



10.27 7008 – 7k Generic Data

Description: This record is produced by the 7kCenter. It contains the sonar beam “I” and “Q” or magnitude and phase data. The 7kCenter transmits this data for each ping. This record is available by subscription only.

This record is used for snippet output as well. Beams and samples are numbered from 0. First beam to last beam fields are always enumerated from low to high numbers.

The Record Data portion is divided into two distinct parts:

1. Beam Descriptors
2. Sample Data

Beam Descriptors:

This part of the Record Data section contains each beam descriptor, followed by the beginning and ending sample numbers for that beam. For example:

b0 s1 s100 b2 s1 s100 b3 s1 s100 ...

where b = Beam
s = sample

Sample Data

After all of the beams and their corresponding samples have been listed, the sample data will be output.

Sample data will be output in one of two ways:

1. All samples for a beam followed by all samples for the next beam (Row Column Flag = 0)
2. First sample for each beam followed by next sample for each beam (Row Column Flag = 1).

For example:

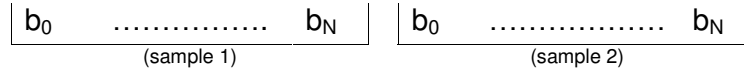
1. If the Row Column Flag = 0, the second part of the data would be:

$sd_0 \quad \dots \quad sd_N$	$sd_0 \quad \dots \quad sd_N$
(beam 1)	(beam 2)

where sd = sample data



2. If the Row Column Flag = 0, the second part of the data would be:



where b_x = sample data for each beam

Data Definition:

DRF	RTH	RD	OD	DRF
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Table 44: 7008 – Record Type Header

NAME	SIZE	DESCRIPTION
Sonar Id	u64	Sonar serial number.
Ping number	u32	Sequential number.
Multi-Ping Sequence	u16	Flag to indicate Multi-Ping Sequence. Always 0 (zero) if not in Multi-Ping mode; otherwise this represents the sequence number of the ping in the multi-ping sequence.
N	u16	Total number of beam descriptors or elements in record.
Reserved	u16	Reserved.
Samples	u32	Samples in ping. Only valid if all beams and samples are in record.
Record subset flag	u8	0 – All beams and samples in ping. 1 – Beam and / or sample ping subset.
Row column flag	u8	0 – All samples for a beam, followed by all samples for the next beam. 1 – Sample 1 for all beams, followed by Sample 2 for all beams, etc.
Reserved	u16	Reserved

NAME	SIZE	DESCRIPTION
Data sample type(s)	u32	BITFIELD (Least significant bit corresponds to Bit 0. Each grouping of bits is to be treated as an unsigned integer of the specified width. E.g. Magnitude is a u4 with possible values in range 0 to 16) 0-3 Magnitude: 0 = No magnitude 1 = Reserved 2 = Magnitude (16 bits) 3 = Magnitude (32 bits) 4-7 Phase: 0 = No phase 1 = Reserved 2 = Phase (16 bits) 3 = Phase (32 bits) 8-11 I and Q: 0 = No I and Q 1 = Signed 16 bit I and signed 16 bit Q 2 = Signed 32 bit I and signed 32 bit Q 12 -14 Beam forming Flag: 0 = Beam formed data 1 = Element data

DRF	RTH	RD	OD	DRF
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Table 45: 7008 – Record Data (Part 1)

NAME	SIZE	DESCRIPTION
Descriptor 0	u16	First beam or element number.
First sample number	u32	First sample number in beam from transmitter and outward.
Last sample number	u32	Last sample number in beam from transmitter and outward.
...
Descriptor N-1	u16	Last beam or element number.

NAME	SIZE	DESCRIPTION
First sample number	u32	First sample number in beam from transmitter and outward
Last sample number	u32	Last sample number in beam from transmitter and outward.

Table 46: 7008 – Record Data (Part 2)

NAME	SIZE	DESCRIPTION
First column / row	dynamic	First sample header + Magnitude/Phase series. Array is populated with samples from transmitter and outward, or beams from low beam number and increasing.
...
Last column / row	dynamic	Last Sample header + Magnitude/Phase series. Array is populated with samples from transmitter and outward, or beams from low beam number and increasing.

See PDS2000 Optional Data for information on Optional Data.

Additional SeaBat™ data settings (data reduction)
Beam limits, sample limits and SeaBat™ format types can be combined.

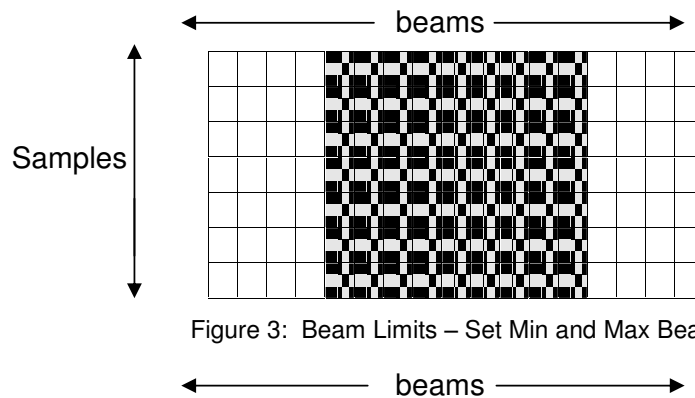


Figure 3: Beam Limits – Set Min and Max Beam

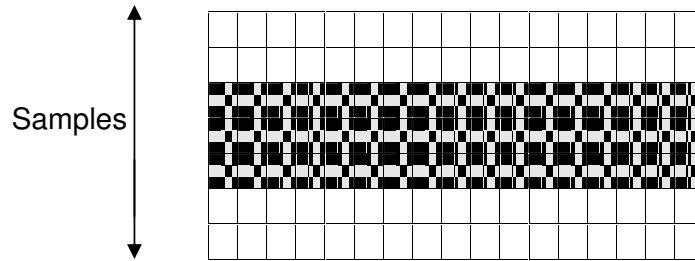


Figure 4: Sample Limits – Set Min and Max Sample

10.28 7009 – Vertical Depth

Description: This record provides vertical depth relative to chart datum or relative to the vessel if tidal data is unavailable.

Data Definition:

DRF	RTH	RD	OD	DRF
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Table 47: 7009 - Record Type Header

NAME	SIZE	DESCRIPTION
Frequency	f32	Ping frequency in Hz.
Ping Number	u32	Sequential number.
Multi-Ping Sequence	u16	Flag to indicate Multi-Ping Sequence. Always 0 (zero) if not in Multi-Ping mode; otherwise this represents the sequence number of the ping in the multi-ping sequence.
Latitude	f64	Latitude of vessel reference point in radians $-\pi/2$ to $\pi/2$, south negative.
Longitude	f64	Longitude of vessel reference point in radians $-\pi$ to π , west negative.
Heading	f32	Heading of vessel at transmit time in radians
Along Track Distance	f32	Along track distance in vessel grid from reference point. Units = meters