Preliminary Determination of Epicenter

body-wave magnitude
surface-wave magnitude

	year		day		min							
		month		hour		sec	latitude	longitude	depth	mb	Ms	PDE event name
PDE	2002	11	3	22	12	41.00	63.5200	-147.4400	4.9	7.0	8.5	CENTRAL ALASKA

Harvard CMT solution

```
event name:        110302J
time shift:        47.0000
half duration:     23.5000
latitude:          63.2300
longitude:        -144.8900
depth:             15.0000
Mrr:         5.130000e+26
Mtt:        -6.038000e+27
Mpp:         5.525000e+27
Mrt:         1.830000e+26
Mrp:         2.615000e+27
Mtp:        -3.937000e+27
```

$$\mathbf{M} = \begin{bmatrix} M_{rr} & M_{r\theta} & M_{r\phi} \\ M_{r\theta} & M_{\theta\theta} & M_{\theta\phi} \\ M_{r\phi} & M_{\theta\phi} & M_{\phi\phi} \end{bmatrix}$$

$$M_0 = \frac{1}{\sqrt{2}} (\mathbf{M} : \mathbf{M})^{1/2} \approx 7.48 \times 10^{27} \text{ dyne cm}$$

$$M_w = \frac{2}{3} (\log_{10} M_0 - 16.1) \approx 7.85$$