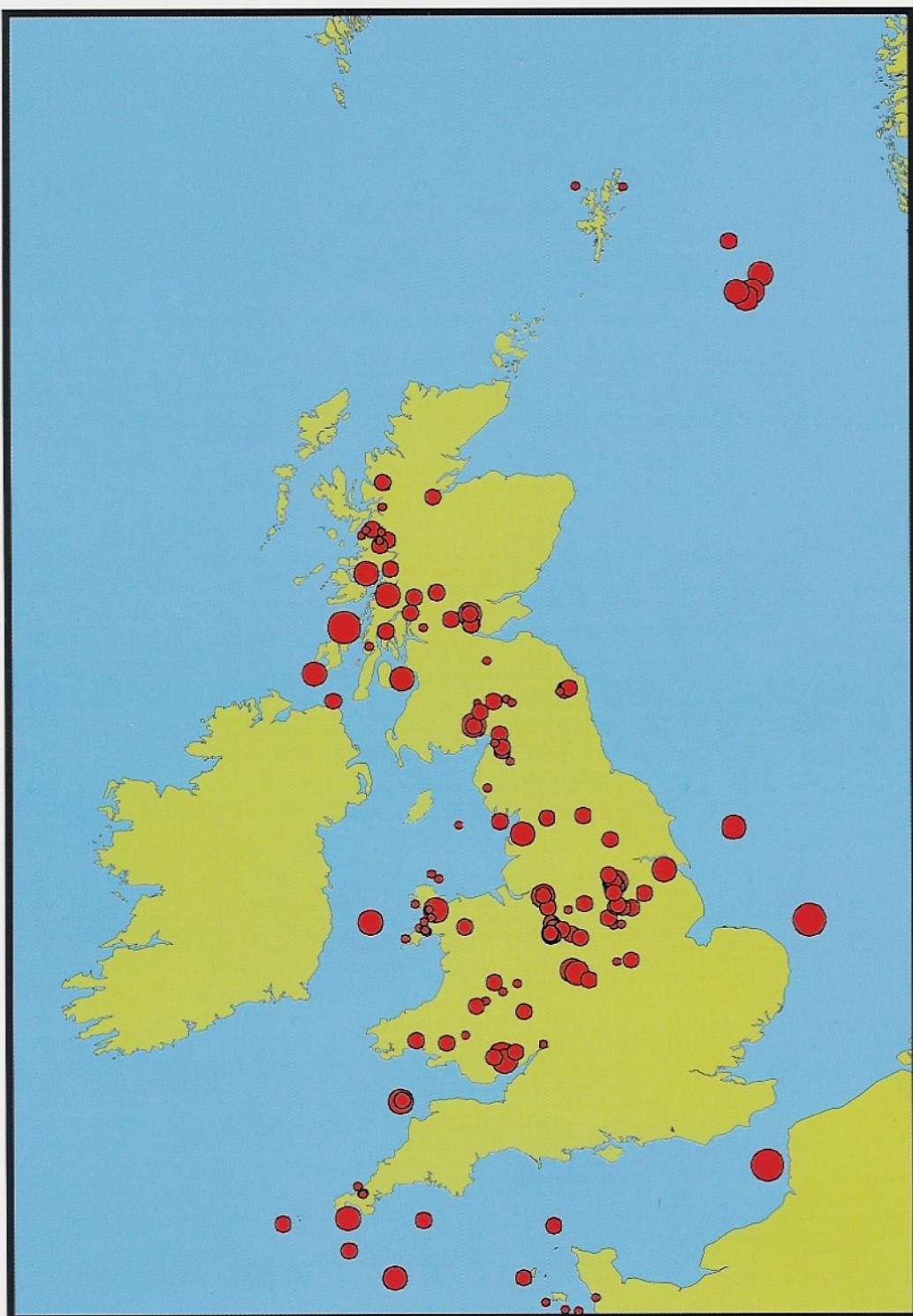




British Geological Survey

**BULLETIN OF BRITISH
EARTHQUAKES 1998**



British Geological Survey
Murchison House
West Mains Road
Edinburgh EH9 3LA
Scotland

Tel: 0131-667-1000
Fax: 0131-667-1877
Internet: <http://www.gsrg.nmh.ac.uk/>

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Bulletin of British earthquakes 1998

A B Walker (editor)

*Contributors G D Ford, D D Galloway and
B A Simpson*

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The British Geological Survey is a component body of the Natural Environment Research Council

Keyworth, Nottingham NG12 5GG
(**0115**) 936 3100
FAX 0115 936 3200

Murchison House, West Mains Road
Edinburgh EH9 3LA
(**0131**) 667 1000
FAX 0131 668 2683

London Information Office at the Natural History Museum, Earth Galleries, Exhibition Road, South Kensington, London SW7 2DE
(**0171**) 589 4090
(**0171**) 938 9056/57
FAX 0171 584 8270

St Just, 30 Pennsylvania Road
Exeter EX4 6BX
(**01392**) 78312
FAX 01392 437505

Geological Survey of Northern Ireland,
20 College Gardens,
Belfast BT9 6BS
(**01232**) 666595
FAX 01232 662835

Maclean Building,
Crowmarsh Gifford, Wallingford,
Oxfordshire OX10 8BB
(**01491**) 838800
FAX 01491 825338

Parent Body
Natural Environment Research Council
Polaris House, North Star Avenue, Swindon
Wiltshire SN2 1EU
(**01793**) 411500
FAX 01793 411501

CONTENTS

	Page
1. INTRODUCTION	1
1.1 The Bulletin.....	1
1.2 Summary of 1998 Seismicity.....	1
2. BULLETIN FORMAT	4
2.1 Tables	4
2.2 Figures.....	4
3. THE BGS UK SEISMOGRAPH NETWORK.....	5
3.1 Instrumentation	5
3.2 Detection Threshold	5
3.3 Environmental Monitoring.....	6
4. HYPOCENTRE PARAMETERS AND THEIR ERRORS	6
4.1 Epicentre Location	6
4.2 Depth Determination.....	6
4.3 Seismicity Distribution	7
4.4 Magnitude	7
4.5 Intensity	7
5. BULLETIN CONTENT AND COMPLETENESS.....	8
5.1 The Geographical Area	8
5.2 Events Included.....	8
5.3 Events Excluded.....	8
5.4 Completeness	8
6. ACKNOWLEDGEMENTS.....	9
7. REFERENCES.....	10

Tables

Figures

Appendices:

Appendix A: Significant earthquakes in 1998

Appendix B: Earthquake information charges

Appendix C: The European Macroseismic Scale (EMS 92)

1. INTRODUCTION

1.1 The Bulletin

The British Geological Survey's Seismic Monitoring and Information Service operates a nationwide network of seismograph stations in the United Kingdom. The whole of the UK, including coastal waters, is covered within the limits of the detection capabilities of the seismograph network, and accuracy is extended through data exchange with neighbouring countries. Seismic phase data, location details and magnitudes are presented in the Bulletin for all earthquakes detected and located by BGS during 1998 together with maps showing the larger magnitude events since 1979 ($ML \geq 2.5$) and since 1970 ($ML \geq 3.5$). All felt areas are quoted in km^2 , and are for the area enclosed within isoseismal 3 EMS (European Macroseismic Scale, Appendix C).

1.2 Summary of 1998 Seismicity

There have been 201 earthquakes located by the monitoring network during the year, with 31 of them having magnitudes 2.0 ML or greater. Of these, 8 are known to have been felt, together with a further 22 smaller ones, bringing the total to 30 felt earthquakes in 1998.

The largest onshore earthquake occurred on 3 May, with a magnitude of 3.5 ML; and was located near Jura (Appendix A1). A macroseismic survey was carried out and 240 responses were received. The earthquake was felt over an area of 12,000 km^2 . The highest intensities were reached on the Islands of Colonsay and Jura, where an intensity of 4 EMS was assigned from reports describing "the whole house shaking", "loud bangs and rumbles", and "objects rattling and falling down". The earthquake was felt throughout most of Argyll and Bute, as far north as the Glencoe area, towards the Isle of Arran in the east and Southend, Kintyre in the south. This is the first event that has been felt in the area since the magnitude 3.0 ML Colonsay earthquake, on 26 January 1990, which was felt with intensities of at least 4 EMS in the epicentral area.

The largest offshore earthquake occurred in the southern North Sea on 16 May. It had a magnitude of 3.8 ML and was located approximately 60 km NE of Great Yarmouth. The Coastguard, Police and local gas and oil rig operators were contacted but no felt reports were received. A further six events occurred in the North Sea area during the year, with magnitudes between 1.7 and 2.8 ML, and were located using both the BGS and Norwegian networks.

Near Onich, Highland, an earthquake, with a magnitude of 1.5 ML, occurred on 8 January. It was felt in the village of Onich, where local residents described "a large rumble like thunder", "the house trembled" and "we thought it was a landslide" indicating an intensity of at least 3 EMS.

On 27 January, an earthquake, with a magnitude of 3.1 ML, occurred in the Strait of Dover. The Dover Coastguard and LDG in France were contacted, but both confirmed that no felt reports were received.

On 8 February, an earthquake, with a magnitude of 2.4 ML, occurred 15 km south of Penzance, Cornwall. Felt reports were received from Penzance, Land's End and St. Ives, which

described its effects as “sounded like a train under the house” and “light fittings rattled”, indicating an intensity of at least 4 EMS.

On 11 February, an earthquake with a magnitude of 2.3 ML, occurred in the Cwmbran area of Gwent. It was felt throughout Cwmbran and Newport with intensities of at least 3 EMS. Felt reports described “windows and doors rattling” and “felt like the wall was moving”. In 1974, the same area was affected by two felt events, the largest with magnitude 4.1 ML, which caused damage to chimneys and roofs.

On 5 March, two earthquakes, with magnitudes of 1.9 and 1.7 ML, occurred in the Killin area of the Central region of Scotland. Felt reports were received from Killin, Balquhidder and Glen Lochay which described “loud rumble like an airplane flying past” and “loud rumbling sound”, indicating intensities of at least 3 EMS.

Near Oban, Strathclyde, an earthquake, with a magnitude of 2.7 ML, occurred on 7 March. It was felt throughout the Oban area, where many people described “we were woken up from sleep” and “we heard a loud bang”, indicating intensities of at least 4 EMS in the epicentral area.

On 3 April, an earthquake, with a magnitude of 1.1 ML, occurred in the Annan area of the Dumfries and Galloway region of Scotland. It was recorded on the strong motion instrument, some 3 km away, where accelerations of 3.7, 8.2 and 8.4 mm/s², for the vertical, NS and EW components, respectively, were measured.

On 31 May, two earthquakes, with magnitudes of 2.6 and 1.7 ML, occurred 8 minutes apart, in the Bristol Channel; no felt reports were received. These are the largest events in the area since the magnitude 2.8 ML Bristol Channel earthquake, on 1 January 1994, which was felt with intensities of at least 4 EMS in the epicentral area.

On 23 June, an earthquake, with a magnitude of 3.5 ML, occurred in the north Atlantic near Hatton Bank, some 540 km west of the Outer Hebrides. It was located using stations from northern Scotland and Iceland and represents the first seismicity to be detected in the area.

Two felt earthquakes with magnitudes of 2.0 and 1.4 ML, occurred in the Locharbriggs area of Dumfries and Galloway, with intensities of at least 3 EMS on 21 and 23 July, respectively. Felt reports described “a rumble lasted 5-10 seconds and neighbours rushed into the streets” and “the whole house shook”. A fault plane solution of the largest event showed dominant strike slip motion on planes striking north-south or east-west (Appendix A2).

Near Beauly, Highland, two earthquakes, with magnitudes of 0.9 and 1.1 ML, occurred on 28 September. They locate in an area which historically has been active (two earthquakes with magnitudes of 5.1 ML on 13 August, 1816 and 18 September, 1901) but which has remained quiet since then.

On 16 October, an earthquake, with a magnitude of 2.7 ML, occurred in the Menai Straits, Gwynedd (Appendix 3). A macroseismic survey was carried out and questionnaires were placed in a local weekly newspaper, resulting in 41 replies which indicated a maximum

intensity of 4 EMS. The earthquake was felt in Port Dinorwic, Caernarvon, Bangor and Llangefni where residents described “heard a loud rumble”, “the ground shook” and “the house shook”.

Near Doune, Central Scotland, one earthquake was detected during 1998 with a magnitude of 1.2 ML. It was not felt but located in the same area as the swarm of events which occurred in 1997, with magnitudes between 0.9 and 2.7 ML, of which six were felt by local residents.

A swarm of ten earthquakes, two felt by local residents, were detected in the Blackford area of Tayside during 1998, with magnitudes ranging between 0.4 and 2.2 ML. The largest, occurred on 26 March and was felt in Blackford, Alva, Gleneagles and Glendevon. The felt reports described “the whole house and furniture shook” and “felt like an underground explosion”, indicating intensities of at least 3 EMS. This is an area that has continued to be active; 49 events occurred in 1997, of which five were felt by local residents. In 1979, the magnitude 3.2 ML Ochil Hills earthquake was felt with a maximum intensity of 5 EMS.

In North Wales, seven events with magnitudes between 0.1 to 0.8 ML, were located on the Lleyn Peninsula, in the same area and at similar depths as the magnitude 5.4 ML Lleyn earthquake of 19 July 1984, which was felt throughout England and Wales and into Scotland and Ireland.

The coalfield areas of central Scotland, Yorkshire, Staffordshire, West Midlands and Nottinghamshire continued to experience shallow earthquake activity which is believed to be mining induced. Some 54 coalfield events, with magnitudes ranging between 0.6 and 2.0 ML, were detected in the year. Sixteen of these were reported felt by local residents.

Near Newcastle-under-Lyme, Staffordshire, 24 shallow events occurred with magnitudes between 0.9 and 1.6 ML. Seven of these events were felt by local residents in the Keele, Whitmore and Newcastle-under-Lyme areas of Staffordshire.

Seven events, with magnitudes between 0.8 and 1.8 ML, were located near Clackmannan in the central region of Scotland. Four of these were felt by local residents in Clackmannan, Coalsnaughton, Dollar and Shannockhill. This is an area which has experienced many such mining induced events in the past.

2. BULLETIN FORMAT

2.1 Tables

Data on the earthquakes and seismograph stations operated in 1998 are arranged as follows:

TABLE 1: This is a chronological listing of all earthquakes in and near the UK for which a reliable epicentral location could be obtained together with felt sonic events and other significant non-natural events.

TABLE 2: This is a listing of earthquakes arranged in order of decreasing latitude to facilitate identification of earthquakes in selected regions.

TABLE 3: This is a chronological listing of felt sonic events and significant non-natural events detected by the seismograph network. These events are included in Table 1 but not Table 2.

TABLES 4: This is an alphabetical listing of the geographical co-ordinates of seismograph stations operated in 1998 by BGS, DIAS (the Dublin Institute of Advanced Studies) and KUN (Keele University). Table 4a lists the short period instruments; Table 4b the BGS low gain stations and Table 4c the BGS strong motion instruments.

TABLE 5: This lists the arrival times of phases for the events in Table 2 at each station, together with amplitude information used for magnitude calculation.

TABLE 6: This shows the crustal seismic velocity models used for event location.

2.2 Figures

FIGURE 1: Seismograph network operational in December 1998.

FIGURE 2: Detection threshold of the seismograph stations operational in December 1998 for average background noise conditions where the detection criterion is that the signal has to exceed 4 nanometers at 10 Hz on 4 stations.

FIGURE 3: Epicentral location map of all the events in 1998 that are listed in Table 2. It is estimated that the dataset is complete for the land area.

FIGURE 4: Locations of earthquakes in the UK of magnitude 2.5 ML and above in the period 1979 to 1998. It is estimated that the dataset is complete for the land area.

FIGURE 5: Locations of earthquakes in the UK of magnitude 3.5 ML and above in the period 1970 to 1998.

3. THE BGS UK SEISMOGRAPH NETWORK

3.1 Instrumentation

A standard seismic network consists of up to ten ‘outstation’ vertical seismometers radio-linked over distances of up to 100 km to a central site. Here the data, along with that from a local 3-component set of two horizontal and one vertical seismometers, are recorded onto a digital event-triggered recorder (SEISLOG). It is designed to trigger on events and write to a computer disk which is accessed from Edinburgh via a modem. Four times a day, data is transferred automatically to the Edinburgh central computer and the events are analysed during that day providing a rapid response for location and magnitude determinations. All of the recording centres in the UK have been upgraded to provide a SEISLOG system (Figs 1 and 2). At some centres, a continuous back-up facility is provided by the traditional magnetic tape Geostore recorders, and tapes are dispatched weekly to Edinburgh for analysis. SEISLOGS have the advantage over the Geostore system by providing digital data, of wider dynamic range (72 db), a bandwidth of up to 40 Hz and the capacity for 32 seismic channels. The system also has the facility to auto-reboot in the event of mains power failure and this normally takes three minutes once power has recovered.

At some locations, on-line paper chart recorders display three channels to enable local operators to view earthquake data. At other stations, low-gain vertical seismometers extend the dynamic range of the system (by 34 db) to stronger motions, and low frequency microphones are used to aid the discrimination of sonic booms. In addition, strong motion accelerometers were installed at locations throughout the country and record accelerations up to 0.1g. A digitally recorded broad-band station (Guralp) located in Edinburgh, provides an assessment of surface-wave (Richter magnitude) for large Global earthquakes.

Recent developments in geographic coverage of the UK are described in Walker (1999, in press) and details of the SEISLOG system, which has been jointly developed by Bergen university and BGS are given in Utthem and Havskov (1993).

3.2 Detection Threshold

The detection capabilities of a network depend upon station distribution, instrument sensitivity and background noise levels. For the BGS UK network, the lower limit of sensitivity is governed by the background noise level. The contours in Figure 2 illustrate the lower threshold magnitude for an earthquake to significantly exceed 4 nanometers of noise (average) at 10 Hz on at least four seismographs. Noise sources such as wind, waves, traffic and livestock vary considerably with time (typically 0.5 to 15 nanometers, at 10 Hz) causing the magnitude thresholds to increase or decrease. In conditions of high noise, 0.8 ML should be added to the contour values.

The detection contours in Figure 2 hold true only if all stations are continuously monitored. Small events in unmonitored areas may then go undetected unless they are felt and reported to BGS by local inhabitants. The detection capabilities by this process are strongly dependent on population density.

3.3 Environmental Monitoring

The infrastructure provided by the UK nationwide seismic monitoring network, comprising remote sensing stations linked to computers, is ideal for expansion into a full-spectrum environmental monitoring network (including pollution, radioactivity and climate). The remote sites required for seismic stations (in order to escape ‘cultural’ vibration noise from industry, towns, roads etc) are ideal for establishing environmental baselines, long-term trends, the effects of sudden release incidents and the long-range impacts of power stations, traffic and city emissions. The data-rate for seismics, at 100 samples per second per channel, is very high compared to the normal requirements of an environmental monitoring station. It has, therefore, proved to be relatively simple to provide for the transmission of 16 channels of environmental data, at 1 minute intervals, alongside the seismics. To this end, BGS has established three environmental stations which are recording UVB, humidity, temperature, radioactivity, NO_x gases and radon. In collaboration with the Institute of Terrestrial Ecology (ITE) another station, some 35 km south of Edinburgh, has been installed and is transmitting ozone data from an ITE sensor as well as recording temperature and humidity.

4. HYPOCENTRE PARAMETERS AND THEIR ERRORS

4.1 Epicentre Location

By accurately timing the signal onsets at a minimum of three stations, a location can be found for an earthquake which satisfies the observed pattern of arrivals. Instrumental locations in the bulletin were obtained using the computer program HYPO71 (Lee and Lahr, 1975) which iteratively adjusts a trial hypocentre (latitude, longitude, depth, and origin time) until the observed and computed arrival times coincide closely.

The accuracy of locations is dependent on distances from the closest stations, the distribution of the stations around the epicentre, the resolution to which signal onsets can be timed from the records, and the accuracy with which the seismic wave velocity through the earth can be modelled.

The velocity models used for the location of events in 1998 are given in Table 6 and were derived from a series of refraction profiles traversing Britain, LISPB (Bamford et al, 1976; Bamford et al, 1978; Assumpçao and Bamford, 1978 and Bott et al., 1985).

4.2 Depth Determination

The accurate determination of earthquake depth presents a more difficult problem, mainly because phase arrival patterns at the seismographs can still be satisfied for a large range of depths merely by adjusting the origin time to suit. Constraints on the depth can usually only be imposed when a station is very near the epicentre and even then the accuracy depends on the velocity model.

The best depth determinations have been obtained when an earthquake or earthquake series occurred almost beneath a network. For events at larger distances, and where the error columns (ERH and ERZ), in the tables, are blank, the depth errors can be up to tens of kilometres. The quality factor of the event, as listed in the tables (SQD), is an indication of the depth error. As a general guide only, A*A, A*B, B*A and possibly B*B class events, have reliable depths.

4.3 Seismicity Distribution

Owing to variability in the earthquake detection threshold, which is governed by ambient noise conditions and the geometry of the observing network (see 3.2), the bulletin is biased towards certain localities. In order to present a consistent picture of UK seismic activity, earthquakes with magnitude 2.5 ML or greater, in the period 1979 to 1998, have been plotted in Figure 4. The data set is considered complete for these magnitudes in all localities of the onshore area. Seismicity for the period 1970 to 1998 is shown in Figure 5 with a threshold magnitude of 3.5 ML. This is the period covered by BGS instrumentation which in the early years, only consisted of the network around Edinburgh (LOWNET) and Eskdalemuir (ESK) and a station near Kyle of Lochalsh (KYL). The dataset is likely to be complete for such magnitudes.

4.4 Magnitude

All earthquakes in the bulletin have been assigned a local magnitude (ML) as defined by Richter (1935):

$$ML = \log_{10} (A/A_0)$$

where A is the maximum deflection (centre to peak in mm) registered by the earthquake on a Wood-Anderson seismograph and A_0 is that for a ‘standard’ magnitude zero earthquake at the same distance. The A_0 term is thus a distance correction factor tabulated by Richter out to 200 km, and later adjusted to include up to 600 km. Although Richter intended his method to be an approximate quantification of earthquake size and his attenuation term, A_0 , strictly only applies to California, the formula is still used world-wide today. The ML magnitudes in this bulletin have been calculated according to Richter by converting the output of the BGS instruments to an equivalent Wood-Anderson deflection. Ideally, the measurements are made on two horizontal instruments and averaged but, if this was not possible, the mean of the magnitudes from a number of verticals has been used. Ground motion registered at a seismograph varies with site conditions, direction from the earthquake, and the nature of the ray path. Consequently, it is important to take the mean from a good distribution of stations. The resulting errors on magnitudes quoted in the bulletin will normally be less than 0.4 ML.

4.5 Intensity

Intensity is a measure of the effect of the shaking on people, structures and objects. It decreases with distance from a maximum value (I_{max}) usually found close to the epicentre. The maximum felt intensity is quoted, where known, on the European Macroseismic Scale (EMS), (Grünthal, 1993).

5. BULLETIN CONTENT AND COMPLETENESS

5.1 The Geographical Area

The bulletin covers all of the UK land mass and its coastal waters including the North Sea to 800 kmE and 1400 kmN.

5.2 Events Included

All events believed to be of true tectonic origins have been included, that is, events caused by natural stresses within the earth.

Coalfield events are also included. These are small events occurring near coal workings which are believed to be caused by the redistribution of stress as the coal is extracted and, in some cases by collapse in old workings. They are indicated by C/F in the comments column of Tables 1, 2 and 5.

Acoustic disturbances, such as sonic booms from supersonic aircraft, are included when they are felt. The air-borne waves are readily identified by their slow travel time across an array or by their signature on a microphone but they are frequently reported by local people as small earthquakes. They are indicated by 'SONIC' in both the locality and comments column of Tables 1 and 3. In 1998, five sonic events were reported felt and were detected by the UK network.

Significant non-natural events which received media attention or were greater than magnitude 2.5 ML and felt explosions are also included in Tables 1 and 3. The felt explosions are indicated by 'EXPL' in both the locality and comments column. In 1998, six felt explosions were detected.

5.3 Events Excluded

Events that are known, or suspected to be of explosive origin, are excluded from the bulletin. Explosions due to quarrying, mining, weapon testing or disposal, naval exercises, geophysical prospecting and civil engineering are all excluded where possible, unless they are greater than 2.5 ML or reported to be felt. Unfortunately, identification by record character, location and time of occurrence is not always conclusive and some man-made events may have been included in the bulletin or, more rarely, a small natural event may have been excluded.

5.4 Completeness

The contours of detection threshold in Figure 2 show that the whole of the UK is covered by the seismograph network for approximately magnitude 1.5 ML, and above, at times of average ambient noise levels. High noise levels may cause this threshold to rise to about 2.3 ML. Normally, however, an earthquake of this size would be felt, if not detected, in the areas of poorer instrumental coverage. The bulletin can, therefore, be assumed to be complete for all earthquakes of magnitude 2.3 ML and above.

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Laboratoire de Detection et de Geophysique (Bruyeres-de-Chatel, France)
Laboratoire Souterrain de Geodynamique (Walferdange, Luxembourg)
NORSAR (Oslo, Norway)
Observatoire Royal de Belgique (Brussels, Belgium)
Powys Observatory (Knighton, UK)
University of Bergen (Bergen, Norway)
University of Keele (Keele, UK)
University of Liverpool (Liverpool, UK)

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UK Earthquake Monitoring Annual Reports

YEAR	AUTHOR(S)	BGS REPORT NO.
89/90	Browitt, CWA and Turbitt, T	WL/90/13
90/91	Browitt, CWA and Turbitt T	WL/91/26
91/92	Browitt, CWA and Turbitt T	WL/92/11
92/93	Browitt, CWA and Walker, AB	WL/93/08
93/94	Walker, AB and Browitt, CWA	WL/94/10
94/95	Walker, AB and Browitt, CWA	WL/95/10
95/96	Walker, AB and Browitt, CWA	WL/96/06
96/97	Walker, AB	WL/97/16
97/98	Walker, AB	WL/98/03
98/99	Walker, AB	WL/99/03

TABLE 1

CATALOGUE OF EVENTS LISTED CHRONOLOGICALLY: 1998

KEY TO BULLETIN ENCODING

YearMoDy	: Year, month and day of event.
HrMn Secs	: Time of occurrence of event in hours, mins and secs, (UTC).
Lat	: Latitude of the event, positive latitude indicates north.
Lon	: Longitude of the event, negative longitude indicates west.
kmE	: UK National Grid Reference in kilometres east of grid origin.
kmN	: UK National Grid Reference in kilometres north of grid origin.
Dep	: Depth of the hypocentre in kilometres.
Mag	: Richter local magnitude of the event.
Locality	: A geographical indication of the epicentral area, usually the nearest town followed by the region. A key to the abbreviations used in the locality column are given below.
Int	: Maximum EMS intensity. 2+ indicates felt, no macroseismic details. 3+, 4+ etc indicates felt at 3 or 4, but no survey carried out. 3, 4, 5 etc describes the maximum EMS intensity produced by the event.
Comments	: Additional comments about the event eg: C/F, see below under comments abbreviations.

The following abbreviations are extracted from the output of the location program HYPO71 (Lee and Lahr,1975)

No	: Total number of P and S readings used in the event location.
DM	: Epicentral distance in kilometres to the closest station.
Gap	: Largest azimuthal separation in degrees between stations.
RMS	: Root Mean Square of the travel-time residuals in seconds.
ERH	: Standard error of the epicentre in kilometres. When this column is blank, the error is large and indeterminate.
ERZ	: Standard error of the focal depth in kilometres. When this column is blank, the error is large and indeterminate.
SQD	: S is quality factor ascribed to RMS, D is quality ascribed to number and distribution of stations.

Locality abbreviations

Sonic	: Sonic boom	W Glamorgan	: West Glamorgan
Expl	: Explosion	Notts	: Nottinghamshire
D & G	: Dumfries and Galloway	S' Clyde	: Strathclyde
Her & Wor	: Hereford and Worcester	S Yorkshire	: South Yorkshire
N'umberland	: Northumberland	West Yorks	: West Yorkshire
Leics	: Leicestershire	Staffs	: Staffordshire
New-U-Lyme	: Newcastle-Under-Lyme	Gloucs	: Gloucestershire
Penin	: Peninsula	Cbr	: Cumbria
W Mid	: West Midlands	Lincs	: Lincolnshire

Comments abbreviations

Sonic	: Sonic boom
Expl	: Explosion
C/F	: Coalfield type event
...	: and felt elsewhere

TABLE 1: CATALOGUE OF EVENTS LISTED CHRONOLOGICALLY:1998

Year	Mo	Dy	Hr	Mn	Secs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments
1998	01	01	18	55	27.5	49.37	-4.71	203.3	-55.9	15.0	2.3	ENGLISH CHANNEL	3122	356	0.55			D*D			
1998	01	02	05	56	44.7	53.06	-2.25	383.5	351.7	7.8	1.7	KIDSGROVE, STAFFORDSHIRE	8	28	170	0.16	1.4	C*C			
1998	01	07	21	01	15.9	56.25	-3.76	291.3	708.0	5.7	0.6	BLACKFORD, TAYSIDE	7	15	107	0.04	0.5	0.9	A*C		
1998	01	07	21	22	14.1	52.93	-2.25	382.9	337.0	0.4	1.6	NEWCASTLE-U-LYME, STAFFS2+	7	29	146	0.05	0.8	1.4	A*C	C/F, FELT WHITMORE	
1998	01	08	15	56	46.3	56.69	-5.24	201.5	760.0	15.1	1.5	ONICH, HIGHLAND	3+	6	44	170	0.06	1.6	2.4	B*C	FELT ONICH
1998	01	09	07	44	40.8	56.98	-5.32	198.1	792.9	7.8	1.9	GLEN GARRY, HIGHLAND	7	44	188	0.10	1.3		C*D		
1998	01	10	04	17	40.0	52.94	-2.24	383.8	338.3	1.6	1.2	NEWCASTLE-U-LYME, STAFFS2+	6	28	147	0.05	0.9	1.5	A*C	C/F, FELT WHITMORE	
1998	01	13	04	03	12.9	55.34	-2.95	339.5	605.9	10.1	0.9	TEVIOTHEAD, D & G	8	16	170	0.10	1.2	3.2	B*C		
1998	01	14	11	30	05.5	60.07	1.41	590.0	01136.8	15.0	1.8	NORTHERN NORTH SEA	7144	337	0.60			D*D			
1998	01	16	23	21	46.4	50.22	-5.27	166.5	40.7	0.2	0.1	CAMBORNE, CORNWALL	7	5	304	0.01	0.5	1.7	A*D		
1998	01	19	18	34	08.9	52.95	-2.27	381.8	339.8	1.5	1.6	NEWCASTLE-U-LYME, STAFFS	7	30	193	0.10	1.3	1.4	B*D	C/F	
1998	01	20	01	33	17.3	52.94	-2.25	383.4	338.5	1.0	1.1	NEWCASTLE-U-LYME, STAFFS	7	28	189	0.09	1.3	1.6	B*D	C/F	
1998	01	21	20	37	50.8	56.25	-3.76	291.2	707.7	2.8	0.5	BLACKFORD, TAYSIDE	6	15	126	0.09	0.8	3.0	B*C		
1998	01	22	00	50	12.6	56.25	-3.75	291.4	707.9	4.2	1.4	BLACKFORD, TAYSIDE	3+	6	15	107	0.02	0.2	0.5	A*C	FELT BLACKFORD
1998	01	22	09	03	30.5	56.25	-3.76	291.3	708.2	5.3	1.2	BLACKFORD, TAYSIDE	7	15	108	0.04	0.6	1.1	A*C		
1998	01	23	12	03	03.3	50.22	-5.29	165.4	41.3	0.2	0.8	SOUTH CROFTY, CORNWALL	3+	12	6	173	0.04	0.1	1.7	A*C	COLLAPSE-FELT S CROFTY
1998	01	24	15	23	11.8	56.26	-3.75	291.6	708.5	6.0	0.8	BLACKFORD, TAYSIDE	6	15	107	0.04	0.4	0.8	A*C		
1998	01	25	07	43	27.7	53.18	-4.34	243.6	367.7	11.6	-0.1	ANGLESEY, GWYNEDD	9	12	102	0.02	0.1	0.2	A*B		
1998	01	25	16	24	37.5	56.10	-4.60	238.6	692.5	13.3	0.8	LOCH LOMOND, CENTRAL	11	19	220	0.07	0.6	1.1	A*D		
1998	01	25	21	23	03.4	52.94	-2.26	382.8	338.5	0.7	1.4	NEWCASTLE-U-LYME, STAFFS2+	7	29	190	0.17	2.4	2.7	B*D	C/F, FELT WHITMORE	
1998	01	26	01	14	28.0	53.04	-1.19	454.2	349.4	1.0	0.9	MANSFIELD, NOTTS	8	33	117	0.15	0.9	1.7	B*C	C/F	
1998	01	26	18	56	14.8	52.96	-2.27	381.7	340.3	2.3	1.4	NEWCASTLE-U-LYME, STAFFS	7	30	160	0.09	0.8	2.0	A*C	C/F	
1998	01	27	08	36	15.1	50.51	1.24	629.5	72.8	2.8	3.1	STRAIT OF DOVER	18	68	233	0.36	3.1	4.5	C*D		
1998	01	27	22	03	27.2	53.06	-4.42	237.9	354.0	20.1	0.5	CAERNARVON BAY, GWYNEDD	9	9	151	0.05	0.7	1.5	A*C		
1998	02	03	17	58	59.2	52.95	-2.25	382.9	338.9	3.3	1.6	NEWCASTLE-U-LYME, STAFFS	7	29	190	0.10	1.1	1.6	B*D	C/F	
1998	02	04	20	10	47.1	50.23	-5.27	167.0	41.6	0.8	0.0	W OF REDRUTH, CORNWALL	8	5	309	0.03	0.5	3.3	B*D		
1998	02	05	08	28	30.0	52.96	-2.27	382.2	340.2	1.1	1.6	NEWCASTLE-U-LYME, STAFFS	7	29	143	0.07	0.8	1.7	A*C	C/F	
1998	02	06	03	00	09.0	52.96	-2.27	381.8	340.7	2.1	0.9	NEWCASTLE-U-LYME, STAFFS	6	29	194	0.08	1.6	1.6	B*D	C/F	
1998	02	08	05	51	27.3	49.96	-5.50	149.1	12.8	12.4	2.4	PENZANCE, CORNWALL	4+	12	22	277	0.02	0.4	0.4	A*D	FELT SW CORNWALL...
1998	02	10	19	13	42.3	52.94	-2.26	382.8	338.5	0.1	1.3	NEWCASTLE-U-LYME, STAFFS	6	29	190	0.06	1.8	1.6	B*D	C/F	
1998	02	11	20	39	19.3	51.63	-3.01	329.8	193.2	5.2	2.3	CWMBRAN, GWENT	3+	6	14	129	0.06	1.0	1.3	B*C	FELT CWMBRAN...
1998	02	13	11	04	12.3	52.95	-2.27	382.0	339.3	2.0	1.6	NEWCASTLE-U-LYME, STAFFS3+	8	30	159	0.19	1.5	2.3	B*C	C/F, FELT KEELE	
1998	02	15	13	36	56.3	55.49	-1.91	405.4	622.3	16.8	1.9	WOOLER, NORTHUMBERLAND	11	21	238	0.06	0.6	0.3	A*D	7KM SE OF WOOLER	
1998	02	17	14	26	30.1	53.48	-1.15	456.4	398.7	0.1	2.0	DONCASTER, SOUTH YORKS	3+	8	35	123	0.13	0.8	1.5	A*C	C/F, FELT MALTBY...
1998	02	18	01	23	51.1	52.95	-2.27	382.1	339.1	1.3	1.5	NEWCASTLE-U-LYME, STAFFS	8	30	150	0.07	0.7	1.1	A*C	C/F	
1998	02	19	22	45	37.2	52.96	-2.26	382.4	340.2	0.3	1.4	NEWCASTLE-U-LYME, STAFFS2+	6	29	193	0.10	1.4	1.4	B*D	C/F, FELT NEW-U-LYME	
1998	02	22	23	07	04.4	49.39	-2.69	350.2	-55.9	10.4	1.6	GUERNSEY, CHANNEL ISLES	5	44	349	0.01	0.7	4.9	B*D	SOUTH OF GUERNSEY	
1998	02	22	08	04	259.2	52.95	-2.26	382.2	339.7	1.5	1.5	NEWCASTLE-U-LYME, STAFFS3+	7	29	192	0.05	0.7	0.7	A*D	C/F, FELT WHITMORE HEATH	
1998	03	05	20	17	07.2	56.46	-4.37	253.8	732.7	3.6	1.9	KILLIN, CENTRAL	3+	10	31	245	0.07	1.3	0.8	B*D	FELT KILLIN...
1998	03	05	20	21	23.5	56.46	-4.36	254.3	732.5	3.7	1.7	KILLIN, CENTRAL	3+	11	31	245	0.09	1.2	0.9	B*D	FELT KILLIN...
1998	03	06	18	43	46.3	52.97	-4.39	239.4	344.1	23.9	0.1	LLEYN PENIN, GWYNEDD	8	3	188	0.02	0.4	0.4	A*D		
1998	03	07	02	08	59.4	56.42	-5.28	197.8	729.8	5.9	2.7	OBAN, STRATHCLYDE	4+	13	64	195	0.11	1.0	2.8	B*D	FELT OBAN...
1998	03	07	17	00	57.9	55.47	-1.99	400.5	619.7	18.3	1.9	WOOLER, NORTHUMBERLAND	11	17	230	0.09	0.9	0.4	A*D	7KM SOUTH OF WOOLER	

TABLE 1: CATALOGUE OF EVENTS LISTED CHRONOLOGICALLY:1998 continued

Year	Mo	Dy	Hr	Mn	Secs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments	
1998	03	08	01	50	13.7	52.94	-2.26	382.8	338.3	0.9	1.3	NEWCASTLE-U-LYME, STAFFS	7	29	190	0.07	1.1	1.2	B*D	C/F		
1998	03	08	16	50	29.4	60.67	-0.75	468.3	31199.4	15.0	0.9	SHETLAND ISLANDS	3	23	328	0.00			A*D	4KM SE OF UNST		
1998	03	09	17	22	40.2	52.93	-2.22	385.3	337.4	4.3	1.2	STONE, STAFFORDSHIRE	4	27	187	0.09			A*D			
1998	03	09	19	35	49.0	55.46	-2.07	395.4	618.4	19.8	0.8	WOOLER, NORTHUMBERLAND	8	12	221	0.17	2.2	1.5	B*D	8KM SW OF WOOLER		
1998	03	10	09	42	13.4	55.24	-3.53	303.0	595.0	9.3	1.4	JOHNSTONEBRIDGE, D & G	11	11	198	0.14	0.9	2.5	B*D			
1998	03	16	08	23	27.4	52.96	-2.25	383.3	339.9	1.5	1.2	NEWCASTLE-U-LYME, STAFFS	5	28	191	0.15	4.4	4.8	C*D	C/F		
1998	03	16	21	37.5	3.8	51.73	-2.84	341.7	203.5	26.6	1.0	USK, GWENT	7	10	159	0.02	0.4	0.5	A*C			
1998	03	18	17	59	15.0	53.01	-3.72	284.5	347.6	7.9	1.6	BETWS-Y-COED, GWYNEDD	14	30	158	0.09	0.5	4.3	B*C	12KM SE OF BETWS-Y-COED		
1998	03	19	04	59	45.2	49.93	-2.21	384.9	3.6	10.0	1.6	ENGLISH CHANNEL	6	80	237	0.52	15.9		D*D			
1998	03	19	09	57	06.1	52.95	-1.90	406.5	339.2	10.1	1.7	UTTOXETER, STAFFORDSHIRE	8	8	154	0.08	0.6	1.0	A*C			
1998	03	22	23	57	26.6	53.37	-1.18	454.7	386.7	1.6	1.1	WORKSOP, NOTTINGHAMSHIRE	8	27	163	0.31	2.2	3.7	C*C	C/F		
1998	03	23	05	01	10.8	53.37	-1.18	454.8	386.1	2.4	1.1	WORKSOP, NOTTINGHAMSHIRE	8	27	163	0.37	2.4	3.8	C*C	C/F		
1998	03	24	20	51	13.5	56.14	-3.72	292.9	695.9	2.0	1.3	CLACKMANNAN, CENTRAL	10	18	84	0.06	0.3	0.5	A*C	C/F		
1998	03	26	02	53	44.9	52.95	-2.27	382.1	339.4	1.5	1.3	NEWCASTLE-U-LYME, STAFFS	8	29	150	0.08	0.9	1.5	A*C	C/F		
1998	03	26	20	52	04.5	56.25	-3.75	291.5	707.5	5.3	2.2	BLACKFORD, TAYSIDE	3+	9	15	106	0.06	0.4	0.7	A*C	FELT BLACKFORD...	
1998	03	27	07	04	443.4	56.26	-3.75	291.4	708.6	3.0	0.4	BLACKFORD, TAYSIDE	5	15	164	0.14	0.2	0.6	A*D			
1998	03	28	06	10	13.4	48.91	-4.24	236.2	-107.3	9.5	1.8	ENGLISH CHANNEL	13	151	246	0.10	1.4	2.1	B*D			
1998	03	30	19	17	58.5	53.00	-2.06	395.7	344.4	4.3	1.0	KINGSLEY, STAFFORDSHIRE	4	15	292	0.00			A*D	C/F		
1998	03	31	17	50	28.3	52.94	-2.25	383.3	338.0	1.0	1.0	NEWCASTLE-U-LYME, STAFFS	5	29	189	0.09	3.3	3.6	C*D	C/F		
1998	04	01	03	20	55.9	52.95	-2.26	382.5	339.6	1.1	1.2	NEWCASTLE-U-LYME, STAFFS	9	29	117	0.08	0.6	1.3	A*C	C/F, FELT KEELE		
1998	04	03	23	10	09.5	55.01	-3.17	325.3	569.3	6.7	1.1	ANNAN, D & G	13	3	71	0.06	0.3	0.4	A*A			
1998	04	04	23	09	350.2	57.06	-5.44	191.2	802.4	4.1	0.7	KNOYDART, HIGHLAND	4	16	230	0.10			A*D			
1998	04	06	03	57	23.9	54.07	-3.86	278.1	465.2	8.6	0.9	IRISH SEA	11	47	126	0.14	1.2		C*C			
1998	04	06	21	23	17.7	52.98	-4.40	238.8	344.9	21.4	0.3	LLEYN, PENIN, GWYNEDD	7	2	103	0.04	0.5	1.0	A*B			
1998	04	06	21	59	60.0	52.95	-2.26	382.6	339.3	1.0	1.1	NEWCASTLE-U-LYME, STAFFS	8	29	150	0.17	2.0	2.6	B*C	C/F		
1998	04	08	03	28	36.8	56.25	-3.75	291.5	708.3	2.6	0.4	BLACKFORD, TAYSIDE	5	15	123	0.04	0.5		C*D			
1998	04	08	08	12	338.0	55.48	-1.98	401.2	620.5	18.0	1.6	WOOLER, NORTHUMBERLAND	13	17	231	0.09	0.8	0.4	A*D	7KM SOUTH OF WOOLER		
1998	04	17	03	59	01.3	52.95	-2.26	382.7	339.0	1.0	1.4	NEWCASTLE-U-LYME, STAFFS	9	29	116	0.10	0.8	1.4	A*C	C/F		
1998	04	18	03	17	23.1	52.44	-2.82	344.4	282.7	16.7	0.8	RAVEN, SHROPSHIRE	8	10	183	0.09	1.1	1.8	B*D			
1998	04	21	11	34	32.0	53.55	-4.32	246.5	408.6	15.2	0.2	OFF ANGLESEY, IRISH SEA	6	17	282	0.01	0.4	0.3	A*D	15KM NORTH OF ANGLESEY		
1998	04	22	09	40	36.0							SONIC-BOURNEMOUTH	3+							SONIC-FELT BOURNEMOUTH		
1998	04	22	18	41	39.2	52.94	-2.25	383.5	338.3	1.0	1.3	NEWCASTLE-U-LYME, STAFFS	5	28	189	0.08	3.1	2.8	C*D	C/F		
1998	04	23	04	43	30.0	52.66	-1.14	457.8	307.5	10.0	0.9	LEICESTER, LEICS	5	14	260	0.06	3.1	2.8	C*D			
1998	04	26	05	55	38.4	56.24	-4.84	224.0	709.4	16.3	1.0	INVERARAY, STRATHCLYDE	5	45	309	0.03	1.3	5.5	C*D			
1998	04	27	08	21	338.3	54.84	-3.11	328.7	550.3	10.8	1.4	WIGTON, CUMBRIA	14	12	76	0.04	0.2	0.5	A*B	4KM NE OF WIGTON		
1998	04	29	12	07	17.7	55.58	-4.75	226.7	635.5	0.0	2.6	EXPL-IRVINE BAY	12	29	123	0.08	0.6	1.4	A*C	CONFIRMED EXPLOSION		
1998	04	30	01	36	54.8	52.96	-2.26	382.3	340.6	2.5	1.5	NEWCASTLE-U-LYME, STAFFS	9	29	118	0.05	0.4	0.7	A*C	C/F		
1998	05	01	05	22	52.3	56.98	-5.47	189.2	792.6	6.7	0.2	LOCH MORAR, HIGHLAND	5	23	134	0.09	2.7	5.6	C*D			
1998	05	01	06	22	29.4	53.05	-1.05	463.4	350.3	1.1	0.9	OXTON, NOTTINGHAMSHIRE	5	33	160	0.07	0.4	1.2	A*D	C/F		
1998	05	03	02	12	46.7	56.06	-6.05	147.8	692.7	12.9	3.5	OFF JURA, STRATHCLYDE	4	12	85	163	0.11	0.9	1.7	A*D	FELT LOCHGILPHEAD...	
1998	05	05	03	03	3318.2	59.54	1.51	598.4	1078.1	5.2	2.3	NORTHERN NORTH SEA	15	163	126	0.43	2.3	3.6	C*D			
1998	05	05	04	44	13.0	59.47	1.69	609.0	01070.3	15.0	2.3	NORTHERN NORTH SEA	9	176	280	0.33	14.2	17.8	D*D			
1998	05	05	17	21	44.6	53.56	-1.26	448.9	407.0	0.5	1.9	DONCASTER, SOUTH YORKS	4+	6	39	120	0.22	2.2	3.3	B*C	C/F, FELT DONCASTER...	
1998	05	08	08	48	38.0							SONIC-SOUTHERN SCOTLAND2+								SONIC-FELT CRAWFORD		
1998	05	10	12	05	47.0							SONIC-SOUTHERN SCOTLAND2+								SONIC-FELT CRAWFORD		

TABLE 1: CATALOGUE OF EVENTS LISTED CHRONOLOGICALLY:1998 continued

Year	Mo	Dy	Hr	Mn	Secs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments
1998	05	10	22	43	54.3	56.25	-3.74	292.0	707.7	5.1	1.0	BLACKFORD, TAYSIDE	10	15	105	0.08	0.5	0.9	A*C		
1998	05	11	00	14	06.3	55.88	-5.59	175.8	671.3	5.0	0.5	TARBET, STRATHCLYDE	2+	8	53	226	0.13	2.7	6.9	C*D	FELT ACHAHOISH
1998	05	14	18	36	25.8	52.95	-2.26	382.4	339.7	1.0	1.3	NEWCASTLE-U-LYME, STAFFS	6	29	150	0.08	1.6	2.7	B*C	C/F	
1998	05	14	20	47	01.5	51.16-12.10	-305.6	189.1	17.7	3.0	ATLANTIC OCEAN	12156	322	0.37			D*D		150KM WEST OF SW IRELAND		
1998	05	14	21	34	40.8	54.11	-3.14	325.4	469.1	8.2	1.4	BARROW-IN-FURNESS, CBR	14	16	81	0.22	1.1	6.0	C*B		
1998	05	16	23	54	56.3	53.02	2.15	678.6	355.2	0.2	3.8	SOUTHERN NORTH SEA	15	52	290	0.14	2.3	2.0	B*D		
1998	05	18	02	44	552.3	52.96	-4.36	241.5	342.5	23.4	0.8	LLEYN PENIN, GWYNEDD	10	5	102	0.03	0.2	0.6	A*B		
1998	05	18	04	44	619.5	49.02	-1.81	413.7	-97.7	7.6	0.2	JERSEY, CHANNEL ISLANDS	6	26	345	0.02	1.0		C*D		
1998	05	19	06	04	030.1	53.50	-4.20	254.4	403.0	16.9	-0.3	OFF ANGLESEY, GWYNEDD	6	14	266	0.05	2.1	1.8	B*D	8KM NE OF ANGLESEY	
1998	05	22	00	05	804.5	53.24	-1.12	459.0	372.3	2.9	1.6	WORKSOP, NOTTINGHAMSHIRE	8	28	154	0.10	0.8	1.3	A*C	C/F, 7KM SOUTH OF WORKSOP	
1998	05	28	06	44	626.6	54.88	-3.12	328.4	554.2	11.0	1.4	WIGTON, CUMBRIA	13	14	61	0.06	0.2	0.8	A*B		
1998	05	28	11	55	500.7	54.87	-3.11	328.8	553.7	12.0	1.5	WIGTON, CUMBRIA	13	14	61	0.08	0.3	1.0	A*B		
1998	05	29	18	38	332.3	60.69	-1.72	415.11	1200.2	17.7	0.8	NW OF SHETLAND ISLANDS	6	38	300	0.21	4.7	12.3	C*D	20KM NW OF SHETLAND	
1998	05	31	12	55	552.5	51.19	-4.71	210.5	147.0	14.6	2.6	BRISTOL CHANNEL	5	27	213	0.22	7.7	17.2	D*D		
1998	05	31	13	03	321.7	51.21	-4.69	212.2	148.7	8.7	1.7	BRISTOL CHANNEL	6	28	207	0.13	2.0	10.9	C*D		
1998	05	31	13	23	321.6	64.29	-1.08	444.41	1601.8	18.0	3.1	NORWEGIAN SEA	9417	310	0.36			D*D			
1998	06	01	23	02	31.4	53.49	-1.18	454.5	399.1	0.8	1.0	DONCASTER, SOUTH YORKS	5	35	284	0.12	14.5	13.8	D*D	C/F	
1998	06	05	18	27	27.1	56.41	-4.79	227.7	727.2	7.0	1.6	DALMALLY, STRATHCLYDE	8	37	267	0.22	5.5	14.8	D*D		
1998	06	08	04	43	25.1	52.99	-4.49	232.6	346.3	20.9	0.6	CAERNARVON BAY, GWYNEDD	7	5	212	0.04	0.8	0.8	A*D		
1998	06	08	14	06	06.8	56.00	-2.50	369.0	678.9	0.0	1.3	EXPL-DUNBAR, LOTHIAN	3+	6	12	246	0.02	0.1	0.9	A*D	EXPL-FELT DUNBAR
1998	06	09	04	43	25.5	56.14	-3.71	293.6	695.8	1.3	1.5	CLACKMANNAN, CENTRAL	2+	9	17	83	0.03	0.2	0.5	A*C	C/F, FELT CLACKMANNAN
1998	06	17	23	28	07.3	53.44	-1.19	454.0	394.2	1.0	1.5	MALTBY, SOUTH YORKSHIRE	2+	5	31	276	0.17		D*D	C/F, FELT MALTBY	
1998	06	19	20	03	53.8	57.33	-5.44	192.7	831.5	7.3	0.7	PLOCKTON, HIGHLAND	4	13	149	0.04		A*D	15KM SE OF PLOCKTON		
1998	06	21	19	23	39.6	54.02	0.94	592.7	462.0	25.2	2.8	SOUTHERN NORTH SEA	12104	229	0.26	3.3	3.3	C*D			
1998	06	22	16	28	50.5	53.44	-1.13	458.0	394.5	1.0	1.5	MALTBY, SOUTH YORKSHIRE	4	64	281	0.01		A*D	C/F		
1998	06	23	20	16	443.7	58.77	-16.22	418.21	1074.5	22.8	3.5	HATTON BANK, N ATLANTIC	18541	211	0.19	5.1	7.1	D*D	200KM NW OF ROCKALL		
1998	06	25	02	47	553.7	53.45	-1.20	453.3	394.8	2.1	1.9	MALTBY, SOUTH YORKSHIRE	3+	9	31	115	0.16	1.1	2.3	B*C	C/F, FELT STAINTON
1998	06	25	19	55	557.7	49.14	-2.34	375.2	-84.2	24.3	0.3	JERSEY, CHANNEL ISLANDS	6	13	336	0.12	2.3	1.2	B*D	5KM S OF JERSEY	
1998	06	25	20	02	21.1	53.40	-1.19	453.6	389.9	0.3	1.6	MALTBY, SOUTH YORKSHIRE	8	28	122	0.37	2.6	4.8	C*C	C/F, 2KM SE OF MALTBY	
1998	06	26	16	37	720.7	57.54	-5.41	196.0	855.0	7.5	0.7	TORRIDON, HIGHLAND	6	8	158	0.09	2.2	2.3	B*C		
1998	06	28	22	12	10.9	49.07	-2.03	398.1	-92.5	18.1	0.0	JERSEY, CHANNEL ISLANDS	4	15	341	0.00		A*D	10KM SE OF JERSEY		
1998	07	03	04	11	22.5	52.45	-3.20	318.3	284.0	19.2	1.1	NEWTOWN, POWYS	6	7	170	0.05	1.2	0.7	B*C	7KM WSW OF NEWTOWN	
1998	07	03	19	33	46.8	57.58	-5.47	192.4	859.7	7.9	1.7	TORRIDON, HIGHLAND	12	14	96	0.14	0.7	4.4	B*B		
1998	07	05	09	55	39.5	52.88	-4.73	216.3	334.5	17.4	0.5	OFF LLEYN PENIN, GWYNEDD	7	8	249	0.06	1.6	1.2	B*D	3KM OFFSHORE	
1998	07	06	15	55	02.4	56.63	-5.70	173.2	754.3	13.2	2.2	LOCHALINE, HIGHLAND	11	34	200	0.24	3.4	7.2	C*D		
1998	07	08	23	14	43.4	56.89	7.73	991.3	820.2	15.0	3.3	SKAGERAK	28626	320	0.49			D*D			
1998	07	09	02	10	40.2	56.14	-3.71	294.0	694.9	0.8	0.8	CLACKMANNAN, CENTRAL	6	18	167	0.03	0.3	0.7	A*C	C/F	
1998	07	10	05	49	40.5	53.10	-4.30	245.9	358.4	19.0	-0.3	CAERNARVON, GWYNEDD	7	10	149	0.06	0.8	1.6	A*C	4KM SW OF CAERNARVON	
1998	07	13	08	20	44.4	52.15	-2.70	351.8	250.1	18.2	1.9	LEOMINSTER, HER & WOR	9	16	154	0.09	0.7	1.7	A*C	9KM SOUTH OF LEOMINSTER	
1998	07	14	21	17	48.0	57.08	-5.75	173.0	804.8	14.2	0.3	KNOYDART, HIGHLAND	3	18	175	0.01		A*D			
1998	07	16	09	36	34.4	52.96	-4.38	240.3	342.5	22.3	0.6	LLEYN PENIN, GWYNEDD	8	4	188	0.05	0.6	0.8	A*D		
1998	07	17	19	28	04.8	55.38	-3.06	333.1	609.8	11.0	0.8	HAWICK, BORDERS	7	12	284	0.03	0.6	0.7	A*D	16KM SW OF HAWICK	
1998	07	18	05	22	41.4	49.19	-1.55	432.5	-79.0	4.8	0.7	CHERBOURG PENINSULA	6	35	350	0.05	4.1	1.2	C*D	35KM SE OF JERSEY	
1998	07	20	07	38	27.6	55.57	-6.54	114.0	639.6	6.1	2.4	ISLAY, STRATHCLYDE	12	60	211	0.11	1.2	1.8	B*D		
1998	07	21	05	11	39.1	52.68	-0.89	474.7	309.5	4.5	1.1	LEICESTER, LEICS	6	25	251	0.16	5.7	3.9	D*D	13KM NE OF LEICESTER	

TABLE 1: CATALOGUE OF EVENTS LISTED CHRONOLOGICALLY:1998 continued

Year	Mo	Dy	Hr	Mn	Secs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments
1998	07	21	07	10	1.4	55.10	-3.63	295.8	579.9	12.8	2.0	LOCHARBRIGGS, D & G	3+	8	8	134	0.09	0.7	1.6	A*B	FELT LOCHARBRIGGS...
1998	07	23	01	55	1.3	55.09	-3.62	296.5	578.7	8.2	1.4	LOCHARBRIGGS, D & G	3+	7	10	167	0.06	0.6	2.5	B*C	FELT TINWALD
1998	07	23	21	38	14.6	56.14	-3.71	293.8	696.0	1.6	1.6	CLACKMANNAN, CENTRAL	3+	6	17	130	0.04	0.4	1.1	A*C	C/F, FELT COALSNAUGHTON..
1998	07	24	00	57	49.3	53.45	-1.18	454.8	395.0	0.5	1.8	MALTBY, SOUTH YORKSHIRE	5	32	171	0.04	0.7	1.5	A*D	C/F	
1998	07	30	02	02	35.8	53.36	-0.65	490.1	385.9	7.7	1.7	GAINSBOROUGH, LINCS	8	44	219	0.09	0.9	C*D	6KM SE OF GAINSBOROUGH		
1998	07	31	10	59	06.8	53.34	-2.38	374.8	382.8	9.0	2.3	ALTRINCHAM, G MANCHESTER	11	42	131	0.07	0.4	10.6	C*C		
1998	08	03	10	59	32.3	56.14	-3.72	293.4	695.8	1.3	1.2	CLACKMANNAN, CENTRAL	2+	6	17	130	0.02	0.2	0.6	A*C	C/F, FELT SHANNOCKHILL
1998	08	05	06	44	46.3	57.02	-5.82	168.2	798.7	8.2	0.5	KNOYDART, HIGHLAND	4	11	193	0.08		A*D			
1998	08	08	22	07	10.1	53.99	-2.75	350.9	454.7	11.1	2.3	GALGATE, LANCASHIRE	21	45	66	0.10	0.4	1.9	A*C		
1998	08	09	20	05	09.8	53.02	-2.20	386.7	346.6	2.5	1.6	STOKE-ON-TRENT, STAFFS	8	24	159	0.05	0.4	0.7	A*C		
1998	08	10	02	08	53.3	52.96	-4.39	239.3	343.0	21.8	0.1	LLEYN PENIN, GWYNEDD	5	3	192	0.01	1.0	0.3	A*D		
1998	08	11	17	40	26.0	55.22	-3.50	304.5	592.6	6.3	0.4	JOHNSTONEBRIDGE, D & G	7	11	175	0.09	0.9	5.2	C*C		
1998	08	12	08	21	01.5	56.14	-3.66	296.6	694.9	0.1	0.7	EXPL-MEADOWHILL, CENTRAL	5	16	120	0.06	0.9	2.6	B*D	EXPL-FELT FOREST MILL	
1998	08	20	13	31	32.7	53.35	-2.38	374.6	383.4	6.2	1.9	ALTRINCHAM, G MANCHESTER	8	41	153	0.12	1.1	11.1	C*C		
1998	08	25	22	40	34.0	59.54	1.84	616.9	1078.3	18.5	2.3	NORTHERN NORTH SEA	15181	189	0.45	4.2	6.9	C*D			
1998	08	26	18	59	26.9	53.23	-1.14	457.3	370.5	2.4	1.0	MANSFIELD, NOTTS	4	26	275	0.19		B*D	C/F, 8KM NE OF MANSFIELD		
1998	08	27	05	45	32.4	49.63	-5.45	150.6	-24.4	8.5	1.1	ENGLISH CHANNEL	6	55	326	0.06	5.2	D*D	35KM SW OF LIZARD POINT		
1998	08	28	10	35	37.0	56.25	-3.75	291.5	707.6	5.9	1.4	BLACKFORD, TAYSIDE	8	15	106	0.04	0.4	0.8	A*C		
1998	08	30	06	54	17.3	53.10	-4.35	242.7	358.8	16.3	0.4	CAENARVON BAY, GWYNEDD	10	13	105	0.06	0.5	0.9	A*B		
1998	08	30	08	39	52.5	49.87	-6.52	75.0	6.6	3.2	1.7	SCILLY ISLES, CORNWALL	6	75	352	0.16		8.5	D*D	WEST OF SCILLY ISLES	
1998	08	31	12	23	14.3	53.03	-5.33	176.6	353.1	9.2	2.1	IRISH SEA	9	52	176	0.04	0.5	C*D	55KM SW OF HOLYHEAD		
1998	09	02	18	33	27.8	56.15	-3.71	293.7	696.0	2.4	1.8	CLACKMANNAN, CENTRAL	2+	11	17	83	0.09	0.4	0.9	A*C	C/F, FELT DOLLAR...
1998	09	04	01	17	54.5	56.14	-3.71	294.0	695.6	0.8	0.9	CLACKMANNAN, CENTRAL	6	17	128	0.02	0.2	0.6	A*C	C/F	
1998	09	10	02	20	27.0	55.77	-3.42	311.1	654.1	7.6	0.5	WEST LINTON, BORDERS	5	8	257	0.06	1.6	3.3	B*D	5KM NW OF WEST LINTON	
1998	09	12	23	06	11.3	54.73	-2.98	337.0	538.1	9.2	0.2	SEBERGHAM, CUMBRIA	6	17	286	0.04	0.7	1.2	A*D		
1998	09	15	02	33	06.9	55.56	-4.96	213.5	633.6	12.8	2.1	FIRTH OF CLYDE	12	35	143	0.11	0.8	2.3	B*C		
1998	09	15	19	44	38.0	53.24	-4.58	227.7	374.1	10.2	-0.4	ANGLESEY, GWYNEDD	6	2	257	0.05	1.0	1.2	B*D	8KM SOUTH OF HOLYHEAD	
1998	09	18	03	00	57.9	50.30	-5.37	160.4	49.7	0.9	0.4	OFF ST IVES, CORNWALL	10	16	264	0.05	0.9	10.8	C*D	10KM NE OF ST IVES	
1998	09	24	09	07	02.0	58.61	-4.87	233.3	972.3	0.0	0.4	EXPL-CAPE WRATH	4+	6	8	172	0.09	1.1	2.0	B*C	EXPL-FELT DOUNREAY
1998	09	24	09	07	56.8	58.60	-4.86	233.5	971.1	0.0	0.5	EXPL-CAPE WRATH	4+	7	8	164	0.09	1.0	1.4	A*C	EXPL-FELT DOUNREAY
1998	09	24	09	08	56.8	58.60	-4.87	233.3	971.4	0.0	0.1	EXPL-CAPE WRATH	4+	4	8	182	0.06		A*D	EXPL-FELT DOUNREAY	
1998	09	24	09	12	00.2	58.63	-4.88	233.0	974.4	0.0	0.3	EXPL-CAPE WRATH	4+	4	7	209	0.04		A*D	EXPL-FELT DOUNREAY	
1998	09	24	12	58	29.8	56.92	-5.47	189.1	786.7	8.1	1.5	GLENFINNAN, HIGHLAND	6	22	129	0.09	0.8	16.6	C*C	6KM NORTH OF GLENFINNAN	
1998	09	26	13	06	22.7	53.02	-2.19	387.0	347.0	3.9	1.7	NEWCASTLE-U-LYME, STAFFS	7	24	197	0.10	1.1	1.4	B*D		
1998	09	27	11	03	57.6	56.19	-4.10	269.9	702.0	4.1	1.2	DOUNE, CENTRAL	10	15	151	0.06	0.4	0.6	A*C		
1998	09	28	16	42	30.7	54.46	-3.37	311.0	507.9	12.8	0.1	SEASCALE, CUMBRIA	7	8	134	0.04	0.4	1.0	A*B	9KM NE OF SEASCALE	
1998	09	28	16	29	36.6	52.55	-1.81	413.0	294.5	7.5	2.0	SUTTON COLDFIELD, W MID	9	40	163	0.08	0.3	1.2	A*C		
1998	09	28	18	52	39.2	57.44	-4.50	250.2	841.9	7.0	0.9	BEAULY, HIGHLAND	7	8	178	0.07	2.7	0.6	C*C		
1998	09	28	18	54	49.5	57.45	-4.50	250.2	842.8	7.5	1.1	BEAULY, HIGHLAND	7	8	179	0.09	3.6	1.0	C*C		
1998	09	30	02	22	40.6	55.33	-3.57	300.2	605.3	5.2	0.3	MOFFAT, D & G	8	18	257	0.09	1.3	12.9	C*D	9KM WEST OF MOFFAT	
1998	10	01	18	45	09.4	53.12	-1.27	448.7	357.9	0.0	1.0	MANSFIELD, NOTTS	5	23	222	0.37	0.8	1.1	C*D	C/F	
1998	10	04	15	30	19.6	59.71	-2.02	626.0	1098.4	9.1	2.6	NORTHERN NORTH SEA	19185	163	0.51	3.1	4.7	D*D			
1998	10	04	15	30	19.6	53.26	-1.67	422.0	374.1	18.0	1.9	BAKEWELL, DERBYSHIRE	7	10	136	0.05	0.6	0.6	A*C	5KM NORTH OF BAKEWELL	
1998	10	06	02	16	32.8	53.22	-1.04	464.3	369.4	1.0	1.8	NEW OLLERTON, NOTTS	6	33	189	0.06	0.6	0.8	A*D	C/F	
1998	10	07	18	39	42.8	53.60	-0.29	512.8	413.1	30.7	2.8	GRIMSBY, HUMBERSIDE	15	16	143	0.12	0.7	0.5	A*C	13KM NW OF GRIMSBY	

TABLE 1: CATALOGUE OF EVENTS LISTED CHRONOLOGICALLY:1998 continued

Year	Mo	Dy	Hr	Mn	Secs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments
1998	1	09	02	07	15.7	53.22	-1.02	465.1	369.7	1.0	0.6	NEW OLLERTON, NOTTS	5	34	218	0.07	2.2	2.9	B*D	C/F	
1998	1	11	00	36	37.0	57.09	-5.62	180.4	805.9	5.0	1.5	KNOYDART, HIGHLAND	5	18	150	0.04	0.8	8.2	C*D		
1998	1	13	05	21	19.8	53.05	-1.07	462.3	350.2	1.0	0.7	OXTON, NOTTINGHAMSHIRE	3+	5	34	158	0.24	0.6	1.5	B*D	C/F, FELT OXTON
1998	1	16	13	04	51.1	53.18	-4.23	251.1	367.2	11.9	2.7	MENAI STRAIT, GWYNEDD	4	9	6	80	0.03	0.2	0.4	A*A	FELT FELINHELI...
1998	1	19	15	01	38.0							SONIC-NORTH WALES	3+								SONIC-FELT HOLYHEAD...
1998	1	21	22	35	20.3	53.23	-2.30	379.7	369.9	4.1	1.1	MIDDLEWICH, CHESHIRE	4	39	317	0.01			A*D	7KM SE OF MIDDLEWICH	
1998	1	22	07	55	458.9	52.25	-3.34	308.3	262.5	15.9	0.7	LLANDRINDOD WELLS, POWYS	7	20	125	0.04	0.3	1.0	A*B		
1998	1	30	05	27	50.7	51.83	-4.49	228.3	217.2	11.8	1.8	ST CLEARS, DYFED	10	23	122	0.09	0.6	0.7	A*B		
1998	1	31	03	47	41.8	53.10	-1.32	445.3	356.2	0.2	0.7	MANSFIELD, NOTTS	4	22	217	0.18			B*D	C/F, 8KM SW OF MANSFIELD	
1998	1	31	07	08	44.7	54.18	-1.69	420.3	475.8	2.3	1.7	RIPON, NORTH YORKSHIRE	10	28	113	0.12	0.7	1.6	A*C		
1998	1	31	10	19	209.3	52.47	-1.61	426.3	286.4	3.3	1.2	COVENTRY, W MIDLANDS	8	36	206	0.05	1.9	2.9	B*D	C/F	
1998	1	31	12	24	53.0	52.35	-3.06	327.8	273.2	15.0	0.7	KNIGHTON, POWYS	7	8	140	0.04	0.4	0.5	A*C		
1998	1	31	13	25	5840.9	54.92	-3.25	319.9	559.4	5.0	0.7	WIGTON, CUMBRIA	8	19	102	0.04	0.3	5.8	C*C	12KM NW OF WIGTON	
1998	1	31	14	23	443.5	53.09	-1.31	446.1	355.4	0.3	0.8	MANSFIELD, NOTTS	4	23	218	0.46			C*D	C/F, 7KM SW OF MANSFIELD	
1998	1	31	15	06	640.4	52.91	-1.75	416.7	335.0	14.2	1.5	UTTOXETER, STAFFORDSHIRE	5	13	117	0.04	0.7	0.9	A*D	8KM EAST OF UTTOXETER	
1998	1	31	16	13	205.7	54.15	-2.32	379.4	472.9	7.9	1.6	SETTLE, NORTH YORKSHIRE	10	45	121	0.16	1.0		C*C	9KM NORTH OF SETTLE	
1998	1	31	17	14	1439.4	51.81	-2.38	373.5	212.4	14.1	0.9	GLOUCESTER, GLOUC'SHIRE	7	28	172	0.04	0.3	0.9	A*C	10KM WSW OF GLOUCESTER	
1998	1	31	18	14	4334.8	51.70	-3.07	326.4	200.8	15.0	2.0	PONTYPOOL, GWENT	9	19	67	0.08	0.7	1.7	A*B		
1998	1	31	19	24	252.2	55.35	-3.28	318.8	607.0	10.0	1.0	MOFFAT, D & G	3	6	335	0.31			C*D	10KM EAST OF MOFFAT	
1998	1	31	20	24	343.1.9	52.95	-4.37	240.9	342.2	23.3	0.5	LLEYN PENIN, GWYNEDD	8	5	111	0.01	0.1	0.4	A*B		
1998	1	31	21	24	2310.4	56.05	-5.28	195.7	688.5	9.5	1.5	LOCH FYNE, STRATHCLYDE	10	40	230	0.05	0.8	6.0	C*D		
1998	1	31	22	24	2937.1	55.09	-3.62	296.9	578.2	4.2	0.1	LOCHARBRIGGS, D & G	7	10	126	0.11	0.7		C*C		
1998	1	31	23	24	1513.4	53.20	-1.95	403.3	367.3	11.1	0.9	BUXTON, DERBYSHIRE	4	22	209	0.08			A*D	6KM SW OF BUXTON	
1998	1	31	24	24	4435.0	51.89	-3.67	285.2	223.0	13.3	0.7	SENNYBRIDGE, POWYS	10	34	129	0.09	0.6	0.7	A*C	10KM SW OF SENNYBRIDGE	
1998	1	31	25	24	4640.3	53.21	-0.87	475.3	369.1	2.6	1.0	TUXFORD, NOTTINGHAMSHIRE	5	34	230	0.26	8.9	12.9	D*D	C/F	
1998	1	31	26	24	22203.5	55.30	-6.17	135.2	608.2	7.2	1.7	RATHLIN IS, N IRELAND	7	24	268	0.14	3.4	6.9	C*D		
1998	1	31	27	24	05058.2	51.67	-3.20	317.0	197.9	7.7	1.4	BLACKWOOD, GWENT	8	28	137	0.09	0.6		C*C		
1998	1	31	28	24	2846.0							SONIC-LANCASHIRE	4+							SONIC-FELT LANCASHIRE...	
1998	1	29	24	55	44.2	49.97	-4.29	235.8	10.4	15.0	1.1	ENGLISH CHANNEL	3	49	349	0.00			A*D		
1998	1	29	25	08	640.2	52.57	-1.89	407.6	297.4	7.9	2.0	WALSALL, WEST MIDLANDS	9	43	152	0.12	0.9		C*C		
1998	1	29	26	21	2354.6	52.20	-3.50	297.6	256.5	20.8	1.2	BUILTH WELLS, POWYS	10	18	100	0.02	0.1	0.3	A*B	7KM NW OF BUILTH WELLS	
1998	1	29	27	01	2509.9	53.93	-1.22	451.1	448.1	19.8	1.9	YORK, NORTH YORKSHIRE	7	60	267	0.37	10.7		D*D		
1998	1	29	28	03	1030.3	48.94	-2.38	372.4-106.4		8.1	1.6	JERSEY, CHANNEL ISLES	5	31	345	0.05	2.8		C*D	30KM SW OF JERSEY	
1998	1	29	29	08	4944.1	51.81	-3.98	263.3	214.1	18.8	1.5	AMMANFORD, DYFED	10	13	137	0.11	1.4	0.8	B*C		
1998	1	29	30	16	1826.3	56.98	-5.48	188.6	792.6	8.1	0.7	LOCH MORAR, HIGHLAND	5	22	243	0.12	0.7	12.9	C*D		

TABLE 2

**CATALOGUE OF EARTHQUAKES LISTED IN
ORDER OF DECREASING LATITUDE: 1998**

KEY TO BULLETIN ENCODING

YearMoDy	: Year, month and day of event.
HrMn Secs	: Time of occurrence of event in hours, mins and secs, (UTC).
Lat	: Latitude of the event, positive latitude indicates north.
Lon	: Longitude of the event, negative longitude indicates west.
kmE	: UK National Grid Reference in kilometres east of grid origin.
kmN	: UK National Grid Reference in kilometres north of grid origin.
Dep	: Depth of the hypocentre in kilometres.
Mag	: Richter local magnitude of the event.
Locality	: A geographical indication of the epicentral area, usually the nearest town followed by the region. A key to the abbreviations used in the locality column are given below.
Int	: Maximum EMS intensity. 2+ indicates felt, no macroseismic details. 3+, 4+ etc indicates felt at 3 or 4, but no survey carried out. 3, 4, 5 etc describes the maximum EMS intensity produced by the event.
Comments	: Additional comments about the event eg: C/F, see below under comments abbreviations.

The following abbreviations are extracted from the output of the location program HYPO71 (Lee and Lahr, 1975)

No	: Total number of P and S readings used in the event location.
DM	: Epicentral distance in kilometres to the closest station.
Gap	: Largest azimuthal separation in degrees between stations.
RMS	: Root Mean Square of the travel-time residuals in seconds.
ERH	: Standard error of the epicentre in kilometres. When this column is blank, the error is large and indeterminate.
ERZ	: Standard error of the focal depth in kilometres. When this column is blank, the error is large and indeterminate.
SQD	: S is quality factor ascribed to RMS, D is quality ascribed to number and distribution of stations.

Locality abbreviations

Sonic	: Sonic boom	W Glamorgan	: West Glamorgan
Expl	: Explosion	Notts	: Nottinghamshire
D & G	: Dumfries and Galloway	S'Clyde	: Strathclyde
Her & Wor	: Hereford and Worcester	S Yorkshire	: South Yorkshire
N'umberland	: Northumberland	West Yorks	: West Yorkshire
Leics	: Leicestershire	Staffs	: Staffordshire
New-U-Lyme	: Newcastle-Under-Lyme	Gloucs	: Gloucestershire
Penin	: Peninsula	Cbr	: Cumbria
W Mid	: West Midlands	Lincs	: Lincolnshire

Comments abbreviations

Sonic	: Sonic boom
Expl	: Explosion
C/F	: Coalfield type event
...	: and felt elsewhere

TABLE 2: CATALOGUE OF EARTHQUAKES LISTED IN ORDER OF DECREASING LATITUDE:1998

Year	Mo	Dy	Hr	Mn	Secs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments	
19980531	13	23	21	6	42.29	-1.08	444.41	601.8	18.0	3.1	NORWEGIAN SEA	9417	310	0.36			D*D					
19980529	18	38	23	30	6.69	-1.72	415.11	200.2	17.7	0.8	NW OF SHETLAND ISLANDS	6	38	300	0.21	4.7	12.3	C*D	20KM NW OF SHETLAND			
19980308	16	50	29	4	60.67	-0.75	468.31	1199.4	15.0	0.9	SHETLAND ISLANDS	3	23	328	0.00			A*D	4KM SE OF UNST			
19980114	11	30	30	5	60.07	1.41	590.01	1136.8	15.0	1.8	NORTHERN NORTH SEA	7144	337	0.60			D*D					
19981004	10	59	57	0	59.71	2.02	626.01	01098.4	9.1	2.6	NORTHERN NORTH SEA	19185	163	0.51	3.1	4.7	D*D					
19980505	00	33	18	2	59.54	1.51	598.41	01078.1	5.2	2.3	NORTHERN NORTH SEA	15163	126	0.43	2.3	3.6	C*D					
19980825	22	40	34	0	59.54	1.84	616.91	01078.3	18.5	2.3	NORTHERN NORTH SEA	15181	189	0.45	4.2	6.9	C*D					
19980505	00	44	13	0	59.47	1.69	609.01	01070.3	15.0	2.3	NORTHERN NORTH SEA	9176	280	0.33	14.2	17.8	D*D					
19980623	20	16	43	7	58.77	-16.22	418.21	01074.5	22.8	3.5	HATTON BANK, N ATLANTIC	18541	211	0.19	5.1	7.1	D*D	200KM NW OF ROCKALL				
19980703	19	33	46	8	57.58	-5.47	192.4	859.7	7.9	1.7	TORRIDON, HIGHLAND	12	14	96	0.14	0.7	4.4	B*B				
19980626	16	37	20	7	57.54	-5.41	196.0	855.0	7.5	0.7	TORRIDON, HIGHLAND	6	8	158	0.09	2.2	2.3	B*C				
19980928	18	54	49	5	57.45	-4.50	250.2	842.8	7.5	1.1	BEAULY, HIGHLAND	7	8	179	0.09	3.6	1.0	C*C				
19980928	18	52	23	9	57.44	-4.50	250.2	841.9	7.0	0.9	BEAULY, HIGHLAND	7	8	178	0.07	2.7	0.6	C*C				
19980619	20	03	35	8	57.33	-5.44	192.7	831.5	7.3	0.7	PLOCKTON, HIGHLAND	4	13	149	0.04			A*D	15KM SE OF PLOCKTON			
19981011	00	36	37	0	57.09	-5.62	180.4	805.9	5.0	1.5	KNOYDART, HIGHLAND	5	18	150	0.04	0.8	8.2	C*D				
19980714	21	17	48	0	57.08	-5.75	173.0	804.8	14.2	0.3	KNOYDART, HIGHLAND	3	18	175	0.01			A*D				
19980404	23	03	50	2	57.06	-5.44	191.2	802.4	4.1	0.7	KNOYDART, HIGHLAND	4	16	230	0.10			A*D				
19980805	06	44	46	3	57.02	-5.82	168.2	798.7	8.2	0.5	KNOYDART, HIGHLAND	4	11	193	0.08			A*D				
19980109	07	44	40	8	56.98	-5.32	198.1	792.9	7.8	1.9	GLEN GARRY, HIGHLAND	7	44	188	0.10	1.3		C*D				
19980501	00	52	23	3	56.98	-5.47	189.2	792.6	6.7	0.2	LOCH MORAR, HIGHLAND	5	23	134	0.09	2.7	5.6	C*D				
19981228	16	18	26	3	56.98	-5.48	188.6	792.6	8.1	0.7	LOCH MORAR, HIGHLAND	5	22	243	0.12	0.7	12.9	C*D				
19980924	12	58	29	8	56.92	-5.47	189.1	786.7	8.1	1.5	GLENFINNAN, HIGHLAND	6	22	129	0.09	0.8	16.6	C*C	6KM NORTH OF GLENFINNAN			
19980708	23	14	43	4	56.89	7.73	991.3	820.2	15.0	3.3	SKAGERRAK	28626	320	0.49			D*D					
19980108	15	56	46	3	56.69	-5.24	201.5	760.0	15.1	1.5	ONICH, HIGHLAND	3+	6	44	170	0.06	1.6	2.4	B*C	FELT ONICH		
19980706	15	50	25	4	56.63	-5.70	173.2	754.3	13.2	2.2	LOCALINE, HIGHLAND	11	34	200	0.24	3.4	7.2	C*D				
19980305	20	17	07	2	56.46	-4.37	253.8	732.7	3.6	1.9	KILLIN, CENTRAL	3+	10	31	245	0.07	1.3	0.8	B*D	FELT KILLIN...		
19980305	20	21	23	5	56.46	-4.36	254.3	732.5	3.7	1.7	KILLIN, CENTRAL	3+	11	31	245	0.09	1.2	0.9	B*D	FELT KILLIN...		
19980307	02	08	59	4	56.42	-5.28	197.8	729.8	5.9	2.7	OBAN, STRATHCLYDE	4+	13	64	195	0.11	1.0	2.8	B*D	FELT OBAN...		
19980605	18	27	27	1	56.41	-4.79	227.7	727.2	7.0	1.6	DALMALLY, STRATHCLYDE	8	37	267	0.22	5.5	14.8	D*D				
19980124	15	23	11	8	56.26	-3.75	291.6	708.5	6.0	0.8	BLACKFORD, TAYSIDE	6	15	107	0.04	0.4	0.8	A*C				
19980327	07	04	43	4	56.26	-3.75	291.4	708.6	3.0	0.4	BLACKFORD, TAYSIDE	5	15	164	0.14	0.2	0.6	A*D				
19980107	21	01	15	9	56.25	-3.76	291.3	708.0	5.7	0.6	BLACKFORD, TAYSIDE	7	15	107	0.04	0.5	0.9	A*C				
19980121	20	37	50	8	56.25	-3.76	291.2	707.7	2.8	0.5	BLACKFORD, TAYSIDE	6	15	126	0.09	0.8	3.0	B*C				
19980122	00	50	12	6	56.25	-3.75	291.4	707.9	4.2	1.4	BLACKFORD, TAYSIDE	3+	6	15	107	0.02	0.2	0.5	A*C	FELT BLACKFORD		
19980122	09	03	30	5	56.25	-3.76	291.3	708.2	5.3	1.2	BLACKFORD, TAYSIDE	7	15	108	0.04	0.6	1.1	A*C				
19980326	20	52	04	5	56.25	-3.75	291.5	707.5	5.3	2.2	BLACKFORD, TAYSIDE	3+	9	15	106	0.06	0.4	0.7	A*C	FELT BLACKFORD...		
19980408	03	28	36	8	56.25	-3.75	291.5	708.3	2.6	0.4	BLACKFORD, TAYSIDE	5	15	123	0.04	0.5		C*D				
19980510	22	43	54	3	56.25	-3.74	292.0	707.7	5.1	1.0	BLACKFORD, TAYSIDE	10	15	105	0.08	0.5	0.9	A*C				
19980828	10	35	37	0	56.25	-3.75	291.5	707.6	5.9	1.4	BLACKFORD, TAYSIDE	8	15	106	0.04	0.4	0.8	A*C				
19980426	05	55	38	4	56.24	-4.84	224.0	709.4	16.3	1.0	INVERARAY, STRATHCLYDE	5	45	309	0.03	1.3	5.5	C*D				
19980927	11	03	57	6	56.19	-4.10	269.9	702.0	4.1	1.2	DOUNE, CENTRAL	10	15	151	0.06	0.4	0.6	A*C				
19980902	18	33	27	8	56.15	-3.71	293.7	696.0	2.4	1.8	CLACKMANNAN, CENTRAL	2+	11	17	83	0.09	0.4	0.9	A*C	C/F, FELT DOLLAR...		
19980324	20	05	13	5	56.14	-3.72	292.9	695.9	2.0	1.3	CLACKMANNAN, CENTRAL	10	18	84	0.06	0.3	0.5	A*C	C/F			

TABLE 2: CATALOGUE OF EARTHQUAKES LISTED IN ORDER OF DECREASING LATITUDE:1998 continued

Year	Mo	Dy	Hr	Mn	Secs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments
19980609	04	43	52.5	56.14	-3.71	293.6	695.8	1.3	1.5	CLACKMANNAN, CENTRAL	2+	9	17	83	0.03	0.2	0.5	A*C	C/F, FELT	CLACKMANNAN	
19980709	02	10	40.2	56.14	-3.71	294.0	694.9	0.8	0.8	CLACKMANNAN, CENTRAL		6	18	167	0.03	0.3	0.7	A*C	C/F		
19980723	21	38	14.6	56.14	-3.71	293.8	696.0	1.6	1.6	CLACKMANNAN, CENTRAL	3+	6	17	130	0.04	0.4	1.1	A*C	C/F, FELT	COALSNAUGHTON..	
19980803	10	59	32.3	56.14	-3.72	293.4	695.8	1.3	1.2	CLACKMANNAN, CENTRAL	2+	6	17	130	0.02	0.2	0.6	A*C	C/F, FELT	SHANNOCKHILL	
19980904	01	17	54.5	56.14	-3.71	294.0	695.6	0.8	0.9	CLACKMANNAN, CENTRAL		6	17	128	0.02	0.2	0.6	A*C	C/F		
19980915	16	24	37.5	56.10	-4.60	238.6	692.5	13.3	0.8	LOCH LOMOND, CENTRAL		11	19	220	0.07	0.6	1.1	A*D			
19980503	02	12	46.7	56.06	-6.05	147.8	692.7	12.9	3.5	OFF JURA, STRATHCLYDE	4	12	85	163	0.11	0.9	1.7	A*D	FELT	LOCHGILPHEAD...	
19981202	02	32	10.4	56.05	-5.28	195.7	688.5	9.5	1.5	LOCH FYNE, STRATHCLYDE		10	40	230	0.05	0.8	6.0	C*D			
19980511	00	14	06.3	55.88	-5.59	175.8	671.3	5.0	0.5	TARBET, STRATHCLYDE	2+	8	53	226	0.13	2.7	6.9	C*D	FELT	ACHAHOISH	
19980910	02	20	27.0	55.77	-3.42	311.1	654.1	7.6	0.5	WEST LINTON, BORDERS		5	8	257	0.06	1.6	3.3	B*D	5KM NW OF	WEST LINTON	
19980720	07	38	27.6	55.57	-6.54	114.0	639.6	6.1	2.4	ISLAY, STRATHCLYDE		12	60	211	0.11	1.2	1.8	B*D			
19980915	02	33	06.9	55.56	-4.96	213.5	633.6	12.8	2.1	FIRTH OF CLYDE		12	35	143	0.11	0.8	2.3	B*C			
19980215	13	36	56.3	55.49	-1.91	405.4	622.3	16.8	1.9	WOOLER, NORTHUMBERLAND		11	21	238	0.06	0.6	0.3	A*D	7KM SE OF	WOOLER	
19980408	08	12	38.0	55.48	-1.98	401.2	620.5	18.0	1.6	WOOLER, NORTHUMBERLAND		13	17	231	0.09	0.8	0.4	A*D	7KM SOUTH OF	WOOLER	
19980307	17	00	57.9	55.47	-1.99	400.5	619.7	18.3	1.9	WOOLER, NORTHUMBERLAND		11	17	230	0.09	0.9	0.4	A*D	7KM SOUTH OF	WOOLER	
19980309	19	35	49.0	55.46	-2.07	395.4	618.4	19.8	0.8	WOOLER, NORTHUMBERLAND		8	12	221	0.17	2.2	1.5	B*D	8KM SW OF	WOOLER	
19980717	19	28	04.8	55.38	-3.06	333.1	609.8	11.0	0.8	HAWICK, BORDERS		7	12	284	0.03	0.6	0.7	A*D	16KM SW OF	HAWICK	
19981128	02	42	52.2	55.35	-3.28	318.8	607.0	10.0	1.0	MOFFAT, D & G		3	6	335	0.31		C*D	10KM EAST OF	MOFFAT		
19980113	04	03	12.9	55.34	-2.95	339.5	605.9	10.1	0.9	TEVIOTHEAD, D & G		8	16	170	0.10	1.2	3.2	B*C			
19980930	02	24	09.6	55.33	-3.57	300.2	605.3	5.2	0.3	MOFFAT, D & G		8	18	257	0.09	1.3	12.9	C*D	9KM WEST OF	MOFFAT	
19981204	03	22	03.5	55.30	-6.17	135.2	608.2	7.2	1.7	RATHLIN IS, N IRELAND		7	24	268	0.14	3.4	6.9	C*D			
19980310	09	42	13.4	55.24	-3.53	303.0	595.0	9.3	1.4	JOHNSTONEBRIDGE, D & G		11	11	198	0.14	0.9	2.5	B*D			
19980811	17	40	26.0	55.22	-3.50	304.5	592.6	6.3	0.4	JOHNSTONEBRIDGE, D & G		7	11	175	0.09	0.9	5.2	C*C			
19980721	07	17	01.4	55.10	-3.63	295.8	579.9	12.8	2.0	LOCHARBRIGGS, D & G	3+	8	8	134	0.09	0.7	1.6	A*B	FELT	LOCHARBRIGGS...	
19980723	00	15	51.3	55.09	-3.62	296.5	578.7	8.2	1.4	LOCHARBRIGGS, D & G	3+	7	10	167	0.06	0.6	2.5	B*C	FELT	TINWALD	
19981202	19	29	37.1	55.09	-3.62	296.9	578.2	4.2	0.1	LOCHARBRIGGS, D & G		7	10	126	0.11	0.7	C*C				
19980403	23	51	09.5	55.01	-3.17	325.3	569.3	6.7	1.1	ANNAN, D & G		13	3	71	0.06	0.3	0.4	A*A			
19981109	22	58	40.9	54.92	-3.25	319.9	559.4	5.0	0.7	WIGTON, CUMBRIA		8	19	102	0.04	0.3	5.8	C*C	12KM NW OF	WIGTON	
19980528	06	46	26.6	54.88	-3.12	328.4	554.2	11.0	1.4	WIGTON, CUMBRIA		13	14	61	0.06	0.2	0.8	A*B			
19980528	11	55	00.7	54.87	-3.11	328.8	553.7	12.0	1.5	WIGTON, CUMBRIA		13	14	61	0.08	0.3	1.0	A*B			
19980427	08	21	38.3	54.84	-3.11	328.7	550.3	10.8	1.4	WIGTON, CUMBRIA		14	12	76	0.04	0.2	0.5	A*B	4KM NE OF	WIGTON	
19980912	23	06	11.3	54.73	-2.98	337.0	538.1	9.2	0.2	SEBERGHAM, CUMBRIA		6	17	286	0.04	0.7	1.2	A*D			
19980928	06	42	30.7	54.46	-3.37	311.0	507.9	12.8	0.1	SEASCALE, CUMBRIA		7	8	134	0.04	0.4	1.0	A*B	9KM NE OF	SEASCALE	
19981106	07	08	44.7	54.18	-1.69	420.3	475.8	2.3	1.7	RIPON, NORTH YORKSHIRE		10	28	113	0.12	0.7	1.6	A*C			
19981113	15	32	05.7	54.15	-2.32	379.4	472.9	7.9	1.6	SETTLE, NORTH YORKSHIRE		10	45	121	0.16	1.0	C*C	9KM NORTH OF	SETTLE		
19980514	21	34	40.8	54.11	-3.14	325.4	469.1	8.2	1.4	BARROW-IN-FURNESS, CBR		14	16	81	0.22	1.1	6.0	C*B			
19980406	03	57	23.9	54.07	-3.86	278.1	465.2	8.6	0.9	IRISH SEA		11	47	126	0.14	1.2	C*C				
19980621	19	23	39.6	54.02	0.94	592.7	462.0	25.2	2.8	SOUTHERN NORTH SEA		12104	229	0.26	3.3	3.3	C*D				
19980808	22	07	10.1	53.99	-2.75	350.9	454.7	11.1	2.3	GALGATE, LANCASHIRE		21	45	66	0.10	0.4	1.9	A*C			
19981212	01	25	09.9	53.93	-1.22	451.1	448.1	19.8	1.9	YORK, NORTH YORKSHIRE		7	60	267	0.37	10.7	D*D				
19981007	18	39	42.8	53.60	-0.29	512.8	413.1	30.7	2.8	GRIMSBY, HUMBERSIDE		15	16	143	0.12	0.7	0.5	A*C	13KM NW OF	GRIMSBY	
19980505	17	21	44.6	53.56	-1.26	448.9	407.0	0.5	1.9	DONCASTER, SOUTH YORKS	4+	6	39	120	0.22	2.2	3.3	B*C	C/F, FELT	DONCASTER...	
19980421	11	34	32.0	53.55	-4.32	246.5	408.6	15.2	0.2	OFF ANGLESEY, IRISH SEA		6	17	282	0.01	0.4	0.3	A*D	15KM NORTH OF	ANGLESEY	
19980519	06	04	30.1	53.50	-4.20	254.4	403.0	16.9	-0.3	OFF ANGLESEY, GWYNEDD		6	14	266	0.05	2.1	1.8	B*D	8KM NE OF	ANGLESEY	
19980601	23	02	31.4	53.49	-1.18	454.5	399.1	0.8	1.0	DONCASTER, SOUTH YORKS		5	35	284	0.12	14.5	13.8	D*D	C/F		

TABLE 2: CATALOGUE OF EARTHQUAKES LISTED IN ORDER OF DECREASING LATITUDE:1998 continued

Year	Mo	Dy	Hr	Mn	Secs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments
1998	02	17	14	26	30.1	53.48	-1.15	456.4	398.7	0.1	2.0	DONCASTER, SOUTH YORKS	3+	8	36	123	0.13	0.8	1.5	A*C	C/F, FELT MALTBY...
1998	06	25	02	47	53.7	53.45	-1.20	453.3	394.8	2.1	1.9	MALTBY, SOUTH YORKSHIRE	3+	9	31	115	0.16	1.1	2.3	B*C	C/F, FELT STAINTON
1998	07	24	00	57	49.3	53.45	-1.18	454.8	395.0	0.5	1.8	MALTBY, SOUTH YORKSHIRE	5	32	171	0.04	0.7	1.5	A*D	C/F	
1998	08	17	23	28	07.3	53.44	-1.19	454.0	394.2	1.0	1.5	MALTBY, SOUTH YORKSHIRE	2+	5	31	276	0.17		D*D	C/F, FELT MALTBY	
1998	08	22	16	28	50.5	53.44	-1.13	458.0	394.5	1.0	1.5	MALTBY, SOUTH YORKSHIRE	4	64	281	0.01		A*D	C/F		
1998	08	25	20	02	21.1	53.40	-1.19	453.6	389.9	0.3	1.6	MALTBY, SOUTH YORKSHIRE	8	28	122	0.37	2.6	4.8	C*C	C/F, 2KM SE OF MALTBY	
1998	08	32	23	57	26.6	53.37	-1.18	454.7	386.7	1.6	1.1	WORKSOP, NOTTINGHAMSHIRE	8	27	163	0.31	2.2	3.7	C*C	C/F	
1998	08	32	05	01	10.8	53.37	-1.18	454.8	386.1	2.4	1.1	WORKSOP, NOTTINGHAMSHIRE	8	27	163	0.37	2.4	3.8	C*C	C/F	
1998	08	30	02	02	35.8	53.36	-0.65	490.1	385.9	7.7	1.7	GAINSBOROUGH, LINCS	8	44	219	0.09	0.9	C*D	6KM SE OF GAINSBOROUGH		
1998	08	20	13	31	2.7	53.35	-2.38	374.6	383.4	6.2	1.9	ALTRINCHAM, G MANCHESTER	8	41	153	0.12	1.1	11.1	C*C		
1998	08	21	10	56	6.8	53.34	-2.38	374.8	382.8	9.0	2.3	ALTRINCHAM, G MANCHESTER	11	42	131	0.07	0.4	10.6	C*C		
1998	08	10	15	30	19.6	53.26	-1.67	422.0	374.1	18.0	1.9	BAKEWELL, DERBYSHIRE	7	10	136	0.05	0.6	0.6	A*C	5KM NORTH OF BAKEWELL	
1998	08	22	00	58	04.5	53.24	-1.12	459.0	372.3	2.9	1.6	WORKSOP, NOTTINGHAMSHIRE	8	28	154	0.10	0.8	1.3	A*C	C/F, 7KM SOUTH OF WORKSOP	
1998	08	15	19	44	38.0	53.24	-4.58	227.7	374.1	10.2	-0.4	ANGLESEY, GWYNEDD	6	2	257	0.05	1.0	1.2	B*D	8KM SOUTH OF HOLYHEAD	
1998	08	26	18	59	26.9	53.23	-1.14	457.3	370.5	2.4	1.0	MANSFIELD, NOTTS	4	26	275	0.19		B*D	C/F, 8KM NE OF MANSFIELD		
1998	08	21	22	23	53.23	-2.30	379.7	369.9	4.1	1.1	MIDDLEWICH, CHESHIRE	4	39	317	0.01		A*D	7KM SE OF MIDDLEWICH			
1998	08	06	02	16	32.8	53.22	-1.04	464.3	369.4	1.0	1.8	NEW OLLERTON, NOTTS	6	33	189	0.06	0.6	0.8	A*D	C/F	
1998	08	09	02	07	15.7	53.22	-1.02	465.1	369.7	1.0	0.6	NEW OLLERTON, NOTTS	5	34	218	0.07	2.2	2.9	B*D	C/F	
1998	08	12	03	34	40.3	53.21	-0.87	475.3	369.1	2.6	1.0	TUXFORD, NOTTINGHAMSHIRE	5	34	230	0.26	8.9	12.9	D*D	C/F	
1998	08	20	20	15	13.4	53.20	-1.95	403.3	367.3	11.1	0.9	BUXTON, DERBYSHIRE	4	22	209	0.08		A*D	6KM SW OF BUXTON		
1998	08	25	07	43	27.7	53.18	-4.34	243.6	367.7	11.6	-0.1	ANGLESEY, GWYNEDD	9	12	102	0.02	0.1	0.2	A*B		
1998	08	16	13	04	10.1	53.18	-4.23	251.1	367.2	11.9	2.7	MENAI STRAIT, GWYNEDD	4	9	6	80	0.03	0.2	0.4	A*A	FELT FELINHELI...
1998	08	01	18	45	09.4	53.12	-1.27	448.7	357.9	0.0	1.0	MANSFIELD, NOTTS	5	23	222	0.37	0.8	1.1	C*D	C/F	
1998	08	10	05	49	40.5	53.10	-4.30	245.9	358.4	19.0	-0.3	CAERNARVON, GWYNEDD	7	10	149	0.06	0.8	1.6	A*C	4KM SW OF CAERNARVON	
1998	08	30	06	54	17.3	53.10	-4.35	242.7	358.8	16.3	0.4	CAERNARVON BAY, GWYNEDD	10	13	105	0.06	0.5	0.9	A*B		
1998	08	11	03	34	41.8	53.10	-1.32	445.3	356.2	0.2	0.7	MANSFIELD, NOTTS	4	22	217	0.18		B*D	C/F, 8KM SW OF MANSFIELD		
1998	08	11	10	23	44.5	53.09	-1.31	446.1	355.4	0.3	0.8	MANSFIELD, NOTTS	4	23	218	0.46		C*D	C/F, 7KM SW OF MANSFIELD		
1998	08	10	02	55	44.7	53.06	-2.25	383.5	351.7	7.8	1.7	KIDSGROVE, STAFFORDSHIRE	8	28	170	0.16	1.4		C*C		
1998	08	12	07	20	32.7	53.06	-4.42	237.9	354.0	20.1	0.5	CAERNARVON BAY, GWYNEDD	9	9	151	0.05	0.7	1.5	A*C		
1998	08	05	01	06	22.9	53.05	-1.05	463.4	350.3	1.1	0.9	OXTON, NOTTINGHAMSHIRE	5	33	160	0.07	0.4	1.2	A*D	C/F	
1998	08	10	13	21	19.8	53.05	-1.07	462.3	350.2	1.0	0.7	OXTON, NOTTINGHAMSHIRE	3+	5	34	158	0.24	0.6	1.5	B*D	C/F, FELT OXTON
1998	08	12	06	14	28.0	53.04	-1.19	454.2	349.4	1.0	0.9	MANSFIELD, NOTTS	8	33	117	0.15	0.9	1.7	B*C	C/F	
1998	08	31	12	23	14.3	53.03	-5.33	176.6	353.1	9.2	2.1	IRISH SEA	9	52	176	0.04	0.5		C*D	55KM SW OF HOLYHEAD	
1998	08	05	16	23	45.3	53.02	2.15	678.6	355.2	0.2	3.8	SOUTHERN NORTH SEA	15	52	290	0.14	2.3	2.0	B*D		
1998	08	09	20	50	09.8	53.02	-2.20	386.7	346.6	2.5	1.6	STOKE-ON-TRENT, STAFFS	8	24	159	0.05	0.4	0.7	A*C		
1998	08	09	26	13	02	53.02	-2.19	387.0	347.0	3.9	1.7	NEWCASTLE-U-LYME, STAFFS	7	24	197	0.10	1.1	1.4	B*D		
1998	08	31	18	59	15.0	53.01	-3.72	284.5	347.6	7.9	1.6	BETWS-Y-COED, GWYNEDD	14	30	158	0.09	0.5	4.3	B*C	12KM SE OF BETWS-Y-COED	
1998	08	30	33	19	15.8	53.00	-2.06	395.7	344.4	4.3	1.0	KINGSLEY, STAFFORDSHIRE	4	15	292	0.00		A*D	C/F		
1998	08	06	08	44	25.1	52.99	-4.49	232.6	346.3	20.9	0.6	CAERNARVON BAY, GWYNEDD	7	5	212	0.04	0.8	0.8	A*D		
1998	08	04	06	40	17.7	52.98	-4.40	238.8	344.9	21.4	0.3	LLEYN, PENIN, GWYNEDD	7	2	103	0.04	0.5	1.0	A*B		
1998	08	03	06	43	46.3	52.97	-4.39	239.4	344.1	23.9	0.1	LLEYN PENIN, GWYNEDD	8	3	188	0.02	0.4	0.4	A*D		
1998	08	12	16	56	14.8	52.96	-2.27	381.7	340.3	2.3	1.4	NEWCASTLE-U-LYME, STAFFS	7	30	160	0.09	0.8	2.0	A*C	C/F	
1998	08	20	05	08	23.0	52.96	-2.27	382.2	340.2	1.1	1.6	NEWCASTLE-U-LYME, STAFFS	7	29	143	0.07	0.8	1.7	A*C	C/F	
1998	08	06	06	09	09.0	52.96	-2.27	381.8	340.7	2.1	0.9	NEWCASTLE-U-LYME, STAFFS	6	29	194	0.08	1.6	1.6	B*D	C/F	
1998	08	21	19	53	27.2	52.96	-2.26	382.4	340.2	0.3	1.4	NEWCASTLE-U-LYME, STAFFS	6	29	193	0.10	1.4	1.4	B*D	C/F, FELT NEW-U-LYME	

TABLE 2: CATALOGUE OF EARTHQUAKES LISTED IN ORDER OF DECREASING LATITUDE:1998 continued

Year	Mo	Dy	Hr	Mn	Secs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments
1998	03	16	0823	27.4	52.96	-2.25	383.3	339.9	1.5	1.2	NEWCASTLE-U-LYME, STAFFS	5	28	191	0.15	4.4	4.8	C*D	C/F		
1998	04	30	0136	54.8	52.96	-2.26	382.3	340.6	2.5	1.5	NEWCASTLE-U-LYME, STAFFS	9	29	118	0.05	0.4	0.7	A*C	C/F		
1998	05	18	0245	52.3	52.96	-4.36	241.5	342.5	23.4	0.8	LLEYN PENIN, GWYNEDD	10	5	102	0.03	0.2	0.6	A*B			
1998	07	16	0933	634.4	52.96	-4.38	240.3	342.5	22.3	0.6	LLEYN PENIN, GWYNEDD	8	4	188	0.05	0.6	0.8	A*D			
1998	08	10	0208	53.3	52.96	-4.39	239.3	343.0	21.8	0.1	LLEYN PENIN, GWYNEDD	5	3	192	0.01	1.0	0.3	A*D			
1998	08	11	1834	08.9	52.95	-2.27	381.8	339.8	1.5	1.6	NEWCASTLE-U-LYME, STAFFS	7	30	193	0.10	1.3	1.4	B*D	C/F		
1998	08	20	1758	59.2	52.95	-2.25	382.9	338.9	3.3	1.6	NEWCASTLE-U-LYME, STAFFS	7	29	190	0.10	1.1	1.6	B*D	C/F		
1998	08	21	1104	12.3	52.95	-2.27	382.0	339.3	2.0	1.6	NEWCASTLE-U-LYME, STAFFS3+	8	30	159	0.19	1.5	2.3	B*C	C/F, FELT KEELE		
1998	08	21	0123	551.1	52.95	-2.27	382.1	339.1	1.3	1.5	NEWCASTLE-U-LYME, STAFFS	8	30	150	0.07	0.7	1.1	A*C	C/F		
1998	08	22	0042	52.95	52.95	-2.26	382.2	339.7	1.5	1.5	NEWCASTLE-U-LYME, STAFFS3+	7	29	192	0.05	0.7	0.7	A*D	C/F, FELT WHITMORE HEATH		
1998	08	23	0955	706.1	52.95	-1.90	406.5	339.2	10.1	1.7	UTTOXETER, STAFFORDSHIRE	8	8	154	0.08	0.6	1.0	A*C			
1998	08	26	0253	44.9	52.95	-2.27	382.1	339.4	1.5	1.3	NEWCASTLE-U-LYME, STAFFS	8	29	150	0.08	0.9	1.5	A*C	C/F		
1998	08	40	0320	555.9	52.95	-2.26	382.5	339.6	1.1	1.2	NEWCASTLE-U-LYME, STAFFS3+	9	29	117	0.08	0.6	1.3	A*C	C/F, FELT KEELE		
1998	08	40	2159	60.0	52.95	-2.26	382.6	339.3	1.0	1.1	NEWCASTLE-U-LYME, STAFFS	8	29	150	0.17	2.0	2.6	B*C	C/F		
1998	08	41	0359	01.3	52.95	-2.26	382.7	339.0	1.0	1.4	NEWCASTLE-U-LYME, STAFFS	9	29	116	0.10	0.8	1.4	A*C	C/F		
1998	08	51	1836	25.8	52.95	-2.26	382.4	339.7	1.0	1.3	NEWCASTLE-U-LYME, STAFFS	6	29	150	0.08	1.6	2.7	B*C	C/F		
1998	11	29	2034	31.9	52.95	-4.37	240.9	342.2	23.3	0.5	LLEYN PENIN, GWYNEDD	8	5	111	0.01	0.1	0.4	A*B			
1998	08	11	0417	47.0	52.94	-2.24	383.8	338.3	1.6	1.2	NEWCASTLE-U-LYME, STAFFS2+	6	28	147	0.05	0.9	1.5	A*C	C/F, FELT WHITMORE		
1998	08	12	0133	17.3	52.94	-2.25	383.4	338.5	1.0	1.1	NEWCASTLE-U-LYME, STAFFS	7	28	189	0.09	1.3	1.6	B*D	C/F		
1998	08	12	2123	03.4	52.94	-2.26	382.8	338.5	0.7	1.4	NEWCASTLE-U-LYME, STAFFS2+	7	29	190	0.17	2.4	2.7	B*D	C/F, FELT WHITMORE		
1998	08	21	1913	42.3	52.94	-2.26	382.8	338.5	0.1	1.3	NEWCASTLE-U-LYME, STAFFS	6	29	190	0.06	1.8	1.6	B*D	C/F		
1998	08	30	0150	13.7	52.94	-2.26	382.8	338.3	0.9	1.3	NEWCASTLE-U-LYME, STAFFS	7	29	190	0.07	1.1	1.2	B*D	C/F		
1998	08	31	1750	28.3	52.94	-2.25	383.3	338.0	1.0	1.0	NEWCASTLE-U-LYME, STAFFS	5	29	189	0.09	3.3	3.6	C*D	C/F		
1998	08	42	1841	39.2	52.94	-2.25	383.5	338.3	1.0	1.3	NEWCASTLE-U-LYME, STAFFS	5	28	189	0.08	3.1	2.8	C*D	C/F		
1998	08	10	2122	14.1	52.93	-2.25	382.9	337.0	0.4	1.6	NEWCASTLE-U-LYME, STAFFS2+	7	29	146	0.05	0.8	1.4	A*C	C/F, FELT WHITMORE		
1998	08	30	1722	40.2	52.93	-2.22	385.3	337.4	4.3	1.2	STONE, STAFFORDSHIRE	4	27	187	0.09			A*D			
1998	11	13	0006	40.4	52.91	-1.75	416.7	335.0	14.2	1.5	UTTOXETER, STAFFORDSHIRE	5	13	117	0.04	0.7	0.9	A*D	8KM EAST OF UTTOXETER		
1998	08	07	0955	39.5	52.88	-4.73	216.3	334.5	17.4	0.5	OFF LLEYN PENIN, GWYNEDD	7	8	249	0.06	1.6	1.2	B*D	3KM OFFSHORE		
1998	08	07	0511	39.1	52.68	-0.89	474.7	309.5	4.5	1.1	LEICESTER, LEICS	6	25	251	0.16	5.7	3.9	D*D	13KM NE OF LEICESTER		
1998	08	42	0443	30.0	52.66	-1.14	457.8	307.5	10.0	0.9	LEICESTER, LEICS	5	14	260	0.06	3.1	2.8	C*D			
1998	18	20	0806	40.2	52.57	-1.89	407.6	297.4	7.9	2.0	WALSALL, WEST MIDLANDS	9	43	152	0.12	0.9		C*C			
1998	08	09	1629	36.5	52.55	-1.81	413.0	294.5	7.5	2.0	SUTTON COLDFIELD, W MID	9	40	163	0.08	0.3	1.2	A*C			
1998	11	06	1952	20.3	52.47	-1.61	426.3	286.4	3.3	1.2	COVENTRY, W MIDLANDS	8	36	206	0.05	1.9	2.9	B*D	C/F		
1998	08	07	0411	22.5	52.45	-3.20	318.3	284.0	19.2	1.1	NEWTOWN, POWYS	6	7	170	0.05	1.2	0.7	B*C	7KM WSW OF NEWTOWN		
1998	08	41	0317	23.1	52.44	-2.82	344.4	282.7	16.7	0.8	CRAVEN, SHROPSHIRE	8	10	183	0.09	1.1	1.8	B*D			
1998	11	08	1324	53.0	52.35	-3.06	327.8	273.2	15.0	0.7	KNIGHTON, POWYS	7	8	140	0.04	0.4	0.5	A*C			
1998	08	10	0754	58.9	52.25	-3.34	308.3	262.5	15.9	0.7	LLANDRINDOD WELLS, POWYS	7	20	125	0.04	0.3	1.0	A*B			
1998	08	12	2123	54.6	52.20	-3.50	297.6	256.5	20.8	1.2	BUILTH WELLS, POWYS	10	18	100	0.02	0.1	0.3	A*B	7KM NW OF BUILTH WELLS		
1998	08	07	0820	44.4	52.15	-2.70	351.8	250.1	18.2	1.9	LEOMINSTER, HER & WOR	9	16	154	0.09	0.7	1.7	A*C	9KM SOUTH OF LEOMINSTER		
1998	08	12	2244	35.0	51.89	-3.67	285.2	223.0	13.3	0.7	SENNYBRIDGE, POWYS	10	34	129	0.09	0.6	0.7	A*C	10KM SW OF SENNYBRIDGE		
1998	08	10	0527	50.7	51.83	-4.49	228.3	217.2	11.8	1.8	ST CLEARS, DYFED	10	23	122	0.09	0.6	0.7	A*B			
1998	11	15	1714	39.4	51.81	-2.38	373.5	212.4	14.1	0.9	GLOUCESTER, GLOUCESTER	7	28	172	0.04	0.3	0.9	A*C	10KM WSW OF GLOUCESTER		
1998	12	25	0849	44.1	51.81	-3.98	263.3	214.1	18.8	1.5	AMMANFORD, DYFED	10	13	137	0.11	1.4	0.8	B*C			
1998	08	03	2137	53.8	51.73	-2.84	341.7	203.5	26.6	1.0	USK, GWENT	7	10	159	0.02	0.4	0.5	A*C			
1998	11	23	1343	34.8	51.70	-3.07	326.4	200.8	15.0	2.0	PONTYPOOL, GWENT	9	19	67	0.08	0.7	1.7	A*B			

TABLE 2: CATALOGUE OF EARTHQUAKES LISTED IN ORDER OF DECREASING LATITUDE:1998 continued

Year	Mo	Dy	Hr	Mn	Secs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments
1998	12	07	105	058.2	51.67	-3.20	317.0	197.9	7.7	1.4	BLACKWOOD, GWENT		8	28	137	0.09	0.6	C*C			
1998	02	21	203	919.3	51.63	-3.01	329.8	193.2	5.2	2.3	CWMBRAN, GWENT	3+	6	14	129	0.06	1.0	1.3	B*C	FELT CWMBRAN...	
1998	05	31	130	331.7	51.21	-4.69	212.2	148.7	8.7	1.7	BRISTOL CHANNEL		6	28	207	0.13	2.0	10.9	C*D		
1998	05	31	125	552.5	51.19	-4.71	210.5	147.0	14.6	2.6	BRISTOL CHANNEL		5	27	213	0.22	7.7	17.2	D*D		
1998	05	14	204	701.5	51.16	-12.10	305.6	189.1	17.7	3.0	ATLANTIC OCEAN		12156	322	0.37		D*D			150KM WEST OF SW IRELAND	
1998	01	27	083	615.1	50.51	1.24	629.5	72.8	2.8	3.1	STRAIT OF DOVER		18	68	233	0.36	3.1	4.5	C*D		
1998	09	18	030	057.9	50.30	-5.37	160.4	49.7	0.9	0.4	OFF ST IVES, CORNWALL		10	16	264	0.05	0.9	10.8	C*D	10KM NE OF ST IVES	
1998	02	24	201	047.1	50.23	-5.27	167.0	41.6	0.8	0.0	W OF REDRUTH, CORNWALL		8	5	309	0.03	0.5	3.3	B*D		
1998	01	16	232	146.4	50.22	-5.27	166.5	40.7	0.2	0.1	CAMBORNE, CORNWALL		7	5	304	0.01	0.5	1.7	A*D		
1998	01	23	120	303.3	50.22	-5.29	165.4	41.3	0.2	0.8	SOUTH CROFTY, CORNWALL	3+	12	6	173	0.04	0.1	1.7	A*C	COLLAPSE-FELT S CROFTY	
1998	12	08	100	554.2	49.97	-4.29	235.8	10.4	15.0	1.1	ENGLISH CHANNEL		3	49	349	0.00			A*D		
1998	02	08	055	127.3	49.96	-5.50	149.1	12.8	12.4	2.4	PENZANCE, CORNWALL	4+	12	22	277	0.02	0.4	0.4	A*D	FELT SW CORNWALL...	
1998	03	19	045	945.2	49.93	-2.21	384.9	3.6	10.0	1.6	ENGLISH CHANNEL		6	80	237	0.52	15.9		D*D		
1998	08	30	083	952.5	49.87	-6.52	75.0	6.6	3.2	1.7	SCILLY ISLES, CORNWALL		6	75	352	0.16		8.5	D*D	WEST OF SCILLY ISLES	
1998	08	27	054	532.4	49.63	-5.45	150.6	-24.4	8.5	1.1	ENGLISH CHANNEL		6	55	326	0.06	5.2	D*D	35KM SW OF LIZARD POINT		
1998	02	25	230	704.4	49.39	-2.69	350.2	-55.9	10.4	1.6	GUERNSEY, CHANNEL ISLES		5	44	349	0.01	0.7	4.9	B*D	SOUTH OF GUERNSEY	
1998	01	101	185	527.5	49.37	-4.71	203.3	-55.9	15.0	2.3	ENGLISH CHANNEL		3122	356	0.55				D*D		
1998	07	18	052	241.4	49.19	-1.55	432.5	-79.0	4.8	0.7	CHERBOURG PENINSULA		6	35	350	0.05	4.1	1.2	C*D	35KM SE OF JERSEY	
1998	06	25	195	557.7	49.14	-2.34	375.2	-84.2	24.3	0.3	JERSEY, CHANNEL ISLANDS		6	13	336	0.12	2.3	1.2	B*D	5KM S OF JERSEY	
1998	06	28	221	210.9	49.07	-2.03	398.1	-92.5	18.1	0.0	JERSEY, CHANNEL ISLANDS		4	15	341	0.00		A*D	10KM SE OF JERSEY		
1998	05	18	044	619.5	49.02	-1.81	413.7	-97.7	7.6	0.2	JERSEY, CHANNEL ISLANDS		6	26	345	0.02	1.0		C*D		
1998	12	20	031	030.3	48.94	-2.38	372.4	-106.4	8.1	1.6	JERSEY, CHANNEL ISLES		5	31	345	0.05	2.8	C*D	30KM SW OF JERSEY		
1998	03	28	061	013.4	48.91	-4.24	236.2	-107.3	9.5	1.8	ENGLISH CHANNEL		13151	246	0.10	1.4	2.1	B*D			

TABLE 3

CATALOGUE OF NON-NATURAL EVENTS LISTED CHRONOLOGICALLY: 1998

KEY TO BULLETIN ENCODING

YearMoDy	:	Year, month and day of event.
HrMn Secs	:	Time of occurrence of event in hours, mins and secs, (UTC).
Lat	:	Latitude of the event, positive latitude indicates north.
Lon	:	Longitude of the event, negative longitude indicates west.
kmE	:	UK National Grid Reference in kilometres east of grid origin.
kmN	:	UK National Grid Reference in kilometres north of grid origin.
Dep	:	Depth of the hypocentre in kilometres.
Mag	:	Richter local magnitude of the event.
Locality	:	A geographical indication of the epicentral area, usually the nearest town followed by the region. A key to the abbreviations used in the locality column are given below.
Int	:	Maximum EMS intensity. 2+ indicates felt, no macroseismic details. 3+, 4+ etc indicates felt at 3 or 4, but no survey carried out. 3, 4, 5 etc describes the maximum EMS intensity produced by the event.
Comments	:	Additional comments about the event eg: C/F, see below under comments abbreviations.

The following abbreviations are extracted from the output of the location program HYPO71 (Lee and Lahr, 1975)

No	:	Total number of P and S readings used in the event location.
DM	:	Epicentral distance in kilometres to the closest station.
Gap	:	Largest azimuthal separation in degrees between stations.
RMS	:	Root Mean Square of the travel-time residuals in seconds.
ERH	:	Standard error of the epicentre in kilometres. When this column is blank, the error is large and indeterminate.
ERZ	:	Standard error of the focal depth in kilometres. When this column is blank, the error is large and indeterminate.
SQD	:	S is quality factor ascribed to RMS, D is quality ascribed to number and distribution of stations.

Locality abbreviations

Sonic	:	Sonic boom	W Glamorgan	:	West Glamorgan
Expl	:	Explosion	Notts	:	Nottinghamshire
D & G	:	Dumfries and Galloway	S' Clyde	:	Strathclyde
Her & Wor	:	Hereford and Worcester	S Yorkshire	:	South Yorkshire
N'umberland	:	Northumberland	West Yorks	:	West Yorkshire
Leics	:	Leicestershire	Staffs	:	Staffordshire
New-U-Lyme	:	Newcastle-Under-Lyme	Gloucs	:	Gloucestershire
Penin	:	Peninsula	Cbr	:	Cumbria
W Mid	:	West Midlands	Lincs	:	Lincolnshire

Comments abbreviations

Sonic	:	Sonic boom
Expl	:	Explosion
C/F	:	Coalfield type event
...	:	and felt elsewhere

TABLE 3: CATALOGUE OF NON-NATURAL EVENTS LISTED CHRONOLOGICALLY:1998

Year	Mo	Dy	Hr	Mn	Secs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments	
1998	04	22	09	40	36.0							SONIC-BOURNEMOUTH	3+									SONIC-FELT BOURNEMOUTH
1998	04	29	12	07	17.7	55.58	-4.75	226.7	635.5	0.0	2.6	EXPL-IRVINE BAY		12	29	123	0.08	0.6	1.4	A*C	CONFIRMED EXPLOSION	
1998	05	08	08	48	38.0							SONIC-SOUTHERN SCOTLAND2+										SONIC-FELT CRAWFORD
1998	05	08	12	05	47.0							SONIC-SOUTHERN SCOTLAND2+										SONIC-FELT CRAWFORD
1998	06	08	14	06	06.8	56.00	-2.50	369.0	678.9	0.0	1.3	EXPL-DUNBAR,LOTHIAN	3+	6	12	246	0.02	0.1	0.9	A*D	EXPL-FELT DUNBAR	
1998	08	12	08	21	01.5	56.14	-3.66	296.6	694.9	0.1	0.7	EXPL-MEADOWHILL,CENTRAL2+		5	16	120	0.06	0.9	2.6	B*D	EXPL-FELT FOREST MILL	
1998	09	24	09	07	02.0	58.61	-4.87	233.3	972.3	0.0	0.4	EXPL-CAPE WRATH	4+	6	8	172	0.09	1.1	2.0	B*C	EXPL-FELT DOUNREAY	
1998	09	24	09	07	56.8	58.60	-4.86	233.5	971.1	0.0	0.5	EXPL-CAPE WRATH	4+	7	8	164	0.09	1.0	1.4	A*C	EXPL-FELT DOUNREAY	
1998	09	24	09	08	56.8	58.60	-4.87	233.3	971.4	0.0	0.1	EXPL-CAPE WRATH	4+	4	8	182	0.06			A*D	EXPL-FELT DOUNREAY	
1998	09	24	09	12	00.2	58.63	-4.88	233.0	974.4	0.0	0.3	EXPL-CAPE WRATH	4+	4	7	209	0.04			A*D	EXPL-FELT DOUNREAY	
1998	10	19	15	01	38.0							SONIC-NORTH WALES	3+									SONIC-FELT HOLYHEAD...
1998	12	07	14	28	46.0							SONIC-LANCASHIRE	4+									SONIC-FELT LANCASHIRE...

TABLES 4

GEOGRAPHICAL COORDINATES OF SEISMOGRAPH STATIONS: DECEMBER 1998

TABLE 4a

GEOGRAPHIC COORDINATES OF SEISMOGRAPH STATIONS: DECEMBER 1998

Code	Name	Lat	Lon	KmE (km)	KmN (km)	Ht (m)	Yrs open	Comp	Agency
ABA	BACONSTHORPE	52.8884	1.1453	611.58	337.00	74	82-	1	BGS
AEA	EAST ANGLIA UNIV	52.6208	1.2403	619.30	307.53	45	84-	M	BGS
APA	PACKWAY	52.3006	1.4782	637.12	272.68	58	84-	1	BGS
AWH	WHINBURGH	52.6297	0.9507	599.67	307.68	64	80-	1R	BGS
AWI	WITTON	52.8319	1.4471	632.17	331.65	46	83-	1	BGS
BBH	BRUNTSHEIL	55.1333	-2.9299	340.72	582.50	216	92-	1	BGS
BBO	BOTHEL	54.7367	-3.2464	319.76	538.69	209	92-	3	BGS
BCM	CHAPELCROSS MIC	55.0151	-3.2212	321.92	569.64	78	92-	M	BGS
BDL	DOBCROSS HALL	54.8030	-2.9385	339.68	545.76	157	92-	1	BGS
BHH	HOWATS HILL	55.0931	-3.2181	322.27	578.31	216	92-	3	BGS
BNA	NEW ABBEY	54.9658	-3.6242	296.03	564.68	28	92-	1	BGS
BTA	TALKIN	54.9057	-2.6844	356.12	557.00	279	92-	3	BGS
BWH	WARDLAW	55.1758	-3.6549	294.62	588.09	269	92-	1	BGS
CBW	BUDOCK WATER	50.1482	-5.1144	177.53	32.29	94	81-	1	BGS
CCA	CARNMENELLIS	50.1866	-5.2277	169.62	36.90	210	81-	1	BGS
CCO	CONSTANTINE	50.1357	-5.1957	171.66	31.14	168	81-	1	BGS
CDU	DUNNERDALE	54.3362	-3.1952	322.30	494.08	355	92-	1	BGS
CGH	GOONHILLY	50.0507	-5.1649	173.46	21.60	97	81-	1	BGS
CGW	GWEEK	50.1006	-5.2228	169.56	27.32	9	93-	1	BGS
CKE	KESWICK	54.5877	-3.1059	328.54	521.96	304	92-	1	BGS
CMA	MANACCAN	50.0821	-5.1274	176.29	24.98	42	93-	1	BGS
CPZ	PENZANCE	50.1566	-5.5828	144.12	34.72	199	81-	1R	BGS
CR2	ROSEMANOWES 2	50.1667	-5.1687	173.74	34.51	143	81-	3	BGS
CSA	ST AUSTELL	50.3527	-4.8919	194.30	54.38	112	81-	1	BGS
CSF	SCAFELL	54.4478	-3.2430	319.41	506.55	540	92-	1	BGS
CSM	SELLAFIELD MIC	54.4183	-3.4913	303.24	503.58	50	92-	M	BGS
CST	STITHIANS	50.1952	-5.1635	174.24	37.66	141	81-	1	BGS
CWF	CHARNWOOD FST	52.7385	-1.3076	446.74	315.91	203	75-	3R	BGS
DCO	COMBE FARM	50.3201	-3.8721	266.74	48.43	117	82-	1R	BGS
DYA	YADSWORTHY	50.4353	-3.9310	262.88	61.34	292	82-	3R	BGS
EAB	ABERFOYLE	56.1887	-4.3373	254.97	702.02	279	69-	1R	BGS
EAU	AUCHINOON	55.8454	-3.4474	309.38	662.30	359	69-	1R	BGS
EBH	BLACK HILL	56.2476	-3.5084	306.54	707.13	375	69-	1R	BGS
EBL	BROAD LAW	55.7723	-3.0445	334.48	653.71	436	69-	1R	BGS
ECK	CAULDKAINE HILL	55.1810	-3.1292	328.10	588.00	351	81-	1R	BGS
EDI	EDINBURGH	55.9233	-3.1875	325.80	670.66	125	69-	3R	BGS
EDR	DRUMTOCHTY	56.9190	-2.5393	367.17	780.97	401	89-	1R	BGS
EDU	DUNDEE	56.5477	-3.0110	337.85	739.97	421	69-	1R	BGS
ELO	LOGIEALMOND	56.4703	-3.7112	294.59	732.21	523	69-	1R	BGS
ESK	ESKDALEMUIR	55.3165	-3.2052	323.52	603.16	261	65-	3R	BGS
ESY	STONEYPATH	55.9175	-2.6141	361.62	669.55	337	81-	1R	BGS
GAL	GALLOWAY	54.8664	-4.7114	226.02	555.78	117	89-	3M	BGS
GCD	CASTLE DOUGLAS	54.8630	-3.9403	275.48	553.76	184	89-	1R	BGS
GCL	CUSHENDALL	55.0783	-6.1264	136.66	583.77	278	89-	1R	BGS
GIM	ISLE OF MAN (North)	54.2923	-4.4672	239.44	491.35	346	89-	3R	BGS
GMK	MULL OF KINTYRE	55.3458	-5.5934	172.19	611.64	164	89-	1R	BGS
GMM	MTNS OF MOURNE	54.2377	-5.9498	142.66	489.67	155	89-	1R	BGS
HAE	ALDERS END	52.0368	-2.5434	362.73	237.79	260	82-	1R	BGS
HCG	CRAIG GOCH	52.3231	-3.6570	287.08	270.78	533	80-	1R	BGS
HEX	EXMOOR	51.0664	-3.8026	273.71	131.28	230	91-	1R	BGS
HGH	GRAY HILL	51.6379	-2.8057	344.25	193.59	223	80-	1R	BGS
HLM	LONG MYND	52.5184	-2.8807	340.25	291.57	429	84-	1	BGS
HPE	PEMBROKE	51.9372	-4.7746	209.29	230.21	349	90-	1R	BGS
HPK	HAVERAH PARK	53.9581	-1.6241	424.66	451.42	233	78-	3R	BGS
HSA	SWANSEA	51.7500	-4.1532	251.38	207.94	293	87-	1R	BGS
HTL	HARTLAND	50.9943	-4.4849	225.64	124.66	86	81-	3RM	BGS
HTR	TREWERN HILL	52.0785	-3.2679	313.12	243.04	337	82-	1R	BGS
JLP	LES PLATONS	49.2486	-2.1039			129	81-	1R	BGS

TABLE 4a: continued

Code	Name	Lat	Lon	KmE (km)	KmN (km)	Ht (m)	Yrs open	Comp	Agency
JQE	QUEENS EAST	49.2000	-2.0383			58	91-	1	BGS
JRS	MAISON ST LOUIS	49.1922	-2.0922			56	81-	3R	BGS
JSA	ST AUBINS	49.1878	-2.1717			39	81-	1R	BGS
JVM	VALLE D.L.MARE	49.2169	-2.2067			64	81	1R	BGS
KAC	ACHNASHELLACH	57.4989	-5.2988	202.36	850.19	206	83-	1R	BGS
KAR	ARISAIG	56.9188	-5.8290	166.98	787.34	186	83-	1	BGS
KBI	BIRLEY GRANGE	53.2543	-1.5279	431.49	373.17	272	88-	1	BGS
KLE	KEELE UNIVERSITY	53.0038	-2.2657	382.17	345.23	203		1	KUN
KLE2	TRENT VALE	52.9878	-2.1968	386.79	343.44	125		1	KUN
KLE3	NEWCHAPEL	53.0928	-2.2047	386.29	355.12	200		1	KUN
KNR	NEVIS RANGE	56.8219	-4.9714	218.68	773.97	1147	91-	1R	BGS
KPL	PLOCKTON	57.3391	-5.6527	180.21	833.50	13	86-	3R	BGS
KSB	SHIEL BRIDGE	57.2099	-5.4214	193.40	818.40	417	83-	1R	BGS
KSK	SCOVAL	57.4659	-6.7002	118.21	851.46	265	89-	1R	BGS
KSY	SYSTON	52.9642	-0.5872	494.88	341.73	121	88-	1R	BGS
KTG	TILBROOK GRNGE	52.3264	-0.4019	508.90	271.06	83	88-	1	BGS
KUF	UFFORD	52.6170	-0.3907	508.94	303.39	38	88-	1R	BGS
KWE	WEAVER FARM	53.0164	-1.8412	410.65	346.61	328	88-	1R	BGS
LCP	CASSOP	54.7370	-1.4744	433.84	538.14	185	91-	1R	BGS
LDU	LEEDS	53.8058	-1.5540	429.37	434.51	74	83-	M	BGS
LHO	HOLMEFIRTH	53.5453	-1.8548	409.62	405.44	462	91-	1R	BGS
LMI	MILLOM	54.2206	-3.3070	314.79	481.35	129	89-	3R	BGS
LMK	MARKET RASEN	53.4569	-0.3260	511.14	396.90	146	91-	1R	BGS
LRN	RICHMOND	54.4165	-1.8007	412.93	502.37	313	91-	1R	BGS
LRW	LERWICK	60.1360	-1.1779	445.66	1139.27	98	78-	3R	BGS
LWH	WHINNY NAB	54.3338	-0.6717	486.36	493.97	277	91-	1R	BGS
MCD	COLEBURN DISTIL	57.5828	-3.2541	325.02	855.42	293	81-	3RM	BGS
MCH	MICHAELCHURCH	51.9974	-2.9983	331.47	233.74	219	78-	3	BGS
MDO	DOCHFOUR	57.4409	-4.3633	258.17	841.39	415	81-	1R	BGS
MFI	FISHRIE	57.6119	-2.2956	382.34	858.00	232	88-	1R	BGS
MLA	LATHERON	58.3055	-3.3627	320.15	935.98	188	81-	1	BGS
MME	MEIKLE CAIRN	57.3149	-2.9647	341.90	825.32	475	81-	1	BGS
MVH	ACHVAICH	57.9250	-4.1825	270.75	894.90	185	84-	1	BGS
OBR	BRABSTER	58.6142	-3.1626	332.47	970.13	89	95-	1R	BGS
OHO	HOY	58.8322	-3.2465	328.05	994.48	172	95-	1R	BGS
ORE	REAY	58.5480	-3.7622	297.45	963.52	100	95-	3RM	BGS
OST	STRONSAY	59.0860	-2.5516	368.39	1022.20	21	95-	1R	BGS
OTO	TONGUE	58.4953	-4.3939	260.49	958.79	338	95-	1R	BGS
OWE	WESTRAY	59.3180	-3.0289	341.44	1048.36	87	95-	1R	BGS
PCA	CARROT	55.7007	-4.2550	258.30	647.55	302	83-	1	BGS
PCO	CORRIE	55.9880	-4.1002	269.00	679.21	267	83-	1	BGS
PGB	GLENIFFERBRAES	55.8115	-4.4837	244.38	660.37	199	84-	3	BGS
PMS	MUIRSHIEL	55.8459	-4.7452	228.15	664.82	351	83-	1	BGS
RCR	CAPE WRATH	58.6245	-4.9987	225.90	974.58	100	95-	1R	BGS
REB	EISG-BRACHAIDH	58.1194	-5.2802	206.82	919.16	100	95-	1R	BGS
RFO	FORSNAVAL	58.2133	-7.0052	106.10	935.83	195	95-	1R	BGS
RRH	RHENIGIDALE	57.9197	-6.6881	122.43	901.86	103	95-	1R	BGS
RRR	RUBHA REIDH	57.8577	-5.8067	174.19	891.68	61	95-	3RM	BGS
RSC	SCOURIE	58.3485	-5.1683	214.61	944.33	60	95-	1R	BGS
RTO	TOLSTA	58.3778	-6.2092	153.95	950.93	74	95-	1R	BGS
SAN	SANDWICK	60.0179	-1.2392	442.41	1126.08	150	85-	1	BGS
SBD	BRYN DU	52.9055	-3.2585	315.37	335.01	489	80-	1	BGS
SFH	HASELMERE	51.0604	-0.6912	491.71	129.88	260	93-	1	BGS
SIW	ISLE OF WHITE	50.6711	-1.3747	444.18	85.97	162	93-	1	BGS
SKP	KOPHILL	51.7218	-0.8096	482.22	203.29	212	93-	1	BGS
SMD	MENDIPS	51.3083	-2.7170	350.03	156.88	310	93-	1	BGS
SSP	STONEY POUND	52.4177	-3.1119	324.39	280.59	428	90-	3	BGS
SSW	STOW-ON-WOLD	51.9667	-1.8499	410.31	229.86	291	93-	1	BGS
SWK	WARMINSTER	51.1483	-2.2471	382.72	138.87	266	93-	1	BGS
SWN	SWINDON	51.5131	-1.8004	413.85	179.42	192	93-	3	BGS

TABLE 4a: continued

Code	Name	Lat	Lon	KmE (km)	KmN (km)	Ht (m)	Yrs open	Comp	Agency
TBW	BRENTWOOD	51.6549	0.2913	558.48	197.66	89	89-	1R	BGS
TCR	COLCHESTER	51.8347	0.9212	601.24	219.20	45	89-	1R	BGS
TEB	EASTBOURNE	50.8187	0.1457	551.13	104.39	68	89-	1R	BGS
TFO	FOLKESTONE	51.1135	1.1409	619.81	139.66	202	89-	3	BGS
TSA	SEVENOAKS	51.2426	0.1561	550.48	151.53	177	89-	1	BGS
WAL	WALLS	60.2564	-1.6173	421.18	1152.46	167	80-	1	BGS
WCB	CHURCH BAY	53.3782	-4.5467	230.62	389.87	139	85-	3M	BGS
WFB	FAIRBOURNE	52.6831	-4.0383	262.23	311.48	316	85-	1R	BGS
WIM	ISLE OF MAN (South)	54.1475	-4.6738	225.39	475.73	386	85-	1R	BGS
WLF	LLYNFAES	53.2894	-4.3966	240.27	379.65	58	85-	1	BGS
WME	MYNDD EILIAN	53.3969	-4.3032	246.88	391.40	129	85-	1R	BGS
WPM	PENMAENMAWR	53.2581	-3.9048	272.95	375.18	353	85-	1R	BGS
XAL	ALLENDALE	54.8617	-2.2147	386.22	551.91	458	83-	1R	BGS
XDE	DENT	54.5056	-3.4902	303.52	513.29	301	83-	1R	BGS
XSO	SOURHOPE	55.4924	-2.2510	384.14	622.10	516	83-	1R	BGS
YEL	YELL	60.5509	-1.0830	450.29	1185.55	203	79-	1	BGS
YLL	LLANBERIS	53.1402	-4.1704	254.84	362.57	159	84-	1R	BGS
YRC	RHOSCOLYN	53.2508	-4.5753	228.21	375.77	22	84-	1R	BGS
YRE	YR EIFL	52.9811	-4.4254	237.19	345.43	193	84-	1R	BGS
YRH	RHIW	52.8336	-4.6288	222.94	329.51	286	84-	1R	BGS
DCN	CROGHAN	53.3439	-7.2767			150	77-	1R	DIAS
DLF	LYONS FARM	53.2958	-6.5314			96	91-	3	DIAS
DMUB	KINGSCOURT B	53.9000	-6.9086			280	94-	1	DIAS
ECB	CARRICKBYRNE	52.3661	-6.7811			125	81-	1R	DIAS
ECP	CARNSORE PT	52.1800	-6.3689			5	80-	3R	DIAS
ETA	TARA HILL	52.6958	-6.2100			140	82-	1R	DIAS
VAL	VALENTIA	51.9370	-10.2398			14	62-	3R	DIAS
ASK	ASKOY	60.4830	5.1950			50	83-	1	BER
FOO	FLORO	61.5980	5.0440			50		1	BER
HYA	HOYANGER	61.1660	6.1870			30		1	BER
KMY	KARMOY	59.2120	5.2470			58		1	BER
ODD1	ODDA	59.9120	6.6280			684		1	BER
SUE	SULEN	61.0570	4.7610			10		1	BER
ASM		63.8340	-20.6149			19		1	ICE
BJA		63.9462	-21.3029			58		1	ICE
KAL		63.9476	-17.6870			83		1	ICE
MID		63.6583	-19.8857			132		1	ICE
SAU		63.9901	-20.4156			77		1	ICE
SNB		63.7362	-18.6304			230		1	ICE

Component Codes:

- 1 Single vertical seismometer
 3 Orthogonal set of 3 seismometers
 M Low-frequency microphone
 R Station coordinates registered with the International Seismological Centre (ISC), England and the National Earthquake Information Centre (NEIC), USA

Agency Codes:

- BGS British Geological Survey
 DIAS Dublin Institute of Advanced Studies
 KUN Keele University
 ICE Icelandic Meteorological Office
 BER University of Bergen

TABLE 4b**GEOGRAPHIC COORDINATES OF LOW GAIN STATIONS, DECEMBER 1998**

Code	Name	Lat	Lon	KmE (km)	KmN (km)	Ht (m)	Yrs open	Comp	Agency
AEU	EAST ANGLIA	52.6202	1.2347	618.93	307.45	28	94-	L	BGS
BCC	CHAPELCROSS	55.0153	-3.2201	321.99	569.66	138	92-	L	BGS
CRQ	ROSEMANOWES	50.1672	-5.1726	173.46	34.57	156	81-	L	BGS
DYA	YADSWORTHY	50.4353	-3.9310	262.88	61.34	292	82-	LR	BGS
EDI	EDINBURGH	55.9233	-3.1875	325.80	670.66	125	89-	LR	BGS
ESK	ESKDALEMUIR	55.3165	-3.2052	323.52	603.16	261	86-	LR	BGS
GAL	GALLOWAY	54.8664	-4.7114	226.02	555.78	117	89-	L	BGS
HBL2	BONNYLANDS	52.0508	-3.0384	328.80	239.71	437	91-	LR	BGS
HTL	HARTLAND	50.9943	-4.4849	225.64	124.66	86	87-	LR	BGS
JRS	MAISON ST LOUIS	49.1922	-2.0922			56	81-	LR	BGS
KEY	KEYWORTH	52.8779	-1.0757	462.20	331.59	59	88-	L	BGS
KPL	PLOCKTON	57.3391	-5.6527	180.21	833.50	13	86-	LR	BGS
LDU	LEEDS	53.8058	-1.5540	429.37	434.51	74	94-	L	BGS
LRW	LERWICK	60.1360	-1.1779	445.66	1139.27	98	78-	LR	BGS
MCH	MICHAELCHURCH	51.9974	-2.9983	331.47	233.74	219	78-	L	BGS
MCD	COLEBURN DISTIL	57.5828	-3.2541	325.02	855.42	293	81-	LR	BGS
ORE	REAY	58.5480	-3.7622	297.45	963.52	100	95-	LR	BGS
POB	OBSERVATORY	55.8458	-4.4299	247.88	664.06	34	92-	L	BGS
RRR	RUBHA REIDH	57.8577	-5.8067	174.19	891.68	61	95-	LR	BGS
SWN	SWINDON	51.5131	-1.8004	413.85	179.42	192	93-	L	BGS
TFO	FOLKESTONE	51.1135	1.1409	619.81	139.66	202	89-	L	BGS
WCB	CHURCH BAY	53.3782	-4.5467	230.62	389.87	139	85-	L	BGS

Component Codes:

- L Single low-gain vertical seismometer
 R Station coordinates registered with the International Seismological Centre (ISC), England and the National Earthquake Information Centre (NEIC), USA

Agency Codes:

- BGS British Geological Survey

TABLE 4c**GEOGRAPHIC COORDINATES OF STRONG MOTION STATIONS, DECEMBER 1998**

Code	Name	Lat	Lon	KmE (km)	KmN (km)	Ht (m)	Yrs open	Comp	Agency
AEU	EAST ANGLIA	52.6202	1.2347	618.93	307.45	28	95-	S	BGS
BCC	CHAPELCROSS	55.0153	-3.2201	321.99	569.66	138	92-	S	BGS
CRQ	ROSEMANOWES	50.1672	-5.1726	173.46	34.57	156	87-	SR	BGS
JDC	DAM (CREST)	49.1947	-2.0469			39	92-	1	BGS
JDG	DAM (GALLERY)	49.1947	-2.0469			7	92-	S	BGS
HUA	HUNTERSTON A	55.7190	-4.8970	218.06	651.09	10	90-	S	BGS
HUB	HUNTERSTON B	55.7210	-4.8890	218.57	651.29	10	90-	S	BGS
KEY2	KEYWORTH	52.8790	-1.0770	462.13	331.73	76	97-	S	BGS
KPL	PLOCKTON	57.3391	-5.6527	180.21	833.50	13	94-	SR	BGS
HBL2	BONNYLANDS	52.0508	-3.0384	328.80	239.71	437	94-	SR	BGS
LDU	LEEDS	53.8058	-1.5540	429.00	435.00	74	98-	S	BGS
LRWS	LERWICK	60.1397	-1.1831	445.37	1139.69	80	96-	S	BGS
MCD	COLEBURN DISTIL	57.5828	-3.2541	325.02	855.42	293	98-	S	BGS
RRR	RUBHA REIDH	57.8577	-5.8067	174.19	891.68	61	95-	SR	BGS
SWN	SWINDON	51.5131	-1.8004	413.85	179.42	192	95-	S	BGS
TFO	FOLKESTONE	51.1135	1.1409	619.81	139.66	202	94-	S	BGS
TOA	TORNESS A	55.9692	-2.4037	374.80	675.20	5	94-	S	BGS
TOB	TORNESS B	55.9673	-2.4085	374.50	674.99	5	94-	S	BGS
WCB	CHURCH BAY	53.3782	-4.5467	230.62	389.87	139	98-	S	BGS

Component Codes:

S Orthogonal set of 3 strong motion seismometers

1 Single strong motion seismometer - aligned NS

R Station coordinates registered with the International Seismological Centre (ISC), England and the National Earthquake Information Centre (NEIC), USA

Agency Codes:

BGS British Geological Survey

TABLE 5
PHASE DATA: 1998

KEY TO PHASE DATA ENCODING

Time	: Time of occurrence of event in hours, mins and secs, (UTC).
Lat	: Latitude of the event, N indicates North.
Lon	: Longitude of the event, W indicates West, E indicates East.
Depth	: Depth of the hypocentre in kilometres.
Grid Ref	: UK National Grid Reference in kilometres east (kmE) and kilometres north (kmN) of grid origin.
Quality	: Solution quality of hypocentre averaged from QS and QD. A, excellent; B, good; C, fair; D, poor
RMS	: Root Mean Square of the travel-time residuals in seconds.
Magnitude	: Richter local magnitude of the event.
Locality	: A geographical indication of the epicentral area, usually the nearest town followed by the region.
Intensity	: Maximum EMS intensity. 2+ indicates felt, no macroseismic details. 3+, 4+ etc indicates felt at 3 or 4, but no survey carried out. 3, 4, 5 etc describes the maximum EMS intensity produced by the event.
Comments	: Additional comments about the event eg: C/F see list of comments abbreviations below.
STAT	: Station name
CO	: Station component S=short period Z=vertical N=north-south E=east-west
DIST	: Distance from earthquake to station (km)
PHAS	: Phase identifier; the first letter characterizes onset E=emergent I=impulsive, the second indicates the phase eg P, S, PG and PN.
WT	: Hypo weighting factor to arrival 0 or blank=full weighting to 4=zero weighting (ignore). 9=use P-S interval only for this line.
P	: Polarity C=Compression/up D=Dilatation/down
HrMn	: Hour, Minute of event
SECS	: Seconds of event
AMPL	: Amplitude centre to peak in nanometres (nm)
PERI	: Period in seconds

Locality abbreviations

Sonic	: Sonic boom	W Glamorgan	: West Glamorgan
Expl	: Explosion	Notts	: Nottinghamshire
D & G	: Dumfries and Galloway	S'Clyde	: Strathclyde
Her & Wor	: Hereford and Worcester	S Yorkshire	: South Yorkshire
N'umberland	: Northumberland	West Yorks	: West Yorkshire
Leics	: Leicestershire	Staffs	: Staffordshire
New-U-Lyme	: Newcastle-Under-Lyme	Gloucs	: Gloucestershire
Penin	: Peninsula	Cbr	: Cumbria
W Mid	: West Midlands	Lincs	: Lincolnshire

Comments abbreviations

Sonic	: Sonic boom
Expl	: Explosion
C/F	: Coalfield type event
...	: and felt elsewhere

PHASE DATA : 1998

TABLE 5

January 1 1998	Time: 18:55 27.5 UTC	Magnitude: 2.3 ML	KAC SZ 57 EP 1 C 07:44 50.63
Lat: 49.365N	Lon: 4.709W	Depth: 15.0 km	MDO SZ 77 EP 1 D 07:44 53.48
Grid Ref: 203.30 kmE -55.90 kmN		RMS: 0.55 secs	RRR SZ 102 EP 2 07:44 57.75
Locality: ENGLISH CHANNEL		Quality: D	RRR SE 102 ES 3 07:45 09.57
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI		RRR SN 102 07:45 12.70 58 0.18
DCO SZ 122 EP 2 18:55	47.27		RRR SE 102 07:45 12.47 47 0.14
DYA SZ 132 EP 2 18:55	47.23		EAB SZ 107 EP 1 C 07:44 58.15
DYA SN 132 ES 2 18:56	03.30		ELO SZ 114 EP 2 07:44 59.37
DYA SN 132	18:56	03.77 49 0.13	
DYA SE 132	18:56	03.98 45 0.16	
January 2 1998	Time: 05:56 44.7 UTC	Magnitude: 1.7 ML	January 10 1998 Time: 04:17 47.0 UTC Magnitude: 1.2 ML
Lat: 53.062N	Lon: 2.246W	Depth: 7.8 km	Lat: 52.942N Lon: 2.241W Depth: 1.6 km
Grid Ref: 383.49 kmE 351.72 kmN		RMS: 0.16 secs	Grid Ref: 383.77 kmE 338.30 kmN
Locality: KIDS GROVE, STAFFORDSHIRE		Quality: C	Locality: NEWCASTLE-U-LYME, STAFFS
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI		Comments: C/F, FELT WHITMORE
KWE SZ 28 IP 1 C 05:56	49.53		STAT CO DIST PHAS WT P HrMn
KBI SZ 53 IP 1 C 05:56	53.78		KWE SZ 28 IP 1 D 04:17 52.41
SBD SZ 70 EP 2 05:56	56.48		KBI SZ 59 IP 1 D 04:17 57.54
CWF SZ 73 IP 1 C 05:56	56.98		CWF SZ 67 EP 3 04:17 59.06
CWF SN 73 ES 2 05:57	59.93		CWF SN 67 ES 3 04:18 07.31
CWF SN 73	05:57	60.42 50 0.15	CWF SN 67 04:18 08.21 9 0.29
CWF SE 73	05:57	60.14 30 0.18	CWF SE 67 04:18 09.82 6 0.30
HLM SZ 74 EP 3 05:56	56.97		SBD SZ 69 EP 2 04:17 59.02
SSP SZ 93 EP 2 05:57	00.07		SSP SZ 83 EP 2 04:18 01.16
SSP SN 93 ES 3 05:57	11.26		SSP SN 83 ES 3 04:18 10.96
SSP SN 93	05:57	13.40 17 0.19	SSP SN 83 04:18 12.59 11 0.26
SSP SE 93	05:57	13.60 11 0.13	SSP SE 83 04:18 16.40 12 0.27
January 7 1998	Time: 21:01 15.9 UTC	Magnitude: 0.6 ML	January 13 1998 Time: 04:03 12.9 UTC Magnitude: 0.9 ML
Lat: 56.252N	Lon: 3.755W	Depth: 5.7 km	Lat: 55.343N Lon: 2.954W Depth: 10.1 km
Grid Ref: 291.26 kmE 708.01 kmN		RMS: 0.04 secs	Grid Ref: 339.49 kmE 605.88 kmN
Locality: BLACKFORD, TAYSIDE		Quality: B	Locality: TEVIOTHEAD, D & G
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI		STAT CO DIST PHAS WT P HrMn
EBH SZ 15 IP C 21:01	19.05		ESK SZ 16 IP C 04:03 16.47
ELO SZ 24 IP 1 C 21:01	20.59		ESK SN 16 ES 2 04:03 18.78
PCO SZ 36 EP 2 21:01	22.45		ESK SN 16 04:03 18.87 65 0.10
EAB SZ 37 IP C 21:01	22.60		ECK SZ 21 IP C 04:03 18.82 48 0.07
EAU SZ 49 EP 2 21:01	24.68		BBH SZ 23 IP 1 C 04:03 17.75
EDI SZ 51 EP 2 21:01	24.85		BHH SZ 33 IP 1 C 04:03 18.91
EDI SN 51 ES 2 21:01	31.24		BHH SN 33 ES 2 04:03 23.02
EDI SN 51	21:01	31.89 3 0.17	BHH SN 33 04:03 24.73 21 0.23
EDI SE 51	21:01	31.49 4 0.25	BHH SE 33 04:03 23.28 18 0.15
XSO SZ 48	IP 1 C 04:03		BWH SZ 48 IP 1 C 04:03 21.26
January 7 1998	Time: 21:22 14.1 UTC	Magnitude: 1.6 ML	XSO SZ 48 IP 1 C 04:03 21.27
Lat: 52.930N	Lon: 2.254W	Depth: 0.4 km	January 14 1998 Time: 11:30 30.5 UTC Magnitude: 1.8 ML
Grid Ref: 382.94 kmE 336.98 kmN		RMS: 0.05 secs	Lat: 60.072N Lon: 1.414E Depth: 15.0 km
Locality: NEWCASTLE-U-LYME, STAFFS		Quality: B	Grid Ref: 589.96 kmE 1136.81 kmN
Comments: C/F, FELT WHITMORE			Locality: NORTHERN NORTH SEA
10KM SOUTH OF NEWCASTLE-U-LYME		Intensity: 2+	STAT CO DIST PHAS WT P HrMn
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI		LRW SZ 144 EP 3 11:30 52.64
KWE SZ 29 IP 1 D 21:22	20.00		LRW SE 144 ES 3 11:31 07.17
KBI SZ 61 IP 1 D 21:22	25.12		LRW SN 144 11:31 17.46 12 0.22
HLM SZ 62 EP 2 21:22	25.37		LRW SE 144 11:31 14.81 13 0.25
CWF SZ 67 EP 3 21:22	26.02		YEL SZ 148 EP 3 11:30 53.06
CWF SN 67 ES 3 21:22	34.30		SAN SZ 148 EP 3 11:30 52.81
CWF SN 67	21:22	35.82 16 0.24	SAN SZ 148 ES 3 11:31 10.68
CWF SE 67	21:22	42.42 12 0.19	WAL SZ 169 EP 3 11:30 54.42
SBD SZ 68 EP 1 D 21:22	26.22		WAL SZ 169 ES 3 11:31 13.61
SSP SZ 81 EP 2 21:22	28.75		
SSP SN 81 ES 2 21:22	38.74		
SSP SN 81	21:22	39.78 25 0.19	
SSP SE 81	21:22	43.96 26 0.23	
January 8 1998	Time: 15:56 46.3 UTC	Magnitude: 1.5 ML	January 16 1998 Time: 23:21 46.4 UTC Magnitude: 0.1 ML
Lat: 56.690N	Lon: 5.242W	Depth: 15.1 km	Lat: 50.219N Lon: 5.274W Depth: 0.2 km
Grid Ref: 201.47 kmE 760.03 kmN		RMS: 0.06 secs	Grid Ref: 166.46 kmE 40.66 kmN
Locality: ONICH, HIGHLAND		Quality: C	Locality: CAMBORNE, CORNWALL
Comments: FELT ONICH		Intensity: 3+	STAT CO DIST PHAS WT P HrMn
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI		CCA SZ 5 IP D 23:21 47.23
KAR SZ 44 IP 1 C 15:56	54.10		CST SZ 8 IP 1 D 23:21 47.83
KPL SZ 77 IP 1 D 15:56	59.04		CR2 SZ 10 IP D 23:21 48.04
KPL SN 77 ES 3 15:57	08.56		CR2 SE 10 ES 1 23:21 49.32
KPL SN 77	15:57	11.60 13 0.08	CR2 SN 10 23:21 49.43 14 0.06
KPL SE 77	15:57	11.88 22 0.14	CR2 SE 10 23:21 49.43 18 0.05
EAB SZ 79 EP 1 C 15:56	59.49		CCO SZ 11 IP D 23:21 48.25
KAC SZ 90 EP 1 C 15:57	01.25		CGW SZ 14 IP D 23:21 48.77
ELO SZ 97 IP 1 C 15:57	01.94		CBW SZ 14 IP D 23:21 48.79
MDO SZ 99 EP 3 15:57	01.94		
EBH SZ 118 EP 2 15:57	05.58		
January 9 1998	Time: 07:44 40.8 UTC	Magnitude: 1.9 ML	January 19 1998 Time: 18:34 8.9 UTC Magnitude: 1.6 ML
Lat: 56.984N	Lon: 5.324W	Depth: 7.8 km	Lat: 52.955N Lon: 2.271W Depth: 1.5 km
Grid Ref: 198.07 kmE 792.95 kmN		RMS: 0.10 secs	Grid Ref: 381.77 kmE 339.77 kmN
Locality: GLEN GARRY, HIGHLAND		Quality: D	Locality: NEWCASTLE-U-LYME, STAFFS
Comments: C/F			Comments: C/F
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI		STAT CO DIST PHAS WT P HrMn
KPL SZ 44 IP C 07:44	48.51		KWE SZ 30 IP 1 D 18:34 14.52
KPL SE 44 ES 1 07:44	53.95		KBI SZ 60 IP 1 D 18:34 19.66
KPL SN 44	07:44	57.23 34 0.07	HLM SZ 64 EP 2 18:34 19.99
KPL SE 44	07:44	54.08 65 0.17	CWF SZ 69 EP 1 C 18:34 21.07
			CWF SN 69 ES 2 18:34 29.83
			CWF SN 69 18:34 30.73 16 0.16
			SSP SZ 83 IP 1 C 18:34 23.23
			SSP SN 83 ES 2 18:34 33.47
			SSP SN 83 18:34 34.72 29 0.14

PHASE DATA : 1998

TABLE 5 (cont'd)

SSP	SE	83				18:34	38.49	36	0.25
January 20 1998	Time: 01:33 17.3 UTC								
Lat: 52.943N	Lon: 2.247W								
Grid Ref: 383.42 kmE 338.50 kmN									
Locality: NEWCASTLE-U-LYME, STAFFS									
Comments: C/F									
KWE	SZ	28	IP	1	D	01:33	22.85		
KBI	SZ	59	IP	1	D	01:33	27.97		
HLM	SZ	64	EP	2		01:33	28.57		
CWF	SZ	67	EP	2		01:33	29.39		
CWF	SN	67	ES	3		01:33	37.74		
CWF	SN	67				01:33	38.65	8	0.25
CWF	SE	67				01:33	40.23	4	0.23
SSP	SZ	83	EP	2		01:33	31.63		
SSP	SE	83	ES	3		01:33	42.24		
SSP	SN	83				01:33	44.36	10	0.41
SSP	SE	83				01:33	46.82	9	0.20
January 21 1998	Time: 20:37 50.8 UTC								
Lat: 56.249N	Lon: 3.756W								
Grid Ref: 291.23 kmE 707.69 kmN									
Locality: BLACKFORD, TAYSIDE									
Comments: C/F									
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
EBH	SZ	15	IP		C	20:37	53.85		
EBH	SZ	15	ES	3		20:37	56.03		
EBH	SZ	15				20:37	56.16	33	0.07
ELO	SZ	25	EP	2		20:37	55.62		
PCO	SZ	36	EP	2		20:37	57.54		
EAB	SZ	37	IP	1	C	20:37	57.47		
EAB	SZ	37				20:38	03.44	5	0.39
EDU	SZ	57	EP	2		20:38	00.94		
January 22 1998	Time: 00:50 12.6 UTC								
Lat: 56.251N	Lon: 3.754W								
Grid Ref: 291.36 kmE 707.93 kmN									
Locality: BLACKFORD, TAYSIDE									
Comments: FELT BLACKFORD									
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
EBH	SZ	15	IP		C	00:50	15.71		
ELO	SZ	25	IP	1	D	00:50	17.27		
PCO	SZ	36	EP	1	C	00:50	19.29		
EAB	SZ	37	IP		C	00:50	19.36		
EDI	SZ	51	EP	1	D	00:50	21.65		
EDI	SE	51	ES	2		00:50	28.06		
EDI	SN	51				00:50	29.42	18	0.24
EDI	SE	51				00:50	28.25	25	0.25
January 22 1998	Time: 09:03 30.5 UTC								
Lat: 56.254N	Lon: 3.755W								
Grid Ref: 291.27 kmE 708.17 kmN									
Locality: BLACKFORD, TAYSIDE									
Comments: C/F,FELT WHITMORE									
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
EBH	SZ	15	IP		C	09:03	33.64		
ELO	SZ	24	EP	2		09:03	35.17		
EAB	SZ	37	IP		C	09:03	37.24		
PCO	SZ	37	EP	2		09:03	37.22		
EAU	SZ	49	EP	2		09:03	39.34		
EDI	SZ	51	IP	1	D	09:03	39.51		
EDI	SN	51	ES	2		09:03	45.85		
EDI	SN	51				09:03	45.97	11	0.21
EDI	SE	51				09:03	46.13	18	0.23
January 23 1998	Time: 12:03 3.3 UTC								
Lat: 50.224N	Lon: 5.289W								
Grid Ref: 165.41 kmE 41.30 kmN									
Locality: SOUTH CROFTY, CORNWALL									
Comments: COLLAPSE-FELT'S CROFTY									
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
CCA	SZ	6	IP		D	12:03	04.29		
CST	SZ	10	IP		D	12:03	04.92		
CR2	SZ	11	IP		D	12:03	05.12		
CR2	SN	11	ES	1		12:03	06.46		
CR2	SN	11				12:03	06.51	61	0.06
CR2	SE	11				12:03	06.54	72	0.07
CRQ	SZ	11	IP		D	12:03	05.07		
CCO	SZ	12	IP		D	12:03	05.34		
CBW	SZ	15	IP		D	12:03	05.87		
CGW	SZ	15	IP		D	12:03	05.85		
CMA	SZ	20	IP		D	12:03	06.75		
CGH	SZ	21	EP	1	D	12:03	07.06		
CPZ	SZ	22	IP		D	12:03	07.15		
CSA	SZ	32	EP	1	D	12:03	08.81		
January 24 1998	Time: 15:23 11.8 UTC								
Lat: 56.256N	Lon: 3.749W								
Grid Ref: 291.65 kmE 708.46 kmN									
Locality: BLACKFORD, TAYSIDE									
Comments: C/F									
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
EBH	SZ	15	IP		C	15:23	14.89		
January 25 1998	Time: 07:43 27.7 UTC								
Lat: 53.183N	Lon: 4.341W								
Grid Ref: 243.59 kmE 367.69 kmN									
Locality: ANGLESEY, GWYNEDD									
Comments: C/F									
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
EBH	SZ	15	IP		D	07:43	30.54		
WLF	SZ	12	IP			07:43	32.46		
WLF	SZ	12	ES			07:43	32.53	10	0.08
YLL	SZ	12	IP		C	07:43	30.54		
YLL	SZ	12	ES			07:43	32.45		
YRC	SZ	17	EP			07:43	31.15		
YRC	SZ	17				07:43	33.74	5	0.15
WRE	SZ	23	EP			07:43	32.01		
WME	SZ	24	IP		D	07:43	32.12		
WCB	SZ	26	EP			07:43	32.44		
WPM	SZ	30	EP			07:43	33.10		
January 25 1998	Time: 16:24 37.5 UTC								
Lat: 56.098N	Lon: 4.596W								
Grid Ref: 238.55 kmE 692.52 kmN									
Locality: LOCH LOMOND, CENTRAL									
Comments: C/F,FELT WHITMORE									
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
EAB	SZ	19	IP		C	16:24	41.51		
PMS	SZ	30	IP			16:24	43.02		
PGB	SZ	33	EP	1	C	16:24	43.51		
PGB	SN	33	ES	3		16:24	47.75		
PGB	SE	33				16:24	51.46	15	0.93
PCO	SZ	33	IP	1	C	16:24	54.36	7	0.08
PCA	SZ	49	IP	1	C	16:24	46.02		
EBH	SZ	70	EP	2		16:24	48.97		
EAU	SZ	77	EP	1	C	16:24	50.27		
EDI	SZ	90	EP	2		16:24	52.13		
EDI	SE	90	ES	3		16:25	03.17		
EDI	SN	90				16:25	05.84	4	0.12
EDB	SZ	104	EP	1	C	16:24	54.27		
January 25 1998	Time: 21:23 3.4 UTC								
Lat: 52.943N	Lon: 2.255W								
Grid Ref: 382.84 kmE 338.47 kmN									
Locality: NEWCASTLE-U-LYME, STAFFS									
Comments: C/F,FELT WHITMORE									
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
KWE	SZ	29	IP	1	D	21:23	09.14		
KBI	SZ	60	IP	1	D	21:23	14.23		
HLM	SZ	63	EP	2		21:23	14.93		
CWF	SZ	68	EP	2		21:23	14.94		
CWF	SE	68	ES	3		21:23	24.54		
CWF	SN	68				21:23	24.82	10	0.22
CWF	SE	68				21:23	26.21	12	0.38
SSP	SZ	82	EP	2		21:23	17.48		
SSP	SN	82	ES	3		21:23	28.20		
SSP	SN	82				21:23	31.63	12	0.09
SSP	SE	82				21:23	33.10	13	
January 26 1998	Time: 01:14 28.0 UTC								
Lat: 53.039N	Lon: 1.191W								
Grid Ref: 454.20 kmE 349.40 kmN									
Locality: MANSFIELD, NOTTS									
Comments: C/F									
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
KBI	SZ	33	IP	1	C	01:14	34.07		
CWF	SZ	34	EP	1	C	01:14	34.77		
CWF	SE	34	ES	2		01:14	39.18		
CWF	SN	34				01:14	56.02	51	1.14
CWF	SE	34				01:14	44.00	10	0.27
KSY	SZ	41	EP	2		01:14	35.66		
KWE	SZ	44	EP	2		01:14	36.07		
LHO	SZ	72	EP	2		01:14	40.49		
HPK	SZ	106	EP	2		01:14	46.34		
HPK	SE	106	ES	2		01:14	59.36		
January 26 1998	Time: 18:56 14.8 UTC								
Lat: 52.959N	Lon: 2.273W								
Grid Ref: 381.65 kmE 340.25 kmN									
Locality: NEWCASTLE-U-LYME, STAFFS									
Comments: C/F									
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
KWE	SZ	30	IP		D	18:			

PHASE DATA : 1998

TABLE 5 (cont'd)

CWF	SZ	70	EP	2	18:56	26.78		CGW	SZ	15	EP	1	C	20:10	49.64												
CWF	SN	70	ES	3	18:56	35.46		CGH	SZ	21	EP	1	D	20:10	50.85												
CWF	SN	70			18:56	35.97	12 0.19	February 5 1998																			
CWF	SE	70			18:56	37.69	7 0.29	Time:	08:28	30.0	UTC	Magnitude: 1.6 ML															
LHO	SZ	71	EP	2	18:56	26.96		Lat:	52.958N	Depth: 1.1 km			Grid Ref: 382.19 kmE 340.19 kmN			RMS: 0.07 secs											
SSP	SZ	83	EP	1	C	18:56	28.94	Locality:	NEWCASTLE-U-LYME, STAFFS	Quality: B																	
SSP	SE	83	ES	3	18:56	39.68		Comments:	C/F																		
SSP	SN	83			18:56	40.37	14 0.31	STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI										
SSP	SE	83			18:56	44.26	17 0.22	KWE	SZ	29	IP	1	D	08:28	35.61												
January 27 1998		Time: 08:36 15.1 UTC														Depth: 2.8 km											
Lat: 50.509N		Lon: 1.237E														RMS: 0.36 secs											
Grid Ref: 629.46 kmE 72.78 kmN		Locality: STRAIT OF DOVER														Quality: D											
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI																		
TFO	SZ	68	EP	1	C	08:36	26.40																				
TFO	SN	68	ES	2		08:36	35.13													Depth: 1.1 km							
TFO	SN	68				08:36	36.74	798 0.16	KBI	SZ	59	IP	1	D	08:28	40.74											
TFO	SE	68				08:36	36.70	653 0.22	HLM	SZ	64	EP	2		08:28	41.10											
TEB	SZ	84	EP	1	D	08:36	28.95													RMS: 0.07 secs							
TSA	SZ	112	EP	1	D	08:36	33.56													Quality: B							
TBW	SZ	144	EP	1	D	08:36	38.75																				
SFH	SZ	149	EP	2		08:36	39.75													Comments: C/F							
SIW	SZ	186	EP	3		08:36	44.86																				
SKP	SZ	197	EP	2		08:36	45.66																				
APA	SZ	200	EP	2		08:36	46.49																				
AWH	SZ	237	EP	3		08:36	51.00																				
SWN	SN	241	ES	3		08:37	15.19																				
SWN	SN	241				08:37	38.30	160 1.02	KBI	SZ	59	EP	2		03:00	19.53											
SWN	SE	241				08:37	33.45	88 0.77	HLM	SZ	64	EP	2		03:00	21.26											
SWK	SZ	256	EP	3		08:36	52.70																				
JQE	SZ	277	EP	2		08:36	54.75																				
JLP	SZ	278	IP	2		08:36	54.85																				
JRS	SZ	281	IP	2		08:36	55.14																				
JRS	SN	281	ES	3		08:37	24.42																				
JRS	SN	281				08:37	38.34	81 0.15	CWF	SZ	70	EP	3		03:00	29.79											
JRS	SE	281				08:37	37.92	130 0.19	CWF	SN	70	EP	3		03:00	30.23											
ISA	SZ	286	EP	2		08:36	55.74																				
JVM	SZ	286	EP	2		08:36	55.81																				
SMD	SZ	292	EP	3		08:36	56.60																				
January 27 1998		Time: 22:03 27.2 UTC														Magnitude: 0.5 ML											
Lat: 53.059N		Lon: 4.419W														Depth: 20.1 km											
Grid Ref: 237.92 kmE 354.04 kmN		Locality: CAERNARVON BAY, GWYNEDD														RMS: 0.05 secs											
Quality: B																Comments: FELT SW CORNWALL...											
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI																		
YRE	SZ	9	IP		D	22:03	30.80																				
YLL	SZ	19	IP		C	22:03	31.76																				
YRC	SZ	24	IP		D	22:03	32.31																				
WLF	SZ	26	EP	1	C	22:03	32.42																				
WCB	SZ	37	EP	2		22:03	34.15																				
WCB	SE	37	ES	2		22:03	38.69																				
WCB	SN	37				22:03	39.14	5 0.10																			
WME	SZ	38	EP	2		22:03	34.15																				
WPM	SZ	41	EP	1	C	22:03	34.67																				
WFB	SZ	49	EP	2		22:03	35.86																				
February 3 1998		Time: 17:58 59.2 UTC														Magnitude: 1.6 ML											
Lat: 52.947N		Lon: 2.254W														Depth: 3.3 km											
Grid Ref: 382.95 kmE 338.91 kmN		Locality: NEWCASTLE-U-LYME, STAFFS														RMS: 0.10 secs											
Comments: C/F																											
9KM SOUTH OF NEWCASTLE-U-LYME																											
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI																		
KWE	SZ	29	IP	1	D	17:59	04.49																				
KBI	SZ	60	IP	1	D	17:59	09.66																				
HLM	SZ	64	EP	2		17:59	10.31																				
CWF	SZ	68	EP	2		17:59	11.20																				
CWF	SN	68	ES	2		17:59	19.37																				

PHASE DATA : 1998

TABLE 5 (cont'd)

HAE	SZ	56	IP	1	C	20:39	29.24		CWF	SN	69			01:24	12.40	19	0.23	
HSA	SZ	80	IP	1	C	20:39	32.91		CWF	SE	69			01:24	12.54	9	0.17	
HEX	SZ	84	IP	C	20:39	33.78		SSP	SZ	82	EP	1	C	01:24	05.42			
SWN	SZ	85	EP	2		20:39	34.47	SSP	SN	82	ES	2		01:24	15.57			
SWN	SE	85	ES	2		20:39	45.28	SSP	SN	82				01:24	16.81	18	0.33	
SWN	SN	85				20:39	46.00	94	0.17	SSP	SE	82			01:24	18.28	17	0.27
SWN	SE	85				20:39	45.97	126	0.18									
SSP	SZ	88	EP	2		20:39	34.07											
SSP	SE	88	ES	2		20:39	44.55											
SSP	SN	88				20:39	51.03	51	0.13									
SSP	SE	88				20:39	45.02	63	0.24									
HCG	SZ	89	IP	1	D	20:39	34.36											
HTL	SZ	125	EP	4		20:39	40.61											
HTL	SN	125				20:39	57.61	57	0.18									
HTL	SE	125				20:39	56.75	64	0.17									
February 13 1998		Time: 11:04 12.3 UTC					Magnitude: 1.6 ML											
Lat: 52.951N		Lon: 2.267W					Depth: 2.0 km											
Grid Ref: 382.04 kmE 339.34 kmN		Locality: NEWCASTLE-U-LYME, STAFFS					RMS: 0.19 secs											
Comments: C/F,FELT KEELE		Comments: C/F,FELT KEELE					Quality: C											
Intensity: 3+		Intensity: 3+																
STAT	CO	DIST	PHAS	WT	P	HrMn												
KLE	SZ	6	EP	9		11:04		15.00										
KLE	SZ	6	ES	4		11:04	15.88											
KLE2	SZ	6	EP	9		11:04	16.00											
KLE2	SZ	6	ES	4		11:04	17.26											
KWE	SZ	30	IP	1	D	11:04	17.82											
KBI	SZ	60	IP	1	D	11:04	22.99											
HLM	SZ	64	EP	2		11:04	23.08											
CWF	SZ	69	EP	2		11:04	24.65											
CWF	SN	69	ES	2		11:04	32.72											
CWF	SN	69				11:04	33.52	22	0.23									
CWF	SE	69				11:04	33.67	11	0.24									
LHO	SZ	72	EP	2		11:04	24.62											
SSP	SZ	82	IP	C		11:04	26.56											
SSP	SN	82	ES	2		11:04	36.78											
SSP	SN	82				11:04	37.94	23	0.32									
SSP	SE	82				11:04	39.74	22	0.22									
HAE	SZ	103	EP	2		11:04	29.98											
February 15 1998		Time: 13:36 56.3 UTC					Magnitude: 1.9 ML											
Lat: 55.494N		Lon: 1.914W					Depth: 16.8 km											
Grid Ref: 405.43 kmE 622.25 kmN		RMS: 0.06 secs					Locality: WOOLER,NORTHUMBERLAND											
Comments: 7KM SE OF WOOLER		Comments: 7KM SE OF WOOLER					Quality: C											
STAT	CO	DIST	PHAS	WT	P	HrMn												
XSO	SZ	21	IP	C		13:37		09.92										
XSO	SZ	21	ES	2		13:37		04.30										
ESY	SZ	65	IP	1	D	13:37		07.22										
XAL	SZ	73	EP	2		13:37		08.56										
BBH	SZ	76	EP	2		13:37		08.75										
EBL	SZ	78	EP	2		13:37		09.10										
ESK	SZ	84	IP	1	C	13:37		10.08										
ECK	SZ	85	IP	1	C	13:37		10.10										
EDI	SN	93	ES	2		13:37		22.53										
EDI	SN	93				13:37		24.12	28	0.24								
EDI	SE	93				13:37		23.83	15	0.30								
BHH	SZ	94	EP	2		13:37		11.64										
BHH	SN	94	ES	2		13:37		22.60										
BHH	SN	94				13:37		24.24	29	0.27								
BHH	SE	94				13:37		24.24	51	0.25								
February 17 1998		Time: 14:26 30.1 UTC					Magnitude: 2.0 ML											
Lat: 53.482N		Lon: 1.151W					Depth: 0.1 km											
Grid Ref: 456.36 kmE 398.73 kmN		RMS: 0.13 secs					Locality: DONCASTER,SOUTH YORKS											
Comments: C/F,FELT MALTBY...		Comments: C/F,FELT MALTBY...					Quality: B											
STAT	CO	DIST	PHAS	WT	P	HrMn												
KBI	SZ	36	EP	2		14:26		36.89										
LMK	SZ	55	EP	2		14:26		40.17										
HPK	SZ	62	EP	2		14:26		41.49										
HPK	SE	62	ES	2		14:26		49.39										
KWE	SZ	69	IP	1	D	14:26		42.52										
KSY	SZ	69	EP	2		14:26		42.74										
CWF	SZ	83	EP	1	C	14:26		44.76										
CWF	SE	83	ES	2		14:26		55.53										
CWF	SN	83				14:26		59.29	41	0.16								
CWF	SE	83				14:26		59.34	54	0.16								
February 18 1998		Time: 01:23 51.1 UTC					Magnitude: 1.5 ML											
Lat: 52.949N		Lon: 2.266W					Depth: 1.3 km											
Grid Ref: 382.10 kmE 339.12 kmN		RMS: 0.07 secs					Locality: NEWCASTLE-U-LYME, STAFFS											
Comments: C/F		Comments: C/F					Quality: B											
STAT	CO	DIST	PHAS	WT	P	HrMn												
KWE	SZ	30	IP	1	D	01:23		56.72										
KBI	SZ	60	IP	1	D	01:24		01.83										
HLM	SZ	63	EP	3		01:24		02.12										
SBD	SZ	67	EP	1	C	01:24		02.90										
CWF	SZ	69	EP	2		01:24		03.22										
CWF	SE	69	ES	3		01:24		12.01										
February 19 1998		Time: 22:45 37.2 UTC					Magnitude: 1.4 ML											
Lat: 52.958N		Lon: 2.262W					Depth: 0.3 km											
Grid Ref: 382.39 kmE 340.15 kmN		RMS: 0.10 secs					Locality: NEWCASTLE-U-LYME, STAFFS											
Comments: C/F,FELT NEW-U-LYME		Comments: C/F,FELT NEW-U-LYME					Quality: C											
Intensity: 2+		Intensity: 2+																
STAT	CO	DIST	PHAS	WT	P	HrMn												
KWE	SZ	29	IP	1	D	22:45												
KBI	SZ	59	EP	1	D	22:45												
CWF	SZ	69	EP	3		22:45												
CWF	SE	69	ES	3		22:45												
February 25 1998		Time: 23:07 4.4 UTC																

PHASE DATA : 1998

TABLE 5 (cont'd)

EAB	SZ	31	IP	D	20:21	29.13			March	8	1998	Time: 01:50 13.7 UTC	Magnitude: 1.3 ML						
ELO	SZ	40	IP	C	20:21	30.70			Lat:	52.942N	Lon: 2.256W	Depth: 0.9 km							
PCO	SZ	55	EP	2	20:21	33.10			Grid Ref:	382.81 kmE 338.34 kmN	RMS: 0.07 secs								
EBH	SZ	58	EP	1	C	20:21	33.69		Locality:	NEWCASTLE-U-LYME, STAFFS	Quality: C								
PMS	SZ	73	EP	1	D	20:21	35.81		Comments:	C/F									
PGB	SZ	73	EP	1	C	20:21	35.89	STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI		
PGB	SN	73	ES	1		20:21	44.87	KLE2	SZ	7	EP	9		01:50	18.00				
PGB	SN	73				20:21	48.17	15	0.17	KLE2	SZ	7	ES	4		01:50	19.27		
PGB	SE	73				20:21	45.77	15	0.14	KLE	SZ	7	EP	9		01:50	17.00		
EDU	SZ	84	EP	2		20:21	37.65	KLE	SZ	7	ES	4		01:50	17.87				
PCA	SZ	85	IP	1	D	20:21	37.66	KWE	SZ	29	IP	1	D	01:50	19.35				
EDI	SZ	95	EP	2		20:21	39.24	KBI	SZ	60	EP	1	D	01:50	24.49				
EDI	SN	95	ES	2		20:21	50.21	HLM	SZ	63	EP	1	C	01:50	24.96				
EDI	SN	95				20:21	53.21	CWF	SZ	68	EP	3		01:50	25.72				
EDI	SE	95				20:21	51.17	CWF	SN	68	ES	3		01:50	34.51				
KPL	SZ	125	EP	3		20:21	44.53	CWF	SN	68				01:50	35.06	13 0.21			
KPL	SN	125				20:22	00.97	CWF	SE	68				01:50	41.19	5 0.16			
KPL	SE	125				20:22	00.03	SSP	SZ	82	EP	1	C	01:50	28.11				
KPL	SE	125				20:22	22	0.17	SSP	SE	82	ES	3		01:50	38.24			
March	6	1998	Time: 18:43 46.3 UTC	Magnitude: 0.1 ML	SSP	SN	82							01:50	39.92	14 0.14			
			Lat: 52.970N	Lon: 4.392W										01:50	43.36	18 0.26			
			Grid Ref: 239.38 kmE 344.06 kmN																
			Locality: LLEYN PENIN, GWYNEDD																
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	March	8	1998	Time: 16:50 29.4 UTC	Magnitude: 0.9 ML					
YRE	SZ	3	IP	1	D	18:43	50.20			Lat:	60.672N	Lon: 0.749W	Depth: 15.0 km						
YRE	SZ	3				18:43	53.48	9	0.11	Grid Ref:	468.35 kmE 1199.37 kmN	RMS: 0.00 secs							
YRH	SZ	22	EP	2		18:43	51.60			Locality:	SHETLAND ISLANDS	Quality: C							
YRH	SZ	22	ES	2		18:43	55.16			Comments:	4KM SE OF UNST								
YRH	SZ	22				18:43	55.27	12	0.08	STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
YLL	SZ	24	EP	2		18:43	51.81			YEL	SZ	23	EP	3		16:50	33.71		
YLL	SZ	24	ES	2		18:43	55.59			LRW	SZ	64	EP	3		16:50	39.85		
YLL	SZ	24				18:43	55.89	10	0.05	LRW	SN	64	ES	3		16:50	47.51		
YRC	SZ	34	EP	2		18:43	52.99			LRW	SN	64				16:50	47.93	4 0.09	
WLF	SZ	36	IP	1	D	18:43	53.28			LRW	SE	64				16:50	48.49	6 0.11	
WLF	SZ	36	ES	3		18:43	57.96												
March	7	1998	Time: 02:08 59.4 UTC	Magnitude: 2.7 ML	March	9	1998	Time: 17:22 40.2 UTC	Magnitude: 1.2 ML										
			Lat: 56.417N	Lon: 5.279W						Lat:	52.934N	Lon:	2.219W	Depth: 4.3 km					
			Grid Ref: 197.80 kmE 729.79 kmN							Grid Ref:	385.26 kmE 337.42 kmN	RMS: 0.09 secs							
			Locality: OBAN, STRATHCLYDE							Locality:	STONE, STAFFORDSHIRE	Quality: C							
			Comments: FELT OBAN...							STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
			12KM EAST OF OBAN							KWE	SZ	27	EP	2		17:22	45.25		
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	KBI	SZ	59	EP	2		17:22	50.25		
EAB	SZ	64	IP	1	C	02:09	10.00			WFB	SZ	126	EP	2		17:23	00.58		
PMS	SZ	72	IP	1	D	02:09	11.38			WFB	SZ	126	ES	3		17:23	14.45		
POB	SZ	83	EP	1	C	02:09	13.31			YLL	SZ	133	EP	2		17:23	02.16		
PGB	SZ	84	IP	1	C	02:09	13.40			WCB	SZ	163	EP	3		17:23	06.13		
PGB	SN	84	ES	2		02:09	22.88			WCB	SN	163	ES	3		17:23	25.50		
PGB	SN	84				02:09	23.72	279	0.21	WCB	SN	163				17:23	25.83	3 0.20	
PGB	SE	84				02:09	23.49	225	0.33	WCB	SE	163				17:23	26.31	3 0.19	
PCO	SZ	87	IP	1	C	02:09	14.05			March	9	1998	Time: 19:35 49.0 UTC	Magnitude: 0.8 ML					
ELO	SZ	97	IP	1	C	02:09	15.38												
PCA	SZ	102	IP	1	C	02:09	16.23			Lat:	55.460N	Lon:	2.073W	Depth: 19.8 km					
KPL	SZ	105	IP	1	D	02:09	16.62			Grid Ref:	395.35 kmE 618.45 kmN	RMS: 0.17 secs							
KPL	SE	105	ES	2		02:09	29.29			Locality:	WOOLER, NORTHUMBERLAND	Quality: C							
KPL	SN	105				02:09	32.31	196	0.11	Comments:	8KM SW OF WOOLER								
KPL	SE	105				02:09	31.77	171	0.11	STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
EBH	SZ	111	EP	2		02:09	17.80			XSO	SZ	12	IP	C		19:35	52.79		
KAC	SZ	121	EP	2		02:09	19.07			XSO	SZ	12	ES	3		19:35	56.03		
EAU	SZ	131	EP	1	C	02:09	20.62			ESY	SZ	61	EP	2		19:35	59.30		
EDU	SZ	140	EP	2		02:09	22.24			XAL	SZ	67	EP	2		19:36	00.31		
EDI	SZ	141	EP	2		02:09	22.35			EBL	SZ	70	EP	2		19:36	00.96		
EDI	SE	141	ES	2		02:09	38.91			ESK	SZ	74	EP	2		19:36	00.98		
EDI	SN	141				02:09	42.40	141	0.16	ESK	SE	74	ES	2		19:36	10.51		
EDI	SE	141				02:09	41.52	110	0.24	ESK	SN	74				19:36	10.48	3 0.14	
RRR	SZ	164	EP	2		02:09	24.38			ESK	SE	74				19:36	11.09	3 0.09	
RRR	SN	164				02:09	47.51	102	0.29	ECK	SZ	74	EP	2		19:36	01.02		
RRR	SE	164				02:09	46.53	95	0.19										
March	7	1998	Time: 17:00 57.9 UTC	Magnitude: 1.9 ML	March	10	1998	Time: 09:42 13.4 UTC	Magnitude: 1.4 ML										
			Lat: 55.471N	Lon: 1.992W						Lat:	55.240N	Lon:	3.526W	Depth: 9.3 km					
			Grid Ref: 400.52 kmE 619.72 kmN							Grid Ref:	303.00 kmE 595.01 kmN	RMS: 0.14 secs							
			Locality: WOOLER, NORTHUMBERLAND							Locality:	JOHNSTONEBRIDGE, D & G	Quality: C							
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
XSO	SZ	17	IP		C	17:01	02.04			BWH	SZ	11	IP	1	C	09:42	16.25		
XSO	SZ	17	ES	3		17:01	05.28			ESK	SZ	22	IP		C	09:42	17.83		
ESY	SZ	63	IP	1	D	17:01	08.55			ESK	SN	22	ES	2		09:42	20.58		
XAL	SZ	69	EP	2		17:01	09.56			ESK	SN	22				09:42	20.62	117 0.06	
BBH	SZ	71	IP	1	C	17:01	09.53			ESK	SE	22				09:42	20.67	127 0.12	
EBL	SZ	74	IP	1	C	17:01	10.27			BHH	SZ	26	IP	1	C	09:42	18.45		
ECK	SZ	79	IP	1	C	17:01	10.77			BHH	SN	26	ES	2		09:42	21.56		
ESK	SZ	79	IP	1	C	17:01	10.84			BHH	SN	26				09:42	21.63	167 0.27	
ESK	SN	79	ES	2		17:01	20.39			BHH	SE	26				09:42	21.61	276 0.24	
ESK	SN	79				17:01	20.72	39	0.19	ECK	SZ	26	IP	C		09:42	18.48		
ESK	SE	79				17:01	21.38	74	0.09	BNA	SZ	31	IP	1	D	09:42	19.05		
BHH	SZ	89	IP	1	C	17:01	12.31			BBH	SZ	40	IP		C	09:42	20.63		
EDI	SZ	90	IP	1	C	17:01	12.84			GCD	SZ	50	IP	1	C	09:42	21.97		
EDI	SN	90	ES	3		17:01	23.78			BBO	SZ	59	IP	1	D	09:42	23.82		
EDI	SN	90				17:01	24.72	27	0.15	BBO	SE	59	ES	2		09:42	31.00		
EDI	SE	90	</td																

PHASE DATA : 1998

TABLE 5 (cont'd)

March 16 1998	Time: 08:23 27.4 UTC	Magnitude: 1.2 ML	March 22 1998	Time: 23:57 26.6 UTC	Magnitude: 1.1 ML
Lat: 52.956N	Lon: 2.249W	Depth: 1.5 km	Lat: 53.374N	Lon: 1.178W	Depth: 1.6 km
Grid Ref: 383.26 kmE 339.86 kmN		RMS: 0.15 secs	Grid Ref: 454.67 kmE 386.69 kmN		RMS: 0.31 secs
Locality: NEWCASTLE-U-LYME, STAFFS		Quality: D	Locality: WORKSOP, NOTTINGHAMSHIRE		Quality: C
Comments: C/F			Comments: C/F		
STAT CO DIST PHAS WT P HrMn		SECS AMPL PERI	STAT CO DIST PHAS WT P HrMn		SECS AMPL PERI
KWE SZ 28 IP 1 D 08:23		32.85	KBI SZ 27 EP 2		23:57 31.36
KBI SZ 59 EP 1 D 08:23		37.88	LHO SZ 49 EP 1 C		23:57 35.81
HLM SZ 65 EP 2 08:23		39.29	KSY SZ 60 EP 2		23:57 37.23
SSP SZ 84 EP 1 C 08:23		41.66	KWE SZ 60 EP 2		23:57 36.96
SSP SN 84 ES 2 08:23		51.83	CWF SZ 71 EP 2		23:57 39.43
SSP SN 84 ES 2 08:23		53.45 9 0.13	CWF SN 71 ES 3		23:57 48.24
SSP SE 84 ES 2 08:23		54.76 6 0.43	CWF SN 71		23:57 53.99 7 0.20
March 16 1998	Time: 21:37 53.8 UTC	Magnitude: 1.0 ML	CWF SE 71	23:57 53.67 9 0.26	
Lat: 51.727N	Lon: 2.845W	Depth: 26.6 km	HPK SZ 71 EP 3		23:57 39.21
Grid Ref: 341.67 kmE 203.48 kmN		RMS: 0.02 secs	HPK SE 71 ES 3		23:57 47.39
Locality: USK, GWENT		Quality: B			
STAT CO DIST PHAS WT P HrMn		SECS AMPL PERI			
HGH SZ 10 IP 1 C 21:37		58.39			
MCH SZ 32 IP 1 D 21:38		00.45			
MCH SE 32 ES 2 21:38		05.31			
MCH SN 32 ES 2 21:38		05.59 11 0.25			
MCH SE 32 ES 2 21:38		05.40 13 0.12			
HAE SZ 40 IP 1 C 21:38		01.57			
HTR SZ 49 IP 1 D 21:38		02.71			
SSP SZ 79 IP 1 C 21:38		07.39			
SSP SE 79 ES 2 21:38		16.97			
SSP SN 79 ES 2 21:38		17.13 9 0.10			
SSP SE 79 ES 2 21:38		17.02 8 0.18			
HCG SZ 87 EP 2 21:38		08.68			
March 18 1998	Time: 17:59 15.0 UTC	Magnitude: 1.6 ML			
Lat: 53.013N	Lon: 3.723W	Depth: 7.9 km			
Grid Ref: 284.45 kmE 347.61 kmN		RMS: 0.09 secs			
Locality: BETWS-Y-COED, GWYNEDD		Quality: C			
Comments: 12KM SE OF BETWS-Y-COED					
STAT CO DIST PHAS WT P HrMn		SECS AMPL PERI			
WPM SZ 30 IP 1 D 17:59		20.25			
YLL SZ 33 IP 1 D 17:59		20.91			
WFB SZ 42 IP 1 C 17:59		22.18			
YRE SZ 47 EP 1 C 17:59		23.31			
WLF SZ 55 IP 1 D 17:59		24.28			
WME SZ 58 EP 1 D 17:59		24.71			
YRC SZ 63 IP 1 D 17:59		25.56			
YRH SZ 64 IP 1 C 17:59		26.02			
WCB SZ 68 EP 2 17:59		26.39			
WCB SN 68 ES 2 17:59		34.41			
WCB SN 68 ES 2 17:59		35.35 11 0.16			
WCB SE 68 ES 2 17:59		34.53 25 0.22			
HCG SZ 77 EP 1 C 17:59		27.59			
SSP SZ 78 IP 1 D 17:59		28.14			
SSP SN 78 ES 2 17:59		37.30			
SSP SN 78 ES 2 17:59		37.81 15 0.38			
SSP SE 78 ES 2 17:59		37.61 45 0.19			
HLM SZ 79 IP 1 D 17:59		28.34			
March 19 1998	Time: 04:59 45.2 UTC	Magnitude: 1.6 ML	March 24 1998	Time: 20:05 13.5 UTC	Magnitude: 1.3 ML
Lat: 49.932N	Lon: 2.211W	Depth: 10.0 km	Lat: 56.144N	Lon: 3.724W	Depth: 2.0 km
Grid Ref: 384.89 kmE 3.63 kmN		RMS: 0.52 secs	Grid Ref: 292.92 kmE 695.90 kmN		RMS: 0.06 secs
Locality: ENGLISH CHANNEL		Quality: D	Locality: CLACKMANNAN, CENTRAL		Quality: B
Comments: C/F			Comments: C/F		
STAT CO DIST PHAS WT P HrMn		SECS AMPL PERI	STAT CO DIST PHAS WT P HrMn		SECS AMPL PERI
JVM SZ 80 EP 2 04:59		57.25	EBH SZ 18 IP 1 C		20:05 16.98
JQE SZ 82 EP 2 04:59		59.56	PCO SZ 29 IP 1 D		20:05 19.02
JRS SZ 83 EP 2 04:59		58.60	ELO SZ 36 IP 1 C		20:05 20.23
JRS SE 83 ES 2 05:00		09.25	EAU SZ 37 EP 2		20:05 20.41
JRS SN 83 ES 2 05:00		12.17 26 0.14	EAB SZ 38 IP 1 D		20:05 20.42
JRS SE 83 ES 2 05:00		12.18 26 0.16	EDI SZ 42 EP 2		20:05 21.01
ISA SZ 83 EP 3 04:59		57.84	EDI SN 42 ES 2		20:05 26.58
DYA SZ 135 EP 2 05:00		06.78	EDI SN 42		20:05 26.91 33 0.31
DYA SN 135 EP 2 05:00		23.90 6 0.20	EDI SE 42		20:05 27.24 48 0.84
DYA SE 135 EP 2 05:00		23.95 8 0.13	PGB SZ 60 EP 2		20:05 23.97
March 19 1998	Time: 09:57 6.1 UTC	Magnitude: 1.7 ML	PGB SN 60 ES 2		31.84
Lat: 52.951N	Lon: 1.903W	Depth: 10.1 km	PGB SN 60		20:05 32.01 14 0.39
Grid Ref: 406.51 kmE 339.18 kmN		RMS: 0.08 secs	PGB SE 60		20:05 33.52 13 0.38
Locality: UTTOXETER, STAFFORDSHIRE		Quality: B	EDU SZ 63 EP 2		20:05 24.53
Comments: C/F					
STAT CO DIST PHAS WT P HrMn		SECS AMPL PERI			
KWE SZ 8 IP C 09:57		08.54			
KBI SZ 42 IP C 09:57		13.45			
CWF SZ 47 EP 1 C 09:57		14.23			
CWF SN 47 ES 2 09:57		20.00			
CWF SN 47 ES 2 09:57		20.67 49 0.23			
CWF SE 47 ES 2 09:57		20.88 34 0.12			
HLM SZ 82 EP 2 09:57		19.36			
SSP SZ 101 EP 2 09:57		22.61			
SSP SN 101 ES 3 09:57		34.81			
SSP SN 101 EP 2 09:57		35.78 12 0.10			
SSP SE 101 EP 2 09:57		36.43 11 0.14			
HAE SZ 111 EP 2 09:57		24.28			
MCH SN 130 ES 4 09:57		41.93			
March 19 1998	Time: 02:53 44.9 UTC	Magnitude: 1.3 ML			
Lat: 52.952N	Lon: 2.266W	Depth: 1.5 km			
Grid Ref: 382.11 kmE 339.43 kmN		RMS: 0.08 secs			
Locality: NEWCASTLE-U-LYME, STAFFS		Quality: B			
Comments: C/F					
STAT CO DIST PHAS WT P HrMn		SECS AMPL PERI	STAT CO DIST PHAS WT P HrMn		SECS AMPL PERI
KWE SZ 29 IP 1 D		02:53 50.41	KBI SZ 60 EP 1 D		02:53 55.58
HLM SZ 64 EP 3		02:53	SBD SZ 67 EP 1 C		02:53 56.60
CWF SZ 69 EP 3		02:53	CWF SN 69 ES 3		02:54 57.15
CWF SN 69 ES 3		02:54	CWF SN 69		02:54 05.73
CWF SE 69		02:54	CWF SE 69		02:54 09.89 8 0.37
SSP SZ 83 EP 2		02:53	SSP SN 83 ES 3		02:54 13.02 5 0.27
SSP SN 83 ES 3		02:54	SSP SN 83		02:54 59.13
SSP SE 83 ES 3		02:54	SSP SE 83		02:54 09.33
March 26 1998	Time: 20:52 4.5 UTC	Magnitude: 2.2 ML			
Lat: 56.248N	Lon: 3.750W	Depth: 5.3 km			
Grid Ref: 291.54 kmE 707.48 kmN		RMS: 0.06 secs			
Locality: BLACKFORD, TAYSIDE		Quality: B			
Comments: FELT BLACKFORD...					
STAT CO DIST PHAS WT P HrMn		SECS AMPL PERI	STAT CO DIST PHAS WT P HrMn		SECS AMPL PERI
EBH SZ 15 IP C		20:52 07.51	ELO SZ 25 IP C		20:52 09.19
ELO SZ 25 IP C		20:52	PCO SZ 36 IP C		20:52 11.10
PCO SZ 36 IP C		20:52	EAB SZ 37 IP C		20:52 11.21
EAB SZ 37 IP C		20:52	EAU SZ 49 EP 2		20:52 13.08
EAU SZ 49 EP 2		20:52	EDI SZ 50 IP 1 D		20:52 13.36
EDI SZ 50 IP 1 D		20:52	EDI SN 50 ES 2		20:52 19.70
EDI SN 50 ES 2		20:52			25.47 112 0.31

PHASE DATA : 1998

TABLE 5 (cont'd)

PHASE DATA : 1998

TABLE 5 (cont'd)

PHASE DATA : 1998

TABLE 5 (cont'd)

PHASE DATA : 1998

TABLE 5 (cont'd)

PHASE DATA : 1998

TABLE 5 (cont'd)

BHH	SZ	25	IP	D	06:46	31.54			HTL	SZ	28	IP	D	13:03	36.95				
BHH	SE	25	ES	1	06:46	34.83			HTL	SE	28	ES	2	13:03	40.39				
BHH	SN	25			06:46	35.30	65	0.30	HTL	SN	28			13:03	41.18	187	0.13		
BHH	SE	25			06:46	35.21	56	0.22	HTL	SE	28			13:03	41.61	110	0.16		
BTA	SZ	28	IP	C	06:46	31.92			HEX	SZ	64	EP	2	13:03	42.52				
BBH	SZ	31	IP	D	06:46	32.40			HPE	SZ	82	IP	1	C	13:03	45.11			
CKE	SZ	32	IP	1	D	06:46	32.50		HTR	SZ	138	IP	1	D	13:03	54.48			
BNA	SZ	34	IP	C	06:46	32.93			HCG	SZ	143	EP	2		13:03	55.11			
XDE	SZ	48	EP	2	06:46	35.10			MCH	SZ	147	EP	2		13:03	55.89			
BWH	SZ	48	EP	2	06:46	35.18			MCH	SE	147	ES	2		13:04	13.03			
CSF	SZ	49	EP	1	D	06:46	35.01			MCH	SN	147				13:04	14.75	15	0.13
GCD	SZ	53	EP	1	C	06:46	35.78			MCH	SE	147				13:04	14.37	16	0.22
GIM	SZ	109	EP	2	06:46	44.93													
GIM	SE	109	ES	2	06:46	58.32													
GIM	SN	109			06:46	59.53	18	0.16											
GIM	SE	109			06:46	59.95	9	0.11											
May	28	1998	Time: 11:55 0.7 UTC	Magnitude: 1.5 ML					May	31	1998	Time: 13:23 21.6 UTC	Magnitude: 3.1 ML						
Lat:	54.873N	Lon:	3.110W						Lat:	64.288N	Lon:	1.083W							
Grid Ref:	328.76 kmE	553.75 kmN						Grid Ref:	444.38 kmE	1601.82 kmN									
Locality:	WIGTON, CUMBRIA							Locality:	NORWEGIAN SEA										
STAT	CO	DIST	PHAS	WT	P	HrMn		STAT	CO	DIST	PHAS	WT	P	HrMn		SECS	AMPL	PERI	
BDL	SZ	14	IP	1	D	11:55		YEL	SZ	417	EP	3							
BBO	SZ	18	IP		C	11:55		WAL	SZ	450	EP	3							
BBO	SN	18	ES	2		11:55		LRW	SZ	463	EP	2							
BBO	SZ	18				11:55		LRW	SE	463	ES	3							
BBO	SZ	18				11:55	07.56	238	0.21										
BBO	SE	18				11:55	07.39	501	0.20										
BHH	SZ	25	IP		D	11:55		SUE	SZ	468	EP	3							
BHH	SN	25	ES	2		11:55		SAN	SZ	476	EP	3							
BHH	SN	25				11:55		ASK	SZ	535	EP	3							
BHH	SN	25				11:55		OWE	SZ	563	EP	3							
BHH	SN	25				11:55		OHO	SZ	619	EP	3							
BHH	SE	25				11:55													
BTA	SZ	28	IP	C	11:55	09.42	86	0.19											
BTA	SN	28	ES	2		11:55													
BTA	SN	28				11:55													
BTA	SN	28				11:55													
BTA	SE	28				11:55													
BBH	SZ	31	IP	D	11:55	06.60													
CKE	SZ	32	IP	D	11:55	06.72													
BNA	SZ	35	IP	C	11:55	07.13													
CSF	SZ	48	IP	D	11:55	09.23													
XDE	SZ	48	IP	D	11:55	09.30													
GCD	SZ	53	IP	1	C	11:55													
CDU	SZ	60	IP	1	D	11:55													
LMI	SZ	74	IP	1	C	11:55													
GIM	SZ	109	IP	1	D	11:55													
GIM	SN	109				11:55													
GIM	SE	109				11:55													
May	29	1998	Time: 18:38 32.3 UTC	Magnitude: 0.8 ML					June	1	1998	Time: 23:02 31.4 UTC	Magnitude: 1.0 ML						
Lat:	60.686N	Lon:	1.723W					Lat:	53.486N	Lon:	1.179W								
Grid Ref:	415.13 kmE	1200.22 kmN						Grid Ref:	454.51 kmE	399.10 kmN									
Locality:	NW OF SHETLAND ISLANDS							Locality:	DONCASTER, SOUTH YORKS										
Comments:	20KM NW OF SHETLAND							Comments:	C/F										
STAT	CO	DIST	PHAS	WT	P	HrMn		STAT	CO	DIST	PHAS	WT	P	HrMn		SECS	AMPL	PERI	
YEL	SZ	38	EP	3		18:38		EAB	SZ	37	IP	1	C	18:27					
YEL	SZ	38	ES	3		18:38		PMS	SZ	62	EP	1	D	18:27					
WAL	SZ	48	EP	3		18:38		PCO	SZ	63	EP	1	C	18:27					
LRW	SZ	68	EP	3		18:38		ELO	SZ	67	IP	1	C	18:27					
LRW	SE	68	ES	3		18:38		PGB	SZ	69	EP	3		18:27					
LRW	SN	68				18:38		PGB	SE	69	ES	3		18:27					
LRW	SE	68				18:38		PGB	SN	69				18:27					
SAN	SZ	79	ES	3		18:38		PGB	SE	69				18:27					
May	31	1998	Time: 12:55 52.5 UTC	Magnitude: 2.6 ML					EBH	SZ	81	EP	1	D	18:27				
Lat:	51.190N	Lon:	4.712W					EAU	SZ	104	EP	2		18:27					
Grid Ref:	210.50 kmE	146.99 kmN						EDI	SE	113	ES	4		18:27					
Locality:	BRISTOL CHANNEL							EDI	SN	113				18:28					
STAT	CO	DIST	PHAS	WT	P	HrMn		EDI	SE	113				18:28					
HTL	SZ	27	IP		D	12:55								18:28					
HTL	SN	27	ES	2		12:56								18:28					
HEX	SZ	65	EP	2		12:56								18:28					
HSA	SZ	73	IP	1	C	12:56								18:28					
HPE	SZ	83	IP	1	C	12:56								18:28					
DYA	SZ	100	IP	1	C	12:56								18:28					
DYA	SE	100	ES	2		12:56								18:28					
DYA	SN	100				12:56								18:28					
HTR	SZ	141	EP	2		12:56								18:28					
HGH	SZ	142	EP	2		12:56								18:28					
MCH	SZ	149	EP	2		12:56								18:28					
MCH	SN	149	ES	2		12:56								18:28					
MCH	SN	149				12:56								18:28					
MCH	SE	149				12:56								18:28					
SSP	SZ	176	EP	2		12:56								18:28					
SSP	SN	176				12:56								18:28					
SSP	SE	176				12:56								18:28					
May	31	1998	Time: 13:03 31.7 UTC	Magnitude: 1.7 ML					June	9	1998	Time: 04:43 52.5 UTC	Magnitude: 1.5 ML						
Lat:	51.206N	Lon:	4.688W					Lat:	56.143N	Lon:	3.712W								
Grid Ref:	212.22 kmE	148.65 kmN						Grid Ref:	293.63 kmE	695.77 kmN									
Locality:	BRISTOL CHANNEL							Locality:	CLACKMANNAN, CENTRAL										
STAT	CO	DIST	PHAS	WT	P	HrMn		Comments:	C/F,FELT CLACKMANNAN										
HTL	SZ	28	IP	2		13:03		STAT	CO	DIST	PHAS	WT	P	HrMn		SECS	AMPL	PERI	
HTL	SN	28	ES	2		13:03		YRE	SZ	5	IP		D	04:43					
HEX	SZ	64	EP	2		13:03		YLL	SZ	28	IP	1	C	04:43					
HPE	SZ	82	IP	2		13:03		YRC	SZ	30	IP	1	D	04:43					
DYA	SZ	147	IP	2		13:03		WLF	SZ	34	IP	1	D	04:43					
DYA	SE	147	ES	2		13:03													

PHASE DATA : 1998

TABLE 5 (cont'd)

PHASE DATA : 1998

TABLE 5 (cont'd)

June 28 1998 Time: 22:12 10.9 UTC											July 8 1998 Time: 23:14 43.4 UTC											July 9 1998 Time: 02:10 40.2 UTC										
Lat: 49.068N Lon: 2.025W											Lat: 56.894N Lon: 7.725E											Lat: 56.136N Lon: 3.706W										
Grid Ref: 398.15 kmE -92.48 kmN											Grid Ref: 991.25 kmE 820.23 kmN											Lat: 56.136N Lon: 3.706W										
Locality: JERSEY, CHANNEL ISLANDS											Locality: SKAGERRAK											Lat: 56.136N Lon: 3.706W										
Comments: 10KM SE OF JERSEY											Comments: 7KM WSW OF NEWTOWN											Comments: C/F										
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI			
JRS	SZ	15	EP	2		22:12	14.86			JRS	SZ	626	EP	3		23:16	05.89			JRS	SZ	626	EP	3		23:16	05.89					
JRS	SN	15	ES	2		22:12	17.77			JRS	SZ	639	EP	3		23:16	07.14			JRS	SZ	639	EP	3		23:16	07.14					
JRS	SN	15								JRS	SZ	648	EP	3		23:16	08.12			JRS	SZ	648	EP	3		23:16	08.12					
JRS	SE	15								JAL	SZ	659	EP	3		23:16	10.08			JAL	SZ	662	EP	3		23:16	10.08					
JSA	SZ	17	EP	2		22:12	17.85	7	0.12	JBL	SZ	678	EP	3		23:16	11.83			JBL	SZ	678	EP	3		23:16	11.83					
JVM	SZ	21	EP	3		22:12	15.13			EDI	SZ	682	EP	3		23:16	12.80			EDI	SZ	682	EP	3		23:16	12.80					
							15.61			EDI	SE	682	ES	3		23:17	16.36			EDI	SN	682					23:17	29.28	12	0.85		
										EDI	SE	682								EDI	SE	682					23:17	45.63	13	1.39		
July 3 1998	Time: 04:11 22.5 UTC										Magnitude: 1.1 ML	Depth: 19.2 km										Comments: 7KM WSW OF NEWTOWN										
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI			
SSP	SZ	7	IP	1	D	04:11	26.02			SSP	SZ	690	EP	3		23:16	13.26			SSP	SZ	690	EP	3		23:16	13.26					
SSP	SN	7	ES	2		04:11	28.32			SSP	SZ	693	EP	3		23:16	13.40			SSP	SZ	693	EP	3		23:16	13.40					
SSP	SN	7					28.39	37	0.05	SSP	SZ	694	EP	3		23:16	14.30			SSP	SZ	694	EP	3		23:16	14.30					
SSP	SE	7					28.40	24	0.10	EAU	SZ	700	EP	3		23:16	14.97			EAU	SZ	700	EP	3		23:16	14.97					
HLM	SZ	23	IP	1	C	04:11	27.53			ECK	SZ	704	EP	3		23:16	14.61			ECK	SZ	704	EP	3		23:16	14.61					
HTR	SZ	41	IP	1	C	04:11	30.04			BDL	SZ	708	EP	3		23:16	15.04			BDL	SZ	708	EP	3		23:16	15.04					
SBD	SZ	51	EP	3		04:11	31.39			BHH	SZ	712	EP	3		23:16	15.66			BHH	SZ	712	EP	3		23:16	15.66					
MCH	SZ	52	EP	2		04:11	31.43			KBI	SZ	716	EP	3		23:16	16.85			KBI	SZ	716	EP	3		23:16	16.85					
MCH	SN	52					37.77	37	0.09	CKE	SZ	728	EP	3		23:16	17.25			CKE	SZ	728	EP	3		23:16	17.25					
MCH	SE	52					37.78	62	0.14	BBO	SZ	729	EP	3		23:16	17.37			BBO	SZ	729	EP	3		23:16	17.37					
July 3 1998	Time: 19:33 46.8 UTC										Magnitude: 1.7 ML	Depth: 7.9 km										Comments: C/F										
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI			
KAC	SZ	14	IP		C	19:33	49.82			KPL	SZ	18	EP	2		02:10	43.85			KPL	SZ	18	EP	2		02:10	43.85					
KPL	SZ	29	IP	1	D	19:33	52.22			KPL	SZ	30	EP	2		02:10	45.94			KPL	SZ	30	EP	2		02:10	45.94					
KPL	SN	29	ES	2		19:33	55.53			KPL	SZ	36	EP	2		02:10	47.06			KPL	SZ	36	EP	2		02:10	47.06					
KPL	SN	29					56.01	154	0.09	KPL	SZ	40	EP	2		02:10	47.77			KPL	SZ	40	EP	2		02:10	47.77					
KPL	SE	29					56.06	204	0.10	KPL	SE	40	ES	2		02:10	53.28			KPL	SE	40	ES	2		02:10	53.28					
RRR	SZ	37	EP	1	C	19:33	53.49			RRR	SE	40	EP	2		02:10	53.89	8	0.38	RRR	SE	40	EP	2		02:10	53.89	8	0.38			
RRR	SE	37	ES	2		19:33	57.99			RRR	SE	40	EP	2		02:10	55.10	11	0.30	RRR	SE	40	EP	2		02:10	55.10	11	0.30			
RRR	SN	37					59.75	66	0.13	RRR	SE	40	EP	2		02:10	55.15			RRR	SE	40	EP	2		02:10	55.15					
RRR	SE	37					58.59	118	0.14	RRR	SZ	63	EP	2		02:10	55.15			RRR	SZ	63	EP	2		02:10	55.15					
KSB	SZ	41	IP	1	D	19:33	54.13			July 10 1998	Time: 05:49 40.5 UTC										Magnitude: 0.8 ML	Depth: 0.8 km										
REB	SZ	61	IP	1	D	19:33	57.11			YLL	SZ	10	EP	1	C	05:49	44.05			YLL	SZ	10	EP	1	C	05:49	44.05					
MDO	SZ	68	EP	1	C	19:33	58.17			YRE	SZ	16	IP	1	C	05:49	44.66			YRE	SZ	16	IP	1	C	05:49	44.66					
RRH	SZ	82	EP	2		19:34	00.60			YRE	SZ	16	ES	3		05:49	47.15			YRE	SZ	16	ES	3		05:49	47.15					
MVH	SZ	86	EP	2		19:34	01.18			WLF	SZ	22	EP	2		05:49	45.21			WLF	SZ	22	EP	2		05:49	45.21					
RSC	SZ	88	IP	1	D	19:34	01.18			YRC	SZ	25	EP	2		05:49	45.65			YRC	SZ	25	EP	2		05:49	45.65					
RTO	SZ	99	EP	1	D	19:34	03.40			WCB	SE	35	ES	3		05:49	51.44			WCB	SE	35	ES	3		05:49	51.44					
July 6 1998	Time: 15:50 25.4 UTC										Magnitude: 2.2 ML	Depth: 13.2 km										Magnitude: 1.9 ML	Depth: 18.2 km									
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI			
YRH	SZ	8	IP	1	D	09:55	42.73			YRH	SZ	17	EP	1	D	08:20	48.50			YRH	SZ	17	EP	1	D	08:20	48.50					
YRH	SN	8	ES	3		09:55	44.80			YRH	SZ	26	IP	1	C	08:20	49.66			YRH	SZ	26	IP	1	C	08:20	49.66					
YRH	SN	8					44.98	34	0.09	YRH	SZ																					

PHASE DATA : 1998

TABLE 5 (cont'd)

PHASE DATA : 1998

TABLE 5 (cont'd)

July 24 1998	Time: 00:57 49.3 UTC	Magnitude: 1.8 ML	CKE SZ 71 EP 1 D 22:07 21.84	
Lat: 53.448N	Lon: 1.175W	Depth: 0.5 km	HPK SZ 74 EP 2 22:07 22.24	
Grid Ref: 454.76 kmE 394.96 kmN		RMS: 0.04 secs	HPK SN 74 ES 2 22:07 31.35	
Locality: MALTBY, SOUTH YORKSHIRE		Quality: C	HPK SN 74 22:07 34.73	
Comments: C/F			HPK SE 74 22:07 34.65	
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI	XDE SZ 75 IP D 22:07 22.78	141 0.19	
KBI SZ 32 EP 2 00:57	55.49	LHO SZ 77 EP 2 22:07 22.87	88 0.15	
HPK SZ 64 EP 3 00:58	00.77	LRN SZ 78 EP 2 22:07 22.87		
HPK SN 64 ES 2 00:58	09.21	BBO SZ 90 IP 1 D 22:07 24.87		
HPK SN 64 00:58	12.62 40 0.28	BBO SE 90 ES 2 22:07 35.06		
HPK SE 64 00:58	12.22 32 0.46	BBO SN 90 22:07 37.07	104 0.26	
KWE SZ 66 EP 2 00:58	01.12	BBO SE 90 22:07 36.98	129 0.25	
KSY SZ 67 IP 1 C 00:58	01.21	BDL SZ 92 IP 1 D 22:07 25.24		
		BTA SZ 102 EP 1 D 22:07 26.94		
July 30 1998	Time: 02:02 35.8 UTC	Magnitude: 1.7 ML	BTA SE 102 ES 2 22:07 38.96	
Lat: 53.362N	Lon: 0.645W	Depth: 7.7 km	BTA SN 102 22:07 40.74	
Grid Ref: 490.14 kmE 385.92 kmN		RMS: 0.09 secs	BTA SE 102 22:07 40.63	
Locality: GAINSBOROUGH, LINCS		Quality: D	XAL SZ 103 EP 1 C 22:07 27.05	
Comments: 6KM SE OF GAINSBOROUGH			WPM SZ 112 EP 2 22:07 28.11	
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI	GIM SZ 118 EP 1 C 22:07 28.50		
KSY SZ 45 IP 1 D 02:02	43.51	GIM SN 118 22:07 45.37	51 0.20	
KBI SZ 60 IP 1 C 02:02	45.94	GIM SE 118 22:07 45.41	33 0.19	
CWF SZ 82 EP 2 02:02	49.13	WME SZ 122 EP 2 22:07 29.13		
CWF SE 82 ES 2 02:02	59.26	SBD SZ 125 EP 2 22:07 30.33		
CWF SN 82 02:03	01.48 11 0.12	BHH SZ 127 EP 2 22:07 30.03		
CWF SE 82 02:03	01.26 14 0.09	BHH SN 127 22:07 48.81	47 0.32	
LHO SZ 83 EP 2 02:02	49.50	BHH SE 127 22:07 47.73	62 0.28	
KWE SZ 89 EP 2 02:02	50.43	WIM SZ 127 EP 2 22:07 30.03		
HPK SZ 93 EP 2 02:02	50.85	WCB SZ 137 EP 2 22:07 31.38		
HPK SN 93 ES 2 02:03	01.86	WCB SN 137 22:07 48.43	12 0.12	
HPK SN 93 02:03	04.36 28 0.18	WCB SE 137 22:07 49.85	39 0.20	
HPK SE 93 02:03	04.04 41 0.21			
July 31 1998	Time: 10:56 6.8 UTC	Magnitude: 2.3 ML	August 9 1998 Time: 20:50 9.8 UTC Magnitude: 1.6 ML	
Lat: 53.341N	Lon: 2.379W	Depth: 9.0 km	Lat: 53.016N Lon: 2.199W	
Grid Ref: 374.77 kmE 382.83 kmN		RMS: 0.07 secs	Grid Ref: 386.65 kmE 346.63 kmN	
Locality: ALTRINCHAM, G MANCHESTER		Quality: C	Locality: STOKE-ON-TRENT, STAFFS	
Comments: C/F			STAT CO DIST PHAS WT P HrMn	
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI	KWE SZ 24 IP 1 C 20:50 14.32	SECS AMPL PERI	
LHO SZ 42 IP C 10:56	14.06	KBI SZ 52 IP 1 C 20:50 19.10		
KWE SZ 51 EP 2 10:56	15.50	CWF SZ 68 EP 2 20:50 21.53		
KBI SZ 58 IP 1 C 10:56	16.58	CWF SE 68 ES 3 20:50 29.96		
SBD SZ 76 EP 2 10:56	19.30	CWF SN 68 20:50 30.62	15 0.16	
HPK SZ 85 EP 2 10:56	20.76	CWF SE 68 20:50 30.24	19 0.24	
HPK SN 85 ES 2 10:56	30.67	HLM SZ 72 EP 3 20:50 22.24		
HPK SN 85 10:56	31.92 184 0.20	SBD SZ 72 EP 2 20:50 22.21		
HPK SE 85 10:56	32.91 188 0.15	SSP SZ 91 EP 2 20:50 25.23		
HLM SZ 98 EP 2 10:56	22.83	SSP SN 91 ES 2 20:50 36.04		
CWF SZ 98 EP 2 10:56	22.87	SSP SN 91 20:50 36.94	23 0.12	
CWF SN 98 10:56	34.93 49 0.19	SSP SE 91 20:50 39.28	17 0.32	
CWF SE 98 10:56	37.34 69 0.22			
WPM SZ 102 EP 2 10:56	23.52	August 10 1998 Time: 02:08 53.3 UTC Magnitude: 0.1 ML		
SSP SZ 114 EP 2 10:56	25.43	Lat: 52.960N Lon: 4.393W		
SSP SE 114 ES 2 10:56	38.69	Grid Ref: 239.25 kmE 342.99 kmN		
SSP SN 114 10:56	40.33 36 0.15	Locality: LLEYN PENIN, GWYNEDD		
SSP SE 114 10:56	40.74 43 0.18	STAT CO DIST PHAS WT P HrMn		
		YRE SZ 3 IP 1 D 02:08 56.83	SECS AMPL PERI	
August 3 1998	Time: 10:59 32.3 UTC	Magnitude: 1.2 ML	YRE SZ 3 ES 3 02:08 59.31	
Lat: 56.143N	Lon: 3.715W	Depth: 1.3 km	YRH SZ 21 IP 1 D 02:08 58.21	
Grid Ref: 293.43 kmE 695.83 kmN		RMS: 0.02 secs	YLL SZ 25 IP 1 C 02:08 58.67	
Locality: CLACKMANNAN, CENTRAL		Quality: B	WLF SZ 37 IP 1 D 02:09 00.19	
Comments: C/F,FELT SHANNOCKHILL		Intensity: 2+	WCB SN 48 ES 2 02:09 07.81	
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI	WCB SN 48 02:09 08.36	1 0.07	
EBH SZ 17 IP 1 C 10:59	35.86	WCB SE 48 02:09 08.71	2 0.17	
PCO SZ 30 EP 2 10:59	37.91			
EAU SZ 37 EP 2 10:59	39.29	August 11 1998 Time: 17:40 26.0 UTC Magnitude: 0.4 ML		
EAB SZ 39 IP 1 D 10:59	39.54	Lat: 55.218N Lon: 3.501W		
EDI SZ 41 IP 1 C 10:59	39.89	Grid Ref: 304.50 kmE 592.56 kmN		
EDI SN 41 ES 2 10:59	45.48	Locality: JOHNSTONEBRIDGE, D & G		
EDI SN 41 10:59	45.71 18 0.28	STAT CO DIST PHAS WT P HrMn		
EDI SE 41 10:59	47.17 31 0.47	BWH SZ 11 IP C 17:40 28.51	SECS AMPL PERI	
August 5 1998	Time: 06:44 46.3 UTC	Magnitude: 0.5 ML	ESK SZ 22 IP 1 C 17:40 30.23	
Lat: 57.021N	Lon: 5.819W	Depth: 8.2 km	ESK SE 22 ES 2 17:40 33.13	
Grid Ref: 168.22 kmE 798.73 kmN		RMS: 0.08 secs	BHH SZ 23 IP 1 D 17:40 30.52	
Locality: KNOYDART, HIGHLAND		Quality: C	BHH SE 23 ES 2 17:40 33.41	
Comments: C/F			BHH SN 23 17:40 33.68	
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI	BHH SE 23 17:40 33.45	17 0.21	
KAR SZ 12 IP 1 D 06:44	48.99	ECK SZ 24 IP C 17:40 30.68	11 0.12	
KSB SZ 32 IP D 06:44	52.14	BNA SZ 29 EP 2 17:40 31.15		
KPL SZ 37 EP 2 06:44	53.10			
KPL SE 37 ES 2 06:44	57.57	August 20 1998 Time: 13:31 32.7 UTC Magnitude: 1.9 ML		
KPL SN 37 06:44	58.15 4 0.15	Lat: 53.347N Lon: 2.382W		
KPL SE 37 06:44	57.81 6 0.17	Grid Ref: 374.57 kmE 383.41 kmN		
		Locality: ALTRINCHAM, G MANCHESTER		
August 8 1998	Time: 22:07 10.1 UTC	Magnitude: 2.3 ML	STAT CO DIST PHAS WT P HrMn	
Lat: 53.986N	Lon: 2.748W	Depth: 11.1 km	LHO SZ 42 IP C 13:31 40.01	SECS AMPL PERI
Grid Ref: 350.95 kmE 454.72 kmN		RMS: 0.10 secs	KWE SZ 52 EP 1 C 13:31 41.54	
Locality: GALGATE, LANCASHIRE		Quality: B	KBI SZ 58 EP 1 C 13:31 42.55	
Comments: C/F			SBD SZ 77 EP 2 13:31 45.25	
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI	HLM SZ 98 EP 2 13:31 48.96		
LMI SZ 45 IP 1 C 22:07	17.87	CWF SZ 99 EP 2 13:31 49.25		
CDU SZ 49 IP D 22:07	18.41	CWF SE 99 ES 3 13:32 00.91		
CSF SZ 61 IP D 22:07	20.26			

PHASE DATA : 1998

TABLE 5 (cont'd)

CWF	SN	99			13:32	03.20	27	0.22		WPM	SZ	34	EP	2		06:54	23.75		
CWF	SE	99			13:32	03.30	37	0.24		YRH	SZ	35	IP		C	06:54	23.72		
WPM	SZ	102	EP	2	13:31	49.76				WFB	SZ	51	EP	2		06:54	26.04		
SSP	SN	115	ES	4	13:32	04.96													
SSP	SN	115			13:32	06.27	20	0.11											
SSP	SE	115			13:32	06.68	26	0.16											
August 25 1998		Time: 22:40 34.0 UTC				Magnitude: 2.3 ML													
Lat: 59.535N		Lon: 1.837E				Depth: 18.5 km													
Grid Ref: 616.89 kmE 1078.35 kmN						RMS: 0.45 secs													
Locality: NORTHERN NORTH SEA						Quality: D													
STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI	STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
SAN	SZ	181	EP	2		22:40	59.44			CPZ	SZ	75	EP	3		08:40	05.47		
LRW	SZ	182	EP	2		22:41	00.29			CCA	SZ	99	EP	3		08:40	09.54		
LRW	SN	182				22:41	22.43	29	0.15	CCO	SZ	100	EP	3		08:40	09.27		
LRW	SE	182				22:41	22.44	29	0.21	CR2	SZ	103	EP	2		08:40	10.19		
YEL	SZ	198	EP	2		22:41	02.23			CR2	SE	103	ES	3		08:40	23.35		
WAL	SZ	209	EP	2		22:41	03.44			CR2	SN	103				08:40	24.13	18 0.07	
ASK	SZ	215	EP	3		22:41	04.20			CR2	SE	103				08:40	23.99	20 0.10	
ASK	SZ	215	ES	3		22:41	26.00			CST	SZ	104	EP	3		08:40	09.80		
SUE	SZ	234	EP	3		22:41	07.07												
SUE	SZ	234	ES	3		22:41	31.40												
OST	SZ	255	EP	3		22:41	10.07												
OWE	SZ	278	EP	3		22:41	12.44												
OHO	SZ	301	EP	3		22:41	15.33												
OBR	SZ	304	EP	3		22:41	15.49												
ORE	SZ	340	EP	3		22:41	20.58												
ORE	SE	340	ES	3		22:41	51.98												
ORE	SN	340				22:42	15.71	11	1.40										
OTE	SE	340				22:42	04.57	10	1.05										
OTO	SZ	376	EP	3		22:41	24.77												
August 26 1998		Time: 18:59 26.9 UTC				Magnitude: 1.0 ML													
Lat: 53.228N		Lon: 1.141W				Depth: 2.4 km													
Grid Ref: 457.30 kmE 370.48 kmN						RMS: 0.19 secs													
Locality: MANSFIELD, NOTTS						Quality: C													
Comments: C/F,8KM NE OF MANSFIELD		STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI								
KBI	SZ	26	EP	2		18:59			31.64										
KWE	SZ	53	EP	2		18:59			36.54										
CWF	SZ	56	EP	3		18:59			36.61										
CWF	SE	56	ES	3		18:59			43.93										
CWF	SN	56				18:59			44.94	7	0.19								
CWF	SE	56				18:59			48.48	8	0.11								
August 27 1998		Time: 05:45 32.4 UTC				Magnitude: 1.1 ML													
Lat: 49.628N		Lon: 5.455W				Depth: 8.5 km													
Grid Ref: 150.57 kmE -24.42 kmN						RMS: 0.06 secs													
Locality: ENGLISH CHANNEL						Quality: D													
Comments: 35KM SW OF LIZARD POINT		STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI								
CGW	SZ	55	EP	2		05:45			42.00										
CMA	SZ	56	EP	2		05:45			42.31										
CCO	SZ	59	EP	2		05:45			42.91										
CPZ	SZ	60	EP	2		05:45			42.89										
CR2	SZ	63	EP	2		05:45			43.51										
CR2	SN	63	ES	2		05:45			52.09										
CR2	SN	63				05:45			53.92	6	0.12								
CR2	SE	63				05:45			54.40	9	0.08								
August 28 1998		Time: 10:35 37.0 UTC				Magnitude: 1.4 ML													
Lat: 56.248N		Lon: 3.752W				Depth: 5.9 km													
Grid Ref: 291.45 kmE 707.55 kmN						RMS: 0.04 secs													
Locality: BLACKFORD, TAYSIDE		STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI								
EBH	SZ	15	IP		C	10:35			40.13										
ELO	SZ	25	IP	1	C	10:35			41.77										
PCO	SZ	36	IP	1	C	10:35			43.61										
EAB	SZ	37	IP	1	C	10:35			43.70										
EAU	SZ	49	EP	2		10:35			45.62										
EDI	SZ	51	IP	1	D	10:35			45.87										
EDI	SN	51	ES	2		10:35			52.15										
EDI	SN	51				10:35			52.37	20	0.39								
EDI	SE	51				10:35			52.44	23	0.27								
PCA	SZ	69	EP	2		10:35			48.84										
August 30 1998		Time: 06:54 17.3 UTC				Magnitude: 0.4 ML													
Lat: 53.103N		Lon: 4.349W				Depth: 16.3 km													
Grid Ref: 242.74 kmE 358.81 kmN						RMS: 0.06 secs													
Locality: CAENARVON BAY, GWYNEDD		STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI								
YLL	SZ	13	IP		C	06:54			20.69										
YLL	SZ	13				06:54			22.93	27	0.08								
YRE	SZ	15	IP		C	06:54			20.98										
WLF	SZ	21	IP		D	06:54			21.64										
WLF	SZ	21				06:54			24.71	11	0.11								
YRC	SZ	22	EP	2		06:54			21										

PHASE DATA : 1998

TABLE 5 (cont'd)

September 12 1998	Time: 23:06 11.3 UTC	Magnitude: 0.2 ML	September 26 1998	Time: 13:06 22.7 UTC	Magnitude: 1.7 ML
Lat: 54.734N	Lon: 2.978W	Depth: 9.2 km	Lat: 53.020N	Lon: 2.194W	Depth: 3.9 km
Grid Ref: 337.03 kmE 538.06 kmN		RMS: 0.04 secs	Grid Ref: 386.98 kmE 346.98 kmN		RMS: 0.10 secs
Locality: SEBERGHAM, CUMBRIA		Quality: C	Locality: NEWCASTLE-U-LYME, STAFFS		Quality: C
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI		STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI	
BBO SZ 17 IP 1 C 23:06	14.87		KWE SZ 24 IP 1 C 13:06	27.12	
BBO SE 17 ES 2 23:06	17.40		KBI SZ 52 IP 1 D 13:06	31.82	
BBO SN 17 23:06	17.36	14 0.16	CWF SZ 67 EP 2 13:06	34.36	
BBO SE 17 23:06	17.49	11 0.10	CWF SN 67 ES 3 13:06	42.50	
CKE SZ 18 IP 1 C 23:06	15.07		CWF SN 67 13:06	43.46	21 0.18
CSF SZ 36 EP 2 23:06	17.74		CWF SE 67 13:06	47.11	18 0.12
XDE SZ 42 IP 1 C 23:06	18.69		HLM SZ 73 EP 3 13:06	35.01	
CDU SZ 46 EP 2 23:06	19.44		SSP SZ 91 EP 2 13:06	38.17	
September 15 1998	Time: 02:33 6.9 UTC	Magnitude: 2.1 ML	SSP SN 91 ES 2 13:06	48.83	
Lat: 55.560N	Lon: 4.957W	Depth: 12.8 km	SSP SN 91 13:06	49.76	31 0.11
Grid Ref: 213.51 kmE 633.56 kmN		RMS: 0.11 secs	SSP SE 91 13:06	50.29	18 0.13
Locality: FIRTH OF CLYDE		Quality: C	September 27 1998	Time: 11:03 57.6 UTC	Magnitude: 1.2 ML
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI		Lat: 56.193N	Lon: 4.097W	Depth: 4.1 km
PMS SZ 35 IP 1 D 02:33	13.37		Grid Ref: 269.91 kmE 702.01 kmN		RMS: 0.06 secs
PGB SZ 41 IP C 02:33	14.24		Locality: DOUNE, CENTRAL		Quality: B
PGB SN 41 ES 2 02:33	19.44		STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI	
PGB SN 41 02:33	19.51	423 0.17	EAB SZ 15 IP C 11:04	00.58	
PGB SE 41 02:33	21.06	170 0.14	PCO SZ 23 IP D 11:04	01.95	
POB SZ 46 IP 1 C 02:33	14.94		EBH SZ 37 EP 2 11:04	04.34	
PCA SZ 47 IP 1 C 02:33	15.07		PGB SZ 49 IP 1 D 11:04	06.23	
GMK SZ 47 IP C 02:33	15.11		PGB SN 49 ES 2 11:04	12.49	
PCO SZ 72 EP 2 02:33	18.77		PGB SN 49 11:04	13.01	12 0.16
GAL SZ 79 IP 1 C 02:33	19.96		PGB SE 49 11:04	15.15	9 0.18
GAL SN 79 02:33	31.39	70 0.12	PCA SZ 56 IP 1 D 11:04	07.27	
GAL SE 79 02:33	31.36	65 0.09	PMS SZ 56 EP 2 11:04	07.51	
EAB SZ 80 IP 1 D 02:33	20.08		EAU SZ 56 EP 2 11:04	07.43	
GCL SZ 92 EP 2 02:33	21.71		EDI SN 64 ES 3 11:04	16.44	
GCD SZ 101 IP 1 C 02:33	23.57		EDI SN 64 11:04	16.79	16 0.39
ESK SZ 114 EP 2 02:33	25.59		EDI SE 64 11:04	16.76	18 0.21
ESK SN 114 02:33	41.11	33 0.12	EDU SZ 78 EP 2 11:04	10.72	
ESK SE 114 02:33	40.13	23 0.10			
September 15 1998	Time: 19:44 38.0 UTC	Magnitude: -0.4 ML	September 28 1998	Time: 06:42 30.7 UTC	Magnitude: 0.1 ML
Lat: 53.236N	Lon: 4.582W	Depth: 10.2 km	Lat: 54.458N	Lon: 3.373W	Depth: 12.8 km
Grid Ref: 227.70 kmE 374.08 kmN		RMS: 0.05 secs	Grid Ref: 311.01 kmE 507.86 kmN		RMS: 0.04 secs
Locality: ANGLESEY, GWYNEDD		Quality: C	Locality: SEASCALE, CUMBRIA		Quality: B
Comments: 8KM SOUTH OF HOLYHEAD			Comments: 9KM NE OF SEASCALE		
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI		STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI	
YRC SZ 2 IP 1 C 19:44	39.73		CSF SZ 9 IP C 06:42	33.50	
WLF SZ 14 IP 1 C 19:44	40.80		XDE SZ 9 IP D 06:42	33.54	
WCB SZ 16 IP C 19:44	41.14		CDU SZ 18 IP 1 D 06:42	34.58	
WCB SE 16 ES 2 19:44	43.34		CKE SZ 23 IP 1 C 06:42	35.26	
WCB SN 16 19:44	43.65	2 0.05	LMI SZ 27 IP 1 D 06:42	36.01	
WCB SE 16 19:44	43.40	6 0.10	LMI SE 27 ES 2 06:42	39.54	
WME SZ 26 EP 2 19:44	42.77		LMI SN 27 06:42	39.74	4 0.18
YLL SZ 30 EP 2 19:44	43.23		LMI SE 27 06:42	39.84	2 0.15
September 18 1998	Time: 03:00 57.9 UTC	Magnitude: 0.4 ML	BBO SZ 32 EP 2 06:42	36.76	
Lat: 50.298N	Lon: 5.365W	Depth: 0.9 km	BBO SN 32 06:42	40.79	4 0.20
Grid Ref: 160.36 kmE 49.73 kmN		RMS: 0.05 secs	BBO SE 32 06:42	40.73	5 0.25
Locality: OFF ST IVES, CORNWALL		Quality: D			
Comments: 10KM NE OF ST IVES			September 28 1998	Time: 16:29 36.6 UTC	Magnitude: 2.0 ML
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI		Lat: 52.548N	Lon: 1.808W	Depth: 7.5 km
CCA SZ 16 IP D 03:01	00.68		Grid Ref: 413.04 kmE 294.54 kmN		RMS: 0.08 secs
CST SZ 18 IP 1 D 03:01	01.03		Locality: SUTTON COLDFIELD, W MID		Quality: B
CR2 SZ 20 IP D 03:01	01.38		STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI	
CR2 SN 20 ES 2 03:01	04.01		CWF SZ 40 IP C 16:29	43.66	
CR2 SN 20 03:01	04.05	13 0.06	CWF SE 40 ES 2 16:29	48.55	
CR2 SE 20 03:01	04.05	27 0.07	KWE SZ 52 EP 1 C 16:29	45.58	
CCO SZ 22 IP 1 D 03:01	01.69		HLM SZ 73 EP 1 C 16:29	48.70	
CPZ SZ 22 IP C 03:01	01.73		HAE SZ 76 IP C 16:29	49.23	
CGW SZ 24 IP 1 D 03:01	02.19		SSP SZ 90 EP 1 C 16:29	51.47	
CBW SZ 25 IP D 03:01	02.07		SSP SN 90 ES 2 16:30	01.88	
CMA SZ 29 IP 1 D 03:01	03.04		SSP SN 90 16:30	02.16	55 0.18
CGH SZ 31 IP 1 D 03:01	03.41		SSP SE 90 16:30	02.36	54 0.13
September 24 1998	Time: 12:58 29.8 UTC	Magnitude: 1.5 ML	MCH SZ 102 EP 2 16:29	53.05	
Lat: 56.924N	Lon: 5.465W	Depth: 8.1 km	MCH SN 102 ES 2 16:30	05.26	
Grid Ref: 189.14 kmE 786.72 kmN		RMS: 0.09 secs	MCH SN 102 16:30	06.00	28 0.13
Locality: GLENFINNAN, HIGHLAND		Quality: C	MCH SE 102 16:30	05.73	23 0.15
Comments: 6KM NORTH OF GLENFINNAN			HGH SZ 122 EP 1 C 16:29	56.39	
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI				
KAR SZ 22 IP 1 C 12:58	34.10		September 28 1998	Time: 18:52 39.2 UTC	Magnitude: 0.9 ML
KSB SZ 32 IP 1 D 12:58	35.55		Lat: 57.443N	Lon: 4.497W	Depth: 7.0 km
KPL SZ 48 IP 1 C 12:58	38.27		Grid Ref: 250.16 kmE 841.86 kmN		RMS: 0.07 secs
KPL SE 48 ES 2 12:58	44.07		Locality: BEAULY, HIGHLAND		Quality: C
KPL SN 48 12:58	44.70	31 0.07	STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI	
KPL SE 48 12:58	44.26	33 0.14	MDO SZ 8 IP D 18:52	41.22	
MDO SZ 88 EP 2 12:58	44.30		KSB SZ 61 EP 3 18:52	49.56	
EAB SZ 107 EP 2 12:58	47.33		KPL SZ 70 EP 2 18:52	51.02	
			KPL SN 70 ES 3 18:52	59.33	
			KPL SN 70 18:53	02.15	5 0.18
			KPL SE 70 18:53	02.38	5 0.19
			MCD SZ 76 EP 3 18:52	51.46	
			MCD SN 76 ES 3 18:53	01.12	
			MCD SN 76 18:53	02.76	4 0.26
			MCD SE 76 18:53	02.05	3 0.17
			MME SZ 93 EP 2 18:52	54.41	

PHASE DATA : 1998

TABLE 5 (cont'd)

September 28 1998	Time: 18:54 49.5 UTC	Magnitude: 1.1 ML	CWF	SE	63			15:30	38.40	28	0.12
Lat: 57.451N	Lon: 4.497W	Depth: 7.5 km	HPK	SZ	77	EP	3	15:30	32.29		
Grid Ref: 250.21 kmE 842.82 kmN		RMS: 0.09 secs	HPK	SN	77	ES	2	15:30	41.72		
Locality: BEAULY, HIGHLAND		Quality: C	HPK	SN	77			15:30	44.21	68	0.32
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI		HPK	SE	77			15:30	43.75	59	0.14
MDO SZ 8 IP D 18:54	51.57		KSY	SZ	80	EP	1	C	15:30		
KSB SZ 62 EP 3 18:54	59.92								32.87		
KPL SZ 71 EP 1 C 18:55	01.29										
KPL SE 71 ES 3 18:55	09.52										
KPL SN 71	18:55	12.51 8 0.17									
KPL SE 71	18:55	12.75 6 0.15									
MCD SZ 76 EP 3 18:55	02.19										
MCD SN 76 ES 3 18:55	11.20										
MCD SN 76	18:55	11.67 6 0.16									
MCD SE 76	18:55	11.82 5 0.10									
MME SZ 93 EP 2 18:55	04.76										
September 30 1998	Time: 02:24 9.6 UTC	Magnitude: 0.3 ML	CWF	SN	56			02:16	54.87	20	0.28
Lat: 55.332N	Lon: 3.573W	Depth: 5.2 km	CWF	SE	56			02:16	53.41	32	0.30
Grid Ref: 300.24 kmE 605.31 kmN		RMS: 0.09 secs	KWE	SZ	58	EP	2	02:16	43.33		
Locality: MOFFAT, D & G		Quality: D	LHO	SZ	66	EP	3	02:16	43.75		
Comments: 9KM WEST OF MOFFAT			HPK	SE	91	ES	4	02:16	58.95		
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI		HPK	SN	91			02:17	03.86	48	0.28
BWH SZ 18 IP D 02:24	13.15		HPK	SE	91			02:17	02.26	38	0.22
ESK SZ 23 IP 1 C 02:24	14.01										
ESK SE 23 ES 2 02:24	16.99										
ESK SN 23	02:24	17.14 9 0.07									
ESK SE 23	02:24	17.08 5 0.11									
ECK SZ 33 IP 1 C 02:24	15.63										
BHH SZ 35 IP D 02:24	15.99										
BHH SN 35 ES 2 02:24	20.33										
BHH SN 35	02:24	20.73 4 0.09									
BHH SE 35	02:24	20.37 8 0.26									
BNA SZ 41 IP 1 D 02:24	16.65										
BBH SZ 47 EP 2 02:24	17.93										
October 1 1998	Time: 18:45 9.4 UTC	Magnitude: 1.0 ML	October 7 1998	Time: 18:39 42.8 UTC	Magnitude: 2.8 ML						
Lat: 53.115N	Lon: 1.272W	Depth: 0.0 km	Lat: 53.602N	Lon: 0.295W	Depth: 30.7 km						
Grid Ref: 448.74 kmE 357.85 kmN		RMS: 0.37 secs	Grid Ref: 512.81 kmE 413.09 kmN		RMS: 0.12 secs						
Locality: MANSFIELD, NOTTS		Quality: D	Locality: GRIMSBY, HUMBERSIDE		Quality: B						
Comments: C/F			Comments: 13KM NW OF GRIMSBY								
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI		STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI							
KBI SZ 23 EP 1 C 18:45	14.24		LMK SZ 16 IP D 18:39	48.31							
KWE SZ 40 EP 1 C 18:45	16.97		KSY SZ 74 EP 2 18:39	55.62							
CWF SZ 42 EP 3 18:45	16.95		LWH SZ 85 EP 2 18:39	56.79							
CWF SE 42 ES 3 18:45	24.23		KBI SZ 91 EP 1 C 18:39	57.53							
CWF SN 42	18:45	30.68 11 0.29	HPK SZ 96 EP 2 18:39	58.17							
CWF SE 42	18:45	27.07 14 0.25	HPK SE 96 ES 3 18:40	09.66							
LHO SZ 62 EP 3 18:45	20.88		LHO SZ 104 IP 1 C 18:39	59.03							
October 4 1998	Time: 10:59 57.0 UTC	Magnitude: 2.6 ML	KUF SZ 110 EP 2 18:39	59.97							
Lat: 59.710N	Lon: 2.019E	Depth: 9.1 km	CWF SZ 118 EP 2 18:40	00.59							
Grid Ref: 626.03 kmE 1098.37 kmN		RMS: 0.51 secs	CWF SE 118 ES 3 18:40	14.56							
Locality: NORTHERN NORTH SEA		Quality: D	CWF SN 118	18:40	178 0.16						
Comments: C/F			CWF SE 118	18:40	228 0.12						
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI		KWE SZ 122 EP 2 18:40	01.37							
LRW SZ 185 EP 2 11:00	24.52		ABA SZ 125 EP 2 18:40	01.79							
LRW SN 185 ES 3 11:00	44.00		LRN SZ 134 EP 2 18:40	03.31							
LRW SN 185	11:00	48.01 48 0.12	AWH SZ 137 EP 2 18:40	03.16							
LRW SE 185	11:00	48.95 48 0.24	AWI SZ 145 EP 2 18:40	04.27							
SAN SZ 186 EP 2 11:00	24.31		LMI SZ 210 EP 3 18:40	13.85							
YEL SZ 196 EP 2 11:00	26.49		LMI SN 210	18:40	47.37 46 0.38						
ASK SZ 197 EP 3 11:00	25.30		LMI SE 210	18:40	43.29 51 0.23						
WAL SZ 212 EP 2 11:00	27.95										
SUE SZ 213 EP 3 11:00	28.21										
SUE SZ 213 ES 3 11:00	50.85										
ODD1 SZ 260 EP 3 11:00	32.41										
ODD1 SZ 260 ES 3 11:01	01.17										
FOO SZ 268 EP 3 11:00	34.82										
FOO SZ 268 ES 3 11:01	02.37										
OST SZ 269 EP 3 11:00	35.93										
HYA SZ 281 EP 3 11:00	36.56										
OHO SZ 316 EP 2 11:00	41.24										
OBR SZ 320 EP 2 11:00	41.69										
ORE SZ 356 EP 2 11:00	45.86										
ORE SE 356 ES 3 11:01	20.81										
ORE SN 356	11:01	33.40 15 0.87									
ORE SE 356	11:01	26.76 22 1.16									
OTO SZ 392 EP 2 11:00	50.04										
October 4 1998	Time: 15:30 19.6 UTC	Magnitude: 1.9 ML	October 9 1998	Time: 02:07 15.7 UTC	Magnitude: 0.6 ML						
Lat: 53.263N	Lon: 1.670W	Depth: 18.0 km	Lat: 53.220N	Lon: 1.025W	Depth: 1.0 km						
Grid Ref: 422.01 kmE 374.10 kmN		RMS: 0.05 secs	Grid Ref: 465.11 kmE 369.71 kmN		RMS: 0.07 secs						
Locality: BAKEWELL, DERBYSHIRE		Quality: D	Locality: NEW OLLERTON, NOTTS		Quality: C						
Comments: 5KM NORTH OF BAKEWELL		Comments: C/F	STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI							
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI		KBI SZ 34 EP 3 02:07	22.16							
KBI SZ 10 IP 1 D 15:30	23.06		KSY SZ 41 EP 3 02:07	23.29							
KWE SZ 30 IP C 15:30	25.45		CWF SZ 57 EP 3 02:07	26.11							
LHO SZ 34 IP 1 D 15:30	25.99		CWF SE 57 ES 3 02:07	33.44							
CWF SZ 63 EP 2 15:30	30.14		CWF SN 57	02:07	34.51 4 0.14						
CWF SN 63 ES 2 15:30	37.38		CWF SE 57	02:07	39.46 2 0.12						
CWF SN 63	15:30	37.99 18 0.11	KWE SZ 59 EP 3 02:07	26.24							
October 4 1998	Time: 15:30 19.6 UTC	Magnitude: 1.9 ML	October 11 1998	Time: 00:36 37.0 UTC	Magnitude: 1.5 ML						
Lat: 53.263N	Lon: 1.670W	Depth: 18.0 km	Lat: 57.092N	Lon: 5.625W	Depth: 5.0 km						
Grid Ref: 422.01 kmE 374.10 kmN		RMS: 0.05 secs	Grid Ref: 180.43 kmE 805.91 kmN		RMS: 0.04 secs						
Locality: BAKEWELL, DERBYSHIRE		Quality: B	Locality: KNOYDART, HIGHLAND		Quality: D						
Comments: 5KM NORTH OF BAKEWELL		Comments: C/F,FELT OXTON	STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI							
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI		KSB SZ 18 IP D 00:36	40.56							
KBI SZ 10 IP 1 D 15:30	23.06		KAR SZ 23 EP 1 D 00:36	41.35							
KWE SZ 30 IP C 15:30	25.45		KPL SZ 28 IP C 00:36	42.21							
LHO SZ 34 IP 1 D 15:30	25.99		KPL SE 28 ES 2 00:36	45.83							
CWF SZ 63 EP 2 15:30	30.14		KPL SN 28	00:36	46.04 64 0.18						
CWF SN 63 ES 2 15:30	37.38		KPL SE 28	00:36	46.01 167 0.11						
CWF SN 63	15:30	37.99 18 0.11	MDO SZ 85 EP 3 00:36	50.82							
October 13 1998	Time: 05:21 19.8 UTC	Magnitude: 0.7 ML	RRR SZ 86 EP 3 00:36	51.91							
Lat: 53.045N	Lon: 1.071W	Depth: 1.0 km	RRR SN 86 ES 3 00:37	01.35							
Grid Ref: 462.25 kmE 350.22 kmN		RMS: 0.24 secs	RRR SN 86	00:37	03.93 27 0.10						
Locality: OXTON, NOTTINGHAMSHIRE		Quality: C	RRR SE 86	00:37	05.07 11 0.11						
Comments: C/F,FELT OXTON		Intensity: 3+									
STAT CO DIST PHAS WT P HrMn	SECS AMPL PERI		KSY SZ 34 EP 3 05:21	26.16							
KSY SZ 34 EP 3 05:21	26.16		CWF SZ 38 EP 3 05:21	27.30							

PHASE DATA : 1998

TABLE 5 (cont'd)

PHASE DATA : 1998

TABLE 5 (cont'd)

PHASE DATA : 1998

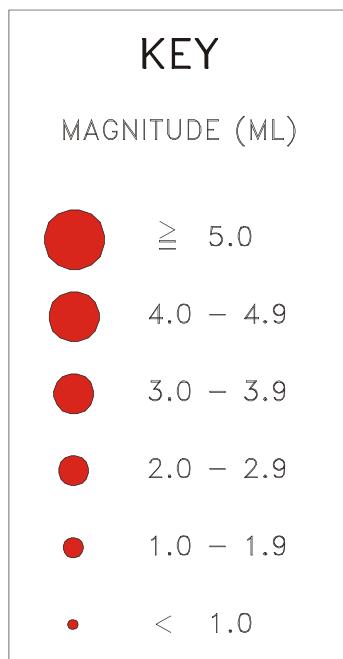
TABLE 5 (cont'd)

TABLE 6
DEPTH/CRUSTAL VELOCITY MODELS

TABLE 6
Depth / crustal velocity models used in earthquake locations

Structural area	Depth to top of layer (km)	P-wave velocity (km/sec)	Vp/Vs
North Sea	0.00	6.20	1.73
	12.00	6.50	
	23.00	7.10	
	31.00	8.05	
Lownet and general UK	0.00	4.00	1.73
	2.52	5.90	
	7.55	6.45	
	18.87	7.00	
	34.15	8.00	
Borders	0.00	4.10	1.71
	3.00	5.60	
	4.10	6.15	
	17.00	6.60	
	30.00	8.00	
North Wales (Lleyn)	0.00	5.40	1.68
	2.00	6.05	
	13.00	6.50	
	25.00	6.80	
	34.00	8.00	
Mid Wales	0.00	5.40	1.72
	3.80	6.05	
	15.50	6.65	
	34.30	8.00	
Cornwall	0.00	5.50	1.77
	0.30	5.76	
	15.00	6.90	
	30.00	8.00	

FIGURES 1 TO 5



KEY TO EPICENTRE MAPS, FIGURES 3 TO 5

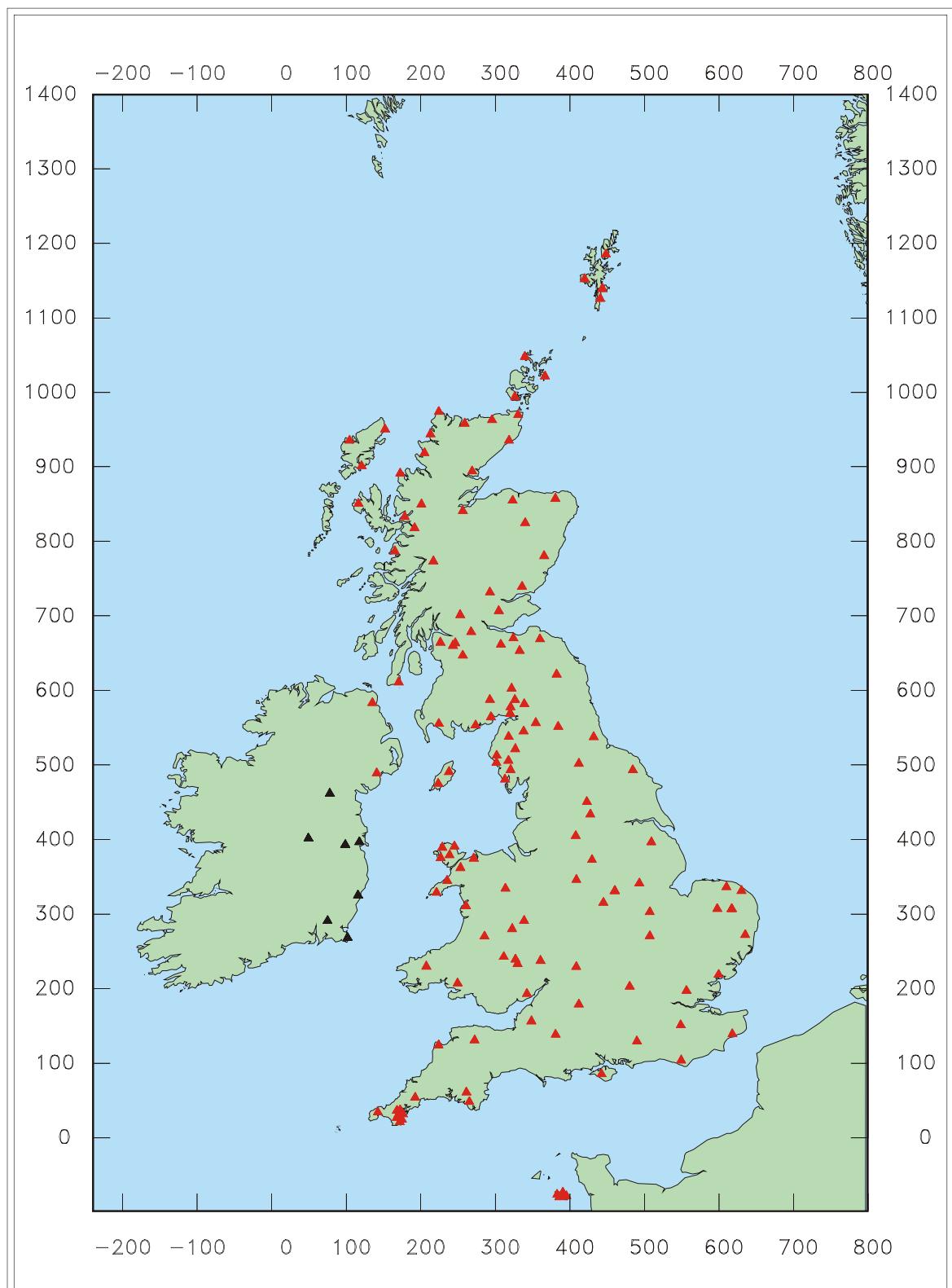


Figure 1. Seismograph network operational in December 1998. Colour coding shows the rapid access stations (red) and DIAS stations (black).

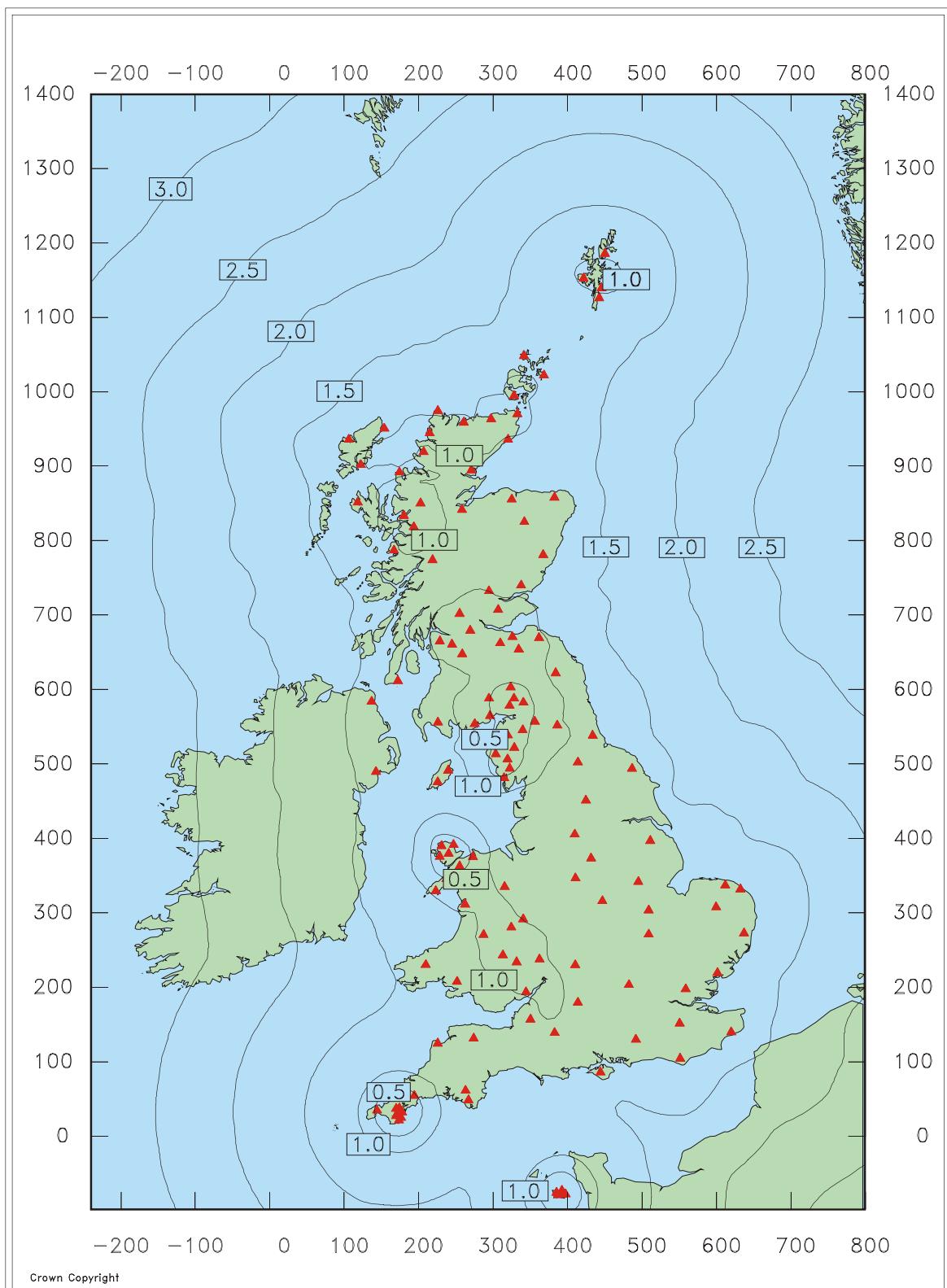


Figure 2. Earthquake detection capability in December 1998. Contour values are Richter local magnitude (ML) for 4 nanometres of noise (average) and S-wave amplitude twice that at the fourth nearest station.

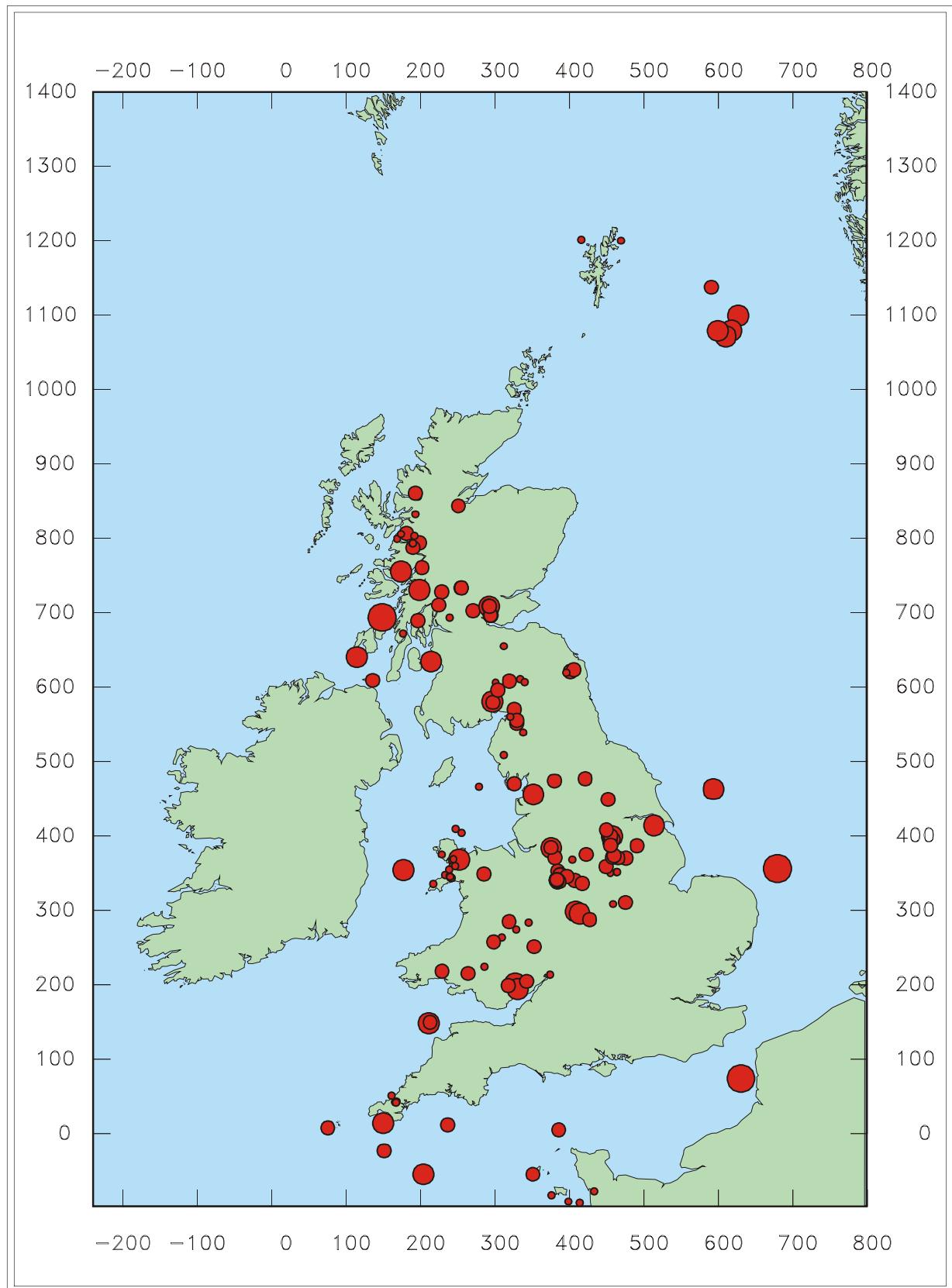


Figure 3. Epicentres of all UK earthquakes located in 1998.

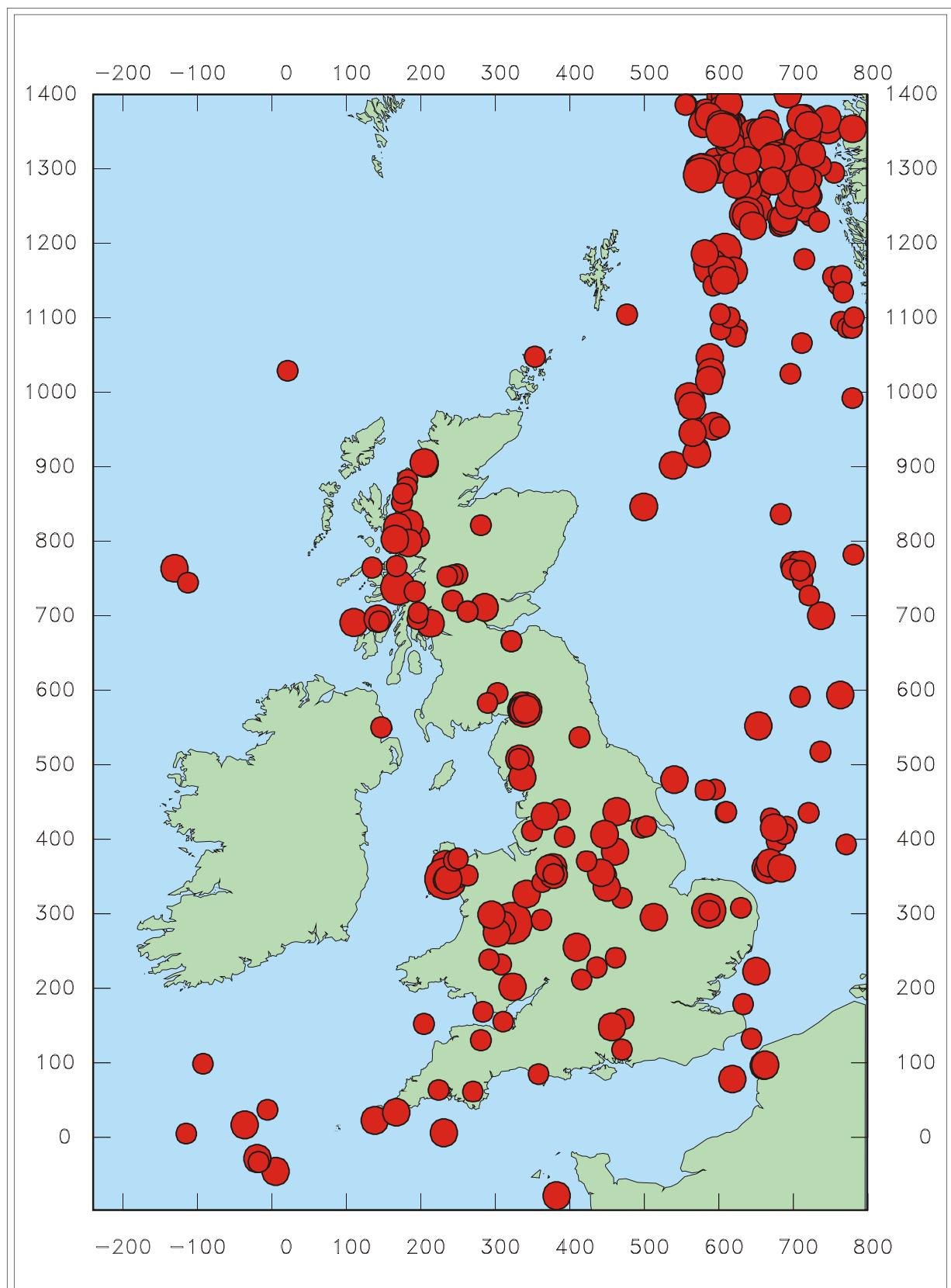


Figure 4. Epicentres of earthquakes with magnitudes 2.5 ML or greater, for the period 1979 to 1998.

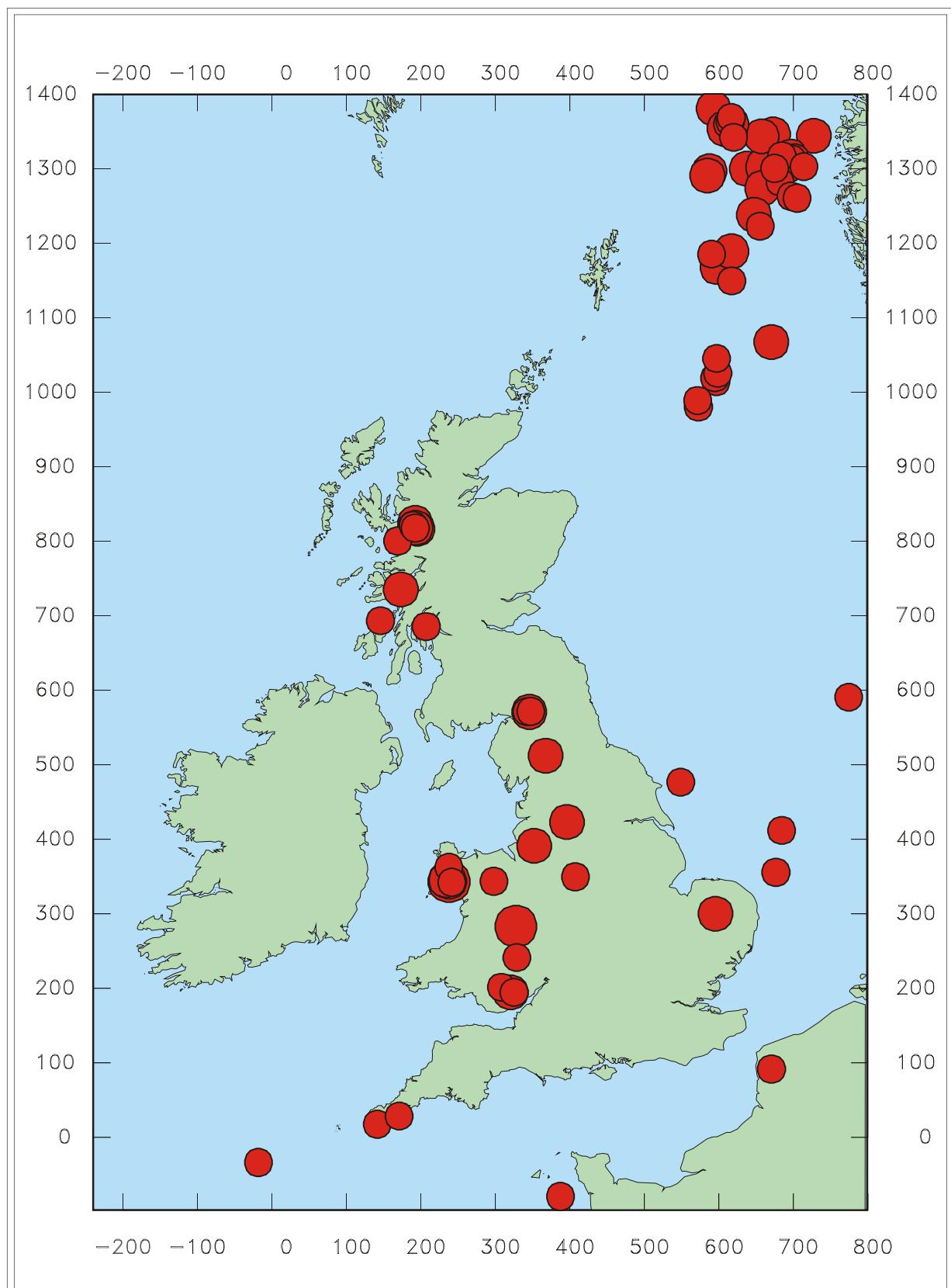


Figure 5. Epicentres of earthquakes with magnitudes 3.5 ML or greater, for the period 1970 to 1998.

APPENDIX A

SIGNIFICANT EARTHQUAKES IN 1998

APPENDIX A1

JURA EARTHQUAKE, 3 MAY 1998

PARAMETERS

Date:	3 May 1998
Origin Time:	02:12 46.7 UTC
Latitude and longitude:	56.06° N 6.05° W
Grid Reference:	147.8 km E 692.8 km N
Depth:	12.9 km
Magnitude:	3.5 ML
Hypo Solution Quality:	C (A*D)
Epicentral Error (1 std. dev.):	1.5 km
Depth Error (1 std. dev.):	6.0 km

Discussion

The largest onshore earthquake occurred on 3 May, with a magnitude of 3.5 ML; and was located near Jura. A macroseismic survey was carried out and 240 responses were received. The earthquake was felt over an area of 12,000 km². The highest intensities were reached on the Islands of Colonsay and Jura, where an intensity of 4 EMS was assigned from reports describing “the whole house shaking”, “loud bangs and rumbles”, and “objects rattling and falling down”. The earthquake was felt throughout most of Argyll and Bute, as far north as the Glencoe area, towards the Isle of Arran in the east and Southend, Kintyre in the south. This is the first event that has been felt in the area, since the magnitude 3.0 ML Colonsay earthquake, on 26 January 1990, which was felt with intensities of at least 4 EMS in the epicentral area.

Seismograms recorded by the BGS networks around Kyle and LOWNET are shown in Figure A1.1 and the isoseismal map shown in Figure A1.2.

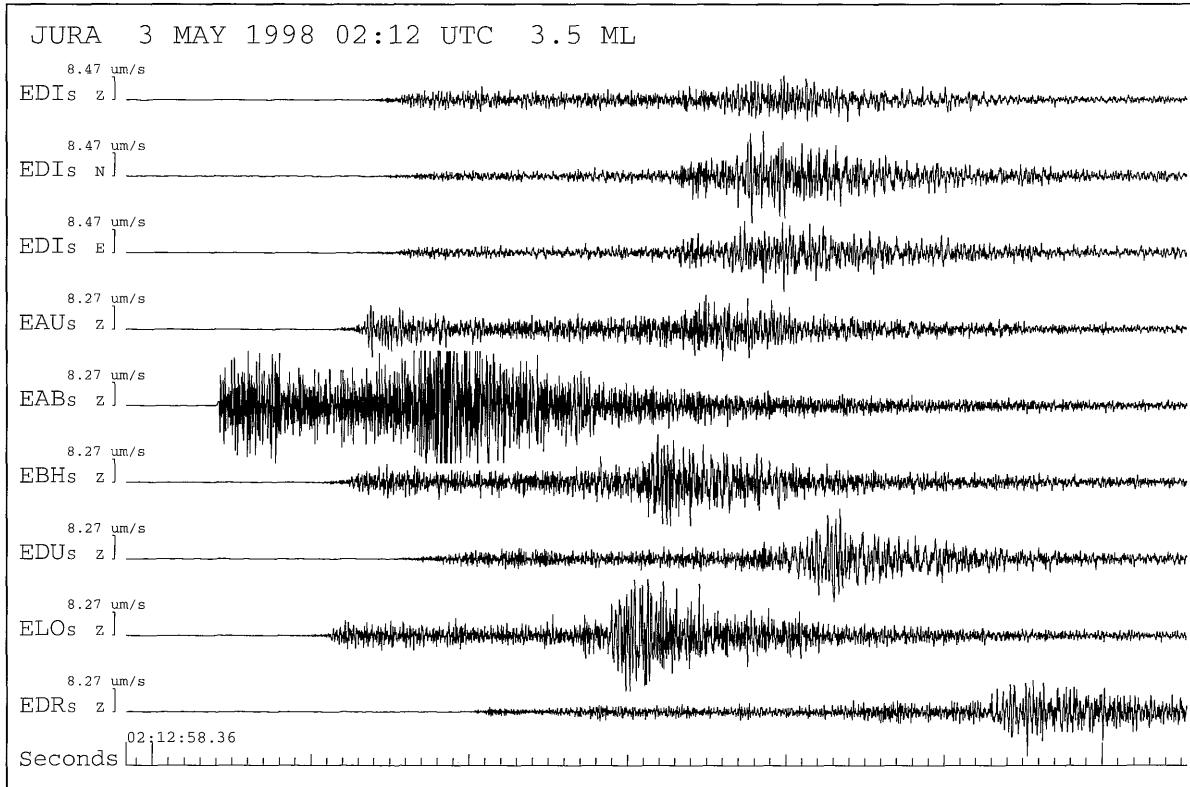
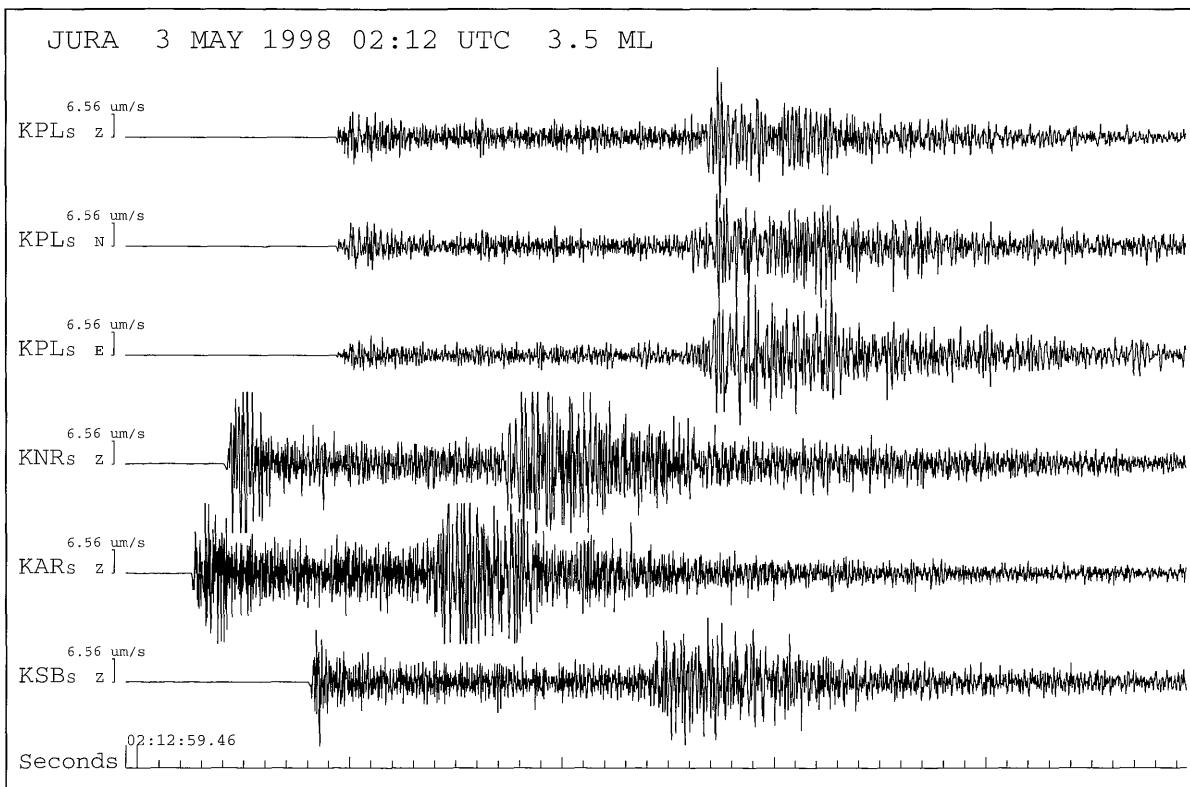


Figure A1.1. Seismograms of the Jura earthquake 3 May 1998 02:12 UTC 3.5 ML recorded on the Kyle and LOWNET networks.

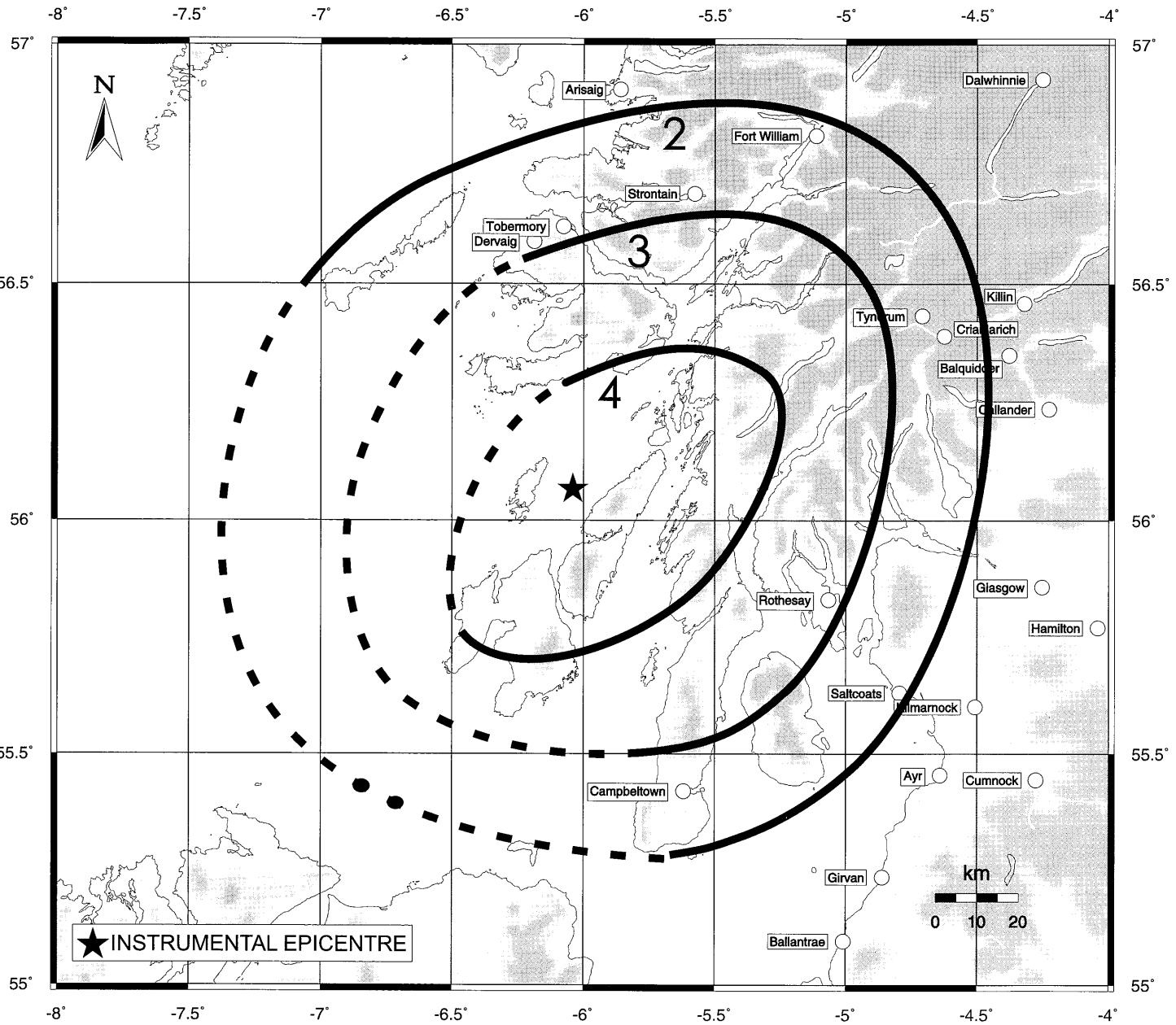


Figure A1.2. Jura Earthquake 3rd May 1998, 02:12 UTC (3.5 ML) - EMS Intensities

APPENDIX A2

LOCHARBRIGGS EARTHQUAKE, 21 JULY 1998

PARAMETERS

Date:	21 July 1998
Origin Time:	07:17 01.4 UTC
Latitude and longitude:	55.10° N 3.63° W
Grid Reference:	295.8 km E 579.9 km N
Depth:	12.8 km
Magnitude:	2.0 ML
Hypo Solution Quality:	B (A*B)
Epicentral Error (1 std. dev.):	1.2 km
Depth Error (1 std. dev.):	2.6 km

Discussion

Two felt earthquakes with magnitudes of 2.0 and 1.4 ML, occurred in the Locharbriggs area of Dumfries and Galloway, with intensities of at least 3 EMS on 21 and 23 July, respectively. Felt reports described “a rumble lasted 5-10 seconds and neighbours rushed into the streets” and “the whole house shook”.

Seismograms recorded by the BGS networks around Cumbria and LOWNET are shown in Figure A2.1. A fault plane solution (Figure A2.2) of the largest event showed dominant strike slip motion on planes striking north-south or east-west.

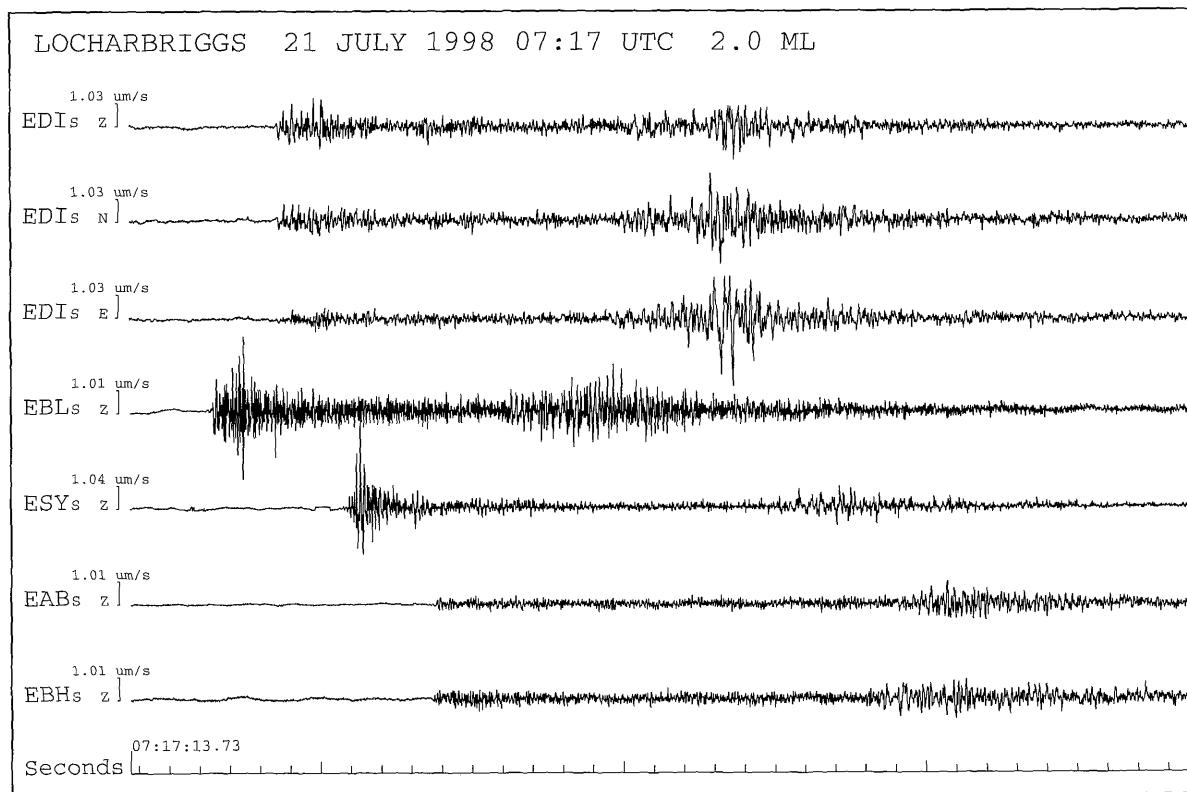
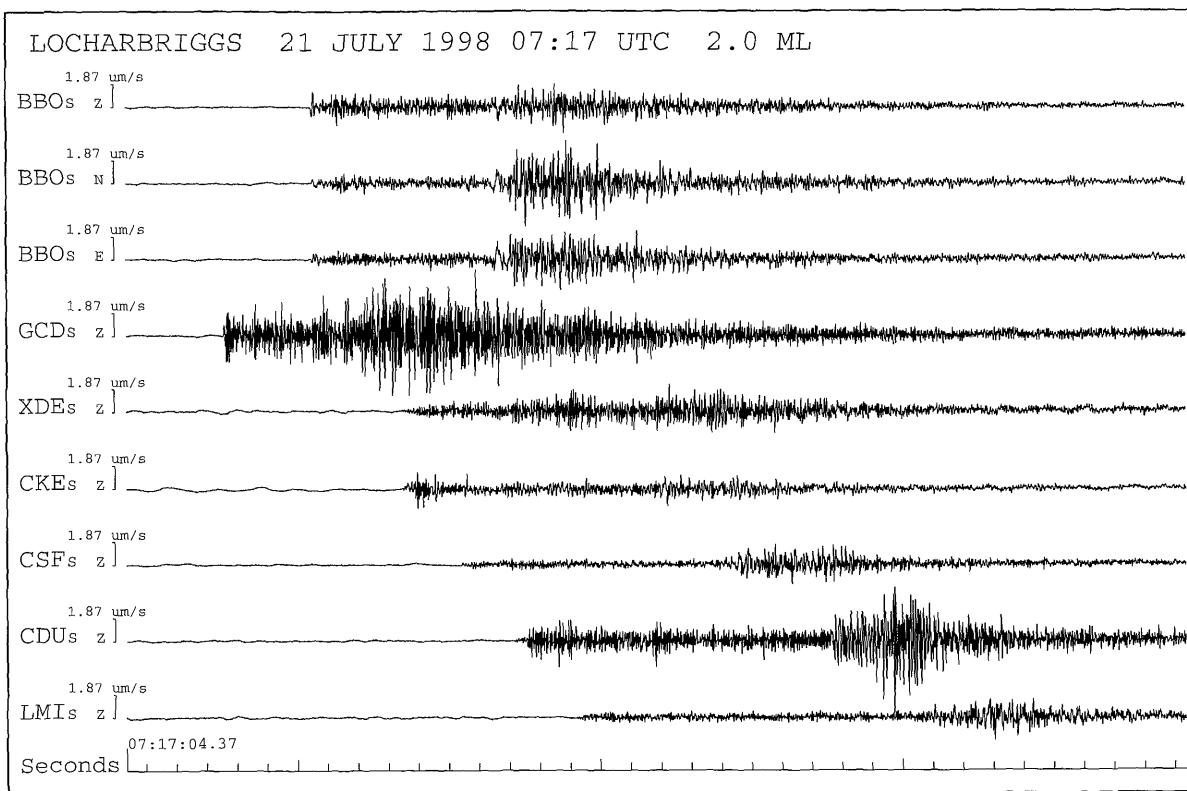


Figure A2.1. Seismograms of the Locharbriggs earthquake 21 July 1998 07:17 UTC 2.0 ML recorded on the Cumbria and LOWNET networks.

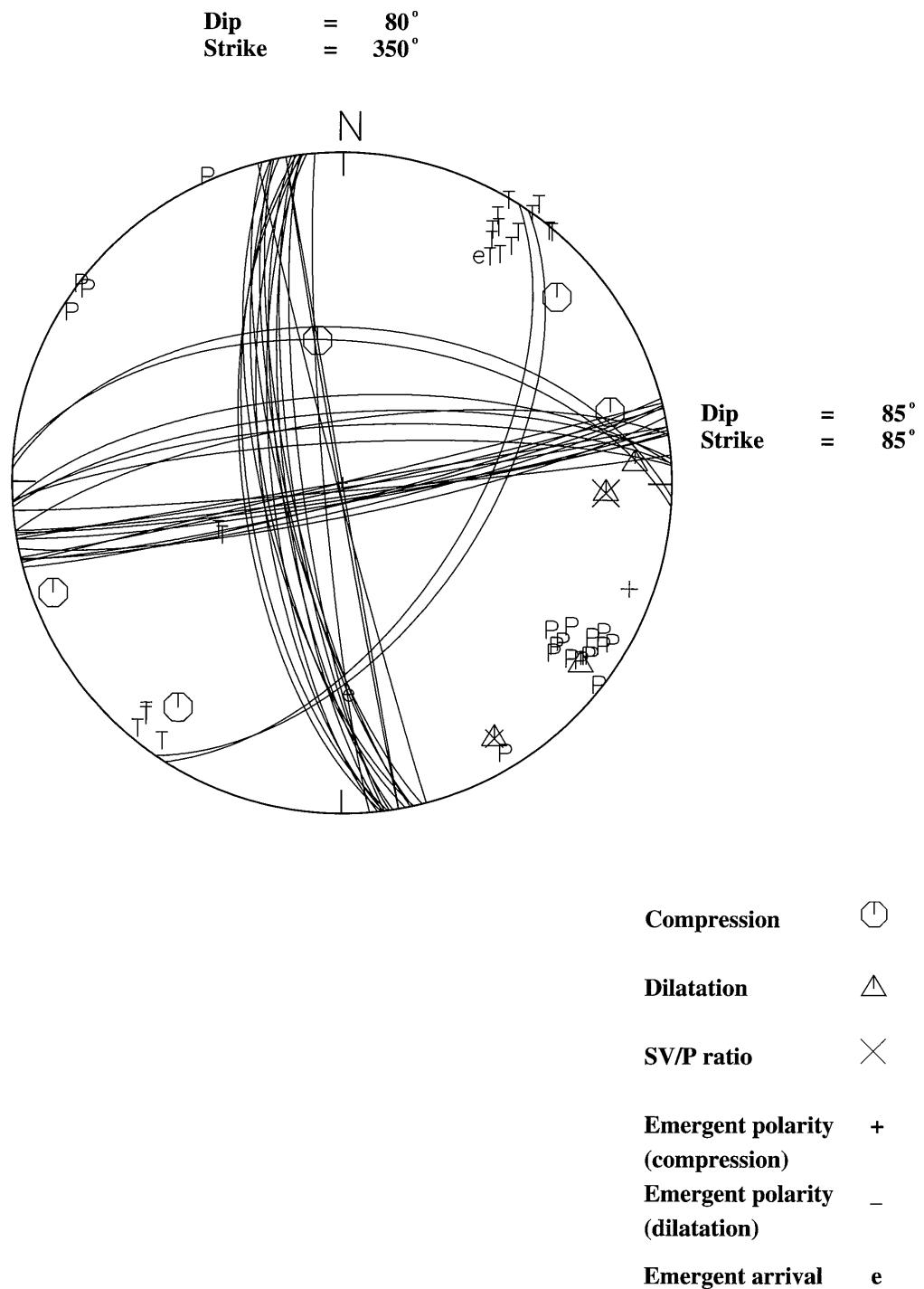


Figure A2.2 Equal area projection of the upper focal hemisphere for the Locharbriggs earthquake of 21 July 1998 2.0 ML. The axes of maximum and minimum compressive stress are denoted by P and T respectively.

APPENDIX A3

MENAI STRAIT EARTHQUAKE, 16 OCTOBER 1998

PARAMETERS

Date:	16 October 1998
Origin Time:	13:04 51.1 UTC
Latitude and longitude:	53.18° N 4.23° W
Grid Reference:	251.2 km E 367.2 km N
Depth:	11.9 km
Magnitude:	2.7 ML
Hypo Solution Quality:	A (A*A)
Epicentral Error (1 std. dev.):	0.6 km
Depth Error (1 std. dev.):	2.3 km

Discussion

On 16 October, an earthquake, with a magnitude of 2.7 ML, occurred in the Menai Straits, Gwynedd. A macroseismic survey was carried out and questionnaires were placed in a local weekly newspaper, resulting in 41 replies which indicated a maximum intensity of 4 EMS. The earthquake was felt in Port Dinorwic, Caernarvon, Bangor and Llangefni where residents described “heard a loud rumble”, “the ground shook” and “the house shook”.

Seismograms recorded by the BGS networks around North Wales and Hereford are shown in Figure A3.1 and an isoseismal map in Figure A3.2.

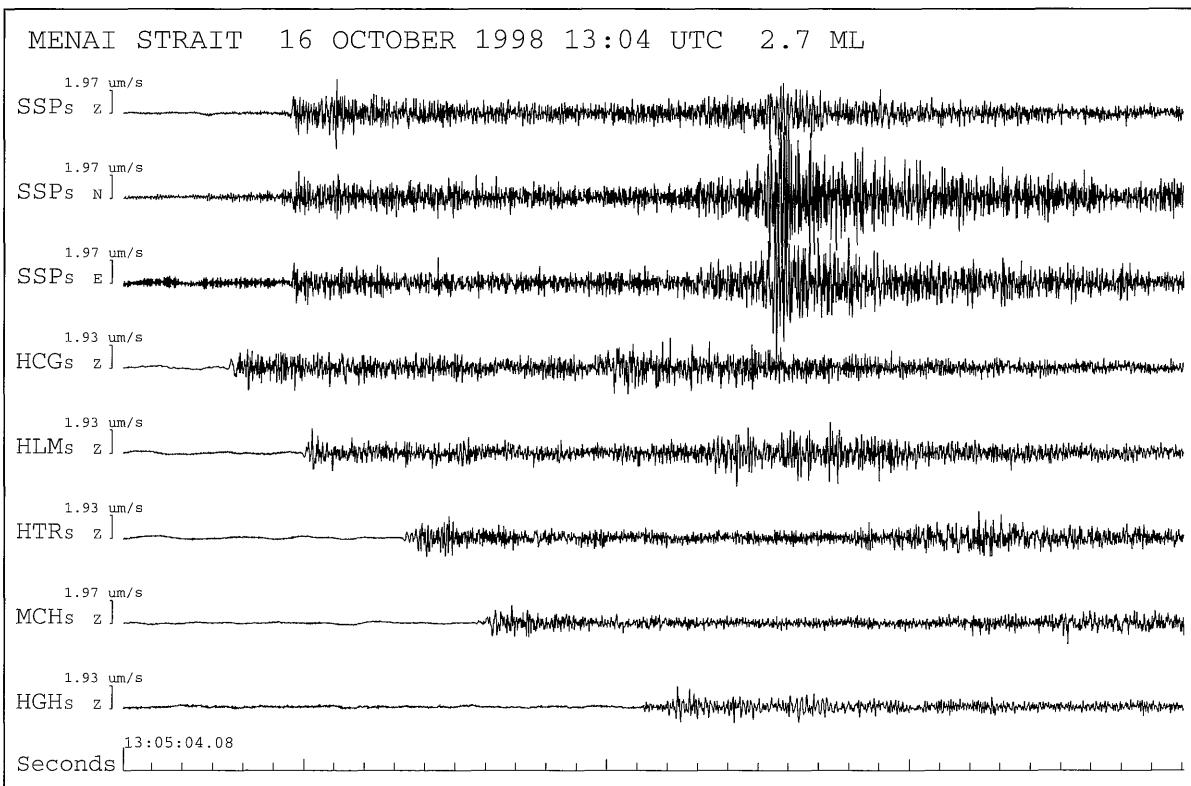
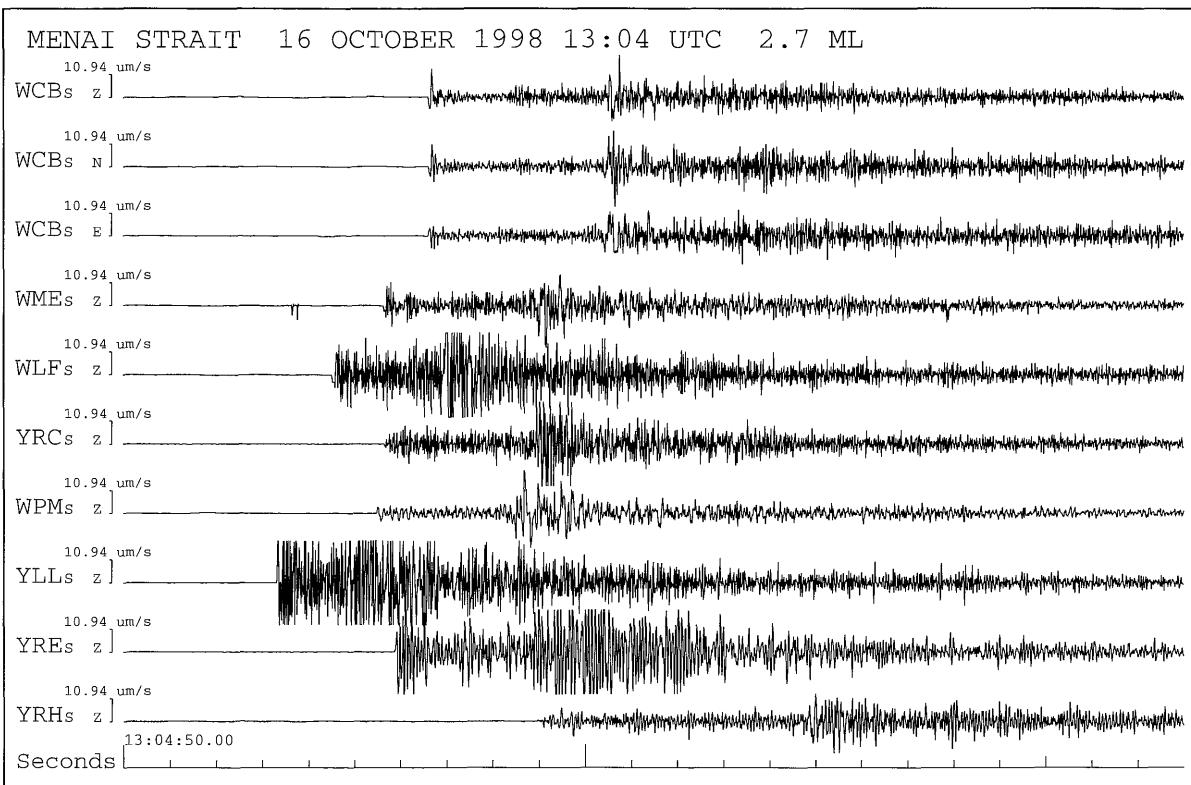


Figure A3.1. Seismograms of the Menai Strait earthquake 16 October 1998 13:04 UTC 2.7 ML recorded on the North Wales and Hereford networks.

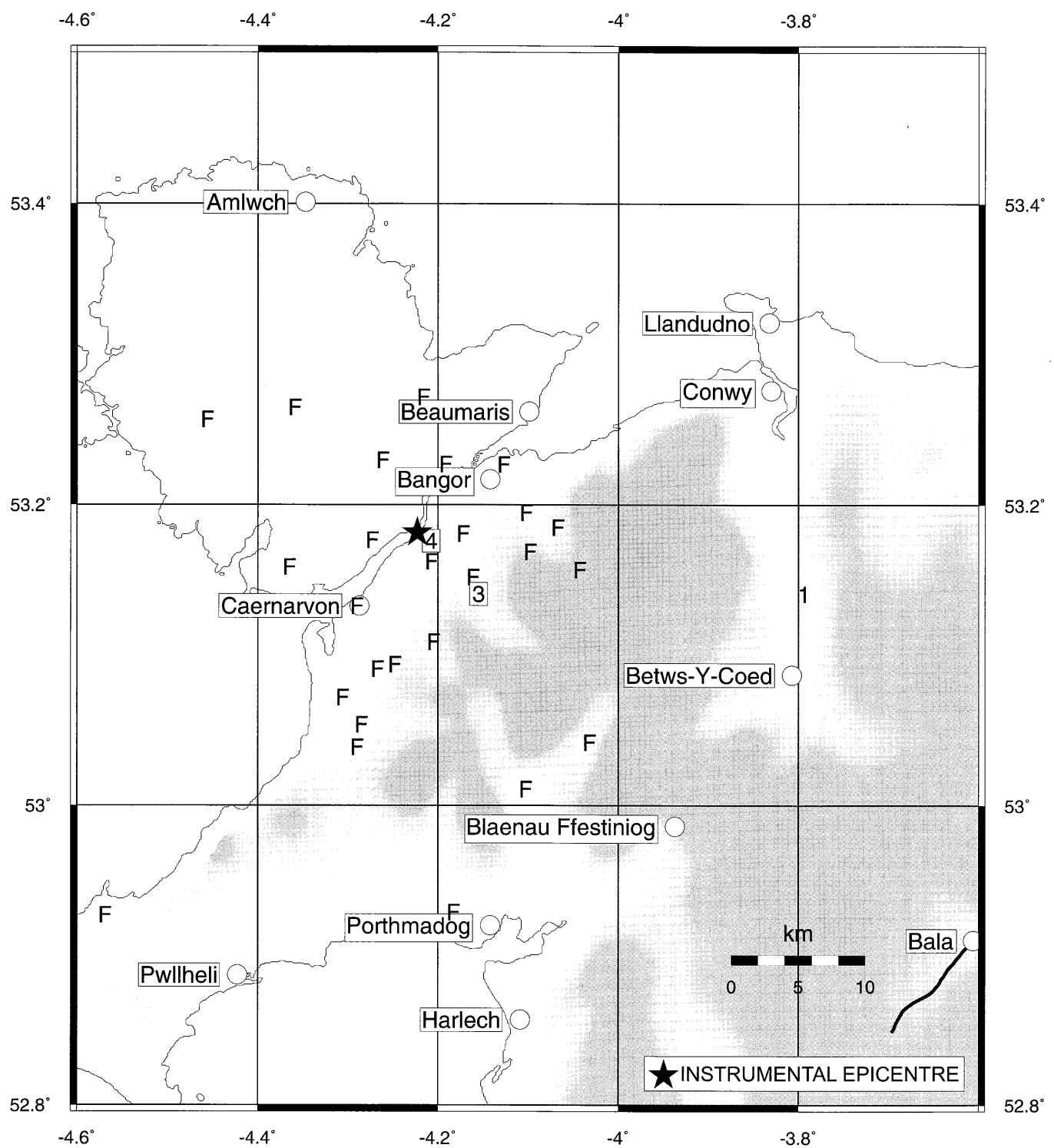


Figure A3.2. Menai Straits Earthquake 16th October 1998, 13:04 UTC (2.7 ML) - EMS Intensities

APPENDIX B

EARTHQUAKE INFORMATION CHARGES

APPENDIX B

SUMMARY OF CHARGES FOR DATABASE ENQUIRIES	COST (£)
A search of the instrumental database producing a catalogue list, a map of the seismicity, a key to the abbreviations and a covering letter.	£150.00 + VAT
A search of the historical database producing a catalogue list, a map of the seismicity, a key to the abbreviations and a covering letter.	£150.00 + VAT
A combined search of both the historical and instrumental database providing the above for both the historical and instrumental seismicity.	£275.00 + VAT
An enquiry involving searching data tapes for specific events. £80.00 for first hour and £40.00 for each additional $\frac{1}{2}$ hour. Note: charges can be waived for the public, media and schools.	£80.00 + VAT
A search and interpretation of raw macroseismic data (felt reports) for a specific region for an individual earthquake.	£90.00 + VAT

For more information on the above and other services available please contact Mr Glenn D Ford, (g.ford@bgs.ac.uk) or Mr Bennett Simpson, (b.simpson@bgs.ac.uk) at the Global Seismology and Geomagnetism Group, Murchison House, West Mains Road, Edinburgh, EH9 3LA.

BULLETIN OF BRITISH EARTHQUAKES: PRICE LIST

Burton, P.W. and Neilson, G., 1980. Annual catalogues of British earthquakes recorded on LOWNET (1967-1978). Inst.Geol.Sci. Seismological Bulletin No.7.	£3 + pp
Turbitt, T., et al., 1984. Catalogue of British earthquakes recorded by the BGS seismograph network 1979, 1980, 1981. BGS Global Seismology Report No. 210.	£11 + pp
Turbitt, T., et al., 1985. Catalogue of British Earthquakes recorded by the BGS Seismograph Network 1982, 1983, 1984. BGS Global Seismology Report No. 260.	£15 + pp
Turbitt, T., et al., 1987. Bulletin of British Earthquakes 1985. BGS Global Seismology Report No. 303.	£10 + pp
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Turbitt, T., et al., 1989. Bulletin of British Earthquakes 1987. BGS Global Seismology Report No. WL/89/09.	£10 + pp
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Walker, A.B., et al., 1998. Bulletin of British Earthquakes 1997. BGS Global Seismology Report No. WL/98/01.	£12.50 + pp

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APPENDIX C

EUROPEAN MACROSEISMIC SCALE (EMS 92)

APPENDIX C

SYNOPSIS OF EMS-92 INTENSITY SCALE

1 - Not felt

Not felt, even under the most favourable circumstances.

2 - Scarcely felt

Vibration is felt only by individual people at rest in houses, especially on upper floors of buildings.

3 - Weak

The vibration is weak and is felt indoors by a few people. People at rest feel a swaying or light trembling.

4 - Largely observed

The earthquake is felt indoors by many people, outdoors by very few. A few people are awakened. The level of vibration is not frightening. Windows, doors and dishes rattle. Hanging objects swing.

5 - Strong

The earthquake is felt indoors by most, outdoors by few. Many sleeping people awake. A few run outdoors. Buildings tremble throughout. Hanging objects swing considerably. China and glasses clatter together. The vibration is strong. Top heavy objects topple over. Doors and windows swing open or shut.

6 - Slightly damaging

Felt by most indoors and by many outdoors. Many people in buildings are frightened and run outdoors. Small objects fall. Slight damage to many ordinary buildings eg; fine cracks in plaster and small pieces of plaster fall.

7 - Damaging

Most people are frightened and run outdoors. Furniture is shifted and objects fall from shelves in large numbers. Many ordinary buildings suffer moderate damage: small cracks in walls; partial collapse of chimneys.

8 - Heavily damaging

Furniture may be overturned. Many ordinary buildings suffer damage: chimneys fall; large cracks appear in walls and a few buildings may partially collapse.

9 - Destructive

Monuments and columns fall or are twisted. Many ordinary buildings partially collapse and a few collapse completely.

10 - Very destructive

Many ordinary buildings collapse.

11 - Devastating

Most ordinary buildings collapse.

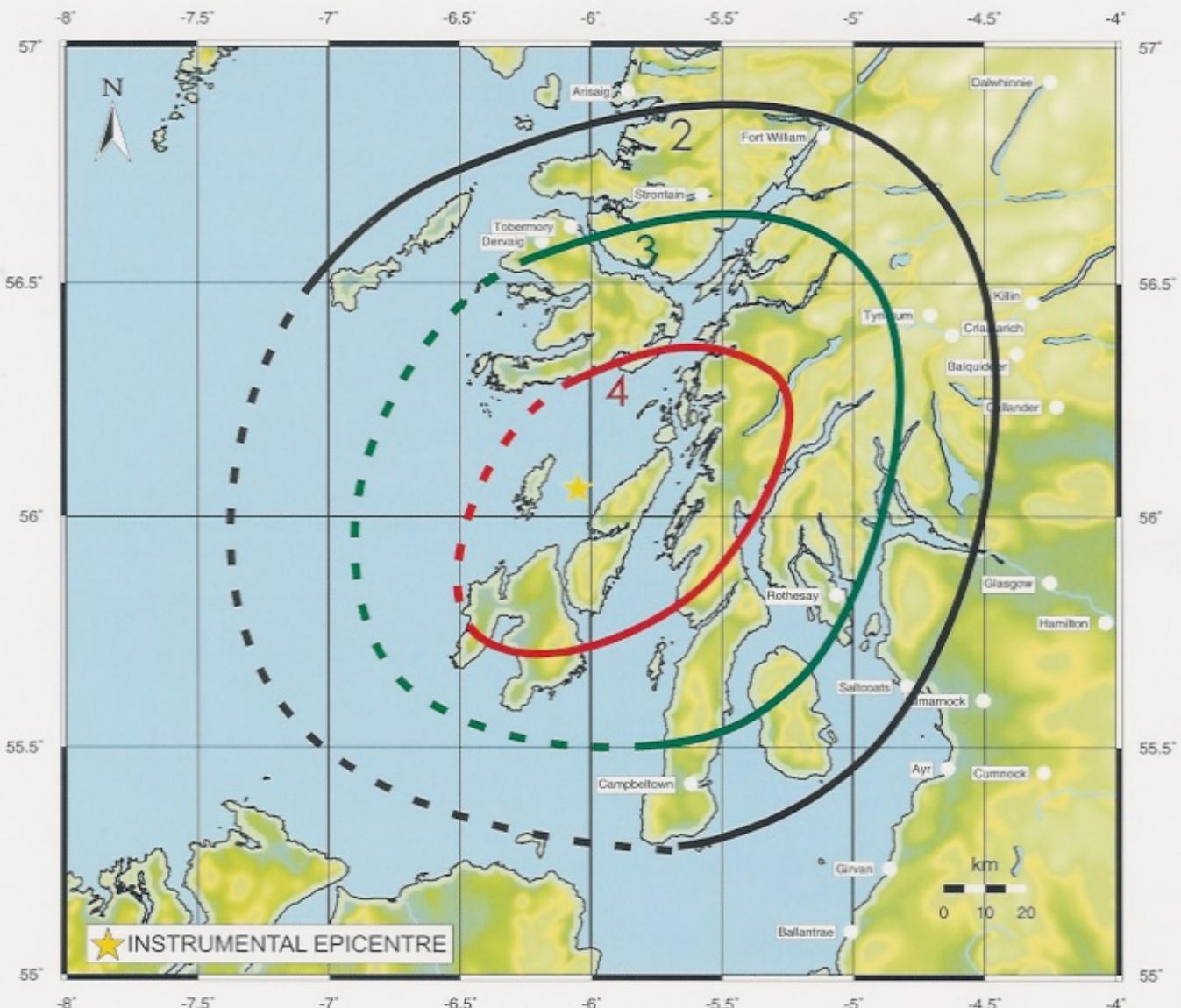
12 - Completely devastating

Practically all structures above and below ground are heavily damaged or destroyed.

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A complete description of the EMS-92 scale is given in:

Grunthal, G.,(Ed) 1993. European Macroseismic scale 1992 (up-dated MSK-scale). Cahiers du Centre European de Geodynamique et de Seismologie. **Vol 7**.



Jura Earthquake 3rd May 1998, 02:12 UTC (3.5 ML) - EMS Intensities