Republic of Lebanon
National Council for Scientific Research

Provisional Seismological Bulletin

from the

NATIONAL SEISMIC NETWORK

February

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Prepared by

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GENERAL BULLETIN INFORMATION

The National Centre for Geophysical Research is a governmental agency established 1975 in Lebanon by the National Council for Scientific Research (CNRS). The mission of the Centre, among other assignments, is the monitoring of seismic activity within the national territory. Currently, the national seismic network is under deployment; it has been officially registered as GRAL, an acronym for Geophysical Research Arrays of Lebanon. Station coordinates and status are given below.

Since 1993, the Centre has been participating in a regional initiative by the UNESCO and the USGS known as RELEMR, i.e. Reducing Earthquake Losses in the Eastern Mediterranean Region.

Within this framework, the Centre routinely contributes to the database set up for this purpose and maintained by the Euro-Mediterranean Seismological Centre (EMSC). For coherence, the Centre has adopted the recommended seismic analysis system SEISAN developed by Jens Havskov and Lars Ottemoller from the University of Bergen, Norway.

The localization program currently used for locating earthquakes is Hypocenter (Lienert et al.,1986). Plane parallel layers are assumed for local and regional events, while the IASPEI travel time tables are used for distant events.

The velocity model used for all local and regional events is the one currently adopted by the RELEMR initiative.

P-wave velocity (km/sec)	**depth to top of layer (km)**
6.2	**0.0**
6.8	**14.0**
8.05	**34.0**
8.25	**50.0**
8.5	**80.0**

Magnitudes are calculated from the coda duration. The coda wave magnitude is estimated via the formula:

Mc = 0.08 + 1.63 * log10(T) + 0.0009 * D.

where T is the coda duration (sec) and D is the epicentral distance (km). The coefficients above were adopted at the outset of our Centre in 1980 and thus are still in use for the sake of continuity.

All available coda values are used for magnitude calculations. No station corrections are used for either travel times or magnitudes calculations. The Vp/Vs velocity ratio used in both layered models above is 1.74.

As a general policy, neither depths, nor epicenters, are fixed unless stated otherwise since this might restrict later use of the data. Consequently, some event locations might be unrealistic such as zero depth earthquakes or teleseismic locations off by 1000 km. However, the locations are based on the available data and reflect the localization procedure and the models used.

STATIONS USED

The stations listed below are operated by the National Centre for Geophysical Research. They constitute the basic setup of the National Seismic Network of Lebanon.

However, readings from other cooperating agencies are also used in locating the events and thus more stations may appear in the event lists than in the station list; it is worth mentioning the systematic use of arrival times from the Cypriot seismic network CSS and the Syrian seismic network SNSN in order to constrain events corresponding to an active zone off the Lebanese shorelines.

STATION	LATITUDE	LONGITUDE	HEIGHT(m)	NAME	COMMENTS
BHL	3354.25N	3539.25E	1000	BHANNES	Opened May 1980
HWQ	3416.68N	3556.78E	1161	HAWQA	Opened Jan 2001
MATL	3329.32N	3519.78E	5	MATARIH	Opened Nov 2000
FKH	3414.13N	3624.11E	1170	FAKEHEH	Scheduled 2003
RCY	3329.08N	3549.13E	1360	RACHAYA	Scheduled 2003
DWR	3323.13N	3524.08E	420	DWEIR	Scheduled 2003

MACROSEISMIC DATA

Macroseismic data, if available, are included in the bulletin.

MONTHLY EPICENTER MAPS

Maps will be found on the last page.

ELECTRONIC PUBLICATION

This provisional bulletin will be available for download in pdf format on:
http://www.cnrs.edu.lb/geophysicalresearch/

REFERENCES

Havskov, J. and Ottemoller, L.(2001). SEISAN: The Earthquake Analysis Software. -version 7.2-
Institute of Solid Earth Physics, University of Bergen.
http://www.ifjf.uib.no/seismo/software/seisan.html

Lienert, B.R., Berg, E. and Frazer, L.N.(1986). Hypocenter: An earthquake location method using centered, scaled, and adaptively least squares. Bull. Seism. Soc. Am., 76.,
pp 771-783.

Abbreviations:

TIME:	Origin time in UTC (hr. min. and sec.) or data file onset time if event is not located.
LAT:	Latitude of epicenter
LON:	Longitude of epicenter
DEPTH:	Focal depth in kilometer (trailing F indicates fixed depth)
AGENCY:	GRL throughout the bulletin, aka. Geophysical Research Lebanon
MAGNITUDES:	Up to 3 different magnitudes can be given followed by type and and reporting agency, e.g. 3.1 MC GRL - coda magnitude calculated according to GRL standard parameters.
RMS:	Root mean square value of travel time residuals
STAT:	Station code
CO:	Component; S:short period, L:long period, B:broadband.
DIST:	Epicenter distance (km)
AZI:	Azimuth from source to station
PHAS:	Phase; The first letter characterizes onset E(mergent) or I(mpulsive)
P:	Polarity (C for compression, D for dilatation)
HR:	Hour
MN:	Minute
SECON:	Seconds
TRES:	Residual (seconds)
CODA:	Signal duration in seconds
AMPL:	Ground Amplitude (0.5*(peak to peak)), (nm) at period PERI
PERI:	Period where amplitude is measured
BAZ:	Back azimuth (station to event)
ARES:	Back azimuth residual
VELO:	Apparent phase velocity (km/sec)
WT:	Weight of phase in the location
*:	An asterisk before the phase arrival time implies a potential timing error. If an S phase is read, differential S-P times will be used in the hypocenter location.

February 2 2004 Hour: 18:32 57.0 Lat: 33.28N Lon: 35.19E Depth: 18 Agency: REL Local
Magnitudes: 3.0MC REL Rms: 0.2 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	27.06	29	IPG		1833	2.24	0.1							1.0
BHL	SZ	82.06	32	IPG		1833	9.83	-0.2							1.0
BHL	SE	82.06	32	ISG		1833	19.46	-0.3							1.0
HWQ	SZ	131.5	32	IPG		1833	17.44	0.1	49						1.0
HWQ	SN	131.5	32	ISG		1833	32.67	0.3							1.0

February 3 2004 Hour: 19:30 48.4 Lat: 33.32N Lon: 35.16E Depth: 9 Agency: REL Local
Magnitudes: 3.2MC REL Rms: 0.4 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	78.96	35	IPG		1931	1.01	-0.3	71			306	91	22.8	1.0
BHL	SE	78.96	35	ISG		1931	10.22	-0.6							1.0
HWQ	SZ	128.4	34	IPG		1931	9.66	0.4							1.0
HWQ	SE	128.4	34	ISG		1931	25.02	0.4							1.0

February 7 2004 Hour: 21:17 21.9 Lat: 36.11N Lon: 26.94E Depth: 0 Agency: REL Regional
Magnitudes: 4.9MC REL Rms: 0.2 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	820.9	108	EPN		2119	10.06	0.2							1.0
BHL	SZ	832.1	105	EPN		2119	10.92	-0.4							1.0
BHL	SE	832.1	105	SN		2120	32.39	0.0							1.0
HWQ	SZ	845.0	101	EPN		2119	13.20	0.2	289						1.0
HWQ	SN	845.0	101	SN		2120	35.19	0.0							1.0

February 8 2004 Hour: 11:18 25.4 Lat: 33.83N Lon: 36.71E Depth: 15 Agency: REL Local
Magnitudes: 2.9MC REL Rms: 0.1 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	85.50	305	IPG		1118	39.03	0.0	49						1.0
HWQ	SE	85.50	305	ISG		1118	49.21	0.2							1.0
BHL	SZ	97.49	275	IPG		1118	40.62	-0.1				276	178	39.3	1.0
BHL	SN	97.49	275	ISG		1118	52.06	0.0							1.0

February 8 2004 Hour: 11:21 16.5 Lat: 33.84N Lon: 36.72E Depth: 14 Agency: REL Local
Magnitudes: 3.6MC REL Rms: 0.4 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MARH	SZ	29.73	313	IPG		1121	22.21	0.2							1.0
QASN	SZ	53.26	230	IPG		1121	25.56	0.1							1.0
QASN	SE	53.26	230	ISG		1121	32.22	0.2							1.0
HWQ	SZ	85.91	304	IPG		1121	30.71	0.1	134						1.0
HWQ	SE	85.91	304	ISG		1121	41.40	0.4							1.0
BHL	SZ	98.44	274	IPG		1121	32.46	-0.1							1.0
BHL	SN	98.44	274	ISG		1121	44.07	-0.4							1.0
SALA	SZ	125.4	179	IPG		1121	37.09	0.2							1.0
SALA	SE	125.4	179	ISG		1121	52.09	0.1							1.0
MATL	SZ	134.4	253	IPG		1121	38.12	-0.2							1.0
BIDA	SZ	134.9	345	IPG		1121	38.87	0.4							1.0
BIDA	SE	134.9	345	ISG		1121	55.40	0.8							1.0
TCHB	SZ	147.5	208	IPG		1121	40.28	-0.2							1.0
TCHB	SE	147.5	208	ISG		1121	58.13	0.0							1.0
WRDH	SZ	186.9	352	IPG		1121	46.19	-0.6							1.0
WRDH	SE	186.9	352	ISG		1122	8.41	-0.7							1.0

February 8 2004 Hour: 11:30 3.6 Lat: 33.82N Lon: 36.67E Depth: 15 Agency: REL Local
Magnitudes: 3.3MC REL Rms: 0.4 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MARH	SZ	29.33	323	IPG		1130	08.23	-0.9							1.0
MARH	SE	29.33	323	ISG		1130	12.18	-1.0							1.0
QASN	SZ	48.41	230	IPG		1130	11.62	-0.1							1.0
QASN	SE	48.41	230	ISG		1130	17.44	-0.3							1.0
HWQ	SZ	84.50	308	IPG		1130	17.24	0.2	89						1.0
HWQ	SE	84.50	308	ISG		1130	27.57	0.6							1.0

BHL	SZ94.86	276	IPG		1130	18.59	0.0							1.0
BHL	SN94.86	276	ISG		1130	29.98	0.4							1.0
SALA	SZ122.6	177	IPG		1130	23.03	0.3							1.0
MATL	SZ129.8	254	IPG		1130	23.75	0.1							1.0
BIDA	SZ136.8	346	IPG		1130	24.96	0.2							1.0
BIDA	SE136.8	346	ISG		1130	40.61	0.3							1.0
WRDH	SZ189.3	353	IPG		1130	32.17	-0.3							1.0
WRDH	SE189.3	353	ISG		1130	54.11	0.4							1.0

February 8 2004 Hour: 11:32 47.1 Lat: 33.74N Lon: 36.65E Depth: 15 Agency: REL Local Magnitudes: 3.1MC REL Rms: 1.3 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MARH	SZ	35.04	335	IPG		1132	51.36	-2.1							1.0
QASN	SZ	41.26	236	IPG		1132	54.40	0.2							1.0
HWQ	SZ	87.80	313	IPG		1132	59.96	-1.1							1.0
HWQ	SE	87.80	313	ISG		1133	10.73	-0.6							1.0
BHL	SZ	93.47	281	IPG		1133	1.72	-0.2	63			269	168	34.2	1.0
BHL	SN	93.47	281	ISG		1133	13.25	0.5							1.0
SALA	SZ	114.5	176	IPG		1133	06.02	1.0							1.0
SALA	SE	114.5	176	ISG		1133	19.31	1.1							1.0
TCHB	SZ	134.5	208	IPG		1133	09.07	1.2							1.0
TCHB	SE	134.5	208	ISG		1133	26.18	3.0							1.0
BIDA	SZ	144.3	348	IPG		1133	08.86	-0.5							1.0
WRDH	SZ	197.2	354	IPG		1133	15.76	-1.3							1.0
WRDH	SE	197.2	354	ISG		1133	38.11	-1.2							1.0

February 8 2004 Hour: 11:51 19.7 Lat: 33.82N Lon: 36.74E Depth: 8 Agency: REL Local Magnitudes: 3.3MC REL Rms: 0.6 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MARH	SZ	33.13	313	IPG		1151	25.67	0.4							1.0
QASN	SZ	53.74	234	IPG		1151	28.72	0.3							1.0
HWQ	SZ	89.26	305	IPG		1151	34.25	0.1							1.0
HWQ	SE	89.26	305	ISG		1151	44.92	0.1							1.0
BHL	SZ	101.1	276	IPG		1151	35.97	-0.1	84						1.0
BHL	SN	101.1	276	ISG		1151	47.49	-0.7							1.0
SALA	SZ	123.1	180	IPG		1151	39.99	0.4							1.0
SALA	SE	123.1	180	ISG		1151	53.18	-1.1							1.0
MATL	SZ	136.1	255	ISG		1151	57.95	0.0							1.0
BIDA	SZ	137.9	344	IPG		1151	43.30	1.3							1.0
BIDA	SE	137.9	344	ISG		1151	58.52	0.1							1.0
TCHB	SZ	146.7	210	IPG		1151	43.56	0.2							1.0
TCHB	SE	146.7	210	ISG		1152	01.39	0.5							1.0
WRDH	SZ	189.6	351	IPG		1151	49.89	-0.4							1.0
WRDH	SE	189.6	351	ISG		1152	11.89	-1.0							1.0

February 8 2004 Hour: 12:51 9.4 Lat: 33.83N Lon: 36.70E Depth: 13 Agency: REL Local Magnitudes: 3.6MC REL Rms: 0.4 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MARH	SZ	29.47	317	IPG		1251	15.01	0.2							1.0
QASN	SZ	51.40	230	IPG		1251	18.30	0.3							1.0
HWQ	SZ	85.32	306	IPG		1251	23.41	0.1	125						1.0
HWQ	SE	85.32	306	ISG		1251	34.19	0.5							1.0
BHL	SZ	97.04	275	IPG		1251	25.12	-0.1							1.0
BHL	SN	97.04	275	ISG		1251	36.76	-0.1							1.0
SALA	SZ	124.3	179	IPG		1251	28.90	-0.7							1.0
SALA	SE	124.3	179	ISG		1251	45.13	0.6							1.0
MATL	SZ	132.6	254	IPG		1251	30.93	0.1							1.0
BIDA	SZ	135.6	345	IPG		1251	31.58	0.2							1.0
BIDA	SE	135.6	345	ISG		1251	47.90	0.3							1.0
TCHB	SZ	145.8	208	IPG		1251	32.88	-0.1							1.0
TCHB	SE	145.8	208	ISG		1251	50.51	0.0							1.0
WRDH	SZ	187.8	352	IPG		1251	38.82	-0.9							1.0
WRDH	SE	187.8	352	ISG		1252	1.82	-0.4							1.0

February 8 2004 Hour: 14:21 43.2 Lat: 33.87N Lon: 36.70E Depth: 0 Agency: REL Local Magnitudes: 2.9MC REL Rms: 0.3 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	82.76	303	IPG		1421	56.72	0.2	49						1.0
HWQ	SE	82.76	303	ISG		1422	6.51	0.1							1.0
BHL	SZ	96.44	273	IPG		1421	58.35	-0.4							1.0
BHL	SN	96.44	273	ISG		1422	9.86	-0.4							1.0
MATL	SZ	133.5	252	ISG		1422	20.99	0.4							1.0

February 8 2004 Hour: 14:51 28.5 Lat: 33.83N Lon: 36.72E Depth: 15 Agency: REL Local Magnitudes: 3.2MC REL Rms: 0.7 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MARH	SZ	30.51	315	IPG		1451	33.65	-0.5							1.0
MARH	SE	30.51	315	ISG		1451	38.21	-0.1							1.0
QASN	SZ	52.75	231	IPG		1451	36.40	-0.9							1.0
QASN	SE	52.75	231	ISG		1451	42.32	-1.4							1.0
HWQ	SZ	86.57	305	IPG		1451	42.36	0.1	70						1.0
HWQ	SE	86.57	305	ISG		1451	53.03	0.6							1.0
BHL	SZ	98.66	275	IPG		1451	44.05	0.0							1.0
BHL	SN	98.66	275	ISG		1451	55.43	-0.1							1.0
MATL	SZ	134.2	254	IPG		1451	49.86	0.7							1.0
BIDA	SZ	135.9	345	IPG		1451	49.18	-0.3							1.0
BIDA	SE	135.9	345	ISG		1452	05.75	0.7							1.0
TCHB	SZ	146.7	209	IPG		1451	51.33	0.3							1.0
TCHB	SE	146.7	209	ISG		1452	09.19	1.5							1.0
WRDH	SZ	187.9	352	IPG		1451	56.43	-0.7							1.0
WRDH	SE	187.9	352	ISG		1452	18.34	0.1							1.0

February 8 2004 Hour: 16:37 49.1 Lat: 33.85N Lon: 36.68E Depth: 15 Agency: REL Local Magnitudes: 3.3MC REL Rms: 0.8 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MARH	SZ	26.56	317	IPG		1637	53.70	-0.5							1.0
MARH	SE	26.56	317	ISG		1637	57.09	-0.9							1.0
QASN	SZ	51.36	227	IPG		1637	57.09	-0.6							1.0
QASN	SE	51.36	227	ISG		1638	03.49	-0.5							1.0
HWQ	SZ	82.48	305	IPG		1638	2.10	-0.2	87						1.0
HWQ	SE	82.48	305	ISG		1638	13.08	1.1							1.0
BHL	SZ	94.91	274	IPG		1638	4.06	0.0							1.0
BHL	SN	94.91	274	ISG		1638	15.54	0.4							1.0
SALA	SZ	126.5	178	IPG		1638	08.58	-0.2							1.0
SALA	SE	126.5	178	ISG		1638	24.85	1.5							1.0
MATL	SZ	131.4	253	IPG		1638	9.78	0.4							1.0
BIDA	SZ	133.0	346	IPG		1638	09.95	0.3							1.0
BIDA	SE	133.0	346	ISG		1638	26.44	1.5							1.0
TCHB	SZ	146.8	207	IPG		1638	11.15	-0.5							1.0
TCHB	SE	146.8	207	ISG		1638	28.14	-0.2							1.0
WRDH	SZ	185.4	353	IPG		1638	16.26	-1.1							1.0
WRDH	SE	185.4	353	ISG		1638	37.90	-0.4							1.0

February 9 2004 Hour: 11:49 8.7 Lat: 33.50N Lon: 36.57E Depth: 15 Agency: REL Local Magnitudes: 2.9MC REL Rms: 0.1 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	95.70	298	IPG		1149	23.57	-0.2	46			245	128	44.5	1.0
BHL	SN	95.70	298	ISG		1149	35.05	0.2							1.0
HWQ	SZ	103.4	326	IPG		1149	24.74	-0.1							1.0
HWQ	SE	103.4	326	ISG		1149	36.99	0.1							1.0

February 11 2004 Hour: 0:48 37.7 **Agency: REL Regional**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	2619	329	EP		053	47.92	0.3							1.0
BHL	SZ	2639	331	EP		053	48.82	-0.6							1.0
HWQ	SZ	2658	332	EP		053	51.32	0.3							1.0

February 11 2004 Hour: 8:15 1.1 Lat: 31.61N Lon: 35.70E Depth: 15 Agency: REL Local
Magnitudes: 5.0MC REL **Rms: 1.5 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	210.7	351	IPG		815	33.24	0.2							1.0
BHL	SZ	253.9	359	IPG		815	39.36	0.0	800						1.0
BHL	SN	253.9	359	ISG		816	04.48	-3.3							1.0
HWQ	SZ	296.2	4	IPG		815	45.21	-0.4							1.0
PHNC	SZ	406.8	338	EP		815	56.7	0.7							1.0
PHNC	SE	406.8	338	ES		816	36.1	-0.6							1.0
CSS	SZ	431.9	330	EP		815	59.2	0.1							1.0
CSS	SE	431.9	330	ES		816	38.8	-3.2							1.0
PPCY	SZ	478.9	320	EP		816	06.0	1.3							1.0
PPCY	SE	478.9	320	ES		816	54.0	2.1							1.0
ALFC	SZ	487.5	325	EP		816	07.0	1.2							1.0
ALFC	SE	487.5	325	ES		816	55.0	1.2							1.0
AKMC	SZ	491.7	321	EP		816	07.5	1.2							1.0

February 12 2004 Hour: 16:20 18.1 Lat: 33.70N Lon: 35.43E Depth: 15 Agency: REL Local
Magnitudes: 2.8MC REL **Rms: 0.1 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	30.15	42	IPG		1620	23.45	-0.1	43			289	67	70.1	1.0
BHL	SE	30.15	42	ISG		1620	27.54	0.0							1.0
HWQ	SZ	79.35	36	IPG		1620	30.77	0.0							1.0
HWQ	SE	79.35	36	ISG		1620	40.23	0.1							1.0

February 13 2004 Hour: 1:23 24.6 Lat: 31.70N Lon: 35.86E Depth: 14 Agency: REL Local
Rms: 0.6 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	204.6	346	IPG		123	56.16	0.6							1.0
BHL	SZ	245.3	356	IPG		124	1.51	-0.1							1.0
BHL	SN	245.3	356	ISG		124	28.34	-0.7							1.0
HWQ	SZ	286.1	2	IPG		124	7.22	-0.4							1.0
HWQ	SE	286.1	2	ISG		124	40.30	0.8							1.0

February 13 2004 Hour: 7: 2 34.8 Lat: 31.68N Lon: 34.56E Depth: 15 Agency: REL Local
Magnitudes: 3.6MC REL **Rms: 0.2 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	266.8	22	IPG		7 3	15.32	0.3	96			274	71	24.3	1.0
BHL	SN	266.8	22	ISG		7 3	44.77	0.0							1.0
HWQ	SZ	315.6	24	IPG		7 3	22.33	0.1							1.0
HWQ	SE	315.6	24	ISG		7 3	56.93	-0.4							1.0

February 17 2004 Hour: 7:22 31.5 **Agency: REL Local**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	115.4	312	IPG		722	49.44	0.0							1.0
BHL	SZ	135.1	336	IPG		722	52.41	0.0							1.0
HWQ	SZ	167.0	350	IPG		722	57.11	0.0							1.0

February 17 2004 Hour: 16:42 34.8 Lat: 32.34N Lon: 35.42E Depth: 33 Agency: REL Local
Magnitudes: 3.2MC REL **Rms: 0.6 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	128.1	356	IPG		1642	55.02	0.2							1.0
BHL	SZ	175.4	7	IPG		1643	2.34	0.6	67						1.0
BHL	SE	175.4	7	ISG		1643	21.10	-0.6							1.0
HWQ	SZ	221.0	13	IPG		1643	7.67	-0.8							1.0
HWQ	SE	221.0	13	ISG		1643	33.99	0.6							1.0

February 22 2004 Hour: 13:27 30.7 Lat: 33.89N Lon: 36.81E Depth: 15 Agency: REL Local
Magnitudes: 3.2MC REL Rms: 1.2 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MARH	SZ	33.69	296	IPG		1327	36.96	0.1							1.0
MARH	SE	33.69	296	ISG		1327	40.94	-0.4							1.0
QASN	SZ	63.44	231	IPG		1327	39.98	-1.1							1.0
HWQ	SZ	90.37	299	IPG		1327	45.65	0.6	71			301	177	15.2	1.0
HWQ	SE	90.37	299	ISG		1327	56.44	0.8							1.0
BHL	SZ	106.8	271	IPG		1327	47.25	-0.2							1.0
BHL	SN	106.8	271	ISG		1327	59.10	-0.7							1.0
BTCH	SZ	240.1	352	IPG		1328	08.23	1.2							1.0
BTCH	SE	240.1	352	ISG		1328	33.07	-0.8							1.0
DRWC	SZ	303.1	358	IPG		1328	18.74	2.4							1.0
DRWC	SE	303.1	358	ISG		1328	47.97	-2.0							1.0

February 22 2004 Hour: 13:29 57.1 Lat: 33.88N Lon: 36.79E Depth: 15 Agency: REL Local
Magnitudes: 3.2MC REL Rms: 1.9 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MARH	SZ	32.95	300	IPG		1330	03.57	0.5							1.0
MARH	SE	32.95	300	ISG		1330	06.57	-1.0							1.0
QASN	SZ	60.93	231	IPG		1330	05.49	-1.6							1.0
HWQ	SZ	89.68	300	IPG		1330	11.94	0.6	76			301	179	16.4	1.0
HWQ	SE	89.68	300	ISG		1330	22.64	0.8							1.0
BHL	SZ	105.1	272	IPG		1330	13.61	0.1							1.0
BHL	SN	105.1	272	ISG		1330	25.41	-0.3							1.0
BTCH	SZ	241.7	353	IPG		1330	30.30	-3.3							1.0
BTCH	SE	241.7	353	ISG		1330	59.99	-0.7							1.0
DRWC	SZ	304.8	358	IPG		1330	47.61	4.7							1.0
DRWC	SE	304.8	358	ISG		1331	16.99	0.2							1.0

February 24 2004 Hour: 2:11 34.4 Lat: 31.81N Lon: 34.85E Depth: 15 Agency: REL Local
Magnitudes: 3.6MC REL Rms: 1.0 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	243.8	18	IPG		212	10.34	-0.9	101						1.0
BHL	SN	243.8	18	ISG		212	39.44	0.9							1.0
HWQ	SZ	291.9	20	IPG		212	17.18	-1.2				72	-99	34.9	1.0
HWQ	SE	291.9	20	ISG		212	52.02	1.2							1.0

February 25 2004 Hour: 22: 2 5.0 Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	443.8	318	EPN		22 3	6.47	0.3							1.0
BHL	SZ	459.6	325	EPN		22 3	8.40	0.2							1.0
BHL	SE	459.6	325	SN		22 3	54.46	-0.5							1.0
HWQ	SZ	479.0	330	EPN		22 3	10.09	-0.5							1.0
HWQ	SE	479.0	330	SN		22 3	59.74	0.5							1.0

February 26 2004 Hour: 4:13 41.4 Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	616.5	215	EPN		415	2.63	0.0							1.0
HWQ	SE	616.5	215	SN		416	1.01	-1.7							1.0
BHL	SZ	666.0	215	EPN		415	8.86	0.1							1.0
BHL	SN	666.0	215	SN		416	15.09	1.7							1.0
MATL	SZ	721.0	215	EPN		415	15.35	-0.1							1.0

February 26 2004 Hour: 14:52 0.8 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			IPG		1452	48.41								
HWQ	SZ			IPG		1452	55.23								
BHL	SN			ISG		1452	53.02								
HWQ	SN			ISG		1453	2.52								

February 27 2004 Hour: 1: 4 8.9 Lat: 33.76N Lon: 36.16E Depth: 15 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.7 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	49.12	289	IPG		1 4	17.29	0.2	33			257	149	32.9	1.0
BHL	SN	49.12	289	ISG		1 4	22.95	-0.3							1.0
HWQ	SZ	60.26	341	IPG		1 4	19.82	1.0							1.0
HWQ	SN	60.26	341	ISG		1 4	25.16	-0.9							1.0

February 28 2004 Hour: 2:32 51.0 Lat: 33.93N Lon: 36.10E Depth: 15 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 1.2 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	41.12	340	IPG		232	59.41	1.4				72	-87	21.2	1.0
HWQ	SN	41.12	340	ISG		233	4.32	1.0							1.0
BHL	SZ	41.20	266	IPG		232	57.02	-1.0	39						1.0
BHL	SN	41.20	266	ISG		233	1.92	-1.4							1.0

February 28 2004 Hour: 15:34 15.9 Lat: 33.97N Lon: 37.14E Depth: 15 Agency: REL Local
Magnitudes: 3.2MC REL Rms: 0.9 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	115.6	287	IPG		1534	34.45	0.6	72			299	167	31.3	1.0
HWQ	SE	115.6	287	ISG		1534	48.24	1.0							1.0
BHL	SZ	138.0	267	IPG		1534	36.02	-1.2							1.0
BHL	SN	138.0	267	ISG		1534	52.48	-0.4							1.0

February 29 2004 Hour: 2:16 23.6 Lat: 33.71N Lon: 35.59E Depth: 12 Agency: REL Local
Magnitudes: 3.0MC REL Rms: 1.0 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	22.47	15	IPG		216	26.80	-1.0	53			36	-99	20.1	1.0
BHL	SN	22.47	15	ISG		216	29.59	-1.3							1.0
MATL	SZ	34.35	225	IPG		216	29.46	0.0							1.0
HWQ	SZ	71.20	27	IPG		216	36.03	0.8	72						1.0
HWQ	SE	71.20	27	ISG		216	45.29	1.4							1.0

February 29 2004 Hour: 11:53 0.2 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			IPG		1154	23.15								
BHL	SE			ISG		1154	37.68								
HWQ	SZ			IPG		1154	16.32								
HWQ	SE			ISG		1154	23.49								

February 29 2004 Hour: 13:21 8.8 Lat: 34.20N Lon: 35.44E Depth: 15 Agency: REL Local
Magnitudes: 2.5MC REL Rms: 0.4 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	38.56	149	IPG		1321	15.29	-0.2	27			129	160	43.3	1.0
BHL	SE	38.56	149	ISG		1321	19.89	-0.6							1.0
HWQ	SZ	47.42	80	IPG		1321	17.33	0.5							1.0
HWQ	SE	47.42	80	ISG		1321	23.03	0.3							1.0

February 29 2004 Hour: 14:41 0.9 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SE			ISG		1442	51.29								
HWQ	SZ			IPG		1442	28.24								
BHL	SZ			IPG		1442	35.53								
HWQ	SE			ISG		1442	37.86								

Seismic Events of February 2004 as recorded by the GRAL network

Magnitudes:

Unknown +

M = 1

M = 2

M = 3

M = 4

M = 5