Appendix 1 - The Nordic format

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 Free columns are included for two purposes:
      1. To obtain a readable format
      2. To have some space for possible future extensions


 Here are examples, top 3 lines for positioning only.


         1         2         3         4         5         6         7
12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789
.         .         .         .         .         .         .         .
--------------------------------------------------------------------------------

 1984 1022 2102 23.2 LE 69.330  27.440 11.0F NAO 34 5.2 3.8LNAO 4.0BPDE 3.2SISC1
 NORTHERN FINLAND                                                              3
 NRSA SZ IPN  1 D 2244 13.44 0345 1234.6 1.33 245.2 08.6 841022 120.2 3 5 12345
 NRSA SZ ILG  1 D 2244 13.44 0345 1234.6 1.33 265.0 03.6 841022 120.2 3 5 12345

 1985  510 21 5 16.1 LE 60.240   6.170 30.0F BER  6 2.3 3.8LNAO 4.0BPDE 3.2SISC
                1.5     0.5     0.9    5.0             0.4                    5
 8505210425.WNN                                                                6
 NORTHERN HORDALAND       F 3.5 61.22 0.5   5.33 0.8  23456 2    456 2 99 11BER1
 STAT SP IPHASW D HRMM SECON CODA AMPLIT PERI AZIMU VELO SNR                    7
 BER  SZ IPG  2 U 2105 25.41  200
 HYA  SZ ISG  1   2105 33.1
 ODD  SZ IP   3   2105 20.1   250
 ODD  SZ EPG      2105 22.9
 ODD  SZ  LG      2105 55.8

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 Below are examples of how the last free columns of type 4 lines are used
 in the Nordic Databank in Helsinki and in Bergen:

 1985  510 21 5 16.1 LE 60.240   6.170 30.0F BER  6 2.3 3.8LNAO 4.0BPDE 3.2SISC1
                1.5     0.5     0.9    5.0             0.4                    5
 8505210425.WNN                                                                6
 ACTION:UPD 93-07-09 09:40 OP:jens STATUS:               ID:19920101080359     I
 STAT SP IPHASW D HRMM SECON CODA AMPLIT PERI AZIMU VELO SNR AR TRES W  DIS CAZ7
 NRSA SZ IPN  1 D 2105 13.44 0345 1234.6 1.33 245.2 08.6 5.5  2 -0.7 9  555 235
 BER  SZ IPG  2 U 2105 25.41  200
 HYA  SZ ISG  1   2105 33.1
 ODD  SZ IP   3   2105 20.1   250
 ODD  SZ EPG      2105 22.9
 ODD  SZ  LG      2105 55.8

Note in this example the fault plane solution line(F) and the HYP error line(E)

 1993 1028 0800 26.4 L  57.518   7.119 18.8  BER  6  .6 2.6CBER               1
  GAP=201       1.20       6.4     7.0  6.8   .3359E+01  -.2719E+00   .3054E+02E
      93.2      74.8     -48.2     2                                         F
 ACTION:SPL 95-01-08 09:40 OP:jh   STATUS:               ID:19931028080019     I
 9310-28-0800-19S.NSN_17                                                       6
 STAT SP IPHASW D HRMM SECON CODA AMPLIT PERI AZIMU VELO SNR AR TRES W  DIS CAZ7
 BLS5 SZ EP     D  8 0 56.80  129                                  -.110  216 349
 BLS5 SZ ESG       8 1 23.59                                       -.910  216 349
 BLS5 SZ EP        8 0 56.80  129                                  -.110  216 349
 BLS5 SZ ESG       8 1 23.59                                       -.910  216 349


 Location parameters:
 AR  : Azimuth residual when using azimuth information in locations
 TRES: Travel time residual
 W   : Actual weight used for location ( inc. e.g. distance weight), i2
 DIS : Epicentral distance in kms
 CAZ : Azimuth from event to station
```

Note: Type 1 line must be the first, all type 4 lines should be together and the last line must be blank

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FORMAT DESCRIPTION:

Type 1 Line:

Columns	Format	Description	Comments
1		Free	
2- 5	I4	Year	
6		Free	
7- 8	I2	Month	
9-10	I2	Day of Month	
11		Fix o. time	Normally blank, an F fixes origin time
12-13	I2	Hour	
14-15	I2	Minutes	
16		Free	
17-20	F4.1	Seconds	
21		Location model indicator	Any character
22	A1	Distance Indicator	L = Local, R = Regional, etc.
23	A1	Event ID	E = Explosion, etc. P = Probable explosion V = Volcanic
24-30	F7.3	Latitude	Degrees (+ N)
31-38	F8.3	Longitude	Degrees (+ E)
39-43	F5.1	Depth	Km
44	A1	Depth Indicator	F = Fixed, S = Starting value
45	A1	Locating indicator	----------, * do not locate
46-48	A3	Hypocenter Reporting Agency	
49-51		Number of Stations Used	
52-55		RMS of Time Residuals	
56		Free, unless magnitude is negative	
57-59	F3.1	Magnitude No. 1	
60	A1	Type of Magnitude	L = ML, B = mb, S = Ms, etc
61-63	A3	Magnitude Reporting Agency	
64		Free, unless magnitude is negative	
65-67	F3.1	Magnitude No. 2	
68	A1	Type of Magnitude	L = ML, B = mb, S = Ms
69-71	A3	Magnitude Reporting Agency	
72		Free, unless magnitude is negative	
73-75	F3.1	Magnitude No. 3	
76	A1	Type of Magnitude	L = ML, B = mb, S = Ms
77-79	A3	Magnitude Reporting Agency	
80	A1	Type of this line ("1"), can be blank if first line of event	

If more than 3 magnitudes need to be associated with the hypocenter in the first line, a subsequent additional type one line can be written with the same year, month, day until event ID and hypocenter agency. The magnitudes on this line will then be associated with the main header line and there is then room for 6 magnitudes.

Type 2 line (Macroseismic information)

1-5		Blank
6-20	a	Any descriptive text
21		Free
22	a1	Diastrophism code (PDE type) F = Surface faulting U = Uplift or subsidence D = Faulting and Uplift/Subsidence
23	a1	Tsunami code (PDE type) T = Tsunami generated Q = Possible tsunami
24	a1	Seiche code (PDE type) S = Seiche Q = Possible seiche

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25    a1     Cultural effects (PDE type)
                    C = Casualties reported
                    D = Damage reported
                    F = Earthquake was felt
                    H = Earthquake was heard
26    a1     Unusual events (PDE type)
                    L = Liquefaction
                    G = Geysir/fumerol
                    S = Landslides/Avalanches
                    B = Sand blows
                    C = Cracking in the ground (not normal faulting).
                    V = Visual phenomena
                    O = Olfactory  phenomena
                    M = More than one of the above observed.
27                  Free
28-29 i2     Max Intensity
30    a1     Max Intensity qualifier
                    (+ or - indicating more precicely the intensity)
31-32 a2     Intensity scale (ISC type defintions)
                    MM = Modified Mercalli
                    RF = Rossi Forel
                    CS = Mercalli - Cancani - Seberg
                    SK = Medevev - Sponheur - Karnik
33           Free
34-39 f6.2   Macroseismic latitude (Decimal)
40           Free
41-47 f7.2   Macroseismic longitude (Decimal)
48           Free
49-51 f3.1   Macroseismic magnitude
52    a1     Type of magnitude
                    I = Magnitude based on maximum Intensity.
                    A = Magnitude based on felt area.
                    R = Magnitude based on radius of felt area.
                    * = Magnitude calculated by use of special formulas
                        developed by some person for a certain area.
                        Further info should be given on line 3.
53-56 f4.2   Logarithm (base 10) of radius of felt area.
57-61 f5.2   Logarithm (base 10) of area (km**2) number 1 where
                    earthquake was felt exceeding a given intensity.
62-63 i2     Intensity boardering the area number 1.
64-68 f5.2   Logarithm (base 10) of area (km**2) number 2 where
                    earthquake was felt  exceeding a given intensity.
69-70 i2     Intensity boardering the area number 2.
71           Free
72    a1     Quality rank of the report (A, B, C, D)
73-75 a3     Reporting  agency
76-79        Free
80    a1     Type of this line ("2")
```

Type 3 Line (Optional):

Columns	Format	Description	Comments
1		Free	
2-79	A	Text	Anything
80	A1	Type of this line ("3")	

Type 4 line:

Columns	Format	Description	Comments
1		Free	
2- 6	A5	Station Name	Blank = End of readings = end of event
7	A1	Instrument Type	S = SP, I = IP, L = LP etc
8	A1	Component	Z, N, E
9		Free or weight, see note below	
10	A1	Quality Indicator	I, E, etc.
11-14	A2	Phase ID	PN, PG, LG, P, S, etc. **
15	I1	Weighting Indicator (1-4)	0 = full weight (as in HYPO)
16		Free or flag A to indicate automartic pick, removed when rpicking	
17	A1	First Motion	C, D

18		Note: Currently 15 to 18 can also be used for phase assuming column 11-14 is not blank. See note ** below.	
19-20	I2	Hour	Hour can be up to 48 to indicate next day
21-22	I2	Minutes	
23-28	F6.0	Seconds	
29		Free	
30-33	I4	Duration (to noise)	Seconds
34-40	g7.1	Amplitude (Zero-Peak)	Nanometers
41		Free	
42-45	F4.0	Period	Seconds
46		Free	
47-51	F5.0	Direction of Approach	Degrees
52		Free	
53-56	F4.0	Phase Velocity	Km/second
57-60	F4.0	Signal to noise ratio	
61-63	I3	Azimuth residual	
64-68	F5.1	Travel time residual	
69-70	I2	Weight	
71-75	F5.0	Epicentral distance(km)	
76		Free	
77-79	I3	Azimuth at source	
80	A1	Type of this line ("4"), can be blank, which it is most often	

NB: Epicentral distance: Had format I5 before version 7.2. All old lines can be read with format F5.0 with same results, but now distance can also be e.g. 1.23 km which cannot be read by earlier versions. However, an UPDATE would fix that.

** Long phase names: An 8 character phase can be used in column 11-18. There is then not room for polarity information. The weight is then put into column 9. This format is recognized by HYP and MULPLT.

Type 4 cards should be followed by a Blank Card (Type 0)

Type 5 line (optional): Error estimates of previous line, currently not used by any SEISAN programs.

Columns	Format	Description	Comments
1		Free	
2-79		Error estimates in same format as previous line, normally type 4	
80	A1	Type of this line ("5")	

Type 6 Line (Optional):

Columns	Format	Description	Comments
1		Free	
2-79	A	Name(s) of tracedata files	
80	A1	Type of this line ("6")	

Type 7 Line (Optional):

Columns	Format	Description	Comments
1		Free	
2-79	A	Help lines to place the numbers in right positions	
80	A1	Type of this line ("7")	

Type F Line (Optional): Fault plane solution

Columns	Format	Description
1:30	3F10.0	Strike, dip and rake, Aki convention
31:36	I6	Number of bad polarities
71:76	A6	Method or source of solution, seisan amkes INVRAD or FOCMEC
79:79	A1	Blank: Prime solution, overwritten when focmec or invrad makes a new solution, non blank: remain in file, cannot be plotted O: Remain in file and can be plotted

Type E Line (Optional): Hyp error estimates

Columns	Format	Description
1		Free
2 - 5	A4	The text GAP=
6 - 8	I3	Gap
15-20	F6.2	Origin time error
25-30	F6.1	Latitude (y) error
31-32		Free
33-38	F6.1	Longitude (x) error (km)
39-43	F5.1	Depth (z) error (km)
44-55	E12.4	Covariance (x,y) km*km
56-67	E12.4	Covarience (x,z) km*km
68-79	E14.4	Covariance (y,z) km*km

Type I Line, ID line

Columns	Format description
1	Free
2:8	Help text for the action indicator
9:11	Last action done, so far defined SPL: Split REG: Register ARG: AUTO Register, AUTOREG UPD: Update UP : Update only from EEV REE: Register from EEV DUB: Duplicated event NEW: New event
12	Free
13:26	Date and time of last action
27	Free
28:30	Help text for operator
31:34	Operater code
35	Free
36:42	Help text for status
43:56	Status flags, not yet defined
57	Free
58:60	Help text for ID
61:74	ID, year to second
75	If d, this indicate that a new file id had to be created which was one or more seconds different from an existing ID to avoid overwrite.
76	Indicate if ID is locked. Blank means not locked, L means locked.

Type H line, High accuracy hypoenter line

Columns	
1:55	As type 1 line
16	Free
17	Seconds, f6.3
23	Free
24:32	Latitude, f9.5
33	Free
34:44	Longitude, f10.5
44	Free
45:52	Depth, f8.3
53	Free
54:59	RMS, f6.3
60:79	Free
80	H