

**TABLE II: Instrumental Parameters of the Seismological Stations in Germany (state: December 1996)**

| Station Code | Seismometer |   | Instrument Parameters |      |           | analog recording |            | digital recording |            | Remarks  |
|--------------|-------------|---|-----------------------|------|-----------|------------------|------------|-------------------|------------|--|
|              | Type        | C | Ts [s]                | hs   | G [V/m/s] | M [*1000]        | R [mm/min] | NB                | LSB [nm/s] |  |
| ABH          | GT          | Z | 2.0                   | .7   | 405*      |                  |            | 12                | 2-20*      | event recording, 125 Hz sampling rate, *accurate values on request   |
| ALG          | MK          | Z | 1.0                   | .7   | 57.4      | *                |            |                   |            | output recorded on magnetic tape (.33 mm/s) in 3 different levels<br>* accurate magn. on request           |
| ASS          | GT          | Z | 1.0                   | .65  | 200       | 84.8 (1 Hz)      | 60         | 12                | 8          | PCM recording, Nyquist frequency 40 Hz   |
|              | GT          | N | 1.0                   | .65  | 200       | 471 (5 Hz)       |            | 12                | 8          |  |
|              | GT          | E | 1.0                   | .65  | 200       | 942 (10 Hz)      |            | 12                | 8          |  |
| BAS          | GT          | Z | 2.0                   | .7   | 405*      |                  |            | 14                | 2-10*      | PCM event recording (5800 Lennartz) 200 sps/chan.<br>* accurate values on request                          |
|              | SH1         | N | 5.0                   | .7   | 180*      |                  |            | 14                | 2-10*      |  |
|              | SH1         | E | 5.0                   | .7   | 180*      |                  |            | 14                | 2-10*      |  |
| × BAW        | GT          | Z | 2.0                   | .7   | 405*      |                  |            | 14                | 2-10*      | PCM event recording (5800 Lennartz), 250 sps/chan<br>* accurate values on request                          |
|              | SH1         | N | 5.0                   | .7   | 180*      |                  |            | 14                | 2-10*      |  |
|              | SH1         | E | 5.0                   | .7   | 180*      |                  |            | 14                | 2-10*      |  |
| BBS          | GT          | Z | 2.0                   | .7   | 630*      |                  |            | 12                | 2-20*      | event recording, 125 Hz sampling rate, * accurate value on request   |
| BDB          |             |   |                       |      |           |                  |            |                   |            |  |
| BDE          | J2          | Z | 0.7                   | .53  |           | 53               | 60         |                   |            |  |
| BEU          | LE          | Z | 1.0                   | .7   | 400       |                  |            | 16                | 5          | MARS88 event recording<br>62.5 Hz sampling rate<br>120 db dynamic range                                    |
|              | LE          | N | 1.0                   | .7   | 400       |                  |            | 16                | 5          |  |
|              | LE          | E | 1.0                   | .7   | 400       |                  |            | 16                | 5          |  |
| BFO          | GT          | Z | 2.0                   | .7   | 405*      |                  |            | 14                | 2-10*      | PCM event recording (5800 Lennartz) 250 sps/channel,<br>* accurate value on request<br>80 Hz sampling rate |
|              | GT          | N | 2.0                   | .7   | 405*      |                  |            | 14                | 2-10*      |  |
|              | GT          | E | 2.0                   | .7   | 405*      |                  |            | 14                | 2-10*      |  |
|              | S2          | Z | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667      |  |
|              | S2          | N | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667      |  |
|              | S2          | E | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667      |  |

| Station Code | Seismometer |     | Instrument Parameters |          |           | analog recording |               | digital recording |            | Remarks   |                     |
|--------------|-------------|-----|-----------------------|----------|-----------|------------------|---------------|-------------------|------------|---|---------------------|
|              | Type        | C   | Ts [s]                | hs       | G [V/m/s] | M [*1000]        | R [mm/min]    | NB                | LSB [nm/s] |   |                     |
|              | S1          | Z   | 360.0                 | .707     | 2512      |                  |               | 24                | .019       | 20 Hz/0.2Hz sampling rate<br>(IDA/IRIS)   |                     |
|              | S1          | N   | 360.0                 | .707     | 2512      |                  |               | 24                | .019       |   |                     |
|              | S1          | E   | 360.0                 | .707     | 2512      |                  |               | 24                | .019       |   |                     |
| BGG          | GT          | Z   | 1.25                  | .7       | 428.6     |                  |               | 12                | .72        | PCM event recording (5600 Lennartz),<br>100 Hz sampling rate,<br>20 Hz anti-aliasing filter         |                     |
|              | GT          | N   | 1.25                  | .7       | 428.6     |                  |               | 12                | .72        |   |                     |
|              | GT          | E   | 1.25                  | .7       | 428.6     |                  |               | 12                | .72        |   |                     |
| BHB          | GT          | Z   | 2.0                   | .7       | 405*      |                  |               | 14                | 2-10*      | PCM event recording (5800 Lennartz)<br>200 sps/chan sampling rate<br><br>accurate values on request |                     |
|              | SH1         | N   | 5.0                   | .7       | 180*      |                  |               | 14                | 2-10*      |   |                     |
|              | SH1         | E   | 5.0                   | .7       | 180*      |                  |               | 14                | 2-10*      |   |                     |
|              | QF          | E   | 800[Hz]               |          |           |                  |               | 14                |            |   |                     |
| BHG          | GT          | Z   | 1.5                   | .62      | 301       | *                | 120           |                   |            | * variable magnification,<br>accurate value on request  |                     |
|              | HS          | Z   | 1.0                   | .62      | 76        |                  |               | 12                | 100.4      | PCM event recording (5000 Lennartz)<br>166.7 Hz sampling rate<br>35 Hz anti-aliasing filter         |                     |
|              | HS          | N   | 1.0                   | .62      | 72        |                  |               | 12                | 106.0      |   |                     |
|              | HS          | E   | 1.0                   | .62      | 73        |                  |               | 12                | 104.5      |   |                     |
| ∞.           | BHZ         | MK  | Z                     | 0.5      | .7        | 100              |               |                   |            | output recorded on magnetic tape<br>(.33 mm/s) in 3 different levels                                |                     |
|              | BNS         | GT  | Z                     | 1.25     | .71       | 420              | 68 (6.0 Hz)   | 120               | 12         | PC event recording,<br>100 Hz sampling rate,<br>gain ranging  |                     |
|              |             | GT  | N                     | 1.25     | .71       | 420              | 68 (6.0 Hz)   | 120               | 12         |   |                     |
|              |             | GT  | E                     | 1.25     | .71       | 420              | 68 (6.0 Hz)   | 120               | 12         |   |                     |
|              |             | SL1 | Z                     | 14.2     | .65       | 89               | 1.48 (.07 Hz) | 15                |            |   |                     |
|              | BRG         | S2  | Z                     | 120.9    | .718      | 1500             |               |                   | 24         | 1.,667  | 80 Hz sampling rate |
|              |             | S2  | N                     | 120.9    | .718      | 1500             |               |                   | 24         | 1.667   |                     |
|              |             | S2  | E                     | 120.9    | .718      | 1500             |               |                   | 24         | 1.667   |                     |
|              | BRN         | SL1 | Z                     | 15.      | 1.0       |                  | 1.4           | 30                |            | simulation of a long period<br>seismometer by inverse filtering                                     |                     |
|              |             | GT  | Z                     | 1. (10.) |           |                  |               | 60                |            |   |                     |
|              | BRNL        | S2  | Z                     | 120.9    | .718      | 1500             |               |                   | 24         | 1.667   | 80 Hz sampling rate |
|              |             | S2  | N                     | 120.9    | .718      | 1500             |               |                   | 24         | 1.667   |                     |
|              |             | S2  | E                     | 120.9    | .718      | 1500             |               |                   | 24         | 1.667   |                     |
|              | BSEG        | S2  | Z                     | 120.9    | .718      | 1500             |               |                   | 24         | 1.667   | 80 Hz sampling rate |
|              |             | S2  | N                     | 120.9    | .718      | 1500             |               |                   | 24         | 1.667   |                     |
|              |             | S2  | E                     | 120.9    | .718      | 1500             |               |                   | 24         | 1.667   |                     |

| Station Code | Seismometer |     | Instrument Parameters |      |           | analog recording |            | digital recording |                    | Remarks  |
|--------------|-------------|-----|-----------------------|------|-----------|------------------|------------|-------------------|--------------------|--|
|              | Type        | C   | Ts [s]                | hs   | G [V/m/s] | M [*1000]        | R [mm/min] | NB                | LSB [nm/s]         |  |
| BUG          | S2          | Z   | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667              | 80 Hz sampling rate<br><br>* gain ranging system, 12 bit mant.,<br>4 bit exponent, 100 Hz sampling rate<br>8 bit/8 Hz reduced data type<br>for continuous monitoring;<br>seismometer transfer functions<br>on request. <sup>1)</sup> Site KLB<br><sup>1)</sup> Sites SHA, TEZ, NAB<br><sup>2)</sup> Sites HRM, RPM |
|              | S2          | N   | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667              |  |
|              | S2          | E   | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667              |  |
|              | S1          | Z   | 20                    | .7   | 2400      |                  |            | 16*               | 0.5 <sup>1)</sup>  |  |
|              | S1          | N   | 20                    | .7   | 2400      |                  |            | 16*               | 0.5 <sup>1)</sup>  |  |
|              | S1          | E   | 20                    | .7   | 2400      |                  |            | 16*               | 0.5 <sup>1)</sup>  |  |
|              | GT          | Z   | 1.0                   | .7   | 200       |                  |            | 16                | 8 <sup>1) 2)</sup> |  |
|              | GT          | Z   | 1.0                   | .7   | 200       |                  |            | 16*               | 6 <sup>3)</sup>    |  |
|              | GT          | N   | 1.0                   | .7   | 200       |                  |            | 16*               | 6 <sup>3)</sup>    |  |
| GT           | E           | 1.0 | .7                    | 200  |           |                  | 16*        | 6 <sup>3)</sup>   |                    |  |
| CLL          | J2          | Z   | 2.18                  | .54  |           | 52 (1 Hz)        | 60         |                   |                    | 80 Hz sampling rate  |
|              | J1          | Z   | 20                    | 1.20 |           | 1.09             | 15         |                   |                    |  |
|              | J1          | N   | 20                    | 1.10 |           | 1.08             | 15         |                   |                    |  |
|              | J1          | E   | 20                    | 1.21 |           | 1.12             | 15         |                   |                    |  |
|              | WH          | N   | 10                    | .28  |           | .37              | 15         |                   |                    |  |
|              | WH          | E   | 10                    | .34  |           | .34              | 15         |                   |                    |  |
|              | S2          | Z   | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667              |  |
|              | S2          | N   | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667              |  |
|              | S2          | E   | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667              |  |
| CLZ          | GT          | Z   | 1.0                   | .7   | 200       | 28 (1 Hz)        | 120        |                   |                    | 80 Hz sampling rate  |
|              | GT          | N   | 1.0                   | .7   | 200       | 28 (1 Hz)        | 120        |                   |                    |  |
|              | GT          | E   | 1.0                   | .7   | 200       | 28 (1 Hz)        | 120        |                   |                    |  |
|              | S2          | Z   | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667              |  |
|              | S2          | N   | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667              |  |
|              | S2          | E   | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667              |  |
| DRE          | LE          | Z   | 1.0                   | .7   | 400       |                  |            | 16                |                    | MARS 88/FD event recording   |
|              | LE          | N   | 1.0                   | .7   | 400       |                  |            | 16                |                    |  |
|              | LE          | E   | 1.0                   | .7   | 400       |                  |            | 16                |                    |  |
| EFR          | GT          | Z   | 2.0                   | .7   | 405*      |                  |            | 14                | 2–10*              | PCM event recording (5800 Lennartz),<br>250 sps/chan sampling rate<br>*accurate values on request  |
|              | SH1         | N   | 5.0                   | .7   | 180*      |                  |            | 14                | 2–10*              |  |
|              | SH1         | E   | 5.0                   | .7   | 180*      |                  |            | 14                | 2–10*              |  |

| Station Code     | Seismometer |                 | Instrument Parameters |       |           | analog recording |            | digital recording |                      | Remarks  |
|------------------|-------------|-----------------|-----------------------|-------|-----------|------------------|------------|-------------------|----------------------|--|
|                  | Type        | C               | Ts [s]                | hs    | G [V/m/s] | M [*1000]        | R [mm/min] | NB                | LSB [nm/s]           |  |
| END              | GT          | Z               | 2.0                   | .7    | 405*      |                  |            | 14                | 2-10*                | PCM event recording (5800 Lennartz),<br>250 sps/chan sampling rate<br>*accurate values on request            |
|                  | SH1         | N               | 5.0                   | .7    | 180*      |                  |            | 14                | 2-10*                |  |
|                  | SH1         | E               | 5.0                   | .7    | 180*      |                  |            | 14                | 2-10*                |  |
| ENG              | ST          | Z               | 1.5                   |       |           |                  |            | 12                | 15*                  | PCM event recording, 267 Hz<br>sampling rate, * value in nm;<br><br>value on request                         |
|                  | WM          | N               | 1.0                   |       |           |                  |            | 12                | 300                  |  |
|                  | WM          | E               | 1.0                   |       |           |                  |            | 12                | 300                  |  |
|                  | QF          | N               | 800[Hz]               |       |           |                  |            | 12                |                      |  |
| FBB              | ST          | Z               | 1.5                   | 0.8   | 1000*     | 5                | 60         |                   |                      | *sensitivity in V/m<br>event recording,<br>125 Hz sampling rate,   |
|                  | LE          | Z               | 1.0                   | .7    | 400       |                  |            | 12                | 6000                 |  |
|                  | LE          | N               | 1.0                   | .7    | 400       |                  |            | 12                | 6000                 |  |
|                  | LE          | E               | 1.0                   | .7    | 400       |                  |            | 12                | 6000                 |  |
| FELD             | GT          | Z               | 2.0                   | .7    | 405       |                  |            | 12                | 2-20*                | event recording, 125 Hz sampling<br>rate, *accurate values on request  |
| FFM              | MK          | Z               | 0.5                   | .7    | 100       |                  |            |                   |                      | output recorded on magnetic tape<br>(.33 mm/s) in 3 different levels   |
| FOA              | WM          | Z               | 1.4                   |       | 400       |                  |            |                   |                      | output recorded on magntic tape<br>(.33mm/s) in 3 different levels   |
| FUR              | S2          | Z               | 120.9                 | .718  | 1500      |                  |            | 24                | 1.667                | 80 Hz sampling rate<br><br>* variable magnification,<br>accurate value on request                            |
|                  | S2          | N               | 120.9                 | .718  | 1500      |                  |            | 24                | 1.667                |  |
|                  | S2          | E               | 120.9                 | .718  | 1500      |                  |            | 24                | 1.667                |  |
|                  | GT          | Z               | 1.5                   | .62   | 4000      | *                | 120        |                   |                      |  |
|                  | GT          | N               | 1.5                   | .62   | 4000      | *                | 120        |                   |                      |  |
|                  | GT          | E               | 1.5                   | .62   | 4000      | *                | 120        |                   |                      |  |
| GAPA             | MK          | Z               | 1.0                   | .62   | 100       |                  |            | 12                | 38.15                | PCM recording<br>133 Hz sampling rate<br>25 Hz anti-aliasing filter  |
|                  | MK          | N               | 1.0                   | .62   | 100       |                  |            | 12                | 38.15                |  |
|                  | MK          | E               | 1.0                   | .62   | 100       |                  |            | 12                | 38.15                |  |
| GERES<br>(Array) | GS          | Z               | 1.0                   | 0.775 | 2000      |                  |            | 24                | 0.0377 <sup>2)</sup> | 40 Hz sampling rate,<br><sup>1)</sup> 3-component: GEA2,GED1,<br>GED4,GED7, <sup>2)</sup> on plateau at 1Hz, |
|                  | GS          | N <sup>1)</sup> | 1.0                   | 0.775 | 2000      |                  |            | 24                | 0.0377 <sup>2)</sup> |  |
|                  | GS          | E <sup>1)</sup> | 1.0                   | 0.775 | 2000      |                  |            | 24                | 0.0377 <sup>2)</sup> |  |
| GEC2             | S2          | Z               | 1.0                   | 0.775 | 2000      |                  |            | 24                | 0.0503 <sup>2)</sup> | 80 Hz sampling rate  |
| GEC2             | S2          | N               | 1.0                   | 0.775 | 2000      |                  |            | 24                | 0.0503 <sup>2)</sup> |  |
| GEC2             | S2          | E               | 1.0                   | 0.775 | 2000      |                  |            | 24                | 0.0503 <sup>2)</sup> |  |

AIX

| Station Code   | Seismometer |    | Instrument Parameters |      |           | analog recording  |            | digital recording |            | Remarks   |
|----------------|-------------|----|-----------------------|------|-----------|---|------------|-------------------|------------|---|
|                | Type        | C  | Ts [s]                | hs   | G [V/m/s] | M [*1000]   | R [mm/min] | NB                | LSB [nm/s] |   |
| GIE            | GT          | Z  | 1.0                   | .7   | 406       | varying   | 12.5       | 16                | 2.0        | PCM recording (5800 Lennartz)   |
|                | GT          | N  | 1.0                   | .7   | 406       |   |            | 16                | 2.0        |   |
|                | GT          | E  | 1.0                   | .7   | 406       |   |            | 16                | 2.0        |   |
| GLO            | GT          | Z  | 2.0                   | .7   | 405*      |   |            | 14                | 10-20*     | PCM event recording (5800 Lennartz)<br>250 sps/chan sampling rate<br>*accurate values on request  |
|                | SH1         | N  | 5.0                   | .7   | 180*      |   |            | 14                | 10-20*     |   |
|                | SH1         | E  | 5.0                   | .7   | 180*      |   |            | 14                | 10-20*     |   |
| GOR1           | MK          | Z  | 1.1                   | .707 | 159       |   |            | 16                | 0.97       | gain ranging system, 12 bit mant.,<br>4 bit exp., 120 Hz sampling rate;<br>anti-aliasing filter: Butterworth type<br>corner frequency: 40 Hz;<br>slope: 47 dB/oct.;<br>orientation of the horizontal<br>components: H1 - 42° ±1°<br>H2 - 132° ±1° |
|                | MK          | H1 | 0.89                  | .707 | 134       |   |            | 16                | 1.05       |   |
|                | MK          | H2 | 1.0                   | .707 | 175       |   |            | 16                | 0.97       |   |
| GOR2           | MK          | Z  | 1.0                   | .707 | 123       |   |            | 16                | 0.90       |   |
| GOR3           | MK          | Z  | 0.96                  | .707 | 163       |   |            | 16                | 0.94       |   |
| GOR4           | MK          | Z  | 1.0                   | .707 | 171       |   |            | 16                | 0.91       |   |
| GOR5           | MK          | Z  | 1.0                   | .707 | 152       |   |            | 16                | 0.97       |   |
| GOR6           | MK          | Z  | 0.91                  | .707 | 164       |   |            | 16                | 1.07       |   |
| GRF<br>(Array) | S1          | Z  | 20.                   | .707 | 2000      | (seismometer transfer<br>function on request)   |            | 16#               | 1.193      |   |
|                | S1          | N  | 20.                   | .707 | 2000      |   |            | 16#               | 1.193      | 3 horizontal N-S seismometers   |
|                | S1          | E  | 20.                   | .707 | 2000      |   |            | 16#               | 1.193      | 3 horizontal E-W seismometers   |
| GRFO           | KS          | Z  | .4                    |      |           | (seismometer transfer function<br>proportional to ground acceleration,<br>poles & zeros on request) |            | 16#               |            | SRO-Station, event recording of<br>short-period vertical output,<br>continuous recording of long<br>period output   |
|                | KS          | Z  | 25.                   |      |           |   |            | 16#               |            |   |
|                | KS          | N  | 25.                   |      |           |   |            | 16#               |            |   |
|                | KS          | E  | 25.                   |      |           |   |            | 16#               |            |   |
| GSH            | WM          | Z  | 1.0                   | .62  | 204       |   |            | 16                |            | PC recording 0-45 Hz<br>200 Hz sampling rate  |
|                | WM          | N  | .95                   | .62  | 207       |   |            | 16                |            |   |
|                | WM          | E  | .95                   | .62  | 207       |   |            | 16                |            |   |
|                | S2 ???      |    |                       |      |           |   |            |                   |            |   |
| GTT            | WI          | N  | 9.5                   | .4   |           |   | .16        | 15                |            |   |
|                | WI          | E  | 10.2                  | .3   |           |   | .17        | 15                |            |   |
|                | WZ          | Z  | 3.8                   | .2   |           |   | .22        | 15                |            |   |
|                | WG          | N  | 1.3                   | .4   |           |   | 2.2        | 60                |            |   |
|                | WG          | E  | 1.4                   | .3   |           |   | 2.1        | 60                |            |   |

# gain ranging data acquisition system, 12 bit mantissa, 4 bit exponent;  $V[\text{nm/s}] = 1.193 * (1/V(f)) * \text{mantissa} * 2^{(12 - \text{exp})}$

| Station Code | Seismometer |   | Instrument Parameters |         |           | analog recording |            | digital recording |            | Remarks  |
|--------------|-------------|---|-----------------------|---------|-----------|------------------|------------|-------------------|------------|--|
|              | Type        | C | Ts [s]                | hs      | G [V/m/s] | M [*1000]        | R [mm/min] | NB                | LSB [nm/s] |  |
| HAM          | SL1         | Z | 26.                   | .62     | 504       | 3.5 (1 Hz)       | 30         | 12                | 182        | Lennartz S 5100 V system<br>* output of displacement pickup in V/mm<br>80 Hz sampling rate<br><br>** simulation of a long-period seismometer by inverse filtering<br>*** value in nm |
|              | SL1         | Z | 26.                   | .62     | 1.0*      | 1.1              | 30         | 12                | 121***     |  |
|              | S2          | Z | 120.9                 | .718    | 1500      |                  |            | 24                | 1.667      |  |
|              | S2          | N | 120.9                 | .718    | 1500      |                  |            | 24                | 1.667      |  |
|              | S2          | E | 120.9                 | .718    | 1500      |                  |            | 24                | 1.667      |  |
|              | GT          | Z | 30.**                 | .7      | 400       | 1.75 (1 Hz)      | 30         | 8                 | 1000       |  |
|              | GT          | N | 30.**                 | .7      | 400       | 1.75 (1 Hz)      | 30         | 8                 | 1000       |  |
|              | GT          | E | 30.**                 | .7      | 400       | 1.75 (1 Hz)      | 30         | 8                 | 1000       |  |
| HDH          | LE          | Z | 1.0                   | 0.7     | 400       |                  |            | 16                | 5          | MARS88 event recording<br>62.5 Hz sampling rate<br>120 db dynamic range  |
|              | LE          | N | 1.0                   | 0.7     | 400       |                  |            | 16                | 5          |  |
|              | LE          | E | 1.0                   | 0.7     | 400       |                  |            | 16                | 5          |  |
| HEI          | GT          | Z | 2.0                   | .7      | 405*      |                  |            | 14                | 2-10*      | PCM event recording (5800 Lennartz)<br>250 sps/chan sampling rate<br>*accurate values on request   |
|              | SH1         | N | 5.0                   | .7      | 180*      |                  |            | 14                | 2-10*      |  |
|              | SH1         | E | 5.0                   | .7      | 180*      |                  |            | 14                | 2-10*      |  |
| HEX          | GT          | Z | 2.0                   | .7      | 405*      |                  |            | 14                | 2-10*      | PCM event recording (5800 Lennartz),<br>250 sps/chan sampling rate<br>*accurate values on request  |
|              | SH1         | N | 5.0                   | .7      | 180*      |                  |            | 14                | 2-10*      |  |
|              | SH1         | E | 5.0                   | .7      | 180*      |                  |            | 14                | 2-10*      |  |
| HLG          | SI          | Z | 1.4*                  | 1.0**   |           | 5.7 (1.25 Hz)    | 15         |                   |            | Seismometer-Galvanometer system<br>* Tg = 1.4 s<br>** hg = 1.0<br>*** Tg = 90 s  |
|              | SI          | N | 1.4*                  | 1.0**   |           | 4.9 (1.25 Hz)    | 15         |                   |            |  |
|              | SI          | E | 1.4*                  | 1.0**   |           | 4.9 (1.25 Hz)    | 15         |                   |            |  |
|              | SL1         | Z |                       | 15.0*** |           | varying          | 15         |                   |            |  |
| HOE          | GT          | Z | 1.0                   | .7      |           | varying          | 30         | 12                | 8.9        | PCM recording  |
| HOF          | WM          | Z | 1.5                   | .62     | 200       | *                | 120        |                   |            | * variable magnification<br>accurate value on request  |
| HOL          | LE          | Z | 1.0                   | .7      | 400       |                  |            | 16                | 5          | MARS88 event recording<br>62.5 Hz sampling rate<br>120 db dynamic range  |
|              | LE          | N | 1.0                   | .7      | 400       |                  |            | 16                | 5          |  |
|              | LE          | E | 1.0                   | .7      | 400       |                  |            | 16                | 5          |  |

| Station Code | Seismometer |    | Instrument Parameters |     |           | analog recording |            | digital recording |            | Remarks  |
|--------------|-------------|----|-----------------------|-----|-----------|------------------|------------|-------------------|------------|--|
|              | Type        | C  | Ts [s]                | hs  | G [V/m/s] | M [*1000]        | R [mm/min] | NB                | LSB [nm/s] |  |
| HSN          | GT          | Z  | 2.0                   | .7  | 405*      |                  |            | 14                | 2-10*      | PCM event recording (5800 Lennartz) sampling rate<br><br>* accurate values on request                  |
|              | SH1         | N  | 5.0                   | .7  | 180*      |                  |            | 14                | 2-10*      |  |
|              | SH1         | E  | 5.0                   | .7  | 180*      |                  |            | 14                | 2-10*      |  |
|              | QF          | N  | 800[Hz]               |     |           |                  |            | 14                |            |  |
| HTN          | GT          | Z  | 2.0                   |     | 405*      |                  |            | 14                | 2-10*      | PCM event recording (5800 Lennartz) sampling rate<br><br>* accurate values on request                  |
|              | SH1         | N  | 5.0                   |     | 180*      |                  |            | 14                | 2-10*      |  |
|              | SH1         | E  | 5.0                   |     | 180*      |                  |            | 14                | 2-10*      |  |
|              | QF          | N  | 800[Hz]               |     |           |                  |            | 14                |            |  |
| IBBN         |             |    |                       |     |           |                  |            |                   |            |  |
| JCK          | MK          | Z  | .98                   | .62 | 184       |                  |            | 24                |            | PC recording 0-45 Hz<br>200 Hz sampling rate<br>* horizontal seismometers not oriented in the borehole |
|              | MK          | H* | .88                   | .62 | 162       |                  |            | 24                |            |  |
|              | MK          | H* | 1.09                  | .62 | 188       |                  |            | 24                |            |  |
| JUE          | HS          | Z  | 1.0                   | .7  | 82.6      |                  | 60         | 12                | 60.6       | PCM event recording (5600 Lennartz) 100 Hz sampling rate, 20 Hz anti-aliasing filter                   |
|              | HS          | N  | 1.0                   | .7  | 82.6      |                  | 60         | 12                | 60.6       |  |
|              | HS          | E  | 1.0                   | .7  | 82.6      |                  | 60         | 12                | 60.6       |  |
| JUN          | ST          | Z  | 1.5                   |     |           |                  |            | 12                | 15 *       | PCM event recording, 267 Hz sampling rate, * value in nm;<br><br>values on request                     |
|              | QF          | Z  | 800[Hz]               |     |           |                  |            | 12                |            |  |
|              | QF          | N  | 800[Hz]               |     |           |                  |            | 12                |            |  |
|              | QF          | E  | 800[Hz]               |     |           |                  |            | 12                |            |  |
| KIZ          | LE          | Z  | 1.0                   | .7  | 400       |                  |            | 16                | 5          | MARS88 event recording, 62.5 Hz sampling reate, 120 db dynamic range                                   |
|              | LE          | N  | 1.0                   | .7  | 400       |                  |            | 16                | 5          |  |
|              | LE          | E  | 1.0                   | .7  | 400       |                  |            | 16                | 5          |  |
| KLI          | J2          | Z  | 1.6                   | .49 |           | 42               | 60         |                   |            |  |
| KLL          | HS          | Z  | 1.0                   | .7  | 82.6      |                  |            | 10                | 1.61       | PCM event recording, gain ranging system, 75 Hz sampling rate, 15 Hz anti-aliasing filter              |
|              | HS          | N  | 1.0                   | .7  | 82.6      |                  |            | 10                | 1.61       |  |
|              | HS          | E  | 1.0                   | .7  | 82.6      |                  |            | 10                | 1.61       |  |

| Station Code | Seismometer |    | Instrument Parameters |       |           | analog recording |            | digital recording |            | Remarks   |
|--------------|-------------|----|-----------------------|-------|-----------|------------------|------------|-------------------|------------|---|
|              | Type        | C  | Ts [s]                | hs    | G [V/m/s] | M [*1000]        | R [mm/min] | NB                | LSB [nm/s] |   |
| KOE          | MK          | Z  | 1.0                   | .7    | 57.4      |                  |            | 14                |            | PCM event recording (5800 Lennartz)<br>100 Hz sampling rate,<br>20 Hz anti-aliasing filter  |
|              | MK          | N  | 1.0                   | .7    | 57.4      |                  |            | 14                |            |   |
|              | MK          | E  | 1.0                   | .7    | 57.4      |                  |            | 14                |            |   |
| KON          | GT          | Z  | 1.0                   | .65   | 200       | 84.8 (1 Hz)      | 60         | 12                | 8          | PCM recording, Nyquist<br>frequency 40 Hz   |
|              | GT          | N  | 1.0                   | .65   | 200       | 471 (5 Hz)       |            | 12                | 8          |   |
|              | GT          | E  | 1.0                   | .65   | 200       | 942.5 (10 Hz)    |            | 12                | 8          |   |
| KRF          | MK          | Z  | 1.0                   | .62   | 191       |                  |            | 16                |            | PC recording 0-45 Hz<br>100 Hz sampling rate<br>* horizontal seismometers not<br>oriented in the borehole                                   |
|              | MK          | H* | 0.5                   | .62   | 101       |                  |            | 16                |            |   |
|              | MK          | H* | 0.5                   | .62   | 109       |                  |            | 16                |            |   |
| KRW          | SV1         | Z  | 5.0                   | .7    | 277       |                  | 100        |                   |            | event recording, 200 Hz sampling<br>rate, 12 bit ADC  |
| KTD          | GT          | Z  | 2.0                   | .7    | 405       |                  |            | 12                | 2-20*      | event recording, 125 Hz sampling<br>rate, *accurate values on request   |
| LBG          | LE          | Z  | 1.0                   | .7    | 400       |                  |            | 16                | 5          | MARS88 event recording<br>62.5 Hz sampling rate<br>120 db dynamic range   |
|              | LE          | N  | 1.0                   | .7    | 400       |                  |            | 16                | 5          |   |
|              | LE          | E  | 1.0                   | .7    | 400       |                  |            | 16                | 5          |   |
| LIBD         | GT          | Z  | 2.0                   | 0.7   | 405       |                  |            | 12                | 2-20*      | event recording, 125 Hz sampling<br>rate, *accurate values on request   |
| MANZ         | S2          | Z  | 120                   | 0.707 | 1500      |                  |            | 20                | 0.333      | MARS 88 event recording<br>125 Hz sampling rate, 50 Hz anti-<br>aliasing filter.  |
|              | S2          | N  | 120                   | 0.707 | 1500      |                  |            | 20                | 0.333      |   |
|              | S2          | E  | 120                   | 0.707 | 1500      |                  |            | 20                | 0.333      |   |
| MER          | WA          | Z  | 1.4                   | .7    | 570       | *(on paper)      | 60         |                   |            | * variable magnification,<br>accurate value on request  |
| MOX          | J2          | Z  | 1.6                   | .5    |           | 47.2             | 60         |                   |            | 92 dB dyn. range, 20 Hz sampling<br>rate, 5 Hz anti-aliasing filter, storage<br>on MO disk: BB event selected and<br>LP (1 Hz) continuously |
|              | J2          | N  | 1.6                   | .5    |           | 47.2             | 60         |                   |            |   |
|              | J2          | E  | 1.6                   | .5    |           | 47.2             | 60         |                   |            |   |
|              | J2          | Z  | .23                   | .33   |           | 300              | 60         |                   |            |   |
|              | TJ          | N  | 10.0                  |       |           |                  |            | 16                | 0.628      |   |
|              | TJ          | E  | 10.0                  |       |           |                  |            | 16                | 0.628      |   |
|              | TJ          | Z  | 10.0                  |       |           |                  |            | 16                | 0.628      |   |



| Station Code | Seismometer |   | Instrument Parameters |      |           | analog recording |            | digital recording |            | Remarks   |
|--------------|-------------|---|-----------------------|------|-----------|------------------|------------|-------------------|------------|---|
|              | Type        | C | Ts [s]                | hs   | G [V/m/s] | M [*1000]        | R [mm/min] | NB                | LSB [nm/s] |   |
|              | J2          | Z | 1.6                   | .5   |           | 200 (1 Hz)       | 60         | 16                | 1.26       | 20 Hz sampling rate,<br>5 Hz anti-aliasing filter,<br>displacement proport. 0.625 – 5.0 Hz<br>80 Hz sampling rate |
|              | S2          | Z | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667      |   |
|              | S2          | N | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667      |   |
|              | S2          | E | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667      |   |
| MSG          | ST          | Z | 1.5                   |      |           |                  |            | 12                | 15 *       | PCM event recording, 267 Hz<br>sampling rate, * value in nm;<br>value on request                                  |
|              | WM          | N | 1.0                   |      |           |                  |            | 12                | 800        |   |
|              | WM          | E | 1.0                   |      |           |                  |            | 12                | 800        |   |
|              | QF          | E | 800[Hz]               |      |           |                  |            | 12                |            |   |
| MSS          | ST          | Z | 1.5                   |      |           |                  |            | 12                | 15 *       | PCM event recording, 267 Hz<br>sampling rate, * value in nm;<br>value on request                                  |
|              | WM          | N | 1.0                   |      |           |                  |            | 12                | 300        |   |
|              | WM          | E | 1.0                   |      |           |                  |            | 12                | 300        |   |
|              | QF          | E | 800[Hz]               |      |           |                  |            | 12                |            |   |
| MUL          | LE          | Z | 1.0                   | .7   | 400       |                  |            | 16                | 5          | MARS88/OD event<br>125 Hz sampling rate   |
|              | LE          | N | 1.0                   | .7   | 400       |                  |            | 16                | 5          |   |
|              | LE          | E | 1.0                   | .7   | 400       |                  |            | 16                | 5          |   |
| MWG          | B4          | Z | 0.5                   | .54  |           |                  |            |                   |            | FM recording on magnetic<br>tape  |
|              | B4          | N | 1.0                   | .71  |           |                  |            |                   |            |   |
|              | B4          | E | 1.0                   | .61  |           |                  |            |                   |            |   |
|              | GT          | Z | 1.33                  | .62  |           |                  | 30         |                   |            |   |
|              | GT          | N | 1.33                  | .62  |           |                  | 30         |                   |            |   |
|              | GT          | E | 1.33                  | .62  |           |                  | 30         |                   |            |   |
| OCH          | LE          | Z | 1.0                   | .7   | 400       | 100 (10 Hz)      | 120        | 14                |            | PCM recording Lennartz 5800<br>100 Hz sampling rate   |
|              | LE          | N | 1.0                   | .7   | 400       |                  |            | 14                |            |   |
|              | LE          | E | 1.0                   | .7   | 400       |                  |            | 14                |            |   |
| OGA          | GT          | Z | 1.5                   | .62  | 300       | *                | 120        |                   |            | * variable magnification,<br>accurate value on request  |
| OGB          | MK          | Z | 1.0                   | .7   | 57.4      |                  |            |                   |            | output recorded on magnetic tape<br>(.33mm/s) in 3 different levels<br>*accurate magn. on request                 |

| Station Code | Seismometer |    | Instrument Parameters |       |           | analog recording |            | digital recording |            | Remarks  |
|--------------|-------------|----|-----------------------|-------|-----------|------------------|------------|-------------------|------------|--|
|              | Type        | C  | Ts [s]                | hs    | G [V/m/s] | M [*1000]        | R [mm/min] | NB                | LSB [nm/s] |  |
| OLF          | MK          | Z  | 1.05                  | .62   | 185       |                  |            | 16                |            | PC recording 0–45 Hz<br>100 Hz sampling rate   |
|              | MK          | N  | 1.02                  | .62   | 194       |                  |            | 16                |            |  |
|              | MK          | E  | 1.0                   | .62   | 187       |                  |            | 16                |            |  |
| PLH          | MK          | Z  | 1.0                   | .62   | 163       |                  |            | 24                |            | PC recording 0–45 Hz<br>200 Hz sampling rate<br>* horizontal components not oriented in the borehole   |
|              | MK          | H* | .8                    | .62   | 157       |                  |            | 24                |            |  |
|              | MK          | H* | .77                   | .62   | 176       |                  |            | 24                |            |  |
| PLN          | J2          | Z  | 1.6                   | .49   |           | 23               | 60         | 16                | 1.26       | 20 Hz sampling rate/SP   |
| PST          | J2          | Z  | 1.6                   | .50   |           | 47               | 60         | 16                | 1.26       | 20 Hz sampling rate/SP   |
| RELO         | LE          | Z  | 1.0                   | .7    | 400       |                  |            | 12                | 76.3       | PCM event recording (5000 Lennartz)<br>166.6 Hz sampling rate,<br>35 Hz anti–aliasing filter   |
|              | LE          | N  | 1.0                   | .7    | 400       |                  |            | 12                | 76.3       |  |
|              | LE          | E  | 1.0                   | .7    | 400       |                  |            | 12                | 76.3       |  |
| RGN          | S2          | Z  | 120.9                 | .718  | 1500      |                  |            | 24                | 1.667      | 20 Hz sampling rate  |
|              | S2          | N  | 120.9                 | .718  | 1500      |                  |            | 24                | 1.667      |  |
|              | S2          | E  | 120.9                 | .718  | 1500      |                  |            | 24                | 1.667      |  |
| ROS          | RK          | Z  | 2.0                   | .7    | 340*      |                  |            |                   | 60         | PCM event recording (5000 Lennartz),<br>267 Hz sampling rate, recording<br>in 3 levels with 30 dB overlapping<br>*accurate values on request |
| ROTZ         | S2          | Z  | 120                   | 0.707 | 1500      |                  |            | 20                | 0.333      | MARS 88 event recording<br>125 Hz sampling rate, 50 Hz anti–<br>aliasing filter.   |
|              | S2          | N  | 120                   | 0.707 | 1500      |                  |            | 20                | 0.333      |  |
|              | S2          | E  | 120                   | 0.707 | 1500      |                  |            | 20                | 0.333      |  |
| RUP          | GT          | Z  | 2.0                   | .7    | 405*      |                  |            | 12                | 2–20*      | event recording, 125 Hz sampling rate,<br>*accurate values on request  |
| SBG          | LE          | Z  | 1.0                   | .7    | 400       |                  |            | 16                | 5          | MARS88/OD event<br>125 Hz sampling rate<br>closed Nov. 1, 1996   |
|              | LE          | N  | 1.0                   | .7    | 400       |                  |            | 16                | 5          |  |
|              | LE          | E  | 1.0                   | .7    | 400       |                  |            | 16                | 5          |  |

| Station Code | Seismometer |    | Instrument Parameters |       |           | analog recording |            | digital recording |            | Remarks   |
|--------------|-------------|----|-----------------------|-------|-----------|------------------|------------|-------------------|------------|---|
|              | Type        | C  | Ts [s]                | hs    | G [V/m/s] | M [*1000]        | R [mm/min] | NB                | LSB [nm/s] |   |
| SCE          | GT          | Z  | 1.5                   | .62   | 310       | *                | 300**      |                   |            | * variable magnification,<br>accurate value on request<br>** during weekends recording<br>speed reduced to 120 mm/min |
| SGW          | LE          | Z  | 1.0                   | .7    | 400       |                  |            | 16                | 5          | MARS88 event recording<br>62.5 Hz sampling rate<br>120 db dynamic range   |
|              | LE          | N  | 1.0                   | .7    | 400       |                  |            | 16                | 5          |   |
|              | LE          | E  | 1.0                   | .7    | 400       |                  |            | 16                | 5          |   |
| SOL          | GT          | Z  | 2.0                   | .7    | 405*      |                  |            | 14                | 2-10*      | PCM event recording (5800 Lennartz),<br>250 sps/chan sampling rate<br>*accurate values on request                     |
|              | SH1         | N  | 5.0                   | .7    | 180*      |                  |            | 14                | 2-10*      |   |
|              | SH1         | E  | 5.0                   | .7    | 180*      |                  |            | 14                | 2-10*      |   |
| SOS          | LE          | Z  | 1.0                   | .7    | 400       |                  |            | 16                | 5          | MARS88/OD event<br>125 Hz sampling rate   |
|              | LE          | N  | 1.0                   | .7    | 400       |                  |            | 16                | 5          |   |
|              | LE          | E  | 1.0                   | .7    | 400       |                  |            | 16                | 5          |   |
| STB          | MK          | Z  | 1.00                  | .7    | 57.4      |                  |            | 14                |            | PCM recording (5800 Lennartz),<br>100 Hz sampling rate,<br>20 Hz anti-aliasing filter                                 |
|              | MK          | N  | 1.00                  | .7    | 57.4      |                  |            | 14                |            |   |
|              | MK          | E  | 1.00                  | .7    | 57.4      |                  |            | 14                |            |   |
| STU          | ST          | Z  | 1.5                   | .8    | 1000*     | 12               | 120        |                   |            | * sensitivity in V/m  |
|              | ST          | N  | 1.5                   | .8    | 1000*     | 12               | 60         |                   |            |   |
|              | ST          | E  | 1.5                   | .8    | 1000*     | 12               | 60         |                   |            |   |
|              | ST          | E  | 1.5                   | .8    | 1000*     | .7               | 60         |                   |            |   |
|              | ST          | E  | 1.5                   | .8    | 1000*     | .084             | 60         |                   |            |   |
|              | ST          | E  | 1.5                   | .8    | 1000*     | .016             | 60         |                   |            |   |
|              | S2          | Z  | 120.7                 | .719  | 1500      |                  |            | 24                | .156       |   |
|              | S2          | N  | 120.7                 | .719  | 1500      |                  |            | 24                | .156       |   |
|              | S2          | E  | 120.7                 | .719  | 1500      |                  |            | 24                | .156       |   |
|              | TNS         | S2 | Z                     | 120.9 | .718      | 1500             |            |                   | 24         |   |
| S2           |             | N  | 120.9                 | .718  | 1500      |                  |            | 24                | 1.667      |   |
| S2           |             | E  | 120.9                 | .718  | 1500      |                  |            | 24                | 1.667      |   |
| TOD          | GT          | Z  | 2.0                   | .7    | 405       |                  |            | 12                | 2-20*      | event recording, 125 Hz sampling<br>rate, *accurate values on request   |
| UBR          | LE          | Z  | 1.0                   | .7    | 400       |                  |            | 16                | 5          | MARS88 event recording<br>62.5 Hz sampling rate<br>120 db dynamic range   |
|              | LE          | N  | 1.0                   | .7    | 400       |                  |            | 16                | 5          |   |
|              | LE          | E  | 1.0                   | .7    | 400       |                  |            | 16                | 5          |   |

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| Station Code | Seismometer |   | Instrument Parameters |      |           | analog recording |            | digital recording |            | Remarks   |
|--------------|-------------|---|-----------------------|------|-----------|------------------|------------|-------------------|------------|---|
|              | Type        | C | Ts [s]                | hs   | G [V/m/s] | M [*1000]        | R [mm/min] | NB                | LSB [nm/s] |   |
| VAD          | MK          | Z | 1.0                   |      | 57.4      | *                |            |                   |            | output recorded on magnetic tape (.33 mm/s) in 3 different levels<br>* accurate magn. on request  |
| VIEL         | LE          | Z | 1.0                   | 0.7  | 400       |                  |            | 16                | 5.0        | MARS88/OD event recording<br>125 Hz sampling rate<br>50 Hz anti-aliasing filter                   |
|              | LE          | N | 1.0                   | 0.7  | 400       |                  |            | 16                | 5.0        |   |
|              | LE          | E | 1.0                   | 0.7  | 400       |                  |            | 16                | 5.0        |   |
| WBS          | MK          | Z | 1.0                   | .62  | 184       |                  |            | 16                |            | PC recording<br>100 Hz sampling rate  |
|              | MK          | N | 1.0                   | .62  | 182       |                  |            | 16                |            |   |
|              | MK          | E | 1.0                   | .62  | 181       |                  |            | 16                |            |   |
| WDB          | WM          | Z | 1.4                   | .7   | 400       | *                |            |                   |            | * output recorded on magnetic tape (.33 mm/s) in 3 different levels                               |
| WET          | S2          | Z | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667      | 80 Hz sampling rate   |
|              | S2          | N | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667      |   |
|              | S2          | E | 120.9                 | .718 | 1500      |                  |            | 24                | 1.667      |   |
|              | GT          | Z | 1.5                   | .62  | 318       | *                | 120        |                   |            |   |
| WRG          | J2          | Z | 0.7                   | .53  |           | 91               | 60         |                   |            |   |
| WYH          | GT          | Z | 2.0                   | .7   | 405*      |                  |            | 14                | 2-10*      | PCM event recording (5800 Lennartz)<br>250 sps/chan sampling rate<br>* accurate values on request |
|              | SH1         | N | 5.0                   | .7   | 180*      |                  |            | 14                | 2-10*      |   |
|              | SH1         | E | 5.0                   | .7   | 180*      |                  |            | 14                | 2-10*      |   |