

SEG-Y Trace Header Format

#	Byte position	Type	SEG Y*	SU**
1	001 - 004	4	Trace sequence number within line	tracl
2	005 - 008	4	Trace sequence number within reel	tracr
3	009 - 012	4	Original field record number	fldr
4	013 - 016	4	Trace sequence number within original field record	tracf
5	017 - 020	4	Energy source point number	ep
6	021 - 024	4	CDP ensemble number	cdp
7	025 - 028	4	Trace sequence number within CDP ensemble	cdpt
8	029 - 030	2	Trace identification code: -1 = Other 0 = Unknown 1 = seismic data 2 = dead 3 = dummy 4 = time break 5 = uphole 6 = sweep 7 = timing 8 = water break 9 = Near-field gun signature 10 = Far-field gun signature 11 = Seismic pressure sensor 12 = Multicomponent seismic sensor - Vertical component 13 = Multicomponent seismic sensor - Cross-line component 14 = Multicomponent seismic sensor - In-line component 15 = Rotated multicomponent seismic sensor - Vertical component 16 = Rotated multicomponent seismic sensor - Transverse component 17 = Rotated multicomponent seismic sensor - Radial component 18 = Vibrator reaction mass 19 = Vibrator baseplate 20 = Vibrator estimated ground force 21 = Vibrator reference 22 = Time-velocity pairs 23+ = optional use (SU: 111 = complex FD, i.e. alternating samples of real and imag, 116 = real, 117 = imag, 118 = amp, 119 = phase)	trid
9	031 - 032	2	Number of vertically summed traces yielding this trace	nvs
10	033 - 034	2	Number of horizontally stacked traces yielding this trace	nhs
11	035 - 036	2	Data use (1 = production, 2 = test)	duse

12	037 - 040	4	Distance from source point to receiver group	offset
13	041 - 044	4	Receiver group elevation	gelev
14	045 - 048	4	Surface elevation at source	selev
15	049 - 052	4	Source depth below surface	sdepth
16	053 - 056	4	Datum elevation at receiver group	gdel
17	057 - 060	4	Datum elevation at source	sdel
18	061 - 064	4	Water depth at source	swdep
19	065 - 068	4	Water depth at receiver group	gwdep
20	069 - 070	2	Scalar for elevations and depths (+ = multiplier, - = divisor)	scael
21	071 - 072	2	Scalar for coordinates (+ = multiplier, - = divisor)	scalco
22	073 - 076	4	X source coordinate	sx
23	077 - 080	4	Y source coordinate	sy
24	081 - 084	4	X receiver group coordinate	gx
25	085 - 088	4	Y receiver group coordinate	gy
26	089 - 090	2	Coordinate units 1 = Length in meters or feet 2 = arc seconds 3 = decimal degrees 4 = degrees, minutes, seconds	counit
27	091 - 092	2	Weathering velocity	wevel
28	093 - 094	2	Subweathering velocity	swevel
29	095 - 096	2	Uphole time at source	sut
30	097 - 098	2	Uphole time at receiver group	gut
31	099 - 100	2	Source static correction	sstat
32	101 - 102	2	Receiver group static correction	gstat
33	103 - 104	2	Total static applied	tstat
34	105 - 106	2	Lag time between end of header and time break in milliseconds	laga
35	107 - 108	2	Lag time between time break and shot in milliseconds	lagb
36	109 - 110	2	Lag time between shot and recording start in milliseconds	delrt
37	111 - 112	2	Start of mute time	mutts
38	113 - 114	2	End of mute time	mute
39	115 - 116	2	Number of samples in this trace	ns
40	117 - 118	2	Sample interval of this trace in microseconds	dt
41	119 - 120	2	Field instrument gain type code: 1 = fixed 2 = binary 3 = floating point 4+ = optional use	gain
42	121 - 122	2	Instrument gain constant	igc
43	123 - 124	2	Intrument early gain in decibels	igi
44	125 - 126	2	Correlated (1 = no, 2 = yes)	corr
45	127 - 128	2	Sweep frequency at start	sfs
46	129 - 130	2	Sweep frequency at end	sfe
47	131 - 132	2	Sweep length in milliseconds	slen

48	133 - 134	2	Sweep type code: 1 = linear 2 = parabolic 3 = exponential 4 = other	styp
49	135 - 136	2	Sweep taper trace length at start in milliseconds	stas
50	137 - 138	2	Sweep taper trace length at end in milliseconds	stae
51	139 - 140	2	Taper type code: 1 = linear 2 = cosine squared 3 = other	tatyp
52	141 - 142	2	Alias filter frequency	afilf
53	143 - 144	2	Alias filter slope	afils
54	145 - 146	2	Notch filter frequency	nofilf
55	147 - 148	2	Notch filter slope	nofils
56	149 - 150	2	Low cut frequency	lcf
57	151 - 152	2	High cut frequency	hcf
58	153 - 154	2	Low cut slope	lcs
59	155 - 156	2	High cut slope	hcs
60	157 - 158	2	Year data recorded	year
61	159 - 160	2	Day of year	day
62	161 - 162	2	Hour of day (24-hour clock)	hour
63	163 - 164	2	Minute of hour	min
64	165 - 166	2	Second of minute	sec
65	167 - 168	2	Time basis (1 = local, 2 = GMT, 3 = other)	timbas
66	169 - 170	2	Trace weighting factor for fixed-point format data	trwf
67	171 - 172	2	Geophone group number of roll switch position one	grnors
68	173 - 174	2	Geophone group number of first trace of original field record	grnofr
69	175 - 176	2	Geophone group number of last trace of original field record	grnlof
70	177 - 178	2	Gap size (total number of groups dropped)	gaps
71	179 - 180	2	Overtravel associated with taper (1 = down/behind, 2 = up/ahead)	otrav
72	181 - 184	4	X cdp coordinate	d1
73	185 - 188	4	Y cdp coordinate	f1
74	189 - 192	4	In-line number	d2
75	193 - 196	4	Cross-line number	f2
76	197 - 200	4	SP number	ungpow
77	201 - 204	4		unscale
78	205 - 206	2		mark
79	207 - 208	2		mutb
80	209 - 212	4		dz
81	213 - 216	4		fz
82	217 - 218	2		n2
83	219 - 220	2		shortpad

84	221 - 224	4		ntr
77	201 - 202	2	SP number scalar (applies to #76)	
78	203 - 204	2	Trace value measurement unit: -1 = Other (should be described in Data Sample Measurement Units Stanza) 0 = Unknown 1 = Pascal (Pa) 2 = Volts (V) 3 = Millivolts (mV) 4 = Amperes (A) 5 = Meters (m) 6 = Meters per second (m/s) 7 = Meters per second squared (m/s ²) 8 = Newton (N) 9 = Watt (W)	
79	205 - 210	6	Transduction constant	
80	211 - 212	2	Transduction Units -1 = Other 0 = Unknown 1 = Pascal (Pa) 2 = Volts (V) 3 = Millivolts (mV) 4 = Amperes (A) 5 = Meters (m) 6 = Meters per second (m/s) 7 = Meters per second squared (m/s ²) 8 = Newton (N) 9 = Watt (W)	
81	213 - 214	2	Device Identifier	
82	215 - 216	2	Scalar for times and statics (applies to #29-39)	
83	217 - 218	2	Source Type/Orientation -1 = Other 0 = Unknown 1 = Vibratory - Vertical orientation 2 = Vibratory - Cross-line orientation 3 = Vibratory - In-line orientation 4 = Impulsive - Vertical orientation 5 = Impulsive - Cross-line orientation 6 = Impulsive - In-line orientation 7 = Distributed Impulsive - Vertical orientation 8 = Distributed Impulsive - Cross-line orientation 9 = Distributed Impulsive - In-line orientation	
84	219 - 224	6	Source Energy Direction	
85	225 - 230	6	Source Measurement	
86	231 - 232	2	Source Measurement Unit -1 = Other 0 = Unknown 1 = Joule (J) 2 = Kilowatt (kW) 3 = Pascal (Pa) 4 = Bar (Bar)	

			4 = Bar-meter (Bar-m) 5 = Newton (N) 6 = Kilograms (kg)	
87	233 - 240	6	unassigned - for optional information	

*The SEG Y trace header length is 240 bytes. The original SEG Y definition (rev 0) leaves the trace header positions 181-240 unformatted and unassigned for optional storage of information (Barry et al., 1975, *Recommended Standards for Digital Tape Formats*, Geophysics 40(2), 344-352). A revision to this standard extended the assigned header, leaving only bytes 233-240 for optional information (SEG Technical Standards Committee, 2002, *SEG Y rev 1 Data Exchange format*, Technical Standard Report, 45 pp).

Revision 1 also extended the reel/file header to previously unassigned positions. In the new standard, the byte positions 3501-3506 are used to store information about the format (rev 0 or 1), variable trace length (not permitted in rev 0), and the number of extended textual file headers (non-existent in rev 0). Note that the new interpretation may result in backward incompatibility.

**Header Mapping to Seismic Unix. Beyond byte position 180 the interpretation between SEG Y and SU differs (grey). This may lead to problems in SU, which can be avoided using *segyclean* to erase the header positions 181-210.