- Filled with silicon oil for neutral buoyancy
- Supplied with robust 50m tow leader
- Complete with pre-amplifier
- Standard models and customised units with grouped elements available
- Medium frequency and low frequency versions

Technical Specification

Streamer hydrophone, fluid filled with multi-elements

Model number	AH1	AH360/8
Tow leader	50m	50m
Array Tube type	Polyurethane	Polyurethane
Array tube length	4.5m	4.5m
Number of elements	1	8
Element spacing	n/a	360mm
Array sensitivity	-187dB ref 1V per μPa	-169dB ref 1V per μPa
Fluid type	Polydimethylsiloxane, PMX561	Polydimethylsiloxane, PMX561
Power	Battery, 9V alkaline, PP3/MN1604	Battery, 9V alkaline, PP3/MN1604
Frequency response	140Hz to 10kHz (-3dB)	140Hz to 10kHz (-3dB)
Signal output	Up to 8V peak to peak	Up to 8V peak to peak
Preamp	Single ended, fixed gain	Single ended, fixed gain
Connector type	BNC, 50/75 ohm cable can be used	BNC, 50/75 ohm cable can be used
Elements		
Dimensions	55 x 16 x 10 mm	55 x 16 x 10 mm
Sensitivity	-187dB ref 1V per μPa	-187dB ref 1V per μPa
Depth recoverable	30m max	30m max
Operating depth	Typical 10m	Typical 10m
Type	Non acceleration cancelling	Non acceleration cancelling
Resonance	@ 9 kHz	@ 9 kHz

Streamer Hydrophones Continued...

Model number	AH250/12	AH150/20
Tow leader	50m	50m
Array Tube type	Polyurethane	Polyurethane
Array tube length	4.5m	4.5m
Number of elements	12	20
Element spacing	250mm	150mm
Array sensitivity	-165dB ref 1V per μ Pa	-161dB ref 1V per μ Pa
Fluid type	Polydimethylsiloxane, PMX561	Polydimethylsiloxane, PMX561
Power	Battery, 9V alkaline, PP3/MN1604	Battery, 9V alkaline, PP3/MN1604
Frequency response	140Hz to 10kHz (-3dB)	140Hz to 10kHz (-3dB)
Signal output	Up to 8V peak to peak	Up to 8V peak to peak
Preamp	Single ended, fixed gain	Single ended, fixed gain
Connector type	BNC, 50/75 ohm cable can be used	BNC, 50/75 ohm cable can be used
Elements		
Dimensions	55 x 16 x 10 mm	55 x 16 x 10 mm
Sensitivity	-187dB ref 1V per μ Pa	-187dB ref 1V per μ Pa
Depth recoverable	30m max	30m max
Operating depth	Typical 10m	Typical 10m
Type	Non acceleration cancelling	Non acceleration cancelling
Resonance	@ 9 kHz	@ 9 kHz

Model number	AH365/20	AH610/24LF (Low Frequency)
Tow leader	50m	50m
Array Tube type	Polyurethane	Polyurethane
Array tube length	10m	14
Number of elements	20	24
Element spacing	365mm	610mm
Array sensitivity	-161dB ref 1V per μ Pa	-162dB ref 1V per μ Pa
Fluid type	Polydimethylsiloxane, PMX561	Polydimethylsiloxane, PMX561
Power	Battery, 9V alkaline, PP3/MN1604	24Vdc
Frequency response	140Hz to 10kHz (-3dB)	115Hz to 7.2kHz (-3dB)
Signal output	Up to 8V peak to peak	Up to 8V peak to peak
Preamp	Single ended, fixed gain	Differential output, link adjustable gain
Connector type	BNC, 50/75 ohm cable can be used	BNC, 50/75 ohm cable can be used
Elements		
Dimensions	55 x 16 x 10 mm	53 x 20mm
Sensitivity	-187dB ref 1V per μ Pa	-192dB ref 1V per μ Pa
Depth recoverable	30m max	30m max
Operating depth	Typical 10m	Typical 10m
Type	Non acceleration cancelling	Acceleration cancelling
Resonance	@ 9 kHz	@ 9 kHz

Other element configurations are available to order



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Streamer Hydrophones/July 2016
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TRITON
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Triton SB-Logger™

A new paradigm for data logging and review

Triton SB-Logger™ is our new subbottom profiler and shallow seismic data acquisition and playback application incorporating years of experience in marine geophysics and state-of-the-art software development architecture. The baseline application is designed for easy setup and operation, with numerous quality control features to ensure data acquisition is done right the first time. Triton SB-Logger features many advanced capabilities for real-time and off-line data review and analysis. These capabilities include a pause tool for on-line review of features while continuing to log data, a “scrubbing” tool for rapid scanning of a data files, an image capture tool for the export of profile sections as bitmap files, and a variety of optional filters designed to enhance imagery and improve interpretation results..

Acquisition

- Support for analog or digital data.
- 24-bit A/D conversion.
- Single TTL trigger output.
- Multiple channel input.
- Dedicated server architecture.
- Status indicators for data reception, logging, and printing.
- Automatic line switching and file naming.
- 32-bit SEG Y output.

Processing

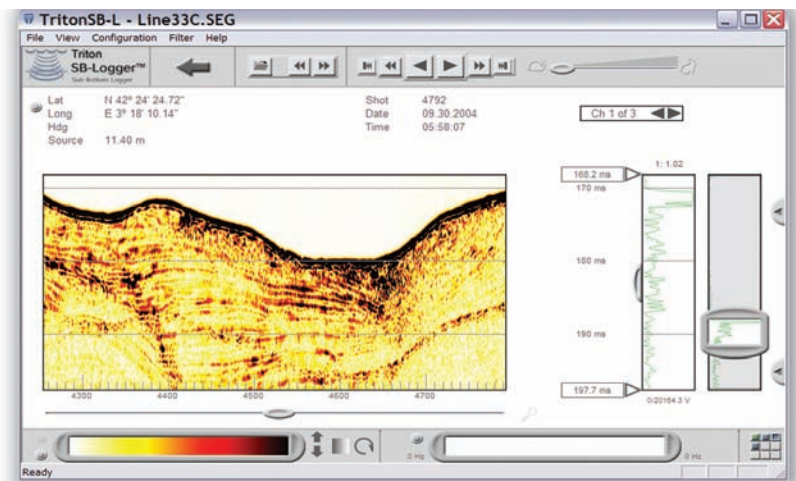
- Bandpass and notch filters.
- TVG / AGC.
- Variable gain control.
- Topographic or depth correction.
- Bottom tracking.
- Advanced filters for swell removal and horizontal stacking.

Playback

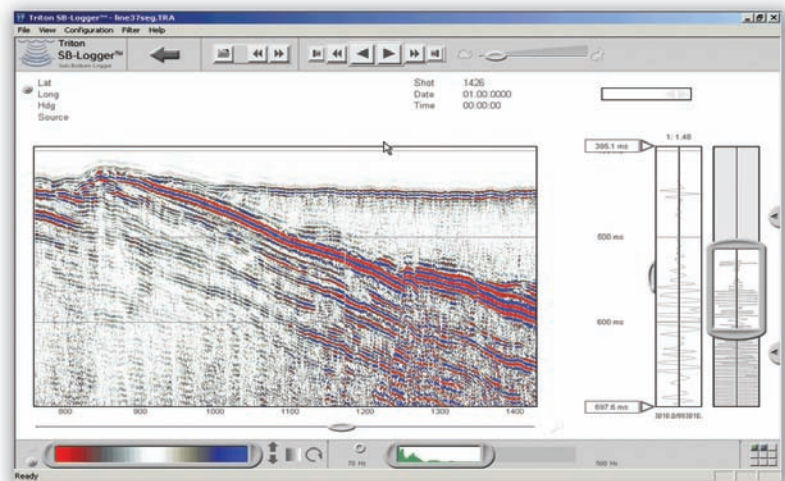
- Intuitive playback controls (VCR-style).
- Image caching for rapid data review.
- Flexible scrolling options (pause, reverse, mirror control).
- Instant application of filter / gradient setting changes.

Unique Attributes

- Supports user-developed filters and color palettes via a plug-in architecture.
- Profile pause tool for on-line data review.
- Image capture tool for bitmap storage of selected profile features.
- Support for any Windows driver printer, selected thermal printers, and direct PDF creation.



Edgetech Chirp data courtesy of USGS



Analog airgun data courtesy of NAVO

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