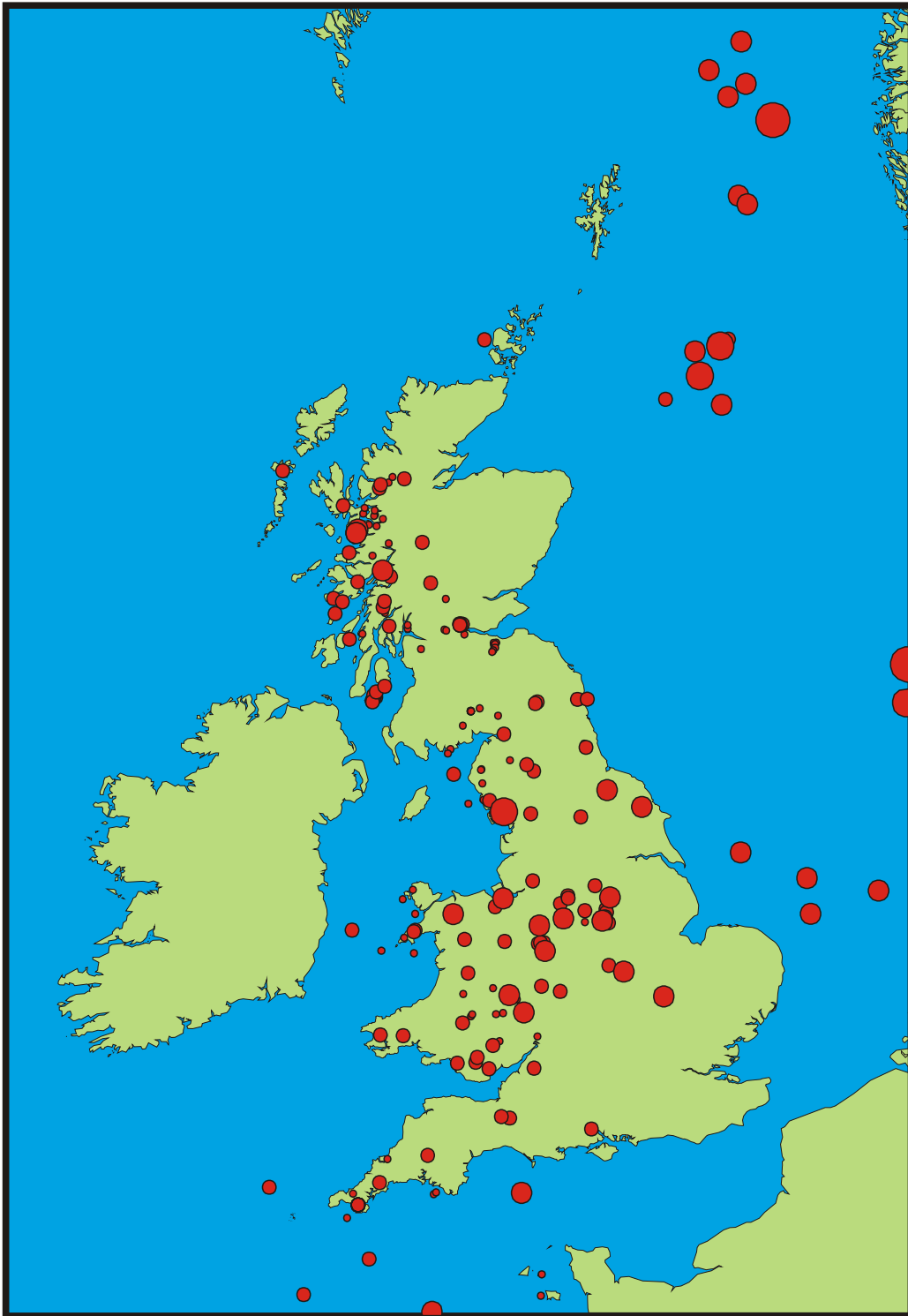




British Geological Survey

BULLETIN OF BRITISH EARTHQUAKES 1993



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Bulletin of British earthquakes 1993

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CONTENTS

	Page
1. INTRODUCTION	1
1.1 The Bulletin	1
1.2 Summary of 1993 seismicity	1
2. BULLETIN FORMAT	3
2.1 Tables	3
2.2 Figures	3
3. THE BGS UK SEISMOGRAPH NETWORK	4
3.1 Instrumentation	4
3.2 Detection Threshold	4
4. HYPOCENTRE PARAMETERS AND THEIR ERRORS	5
4.1 Epicentre Location	5
4.2 Depth Determination	5
4.3 Seismicity Distribution	5
4.4 Magnitude	6
4.5 Intensity	6
5. BULLETIN CONTENT AND COMPLETENESS	6
5.1 The geographical area	6
5.2 Events included	6
5.3 Events excluded	7
5.4 Completeness	7
ACKNOWLEDGEMENTS	7
REFERENCES	9

Tables

Figures

Appendices:

Appendix A: Significant earthquakes in 1993

Appendix B: Earthquake information charges

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 of Great Britain and Northern Ireland. This area, 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 1993 together with maps showing the larger magnitude events since 1979 ($ML \geq 2.5$) and since 1970 ($ML \geq 3.5$).

1.2 Summary of 1993 seismicity

There have been 358 earthquakes located by the monitoring network in the year, with 39 of them having magnitudes of 2.0 or greater. Six in that magnitude category are known to have been felt together with a further seven smaller ones, bringing the total to 13 felt earthquakes in 1993.

The largest onshore earthquake of the year occurred in Grange-Over-Sands, Cumbria, on 26 June with a magnitude of 3.0 ML and a felt area of 2700 km². A macroseismic survey throughout the region showed that it was felt in the epicentral area with a maximum intensity of 5 MSK (just below the damaging level). The focal mechanism interpretation shows two possibilities; strike-slip with a small component of reverse faulting or reverse faulting with a small component of strike-slip faulting. Further details of this event are given in Appendix A1.

The largest felt offshore earthquake in 1993, (magnitude 4.0), occurred on 7 July and was felt at the Gorm hydrocarbons field. The felt reports described "a shuddering" on the Gorm complex and on a nearby standby vessel resulting in a production stoppage of 2 hours. It locates in a similar area to the magnitude 4.0 ML event on 10 June 1985 which was felt on the Gorm and Tyra platforms and on a standby vessel.

A swarm of events occurred 10 km south of the isle of Arran with magnitudes ranging from 0.9 to 1.7 ML, on 6 and 7 January. Later in the year (13 June and 8 August), two events with magnitudes of 1.3 and 1.6 ML were located in the same general area as the swarm.

On 29 June, a small event (magnitude 2.0 ML) was located in the Potteries, Stoke-on-Trent. It was felt in the Talke Pits area and it was reported that unstable objects were overturned indicating an intensity of at least 5 MSK.

Near Coniston in Cumbria, a magnitude 1.5 ML earthquake was detected on 8 July 1993. A single felt report was received from the village of Kirkby-in-Furness describing "a noise like a heavy lorry passing outside". It locates some 18 km from the Grange-Over-Sands earthquake two weeks before.

A series of 22 events near Mallaig in the north-west of Scotland was detected in August and

September with magnitudes ranging from -0.2 to 2.7 ML. The largest was felt with intensities of at least 3 MSK (catalogued as 3+) in the town of Mallaig where residents reported a noise "like a small blast". The event locates in the same general area as the magnitude 3.7 ML Mallaig earthquake of 1 December 1985 which was felt with intensities up to 4 MSK.

Three small events occurred near Ludlow in September with magnitudes of 1.8, 2.3 and 1.6 ML. They all locate at a mid-crustal depth of around 14 km. A fault plane solution of the larger event (2.3 ML) shows strike-slip faulting with a small thrust component (Appendix A2).

In September, 11 small events with magnitudes ranging between -0.2 and 0.6 ML were located near to Johnstonebridge, Dumfries and Galloway. None were reported to be felt. They locate at depths of between 3.9 and 5.0 km in the same general area as the felt Johnstonebridge earthquake on 27 February 1992 (magnitude 2.7 ML).

A magnitude 2.3 ML earthquake was felt by a few people in Betws-y-Coed and Nantbhh, North Wales on 11 October 1993. It located at a depth of 9.3 km and the fault plane solution shows dominant normal faulting with a small component of strike-slip faulting (Appendix A3).

On the Lleyrn Peninsula of North Wales, five events with magnitudes ranging from 0.0 to 1.4 ML were located at depths between 20.7 and 23.4 km and form part of the earthquake series which was detected following the magnitude 5.4 ML earthquake of 19 July 1984.

Throughout the year, 89 small events were located near the village of Constantine in Cornwall with magnitudes ranging between -0.8 and 1.8 ML. None were reported to be felt. They form part of the continuing series which has been instrumentally recorded since 1981 and which has produced five felt earthquakes.

Some 53 coalfield events with magnitudes ranging between -0.2 and 2.4 ML have been detected in 1993, six of which were felt. Thirty of them were located in the Clackmannan area in the central region of Scotland, where 3 events were felt by local residents in the village of Forest Mill; the largest (1.6 ML) had an intensity of at least 3 MSK.

Near Ranskill, Nottinghamshire, a magnitude 2.2 ML coal-mining event was detected on 11 November. It was felt strongly in the village of Ranskill where residents ran out of their houses into the streets, indicating an intensity of at least 5 MSK. The largest coalfield event during the year had a magnitude of 2.4 ML but was not reported to be felt.

2. BULLETIN FORMAT

2.1 Tables

Data on the earthquakes and seismograph stations operated in 1993 are arranged as follows:

TABLE 1 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 is a listing of earthquakes arranged in order of decreasing latitude to facilitate identification of earthquakes in selected regions.

TABLE 3 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.

TABLE 4 is an alphabetical listing of the geographical coordinates of seismograph stations operated in 1993 by BGS and DIAS (the Dublin Institute of Advanced Studies).

TABLE 5 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 shows the crustal seismic velocity models used for event location.

2.2 Figures

FIGURE 1: seismograph network operational in December 1993.

FIGURE 2: detection threshold of the seismograph stations operational in December 1993 for average background noise conditions where the detection criterion is that the signal has to significantly exceed 4 nanometres at 10 Hz on 4 stations.

FIGURE 3: epicentral location map of all the events in 1993 that are listed in Table 2. It is estimated that the data set 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 1993. It is estimated that the data set 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 1993.

3. THE BGS UK SEISMOGRAPH NETWORK

3.1 Instrumentation

A standard seismic network consists of up to seven 'outstation' vertical seismometers radio-linked over distances of up to 100 km to a central site where the data, along with that from a local 3-component set of two horizontal and one vertical seismometers, are recorded on magnetic tape by a Geostore recorder. Tapes are dispatched, usually once per week, to Edinburgh for analysis.

A more detailed description of the system is given by Browitt et al (1985) and the response of the system is described by Turbitt and Stewart (1982).

At some locations, on-line paper chart recorders display three channels to permit rapid investigation of reported felt tremors. At other stations, low-gain vertical seismometers extend the dynamic range (by 34 db) of the system to stronger motions, and low frequency microphones are used to aid the discrimination of sonic booms. In addition, strong motion accelerometers installed at several locations (near Hunterston, Cornwall, Chapelcross and Jersey) record accelerations up to 0.1 g.

At locations shown in red on Figures 1 and 2 the seismograph stations are recording onto digital event triggered recorders (SEISLOG). These are designed to trigger on events and write to a computer disk which is accessed from Edinburgh via a modem. Each morning, automatic data transfers are made to the Edinburgh VAX computer and the events are analysed during that day providing a rapid response for location and magnitude calculations. SEISLOGS have the advantage over the Geostore system of providing a wider dynamic range (72 db), a bandwidth of up to 40 Hz and the capacity for 16 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.

Improvements in geographic coverage of the UK are described in Turbitt (1985), with more recent developments in Walker and Browitt (1994), in press. In December 1993, 68% of the 128 stations were being recorded on a rapid access SEISLOG system.

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 nanometres 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 nanometres, 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 and this is not always the case. 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.

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 1993 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; Assumpcao 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 a 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 1993, 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 1993 is shown in Figure 5 with a threshold magnitude of 3.5. 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 data set 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 A₀ is that for a 'standard' magnitude zero earthquake at the same distance. The A₀ term is thus a distance correction factor tabulated by Richter to 200, and later 600 km. Although Richter intended his method to be an approximate quantification of earthquake size and his attenuation term, A₀, 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 (I₀) usually found close to the epicentre. The maximum felt intensity is quoted, where known, on the MSK scale (Ad Hoc Panel, 1981).

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 due to 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 1993, nineteen sonic events were reported felt and all were detected by the UK network.

Significant non-natural events which received Media attention 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 1993, five felt explosions were detected and a further six were reported in local newspapers.

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 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, and above, at times of average ambient noise levels. High noise levels may cause this threshold to rise to about 2.3. 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 and above.

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TABLE 1: CATALOGUE OF EVENTS LISTED CHRONOLOGICALLY: 1993

YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments...	
19930302	143615.2	51.05	-2.70	350.9	127.8	12.7	1.9	SOMERTON, SOMERSET	22	3	202	0.18	0.7	0.4	B*D			
19930307	041319.0	55.27	-3.33	315.7	598.0	12.9	0.5	NEWTON, D & G	18	9	172	0.09	0.4	0.7	A*C			
19930307	123944.2	49.44	-2.16	388.6	-51.5	12.4	0.7	NORTH OF JERSEY	7	22	333	0.01	0.5	1.3	A*D	25KM NORTH OF JERSEY		
19930309	132209.4	56.65	-5.24	201.6	756.2	2.5	2.0	LOCH LINNHE, HIGHLAND	22	25	120	0.23	0.7	1.1	B*C			
19930310	053916.2	56.12	-3.72	293.0	693.2	0.5	1.0	CLACKMANNAN, CENTRAL	13	19	80	0.09	0.4	0.8	A*C	C/F		
19930310	084051.8	49.97	-5.35	159.9	13.2	17.9	0.4	LIZARD POINT, CORNWALL	8	21	340	0.03	1.1	1.3	B*D	SW OF LIZARD POINT		
19930312	152803.7	57.23	-5.66	178.9	821.5	4.5	-0.3	ISLE OF SKYE, HIGHLAND	4	12	264	0.02			A*D			
19930314	024857.2	54.43	-0.99	465.4	504.3	1.8	2.4	WESTERDALE, N YORKSHIRE	43	23	137	0.21	0.5	0.9	B*C			
19930315	142329.1	53.08	-1.11	459.6	354.2	0.1	2.4	FARNSFIELD, NOTTS	23	23	162	0.22	0.7	1.0	B*C	C/F		
19930316	111306.9	52.86	-2.14	390.7	329.1	3.9	1.7	WHITGREAVE, STAFFS	12	26	135	0.27	1.1	3.8	B*C			
19930317	045037.5	57.11	-5.39	194.5	807.1	8.6	0.8	KINLOCH HOURN, HIGHLAND	6	30	173	0.35	0.2	7.1	C*C			
19930318	023143.5	51.62	-3.29	311.0	191.8	10.0	1.5	SENGHENYDD, M GLAMORGAN	15	33	124	0.16	0.6	1.2	B*C			
19930318	145900.0							SONIC-WORCESTERSHIRE									SONIC-FELT BROADWAY...	
19930318	213340.9	53.02	-2.20	386.4	347.6	6.1	1.4	STOKE-ON-TRENT, STAFFS	7	24	161	0.03	0.2	0.6	A*C			
19930321	192935.1	51.06	-2.84	341.1	129.5	14.3	1.0	SOMERTON, SOMERSET	16	7	135	0.19	0.9	0.8	B*B	7KM WEST OF SOMERTON		
19930324	100220.8	49.22	-2.17	387.5	-76.1	5.5	0.4	ST BRELAD, JERSEY	6	3	144	0.08	1.2	2.2	B*C			
19930324	114752.2	52.62	-1.00	467.3	302.9	7.7	1.5	KEYHAM, LEICESTERSHIRE	8	24	286	0.17	8.0	15.8	D*D			
19930325	025824.9	50.11	-5.18	172.7	28.3	7.0	-0.2	CONSTANTINE, CORNWALL	17	3	122	0.02	0.1	0.1	A*B			
19930325	025836.8	50.11	-5.18	172.8	28.3	7.1	-0.3	CONSTANTINE, CORNWALL	14	3	124	0.02	0.1	0.1	A*B			
19930325	140807.2	53.26	-1.84	410.5	373.5	0.0	1.4	BUXTON, DERBYSHIRE	6	21	94	0.08	0.6	1.1	A*C	COLLAPSE TYPE		
19930326	015009.1	54.87	-1.37	440.5	553.2	0.0	1.7	SUNDERLAND, TYNE & WEAR	29	16	210	0.28	1.1	1.3	B*D	C/F		
19930326	033704.4	57.12	-5.54	185.5	808.6	16.0	0.4	KNOYDART, HIGHLAND	9	12	127	0.11	0.7	1.5	A*B			
19930326	040124.7	54.91	-1.40	438.3	557.5	0.0	0.9	SUNDERLAND, TYNE & WEAR	8	82	301	0.21	7.7	5.8	D*D	C/F		
19930326	063820.6	56.13	-3.72	293.0	694.4	0.6	1.0	CLACKMANNAN, CENTRAL	10	19	103	0.12	0.6	0.8	A*C	C/F		
19930331	064432.4	52.12	-2.95	334.9	247.0	17.8	0.2	STAUNTON-O-WYE, HER&WOR	6	14	172	0.04	0.6	0.7	A*C			
19930404	081357.3	57.03	-5.79	170.0	799.7	2.7	0.7	MALLAIG, HIGHLAND	6	13	183	0.08	1.7	3.0	B*D			
19930405	123946.3	50.11	-5.18	172.7	28.4	6.9	0.8	CONSTANTINE, CORNWALL	13	3	122	0.02	0.1	0.1	A*B			
19930405	123948.3	50.11	-5.18	172.7	28.3	5.9	0.7	CONSTANTINE, CORNWALL	12	3	123	0.05	0.2	0.3	A*B			
19930406	064106.2	58.67	1.01	574.4	979.5	25.8	3.5	NORTHERN NORTH SEA	34197	181	0.24	1.2	2.3	B*D				
19930406	082108.9	56.13	-3.68	295.4	694.5	0.1	1.6	CLACKMANNAN, CENTRAL	3+	10	17	103	0.09	0.5	0.9	A*C	C/F, FELT FOREST MILL	
19930407	110816.5	50.11	-5.18	172.7	28.3	7.4	0.0	CONSTANTINE, CORNWALL	7	3	166	0.02	0.2	0.3	A*C			
19930407	195655.5	50.11	-5.18	172.6	28.3	6.8	0.1	CONSTANTINE, CORNWALL	14	3	169	0.03	0.2	0.2	A*C			
19930407	213434.1	50.11	-5.18	172.6	28.1	7.1	0.2	CONSTANTINE, CORNWALL	15	3	123	0.02	0.1	0.2	A*B			
19930408	012428.0	50.11	-5.18	172.7	28.2	7.1	-0.1	CONSTANTINE, CORNWALL	13	3	123	0.02	0.1	0.2	A*B			
19930408	035821.4	53.34	-1.71	419.2	382.8	14.6	1.1	BRADWELL, DERBYSHIRE	6	16	143	0.08	0.9	2.3	B*C			
19930409	161403.9	50.11	-5.18	172.5	28.0	6.6	0.4	CONSTANTINE, CORNWALL	14	3	122	0.02	0.1	0.1	A*B			
19930409	163511.5	56.13	-3.68	295.8	693.8	1.4	0.5	CLACKMANNAN, CENTRAL	6	17	118	0.05	0.5	0.9	A*C	C/F		
19930409	175720.7	50.11	-5.18	172.6	28.2	7.2	0.6	CONSTANTINE, CORNWALL	15	3	121	0.02	0.1	0.2	A*B			
19930409	190544.2	50.11	-5.18	172.7	28.2	6.8	-0.1	CONSTANTINE, CORNWALL	12	3	123	0.02	0.1	0.2	A*B			
19930415	131548.3	50.11	-5.18	172.6	28.3	7.2	0.2	CONSTANTINE, CORNWALL	11	3	122	0.02	0.1	0.2	A*B			
19930415	213003.4	52.55	-0.75	484.9	295.9	4.7	2.3	GREAT EASTON, LEICS	23	25	77	0.40	1.3	2.8	C*C			
19930417	075520.5	56.12	-3.72	293.3	693.6	1.4	0.8	CLACKMANNAN, CENTRAL	11	19	86	0.08	0.3	0.6	A*C	C/F		
19930419	001704.2	55.95	-3.04	335.0	673.4	1.9	-0.1	MUSSELBURGH, LOTHIAN	6	9	205	0.06	0.8	1.2	A*D	C/F		
19930421	013732.2	56.13	-3.72	293.1	693.8	1.0	1.3	CLACKMANNAN, CENTRAL	19	19	80	0.09	0.2	0.4	A*C	C/F		
19930422	111130.2	50.11	-5.18	172.6	28.2	7.0	0.5	CONSTANTINE, CORNWALL	14	3	169	0.03	0.2	0.2	A*C			
19930422	222249.6	55.95	-3.09	332.0	673.1	0.5	-0.2	MUSSELBURGH, LOTHIAN	6	7	208	0.24	8.5	7.9	D*D	C/F		
19930424	094405.9	52.09	-3.38	305.5	244.6	15.9	0.5	BUILTH WELLS, POWYS	5	8	212	0.01	1.2	0.2	B*D	6KM SOUTH BUILTH WELLS		
19930426	194344.9	57.61	-7.29	84.2	870.6	0.5	1.4	NORTH UIST, W ISLES	11	39	325	0.17	4.2	3.3	C*D			
19930429	180140.3	57.30	-6.06	155.3	830.6	2.9	1.7	ISLE OF SKYE, HIGHLAND	17	25	134	0.09	0.3	0.9	A*C			
19930501	183621.4	51.87	-4.53	225.8	222.3	3.2	1.4	MEIDRIM, DYFED	21	18	115	0.19	0.3	1.2	B*C	4KM NE OF MEIDRIM		

TABLE 1: CATALOGUE OF EVENTS LISTED CHRONOLOGICALLY: 1993

YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments...	
19930102	052245.5	50.11	-5.18	172.8	28.3	7.3	0.1	CONSTANTINE, CORNWALL	11	3	164	0.04	0.3	0.4	A*C			
19930104	211223.8	50.11	-5.17	173.0	28.2	7.0	-0.1	CONSTANTINE, CORNWALL	9	3	159	0.01	0.2	0.2	A*C			
19930104	211226.0	50.11	-5.18	172.9	28.2	7.2	0.1	CONSTANTINE, CORNWALL	8	3	161	0.02	0.2	0.3	A*C			
19930106	181241.4	55.35	-5.28	191.7	610.9	15.5	1.2	ARRAN, STRATHCLYDE	11	20	122	0.17	0.8	2.3	B*B			
19930106	214145.6	55.35	-5.26	193.6	610.9	6.6	1.0	ARRAN, STRATHCLYDE	8	21	121	0.08	0.5	1.0	A*C			
19930106	224657.2	55.31	-5.32	189.1	606.8	13.7	1.0	ARRAN, STRATHCLYDE	5	18	218	0.02	0.5	1.0	A*D			
19930106	232343.2	55.30	-5.30	190.2	605.9	8.5	0.9	ARRAN, STRATHCLYDE	5	19	217	0.02	0.7	4.2	B*D			
19930107	001656.1	55.28	-5.30	190.6	603.2	5.0	0.9	ARRAN, STRATHCLYDE	6	20	209	0.04	9.4	12.1	D*D			
19930107	015345.2	55.35	-5.28	191.8	611.2	14.8	1.0	ARRAN, STRATHCLYDE	10	20	123	0.12	0.5	1.9	A*B			
19930107	155911.7	55.35	-5.28	191.9	610.9	11.8	1.7	ARRAN, STRATHCLYDE	13	20	122	0.17	0.7	2.5	B*B			
19930107	170045.5	55.37	-5.29	191.2	613.1	15.2	1.5	ARRAN, STRATHCLYDE	12	19	130	0.23	1.2	2.7	B*B			
19930107	170618.4	55.32	-5.30	190.9	608.3	13.7	0.9	ARRAN, STRATHCLYDE	5	19	227	0.07	2.0	3.4	B*D			
19930107	184435.8	55.30	-5.31	189.8	605.5	13.1	1.2	ARRAN, STRATHCLYDE	6	19	215	0.03	0.6	1.1	A*D			
19930115	170121.9	50.35	-4.84	198.0	53.7	5.9	1.6	ST AUSTELL, CORNWALL	12	4	298	0.01	0.2	0.2	A*D			
19930117	085255.7	50.10	-5.17	173.2	27.5	5.5	0.1	CONSTANTINE, CORNWALL	9	4	160	0.04	0.3	0.5	A*C			
19930118	060331.7	50.25	-3.94	261.6	40.4	2.0	0.2	PLYMOUTH, DEVON	4	10	331	0.00			A*D	20KM SE OF PLYMOUTH		
19930118	104006.2	50.75	-1.11	462.9	94.7	0.3	2.4	EXPL-PORTSMOUTH	2+	11	89	117	0.48	3.2	10.9	C*D	EXPL-FELT PORTSMOUTH	
19930118	223150.8	50.27	-3.90	264.4	42.5	7.5	0.9	PLYMOUTH, DEVON	6	6	258	0.17	3.6	1.8	C*D	20KM SE OF PLYMOUTH		
19930119	224646.0	52.96	-4.38	239.9	343.2	22.5	1.4	LLEYN PENINSULA	14	3	99	0.07	0.4	0.8	A*B			
19930122	020945.4	53.16	-1.72	419.0	363.1	3.8	0.7	BAKEWELL, DERBYSHIRE	5	16	204	0.06	0.4	0.6	A*D			
19930123	030303.2	55.86	-4.45	246.7	666.0	6.4	0.2	RENFREW, STRATHCLYDE	6	6	153	0.03	0.6	1.0	A*C			
19930125	203356.9	52.85	-2.23	384.5	328.1	10.2	1.5	ECCLESHALL, STAFFS	14	32	131	0.43	2.0	6.2	C*C			
19930131	183941.0	53.20	-1.04	463.9	367.5	0.5	1.0	EDWINSTOWE, NOTTS	2+	6	33	278	0.09	4.3	3.1	C*D	C/F, FELT EDWINSTOWE	
19930201	094606.0							SONIC-MONTROSE									SONIC-FELT MONTROSE....	
19930202	005025.9	56.08	-5.06	209.3	692.3	1.5	1.0	LOCH ECK, STRATHCLYDE	6	33	317	0.03	2.3	2.1	B*D			
19930202	081509.1	57.22	-5.43	192.7	820.1	3.3	0.8	SHEL BRIDGE, HIGHLAND	7	2	142	0.07	0.7	0.9	A*C			
19930202	151849.0							SONIC-DOUNREAY									SONIC-FELT DOUNREAY	
19930205	034457.9	53.22	-0.99	467.4	369.3	0.4	1.2	EDWINSTOWE, NOTTS	2+	5	36	285	0.13	8.0	5.7	D*D	C/F, FELT EDWINSTOWE	
19930205	110709.0							SONIC-SCARBOROUGH									SONIC-FELT SCARBOROUGH	
19930206	014818.9	56.13	-3.68	295.2	694.2	1.6	1.1	CLACKMANNAN, CENTRAL	2+	9	17	112	0.10	0.4	0.7	A*C	C/F, FELT FOREST MILL	
19930207	173344.1	52.95	-4.41	238.3	341.7	22.0	1.0	LLEYN PENINSULA	10	27	297	0.09	1.0	1.4	A*D			
19930209	130233.5	51.55	-3.06	326.6	184.4	10.0	1.7	CARDIFF, S GLAMORGAN	10	50	191	0.25	2.2	2.6	B*D			
19930210	033729.2	56.94	-5.14	208.8	787.3	2.8	0.8	LOCH ARKAIG, HIGHLAND	8	17	170	0.13	1.0	1.8	B*C			
19930211	094003.0							SONIC-DOUNREAY									SONIC-FELT DOUNREAY	
19930211	094028.0							SONIC-DOUNREAY									SONIC-FELT DOUNREAY	
19930211	144509.0							SONIC-DOUNREAY									SONIC-FELT DOUNREAY	
19930211	144611.0							SONIC-DOUNREAY									SONIC-FELT DOUNREAY	
19930211	161903.2	55.01	-2.87	344.1	568.4	12.3	1.0	LONGTOWN, CUMBRIA	25	15	147	0.14	0.5	1.1	A*C			
19930211	194612.6	58.97	1.45	598.3	1013.8	6.4	3.8	NORTHERN NORTH SEA	36	192	159	0.39	1.1	2.1	C*D			
19930211	211925.1	56.12	-3.67	296.0	692.7	1.0	0.6	CLACKMANNAN, CENTRAL	2+	8	18	153	0.09	0.5	0.7	A*C	C/F, FELT FOREST MILL	
19930212	143408.0							SONIC-DOUNREAY									SONIC-FELT DOUNREAY	
19930212	143642.0							SONIC-DOUNREAY									SONIC-FELT DOUNREAY	
19930213	203602.4	56.07	-4.02	274.2	688.3	7.5	0.9	CARRON VALLEY, CENTRAL	10	10	177	0.08	0.5	0.5	A*C			
19930215	122927.0	50.11	-5.18	173.0	28.1	6.2	0.5	CONSTANTINE, CORNWALL	11	6	163	0.02	0.2	0.2	A*C			
19930215	124517.9	50.11	-5.17	173.4	28.3	7.2	0.2	CONSTANTINE, CORNWALL	8	3	149	0.02	0.2	0.3	A*C			
19930218	051420.9	52.88	-4.57	227.0	334.7	10.4	0.3	GARN, GWYNEDD	9	7	143	0.05	0.8	1.0	A*C			
19930222	162800.0							SONIC-HUMBERSIDE									SONIC-FELT BEVERLEY...	
19930223	035349.6	56.13	-3.71	293.4	694.3	0.9	1.4	CLACKMANNAN, CENTRAL	14	18	81	0.10	0.4	0.8	A*C	C/F	SONIC-FELT ANGLESEY...	
19930226	111948.0							SONIC-ANGLESEY									SONIC-FELT ANGLESEY...	
19930227	011558.9	53.03	-2.20	386.4	348.3	7.2	1.8	STOKE-ON-TRENT, STAFFS	10	24	146	0.08	0.5	1.1	A*C			

TABLE 1

CATALOGUE OF EVENTS LISTED CHRONOLOGICALLY: 1993

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 MSK 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 MSK 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 | M Glamorgan | : Mid Glamorgan |
| Expl | : Explosion | Notts | : Nottinghamshire |
| D & G | : Dumfries and Galloway | Gl'shire | : Gloucestershire |
| Her & Wor | : Hereford and Worcester | S Yorks(hire) | : South Yorkshire |
| Gtr Manchester | : Greater Manchester | Leics | : Leicestershire |
| Cambs | : Cambridgeshire | W Midlands | : West Midlands |
| Prt | : Port | N Uist | : North Uist |
| Staffs | : Staffordshire | W Isles | : Western Isles |

Comments abbreviations

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

TABLE 1: CATALOGUE OF EVENTS LISTED CHRONOLOGICALLY: 1993

YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments...
19930502	190825.8	58.92	0.93	568.6	1007.6	15.0	2.3	NORTHERN NORTH SEA	17173	264	0.39	7.0	7.8	D*D			
19930504	142025.9	52.29	-0.06	531.9	267.5	0.2	2.4	HUNTINGDON, CAMBS	19	43	101	0.25	1.0	1.2	B*C	9KM SE OF HUNTINGDON	
19930505	023200.6	56.12	-3.72	293.2	693.5	0.5	0.3	CLACKMANNAN, CENTRAL	11	19	122	0.15	0.6	0.9	B*C	C/F	
19930505	042808.8	49.16	-5.99	108.9	-74.8	6.6	1.4	LAND'S END, CORNWALL	11116	355	0.09	5.3	1.8	D*D		SW OF LAND'S END	
19930505	140738.1	62.08	2.27	622.9	1363.3	10.8	2.2	NORWEGIAN SEA	15175	212	0.42	2.8	3.9	C*D			
19930506	063653.5	54.84	-3.85	281.4	551.2	8.0	0.6	AUCHENCAIRN, D & G	9	7	186	0.03	0.3	0.6	A*D		
19930506	122252.8	54.63	-2.32	379.2	526.0	4.3	1.0	MICKLE FELL, DURHAM	30	27	110	0.14	0.3	1.4	A*C		
19930507	102634.0	56.12	-3.71	293.6	693.6	0.5	-0.1	CLACKMANNAN, CENTRAL	8	19	122	0.24	1.6	2.1	B*C	C/F	
19930507	113000.5	59.07	-3.37	321.3	1021.0	7.2	1.7	WEST OF ORKNEY	9	85	206	0.12	1.7	0.8	B*D		
19930507	125043.0	52.14	-2.47	367.5	249.0	11.5	2.3	BROMYARD, HER & WOR	29	12	133	0.18	0.6	0.6	B*B	6KM SE OF BROMYARD	
19930512	214636.1	56.12	-3.70	294.1	693.6	0.1	0.3	CLACKMANNAN, CENTRAL	11	18	121	0.25	0.8	1.3	B*C	C/F	
19930519	072412.7	60.50	2.00	619.6	1186.3	22.3	2.1	NORTHERN NORTH SEA	10163	156	0.13	1.0	2.0	A*D			
19930521	134302.0	52.32	-3.52	296.3	270.2	15.8	-0.2	RHAYADER, POWYS	6	9	151	0.05	1.3	1.8	B*C		
19930522	220227.9	50.28	-2.49	364.9	42.0	6.9	2.2	ENGLISH CHANNEL	28104	96	0.33	0.8	2.9	C*D		40KM SOUTH OF WEYMOUTH	
19930523	050412.8	50.11	-5.18	172.7	28.3	6.8	0.7	CONSTANTINE, CORNWALL	16	3	123	0.02	0.1	0.1	A*B		
19930524	144903.0							SONIC-SUFFOLK									SONIC-FELT LEISTON...
19930525	182537.9	57.30	-6.12	151.7	831.3	4.7	0.4	ISLE OF SKYE, HIGHLAND	7	29	193	0.05	1.0	0.8	A*D		
19930526	184834.6	55.93	-5.80	162.6	677.3	2.1	1.3	JURA, STRATHCLYDE	9	66	240	0.35	5.1	3.7	D*D	3KM SE OF LAGG, JURA	
19930527	141159.0							EXPL-TAYSIDE									EXPL-HERCULES AIR CRASH
19930529	174341.4	61.52	1.90	607.4	1299.7	16.7	2.7	NORWEGIAN SEA	16167	192	0.28	2.2	3.5	B*D			
19930531	161218.3	56.39	-4.01	275.8	723.5	5.4	0.0	COMRIE, TAYSIDE	6	21	201	0.21	1.0	1.2	B*D		
19930602	084741.6	55.20	-2.98	337.3	589.6	6.9	0.3	LANGHOLM, D & G	15	8	196	0.08	0.4	0.6	A*D		
19930603	040954.9	54.69	-2.45	371.0	533.4	2.3	1.0	MILBURN FOREST, CUMBRIA	30	24	80	0.10	0.2	0.4	A*C		
19930609	190242.6	57.29	-5.64	180.5	828.0	0.2	-0.3	PLOCKTON, HIGHLAND	4	6	230	0.03			A*D		
19930610	113014.3	58.44	0.29	533.9	952.7	15.0	1.8	NORTHERN NORTH SEA	3196	357	0.35				C*D		
19930610	132550.7	52.96	-4.37	241.0	342.6	22.2	0.0	LLEYN PENINSULA	10	5	199	0.08	0.8	0.6	A*D		
19930611	015409.7	52.38	-3.01	331.3	276.9	13.6	0.4	KNIGHTON, POWYS	9	8	111	0.15	1.0	1.2	B*B		
19930613	052255.3	55.40	-5.25	194.2	616.8	17.0	0.3	ARRAN, STRATHCLYDE	14	59	278	0.38	3.5	3.8	C*D		
19930613	112412.9	56.19	-6.09	145.9	706.7	4.9	1.8	COLONSAY, STRATHCLYDE	24	83	256	0.23	1.6	2.3	B*D		
19930613	150055.7	49.03	-3.92	259.7	-94.8	11.1	2.2	ENGLISH CHANNEL	15127	240	0.28	3.9	5.6	C*D			
19930614	062547.7	55.09	-3.63	295.8	578.2	3.1	0.4	DUMFRIES, D & G	8	10	133	0.04	0.4	1.1	A*B		
19930614	073730.8	60.41	2.18	630.0	1176.4	19.8	2.3	NORTHERN NORTH SEA	13167	149	0.38	2.2	3.9	C*D			
19930615	044644.8	56.13	-3.69	295.2	694.8	0.4	0.5	CLACKMANNAN, CENTRAL	8	17	164	0.40	0.8	1.3	C*C	C/F	
19930615	090600.7	54.93	5.68	891.5	586.5	15.0	3.0	SOUTHERN NORTH SEA	15506	331	0.42				D*D		
19930615	163436.7	57.06	-5.75	172.5	803.1	5.7	2.3	KNOYDART, HIGHLAND	35	17	175	0.20	1.3	1.3	B*C		
19930619	162035.8	52.86	-2.19	387.0	329.2	10.9	1.6	STAFFORD, STAFFORDSHIRE	21	29	115	0.16	0.6	1.4	B*C	6KM NW OF STAFFORD	
19930621	085951.0							SONIC-NORFOLK									SONIC-FELT TRIMINGHAM
19930622	053858.6	53.19	-1.40	440.1	366.1	0.3	1.6	CLAY CROSS, DERBYSHIRE	12	11	205	0.32	1.1	1.2	C*D	C/F	
19930622	095933.6	52.96	-4.37	240.9	342.8	23.4	0.5	LLEYN PENINSULA	13	5	189	0.05	0.4	0.3	A*D		
19930622	201146.6	52.13	-2.83	343.1	248.3	19.5	0.3	WELLINGTON, HER & WOR	5	19	123	0.02	0.4	1.0	A*D		
19930626	054220.0	54.21	-2.86	344.1	479.3	8.3	3.0	GRANGE-O-SANDS, CUMBRIA	44	26	36	0.19	0.4	0.6	B*C	FELT GRANGE-OVER-SANDS..	
19930626	211535.7	53.22	-2.99	333.8	370.3	3.9	1.2	CHESTER, CHESHIRE	19	40	245	0.11	0.7	0.7	A*D		
19930628	172723.8	61.65	2.31	628.3	1314.8	10.2	2.1	NORWEGIAN SEA	10146	228	0.39	7.8	7.0	D*D			
19930629	004558.2	58.99	1.39	594.8	1016.4	21.8	2.8	NORTHERN NORTH SEA	22188	135	0.39	1.4	3.1	C*D			
19930629	040348.8	53.04	-2.21	385.7	348.8	4.1	2.0	STOKE-ON-TRENT, STAFFS	27	25	86	0.16	0.4	1.1	B*C	FELT TALKE PITS AREA	
19930630	055956.8	53.31	-2.85	343.2	380.0	8.9	2.2	ELLESMERE PRT, CHESHIRE	51	53	50	0.27	0.4	1.1	B*D		
19930702	111516.4	57.19	-5.28	202.0	815.4	6.7	0.2	GLEN SHIEL, HIGHLAND	6	9	288	0.05	1.0	0.6	B*D		
19930704	015632.7	54.15	-1.47	434.4	473.4	1.3	1.9	RIPON, NORTH YORKSHIRE	29	24	156	0.18	0.7	1.1	B*C		
19930705	163226.2	54.25	-2.96	337.5	483.9	19.1	-0.1	HAVERTHWATE, CUMBRIA	5	18	281	0.39		19.6	D*D	MAGNITUDE FROM VERTICALS	
19930706	054251.6	52.27	-2.60	359.3	264.0	13.4	0.4	TENBURY WELLS, HER&WOR	8	26	209	0.17	1.5	2.1	B*D		

TABLE 1: CATALOGUE OF EVENTS LISTED CHRONOLOGICALLY: 1993

YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments...
19930707	114806.6	55.55	4.63	818.1	648.6	0.3	4.0	CENTRAL NORTH SEA	4+	37301	90	0.24	0.7	0.9	B*D	FELT GORM PLATFORM	
19930708	061835.3	54.32	-3.12	327.3	492.2	8.5	1.5	CONISTON, CUMBRIA	2+	26	5	115	0.13	0.5	0.9	A*B	FELT KIRKBY-IN-FURNESS
19930708	223456.5	55.92	-3.08	332.5	670.3	2.4	0.4	MUSSELBURGH, LOTHIAN		8	7	127	0.13	0.4	0.9	A*B	C/F
19930710	172128.0	51.87	-4.92	199.0	223.1	12.3	1.7	HAVERFORDWEST, DYFED		22	13	126	0.16	0.5	0.5	B*B	7KM NE HAVERFORDWEST
19930712	020852.3	57.21	-5.45	191.7	818.8	5.7	0.0	SHIEL BRIDGE, HIGHLAND		6	2	114	0.10	1.2	0.7	B*B	
19930712	042039.5	53.11	-1.79	414.0	356.9	18.9	2.2	HARTINGTON, DERBYSHIRE		29	11	90	0.22	0.6	0.8	B*A	
19930712	215305.4	53.74	1.37	622.2	432.6	7.4	2.9	SOUTHERN NORTH SEA		31156	270	0.35	3.9	4.1	C*D		
19930713	182903.8	50.11	-5.18	172.8	28.1	6.4	1.4	CONSTANTINE, CORNWALL		13	3	125	0.02	0.1	0.2	A*B	
19930713	183020.8	50.11	-5.18	172.7	28.4	6.9	0.0	CONSTANTINE, CORNWALL		12	3	122	0.02	0.1	0.1	A*B	
19930713	190058.2	50.11	-5.18	172.9	28.1	7.0	0.6	CONSTANTINE, CORNWALL		15	3	127	0.02	0.1	0.2	A*B	
19930715	034420.2	55.93	-3.07	332.9	671.0	1.3	0.7	MUSSELBURGH, LOTHIAN		10	7	125	0.10	0.3	0.3	A*B	C/F
19930716	200013.1	55.92	-3.07	333.2	670.6	0.6	0.6	MUSSELBURGH, LOTHIAN		8	7	125	0.02	0.1	0.1	A*B	C/F
19930717	110651.8	54.19	-2.37	375.6	477.1	4.7	1.4	CHAPEL-LE-DALE, N YORKS		22	46	155	0.15	0.5	1.5	A*C	7KM NE OF INGLETON
19930718	003719.6	50.11	-5.18	172.8	28.1	6.8	0.8	CONSTANTINE, CORNWALL		15	3	126	0.02	0.1	0.2	A*B	
19930718	003850.6	50.11	-5.18	172.5	28.3	6.8	-0.2	CONSTANTINE, CORNWALL		13	3	170	0.02	0.1	0.2	A*C	
19930718	004549.4	50.11	-5.18	172.9	28.2	7.0	0.3	CONSTANTINE, CORNWALL		12	3	127	0.02	0.1	0.3	A*B	
19930718	004649.1	50.11	-5.18	173.0	28.1	7.0	0.1	CONSTANTINE, CORNWALL		12	3	129	0.02	0.1	0.2	A*B	
19930718	004740.3	50.11	-5.18	172.8	28.2	6.8	-0.6	CONSTANTINE, CORNWALL		12	3	125	0.02	0.1	0.2	A*B	
19930718	012720.6	50.11	-5.18	172.7	28.3	7.1	0.2	CONSTANTINE, CORNWALL		15	3	166	0.03	0.2	0.2	A*C	
19930718	021441.1	50.11	-5.18	172.7	28.3	7.1	-0.1	CONSTANTINE, CORNWALL		16	3	165	0.03	0.2	0.2	A*C	
19930718	021804.6	50.11	-5.18	172.9	28.1	7.2	0.0	CONSTANTINE, CORNWALL		13	3	127	0.02	0.1	0.2	A*B	
19930718	055241.2	50.11	-5.17	173.0	28.2	7.1	-0.4	CONSTANTINE, CORNWALL		13	3	158	0.02	0.1	0.1	A*C	
19930718	055249.5	50.11	-5.18	172.9	28.2	7.1	0.2	CONSTANTINE, CORNWALL		13	3	126	0.02	0.1	0.2	A*B	
19930718	055306.0	50.11	-5.17	173.1	28.2	7.0	-0.3	CONSTANTINE, CORNWALL		10	3	157	0.02	0.2	0.2	A*C	
19930718	072225.4	50.11	-5.17	173.0	28.1	7.3	-0.3	CONSTANTINE, CORNWALL		10	3	159	0.02	0.2	0.2	A*C	
19930718	075024.2	50.11	-5.18	172.9	28.1	7.2	0.1	CONSTANTINE, CORNWALL		14	3	163	0.02	0.2	0.1	A*C	
19930718	083746.7	50.11	-5.18	172.9	28.1	7.0	0.6	CONSTANTINE, CORNWALL		15	3	127	0.02	0.1	0.2	A*B	
19930718	083809.5	50.11	-5.17	173.3	28.1	7.2	-0.5	CONSTANTINE, CORNWALL		6	3	154	0.02	0.3	0.4	A*C	
19930718	101134.2	50.11	-5.18	172.6	28.2	7.3	0.3	CONSTANTINE, CORNWALL		14	3	121	0.02	0.1	0.2	A*B	
19930718	101141.5	50.11	-5.18	172.5	28.2	7.3	0.2	CONSTANTINE, CORNWALL		14	3	171	0.03	0.2	0.2	A*C	
19930718	101237.1	50.11	-5.18	172.6	28.1	6.9	0.6	CONSTANTINE, CORNWALL		13	3	123	0.02	0.1	0.3	A*B	
19930718	111534.9	50.11	-5.18	172.9	28.1	7.0	0.3	CONSTANTINE, CORNWALL		13	3	126	0.03	0.2	0.3	A*B	
19930718	111600.4	50.11	-5.17	173.1	28.2	7.1	-0.2	CONSTANTINE, CORNWALL		8	3	156	0.01	0.2	0.2	A*C	
19930718	114805.2	50.11	-5.18	172.6	28.2	7.1	0.5	CONSTANTINE, CORNWALL		13	3	169	0.03	0.3	0.2	A*C	
19930718	162332.0	50.11	-5.18	173.0	28.3	7.2	-0.3	CONSTANTINE, CORNWALL		10	3	159	0.02	0.2	0.2	A*C	
19930718	162601.6	50.11	-5.18	172.6	28.3	6.9	0.7	CONSTANTINE, CORNWALL		15	3	122	0.01	0.1	0.1	A*B	
19930718	170900.4	50.11	-5.18	172.7	28.1	6.8	1.8	CONSTANTINE, CORNWALL		13	3	124	0.01	0.1	0.2	A*B	
19930718	170945.3	50.11	-5.18	172.9	28.0	6.9	1.2	CONSTANTINE, CORNWALL		16	3	128	0.02	0.1	0.1	A*B	
19930718	193739.9	50.11	-5.17	173.0	28.2	7.5	-0.3	CONSTANTINE, CORNWALL		9	3	158	0.02	0.2	0.2	A*C	
19930718	200610.0	50.11	-5.18	172.7	28.2	7.2	0.2	CONSTANTINE, CORNWALL		12	3	124	0.01	0.1	0.2	A*B	
19930718	205705.0	50.11	-5.18	172.8	28.2	7.1	0.0	CONSTANTINE, CORNWALL		15	3	125	0.02	0.1	0.2	A*B	
19930718	210524.0	50.11	-5.18	172.7	28.2	6.9	0.2	CONSTANTINE, CORNWALL		14	3	123	0.02	0.1	0.2	A*B	
19930718	214202.0	50.11	-5.18	172.7	28.1	7.1	0.0	CONSTANTINE, CORNWALL		11	3	166	0.02	0.2	0.3	A*C	
19930718	214811.3	50.11	-5.18	172.9	28.2	7.3	-0.4	CONSTANTINE, CORNWALL		9	3	162	0.02	0.2	0.3	A*C	
19930718	220042.4	50.11	-5.17	173.1	28.1	7.5	-0.8	CONSTANTINE, CORNWALL		9	3	158	0.02	0.2	0.2	A*C	
19930718	220046.0	50.11	-5.18	172.7	28.2	7.0	0.1	CONSTANTINE, CORNWALL		13	3	123	0.02	0.1	0.2	A*B	
19930718	225450.2	50.11	-5.18	172.6	28.1	6.9	0.0	CONSTANTINE, CORNWALL		12	3	122	0.02	0.1	0.2	A*B	
19930718	232434.6	50.11	-5.18	172.7	28.3	6.9	0.2	CONSTANTINE, CORNWALL		16	3	122	0.02	0.1	0.2	A*B	
19930718	235458.4	50.11	-5.18	172.8	28.3	7.2	0.2	CONSTANTINE, CORNWALL		13	3	124	0.02	0.1	0.2	A*B	
19930719	011154.4	50.11	-5.18	172.9	28.4	7.2	-0.5	CONSTANTINE, CORNWALL		9	3	286	0.02	0.3	0.2	A*D	

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YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments...
19930719	022029.0	50.11	-5.17	173.1	27.9	6.9	-0.5	CONSTANTINE, CORNWALL		7	4	291	0.01	0.2	0.1	A*D	
19930719	043512.7	50.11	-5.18	172.8	28.2	7.0	0.9	CONSTANTINE, CORNWALL		13	3	125	0.01	0.1	0.1	A*B	
19930719	045350.5	50.11	-5.18	172.6	28.2	7.2	0.1	CONSTANTINE, CORNWALL		14	3	169	0.03	0.2	0.2	A*C	
19930719	051202.2	50.11	-5.18	172.9	28.2	6.7	-0.6	CONSTANTINE, CORNWALL		6	6	178	0.01	0.1	0.2	A*C	
19930719	062029.7	50.11	-5.17	173.1	28.2	7.5	-0.3	CONSTANTINE, CORNWALL		9	3	156	0.02	0.3	0.3	A*C	
19930719	075301.5	50.11	-5.18	172.9	28.2	7.4	-0.2	CONSTANTINE, CORNWALL		11	3	162	0.02	0.2	0.2	A*C	
19930719	095548.9	50.11	-5.18	172.6	28.3	7.8	-0.2	CONSTANTINE, CORNWALL		10	3	169	0.04	0.5	0.4	A*C	
19930719	162653.6	50.11	-5.17	173.2	28.3	7.2	-0.2	CONSTANTINE, CORNWALL		13	3	155	0.03	0.3	0.2	A*C	
19930719	172405.3	50.11	-5.18	172.7	28.2	7.0	1.0	CONSTANTINE, CORNWALL		12	3	124	0.01	0.1	0.1	A*B	
19930719	172644.6	50.11	-5.18	172.9	28.0	7.0	-0.3	CONSTANTINE, CORNWALL		11	3	163	0.02	0.2	0.2	A*C	
19930719	174408.2	50.11	-5.18	172.9	28.2	7.4	-0.4	CONSTANTINE, CORNWALL		9	3	161	0.02	0.2	0.2	A*C	
19930720	001735.0	50.11	-5.18	172.6	28.2	7.2	0.1	CONSTANTINE, CORNWALL		14	3	123	0.02	0.1	0.2	A*B	
19930720	001745.8	50.11	-5.18	172.9	28.2	7.5	-0.5	CONSTANTINE, CORNWALL		8	3	162	0.02	0.2	0.3	A*C	
19930720	001757.0	50.11	-5.18	172.7	28.3	7.1	0.3	CONSTANTINE, CORNWALL		13	3	166	0.02	0.2	0.2	A*C	
19930720	033426.7	50.11	-5.18	172.5	28.2	6.9	-0.1	CONSTANTINE, CORNWALL		11	3	170	0.04	0.4	0.5	A*C	
19930720	034824.8	52.94	-5.49	165.7	343.5	7.6	1.6	IRISH SEA		22	59	134	0.20	0.5	1.5	B*D	
19930720	113633.3	50.11	-5.18	172.8	28.2	6.8	1.0	CONSTANTINE, CORNWALL		15	3	125	0.02	0.1	0.2	A*B	
19930720	113638.8	50.11	-5.18	172.6	28.4	6.7	0.4	CONSTANTINE, CORNWALL		14	3	121	0.02	0.1	0.2	A*B	
19930720	113711.4	50.11	-5.18	172.7	28.4	7.4	0.2	CONSTANTINE, CORNWALL		10	3	164	0.03	0.4	0.4	A*C	
19930720	125400.7	50.11	-5.19	172.2	28.4	6.8	0.1	CONSTANTINE, CORNWALL		11	3	173	0.02	0.2	0.1	A*C	
19930720	143158.1	50.11	-5.18	172.9	28.3	7.1	-0.1	CONSTANTINE, CORNWALL		10	3	161	0.02	0.2	0.2	A*C	
19930720	165010.7	50.11	-5.18	172.8	28.2	6.8	1.2	CONSTANTINE, CORNWALL		14	3	125	0.02	0.1	0.2	A*B	
19930720	233856.4	50.11	-5.18	172.4	28.3	7.2	-0.3	CONSTANTINE, CORNWALL		10	3	171	0.02	0.3	0.2	A*C	
19930720	234843.4	50.11	-5.18	172.7	28.3	7.1	-0.4	CONSTANTINE, CORNWALL		13	3	167	0.04	0.3	0.3	A*C	
19930721	214950.2	55.51	-4.68	230.5	626.9	0.0	0.9	EXPL-AYR BAY	2+	18	35	180	0.21	1.2	2.6	B*D	EXPL-FELT AYR BAY
19930722	075039.8	57.31	-6.07	155.1	831.6	3.3	0.0	ISLE OF SKYE, HIGHLAND		7	25	264	0.08	1.8	2.3	B*D	
19930724	132633.2	51.84	-2.89	339.0	216.0	9.2	0.1	ABERGAVENNY, GWENT		5	19	170	0.26	3.2	15.1	C*D	8KM EAST OF ABERGAVENNY
19930725	111228.9	52.73	-4.39	238.5	317.0	11.2	0.3	CARDIGAN BAY, WALES		6	20	205	0.09	1.3	3.8	B*D	17KM SOUTH OF PWLLHELHI
19930725	124120.5	56.22	-5.16	204.4	707.6	0.5	0.7	INVERARAY, STRATHCLYDE		5	49	306	0.06	1.4	1.2	B*D	
19930727	040336.2	57.50	-5.37	197.8	850.7	4.0	1.3	GLEN CARRON, HIGHLAND		14	5	149	0.10	0.5	0.6	A*C	
19930727	060735.9	53.26	3.76	784.2	388.8	0.3	2.9	SOUTHERN NORTH SEA		31163	178	0.36	1.7	2.2	C*D		
19930728	035240.0	51.56	-2.30	379.5	185.1	8.6	1.9	CHIPPING SODBURY, AVON		17	36	260	0.22	2.0	1.7	B*D	8KM NE CHIPPING SODBURY
19930730	104305.9	54.26	-0.47	499.8	486.6	0.3	2.2	EXPL-SCARBOROUGH		26160	246	0.38	3.9	5.2	C*D	EXPL-ORDNANCE DETONATION	
19930730	223412.5	50.11	-5.18	172.3	28.1	6.9	0.4	CONSTANTINE, CORNWALL		14	3	173	0.03	0.2	0.2	A*C	
19930730	223954.6	55.94	-3.06	333.7	671.8	2.7	0.2	MUSSELBURGH, LOTHIAN		6	8	193	0.10	0.3	4.7	B*D	C/F
19930801	134038.7	53.28	-4.62	225.3	378.9	11.3	0.0	HOLY ISLAND, GWYNEDD		8	4	226	0.04	0.6	0.7	A*D	
19930803	212205.2	56.34	-6.14	144.0	724.1	7.4	1.2	MULL, STRATHCLYDE		6106	351	0.07	3.6	3.3	C*D		
19930806	111339.9	52.41	-2.17	388.2	279.1	7.6	1.0	WEST HAGLEY, W MIDLANDS		8	49	283	0.18	2.1	2.8	B*D	
19930807	020703.3	50.59	-4.72	207.3	80.7	3.1	0.2	TINTAGEL, CORNWALL		8	29	346	0.12	7.3	2.8	D*D	SOUTH OF TINTAGEL
19930807	035009.9	49.56	-4.96	185.7	-34.0	1.1	1.0	LIZARD POINT, CORNWALL		9	57	336	0.09			D*D	SE OF LIZARD POINT
19930807	141228.8	56.13	-3.73	292.4	694.0	0.3	0.8	CLACKMANNAN, CENTRAL		10	19	93	0.06	0.3	0.7	A*C	C/F
19930807	141234.2	56.13	-3.74	292.1	694.9	0.3	1.0	CLACKMANNAN, CENTRAL		10	19	128	0.29	1.1	1.8	B*C	C/F
19930807	233437.7	53.49	-2.33	377.9	400.0	19.6	1.6	SALFORD, GTR MANCHESTER		23	69	74	0.25	0.6	3.0	B*D	
19930808	115919.2	55.47	-5.10	204.1	623.4	7.6	1.6	ARRAN, STRATHCLYDE		19	34	141	0.09	0.3	1.3	A*C	
19930811	033601.6	54.49	-3.25	318.8	511.9	8.2	-0.2	BUTTERMERE, CUMBRIA		9	5	125	0.12	0.5	1.3	A*B	
19930811	200540.0							SONIC-FIFE									SONIC-FELT ST ANDREWS
19930811	230821.2	55.37	-1.52	430.5	608.3	4.0	1.7	AMBLE, NORTHUMBERLAND		19	48	292	0.31	2.0	2.4	C*D	C/F - OFFSHORE
19930812	163939.2	54.58	-3.78	285.1	522.4	5.2	1.3	WHITEHAVEN, CUMBRIA		32	21	64	0.18	0.4	1.2	B*C	OFFSHORE LOCATION
19930813	164342.7	50.11	-5.18	172.8	28.2	5.6	0.7	CONSTANTINE, CORNWALL		17	3	84	0.02	0.1	0.1	A*A	
19930813	204506.3	50.10	-5.17	173.4	27.4	5.1	0.0	CONSTANTINE, CORNWALL		12	4	139	0.04	0.2	0.4	A*C	

TABLE 1: CATALOGUE OF EVENTS LISTED CHRONOLOGICALLY: 1993

YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments...	
19930814	052005.9	50.11	-5.18	172.9	28.2	5.3	0.4	CONSTANTINE, CORNWALL	15	3	127	0.01	0.1	0.2	A*B			
19930814	175755.5	50.11	-5.18	173.0	28.2	5.5	0.1	CONSTANTINE, CORNWALL	15	3	128	0.01	0.1	0.1	A*B			
19930814	191456.1	52.89	-3.50	298.9	333.4	9.9	0.9	BALA, GWYNEDD	17	16	117	0.06	0.3	0.4	A*B	7KM SE OF BALA		
19930817	082554.2	52.93	-4.35	241.8	339.3	13.1	0.3	PWLLHELI, GWYNEDD	7	8	114	0.07	0.5	1.0	A*B	7KM NE OF PWLLHELI		
19930817	190634.7	57.01	-5.77	171.4	797.7	6.9	-0.2	MALLAIG, HIGHLAND	9	11	171	0.22	5.0	7.6	C*C			
19930818	023803.2	56.13	-3.73	292.5	694.3	0.8	0.7	CLACKMANNAN, CENTRAL	16	19	85	0.07	0.2	0.4	A*C	C/F		
19930819	194554.7	54.64	-3.27	317.8	528.0	13.0	0.7	COCKERMOUTH, CUMBRIA	15	11	68	0.10	0.4	0.8	A*A	6KM SE OF COCKERMOUTH		
19930819	202330.5	54.63	-3.28	317.2	527.3	10.1	0.4	COCKERMOUTH, CUMBRIA	13	12	103	0.08	0.4	0.9	A*B	6KM SE OF COCKERMOUTH		
19930824	231230.9	55.21	-5.42	182.6	595.6	0.4	2.0	EXPL-NORTH CHANNEL	33102	223	0.33	1.7	2.3	C*D	EXPL-ORDNANCE DETONATION			
19930827	084902.2	51.89	-2.24	383.5	221.5	21.9	0.9	GLOUCESTER, GL'SHIRE	5	27	267	0.05	1.5	2.9	B*D			
19930828	123048.6	57.33	-6.10	153.1	834.2	3.8	0.4	ISLE OF SKYE, HIGHLAND	8	27	268	0.12	1.4	1.3	B*D			
19930830	051556.0	59.03	1.62	607.91	1021.6	22.3	1.9	NORTHERN NORTH SEA	10228	177	0.25	2.9	4.1	C*D				
19930831	013949.3	57.27	-5.45	192.3	825.2	2.3	-0.1	LOCH DUICH, HIGHLAND	6	7	149	0.08	0.2	0.4	A*C			
19930831	020159.9	54.79	-3.89	278.3	546.2	7.8	0.8	DUNDRENNAN, D & G	19	8	124	0.07	0.3	0.8	A*B	3KM ESE OF DUNDRENNAN		
19930901	192606.2	50.11	-5.18	172.7	28.3	7.2	-0.2	CONSTANTINE, CORNWALL	10	3	165	0.03	0.3	0.3	A*C			
19930903	211019.7	52.15	-2.47	368.1	250.4	18.3	0.4	BROMYARD, HER & WOR	9	14	238	0.14	1.5	2.2	B*D			
19930904	061348.3	57.03	-5.79	169.9	799.9	3.8	0.3	MALLAIG, HIGHLAND	5	13	184	0.17	1.0	7.8	C*D	MAGNITUDE FROM VERTICALS		
19930904	064528.9	57.03	-5.79	170.1	799.7	2.0	0.3	MALLAIG, HIGHLAND	8	13	182	0.15	0.6	0.5	A*D			
19930904	071455.1	57.03	-5.78	170.4	799.5	2.7	2.7	MALLAIG, HIGHLAND	3+	14	13	119	0.08	0.3	0.7	A*C	FELT MALLAIG	
19930904	071629.1	57.03	-5.78	170.8	799.4	2.4	0.7	MALLAIG, HIGHLAND	7	13	178	0.18	0.4	0.4	B*C			
19930904	080444.9	57.03	-5.78	170.9	799.7	2.8	0.4	MALLAIG, HIGHLAND	9	13	116	0.08	0.4	1.0	A*C			
19930904	102300.8	57.02	-5.77	170.9	798.9	3.4	0.1	MALLAIG, HIGHLAND	5	12	176	0.12	1.0	16.5	C*D	MAGNITUDE FROM VERTICALS		
19930904	103223.6	57.03	-5.78	170.5	799.8	2.8	0.2	MALLAIG, HIGHLAND	5	13	181	0.18	1.4		C*D	MAGNITUDE FROM VERTICALS		
19930904	180442.6	57.03	-5.78	170.4	799.4	3.3	0.1	MALLAIG, HIGHLAND	7	13	180	0.12	1.7	4.5	B*D			
19930905	094819.3	57.03	-5.78	170.6	799.2	2.7	2.0	MALLAIG, HIGHLAND	14	13	117	0.08	0.3	0.8	A*C			
19930906	022831.8	53.07	2.55	704.4	362.2	3.8	2.3	SOUTHERN NORTH SEA	16	78	313	0.08	1.1	1.2	B*D			
19930906	024704.8	53.06	-1.00	466.9	351.8	1.0	1.7	OXTON, NOTTINGHAMSHIRE	21	30	149	0.24	0.7	0.9	B*C	C/F		
19930906	164955.7	57.03	-5.76	171.6	799.0	3.1	0.1	MALLAIG, HIGHLAND	5	13	173	0.09	1.0		C*D	MAGNITUDE FROM VERTICALS		
19930907	011419.8	57.03	-5.78	170.9	799.1	2.9	0.1	MALLAIG, HIGHLAND	7	13	177	0.06	0.6	1.7	A*C			
19930907	021934.1	56.12	-3.73	292.6	693.7	0.7	1.2	CLACKMANNAN, CENTRAL	16	19	83	0.09	0.3	0.4	A*C	C/F		
19930910	225447.6	55.24	-3.49	305.2	594.8	4.5	-0.1	JOHNSTONEBRIDGE, D & G	8	13	188	0.13	0.2	3.5	B*D			
19930911	052537.3	57.02	-5.79	170.0	798.9	2.9	0.7	MALLAIG, HIGHLAND	11	12	120	0.10	0.5	1.1	A*C			
19930911	062503.7	55.24	-3.49	305.2	594.9	4.5	0.0	JOHNSTONEBRIDGE, D & G	8	13	189	0.12	0.1	3.3	B*D			
19930911	130112.7	57.02	-5.76	171.6	798.7	4.0	0.6	MALLAIG, HIGHLAND	9	12	112	0.06	0.3	0.6	A*C			
19930912	123810.4	52.11	-3.36	306.9	246.8	15.8	0.7	BUILTH WELLS, POWYS	7	7	175	0.06	1.2	0.6	B*C	5KM SE BUILTH WELLS		
19930912	131318.8	55.85	-4.25	259.0	664.5	0.3	0.2	EXPL-GLASGOW	2+	7	15	148	0.19	1.0	1.6	B*C	EXPL-FLAT DEMOLITION	
19930912	204236.1	57.02	-5.76	171.6	798.8	2.5	0.6	MALLAIG, HIGHLAND	9	12	172	0.15	0.3	0.4	B*C			
19930913	184813.5	55.24	-3.49	304.9	594.7	3.8	0.6	JOHNSTONEBRIDGE, D & G	11	12	188	0.14	0.4	1.2	A*D			
19930913	190255.6	52.02	-3.52	295.6	236.9	14.5	1.3	BRECON, POWYS	8	18	214	0.09	0.9	0.6	A*D	12KM NW BRECON		
19930914	161504.3	56.13	-3.74	291.7	694.0	2.0	0.9	CLACKMANNAN, CENTRAL	12	20	86	0.11	0.4	0.6	A*C	C/F		
19930915	031557.1	57.03	-5.77	171.0	799.2	3.7	0.1	MALLAIG, HIGHLAND	6	13	176	0.10	0.2	2.3	B*C			
19930915	125847.6	57.61	-4.89	227.1	861.4	3.6	1.2	LOCH FANNICH, HIGHLAND	9	27	167	0.11	0.9	1.4	A*C			
19930916	014910.1	53.44	2.52	700.1	403.3	7.8	2.8	SOUTHERN NORTH SEA	14145	231	0.08	0.8	1.1	A*D				
19930916	132631.1	52.31	-2.73	350.1	268.7	14.1	1.8	LUDLOW, SHROPSHIRE	19	25	94	0.16	0.6	0.7	B*B	7KM SOUTH OF LUDLOW		
19930916	221635.8	55.24	-3.49	305.4	594.8	4.3	0.4	JOHNSTONEBRIDGE, D & G	11	13	188	0.12	0.9		C*D			
19930917	013954.4	52.32	-2.73	350.3	269.0	14.5	2.3	LUDLOW, SHROPSHIRE	29	25	94	0.15	0.4	0.4	B*B	6KM SOUTH OF LUDLOW		
19930917	052900.7	57.03	-5.78	170.8	799.8	2.5	0.3	MALLAIG, HIGHLAND	7	13	179	0.17	1.7	4.7	B*C			
19930917	055752.6	50.24	-6.65	68.5	48.4	2.4	1.8	SCILLY ISLES, CORNWALL	14	77	351	0.27			D*D	SW OF SCILLY ISLES		
19930917	100821.8	57.03	-5.76	172.0	799.1	3.0	0.4	MALLAIG, HIGHLAND	9	13	170	0.10	1.0	2.1	B*C			
19930917	121905.8	52.74	-4.96	200.2	319.9	13.9	0.5	IRISH SEA	15	25	141	0.22	1.1	4.2	B*C			

TABLE 1: CATALOGUE OF EVENTS LISTED CHRONOLOGICALLY: 1993

YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments...
19930918	031415.2	56.12	-3.73	292.5	693.7	2.0	0.8	CLACKMANNAN,CENTRAL	15	20	83	0.08	0.3	0.4	A*C	C/F	
19930920	192855.0							EXPL(IMPACT)-PRESTWICK									SUSPECTED METEORITE
19930921	020051.0	56.13	-3.73	292.4	694.0	0.9	0.5	CLACKMANNAN,CENTRAL	9	19	125	0.06	0.3	0.4	A*C	C/F	
19930921	035848.2	52.17	-2.50	366.0	252.4	15.3	0.5	BROMYARD,HER & WOR	8	15	228	0.16	1.7	1.5	B*D		
19930921	072544.9	52.16	-2.47	367.6	251.5	14.6	1.1	BROMYARD,HER & WOR	12	15	233	0.17	1.4	1.0	B*D		
19930921	091706.8	53.04	-2.20	386.7	349.4	4.4	1.5	STOKE-ON-TRENT,STAFFS	16	24	173	0.08	0.4	0.4	A*C		
19930922	010055.6	53.12	-1.06	463.0	358.6	1.0	1.3	BILSTHORPE,NOTTS	8	36	141	0.28	1.8	2.7	B*C	C/F	
19930923	005422.2	56.06	-3.99	276.3	687.3	3.7	0.3	BANNOCKBURN,CENTRAL	7	11	165	0.18	0.5	5.8	C*C		
19930923	023744.8	56.13	-3.73	292.5	694.2	0.6	1.2	CLACKMANNAN,CENTRAL	20	19	82	0.09	0.2	0.4	A*C	C/F	
19930923	024413.8	56.13	-3.74	292.0	694.2	1.2	0.6	CLACKMANNAN,CENTRAL	14	20	82	0.09	0.3	0.5	A*C	C/F	
19930923	140411.4	55.06	-5.04	206.0	577.8	0.0	1.8	EXPL-STRANRAER	4	73	285	0.03			A*D	EXPL-ORDNANCE DETONATION	
19930923	172155.3	55.24	-3.49	305.3	594.6	4.5	-0.2	JOHNSTONEBRIDGE,D & G	8	13	186	0.13	0.2	4.5	B*D		
19930923	183625.5	55.24	-3.49	305.4	594.5	4.2	-0.1	JOHNSTONEBRIDGE,D & G	8	13	186	0.12	1.0		C*D		
19930923	190436.6	57.03	-5.79	169.9	799.4	2.8	0.2	MALLAIG,HIGHLAND	8	13	183	0.14	1.6	3.0	B*D		
19930923	195556.5	55.24	-3.49	305.3	594.7	3.9	0.2	JOHNSTONEBRIDGE,D & G	12	13	187	0.14	0.4	1.0	A*D		
19930924	105428.0	57.02	-5.77	171.1	798.6	2.8	0.4	MALLAIG,HIGHLAND	9	12	114	0.10	0.5	1.2	A*C		
19930924	105846.3	57.03	-5.78	170.7	799.2	2.5	0.1	MALLAIG,HIGHLAND	7	13	178	0.12	1.5	3.7	B*C		
19930924	110047.7	57.03	-5.78	170.3	799.1	2.2	0.7	MALLAIG,HIGHLAND	7	12	180	0.09	0.3	0.4	A*D		
19930924	114532.2	53.32	-1.71	419.6	380.1	2.2	1.4	BAKEWELL,DERBYSHIRE	13	35	297	0.39	9.4	7.4	D*D		
19930925	014203.8	57.54	-5.35	199.3	854.7	4.0	1.7	COULIN FOREST,HIGHLAND	2+	22	5	154	0.24	0.8	1.2	B*C	FELT COULIN
19930925	095603.0	54.74	-2.76	351.2	538.4	3.5	0.9	PLUMPTON,CUMBRIA	18	14	143	0.09	0.4	1.8	A*C		
19930926	214617.1	52.36	-1.85	410.2	273.2	9.4	1.3	BIRMINGHAM,W MIDLANDS	14	43	139	0.38	1.6	8.4	C*C		
19930927	035507.5	55.24	-3.49	305.3	594.8	4.2	0.6	JOHNSTONEBRIDGE,D & G	12	13	188	0.15	0.8		C*D		
19930927	035532.5	55.24	-3.49	305.1	595.3	6.1	0.2	JOHNSTONEBRIDGE,D & G	10	13	191	0.15	0.7	3.4	B*D		
19930927	043903.6	55.24	-3.49	305.1	594.9	4.7	-0.2	JOHNSTONEBRIDGE,D & G	8	13	189	0.12	0.2	4.5	B*D		
19930927	093901.1	55.24	-3.49	305.5	594.6	5.4	-0.2	JOHNSTONEBRIDGE,D & G	8	13	186	0.14	0.9	7.2	C*D		
19930927	135412.6	52.31	-2.73	350.3	268.6	14.2	1.6	LUDLOW,SHROPSHIRE	12	25	94	0.16	0.7	0.9	B*B	7KM SOUTH OF LUDLOW	
19930928	003603.0	53.38	-4.45	237.2	389.8	14.3	0.6	ANGLESEY,GWYNEDD	13	7	89	0.07	0.4	0.4	A*A		
19930928	125936.5	58.36	1.42	600.0	946.4	11.2	2.0	NORTHERN NORTH SEA	15239	179	0.23		1.0	1.9	B*D		
19930930	063409.4	56.07	-4.72	231.0	689.4	4.6	0.8	GLEN FRUIN,STRATHCLYDE	10	25	236	0.09	0.8	0.9	A*D		
19930930	213307.1	56.60	-5.08	211.1	749.1	7.1	1.1	GLEN ETIVE,HIGHLAND	17	26	142	0.08	0.3	0.9	A*C		
19931001	071401.3	52.97	-4.41	238.4	344.7	20.7	0.4	LLEYN PENINSULA	13	1	96	0.10	0.5	0.8	A*B		
19931002	232843.8	54.33	-3.23	320.2	493.0	13.4	0.9	DUNNERDALE,CUMBRIA	18	2	142	0.07	0.4	0.4	A*C		
19931004	202148.0	61.81	1.51	584.9	1330.4	1.4	2.2	NORWEGIAN SEA	12189	210	0.26		3.6	3.3	C*D		
19931005	020514.8	52.77	-2.11	392.3	319.6	8.6	2.2	STAFFORD,STAFFORDSHIRE	20	33	101	0.09	0.4	0.7	A*C		
19931008	064648.3	56.28	-5.20	202.2	714.2	0.6	1.3	LOCH AWE,STRATHCLYDE	11	54	287	0.12	2.9	2.1	C*D		
19931011	094334.0	53.14	-3.73	284.6	361.9	9.3	2.3	BETWS-Y-COED,GWYNEDD	3+	32	18	115	0.22	0.6	0.9	B*B	FELT BETWS-Y-COED...
19931011	225401.2	56.53	-5.70	172.5	743.2	2.4	1.3	LOCHALINE,STRATHCLYDE	12	44	208	0.17	1.3	1.0	B*D		
19931014	135424.4	52.99	-3.89	272.9	345.4	0.4	0.9	EXPL-BL.FFEST,GWYNEDD	2+	15	25	104	0.22	0.8	4.3	B*C	EXPL-FELT BL.FFESTINIOG
19931020	023320.0	53.44	-1.23	451.1	394.4	0.2	1.5	MALTBY,S YORKSHIRE	11	43	166	0.33	1.7	2.5	C*C	C/F	
19931020	120141.9	55.87	-3.97	276.7	666.1	0.3	1.0	EXPL-AIRDRIE	2+	10	33	226	0.10	0.6	0.6	A*D	EXPL-FELT AIRDRIE
19931020	221123.2	55.90	-3.06	333.8	667.6	0.1	0.1	DALKEITH,LOTHIAN	5	8	155	0.09	0.7	0.9	A*D	C/F	
19931022	205700.0							SONIC-SWANSEA									SONIC-FELT SWANSEA...
19931024	003143.5	55.87	-3.09	331.6	664.6	0.1	-0.1	BONNYRIGG,LOTHIAN	6	8	208	0.06	1.4	0.9	B*D	C/F	
19931024	050702.2	50.65	-4.06	254.6	85.0	8.7	1.7	OKEHAMPTON,DEVON	18	25	138	0.25	0.4	5.4	C*C		SW OF OKEHAMPTON
19931024	170300.0							SONIC-SWANSEA									SONIC-FELT SWANSEA...
19931024	220909.3	52.54	-3.45	301.9	294.2	20.9	1.7	NEWTOWN,POWYS	20	26	81	0.06	0.2	0.5	A*B		
19931027	101200.0							SONIC-NORTHUMBERLAND									SONIC-FELT AMBLE
19931027	194828.0							SONIC-FIFE									SONIC-FELT KIRKCALDY...
19931028	170640.3	52.87	-2.82	345.0	330.6	1.6	1.2	WHITCHURCH,STAFFS	8	30	251	0.05	1.7	1.7	B*D		

TABLE 1: CATALOGUE OF EVENTS LISTED CHRONOLOGICALLY: 1993

YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments...	
19931029	141749.9	55.34	-2.26	383.3	605.3	12.4	1.3	BYRNESS, NORTHUMBERLAND	21	17	174	0.06	0.3	0.5	A*C			
19931102	002336.6	55.99	-5.56	177.9	683.4	8.5	0.8	KNAPDALE, STRATHCLYDE	8	54	243	0.20	2.4	4.4	B*D	10KM SW OF LOCHGILPHEAD		
19931102	163402.3	56.03	-3.64	297.7	682.8	6.1	0.7	BO'NESS, CENTRAL	14	24	94	0.09	0.3	0.5	A*C			
19931103	213837.0	57.56	-5.20	208.5	857.1	6.6	0.3	GLEN CARRON, HIGHLAND	6	9	331	0.01	0.0	0.0	A*D			
19931105	121955.3	57.69	-1.78	413.3	867.0	0.3	1.0	EXPL-OFF FRASERBURGH	8	32	293	0.07	2.2	1.4	B*D	EXPL-CONTRIBAND EXPLODED		
19931110	013840.8	56.13	-3.73	292.3	694.2	1.0	0.8	CLACKMANNAN, CENTRAL	11	19	82	0.07	0.3	0.6	A*C	C/F - DOUBLE EVENT		
19931111	175246.4	53.32	-0.97	468.7	381.1	0.0	2.2	RANSKILL, NOTTS	5+	16	45	77	0.32	1.4	2.2	C*C	C/F, FELT RANSKILL	
19931112	062419.6	50.22	-5.27	166.9	41.1	1.4	0.8	CAMBORNE, CORNWALL	13	5	306	0.03	0.3	0.8	A*D	NR SOUTH CROFTY TIN MINE		
19931113	111038.3	56.82	-5.89	162.3	776.6	6.1	1.1	LOCH MOIDART, HIGHLAND	17	12	228	0.12	1.2	0.6	B*D	OFFSHORE LOCATION		
19931113	195439.5	55.33	-2.30	381.0	603.6	8.6	1.0	BYRNESS, NORTHUMBERLAND	21	19	165	0.06	0.2	1.0	A*C			
19931115	004855.8	54.25	-0.37	506.1	484.9	31.0	2.0	SCARBOROUGH, N YORKS	10	22	242	0.08	1.3	0.7	B*D			
19931115	073333.7	56.55	-4.31	258.1	741.8	2.5	1.1	GLEN LYON, TAYSIDE	8	38	267	0.06	1.2	0.8	B*D	6KM S OF INNERWICK		
19931117	042600.2	56.14	-3.72	292.9	695.5	0.3	0.5	CLACKMANNAN, CENTRAL	10	18	130	0.14	0.6	0.9	A*C	C/F		
19931117	094901.8	56.13	-3.73	292.6	694.2	0.6	0.8	CLACKMANNAN, CENTRAL	11	19	85	0.08	0.3	0.5	A*C	C/F - DOUBLE EVENT		
19931118	015204.4	56.12	-3.73	292.4	693.4	1.4	0.8	CLACKMANNAN, CENTRAL	10	20	87	0.08	0.3	0.6	A*C	C/F		
19931121	055405.9	56.34	-5.18	203.7	720.8	5.9	1.1	LOCH AWE, STRATHCLYDE	11	54	287	0.19	4.4	8.2	C*D			
19931123	211100.9	56.13	-3.73	292.5	694.2	1.9	0.9	CLACKMANNAN, CENTRAL	22	19	82	0.13	0.3	0.5	A*C	C/F		
19931127	020546.4	54.28	-3.50	302.4	488.6	9.4	0.2	TARN BAY, CUMBRIA	5	14	278	0.25	4.8	9.9	C*D	OFFSHORE LOCATION		
19931127	195606.5	53.13	-4.39	239.9	362.1	10.3	0.2	CAERNARVON BAY, GWYNEDD	10	15	112	0.06	0.4	1.2	A*B			
19931205	164055.3	56.10	-4.72	231.0	693.6	6.9	0.8	GLEN LUSS, STRATHCLYDE	8	25	261	0.03	0.6	1.1	A*D			
19931211	224139.8	56.31	-5.97	154.4	720.3	6.8	1.3	MULL, STRATHCLYDE	13	68	245	0.09	1.3	2.0	B*D			
19931213	040513.1	57.62	-5.13	213.3	863.5	5.8	0.6	KINLOCHEWE, HIGHLAND	7	17	249	0.05	0.7	0.5	A*D	8KM EAST OF KINLOCHEWE		
19931213	085953.9	55.16	4.55	816.7	604.7	20.4	3.4	CENTRAL NORTH SEA	24415	216	0.27	1.8	2.7	B*D				
19931214	021724.0	55.37	-1.34	442.0	608.6	0.7	1.5	AMBLE, NORTHUMBERLAND	13100	332	0.08	2.4	1.8	B*D	C/F - OFFSHORE			
19931215	153043.0	51.67	-3.26	312.8	197.4	5.0	1.3	BARGOED, MID GLAMORGAN	8	32	182	0.08	0.7	17.4	C*D	C/F		
19931216	110520.5	56.96	-4.50	248.2	788.5	2.6	1.9	LOCH LAGGAN, HIGHLAND	18	33	68	0.17	0.7	1.9	B*C			
19931219	100246.9	55.85	-3.11	330.3	662.8	0.5	0.4	ROSEWELL, LOTHIAN	5	9	184	0.03	3.8	2.7	C*D	C/F		
19931223	052816.4	56.13	-3.73	292.1	694.4	1.8	0.5	CLACKMANNAN, CENTRAL	11	19	84	0.09	0.4	0.6	A*C	C/F - DOUBLE EVENT		
19931223	074928.7	56.13	-3.73	292.2	694.6	0.9	0.7	CLACKMANNAN, CENTRAL	12	19	84	0.11	0.4	0.6	A*C	C/F		
19931224	014446.8	56.12	-3.73	292.4	693.7	1.5	1.1	CLACKMANNAN, CENTRAL	16	20	81	0.09	0.3	0.4	A*C	C/F		
19931224	194545.8	51.79	-3.00	331.1	211.1	14.6	1.3	ABERGAVENNY, GWENT	15	22	66	0.18	0.8	0.8	B*B			
19931225	022055.5	52.88	-3.52	297.9	332.8	10.8	1.2	BALA, GWYNEDD	18	18	113	0.09	0.4	0.6	A*B	6KM SE OF BALA		
19931226	192701.3	50.93	-1.33	446.9	115.2	7.0	1.2	SOUTHAMPTON, HAMPSHIRE	11	30	117	0.19	0.7	3.0	B*C			
19931227	052045.9	61.25	2.85	660.01273.1	17.9	4.3		NORTHERN NORTH SEA	48123	169	0.38	1.0	1.9	C*D				
19931227	194430.8	56.80	-5.44	189.7	773.2	2.8	0.7	LOCH SHIEL, HIGHLAND	9	27	213	0.09	0.7	1.3	A*D			
19931230	184843.3	52.12	-2.57	360.8	247.4	15.5	0.5	HEREFORD, HER & WOR	6	10	196	0.02	0.3	0.3	A*D	13KM NE OF HEREFORD		
19931231	014531.7	53.07	-1.41	439.3	352.7	0.1	0.6	MATLOCK, DERBYSHIRE	5	22	122	0.54	6.6		D*D	C/F		
19931231	212058.7	51.60	-3.60	289.4	190.7	7.7	1.9	PONTYCYMER, W GLAMORGAN	17	42	75	0.12	0.4	1.4	A*C			

TABLE 2

**CATALOGUE OF EARTHQUAKES LISTED IN
ORDER OF DECREASING LATITUDE: 1993**

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 MSK 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 MSK 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 | M Glamorgan | : Mid Glamorgan |
| Expl | : Explosion | Notts | : Nottinghamshire |
| D & G | : Dumfries and Galloway | Gl'shire | : Gloucestershire |
| Her & Wor | : Hereford and Worcester | S Yorks(hire) | : South Yorkshire |
| Gtr Manchester | : Greater Manchester | Leics | : Leicestershire |
| Cambs | : Cambridgeshire | W Midlands | : West Midlands |
| Prt | : Port | N Uist | : North Uist |
| Staffs | : Staffordshire | W Isles | : Western Isles |

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: 1993

YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments...	
19930505	140738.1	62.08	2.27	622.91363.3	10.8	2.2	2.2	NORWEGIAN SEA		15175	212	0.42	2.8	3.9	C*D			
19931004	202148.0	61.81	1.51	584.91330.4	1.4	2.2	2.2	NORWEGIAN SEA		12189	210	0.26	3.6	3.3	C*D			
19930628	172723.8	61.65	2.31	628.31314.8	10.2	2.1	2.1	NORWEGIAN SEA		10146	228	0.39	7.8	7.0	D*D			
19930529	174341.4	61.52	1.90	607.41299.7	16.7	2.7	2.7	NORWEGIAN SEA		16167	192	0.28	2.2	3.5	B*D			
19931227	052045.9	61.25	2.85	660.01273.1	17.9	4.3	4.3	NORTHERN NORTH SEA		48123	169	0.38	1.0	1.9	C*D			
19930519	072412.7	60.50	2.00	619.61186.3	22.3	2.1	2.1	NORTHERN NORTH SEA		10163	156	0.13	1.0	2.0	A*D			
19930614	073730.8	60.41	2.18	630.01176.4	19.8	2.3	2.3	NORTHERN NORTH SEA		13167	149	0.38	2.2	3.9	C*D			
19930507	113000.5	59.07	-3.37	321.31021.0	7.2	1.7	1.7	WEST OF ORKNEY		9	85	206	0.12	1.7	0.8	B*D		
19930830	051556.0	59.03	1.62	607.91021.6	22.3	1.9	1.9	NORTHERN NORTH SEA		10228	177	0.25	2.9	4.1	C*D			
19930629	004558.2	58.99	1.39	594.81016.4	21.8	2.8	2.8	NORTHERN NORTH SEA		22188	135	0.39	1.4	3.1	C*D			
19930211	194612.6	58.97	1.45	598.31013.8	6.4	3.8	3.8	NORTHERN NORTH SEA		36192	159	0.39	1.1	2.1	C*D			
19930502	190825.8	58.92	0.93	568.61007.6	15.0	2.3	2.3	NORTHERN NORTH SEA		17173	264	0.39	7.0	7.8	D*D			
19930406	064106.2	58.67	1.01	574.4	979.5	25.8	3.5	NORTHERN NORTH SEA		34197	181	0.24	1.2	2.3	B*D			
19930610	113014.3	58.44	0.29	533.9	952.7	15.0	1.8	NORTHERN NORTH SEA		3196	357	0.35			C*D			
19930928	125936.5	58.36	1.42	600.0	946.4	11.2	2.0	NORTHERN NORTH SEA		15239	179	0.23	1.0	1.9	B*D			
19931213	040513.1	57.62	-5.13	213.3	863.5	5.8	0.6	KINLOCHEWE, HIGHLAND		7	17	249	0.05	0.7	0.5	A*D	8KM EAST OF KINLOCHEWE	
19930426	194344.9	57.61	-7.29	84.2	870.6	0.5	1.4	NORTH UIST, W ISLES		11	39	325	0.17	4.2	3.3	C*D		
19930915	125847.6	57.61	-4.89	227.1	861.4	3.6	1.2	LOCH FANNICH, HIGHLAND		9	27	167	0.11	0.9	1.4	A*C		
19931103	213837.0	57.56	-5.20	208.5	857.1	6.6	0.3	GLEN CARRON, HIGHLAND		6	9	331	0.01	0.0	0.0	A*D		
19930925	014203.8	57.54	-5.35	199.3	854.7	4.0	1.7	COULIN FOREST, HIGHLAND	2+	22	5	154	0.24	0.8	1.2	B*C	FELT COULIN	
19930727	040336.2	57.50	-5.37	197.8	850.7	4.0	1.3	GLEN CARRON, HIGHLAND		14	5	149	0.10	0.5	0.6	A*C		
19930828	123048.6	57.33	-6.10	153.1	834.2	3.8	0.4	ISLE OF SKYE, HIGHLAND		8	27	268	0.12	1.4	1.3	B*D		
19930722	075039.8	57.31	-6.07	155.1	831.6	3.3	0.0	ISLE OF SKYE, HIGHLAND		7	25	264	0.08	1.8	2.3	B*D		
19930429	180140.3	57.30	-6.06	155.3	830.6	2.9	1.7	ISLE OF SKYE, HIGHLAND		17	25	134	0.09	0.3	0.9	A*C		
19930525	182537.9	57.30	-6.12	151.7	831.3	4.7	0.4	ISLE OF SKYE, HIGHLAND		7	29	193	0.05	1.0	0.8	A*D		
19930609	190242.6	57.29	-5.64	180.5	828.0	0.2	-0.3	PLOCKTON, HIGHLAND		4	6	230	0.03			A*D		
19930831	013949.3	57.27	-5.45	192.3	825.2	2.3	-0.1	LOCH DUICH, HIGHLAND		6	7	149	0.08	0.2	0.4	A*C		
19930312	152803.7	57.23	-5.66	178.9	821.5	4.5	-0.3	ISLE OF SKYE, HIGHLAND		4	12	264	0.02			A*D		
19930202	081509.1	57.22	-5.43	192.7	820.1	3.3	0.8	SHIEL BRIDGE, HIGHLAND		7	2	142	0.07	0.7	0.9	A*C		
19930712	020852.3	57.21	-5.45	191.7	818.8	5.7	0.0	SHIEL BRIDGE, HIGHLAND		6	2	114	0.10	1.2	0.7	B*B		
19930702	111516.4	57.19	-5.28	202.0	815.4	6.7	0.2	GLEN SHIEL, HIGHLAND		6	9	288	0.05	1.0	0.6	B*D		
19930326	033704.4	57.12	-5.54	185.5	808.6	16.0	0.4	KNOYDART, HIGHLAND		9	12	127	0.11	0.7	1.5	A*B		
19930317	045037.5	57.11	-5.39	194.5	807.1	8.6	0.8	KINLOCH HOURN, HIGHLAND		6	30	173	0.35	0.2	7.1	C*C		
19930615	163436.7	57.06	-5.75	172.5	803.1	5.7	2.3	KNOYDART, HIGHLAND		35	17	175	0.20	1.3	1.3	B*C		
19930404	081357.3	57.03	-5.79	170.0	799.7	2.7	0.7	MALLAIG, HIGHLAND		6	13	183	0.08	1.7	3.0	B*D		
19930904	061348.3	57.03	-5.79	169.9	799.9	3.8	0.3	MALLAIG, HIGHLAND		5	13	184	0.17	1.0	7.8	C*D	MAGNITUDE FROM VERTICALS	
19930904	064528.9	57.03	-5.79	170.1	799.7	2.0	0.3	MALLAIG, HIGHLAND		8	13	182	0.15	0.6	0.5	A*D		
19930904	071455.1	57.03	-5.78	170.4	799.5	2.7	2.7	MALLAIG, HIGHLAND	3+	14	13	119	0.08	0.3	0.7	A*C	FELT MALLAIG	
19930904	071629.1	57.03	-5.78	170.8	799.4	2.4	0.7	MALLAIG, HIGHLAND		7	13	178	0.18	0.4	0.4	B*C		
19930904	080444.9	57.03	-5.78	170.9	799.7	2.8	0.4	MALLAIG, HIGHLAND		9	13	116	0.08	0.4	1.0	A*C		
19930904	103223.6	57.03	-5.78	170.5	799.8	2.8	0.2	MALLAIG, HIGHLAND		5	13	181	0.18	1.4		C*D	MAGNITUDE FROM VERTICALS	
19930904	180442.6	57.03	-5.78	170.4	799.4	3.3	0.1	MALLAIG, HIGHLAND		7	13	180	0.12	1.7	4.5	B*D		
19930905	094819.3	57.03	-5.78	170.6	799.2	2.7	2.0	MALLAIG, HIGHLAND		14	13	117	0.08	0.3	0.8	A*C		
19930906	164955.7	57.03	-5.76	171.6	799.0	3.1	0.1	MALLAIG, HIGHLAND		5	13	173	0.09	1.0		C*D	MAGNITUDE FROM VERTICALS	
19930907	011419.8	57.03	-5.78	170.9	799.1	2.9	0.1	MALLAIG, HIGHLAND		7	13	177	0.06	0.6	1.7	A*C		
19930915	031557.1	57.03	-5.77	171.0	799.2	3.7	0.1	MALLAIG, HIGHLAND		6	13	176	0.10	0.2	2.3	B*C		
19930917	052900.7	57.03	-5.78	170.8	799.8	2.5	0.3	MALLAIG, HIGHLAND		7	13	179	0.17	1.7	4.7	B*C		
19930917	100821.8	57.03	-5.76	172.0	799.1	3.0	0.4	MALLAIG, HIGHLAND		9	13	170	0.10	1.0	2.1	B*C		
19930923	190436.6	57.03	-5.79	169.9	799.4	2.8	0.2	MALLAIG, HIGHLAND		8	13	183	0.14	1.6	3.0	B*D		
19930924	105846.3	57.03	-5.78	170.7	799.2	2.5	0.1	MALLAIG, HIGHLAND		7	13	178	0.12	1.5	3.7	B*C		

TABLE 2: CATALOGUE OF EARTHQUAKES LISTED IN ORDER OF DECREASING LATITUDE: 1993

YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments...	
19930924	110047.7	57.03	-5.78	170.3	799.1	2.2	0.7	MALLAIG, HIGHLAND	7	12	180	0.09	0.3	0.4	A*D			
19930904	102300.8	57.02	-5.77	170.9	798.9	3.4	0.1	MALLAIG, HIGHLAND	5	12	176	0.12	1.0	16.5	C*D	MAGNITUDE FROM VERTICALS		
19930911	052537.3	57.02	-5.79	170.0	798.9	2.9	0.7	MALLAIG, HIGHLAND	11	12	120	0.10	0.5	1.1	A*C			
19930911	130112.7	57.02	-5.76	171.6	798.7	4.0	0.6	MALLAIG, HIGHLAND	9	12	112	0.06	0.3	0.6	A*C			
19930912	204236.1	57.02	-5.76	171.6	798.8	2.5	0.6	MALLAIG, HIGHLAND	9	12	172	0.15	0.3	0.4	B*C			
19930924	105428.0	57.02	-5.77	171.1	798.6	2.8	0.4	MALLAIG, HIGHLAND	9	12	114	0.10	0.5	1.2	A*C			
19930817	190634.7	57.01	-5.77	171.4	797.7	6.9	-0.2	MALLAIG, HIGHLAND	9	11	171	0.22	5.0	7.6	C*C			
19931216	110520.5	56.96	-4.50	248.2	788.5	2.6	1.9	LOCH LAGGAN, HIGHLAND	18	33	68	0.17	0.7	1.9	B*C			
19930210	033729.2	56.94	-5.14	208.8	787.3	2.8	0.8	LOCH ARKAIG, HIGHLAND	8	17	170	0.13	1.0	1.8	B*C			
19931113	111038.3	56.82	-5.89	162.3	776.6	6.1	1.1	LOCH MOIDART, HIGHLAND	17	12	228	0.12	1.2	0.6	B*D	OFFSHORE LOCATION		
19931227	194430.8	56.80	-5.44	189.7	773.2	2.8	0.7	LOCH SHIEL, HIGHLAND	9	27	213	0.09	0.7	1.3	A*D			
19930309	132209.4	56.65	-5.24	201.6	756.2	2.5	2.0	LOCH LINNHE, HIGHLAND	22	25	120	0.23	0.7	1.1	B*C			
19930930	213307.1	56.60	-5.08	211.1	749.1	7.1	1.1	GLEN ETIVE, HIGHLAND	17	26	142	0.08	0.3	0.9	A*C			
19931115	073333.7	56.55	-4.31	258.1	741.8	2.5	1.1	GLEN LYON, TAYSIDE	8	38	267	0.06	1.2	0.8	B*D	6KM S OF INNERWICK		
19931011	225401.2	56.53	-5.70	172.5	743.2	2.4	1.3	LOCHALINE, STRATHCLYDE	12	44	208	0.17	1.3	1.0	B*D			
19930531	161218.3	56.39	-4.01	275.8	723.5	5.4	0.0	COMRIE, TAYSIDE	6	21	201	0.21	1.0	1.2	B*D			
19930803	212205.2	56.34	-6.14	144.0	724.1	7.4	1.2	MULL, STRATHCLYDE	6106	351	0.07	3.6	3.3	C*D				
19931121	055405.9	56.34	-5.18	203.7	720.8	5.9	1.1	LOCH AWE, STRATHCLYDE	11	54	287	0.19	4.4	8.2	C*D			
19931211	224139.8	56.31	-5.97	154.4	720.3	6.8	1.3	MULL, STRATHCLYDE	13	68	245	0.09	1.3	2.0	B*D			
19931008	064648.3	56.28	-5.20	202.2	714.2	0.6	1.3	LOCH AWE, STRATHCLYDE	11	54	287	0.12	2.9	2.1	C*D			
19930725	124120.5	56.22	-5.16	204.4	707.6	0.5	0.7	INVERARAY, STRATHCLYDE	5	49	306	0.06	1.4	1.2	B*D			
19930613	112412.9	56.19	-6.09	145.9	706.7	4.9	1.8	COLONSAY, STRATHCLYDE	24	83	256	0.23	1.6	2.3	B*D			
19931117	042600.2	56.14	-3.72	292.9	695.5	0.3	0.5	CLACKMANNAN, CENTRAL	10	18	130	0.14	0.6	0.9	A*C	C/F		
19930206	014818.9	56.13	-3.68	295.2	694.2	1.6	1.1	CLACKMANNAN, CENTRAL	2+	9	17	112	0.10	0.4	0.7	A*C	C/F, FELT FOREST MILL	
19930223	035349.6	56.13	-3.71	293.4	694.3	0.9	1.4	CLACKMANNAN, CENTRAL	14	18	81	0.10	0.4	0.8	A*C	C/F		
19930326	063820.6	56.13	-3.72	293.0	694.4	0.6	1.0	CLACKMANNAN, CENTRAL	10	19	103	0.12	0.6	0.8	A*C	C/F		
19930406	082108.9	56.13	-3.68	295.4	694.5	0.1	1.6	CLACKMANNAN, CENTRAL	3+	10	17	103	0.09	0.5	0.9	A*C	C/F, FELT FOREST MILL	
19930409	163511.5	56.13	-3.68	295.8	693.8	1.4	0.5	CLACKMANNAN, CENTRAL	6	17	118	0.05	0.5	0.9	A*C	C/F		
19930421	013732.2	56.13	-3.72	293.1	693.8	1.0	1.3	CLACKMANNAN, CENTRAL	19	19	80	0.09	0.2	0.4	A*C	C/F		
19930615	044644.8	56.13	-3.69	295.2	694.8	0.4	0.5	CLACKMANNAN, CENTRAL	8	17	164	0.40	0.8	1.3	C*C	C/F		
19930807	141228.8	56.13	-3.73	292.4	694.0	0.3	0.8	CLACKMANNAN, CENTRAL	10	19	93	0.06	0.3	0.7	A*C	C/F		
19930807	141234.2	56.13	-3.74	292.1	694.9	0.3	1.0	CLACKMANNAN, CENTRAL	10	19	128	0.29	1.1	1.8	B*C	C/F		
19930818	023803.2	56.13	-3.73	292.5	694.3	0.8	0.7	CLACKMANNAN, CENTRAL	16	19	85	0.07	0.2	0.4	A*C	C/F		
19930914	161504.3	56.13	-3.74	291.7	694.0	2.0	0.9	CLACKMANNAN, CENTRAL	12	20	86	0.11	0.4	0.6	A*C	C/F		
19930921	020051.0	56.13	-3.73	292.4	694.0	0.9	0.5	CLACKMANNAN, CENTRAL	9	19	125	0.06	0.3	0.4	A*C	C/F		
19930923	023744.8	56.13	-3.73	292.5	694.2	0.6	1.2	CLACKMANNAN, CENTRAL	20	19	82	0.09	0.2	0.4	A*C	C/F		
19930923	024413.8	56.13	-3.74	292.0	694.2	1.2	0.6	CLACKMANNAN, CENTRAL	14	20	82	0.09	0.3	0.5	A*C	C/F		
19931110	013840.8	56.13	-3.73	292.3	694.2	1.0	0.8	CLACKMANNAN, CENTRAL	11	19	82	0.07	0.3	0.6	A*C	C/F - DOUBLE EVENT		
19931117	094901.8	56.13	-3.73	292.6	694.2	0.6	0.8	CLACKMANNAN, CENTRAL	11	19	85	0.08	0.3	0.5	A*C	C/F - DOUBLE EVENT		
19931123	211100.9	56.13	-3.73	292.5	694.2	1.9	0.9	CLACKMANNAN, CENTRAL	22	19	82	0.13	0.3	0.5	A*C	C/F		
19931223	052816.4	56.13	-3.73	292.1	694.4	1.8	0.5	CLACKMANNAN, CENTRAL	11	19	84	0.09	0.4	0.6	A*C	C/F - DOUBLE EVENT		
19931223	074928.7	56.13	-3.73	292.2	694.6	0.9	0.7	CLACKMANNAN, CENTRAL	12	19	84	0.11	0.4	0.6	A*C	C/F		
19930211	211925.1	56.12	-3.67	296.0	692.7	1.0	0.6	CLACKMANNAN, CENTRAL	2+	8	18	153	0.09	0.5	0.7	A*C	C/F, FELT FOREST MILL	
19930310	053916.2	56.12	-3.72	293.0	693.2	0.5	1.0	CLACKMANNAN, CENTRAL	13	19	80	0.09	0.4	0.8	A*C	C/F		
19930417	075520.5	56.12	-3.72	293.3	693.6	1.4	0.8	CLACKMANNAN, CENTRAL	11	19	86	0.08	0.3	0.6	A*C	C/F		
19930505	023200.6	56.12	-3.72	293.2	693.5	0.5	0.3	CLACKMANNAN, CENTRAL	11	19	122	0.15	0.6	0.9	B*C	C/F		
19930507	102634.0	56.12	-3.71	293.6	693.6	0.5	-0.1	CLACKMANNAN, CENTRAL	8	19	122	0.24	1.6	2.1	B*C	C/F		
19930512	214636.1	56.12	-3.70	294.1	693.6	0.1	0.3	CLACKMANNAN, CENTRAL	11	18	121	0.25	0.8	1.3	B*C	C/F		
19930907	021934.1	56.12	-3.73	292.6	693.7	0.7	1.2	CLACKMANNAN, CENTRAL	16	19	83	0.09	0.3	0.4	A*C	C/F		
19930918	031415.2	56.12	-3.73	292.5	693.7	2.0	0.8	CLACKMANNAN, CENTRAL	15	20	83	0.08	0.3	0.4	A*C	C/F		

TABLE 2: CATALOGUE OF EARTHQUAKES LISTED IN ORDER OF DECREASING LATITUDE: 1993

YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments...
19931118	015204.4	56.12	-3.73	292.4	693.4	1.4	0.8	CLACKMANNAN, CENTRAL	10	20	87	0.08	0.3	0.6	A*C	C/F	
19931224	014446.8	56.12	-3.73	292.4	693.7	1.5	1.1	CLACKMANNAN, CENTRAL	16	20	81	0.09	0.3	0.4	A*C	C/F	
19931205	164055.3	56.10	-4.72	231.0	693.6	6.9	0.8	GLEN LUSS, STRATHCLYDE	8	25	261	0.03	0.6	1.1	A*D		
19930202	005025.9	56.08	-5.06	209.3	692.3	1.5	1.0	LOCH ECK, STRATHCLYDE	6	33	317	0.03	2.3	2.1	B*D		
19930213	203602.4	56.07	-4.02	274.2	688.3	7.5	0.9	CARRON VALLEY, CENTRAL	10	10	177	0.08	0.5	0.5	A*C		
19930930	063409.4	56.07	-4.72	231.0	689.4	4.6	0.8	GLEN FRUIN, STRATHCLYDE	10	25	236	0.09	0.8	0.9	A*D		
19930923	005422.2	56.06	-3.99	276.3	687.3	3.7	0.3	BANNOCKBURN, CENTRAL	7	11	165	0.18	0.5	5.8	C*C		
19931102	163402.3	56.03	-3.64	297.7	682.8	6.1	0.7	BO'NESS, CENTRAL	14	24	94	0.09	0.3	0.5	A*C		
19931102	002336.6	55.99	-5.56	177.9	683.4	8.5	0.8	KNAPDALE, STRATHCLYDE	8	54	243	0.20	2.4	4.4	B*D	10KM SW OF LOCHGILPHEAD	
19930419	001704.2	55.95	-3.04	335.0	673.4	1.9	-0.1	MUSSELBURGH, LOTHIAN	6	9	205	0.06	0.8	1.2	A*D	C/F	
19930422	222249.6	55.95	-3.09	332.0	673.1	0.5	-0.2	MUSSELBURGH, LOTHIAN	6	7	208	0.24	8.5	7.9	D*D	C/F	
19930730	223954.6	55.94	-3.06	333.7	671.8	2.7	0.2	MUSSELBURGH, LOTHIAN	6	8	193	0.10	0.3	4.7	B*D	C/F	
19930526	184834.6	55.93	-5.80	162.6	677.3	2.1	1.3	JURA, STRATHCLYDE	9	66	240	0.35	5.1	3.7	D*D	3KM SE OF LAGG, JURA	
19930715	034420.2	55.93	-3.07	332.9	671.0	1.3	0.7	MUSSELBURGH, LOTHIAN	10	7	125	0.10	0.3	0.3	A*B	C/F	
19930708	223456.5	55.92	-3.08	332.5	670.3	2.4	0.4	MUSSELBURGH, LOTHIAN	8	7	127	0.13	0.4	0.9	A*B	C/F	
19930716	200013.1	55.92	-3.07	333.2	670.6	0.6	0.6	MUSSELBURGH, LOTHIAN	8	7	125	0.02	0.1	0.1	A*B	C/F	
19931020	221123.2	55.90	-3.06	333.8	667.6	0.1	0.1	DALKEITH, LOTHIAN	5	8	155	0.09	0.7	0.9	A*D	C/F	
19931024	003143.5	55.87	-3.09	331.6	664.6	0.1	-0.1	BONNYRIGG, LOTHIAN	6	8	208	0.06	1.4	0.9	B*D	C/F	
19930123	030303.2	55.86	-4.45	246.7	666.0	6.4	0.2	RENFREW, STRATHCLYDE	6	6	153	0.03	0.6	1.0	A*C		
19931219	100246.9	55.85	-3.11	330.3	662.8	0.5	0.4	ROSEWELL, LOTHIAN	5	9	184	0.03	3.8	2.7	C*D	C/F	
19930707	114806.6	55.55	4.63	818.1	648.6	0.3	4.0	CENTRAL NORTH SEA	4+	37301	90	0.24	0.7	0.9	B*D	FELT GORM PLATFORM	
19930808	115919.2	55.47	-5.10	204.1	623.4	7.6	1.6	ARRAN, STRATHCLYDE	19	34	141	0.09	0.3	1.3	A*C		
19930613	052255.3	55.40	-5.25	194.2	616.8	17.0	1.3	ARRAN, STRATHCLYDE	14	59	278	0.38	3.5	3.8	C*D		
19930107	170045.5	55.37	-5.29	191.2	613.1	15.2	1.5	ARRAN, STRATHCLYDE	12	19	130	0.23	1.2	2.7	B*B		
19930811	230821.2	55.37	-1.52	430.5	608.3	4.0	1.7	AMBLE, NORTHUMBERLAND	19	48	292	0.31	2.0	2.4	C*D	C/F - OFFSHORE	
19931214	021724.0	55.37	-1.34	442.0	608.6	0.7	1.5	AMBLE, NORTHUMBERLAND	13100	332	0.08	2.4	1.8	B*D	C/F - OFFSHORE		
19930106	181241.4	55.35	-5.28	191.7	610.9	15.5	1.2	ARRAN, STRATHCLYDE	11	20	122	0.17	0.8	2.3	B*B		
19930106	214145.6	55.35	-5.26	193.6	610.9	6.6	1.0	ARRAN, STRATHCLYDE	8	21	121	0.08	0.5	1.0	A*C		
19930107	015345.2	55.35	-5.28	191.8	611.2	14.8	1.2	ARRAN, STRATHCLYDE	10	20	123	0.12	0.5	1.9	A*B		
19930107	155911.7	55.35	-5.28	191.9	610.9	11.8	1.7	ARRAN, STRATHCLYDE	13	20	122	0.17	0.7	2.5	B*B		
19931029	141749.9	55.34	-2.26	383.3	605.3	12.4	1.3	BYRNESS, NORTHUMBERLAND	21	17	174	0.06	0.3	0.5	A*C		
19931113	195439.5	55.33	-2.30	381.0	603.6	8.6	1.0	BYRNESS, NORTHUMBERLAND	21	19	165	0.06	0.2	1.0	A*C		
19930107	170618.4	55.32	-5.30	190.9	608.3	13.7	0.9	ARRAN, STRATHCLYDE	5	19	227	0.07	2.0	3.4	B*D		
19930106	224657.2	55.31	-5.32	189.1	606.8	13.7	1.0	ARRAN, STRATHCLYDE	5	18	218	0.02	0.5	1.0	A*D		
19930106	232343.2	55.30	-5.30	190.2	605.9	8.5	0.9	ARRAN, STRATHCLYDE	5	19	217	0.02	0.7	4.2	B*D		
19930107	184435.8	55.30	-5.31	189.8	605.5	13.1	1.2	ARRAN, STRATHCLYDE	6	19	215	0.03	0.6	1.1	A*D		
19930107	001656.1	55.28	-5.30	190.6	603.2	5.0	0.9	ARRAN, STRATHCLYDE	6	20	209	0.04	9.4	12.1	D*D		
19930307	041319.0	55.27	-3.33	315.7	598.0	12.9	0.5	NEWTON, D & G	18	9	172	0.09	0.4	0.7	A*C		
19930910	225447.6	55.24	-3.49	305.2	594.8	4.5	-0.1	JOHNSTONEBRIDGE, D & G	8	13	188	0.13	0.2	3.5	B*D		
19930911	062503.7	55.24	-3.49	305.2	594.9	4.5	0.0	JOHNSTONEBRIDGE, D & G	8	13	189	0.12	0.1	3.3	B*D		
19930913	184813.5	55.24	-3.49	304.9	594.7	3.8	0.6	JOHNSTONEBRIDGE, D & G	11	12	188	0.14	0.4	1.2	A*D		
19930916	221635.8	55.24	-3.49	305.4	594.8	4.3	0.4	JOHNSTONEBRIDGE, D & G	11	13	188	0.12	0.9		C*D		
19930923	172155.3	55.24	-3.49	305.3	594.6	4.5	-0.2	JOHNSTONEBRIDGE, D & G	8	13	186	0.13	0.2	4.5	B*D		
19930923	183625.5	55.24	-3.49	305.4	594.5	4.2	-0.1	JOHNSTONEBRIDGE, D & G	8	13	186	0.12	1.0		C*D		
19930923	195556.5	55.24	-3.49	305.3	594.7	3.9	0.2	JOHNSTONEBRIDGE, D & G	12	13	187	0.14	0.4	1.0	A*D		
19930927	035507.5	55.24	-3.49	305.3	594.8	4.2	0.6	JOHNSTONEBRIDGE, D & G	12	13	188	0.15	0.8		C*D		
19930927	035532.5	55.24	-3.49	305.1	595.3	6.1	0.2	JOHNSTONEBRIDGE, D & G	10	13	191	0.15	0.7	3.4	B*D		
19930927	043903.6	55.24	-3.49	305.1	594.9	4.7	-0.2	JOHNSTONEBRIDGE, D & G	8	13	189	0.12	0.2	4.5	B*D		
19930927	093901.1	55.24	-3.49	305.5	594.6	5.4	-0.2	JOHNSTONEBRIDGE, D & G	8	13	186	0.14	0.9	7.2	C*D		
19930602	084741.6	55.20	-2.98	337.3	589.6	6.9	0.3	LANGHOLM, D & G	15	8	196	0.08	0.4	0.6	A*D		

TABLE 2: CATALOGUE OF EARTHQUAKES LISTED IN ORDER OF DECREASING LATITUDE: 1993

YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments...
19931213	085953.9	55.16	4.55	816.7	604.7	20.4	3.4	CENTRAL NORTH SEA		24415	216	0.27	1.8	2.7	B*D		
19930614	062547.7	55.09	-3.63	295.8	578.2	3.1	0.4	DUMFRIES, D & G		8	10	133	0.04	0.4	1.1	A*B	
19930211	161903.2	55.01	-2.87	344.1	568.4	12.3	1.0	LONGTOWN, CUMBRIA		25	15	147	0.14	0.5	1.1	A*C	
19930615	090600.7	54.93	5.68	891.5	586.5	15.0	3.0	SOUTHERN NORTH SEA		15506	331	0.42			D*D		
19930326	040124.7	54.91	-1.40	438.3	557.5	0.0	0.9	SUNDERLAND, TYNE & WEAR		8	82	301	0.21	7.7	5.8	D*D	C/F
19930326	015009.1	54.87	-1.37	440.5	553.2	0.0	1.7	SUNDERLAND, TYNE & WEAR		29	16	210	0.28	1.1	1.3	B*D	C/F
19930506	063653.5	54.84	-3.85	281.4	551.2	8.0	0.6	AUCHENCAIRN, D & G		9	7	186	0.03	0.3	0.6	A*D	
19930831	020159.9	54.79	-3.89	278.3	546.2	7.8	0.8	DUNDRENNAN, D & G		19	8	124	0.07	0.3	0.8	A*B	3KM ESE OF DUNDRENNAN
19930925	095603.0	54.74	-2.76	351.2	538.4	3.5	0.9	PLUMPTON, CUMBRIA		18	14	143	0.09	0.4	1.8	A*C	
19930603	040954.9	54.69	-2.45	371.0	533.4	2.3	1.0	MILBURN FOREST, CUMBRIA		30	24	80	0.10	0.2	0.4	A*C	
19930819	194554.7	54.64	-3.27	317.8	528.0	13.0	0.7	COCKERMOUTH, CUMBRIA		15	11	68	0.10	0.4	0.8	A*A	6KM SE OF COCKERMOUTH
19930506	122252.8	54.63	-2.32	379.2	526.0	4.3	1.0	MICKLE FELL, DURHAM		30	27	110	0.14	0.3	1.4	A*C	
19930819	202330.5	54.63	-3.28	317.2	527.3	10.1	0.4	COCKERMOUTH, CUMBRIA		13	12	103	0.08	0.4	0.9	A*B	6KM SE OF COCKERMOUTH
19930812	163939.2	54.58	-3.78	285.1	522.4	5.2	1.3	WHITEHAVEN, CUMBRIA		32	21	64	0.18	0.4	1.2	B*C	OFFSHORE LOCATION
19930811	033601.6	54.49	-3.25	318.8	511.9	8.2	-0.2	BUTTERMERE, CUMBRIA		9	5	125	0.12	0.5	1.3	A*B	
19930314	024857.2	54.43	-0.99	465.4	504.3	1.8	2.4	WESTERDALE, N YORKSHIRE		43	23	137	0.21	0.5	0.9	B*C	
19931002	232843.8	54.33	-3.23	320.2	493.0	13.4	0.9	DUNNERDALE, CUMBRIA		18	2	142	0.07	0.4	0.4	A*C	
19930708	061835.3	54.32	-3.12	327.3	492.2	8.5	1.5	CONISTON, CUMBRIA	2+	26	5	115	0.13	0.5	0.9	A*B	FELT KIRKBY-IN-FURNESS
19931127	020546.4	54.28	-3.50	302.4	488.6	9.4	0.2	TARN BAY, CUMBRIA		5	14	278	0.25	4.8	9.9	C*D	OFFSHORE LOCATION
19930705	163226.2	54.25	-2.96	337.5	483.9	19.1	-0.1	HAVERTHWAITHE, CUMBRIA		5	18	281	0.39		19.6	D*D	MAGNITUDE FROM VERTICALS
19931115	004855.8	54.25	-0.37	506.1	484.9	31.0	2.0	SCARBOROUGH, N YORKS		10	22	242	0.08	1.3	0.7	B*D	
19930626	054220.0	54.21	-2.86	344.1	479.3	8.3	3.0	GRANGE-O-SANDS, CUMBRIA	5	44	26	36	0.19	0.4	0.6	B*C	FELT GRANGE-OVER-SANDS..
19930717	110651.8	54.19	-2.37	375.6	477.1	4.7	1.4	CHAPEL-LE-DALE, N YORKS		22	46	155	0.15	0.5	1.5	A*C	7KM NE OF INGLETON
19930704	015632.7	54.15	-1.47	434.4	473.4	1.3	1.9	RIPON, NORTH YORKSHIRE		29	24	156	0.18	0.7	1.1	B*C	
19930712	215305.4	53.74	1.37	622.2	432.6	7.4	2.9	SOUTHERN NORTH SEA		31156	270	0.35	3.9	4.1	C*D		
19930807	233437.7	53.49	-2.33	377.9	400.0	19.6	1.6	SALFORD, GTR MANCHESTER		23	69	74	0.25	0.6	3.0	B*D	
19930916	014910.1	53.44	2.52	700.1	403.3	7.8	2.8	SOUTHERN NORTH SEA		14145	231	0.08	0.8	1.1	A*D		
19931020	023320.0	53.44	-1.23	451.1	394.4	0.2	1.5	MALTBY, S YORKSHIRE		11	43	166	0.33	1.7	2.5	C*C	C/F
19930928	003603.0	53.38	-4.45	237.2	389.8	14.3	0.6	ANGLESEY, GWYNEDD		13	7	89	0.07	0.4	0.4	A*A	
19930408	035821.4	53.34	-1.71	419.2	382.8	14.6	1.1	BRADWELL, DERBYSHIRE		6	16	143	0.08	0.9	2.3	B*C	
19930924	114532.2	53.32	-1.71	419.6	380.1	2.2	1.4	BAKEWELL, DERBYSHIRE		13	35	297	0.39	9.4	7.4	D*D	
19931111	175246.4	53.32	-0.97	468.7	381.1	0.0	2.2	RANSKILL, NOTTS	5+	16	45	77	0.32	1.4	2.2	C*C	C/F, FELT RANSKILL
19930630	055956.8	53.31	-2.85	343.2	380.0	8.9	2.2	ELLESMERE PRT, CHESHIRE		51	53	50	0.27	0.4	1.1	B*D	
19930801	134038.7	53.28	-4.62	225.3	378.9	11.3	0.0	HOLY ISLAND, GWYNEDD		8	4	226	0.04	0.6	0.7	A*D	
19930325	140807.2	53.26	-1.84	410.5	373.5	0.0	1.4	BUXTON, DERBYSHIRE		6	21	94	0.08	0.6	1.1	A*C	COLLAPSE TYPE
19930727	060735.9	53.26	3.76	784.2	388.8	0.3	2.9	SOUTHERN NORTH SEA		31163	178	0.36	1.7	2.2	C*D		
19930205	034457.9	53.22	-0.99	467.4	369.3	0.4	1.2	EDWINSTOWE, NOTTS	2+	5	36	285	0.13	8.0	5.7	D*D	C/F, FELT EDWINSTOWE
19930626	211535.7	53.22	-2.99	333.8	370.3	3.9	1.2	CHESTER, CHESHIRE		19	40	245	0.11	0.7	0.7	A*D	
19930131	183941.0	53.20	-1.04	463.9	367.5	0.5	1.0	EDWINSTOWE, NOTTS	2+	6	33	278	0.09	4.3	3.1	C*D	C/F, FELT EDWINSTOWE
19930622	053858.6	53.19	-1.40	440.1	366.1	0.3	1.6	CLAY CROSS, DERBYSHIRE		12	11	205	0.32	1.1	1.2	C*D	C/F
19930122	020945.4	53.16	-1.72	419.0	363.1	3.8	0.7	BAKEWELL, DERBYSHIRE		5	16	204	0.06	0.4	0.6	A*D	
19931011	094334.0	53.14	-3.73	284.6	361.9	9.3	2.3	BETWS-Y-COED, GWYNEDD	3+	32	18	115	0.22	0.6	0.9	B*B	FELT BETWS-Y-COED...
19931127	195606.5	53.13	-4.39	239.9	362.1	10.3	0.2	CAERNARVON BAY, GWYNEDD		10	15	112	0.06	0.4	1.2	A*B	
19930922	010055.6	53.12	-1.06	463.0	358.6	1.0	1.3	BILSTHORPE, NOTTS		8	36	141	0.28	1.8	2.7	B*C	C/F
19930712	042039.5	53.11	-1.79	414.0	356.9	18.9	2.0	HARTINGTON, DERBYSHIRE		29	11	90	0.22	0.6	0.8	B*A	
19930315	142329.1	53.08	-1.11	459.6	354.2	0.1	2.4	FARNSFIELD, NOTTS		23	23	162	0.22	0.7	1.0	B*C	C/F
19930906	022831.8	53.07	2.55	704.4	362.2	3.8	2.3	SOUTHERN NORTH SEA		16	78	313	0.08	1.1	1.2	B*D	
19931231	014531.7	53.07	-1.41	439.3	352.7	0.1	0.6	MATLOCK, DERBYSHIRE		5	22	122	0.54	6.6		D*D	C/F
19930906	024704.8	53.06	-1.00	466.9	351.8	1.0	1.7	OXTON, NOTTINGHAMSHIRE		21	30	149	0.24	0.7	0.9	B*C	C/F
19930629	040348.8	53.04	-2.21	385.7	348.8	4.1	2.0	STOKE-ON-TRENT, STAFFS	5+	27	25	86	0.16	0.4	1.1	B*C	FELT TALKE PITS AREA

TABLE 2: CATALOGUE OF EARTHQUAKES LISTED IN ORDER OF DECREASING LATITUDE: 1993

YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments...
19930921	091706.8	53.04	-2.20	386.7	349.4	4.4	1.5	STOKE-ON-TRENT,STAFFS	16	24	173	0.08	0.4	0.4	A*C		
19930227	011558.9	53.03	-2.20	386.4	348.3	7.2	1.8	STOKE-ON-TRENT,STAFFS	10	24	146	0.08	0.5	1.1	A*C		
19930318	213340.9	53.02	-2.20	386.4	347.6	6.1	1.4	STOKE-ON-TRENT,STAFFS	7	24	161	0.03	0.2	0.6	A*C		
19931001	071401.3	52.97	-4.41	238.4	344.7	20.7	0.4	LLEYN PENINSULA	13	1	96	0.10	0.5	0.8	A*B		
19930119	224646.0	52.96	-4.38	239.9	343.2	22.5	1.4	LLEYN PENINSULA	14	3	99	0.07	0.4	0.8	A*B		
19930610	132550.7	52.96	-4.37	241.0	342.6	22.2	0.0	LLEYN PENINSULA	10	5	199	0.08	0.8	0.6	A*D		
19930622	095933.6	52.96	-4.37	240.9	342.8	23.4	0.5	LLEYN PENINSULA	13	5	189	0.05	0.4	0.3	A*D		
19930207	173344.1	52.95	-4.41	238.3	341.7	22.0	1.0	LLEYN PENINSULA	10	27	297	0.09	1.0	1.4	A*D		
19930720	034824.8	52.94	-5.49	165.7	343.5	7.6	1.6	IRISH SEA	22	59	134	0.20	0.5	1.5	B*D		
19930817	082554.2	52.93	-4.35	241.8	339.3	13.1	0.3	PWLLHELI,GWYNEDD	7	8	114	0.07	0.5	1.0	A*B	7KM NE OF PWLLHELI	
19930814	191456.1	52.89	-3.50	298.9	333.4	9.9	0.9	BALA,GWYNEDD	17	16	117	0.06	0.3	0.4	A*B	7KM SE OF BALA	
19930218	051420.9	52.88	-4.57	227.0	334.7	10.4	0.3	GARN,GWYNEDD	9	7	143	0.05	0.8	1.0	A*C		
19931225	022055.5	52.88	-3.52	297.9	332.8	10.8	1.2	BALA,GWYNEDD	18	18	113	0.09	0.4	0.6	A*B	6KM SE OF BALA	
19931028	170640.3	52.87	-2.82	345.0	330.6	1.6	1.2	WHITCHURCH,STAFFS	8	30	251	0.05	1.7	1.7	B*D		
19930316	111306.9	52.86	-2.14	390.7	329.1	3.9	1.7	WHITGREAVE,STAFFS	12	26	135	0.27	1.1	3.8	B*C		
19930619	162035.8	52.86	-2.19	387.0	329.2	10.9	1.6	STAFFORD,STAFFORDSHIRE	21	29	115	0.16	0.6	1.4	B*C	6KM NW OF STAFFORD	
19930125	203356.9	52.85	-2.23	384.5	328.1	10.2	1.5	ECCLESHALL,STAFFS	14	32	131	0.43	2.0	6.2	C*C		
19931005	020514.8	52.77	-2.11	392.3	319.6	8.6	2.2	STAFFORD,STAFFORDSHIRE	20	33	101	0.09	0.4	0.7	A*C		
19930917	121905.8	52.74	-4.96	200.2	319.9	13.9	0.5	IRISH SEA	15	25	141	0.22	1.1	4.2	B*C		
19930725	111228.9	52.73	-4.39	238.5	317.0	11.2	0.3	CARDIGAN BAY,WALES	6	20	205	0.09	1.3	3.8	B*D	17KM SOUTH OF PWLLHELI	
19930324	114752.2	52.62	-1.00	467.3	302.9	7.7	1.5	KEYHAM,LEICESTERSHIRE	8	24	286	0.17	8.0	15.8	D*D		
19930415	213003.4	52.55	-0.75	484.9	295.9	4.7	2.3	GREAT EASTON,LEICS	23	25	77	0.40	1.3	2.8	C*C		
19931024	220909.3	52.54	-3.45	301.9	294.2	20.9	1.7	NEWTOWN,POWYS	20	26	81	0.06	0.2	0.5	A*B		
19930806	111339.9	52.41	-2.17	388.2	279.1	7.6	1.0	WEST HAGLEY,W MIDLANDS	8	49	283	0.18	2.1	2.8	B*D		
19930611	015409.7	52.38	-3.01	331.3	276.9	13.6	0.4	KNIGHTON,POWYS	9	8	111	0.15	1.0	1.2	B*B		
19930926	214617.1	52.36	-1.85	410.2	273.2	9.4	1.3	BIRMINGHAM,W MIDLANDS	14	43	139	0.38	1.6	8.4	C*C		
19930521	134302.0	52.32	-3.52	296.3	270.2	15.8	0.2	RHAYADER,POWYS	6	9	151	0.05	1.3	1.8	B*C		
19930917	013954.4	52.32	-2.73	350.3	269.0	14.5	2.3	LUDLOW,SHROPSHIRE	29	25	94	0.15	0.4	0.4	B*B	6KM SOUTH OF LUDLOW	
19930916	132631.1	52.31	-2.73	350.1	268.7	14.1	1.8	LUDLOW,SHROPSHIRE	19	25	94	0.16	0.6	0.7	B*B	7KM SOUTH OF LUDLOW	
19930927	135412.6	52.31	-2.73	350.3	268.6	14.2	1.6	LUDLOW,SHROPSHIRE	12	25	94	0.16	0.7	0.9	B*B	7KM SOUTH OF LUDLOW	
19930504	142025.9	52.29	-0.06	531.9	267.5	0.2	2.4	HUNTINGDON,CAMBS	19	43	101	0.25	1.0	1.2	B*C	9KM SE OF HUNTINGDON	
19930706	054251.6	52.27	-2.60	359.3	264.0	13.4	0.4	TENBURY WELLS,HER&WOR	8	26	209	0.17	1.5	2.1	B*D		
19930921	035848.2	52.17	-2.50	366.0	252.4	15.3	0.5	BROMYARD,HER & WOR	8	15	228	0.16	1.7	1.5	B*D		
19930921	072544.9	52.16	-2.47	367.6	251.5	14.6	1.1	BROMYARD,HER & WOR	12	15	233	0.17	1.4	1.0	B*D		
19930903	211019.7	52.15	-2.47	368.1	250.4	18.3	0.4	BROMYARD,HER & WOR	9	14	238	0.14	1.5	2.2	B*D		
19930507	125043.0	52.14	-2.47	367.5	249.0	11.5	2.3	BROMYARD,HER & WOR	29	12	133	0.18	0.6	0.6	B*B	6KM SE OF BROMYARD	
19930622	201146.6	52.13	-2.83	343.1	248.3	19.5	0.3	WELLINGTON,HER & WOR	5	19	123	0.02	0.4	1.0	A*D		
19930331	064432.4	52.12	-2.95	334.9	247.0	17.8	0.2	STAUNTON-O-WYE,HER&WOR	6	14	172	0.04	0.6	0.7	A*C		
19931230	184843.3	52.12	-2.57	360.8	247.4	15.5	0.5	HEREFORD,HER & WOR	6	10	196	0.02	0.3	0.3	A*D	13KM NE OF HEREFORD	
19930912	123810.4	52.11	-3.36	306.9	246.8	15.8	0.7	BUILTH WELLS,POWYS	7	7	175	0.06	1.2	0.6	B*C	5KM SE BUILTH WELLS	
19930424	094405.9	52.09	-3.38	305.5	244.6	15.9	0.5	BUILTH WELLS,POWYS	5	8	212	0.01	1.2	0.2	B*D	6KM SOUTH BUILTH WELLS	
19930913	190255.6	52.02	-3.52	295.6	236.9	14.5	1.3	BRECON,POWYS	8	18	214	0.09	0.9	0.6	A*D	12KM NW BRECON	
19930827	084902.2	51.89	-2.24	383.5	221.5	21.9	0.9	GLOUCESTER,GL'SHIRE	5	27	267	0.05	1.5	2.9	B*D		
19930501	183621.4	51.87	-4.53	225.8	222.3	3.2	1.4	MEIDRIM,DYFED	21	18	115	0.19	0.3	1.2	B*C	4KM NE OF MEIDRIM	
19930710	172128.0	51.87	-4.92	199.0	223.1	12.3	1.7	HAFERFORDWEST,DYFED	22	13	126	0.16	0.5	0.5	B*B	7KM NE HAFERFORDWEST	
19930724	132633.2	51.84	-2.89	339.0	216.0	9.2	0.1	ABERGAVENNY,GWENT	5	19	170	0.26	3.2	15.1	C*D	8KM EAST OF ABERGAVENNY	
19931224	194545.8	51.79	-3.00	331.1	211.1	14.6	1.3	ABERGAVENNY,GWENT	15	22	66	0.18	0.8	0.8	B*B		
19931215	153043.0	51.67	-3.26	312.8	197.4	5.0	1.3	BARGOED,MID GLAMORGAN	8	32	182	0.08	0.7	17.4	C*D	C/F	
19930318	023143.5	51.62	-3.29	311.0	191.8	10.0	1.5	SENGHENYDD,M GLAMORGAN	15	33	124	0.16	0.6	1.2	B*C		
19931231	212058.7	51.60	-3.60	289.4	190.7	7.7	1.9	PONTYCYMER,W GLAMORGAN	17	42	75	0.12	0.4	1.4	A*C		

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YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments...
19930728	035240.0	51.56	-2.30	379.5	185.1	8.6	1.9	CHIPPING SODBURY,AVON	17	36	260	0.22	2.0	1.7	B*D	8KM NE CHIPPING SODBURY	
19930209	130233.5	51.55	-3.06	326.6	184.4	10.0	1.7	CARDIFF,S GLAMORGAN	10	50	191	0.25	2.2	2.6	B*D		
19930321	192935.1	51.06	-2.84	341.1	129.5	14.3	1.0	SOMERTON,SOMERSET	16	7	135	0.19	0.9	0.8	B*B	7KM WEST OF SOMERTON	
19930302	143615.2	51.05	-2.70	350.9	127.8	12.7	1.9	SOMERTON,SOMERSET	22	3	202	0.18	0.7	0.4	B*D		
19931226	192701.3	50.93	-1.33	446.9	115.2	7.0	1.2	SOUTHAMPTON, HAMPSHIRE	11	30	117	0.19	0.7	3.0	B*C		
19931024	050702.2	50.65	-4.06	254.6	85.0	8.7	1.7	OKEHAMPTON,DEVON	18	25	138	0.25	0.4	5.4	C*C	SW OF OKEHAMPTON	
19930807	020703.3	50.59	-4.72	207.3	80.7	3.1	0.2	TINTAGEL,CORNWALL	8	29	346	0.12	7.3	2.8	D*D	SOUTH OF TINTAGEL	
19930115	170121.9	50.35	-4.84	198.0	53.7	5.9	1.6	ST AUSTELL,CORNWALL	12	4	298	0.01	0.2	0.2	A*D		
19930522	220227.9	50.28	-2.49	364.9	42.0	6.9	2.2	ENGLISH CHANNEL	28104	96	0.33	0.8	2.9	C*D	40KM SOUTH OF WEYMOUTH		
19930118	223150.8	50.27	-3.90	264.4	42.5	7.5	0.9	PLYMOUTH,DEVON	6	6	258	0.17	3.6	1.8	C*D	20KM SE OF PLYMOUTH	
19930118	060331.7	50.25	-3.94	261.6	40.4	2.0	0.2	PLYMOUTH,DEVON	4	10	331	0.00			A*D	20KM SE OF PLYMOUTH	
19930917	055752.6	50.24	-6.65	68.5	48.4	2.4	1.8	SCILLY ISLES,CORNWALL	14	77	351	0.27			D*D	SW OF SCILLY ISLES	
19931112	062419.6	50.22	-5.27	166.9	41.1	1.4	0.8	CAMBORNE,CORNWALL	13	5	306	0.03	0.3	0.8	A*D	NR SOUTH CROFTY TIN MINE	
19930102	052245.5	50.11	-5.18	172.8	28.3	7.3	0.1	CONSTANTINE,CORNWALL	11	3	164	0.04	0.3	0.4	A*C		
19930104	211223.8	50.11	-5.17	173.0	28.2	7.0	-0.1	CONSTANTINE,CORNWALL	9	3	159	0.01	0.2	0.2	A*C		
19930104	211226.0	50.11	-5.18	172.9	28.2	7.2	0.1	CONSTANTINE,CORNWALL	8	3	161	0.02	0.2	0.3	A*C		
19930215	122927.0	50.11	-5.18	173.0	28.1	6.2	0.5	CONSTANTINE,CORNWALL	11	6	163	0.02	0.2	0.2	A*C		
19930215	124517.9	50.11	-5.17	173.4	28.3	7.2	0.2	CONSTANTINE,CORNWALL	8	3	149	0.02	0.2	0.3	A*C		
19930325	025824.9	50.11	-5.18	172.7	28.3	7.0	-0.2	CONSTANTINE,CORNWALL	17	3	122	0.02	0.1	0.1	A*B		
19930325	025836.8	50.11	-5.18	172.8	28.3	7.1	-0.3	CONSTANTINE,CORNWALL	14	3	124	0.02	0.1	0.1	A*B		
19930405	123946.3	50.11	-5.18	172.7	28.4	6.9	0.8	CONSTANTINE,CORNWALL	13	3	122	0.02	0.1	0.1	A*B		
19930405	123948.3	50.11	-5.18	172.7	28.3	5.9	0.7	CONSTANTINE,CORNWALL	12	3	123	0.05	0.2	0.3	A*B		
19930407	110816.5	50.11	-5.18	172.7	28.3	7.4	0.0	CONSTANTINE,CORNWALL	7	3	166	0.02	0.2	0.3	A*C		
19930407	195655.5	50.11	-5.18	172.6	28.3	6.8	0.1	CONSTANTINE,CORNWALL	14	3	169	0.03	0.2	0.2	A*C		
19930407	213434.1	50.11	-5.18	172.6	28.1	7.1	0.2	CONSTANTINE,CORNWALL	15	3	123	0.02	0.1	0.2	A*B		
19930408	012428.0	50.11	-5.18	172.7	28.2	7.1	-0.1	CONSTANTINE,CORNWALL	13	3	123	0.02	0.1	0.2	A*B		
19930409	161403.9	50.11	-5.18	172.5	28.0	6.6	0.4	CONSTANTINE,CORNWALL	14	3	122	0.02	0.1	0.1	A*B		
19930409	175720.7	50.11	-5.18	172.6	28.2	7.2	0.6	CONSTANTINE,CORNWALL	15	3	121	0.02	0.1	0.2	A*B		
19930409	190544.2	50.11	-5.18	172.7	28.2	6.8	-0.1	CONSTANTINE,CORNWALL	12	3	123	0.02	0.1	0.2	A*B		
19930415	131548.3	50.11	-5.18	172.6	28.3	7.2	0.2	CONSTANTINE,CORNWALL	11	3	122	0.02	0.1	0.2	A*B		
19930422	111130.2	50.11	-5.18	172.6	28.2	7.0	0.5	CONSTANTINE,CORNWALL	14	3	169	0.03	0.2	0.2	A*C		
19930523	050412.8	50.11	-5.18	172.7	28.3	6.8	0.7	CONSTANTINE,CORNWALL	16	3	123	0.02	0.1	0.1	A*B		
19930713	182903.8	50.11	-5.18	172.8	28.1	6.4	1.4	CONSTANTINE,CORNWALL	13	3	125	0.02	0.1	0.2	A*B		
19930713	183020.8	50.11	-5.18	172.7	28.4	6.9	0.0	CONSTANTINE,CORNWALL	12	3	122	0.02	0.1	0.1	A*B		
19930713	190058.2	50.11	-5.18	172.9	28.1	7.0	0.6	CONSTANTINE,CORNWALL	15	3	127	0.02	0.1	0.2	A*B		
19930718	003719.6	50.11	-5.18	172.8	28.1	6.8	0.8	CONSTANTINE,CORNWALL	15	3	126	0.02	0.1	0.2	A*B		
19930718	003850.6	50.11	-5.18	172.5	28.3	6.8	-0.2	CONSTANTINE,CORNWALL	13	3	170	0.02	0.1	0.2	A*C		
19930718	004549.4	50.11	-5.18	172.9	28.2	7.0	0.3	CONSTANTINE,CORNWALL	12	3	127	0.02	0.1	0.3	A*B		
19930718	004649.1	50.11	-5.18	173.0	28.1	7.0	0.1	CONSTANTINE,CORNWALL	12	3	129	0.02	0.1	0.2	A*B		
19930718	004740.3	50.11	-5.18	172.8	28.2	6.8	-0.6	CONSTANTINE,CORNWALL	12	3	125	0.02	0.1	0.2	A*B		
19930718	012720.6	50.11	-5.18	172.7	28.3	7.1	0.2	CONSTANTINE,CORNWALL	15	3	166	0.03	0.2	0.2	A*C		
19930718	021441.1	50.11	-5.18	172.7	28.3	7.1	-0.1	CONSTANTINE,CORNWALL	16	3	165	0.03	0.2	0.2	A*C		
19930718	021804.6	50.11	-5.18	172.9	28.1	7.2	0.0	CONSTANTINE,CORNWALL	13	3	127	0.02	0.1	0.2	A*B		
19930718	055241.2	50.11	-5.17	173.0	28.2	7.1	-0.4	CONSTANTINE,CORNWALL	13	3	158	0.02	0.1	0.1	A*C		
19930718	055249.5	50.11	-5.18	172.9	28.2	7.1	0.2	CONSTANTINE,CORNWALL	13	3	126	0.02	0.1	0.2	A*B		
19930718	055306.0	50.11	-5.17	173.1	28.2	7.0	-0.3	CONSTANTINE,CORNWALL	10	3	157	0.02	0.2	0.2	A*C		
19930718	072225.4	50.11	-5.17	173.0	28.1	7.3	-0.3	CONSTANTINE,CORNWALL	10	3	159	0.02	0.2	0.2	A*C		
19930718	075024.2	50.11	-5.18	172.9	28.1	7.2	0.1	CONSTANTINE,CORNWALL	14	3	163	0.02	0.2	0.1	A*C		
19930718	083746.7	50.11	-5.18	172.9	28.1	7.0	0.6	CONSTANTINE,CORNWALL	15	3	127	0.02	0.1	0.2	A*B		
19930718	083809.5	50.11	-5.17	173.3	28.1	7.2	-0.5	CONSTANTINE,CORNWALL	6	3	154	0.02	0.3	0.4	A*C		

TABLE 2: CATALOGUE OF EARTHQUAKES LISTED IN ORDER OF DECREASING LATITUDE: 1993

YearMoDy	HrMnSecs	Lat	Lon	kME	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments...
19930718	101134.2	50.11	-5.18	172.6	28.2	7.3	0.3	CONSTANTINE, CORNWALL	14	3	121	0.02	0.1	0.2	A*B		
19930718	101141.5	50.11	-5.18	172.5	28.2	7.3	0.2	CONSTANTINE, CORNWALL	14	3	171	0.03	0.2	0.2	A*C		
19930718	101237.1	50.11	-5.18	172.6	28.1	6.9	0.6	CONSTANTINE, CORNWALL	13	3	123	0.02	0.1	0.3	A*B		
19930718	111600.4	50.11	-5.17	173.1	28.2	7.1	-0.2	CONSTANTINE, CORNWALL	8	3	156	0.01	0.2	0.2	A*C		
19930718	111534.9	50.11	-5.18	172.9	28.1	7.0	0.3	CONSTANTINE, CORNWALL	13	3	126	0.03	0.2	0.3	A*B		
19930718	114805.2	50.11	-5.18	172.6	28.2	7.1	0.5	CONSTANTINE, CORNWALL	13	3	169	0.03	0.3	0.2	A*C		
19930718	162332.0	50.11	-5.18	173.0	28.3	7.2	-0.3	CONSTANTINE, CORNWALL	10	3	159	0.02	0.2	0.2	A*C		
19930718	162601.6	50.11	-5.18	172.6	28.3	6.9	0.7	CONSTANTINE, CORNWALL	15	3	122	0.01	0.1	0.1	A*B		
19930718	170900.4	50.11	-5.18	172.7	28.1	6.8	1.8	CONSTANTINE, CORNWALL	13	3	124	0.01	0.1	0.2	A*B		
19930718	170945.3	50.11	-5.18	172.9	28.0	6.9	1.2	CONSTANTINE, CORNWALL	16	3	128	0.02	0.1	0.1	A*B		
19930718	193739.9	50.11	-5.17	173.0	28.2	7.5	-0.3	CONSTANTINE, CORNWALL	9	3	158	0.02	0.2	0.2	A*C		
19930718	200610.0	50.11	-5.18	172.7	28.2	7.2	0.2	CONSTANTINE, CORNWALL	12	3	124	0.01	0.1	0.2	A*B		
19930718	205705.0	50.11	-5.18	172.8	28.2	7.1	0.0	CONSTANTINE, CORNWALL	15	3	125	0.02	0.1	0.2	A*B		
19930718	210524.0	50.11	-5.18	172.7	28.2	6.9	0.2	CONSTANTINE, CORNWALL	14	3	123	0.02	0.1	0.2	A*B		
19930718	214202.0	50.11	-5.18	172.7	28.1	7.1	0.0	CONSTANTINE, CORNWALL	11	3	166	0.02	0.2	0.3	A*C		
19930718	214811.3	50.11	-5.18	172.9	28.2	7.3	-0.4	CONSTANTINE, CORNWALL	9	3	162	0.02	0.2	0.3	A*C		
19930718	220042.4	50.11	-5.17	173.1	28.1	7.5	-0.8	CONSTANTINE, CORNWALL	9	3	158	0.02	0.2	0.2	A*C		
19930718	220046.0	50.11	-5.18	172.7	28.2	7.0	0.1	CONSTANTINE, CORNWALL	13	3	123	0.02	0.1	0.2	A*B		
19930718	225450.2	50.11	-5.18	172.6	28.1	6.9	0.0	CONSTANTINE, CORNWALL	12	3	122	0.02	0.1	0.2	A*B		
19930718	232434.6	50.11	-5.18	172.7	28.3	6.9	0.2	CONSTANTINE, CORNWALL	16	3	122	0.02	0.1	0.2	A*B		
19930718	235458.4	50.11	-5.18	172.8	28.3	7.2	0.2	CONSTANTINE, CORNWALL	13	3	124	0.02	0.1	0.2	A*B		
19930719	011154.4	50.11	-5.18	172.9	28.4	7.2	-0.5	CONSTANTINE, CORNWALL	9	3	286	0.02	0.3	0.2	A*D		
19930719	022029.0	50.11	-5.17	173.1	27.9	6.9	-0.5	CONSTANTINE, CORNWALL	7	4	291	0.01	0.2	0.1	A*D		
19930719	043512.7	50.11	-5.18	172.8	28.2	7.0	0.9	CONSTANTINE, CORNWALL	13	3	125	0.01	0.1	0.1	A*B		
19930719	045350.5	50.11	-5.18	172.6	28.2	7.2	0.1	CONSTANTINE, CORNWALL	14	3	169	0.03	0.2	0.2	A*C		
19930719	051202.2	50.11	-5.18	172.9	28.2	6.7	-0.6	CONSTANTINE, CORNWALL	6	6	178	0.01	0.1	0.2	A*C		
19930719	062029.7	50.11	-5.17	173.1	28.2	7.5	-0.3	CONSTANTINE, CORNWALL	9	3	156	0.02	0.3	0.3	A*C		
19930719	075301.5	50.11	-5.18	172.9	28.2	7.4	-0.2	CONSTANTINE, CORNWALL	11	3	162	0.02	0.2	0.2	A*C		
19930719	095548.9	50.11	-5.18	172.6	28.3	7.8	-0.2	CONSTANTINE, CORNWALL	10	3	169	0.04	0.5	0.4	A*C		
19930719	162653.6	50.11	-5.17	173.2	28.3	7.2	-0.2	CONSTANTINE, CORNWALL	13	3	155	0.03	0.3	0.2	A*C		
19930719	172405.3	50.11	-5.18	172.7	28.2	7.0	1.0	CONSTANTINE, CORNWALL	12	3	124	0.01	0.1	0.1	A*B		
19930719	172644.6	50.11	-5.18	172.9	28.0	7.0	-0.3	CONSTANTINE, CORNWALL	11	3	163	0.02	0.2	0.2	A*C		
19930719	174408.2	50.11	-5.18	172.9	28.2	7.4	-0.4	CONSTANTINE, CORNWALL	9	3	161	0.02	0.2	0.2	A*C		
19930720	001735.0	50.11	-5.18	172.6	28.2	7.2	0.1	CONSTANTINE, CORNWALL	14	3	123	0.02	0.1	0.2	A*B		
19930720	001745.8	50.11	-5.18	172.9	28.2	7.5	-0.5	CONSTANTINE, CORNWALL	8	3	162	0.02	0.2	0.3	A*C		
19930720	001757.0	50.11	-5.18	172.7	28.3	7.1	0.3	CONSTANTINE, CORNWALL	13	3	166	0.02	0.2	0.2	A*C		
19930720	033426.7	50.11	-5.18	172.5	28.2	6.9	-0.1	CONSTANTINE, CORNWALL	11	3	170	0.04	0.4	0.5	A*C		
19930720	113633.3	50.11	-5.18	172.8	28.2	6.8	1.0	CONSTANTINE, CORNWALL	15	3	125	0.02	0.1	0.2	A*B		
19930720	113638.8	50.11	-5.18	172.6	28.4	6.7	0.4	CONSTANTINE, CORNWALL	14	3	121	0.02	0.1	0.2	A*B		
19930720	113711.4	50.11	-5.18	172.7	28.4	7.4	0.2	CONSTANTINE, CORNWALL	10	3	164	0.03	0.4	0.4	A*C		
19930720	125400.7	50.11	-5.19	172.2	28.4	6.8	0.1	CONSTANTINE, CORNWALL	11	3	173	0.02	0.2	0.1	A*C		
19930720	143158.1	50.11	-5.18	172.9	28.3	7.1	-0.1	CONSTANTINE, CORNWALL	10	3	161	0.02	0.2	0.2	A*C		
19930720	165010.7	50.11	-5.18	172.8	28.2	6.8	1.2	CONSTANTINE, CORNWALL	14	3	125	0.02	0.1	0.2	A*B		
19930720	233856.4	50.11	-5.18	172.4	28.3	7.2	-0.3	CONSTANTINE, CORNWALL	10	3	171	0.02	0.3	0.2	A*C		
19930720	234843.4	50.11	-5.18	172.7	28.3	7.1	-0.4	CONSTANTINE, CORNWALL	13	3	167	0.04	0.3	0.3	A*C		
19930730	223412.5	50.11	-5.18	172.3	28.1	6.9	0.4	CONSTANTINE, CORNWALL	14	3	173	0.03	0.2	0.2	A*C		
19930813	164342.7	50.11	-5.18	172.8	28.2	5.6	0.7	CONSTANTINE, CORNWALL	17	3	84	0.02	0.1	0.1	A*A		
19930814	052005.9	50.11	-5.18	172.9	28.2	5.3	0.4	CONSTANTINE, CORNWALL	15	3	127	0.01	0.1	0.2	A*B		
19930814	175755.5	50.11	-5.18	173.0	28.2	5.5	0.1	CONSTANTINE, CORNWALL	15	3	128	0.01	0.1	0.1	A*B		
19930901	192606.2	50.11	-5.18	172.7	28.3	7.2	-0.2	CONSTANTINE, CORNWALL	10	3	165	0.03	0.3	0.3	A*C		

TABLE 2: CATALOGUE OF EARTHQUAKES LISTED IN ORDER OF DECREASING LATITUDE: 1993

YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments...
19930117	085255.7	50.10	-5.17	173.2	27.5	5.5	0.1	CONSTANTINE,CORNWALL	9	4	160	0.04	0.3	0.5	A*C		
19930813	204506.3	50.10	-5.17	173.4	27.4	5.1	0.0	CONSTANTINE,CORNWALL	12	4	139	0.04	0.2	0.4	A*C		
19930310	084051.8	49.97	-5.35	159.9	13.2	17.9	0.4	LIZARD POINT,CORNWALL	8	21	340	0.03	1.1	1.3	B*D	SW OF LIZARD POINT	
19930807	035009.9	49.56	-4.96	185.7	-34.0	1.1	1.0	LIZARD POINT,CORNWALL	9	57	336	0.09				D*D	SE OF LIZARD POINT
19930307	123944.2	49.44	-2.16	388.6	-51.5	12.4	0.7	NORTH OF JERSEY	7	22	333	0.01	0.5	1.3	A*D	25KM NORTH OF JERSEY	
19930324	100220.8	49.22	-2.17	387.5	-76.1	5.5	0.4	ST BRELADE,JERSEY	6	3	144	0.08	1.2	2.2	B*C		
19930505	042808.8	49.16	-5.99	108.9	-74.8	6.6	1.4	LAND'S END,CORNWALL	11116	355	0.09	5.3	1.8	D*D	SW OF LAND'S END		
19930613	150055.7	49.03	-3.92	259.7	-94.8	11.1	2.2	ENGLISH CHANNEL	15127	240	0.28	3.9	5.6	C*D			

TABLE 3

CATALOGUE OF NON-NATURAL EVENTS LISTED CHRONOLOGICALLY: 1993

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 MSK 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 MSK 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 | M Glamorgan | : Mid Glamorgan |
| Expl | : Explosion | Notts | : Nottinghamshire |
| D & G | : Dumfries and Galloway | Gl'shire | : Gloucestershire |
| Her & Wor | : Hereford and Worcester | S Yorks(hire) | : South Yorkshire |
| Gtr Manchester | : Greater Manchester | Leics | : Leicestershire |
| Cambs | : Cambridgeshire | W Midlands | : West Midlands |
| Prt | : Port | N Uist | : North Uist |
| Staffs | : Staffordshire | W Isles | : Western Isles |

Comments abbreviations

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

TABLE 3: CATALOGUE OF NON-NATURAL EVENTS LISTED CHRONOLOGICALLY: 1993

YearMoDy	HrMnSecs	Lat	Lon	kmE	kmN	Dep	Mag	Locality	Int	No	DM	Gap	RMS	ERH	ERZ	SQD	Comments...
19930118	104006.2	50.75	-1.11	462.9	94.7	0.3	2.4	EXPL-PORTSMOUTH	2+	11	89	117	0.48	3.2	10.9	C*D	EXPL-FELT PORTSMOUTH
19930201	094606.0							SONIC-MONTROSE									SONIC-FELT MONTROSE...
19930202	151849.0							SONIC-DOUNREAY									SONIC-FELT DOUNREAY
19930205	110709.0							SONIC-SCARBOROUGH									SONIC-FELT SCARBOROUGH
19930211	094003.0							SONIC-DOUNREAY									SONIC-FELT DOUNREAY
19930211	094028.0							SONIC-DOUNREAY									SONIC-FELT DOUNREAY
19930211	144509.0							SONIC-DOUNREAY									SONIC-FELT DOUNREAY
19930211	144611.0							SONIC-DOUNREAY									SONIC-FELT DOUNREAY
19930212	143408.0							SONIC-DOUNREAY									SONIC-FELT DOUNREAY
19930212	143642.0							SONIC-DOUNREAY									SONIC-FELT DOUNREAY
19930222	162800.0							SONIC-HUMBERSIDE									SONIC-FELT BEVERLEY...
19930226	111948.0							SONIC-ANGLESEY									SONIC-FELT ANGLESEY...
19930318	145900.0							SONIC-WORCESTERSHIRE									SONIC-FELT BROADWAY...
19930524	144903.0							SONIC-SUFFOLK									SONIC-FELT LEISTON...
19930527	141159.0							EXPL-TAYSIDE									EXPL-HERCULES AIR CRASH
19930621	085951.0							SONIC-NORFOLK									SONIC-FELT TRIMINGHAM
19930721	214950.2	55.51	-4.68	230.5	626.9	0.0	0.9	EXPL-AYR BAY	2+	18	35	180	0.21	1.2	2.6	B*D	EXPL-FELT AYR BAY
19930730	104305.9	54.26	-0.47	499.8	486.6	0.3	2.2	EXPL-SCARBOROUGH		26160	246	0.38	3.9	5.2	C*D	EXPL-ORDNANCE DETONATION	
19930811	200540.0							SONIC-FIFE									SONIC-FELT ST ANDREWS
19930824	231230.9	55.21	-5.42	182.6	595.6	0.4	2.0	EXPL-NORTH CHANNEL		33102	223	0.33	1.7	2.3	C*D	EXPL-ORDNANCE DETONATION	
19930912	131318.8	55.85	-4.25	259.0	664.5	0.3	0.2	EXPL-GLASGOW	2+	7	15	148	0.19	1.0	1.6	B*C	EXPL-FLAT DEMOLITION
19930920	192855.0							EXPL(IMPACT)-PRESTWICK									EXPL-SUSPECTED METEORITE
19930923	140411.4	55.06	-5.04	206.0	577.8	0.0	1.8	EXPL-STRANRAER		4	73	285	0.03			A*D	EXPL-ORDNANCE DETONATION
19931014	135424.4	52.99	-3.89	272.9	345.4	0.4	0.9	EXPL-BL.FFEST,GWYNEDD	2+	15	25	104	0.22	0.8	4.3	B*C	EXPL-FELT BL.FFESTINIOG
19931020	120141.9	55.87	-3.97	276.7	666.1	0.3	1.0	EXPL-AIRDRIE	2+	10	33	226	0.10	0.6	0.6	A*D	EXPL-FELT AIRDRIE
19931022	205700.0							SONIC-SWANSEA									SONIC-FELT SWANSEA...
19931024	170300.0							SONIC-SWANSEA									SONIC-FELT SWANSEA...
19931027	101200.0							SONIC-NORTHUMBERLAND									SONIC-FELT AMBLE
19931027	194828.0							SONIC-FIFE									SONIC-FELT KIRKCALDY...
19931105	121955.3	57.69	-1.78	413.3	867.0	0.3	1.0	EXPL-OFF FRASERBURGH		8	32	293	0.07	2.2	1.4	B*D	EXPL-CONTRABAND EXPLODED

Note: The significance of explosions listed above which were not reported to be felt is that they received media attention. Many others (eg. quarry and construction blasts) are recorded but are not analysed in detail.

TABLE 4

GEOGRAPHICAL COORDINATES OF SEISMOGRAPH STATIONS: DECEMBER 1993

TABLE 4 : GEOGRAPHICAL COORDINATES OF SEISMOGRAPH STATIONS: DECEMBER 1993

Code	Name	Lat	Lon	KmE (km)	KmN (km)	Ht (m)	Yrs open	Comp	Agency
ABA	BACONSTHORPE	52.8875	1.1471	611.70	336.90	13	82-	1	BGS
AEA	E.ANGLIA UNIV	52.6208	1.2403	619.30	307.50	45	84-	m	BGS
APA	PACKWAY	52.2999	1.4779	637.10	272.60	35	84-	1	BGS
AWH	WHINBURGH	52.6299	0.9512	599.70	307.70	60	80-	1R	BGS
AWI	WITTON	52.8324	1.4460	632.09	331.69	35	83-	1	BGS
BBH	BRUNTSHEIL	55.1332	-2.9299	340.72	582.50	207	92-	1	BGS
BBO	BOTHEL	54.7367	-3.2465	319.75	538.70	205	92-	3	BGS
BCC	CHAPELCROSS	55.0154	-3.2202	321.98	569.67	68	92-	L	BGS
BCM	CHAPELCROSS MIC	55.0151	-3.2212	321.92	569.64	78	92-	m	BGS
BDL	DOBCROSS HALL	54.8030	-2.9390	339.65	545.76	132	92-	1	BGS
BHH	HOWATS HILL	55.0928	-3.2187	322.23	578.28	198	92-	3	BGS
BNA	NEW ABBEY	54.9659	-3.6244	296.02	564.70	78	92-	1	BGS
BTA	TALKIN	54.9057	-2.6841	356.14	557.00	276	92-	3	BGS
BWH	WARDLAW	55.1757	-3.6551	294.61	588.08	275	92-	1	BGS
CBW	BUDOCK WATER	50.1482	-5.1144	177.53	32.29	98	81-	1	BGS
CCA	CARNMENELLIS	50.1864	-5.2277	169.62	36.87	213	81-	1	BGS
CCO	CONSTANTINE	50.1357	-5.1960	171.64	31.15	183	81-	1	BGS
CDU	DUNNERDALE	54.3363	-3.1950	322.31	494.09	362	92-	1	BGS
CGH	GOONHILLY	50.0508	-5.1649	173.47	21.61	91	81-	1	BGS
*CGW	GWEEK	50.1003	-5.2224	169.58	27.29	76	93-	1	BGS
CKE	KESWICK	54.5878	-3.1062	328.52	521.98	296	92-	1	BGS
*CMA	MANACCAN	50.0819	-5.1273	176.30	24.96	50	93-	3	BGS
CME	MENERDUE FARM	50.1760	-5.1903	172.24	35.61	178	82-	3R	BGS
*CMS	MANACCAN SAT	50.0822	-5.1290	176.18	24.99	55	93-93	1	BGS
CPZ	PENZANCE	50.1560	-5.5835	144.07	34.66	198	81-	1R	BGS
CR2	ROSEMANOWES 2	50.1669	-5.1687	173.74	34.53	152	81-	3	BGS
CRA	RAME	50.1648	-5.1921	172.06	34.36	198	82-	3	BGS
CRQ	ROSEMANOWES	50.1672	-5.1728	173.45	34.57	165	81-	SR	BGS
CSA	ST AUSTELL	50.3528	-4.8936	194.18	54.39	113	81-	1	BGS
CSF	SCAFELL	54.4478	-3.2431	319.40	506.55	548	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	139	81-	1	BGS
CTR	TROLVIS QUARRY	50.1665	-5.1624	174.18	34.47	191	82-	3	BGS
CWF	CHARWOOD FST	52.7382	-1.3071	446.78	315.88	185	75-	3R	BGS
DCO	COMBE FARM	50.3200	-3.8724	266.72	48.42	410	82-	1R	BGS
DYA	YADSWORTHY	50.4352	-3.9309	262.89	61.33	280	82-	3R	BGS
EAB	ABERFOYLE	56.1881	-4.3400	254.80	701.95	250	69-	1R	BGS
EAU	AUCHINOON	55.8454	-3.4474	309.38	662.30	359	69-	1R	BGS
EBH	BLACK HILL	56.2481	-3.5081	306.56	707.19	375	69-	1R	BGS
EBL	BROAD LAW	55.7733	-3.0436	334.54	653.82	365	69-	1R	BGS
ECK	CAULDKAINE HILL	55.1812	-3.1271	328.24	588.02	337	81-	1R	BGS
EDI	EDINBURGH	55.9233	-3.1861	325.89	670.66	125	69-	4R	BGS
EDR	DRUMTOCHTY	56.9190	-2.5394	367.16	780.97	401	89-	1R	BGS
EDU	DUNDEE	56.5475	-3.0142	337.65	739.95	275	69-	1R	BGS
ELO	LOGIEALMOND	56.4706	-3.7119	294.55	732.24	495	69-	1R	BGS
ESK	ESKDALEMUIR	55.3167	-3.2050	323.54	603.18	263	65-	4R	BGS
ESY	STONEYPATH	55.9177	-2.6144	361.60	669.57	328	81-	1R	BGS
GAL	GALLOWAY	54.8664	-4.7114	226.02	555.78	105	89-	4m	BGS
GCD	CASTLE DOUGLAS	54.8638	-3.9417	275.40	553.85	189	89-	1R	BGS
GCL	CUSHENDALL	55.076	-6.130	136.4	583.7	275	89-	1R	BGS
GIM	N ISLE OF MAN	54.2923	-4.4670	239.46	491.35	366	89-	3R	BGS
GMK	MULL OF KINTYRE	55.3459	-5.5936	172.18	611.65	160	89-	1R	BGS
GMM	MTS OF MOURNE	54.239	-5.951	142.6	489.8	140	89-	1R	BGS
HAE	ALDERS END	52.0376	-2.5475	362.45	237.88	224	82-	1R	BGS
HBL2	BONNYLANDS	52.0508	-3.0384	328.80	239.72	440	91-	LR	BGS
HCG	CRAIG GOCH	52.3224	-3.6567	287.10	270.70	511	80-	1R	BGS
HEX	HEXMOOR	51.0668	-3.8025	273.72	131.32	278	91-	1R	BGS
HGH	GRAY HILL	51.6380	-2.8064	344.20	193.64	210	80-	1R	BGS
HLM	LONG MYND	52.5169	-2.8878	339.76	291.41	259	84-	1	BGS
HPE	PEMBROKE	51.9371	-4.7745	209.27	230.18	355	90-	1R	BGS
HPK	HAVERAH PARK	53.9554	-1.6240	424.67	451.12	227	78-	3R	BGS
HSA	SWANSEA	51.7478	-4.1543	251.30	207.70	274	87-	1R	BGS

TABLE 4 : continued

Code	Name	Lat	Lon	KmE (km)	KmN (km)	Ht (m)	Yrs open	Comp	Agency
HTL	HARTLAND	50.9944	-4.4850	225.64	124.67	91	81-	4Rm	BGS
HTR	TREWERN HILL	52.0790	-3.2697	313.00	243.10	329	82-	1R	BGS
JLP	LES PLATONS	49.2428	-2.1039			131	81-	1R	BGS
JQE	QUEENS EAST	49.200	-2.038			56	91-	1	BGS
JQS	QUEENS SOUTH	49.180	-2.063			62	91-	1	BGS
JQW	QUEENS WEST	49.196	-2.057			73	91-	1	BGS
JRS	MAISON ST LOUIS	49.1924	-2.0917			53	81-	4R	BGS
JSA	ST AUBINS	49.1879	-2.1709			21	81-	1R	BGS
JVM	VALLE D.L.MARE	49.2169	-2.2068			64	81	1R	BGS
KAC	ACHNASHELLACH	57.4999	-5.2982	202.40	850.29	330	83-	1R	BGS
KAR	ARISAIG	56.9175	-5.8302	166.90	787.20	225	83-	1	BGS
KBI	BIRLEY GRANGE	53.2546	-1.5278	431.50	373.20	270	88-	1	BGS
KEY	KEYWORTH	52.8774	-1.0751	462.24	331.54	75	88-	L	BGS
KNR	NEVIS RANGE	56.8219	-4.9714	218.68	773.97	1118	91-	1R	BGS
KPL	PLOCKTON	57.3391	-5.6527	180.21	833.50	36	86-	4R	BGS
KSB	SHIEL BRIDGE	57.2098	-5.4230	193.30	818.39	70	83-	1R	BGS
KSK	SCOVAL	57.4653	-6.7020	118.09	851.40	250	89-	1R	BGS
KSY	SYSTON	52.9642	-0.5873	494.88	341.73	123	88-	1R	BGS
KTG	TILBROOK GRNGE	52.3261	-0.4007	508.98	271.03	78	88-	1	BGS
KUF	UFFORD	52.6175	-0.3895	509.02	303.45	35	88-	1R	BGS
KWE	WEAVER FARM	53.0163	-1.8435	410.50	346.60	320	88-	1R	BGS
LCP	CASSOP	54.7368	-1.4741	433.86	538.12	185	91-	1R	BGS
LDU	LEEDS UNIV	53.8025	-1.5553	429.35	434.45	230	83-	m	BGS
LHO	HOLMEFIRTH	53.5451	-1.8548	409.62	405.42	460	91-	1R	BGS
LMI	MILLOM	54.2206	-3.3070	314.79	481.35	140	89-	3R	BGS
LMK	MARKET RASEN	53.4569	-0.3266	511.10	396.90	130	91-	1R	BGS
LRN	RICHMOND	54.4167	-1.7858	413.90	502.40	300	91-	1R	BGS
LRW	LERWICK	60.1360	-1.1779	445.66	1139.27	100	78-	4R	BGS
LWH	WHINNY NAB	54.3335	-0.6714	486.38	493.94	265	91-	1R	BGS
MCD	COLEBURN DISTIL	57.5827	-3.2541	325.02	855.41	280	81-	4Rm	BGS
MCH	MICHAELCHURCH	51.9977	-2.9983	331.47	233.77	233	78-	4	BGS
MDO	DOCHFUR	57.4412	-4.3633	258.17	841.43	366	81-	1R	BGS
MFI	FISHRIE	57.6116	-2.2953	382.36	857.97	220	88-	1R	BGS
MLA	LATHERON	58.305	-3.364	320.1	935.9	190	81-	1	BGS
MME	MEIKLE CAIRN	57.315	-2.965	341.9	825.3	455	81-	1	BGS
MVH	ACHVAICH	57.9232	-4.1816	270.79	894.70	198	84-	1	BGS
PCA	CARROT	55.700	-4.255	258.3	647.5	305	83-	1	BGS
PCO	CORRIE	55.988	-4.097	269.2	679.2	274	83-	1	BGS
PGB	GLENIFFERBRAES	55.810	-4.478	244.5	660.5	200	84-	3	BGS
PMS	MUIRSHIEL	55.846	-4.744	228.2	664.8	351	83-	1	BGS
POB	OBSERVATORY	55.637	-4.417	247.9	664.1	34	92-	L	BGS
SAN	SANDWICK	60.0176	-1.2386	442.44	1126.05	155	85-	1	BGS
SBD	BRYN DU	52.9055	-3.2588	315.35	335.01	497	80-	1	BGS
*SFH	HASELMERE	51.0604	-0.6911	491.71	129.88	260	93-	1	BGS
*SIW	ISLE OF WHITE	50.6716	-1.4027	442.20	86.00	155	93-	1	BGS
*SKP	KOPHILL	51.7215	-0.8099	482.20	203.25	215	93-	1	BGS
*SMD	MENDIPS	51.3082	-2.7174	350.00	156.87	300	93-	1	BGS
SSP	STONEYPOUND	52.4177	-3.1119	324.39	280.59	417	90-	3	BGS
*SSW	STOW-ON-WOLD	51.9667	-1.8499	410.31	229.85	291	93-	1	BGS
*SWK	WARMINSTER	51.1483	-2.2471	382.72	138.87	279	93-	1	BGS
*SWN	SWINDON	51.5130	-1.8005	413.85	179.42	192	93-	4	BGS
TBW	BRENTWOOD	51.6549	0.2911	558.47	197.66	82	89-	1R	BGS
TCR	COLCHESTER	51.8349	0.9215	601.26	219.23	40	89-	1R	BGS
TEB	EASTBOURNE	50.8188	0.1459	551.14	104.40	70	89-	1R	BGS
TFO	FOLKESTONE	51.1136	1.1406	619.79	139.67	188	89-	4	BGS
TSA	SEVENOAKS	51.2427	0.1558	550.46	151.55	170	89-	1	BGS
WAL	WALLS	60.2576	-1.6133	421.40	1152.60	170	80-	1	BGS
WCB	CHURCH BAY	53.3782	-4.5465	230.63	389.86	135	85-	4m	BGS
WFB	FAIRBOURNE	52.6830	-4.0378	262.27	311.47	325	85-	1R	BGS

TABLE 4 : continued

Code	Name	Lat	Lon	KmE (km)	KmN (km)	Ht (m)	Yrs open	Comp	Agency
WIM	ISLE OF MAN	54.1472	-4.6735	225.41	475.70	365	85-	1R	BGS
WLF	LLYNFAES	53.2893	-4.3966	240.27	379.64	65	85-	1	BGS
WME	MYNDD EILIAN	53.3966	-4.3034	246.86	391.37	130	85-	1R	BGS
WPM	PENMAENMAWR	53.2583	-3.9049	272.94	375.20	350	85-	1R	BGS
XAL	ALLENDALE	54.8617	-2.2147	386.22	551.91	462	83-	1R	BGS
XDE	DENT	54.5058	-3.4897	303.55	513.32	291	83-	1R	BGS
XSO	SOURHOPE	55.4925	-2.2511	384.13	622.11	495	83-	1R	BGS
YEL	YELL	60.5509	-1.0830	450.29	1185.55	200	79-	1	BGS
YLL	LLANBERIS	53.1402	-4.1704	254.84	362.57	162	84-	1R	BGS
YRC	RHOSCOLYN	53.2506	-4.5741	228.28	375.74	24	84-	1R	BGS
YRE	YR EIFL	52.9810	-4.4254	237.19	345.42	197	84-	1R	BGS
YRH	RHIW	52.8335	-4.6289	222.93	329.50	300	84-	1R	BGS
DCN	CROGHAN	53.3439	-7.2767			150	77-	1R	DIAS
DLF	LYONS FARM	53.2958	-6.5314			96	91-	3	DIAS
DMU	KINGSCOURT	53.8989	-6.9106			280	77-	1R	DIAS
DMS	MERRION SQUARE	53.3406	-6.2486			5	90-	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

* CGW installed 7 March 1993

* CMA installed 31 July 1993

* CMS installed 31 July 1993 and removed on 5 October 1993

* SFH,SMD,SSW,SWK & SWN installed 21 September 1993

* SIW installed 7 October 1993

* SKP installed 9 December 1993

Agency codes:

BGS British Geological Survey
 DIAS Dublin Institute of Advanced Studies

Component codes:

1 Single vertical seismometer
 3 Orthogonal set of 3 seismometers
 4 As in 3, above, plus one low-gain vertical
 S Orthogonal set of 3 strong motion seismometers plus
 one low-gain vertical seismometer
 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
 m Low-frequency microphone

TABLE 5
PHASE DATA: 1993

KEY TO PHASE DATA ENCODING

Time	: 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.
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 MSK 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 MSK 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 nanometers (nm)
PERI	: Period in seconds

Locality abbreviations

Sonic	: Sonic boom	M Glamorgan	: Mid Glamorgan
Expl	: Explosion	Notts	: Nottinghamshire
D & G	: Dumfries and Galloway	Gl'shire	: Gloucestershire
Her & Wor	: Hereford and Worcester	S Yorks(hire)	: South Yorkshire
Gtr Manchester	: Greater Manchester	Leics	: Leicestershire
Cambs	: Cambridgeshire	W Midlands	: West Midlands
Prt	: Port	N Uist	: North Uist
Staffs	: Staffordshire	W Isles	: Western Isles

Comments abbreviations

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

January 2 1993 Time: 05:22 45.5 UTC
 Lat: 50.110N Lon: 5.178W
 Grid Ref: 172.78 kmE 28.25 kmN
 Locality: CONSTANTINE, CORNWALL
 Magnitude: 0.1 ML
 Depth: 7.3 km
 RMS: 0.04 secs
 Quality: B

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
CR2	SZ	6	IP		D	05:22	47.25		
CR2	SN	6	ES			05:22	48.49		
CR2	SN	6				05:22	48.55	12	0.04
CR2	SE	6				05:22	48.56	20	0.05
CGH	SZ	7	ES		2	05:22	48.54		
CCO	SZ	3	ES			05:22	47.94		
CCA	SZ	9	ES		3	05:22	49.01		
CST	SZ	10	ES		1	05:22	49.13		
CBW	SZ	6	EP			05:22	47.17		
CBW	SZ	6	ES		1	05:22	48.42		
CTR	SE	6	ES		1	05:22	48.51		
CME	SE	7	ES		1	05:22	48.72		
CRA	SE	6	ES		1	05:22	48.53		

January 4 1993 Time: 21:12 23.8 UTC
 Lat: 50.110N Lon: 5.175W
 Grid Ref: 173.04 kmE 28.17 kmN
 Locality: CONSTANTINE, CORNWALL
 Magnitude: -0.1 ML
 Depth: 7.0 km
 RMS: 0.01 secs
 Quality: B

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
CR2	SZ	6	EP		1	21:12	25.49		
CR2	SN	6	ES		2	21:12	26.75		
CR2	SN	6				21:12	26.97	6	0.04
CR2	SE	6				21:12	26.83	17	0.04
CCO	SZ	3	ES		2	21:12	26.21		
CBW	SZ	6	EP		2	21:12	25.42		
CBW	SZ	6	ES		2	21:12	26.69		
CTR	SE	6	ES		2	21:12	26.70		
CME	SE	8	ES		2	21:12	26.96		
CRA	SE	6	ES		2	21:12	26.69		
CGH	SZ	7	ES		3	21:12	26.77		

January 4 1993 Time: 21:12 26.0 UTC
 Lat: 50.110N Lon: 5.176W
 Grid Ref: 172.91 kmE 28.21 kmN
 Locality: CONSTANTINE, CORNWALL
 Magnitude: 0.1 ML
 Depth: 7.2 km
 RMS: 0.02 secs
 Quality: B

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
CTR	SE	6	ES		1	21:12	29.02		
CME	SN	7	ES		1	21:12	29.19		
CR2	SN	6	ES		2	21:12	28.99		
CR2	SN	6				21:12	29.04	16	0.04
CR2	SE	6				21:12	29.06	22	0.05
CGH	SZ	7	ES		2	21:12	29.03		
CCO	SZ	3	ES			21:12	28.44		
CST	SZ	10	ES		2 C	21:12	29.65		
CBW	SZ	6	EP		2	21:12	27.68		
CBW	SZ	6	ES		1	21:12	28.92		

January 6 1993 Time: 18:12 41.4 UTC
 Lat: 55.347N Lon: 5.285W
 Grid Ref: 191.74 kmE 610.86 kmN
 Locality: ARRAN, STRATHCLYDE
 Magnitude: 1.2 ML
 Depth: 15.5 km
 RMS: 0.17 secs
 Quality: B

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
GAL	SN	65				18:13	04.03	7	0.10
GAL	SE	65	ES		3	18:13	00.34		
GAL	SE	65				18:13	03.58	6	0.04
GAL	SZ	65	EP		3	18:12	52.56		
GCL	SZ	62	EP		3	18:12	51.75		
GCL	SZ	62	ES		3	18:12	59.33		
GMK	SZ	20	IP		1 C	18:12	45.87		
GMK	SZ	20	ES		3	18:12	48.61		
PCA	SZ	76	EP		3	18:12	54.12		
PMS	SZ	65	EP		3	18:12	52.48		
PMS	SZ	65	ES		3	18:13	00.35		
PGB	SZ	72	EP		3	18:12	53.24		
PGB	SN	72	ES		3	18:13	02.24		
PGB	SN	72				18:13	03.31	9	0.16
PGB	SE	72				18:13	02.47	11	0.26

January 6 1993 Time: 21:41 45.6 UTC
 Lat: 55.349N Lon: 5.255W
 Grid Ref: 193.63 kmE 610.92 kmN
 Locality: ARRAN, STRATHCLYDE
 Magnitude: 1.0 ML
 Depth: 6.6 km
 RMS: 0.08 secs
 Quality: B

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
GMK	SZ	22	IP		1	21:41	49.79		
GMK	SZ	22	ES		3	21:41	52.59		
GCL	SZ	63	EP		3	21:41	56.46		
GCL	SZ	63	ES		3	21:42	04.14		
GAL	SZ	64	EP		3	21:41	56.47		
GAL	SE	64				21:42	07.76	4	0.10
GAL	SN	64	ES		3	21:42	04.20		
GAL	SN	64				21:42	05.89	7	0.30
PGB	SN	71	ES		3	21:42	06.17		
PGB	SN	71				21:42	08.80	6	0.07
PMS	SZ	64	ES		3	21:42	04.30		

January 6 1993 Time: 22:46 57.2 UTC
 Lat: 55.310N Lon: 5.324W
 Grid Ref: 189.06 kmE 606.79 kmN
 Locality: ARRAN, STRATHCLYDE
 Magnitude: 1.0 ML
 Depth: 13.7 km
 RMS: 0.02 secs
 Quality: C

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
GAL	SZ	63	EP		4	22:47	07.88		
GAL	SN	63	ES		3	22:47	15.61		
GAL	SN	63				22:47	19.23	5	0.06
GAL	SE	63				22:47	18.75	6	0.10
GMK	SZ	18	IP		1 C	22:47	01.07		
GMK	SZ	18	ES		3	22:47	03.86		
GCL	SZ	58	EP		3	22:47	06.95		
GCL	SZ	58	ES		3	22:47	14.18		

January 6 1993 Time: 23:23 43.2 UTC
 Lat: 55.302N Lon: 5.305W
 Grid Ref: 190.24 kmE 605.90 kmN
 Locality: ARRAN, STRATHCLYDE
 Magnitude: 0.9 ML
 Depth: 8.5 km
 RMS: 0.02 secs
 Quality: C

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
GAL	SN	62				23:24	03.92	4	0.11
GAL	SE	62	ES		3	23:24	01.13		
GAL	SE	62				23:24	04.86	5	0.20
GCL	SZ	58	EP		3	23:23	53.10		
GCL	SZ	58	ES		3	23:24	00.22		
GMK	SZ	19	IP		1 C	23:23	46.95		
GMK	SZ	19	ES		3	23:23	49.74		

January 7 1993 Time: 00:16 56.1 UTC
 Lat: 55.278N Lon: 5.297W
 Grid Ref: 190.64 kmE 603.16 kmN
 Locality: ARRAN, STRATHCLYDE
 Magnitude: 0.9 ML
 Depth: 5.0 km
 RMS: 0.04 secs
 Quality: D

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
GAL	SN	59				00:17	17.81	4	0.11
GAL	SE	59	ES		3	00:17	13.63		
GAL	SE	59				00:17	18.01	6	0.06
GMK	SZ	20	IP		1 C	00:17	00.02		
GMK	SZ	20	ES		2	00:17	02.84		
GAL	SZ	59	EP		3	00:17	06.31		
GCL	SZ	58	EP		3	00:17	06.01		
GCL	SZ	58	ES		3	00:17	13.32		

January 7 1993 Time: 01:53 45.2 UTC
 Lat: 55.351N Lon: 5.285W
 Grid Ref: 191.79 kmE 611.21 kmN
 Locality: ARRAN, STRATHCLYDE
 Magnitude: 1.0 ML
 Depth: 14.8 km
 RMS: 0.12 secs
 Quality: B

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
PGB	SE	72	ES		3	01:54	06.06		
PMS	SZ	65	EP		3	01:53	56.11		
PMS	SZ	65	ES		3	01:54	03.92		
GAL	SN	65	ES		3	01:54	04.23		
GAL	SN	65				01:54	07.05	6	0.13
GAL	SE	65				01:54	06.97	6	0.07
GCL	SZ	62	EP		3	01:53	55.73		
GCL	SZ	62	ES		3	01:54	03.09		
GMK	SZ	20	IP		1 C	01:53	49.56		
GMK	SZ	20	ES		3	01:53	52.41		
PCA	SZ	76	EP		3	01:53	57.89		
PCA	SZ	76	ES		3	01:54	07.24		

January 7 1993 Time: 15:59 11.7 UTC
 Lat: 55.347N Lon: 5.283W
 Grid Ref: 191.86 kmE 610.85 kmN
 Locality: ARRAN, STRATHCLYDE
 Magnitude: 1.7 ML
 Depth: 11.8 km
 RMS: 0.17 secs
 Quality: B

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
PGB	SN	72				15:59	34.73	27	0.30
PGB	SE	72	ES		3	15:59	32.15		
PGB	SE	72				15:59	32.48	31	0.15
GAL	SN	65	ES		3	15:59	30.41		
GAL	SN	65				15:59	34.07	27	0.10
GAL	SE	65				15:59	33.91	31	0.11
GAL	SZ	65	EP		2	15:59	22.70		
GMK	SZ	20	IP		1 C	15:59	15.89		
GMK	SZ	20	ES		3	15:59	18.41		
PCA	SZ	76	IP		1 D	15:59	24.30		
PCA	SZ	76	ES		3	15:59	33.36		
PMS	SZ	65	EP		2	15:59	22.83		
PMS	SZ	65	ES		3	15:59	30.48		
GCL	SZ	62	EP		2	15:59	22.05		
GCL	SZ	62	ES		3	15:59	29.40		
PCO	SZ	103	EP		3	15:59	28.70		
PCO	SZ	103	ES		3	15:59	40.55		

January 7 1993 Time: 17:00 45.5 UTC
 Lat: 55.368N Lon: 5.295W
 Grid Ref: 191.23 kmE 613.13 kmN
 Locality: ARRAN, STRATHCLYDE
 Magnitude: 1.5 ML
 Depth: 15.2 km
 RMS: 0.23 secs
 Quality: B

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
PMS	SZ	64	EP		3	17:00	56.62		
PMS	SZ	64	ES		3	17:01	03.75		
PGB	SZ	71	EP		3	17:00	57.30		
PGB	SN	71				17:01	08.76	20	0.18

PHASE DATA : 1993

TABLE 5 (cont'd)

PGB	SE	71	ES	2	17:01	06.15			
PGB	SE	71			17:01	08.89	17	0.14	
GMK	SZ	19	IP	1	17:00	49.92			
GMK	SZ	19	ES	2	17:00	52.72			
GAL	SZ	67	EP	3	17:00	57.37			
GAL	SN	67	ES	3	17:01	04.77			
GAL	SN	67			17:01	07.48	11	0.08	
GAL	SE	67			17:01	07.64	22	0.21	
PCA	SZ	75	EP	2	17:00	58.31			
PCA	SZ	75	ES	3	17:01	07.29			
GCL	SZ	62	EP	2	17:00	56.02			
GCL	SZ	62	ES	3	17:01	03.51			

January 7 1993 Time: 17:06 18.4 UTC
 Lat: 55.324N Lon: 5.297W
 Grid Ref: 190.88 kmE 608.32 kmN
 Locality: ARRAN, STRATHCLYDE
 Magnitude: 0.9 ML
 Depth: 13.7 km
 RMS: 0.07 secs
 Quality: C

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
GAL	SN	63				17:06	40.69	6	0.07
GAL	SE	63	ES	3		17:06	36.92		
GAL	SE	63				17:06	40.01	4	0.11
GMK	SZ	19	EP	2		17:06	22.57		
GMK	SZ	19	ES	3		17:06	25.39		
GCL	SZ	60	EP	3		17:06	28.45		
GCL	SZ	60	ES	3		17:06	36.11		

January 7 1993 Time: 18:44 35.8 UTC
 Lat: 55.299N Lon: 5.312W
 Grid Ref: 189.75 kmE 605.49 kmN
 Locality: ARRAN, STRATHCLYDE
 Magnitude: 1.2 ML
 Depth: 13.1 km
 RMS: 0.03 secs
 Quality: C

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
GCL	SZ	58	EP	2		18:44	45.56		
GCL	SZ	58	ES	3		18:44	52.84		
GMK	SZ	19	IP	1	C	18:44	39.79		
GMK	SZ	19	ES	3		18:44	42.62		
GAL	SZ	62	EP	3		18:44	46.20		
GAL	SN	62				18:44	57.36	7	0.15
GAL	SE	62	ES	2		18:44	53.82		
GAL	SE	62				18:44	57.57	12	0.18

January 15 1993 Time: 17:01 21.9 UTC
 Lat: 50.348N Lon: 4.840W
 Grid Ref: 197.99 kmE 53.75 kmN
 Locality: ST AUSTELL, CORNWALL
 Magnitude: 1.6 ML
 Depth: 5.9 km
 RMS: 0.01 secs
 Quality: C

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
CR2	SZ	31	EP		C	17:01	27.37		
CR2	SN	31	ES			17:01	31.58		
CR2	SN	31				17:01	32.06	93	0.03
CR2	SE	31				17:01	31.63	95	0.11
CSA	SZ	4	IP		C	17:01	23.14		
CGH	SZ	40	EP			17:01	29.00		
CCO	SZ	35	IP		C	17:01	28.05		
CCA	SZ	33	IP		C	17:01	27.73		
CST	SZ	29	IP		C	17:01	26.99		
CBW	SZ	30	IP		C	17:01	27.18		
CME	SZ	32	IP		C	17:01	27.48		
CME	SN	32	ES			17:01	31.78		
CTR	SZ	31	IP		C	17:01	27.33		
CRA	SZ	32	IP		C	17:01	27.63		
DYA	SZ	65	EP	4		17:01	31.45		
DCO	SZ	69	IP	4		17:01	31.69		
HTL	SN	76	ES	4		17:01	41.55		
HTL	SZ	76	EP	4	C	17:01	33.19		

January 17 1993 Time: 08:52 55.7 UTC
 Lat: 50.104N Lon: 5.173W
 Grid Ref: 173.17 kmE 27.53 kmN
 Locality: CONSTANTINE, CORNWALL
 Magnitude: 0.1 ML
 Depth: 5.5 km
 RMS: 0.04 secs
 Quality: B

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
CTR	SN	7	ES	1		08:52	58.49		
CME	SE	8	ES			08:52	58.75		
CR2	SZ	7	EP		C	08:52	57.36		
CR2	SN	7	ES			08:52	58.50		
CR2	SN	7				08:52	58.53	20	0.05
CR2	SE	7				08:52	58.60	11	0.03
CGH	SZ	6	ES	2		08:52	58.19		
CCO	SZ	4	ES	2		08:52	57.83		
CCA	SZ	10	ES	1		08:52	59.19		
CST	SZ	10	ES			08:52	59.23		
CBW	SZ	7	ES			08:52	58.30		

January 18 1993 Time: 06:03 31.7 UTC
 Lat: 50.247N Lon: 3.942W
 Grid Ref: 261.58 kmE 40.43 kmN
 Locality: PLYMOUTH, DEVON
 Comments: 20KM SE OF PLYMOUTH
 Magnitude: 0.2 ML
 Depth: 2.0 km
 RMS: 0.00 secs
 Quality: C

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
DYA	SZ	21	IP		D	06:03	35.81		
DYA	SN	21	ES	1		06:03	38.81		
DYA	SN	21				06:03	39.08	8	0.16
DYA	SE	21				06:03	38.91	11	0.11

DCO	SZ	10	EP	1	06:03	33.88			
DCO	SZ	10	ES	1	06:03	35.45			

January 18 1993 Time: 22:31 50.8 UTC
 Lat: 50.266N Lon: 3.903W
 Grid Ref: 264.39 kmE 42.49 kmN
 Locality: PLYMOUTH, DEVON
 Comments: 20KM SE OF PLYMOUTH
 Magnitude: 0.9 ML
 Depth: 7.5 km
 RMS: 0.17 secs
 Quality: D

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
DYA	SZ	19	IP		D	22:31	54.47		
DYA	SN	19				22:31	57.87	50	0.08
DYA	SE	19	ES	1		22:31	57.44		
DYA	SE	19				22:31	57.53	63	0.14
DCO	SZ	6	IP		C	22:31	52.58		
DCO	SZ	6	ES	1		22:31	54.11		
CSA	SZ	71	EP	2		22:32	03.02		
CSA	SZ	71	ES	2		22:32	11.18		

January 19 1993 Time: 22:46 46.0 UTC
 Lat: 52.962N Lon: 4.384W
 Grid Ref: 239.92 kmE 343.23 kmN
 Locality: LLEYN PENINSULA
 Magnitude: 1.4 ML
 Depth: 22.5 km
 RMS: 0.07 secs
 Quality: B

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
WCB	SN	48				22:47	00.98	19	0.13
WCB	SE	48	ES	2		22:47	00.43		
WCB	SE	48				22:47	01.14	32	0.19
WME	SZ	49	IP		D	22:46	54.58		
WME	SZ	49	ES	2		22:47	00.32		
WLF	SZ	36	IP		D	22:46	52.82		
WLF	SZ	36	ES	2		22:46	57.65		
YRC	SZ	35	IP		D	22:46	52.66		
WPM	SZ	46	IP		C	22:46	54.30		
YLL	SZ	24	IP		C	22:46	51.41		
YRE	SZ	4	IP		D	22:46	49.69		
YRH	SZ	22	IP		C	22:46	51.05		
YRH	SZ	22	ES	2		22:46	54.53		
WFB	SZ	39	EP		C	22:46	53.23		
WFB	SZ	39	ES	2		22:46	58.20		
WCB	SZ	48	IP		C	22:46	54.64		

January 22 1993 Time: 02:09 45.4 UTC
 Lat: 53.165N Lon: 1.717W
 Grid Ref: 418.95 kmE 363.15 kmN
 Locality: BAKEWELL, DERBYSHIRE
 Magnitude: 0.7 ML
 Depth: 3.8 km
 RMS: 0.06 secs
 Quality: C

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
CWF	SZ	55	EP	2		02:09	54.90		
CWF	SN	55				02:10	02.62	4	0.07
CWF	SE	55	ES	3		02:10	02.06		
CWF	SE	55				02:10	02.95	3	0.06
KWE	SZ	19	EP	2		02:09	48.93		
KWE	SZ	19	ES	3		02:09	51.77		
KBI	SZ	16	EP	2		02:09	48.58		

January 23 1993 Time: 03:03 3.2 UTC
 Lat: 55.862N Lon: 4.450W
 Grid Ref: 246.67 kmE 665.95 kmN
 Locality: RENFREW, STRATHCLYDE
 Magnitude: 0.2 ML
 Depth: 6.4 km
 RMS: 0.03 secs
 Quality: B

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
PGB	SZ	6	EP	1		03:03	04.97		
PGB	SN	6				03:03	06.42	22	0.31
PGB	SE	6	ES	2		03:03	06.18		
PGB	SE	6				03:03	06.35	28	0.19
PMS	SZ	19	IP	1	C	03:03	06.82		
PMS	SZ	19	EP			03:03	06.76		
PMS	SZ	19	ES	2		03:03	09.55		
PCO	SZ	26	EP	3		03:03	08.14		
PCO	SZ	26	ES	3		03:03	11.73		

January 25 1993 Time: 20:33 56.9 UTC
 Lat: 52.850N Lon: 2.230W
 Grid Ref: 384.52 kmE 328.08 kmN
 Locality: ECCLESHALL, STAFFS
 Magnitude: 1.5 ML
 Depth: 10.2 km
 RMS: 0.43 secs
 Quality: C

STAT	CO	DIST	PHAS	WT	P	HrMn	SECS	AMPL	PERI
CWF	SZ	64	EP	2		20:34	08.13		
CWF	SN	64	ES			20:34	14.91		
CWF	SN	64				20:34	15.98	30	0.15
CWF	SE	64				20:34	15.71	11	0.18
KWE	SZ	32	EP	1	C	20:34	03.29		
KWE	SZ	32	ES	3		20:34	06.46		
KBI	SZ	65	EP	2		20:34	08.54		
SSP	SZ	77	IP		D	20:34	09.89		
SSP	SN	77	ES	2		20:34	18.51		
SSP	SN	77				20:34	18.87	20	0.15
SSP	SE	77				20:34	20.99	14	0.23
HAE	SZ	93	IP	1	C	20:34	12.64		
HCG	SZ	113	EP	2		20:34	15.47		
HTR	SZ	111	EP	2		20:34	15.13		
HTR	SZ	111	ES	2		20:34	27.93		
SBD	SZ	70	IP		D	20:34	08.46		
SBD	SZ	70	ES	2		20:34	16.55		
KBI	SZ	65	ES	3		20:34	15.13		

PHASE DATA : 1993

TABLE 5 (cont'd)

January 31 1993 Time: 18:39 41.0 UTC
 Lat: 53.200N Lon: 1.044W
 Grid Ref: 463.86 kmE 367.47 kmN
 Locality: EDWINSTOWE, NOTTS
 Comments: C/F,FELT EDWINSTOWE
 Magnitude: 1.0 ML
 Depth: 0.5 km
 RMS: 0.09 secs
 Quality: D
 Intensity: 2+
 STAT CO DIST PHAS WT P HrMn SECS AMPL PERI
 CWF SZ 54 IP 1 C 18:39 51.07
 CWF SN 54 ES 3 18:39 58.36
 CWF SN 54 18:39 57.92 6 0.29
 CWF SE 54 18:39 58.42 8 0.13
 KWE SZ 57 EP 2 18:39 51.49
 KWE SZ 57 ES 3 18:39 58.96
 KBI SZ 33 EP 2 18:39 47.36
 KBI SZ 33 ES 3 18:39 52.34

February 2 1993 Time: 00:50 25.9 UTC
 Lat: 56.085N Lon: 5.065W
 Grid Ref: 209.33 kmE 692.27 kmN
 Locality: LOCH ECK, STRATHCLYDE
 Magnitude: 1.0 ML
 Depth: 1.5 km
 RMS: 0.03 secs
 Quality: C
 STAT CO DIST PHAS WT P HrMn SECS AMPL PERI
 PGB SZ 48 IP 1 C 00:50 34.71
 PCA SZ 66 EP 2 C 00:50 37.56
 PMS SZ 33 IP 1 C 00:50 32.21
 PMS SZ 33 ES 3 00:50 36.91
 PCO SZ 61 EP 2 C 00:50 36.83
 PGB SN 48 00:50 41.13 10 0.29
 PGB SE 48 ES 2 00:50 41.04
 PGB SE 48 00:50 41.41 19 0.77

February 2 1993 Time: 08:15 9.1 UTC
 Lat: 57.225N Lon: 5.435W
 Grid Ref: 192.66 kmE 820.12 kmN
 Locality: SHIEL BRIDGE, HIGHLAND
 Magnitude: 0.8 ML
 Depth: 3.3 km
 RMS: 0.07 secs
 Quality: B
 STAT CO DIST PHAS WT P HrMn SECS AMPL PERI
 KPL SZ 18 IPG 1 C 08:15 12.70
 KAC SZ 32 EPG 2 D 08:15 14.94
 KAC SZ 32 ES 3 08:15 18.24
 KSB SZ 2 IPG 1 D 08:15 09.94
 KSB SZ 2 ES 2 08:15 10.61
 KPL SE 18 ISG 1 08:15 15.21
 KPL SE 18 08:15 15.30 67 0.21
 KPL SN 18 08:15 15.29 39 0.21
 KSK SZ 81 EP 3 08:15 22.89

February 5 1993 Time: 03:44 57.9 UTC
 Lat: 53.216N Lon: 0.990W
 Grid Ref: 467.42 kmE 369.32 kmN
 Locality: EDWINSTOWE, NOTTS
 Comments: C/F,FELT EDWINSTOWE
 Magnitude: 1.2 ML
 Depth: 0.4 km
 RMS: 0.13 secs
 Quality: D
 Intensity: 2+
 STAT CO DIST PHAS WT P HrMn SECS AMPL PERI
 CWF SZ 57 EP 3 03:45 08.48
 KWE SZ 61 EP 3 03:45 08.87
 KWE SZ 61 ES 3 03:45 16.65
 KWE SZ 61 03:45 16.79 14 0.39
 KBI SZ 36 EP 3 03:45 04.82
 KBI SZ 36 ES 3 03:45 10.16
 KBI SZ 36 03:45 11.18 19 0.20

February 6 1993 Time: 01:48 18.9 UTC
 Lat: 56.129N Lon: 3.686W
 Grid Ref: 295.23 kmE 694.19 kmN
 Locality: CLACKMANNAN, CENTRAL
 Comments: C/F,FELT FOREST MILL
 Magnitude: 1.1 ML
 Depth: 1.6 km
 RMS: 0.10 secs
 Quality: B
 Intensity: 2+
 STAT CO DIST PHAS WT P HrMn SECS AMPL PERI
 EDI SN 39 ES 3 01:48 31.31
 EAB SZ 41 EP 3 01:48 26.41
 EAB SZ 41 ES 3 01:48 32.07
 EBH SZ 17 EP 2 01:48 22.28
 EBH SZ 17 ES 3 01:48 25.07
 EBH SZ 17 01:48 30.85 171 0.76
 ELO SZ 38 EP 2 01:48 25.98
 ELO SZ 38 ES 3 01:48 31.25
 PCO SZ 30 EP 2 D 01:48 24.70
 PCO SZ 30 ES 3 01:48 28.58
 PCO SZ 30 01:48 34.54 34 0.61

February 7 1993 Time: 17:33 44.1 UTC
 Lat: 52.948N Lon: 4.407W
 Grid Ref: 238.28 kmE 341.67 kmN
 Locality: LLEYN PENINSULA
 Magnitude: 1.0 ML
 Depth: 22.0 km
 RMS: 0.09 secs
 Quality: C
 STAT CO DIST PHAS WT P HrMn SECS AMPL PERI
 WCB SZ 49 EP 3 17:33 52.43
 WCB SE 49 ES 3 17:33 58.74
 WCB SN 49 17:34 00.52 8 0.07
 WCB SE 49 17:33 59.55 14 0.22
 WPM SZ 48 IP 1 C 17:33 52.64
 WPM SZ 48 ES 2 17:33 58.49
 YRC SZ 36 EP 1 D 17:33 50.99
 YRC SZ 36 ES 2 17:33 55.37
 WME SZ 51 IP 1 C 17:33 52.92
 WME SZ 51 ES 2 17:33 59.06

YLL SZ 27 IP C 17:33 49.74
 YLL SZ 27 ES 3 17:33 53.46

February 9 1993 Time: 13:02 33.5 UTC
 Lat: 51.553N Lon: 3.058W
 Grid Ref: 326.64 kmE 184.39 kmN
 Locality: CARDIFF, S GLAMORGAN
 Magnitude: 1.7 ML
 Depth: 10.0 km
 RMS: 0.25 secs
 Quality: C
 STAT CO DIST PHAS WT P HrMn SECS AMPL PERI
 HTL SN 117 13:03 07.01 17 0.32
 HTL SE 117 ES 2 13:03 06.15
 HTL SE 117 13:03 07.79 14 0.18
 HTL SZ 117 EP 2 13:02 53.00
 HSA SZ 79 EP 2 13:02 46.48
 HEX SZ 75 EP 2 13:02 46.52
 HEX SZ 75 ES 2 13:02 55.55
 MCH SN 50 13:02 48.73 19 0.07
 MCH SE 50 ES 1 13:02 48.46
 MCH SE 50 13:02 48.52 71 0.15
 MCH SZ 50 EP 1 13:02 42.16
 HAE SZ 64 EP 1 13:02 44.24
 HCG SZ 95 EP 2 13:02 49.69
 HTR SZ 60 EP 2 13:02 43.76

February 10 1993 Time: 03:37 29.2 UTC
 Lat: 56.938N Lon: 5.144W
 Grid Ref: 208.76 kmE 787.33 kmN
 Locality: LOCH ARKAIG, HIGHLAND
 Magnitude: 0.8 ML
 Depth: 2.8 km
 RMS: 0.13 secs
 Quality: C
 STAT CO DIST PHAS WT P HrMn SECS AMPL PERI
 KNR SZ 17 EP 2 03:37 32.39
 KNR SZ 17 ES 2 03:37 34.82
 KAR SZ 42 EP 3 03:37 36.82
 KAR SZ 42 ES 3 03:37 42.15
 KSB SZ 35 EP 2 C 03:37 35.64
 KSB SZ 35 ES 3 03:37 39.92
 KPL SZ 54 EP 2 C 03:37 38.96
 KPL SN 54 03:37 46.06 4 0.43
 KPL SE 54 ES 2 03:37 45.59
 KPL SE 54 03:37 45.81 6 0.52

February 11 1993 Time: 16:19 3.2 UTC
 Lat: 55.007N Lon: 2.874W
 Grid Ref: 344.13 kmE 568.37 kmN
 Locality: LONGTOWN, CUMBRIA
 Magnitude: 1.0 ML
 Depth: 12.3 km
 RMS: 0.14 secs
 Quality: B
 STAT CO DIST PHAS WT P HrMn SECS AMPL PERI
 ECK SZ 25 EPG 2 C 16:19 08.04
 ECK SZ 25 ESG 3 16:19 11.41
 ESK SZ 40 EPG 2 16:19 10.39
 ESK SN 40 16:19 15.97 14 0.10
 ESK SE 40 ESG 3 16:19 15.42
 ESK SE 40 16:19 15.83 14 0.13
 GCD SZ 70 EPG 2 16:19 15.15
 GCD SZ 70 ESG 3 16:19 24.00
 XDE SZ 68 EPG 3 16:19 15.18
 BBO SN 38 ESG 3 16:19 15.55
 BBO SN 38 16:19 16.95 16 0.14
 BBO SE 38 16:19 16.44 39 0.18
 CKE SZ 49 EPG 2 16:19 11.74
 CSF SZ 67 EPG 3 16:19 14.78
 CSF SZ 67 ESG 3 16:19 22.48
 CDU SZ 78 EPG 3 16:19 16.15
 LMI SE 92 16:19 31.26 5 0.21
 LMI SN 92 ES 4 16:19 29.82
 LMI SN 92 16:19 31.03 5 0.16
 BHH SZ 24 IPG 1 C 16:19 08.08
 BHH SN 24 ISG 1 16:19 11.56
 BHH SN 24 16:19 11.65 38 0.16
 BHH SE 24 16:19 12.10 30 0.13
 BNA SZ 48 EPG 3 16:19 11.86
 BNA SZ 48 ESG 3 16:19 17.87
 BBO SZ 38 IPG 1 D 16:19 10.25
 BTA SZ 17 IPG 1 C 16:19 07.05
 BTA SZ 17 ESG 3 16:19 09.31
 BWH SZ 53 EPG 3 16:19 12.48
 BWH SZ 53 ESG 3 16:19 19.09
 BBH SZ 15 IPG 1 D 16:19 06.76
 BBH SZ 15 ESG 3 16:19 09.04
 BDL SZ 23 EPG 2 16:19 08.07
 BDL SZ 23 ESG 3 16:19 11.32
 GIM SE 130 16:19 41.75 3 0.16
 GIM SN 130 ES 4 16:19 39.42
 GIM SN 130 16:19 40.98 2 0.11

February 11 1993 Time: 19:46 12.6 UTC
 Lat: 58.966N Lon: 1.449E
 Grid Ref: 598.30 kmE 1013.79 kmN
 Locality: NORTHERN NORTH SEA
 Magnitude: 3.8 ML
 Depth: 6.4 km
 RMS: 0.39 secs
 Quality: D
 STAT CO DIST PHAS WT P HrMn SECS AMPL PERI
 EDI SN 439 ES 3 19:47 54.59
 EDI SN 439 19:47 56.70 116 0.24
 EDI SE 439 19:47 56.32 93 0.42
 EAU SZ 455 EP 3 19:47 13.87

PHASE DATA : 1993

TABLE 5 (cont'd)

March 14 1993 Time: 02:48 57.2 UTC Magnitude: 2.4 ML
Lat: 54.430N Lon: 0.992W Depth: 1.8 km
Grid Ref: 465.42 kmE 504.29 kmN RMS: 0.21 secs
Quality: C

Table with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Lists seismic data for Westerdale, N Yorks.

March 15 1993 Time: 14:23 29.1 UTC Magnitude: 2.4 ML
Lat: 53.081N Lon: 1.110W Depth: 0.1 km
Grid Ref: 459.61 kmE 354.17 kmN RMS: 0.22 secs
Quality: C

Table with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Lists seismic data for Farnsfield, Notts.

Table with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Lists seismic data for Westerdale, N Yorks.

March 16 1993 Time: 11:13 6.9 UTC Magnitude: 1.7 ML
Lat: 52.859N Lon: 2.138W Depth: 3.9 km
Grid Ref: 390.72 kmE 329.10 kmN RMS: 0.27 secs
Quality: C

Table with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Lists seismic data for Whitgreave, Staffs.

March 17 1993 Time: 04:50 37.5 UTC Magnitude: 0.8 ML
Lat: 57.109N Lon: 5.393W Depth: 8.6 km
Grid Ref: 194.54 kmE 807.06 kmN RMS: 0.35 secs
Quality: C

Table with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Lists seismic data for Kinloch Hourn, Highland.

March 18 1993 Time: 02:31 43.5 UTC Magnitude: 1.5 ML
Lat: 51.617N Lon: 3.286W Depth: 10.0 km
Grid Ref: 310.98 kmE 191.76 kmN RMS: 0.16 secs
Quality: C

Table with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Lists seismic data for Senghennydd, Glamorgan.

March 18 1993 Time: 21:33 40.9 UTC Magnitude: 1.4 ML
Lat: 53.025N Lon: 2.204W Depth: 6.1 km
Grid Ref: 386.35 kmE 347.56 kmN RMS: 0.03 secs
Quality: B

Table with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Lists seismic data for Stoke-on-Trent, Staffs.

PHASE DATA : 1993

TABLE 5 (cont'd)

March 21 1993 Time: 19:29 35.1 UTC
Lat: 51.061N Lon: 2.841W
Grid Ref: 341.10 kmE 129.51 kmN
Locality: SOMERTON, SOMERSET
Comments: 7KM WEST OF SOMERTON

Table with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include HP07, HP09, HP03, HP02, HP10, HP06, HEX, DYA, HTL, etc.

Table with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include CGH, CCO, CCA, CST, CBW, CME, CGW, CTR, CRA, etc.

March 25 1993 Time: 14:08 7.2 UTC
Lat: 53.258N Lon: 1.842W
Grid Ref: 410.52 kmE 373.49 kmN
Locality: BUXTON, DERBYSHIRE
Comments: COLLAPSE TYPE

Table with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include KBI, WCB, WME, LHO, KWE, etc.

March 24 1993 Time: 10:02 20.8 UTC
Lat: 49.215N Lon: 2.172W
Grid Ref: 387.46 kmE -76.09 kmN
Locality: ST BRELADE, JERSEY

Table with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include JRS, JLP, JSA, JVM, JRS, etc.

March 26 1993 Time: 01:50 9.1 UTC
Lat: 54.871N Lon: 1.368W
Grid Ref: 440.52 kmE 553.16 kmN
Locality: SUNDERLAND, TYNE & WEAR
Comments: C/F

Table with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include XDE, CKE, CSF, CDU, LMI, LCP, LWH, GCD, ESK, BHH, BNA, BBO, BTA, etc.

March 24 1993 Time: 11:47 52.2 UTC
Lat: 52.620N Lon: 1.006W
Grid Ref: 467.30 kmE 302.94 kmN
Locality: KEYHAM, LEICESTERSHIRE

Table with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include MCH, HAEB, HGH, HTR, HLM, CWF, etc.

March 25 1993 Time: 02:58 24.9 UTC
Lat: 50.111N Lon: 5.180W
Grid Ref: 172.66 kmE 28.31 kmN
Locality: CONSTANTINE, CORNWALL

Table with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include CR2, CGH, CCO, CCA, CST, CBW, CME, CGW, CTR, etc.

March 26 1993 Time: 03:37 4.4 UTC
Lat: 57.119N Lon: 5.544W
Grid Ref: 185.49 kmE 808.63 kmN
Locality: KNOYDART, HIGHLAND

Table with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include KPL, KNR, KNR, KAR, KSB, KSB, KPL, KAC, etc.

March 25 1993 Time: 02:58 36.8 UTC
Lat: 50.111N Lon: 5.178W
Grid Ref: 172.79 kmE 28.34 kmN
Locality: CONSTANTINE, CORNWALL

Table with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include CR2, CR2, CR2, CR2, etc.

Table with columns: STA, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include STA: SUE, HYA, ASK, LRW, SAN, YEL.

Table with columns: STA, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include STA: WCB, WME, WLF, YRC, WPM, YLL, YRH, WCB, YRE, YRE, SSP, SSS, HAE, HLM, HLM, HTR, SBD, SBD, HCG, HCG, BTA, BTA, BTA, BBH, BDL, GIM, GIM, GIM, GCD, XDE, BBO, BBO, BBO, CKE, CSF, CSF, CDU, CDU, LMI, LMI, LMI, WIM, CWF, CWF, CWF, CWF, KWE, KWE, KBI, HPK, HPK, HPK, LRN, LWH, MCH, MCH, MCH, MCH.

June 29 1993 Time: 00:45 58.2 UTC Magnitude: 2.8 ML
Lat: 58.991N Lon: 1.392E Depth: 21.8 km
Grid Ref: 594.85 kmE 1016.40 kmN RMS: 0.39 secs
Locality: NORTHERN NORTH SEA Quality: D

Table with columns: STA, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include STA: KPL, EDI, EDI, EDI, ELO, EDR, EDR, MCD, MFI, MFI, FOO, FOO, KMY, ODD1, LRW, LRW, LRW, SAN, SAN, WAL, YEL, YEL.

June 29 1993 Time: 00:45 58.2 UTC Magnitude: 2.8 ML
Lat: 58.991N Lon: 1.392E Depth: 21.8 km
Grid Ref: 594.85 kmE 1016.40 kmN RMS: 0.39 secs
Locality: NORTHERN NORTH SEA Quality: D

Table with columns: STA, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include STA: SSP, SSP, HAE, HLM, HLM, HTR, SBD, SBD, HCG, HCG, BTA, BTA, BTA, BBH, BDL, GIM, GIM, GIM, GCD, XDE, BBO, BBO, BBO, CKE, CSF, CSF, CDU, CDU, LMI, LMI, LMI, WIM, CWF, CWF, CWF, CWF, KWE, KWE, KBI, HPK, HPK, HPK, LRN, LWH, MCH, MCH, MCH, MCH.

June 29 1993 Time: 04:03 48.8 UTC Magnitude: 2.0 ML
Lat: 53.036N Lon: 2.213W Depth: 4.1 km
Grid Ref: 385.71 kmE 348.82 kmN RMS: 0.16 secs
Locality: STOKE-ON-TRENT, STAFFS Quality: C
Comments: FELT TALKER PIT'S AREA Intensity: 5+

Table with columns: STA, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include STA: CWF, CWF, CWF, CWF, KSY, KWE, KWE, KBI, WLF, YRC, WPM, YLL, YRE, YRE, YRH, WCB, MCH, MCH, MCH, SBD, HAE, HAE, HTR, HTR, HLM, HLM, CDU, LMI, LMI, WCB.

June 29 1993 Time: 04:03 48.8 UTC Magnitude: 2.0 ML
Lat: 53.036N Lon: 2.213W Depth: 4.1 km
Grid Ref: 385.71 kmE 348.82 kmN RMS: 0.16 secs
Locality: STOKE-ON-TRENT, STAFFS Quality: C
Comments: FELT TALKER PIT'S AREA Intensity: 5+

Table with columns: STA, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include STA: LMI, LMI, LMI, WIM, CWF, CWF, CWF, CWF, KWE, KWE, KBI, HPK, HPK, HPK, LRN, LWH, MCH, MCH, MCH, MCH.

June 30 1993 Time: 05:59 56.8 UTC Magnitude: 2.2 ML
Lat: 53.313N Lon: 2.852W Depth: 8.9 km
Grid Ref: 343.21 kmE 379.97 kmN RMS: 0.27 secs
Locality: ELLESMERE PRT, CHESHIRE Quality: C

Table with columns: STA, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include STA: WCB, WCB.

July 2 1993 Time: 11:15 16.4 UTC Magnitude: 0.2 ML
Lat: 57.187N Lon: 5.278W Depth: 6.7 km
Grid Ref: 201.95 kmE 815.45 kmN RMS: 0.05 secs
Locality: GLEN SHIEL, HIGHLAND Quality: C

Table with columns: STA, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include STA: KPL, KPL, KPL, KSB, KSB, KPL, KAC, KAC.

July 4 1993 Time: 01:56 32.7 UTC Magnitude: 1.9 ML
Lat: 54.155N Lon: 1.473W Depth: 1.3 km
Grid Ref: 434.41 kmE 473.35 kmN RMS: 0.18 secs
Locality: RIPON, NORTH YORKSHIRE Quality: C

Table with columns: STA, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include STA: CWF.

PHASE DATA : 1993

TABLE 5 (cont'd)

Table listing seismic station data for July 1993. Columns include station name (e.g., CWF, KSY, LMI), station type (SN, SE, SZ, EP, ES, IP), magnitude, time, and other parameters like depth and quality.

Continuation of seismic station data from the previous table, listing stations such as EDR, WTS, ENN, ABH, RUP, MUD, KMY, BHH, BBH, BWH, BTA, BNA, BHH, EDI, EAU, EBL, ESY, EAB, EBH, ELO, KMY, KMY, KWE, KBI, CWF, and SN.

July 5 1993 Time: 16:32 26.2 UTC Magnitude: -0.1 ML
Lat: 54.247N Lon: 2.960W Depth: 19.1 km
Grid Ref: 337.47 kmE 483.94 kmN RMS: 0.39 secs
Locality: HAVERTHWAITE, CUMBRIA Quality: D
Comments: MAGNITUDE FROM VERTICALS

Table listing seismic station data for July 5, 1993. Columns include STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, and PERI.

July 6 1993 Time: 05:42 51.6 UTC Magnitude: 0.4 ML
Lat: 52.272N Lon: 2.596W Depth: 13.4 km
Grid Ref: 359.35 kmE 263.97 kmN RMS: 0.17 secs
Locality: TENBURY WELLS, HER&WOR Quality: C

Table listing seismic station data for July 6, 1993. Columns include STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, and PERI.

July 7 1993 Time: 11:48 6.6 UTC Magnitude: 4.0 ML
Lat: 55.551N Lon: 4.633E Depth: 0.3 km
Grid Ref: 818.10 kmE 648.62 kmN RMS: 0.24 secs
Locality: CENTRAL NORTH SEA Quality: C

Table listing seismic station data for July 7, 1993. Columns include STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, and PERI.

July 8 1993 Time: 06:18 35.3 UTC Magnitude: 1.5 ML
Lat: 54.320N Lon: 3.118W Depth: 8.5 km
Grid Ref: 327.26 kmE 492.20 kmN RMS: 0.13 secs
Locality: CONISTON, CUMBRIA Quality: B
Comments: FELT KIRKBY-IN-FURNESS Intensity: 2+

Table listing seismic station data for July 8, 1993. Columns include STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, and PERI.

July 8 1993 Time: 22:34 56.5 UTC Magnitude: 0.4 ML
Lat: 55.921N Lon: 3.081W Depth: 2.4 km
Grid Ref: 332.46 kmE 670.33 kmN RMS: 0.13 secs
Locality: MUSSELBURGH, LOTHIAN Quality: B
Comments: C/F

Table listing seismic station data for July 8, 1993. Columns include STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, and PERI.

July 13 1993 Time: 18:30 20.8 UTC Magnitude: 0.0 ML
Lat: 50.111N Lon: 5.180W Depth: 6.9 km
Grid Ref: 172.66 kmE 28.41 kmN RMS: 0.02 secs
Quality: B
Locality: CONSTANTINE, CORNWALL
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI

July 13 1993 Time: 19:00 58.2 UTC Magnitude: 0.6 ML
Lat: 50.109N Lon: 5.176W Depth: 7.0 km
Grid Ref: 172.92 kmE 28.10 kmN RMS: 0.02 secs
Quality: B
Locality: CONSTANTINE, CORNWALL
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI

July 15 1993 Time: 03:44 20.2 UTC Magnitude: 0.7 ML
Lat: 55.927N Lon: 3.075W Depth: 1.3 km
Grid Ref: 332.87 kmE 670.99 kmN RMS: 0.10 secs
Quality: B
Locality: MUSSELBURGH, LOTHIAN
Comments: C/F
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI

July 16 1993 Time: 20:00 13.1 UTC Magnitude: 0.6 ML
Lat: 55.924N Lon: 3.069W Depth: 0.6 km
Grid Ref: 333.20 kmE 670.61 kmN RMS: 0.02 secs
Quality: B
Locality: MUSSELBURGH, LOTHIAN
Comments: C/F
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI

July 17 1993 Time: 11:06 51.8 UTC Magnitude: 1.4 ML
Lat: 54.189N Lon: 2.374W Depth: 4.7 km
Grid Ref: 375.63 kmE 477.15 kmN RMS: 0.15 secs
Quality: B
Locality: CHAPEL-LE-DALE, N YORKS
Comments: 7KM NE OF INGLETION
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI

GIM SZ 137 EP 3 11:07 14.50
GIM SN 137 11:07 31.38 7 0.13
GIM SE 137 11:07 31.65 5 0.10
XDE SZ 81 IP 1 C 11:07 05.49
BBO SN 83 ES 2 11:07 15.87
BBO SN 83 11:07 16.38 5 0.13
BBO SE 83 11:07 16.25 7 0.15
CKE SZ 65 EP 2 11:07 03.02
CSF SZ 64 EP 2 11:07 02.74
CSF SZ 64 ES 3 11:07 10.35
CDU SZ 56 IP 1 D 11:07 01.42
BHH SZ 115 EP 3 11:07 11.23
BHH SN 115 ES 3 11:07 24.54
BHH SN 115 11:07 25.51 16 0.29
BHH SE 115 11:07 25.19 13 0.31
BBO SZ 83 IP 1 D 11:07 05.96
BBH SZ 111 EP 2 11:07 10.68
BDL SZ 78 EP 2 D 11:07 05.32
HPK SZ 56 EP 3 11:07 01.71
HPK SN 56 ES 3 11:07 08.11
HPK SN 56 11:07 10.13 26 0.18
HPK SE 56 11:07 09.25 20 0.18
LRN SZ 46 IP 1 C 11:06 59.89
LRN SZ 46 ES 2 11:07 05.55
ESK SZ 136 EP 4 11:07 00.000
ESK SN 136 11:07 31.38 3 0.09
ESK SE 136 11:07 31.11 4 0.20
XSO SZ 145 ES 3 11:07 32.63
ECK SZ 121 EP 3 11:07 12.03
GCD SZ 126 EP 3 11:07 12.88
XAL SZ 76 EP 3 11:07 05.31
LMI SZ 61 EP 3 11:07 02.58
LMI SN 61 11:07 10.09 12 0.13
LMI SE 61 ES 3 11:07 09.25
LMI SE 61 11:07 10.78 16 0.16

July 18 1993 Time: 00:37 19.6 UTC Magnitude: 0.8 ML
Lat: 50.109N Lon: 5.178W Depth: 6.8 km
Grid Ref: 172.82 kmE 28.12 kmN RMS: 0.02 secs
Quality: B
Locality: CONSTANTINE, CORNWALL
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI

July 18 1993 Time: 00:38 50.6 UTC Magnitude: -0.2 ML
Lat: 50.111N Lon: 5.183W Depth: 6.8 km
Grid Ref: 172.47 kmE 28.32 kmN RMS: 0.02 secs
Quality: B
Locality: CONSTANTINE, CORNWALL
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI

July 18 1993 Time: 00:45 49.4 UTC Magnitude: 0.3 ML
Lat: 50.110N Lon: 5.176W Depth: 7.0 km
Grid Ref: 172.92 kmE 28.23 kmN RMS: 0.02 secs
Quality: B
Locality: CONSTANTINE, CORNWALL
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI

July 19 1993 Time: 02:20 29.0 UTC Magnitude: -0.5 ML
Lat: 50.107N Lon: 5.174W Depth: 6.9 km
Grid Ref: 173.10 kmE 27.89 kmN RMS: 0.01 secs
Locality: CONSTANTINE, CORNWALL
Quality: C

July 19 1993 Time: 07:53 1.5 UTC Magnitude: -0.2 ML
Lat: 50.110N Lon: 5.177W Depth: 7.4 km
Grid Ref: 172.90 kmE 28.21 kmN RMS: 0.02 secs
Locality: CONSTANTINE, CORNWALL
Quality: B

July 19 1993 Time: 04:35 12.7 UTC Magnitude: 0.9 ML
Lat: 50.109N Lon: 5.178W Depth: 7.0 km
Grid Ref: 172.78 kmE 28.16 kmN RMS: 0.01 secs
Locality: CONSTANTINE, CORNWALL
Quality: B

July 19 1993 Time: 09:55 48.9 UTC Magnitude: -0.2 ML
Lat: 50.111N Lon: 5.181W Depth: 7.8 km
Grid Ref: 172.56 kmE 28.32 kmN RMS: 0.04 secs
Locality: CONSTANTINE, CORNWALL
Quality: B

July 19 1993 Time: 04:53 50.5 UTC Magnitude: 0.1 ML
Lat: 50.110N Lon: 5.181W Depth: 7.2 km
Grid Ref: 172.59 kmE 28.18 kmN RMS: 0.03 secs
Locality: CONSTANTINE, CORNWALL
Quality: B

July 19 1993 Time: 16:26 53.6 UTC Magnitude: -0.2 ML
Lat: 50.110N Lon: 5.173W Depth: 7.2 km
Grid Ref: 173.15 kmE 28.25 kmN RMS: 0.03 secs
Locality: CONSTANTINE, CORNWALL
Quality: B

July 19 1993 Time: 05:12 2.2 UTC Magnitude: -0.6 ML
Lat: 50.110N Lon: 5.177W Depth: 6.7 km
Grid Ref: 172.85 kmE 28.19 kmN RMS: 0.01 secs
Locality: CONSTANTINE, CORNWALL
Quality: B

July 19 1993 Time: 17:24 5.3 UTC Magnitude: 1.0 ML
Lat: 50.109N Lon: 5.179W Depth: 7.0 km
Grid Ref: 172.73 kmE 28.16 kmN RMS: 0.01 secs
Locality: CONSTANTINE, CORNWALL
Quality: B

July 19 1993 Time: 06:20 29.7 UTC Magnitude: -0.3 ML
Lat: 50.110N Lon: 5.173W Depth: 7.5 km
Grid Ref: 173.14 kmE 28.22 kmN RMS: 0.02 secs
Locality: CONSTANTINE, CORNWALL
Quality: B

July 19 1993 Time: 17:26 44.6 UTC Magnitude: -0.3 ML
Lat: 50.108N Lon: 5.177W Depth: 7.0 km
Grid Ref: 172.89 kmE 28.04 kmN RMS: 0.02 secs
Locality: CONSTANTINE, CORNWALL
Quality: B

PHASE DATA : 1993

TABLE 5 (cont'd)

CGH SZ 6 EP 2 D 17:26 46.23	CR2 SE 6	03:34 29.65	9	0.05
CCO SZ 3 ES 2 17:26 46.97	CME SZ 7 IP	D 03:34 28.45		
CST SZ 10 EP 1 C 17:26 46.64	CME SN 7 ES	03:34 29.77		
CST SZ 10 ES 17:26 48.20	CRA SZ 6 EP 2	03:34 28.29		
CBW SZ 6 EP C 17:26 46.23	CGH SZ 7 IP	D 03:34 28.31		
CBW SZ 6 ES 17:26 47.48	CCO SZ 3 EP	D 03:34 28.06		
	CCA SZ 9 IP	D 03:34 28.65		
	CCA SZ 9 ES	03:34 30.13		
	CST SZ 10 IP	D 03:34 28.72		
	CBW SZ 7 IP	C 03:34 28.29		
July 19 1993 Time: 17:44 8.2 UTC	July 20 1993 Time: 03:48 24.8 UTC			
Lat: 50.110N Lon: 5.176W	Lat: 52.937N Lon: 5.486W			
Grid Ref: 172.94 kmE 28.25 kmN	Grid Ref: 165.74 kmE 343.46 kmN			
Locality: CONSTANTINE, CORNWALL	Locality: IRISH SEA			
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI	STAT CO DIST PHAS WT P HrMn SECS AMPL PERI			
CR2 SN 6 ES 1 17:44 11.17	SSP SZ 171 EP 2 03:48 52.10			
CR2 SN 6 17:44 11.21 7 0.09	SSP SN 171 03:49 13.59	8	0.21	
CR2 SE 6 17:44 11.24 5 0.07	SSP SE 171 ES 2 03:49 11.71			
CGH SZ 7 ES 11:22 10.64	SSP SE 171 03:49 13.98			0.18
CCO SZ 3 ES 17:44 10.28	HCG SZ 142 EP 2 03:48 48.03			
CST SZ 10 EP C 17:44 11.80	SBD SZ 150 EP 2 03:48 48.89			
CST SZ 10 ES 17:44 11.11	SBD SZ 150 ES 2 03:49 06.16			
CBW SZ 6 ES 17:44 11.20	DLF SZ 81 EP 1 D 03:48 38.14			
CTR SN 6 ES 1 17:44 11.38	DLF SN 81 ES 2 03:48 47.55			
CME SN 7 ES 17:44 11.15	DLF SN 81 03:48 48.95	22	0.13	
CRA SN 6 ES 17:44 11.15	DLF SE 81 03:48 48.40	32	0.09	
	DMU SZ 143 EP 1 03:48 47.91			
July 20 1993 Time: 00:17 35.0 UTC	Depth: 7.2 km			
Lat: 50.110N Lon: 5.180W	RMS: 0.02 secs			
Grid Ref: 172.65 kmE 28.24 kmN	Quality: B			
Locality: CONSTANTINE, CORNWALL				
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI				
CR2 SZ 6 IP C 00:17 36.70	DCN SZ 128 EP 1 03:48 45.64			
CR2 SN 6 ES 00:17 37.97	WLF SZ 83 EP 1 C 03:48 38.48			
CR2 SN 6 00:17 38.00 14 0.09	YRC SZ 70 IP 1 D 03:48 36.64			
CR2 SE 6 00:17 38.01 20 0.06	WPM SZ 112 EP 2 03:48 43.13			
CGH SZ 7 ES 00:17 38.02	YLL SZ 91 EP 2 03:48 39.91			
CCO SZ 3 ES 00:17 37.48	YLL SZ 91 ES 2 03:48 50.15			
CCA SZ 9 EP C 00:17 37.03	YRE SZ 71 EP 3 03:48 36.75			
CCA SZ 9 ES 00:17 38.51	YRH SZ 59 EP 2 03:48 34.78			
CST SZ 10 IP C 00:17 37.10	YRH SZ 59 ES 2 03:48 41.49			
CBW SZ 6 IP C 00:17 36.66	WFB SZ 102 EP 1 03:48 41.67			
CBW SZ 6 ES 00:17 37.94	WIM SZ 145 EP 1 03:48 47.75			
CME SZ 7 IP C 00:17 36.82	HPE SZ 121 ES 3 03:48 58.78			
CME SN 7 ES 00:17 38.15	WME SZ 94 EP 3 03:48 40.38			
CGW SZ 3 EP 2 00:17 36.36	WCB SZ 80 IP 1 C 03:48 38.03			
CTR SZ 6 IP C 00:17 36.69	WCB SN 80 03:48 49.37	9	0.12	
CRA SZ 6 IP C 00:17 36.68	WCB SE 80 ES 2 03:48 47.76			
	WCB SE 80 03:48 49.22	9	0.23	
July 20 1993 Time: 00:17 45.8 UTC	July 20 1993 Time: 11:36 33.3 UTC			
Lat: 50.110N Lon: 5.177W	Lat: 50.109N Lon: 5.178W			
Grid Ref: 172.89 kmE 28.21 kmN	Grid Ref: 172.79 kmE 28.16 kmN			
Locality: CONSTANTINE, CORNWALL	Locality: CONSTANTINE, CORNWALL			
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI	STAT CO DIST PHAS WT P HrMn SECS AMPL PERI			
CR2 SZ 6 IP C 00:17 47.58	CR2 SZ 6 IP C 11:36 34.90			
CR2 SN 6 ES 00:17 48.85	CR2 SN 6 ES 11:36 36.16			
CR2 SN 6 00:17 48.87 3 0.07	CGH SZ 7 IP C 11:36 34.88			
CR2 SE 6 00:17 48.92 7 0.06	CCO SZ 3 IP D 11:36 34.58			
CGH SZ 7 ES 2 00:17 48.91	CCA SZ 9 IP D 11:36 35.22			
CCO SZ 3 ES 1 00:17 48.35	CCA SZ 9 ES 11:36 36.70			
CST SZ 10 ES 00:17 49.52	CST SZ 10 IP C 11:36 35.30			
CBW SZ 6 EP C 00:17 47.56	CST SZ 10 ES 11:36 36.83			
CBW SZ 6 ES 00:17 48.83	CBW SZ 6 IP C 11:36 34.87			
CME SN 7 ES 00:17 49.05	CBW SZ 6 ES 11:36 36.10			
	CME SZ 8 IP C 11:36 35.02			
July 20 1993 Time: 00:17 57.0 UTC	CME SZ 8 ES 11:36 36.35			
Lat: 50.110N Lon: 5.179W	CGW SZ 3 EP 11:36 34.58			
Grid Ref: 172.73 kmE 28.25 kmN	CTR SZ 7 IP C 11:36 34.89			
Locality: CONSTANTINE, CORNWALL	CRA SZ 6 IP C 11:36 34.88			
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI	CSA SZ 34 EP 4 11:36 39.11			
CR2 SZ 6 IP C 00:17 58.62	CSA SZ 34 11:36 39.16	20	0.08	
CR2 SN 6 ES 00:17 59.90				
CR2 SN 6 00:17 59.93 31 0.07	July 20 1993 Time: 11:36 38.8 UTC			
CR2 SE 6 00:17 59.95 22 0.05	Lat: 50.111N Lon: 5.181W			
CGH SZ 7 ES 2 00:17 59.94	Grid Ref: 172.58 kmE 28.35 kmN			
CCO SZ 3 EP C 00:17 58.33	Locality: CONSTANTINE, CORNWALL			
CCA SZ 9 IP C 00:17 58.95	STAT CO DIST PHAS WT P HrMn SECS AMPL PERI			
CST SZ 10 EP C 00:17 59.01	CR2 SZ 6 IP C 11:36 40.40			
CST SZ 10 ES 00:18 00.56	CR2 SN 6 ES 11:36 41.65			
CBW SZ 6 IP C 00:17 58.61	CGH SZ 7 ES 11:36 41.72			
CBW SZ 6 ES 00:17 59.87	CGH SZ 7 11:36 41.76	35	0.05	
CME SZ 7 IP C 00:17 58.74	CCO SZ 3 EP 1 D 11:36 40.16			
CME SN 7 ES 00:18 00.09	CCA SZ 9 EP D 11:36 40.74			
CTR SZ 6 IP C 00:17 58.62	CCA SZ 9 ES 11:36 42.22			
CRA SZ 6 IP C 00:17 58.61	CST SZ 10 IP C 11:36 40.80			
	CST SZ 10 ES 11:36 42.33			
July 20 1993 Time: 03:34 26.7 UTC	CBW SZ 6 IP C 11:36 40.39			
Lat: 50.110N Lon: 5.183W	CBW SZ 6 ES 11:36 41.62			
Grid Ref: 172.46 kmE 28.23 kmN	CME SZ 7 EP D 11:36 40.54			
Locality: CONSTANTINE, CORNWALL	CME SN 7 ES 11:36 41.85			
STAT CO DIST PHAS WT P HrMn SECS AMPL PERI	CGW SZ 3 EP D 11:36 40.06			
CR2 SZ 6 IP D 03:34 28.32	CTR SZ 6 IP C 11:36 40.40			
CR2 SN 6 ES 03:34 29.58				
CR2 SN 6 03:34 29.61 13 0.06				

PHASE DATA : 1993

TABLE 5 (cont'd)

Table with 10 columns: Station Name, Code, Distance, Phase, Weight, Period, Time, Magnitude, Depth, RMS. Rows include stations XAL, XSO, BHH, BNA, BBO, BTA.

Table with 10 columns: Station Name, Code, Distance, Phase, Weight, Period, Time, Magnitude, Depth, RMS. Rows include stations CPZ, CME, CGW, CTR, CRA, CRQ.

August 12 1993 Time: 16:39 39.2 UTC
Lat: 54.583N Lon: 3.779W
Grid Ref: 285.05 kmE 522.35 kmN
Locality: WHITEHAVEN, CUMBRIA
Comments: OFFSHORE LOCATION

Main data table for August 12 1993 with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include stations GIM, GCD, XDE, CDU, LMI, LMI, LMI, CSF, CSF, BHH, BHH, BHH, BNA, BNA, BBO, BBO, BTA, BTA, BWH, BWH, BBH, BDL, BTA, BTA, GAL, GAL, GAL, ESK, ESK, ESK, XAL, XSO, ECK, WCB, WCB, WCB.

August 13 1993 Time: 20:45 6.3 UTC
Lat: 50.103N Lon: 5.169W
Grid Ref: 173.41 kmE 27.39 kmN
Locality: CONSTANTINE, CORNWALL

Main data table for August 13 1993 with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include stations CR2, CR2, CR2, CR2, CGH, CCO, CCA, CST, CBW, CBW, CME, CGW, CTR.

August 14 1993 Time: 05:20 5.9 UTC
Lat: 50.110N Lon: 5.176W
Grid Ref: 172.93 kmE 28.19 kmN
Locality: CONSTANTINE, CORNWALL

Main data table for August 14 1993 with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include stations CR2, CR2, CR2, CR2, CGH, CCO, CCA, CST, CST, CBW, CME, CME, CGW, CTR, CTR, CRA.

August 14 1993 Time: 17:57 55.5 UTC
Lat: 50.110N Lon: 5.176W
Grid Ref: 172.96 kmE 28.17 kmN
Locality: CONSTANTINE, CORNWALL

Main data table for August 14 1993 with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include stations CR2, CR2, CR2, CR2, CGH, CCO, CCO, CCA, CST, CST, CBW, CBW, CME, CME, CGW, CTR, CTR, CRA.

August 13 1993 Time: 16:43 42.7 UTC
Lat: 50.110N Lon: 5.178W
Grid Ref: 172.82 kmE 28.21 kmN
Locality: CONSTANTINE, CORNWALL

Main data table for August 13 1993 with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include stations CMA, CMA, CMA, CMS, CR2, CR2, CSA, CGH, CCO, CCA, CCA, CCA, CST, CST, CBW.

August 14 1993 Time: 19:14 56.1 UTC
Lat: 52.889N Lon: 3.502W
Grid Ref: 298.93 kmE 333.43 kmN
Locality: BALA, GWYNEDD
Comments: 7KM SE OF BALA

Main data table for August 14 1993 with columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include stations WCB, WCB, WCB, WME, WLF, YRC, WPM, WPM, YLL.

PHASE DATA : 1993

TABLE 5 (cont'd)

September 21 1993 Time: 09:17 6.8 UTC
Lat: 53.041N Lon: 2.198W
Grid Ref: 386.75 kmE 349.39 kmN
Locality: STROKE-ON-TRENT, STAFFS
Quality: B

Table with 12 columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include stations like CWF, KWE, SSP, HCG, HLM, HTR, SBD, WCB, YLL, YRH, WFB, MCH.

September 22 1993 Time: 01:00 55.6 UTC
Lat: 53.121N Lon: 1.059W
Grid Ref: 462.98 kmE 358.61 kmN
Locality: BILSTHORPE, NOTTS
Comments: C/F
Quality: C

Table with 12 columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include stations like CWF, KSY, SSP, HAE, SBD, HPK, LHO.

September 23 1993 Time: 00:54 22.2 UTC
Lat: 56.063N Lon: 3.986W
Grid Ref: 276.34 kmE 687.29 kmN
Locality: BANNOCKBURN, CENTRAL
6KM SW OF BANNOCKBURN
Quality: C

Table with 12 columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include stations like EBH, EAB, EAB, PCO, PGB, PGB.

September 23 1993 Time: 02:37 44.8 UTC
Lat: 56.129N Lon: 3.730W
Grid Ref: 292.46 kmE 694.24 kmN
Locality: CLACKMANNAN, CENTRAL
Comments: C/F
Quality: B

Table with 12 columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include stations like EAU, EAU, EBL, ESY, EAB, EAB, EBH, EBH, EDU, EDU, ELO, ELO, PGB, PGB, PGB, PGB, PCA, PMS.

Table with 12 columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include stations like PCO, EDI, EDI, EDI, EDI.

September 23 1993 Time: 02:44 13.8 UTC
Lat: 56.128N Lon: 3.738W
Grid Ref: 291.98 kmE 694.16 kmN
Locality: CLACKMANNAN, CENTRAL
Comments: C/F
Quality: B

Table with 12 columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include stations like EDU, ELO, ELO, EAU, EBL, EAB, EAB, EBH, EBH, EDI, EDI, EDI, EDI, PGB, PGB, PGB, PCO, PCO.

September 23 1993 Time: 17:21 55.3 UTC
Lat: 55.236N Lon: 3.489W
Grid Ref: 305.31 kmE 594.59 kmN
Locality: JOHNSTONEBRIDGE, D & G
Quality: C

Table with 12 columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include stations like BHH, BHH, BHH, BWH, BWH, ESK, ESK, ESK, ESK, ECK, ECK.

September 23 1993 Time: 18:36 25.5 UTC
Lat: 55.236N Lon: 3.488W
Grid Ref: 305.38 kmE 594.55 kmN
Locality: JOHNSTONEBRIDGE, D & G
Quality: D

Table with 12 columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include stations like BHH, BHH, BHH, BWH, BWH, ESK, ESK, ESK, ESK, ECK, ECK.

September 23 1993 Time: 19:04 36.6 UTC
Lat: 57.028N Lon: 5.791W
Grid Ref: 169.95 kmE 799.40 kmN
Locality: MALLAIG, HIGHLAND
Quality: C

Table with 12 columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include stations like KPL, KPL, KPL, KNR, KAR, KAR, KSB, KSB, KAC, KPL.

September 23 1993 Time: 19:55 56.5 UTC
Lat: 55.237N Lon: 3.490W
Grid Ref: 305.28 kmE 594.68 kmN
Locality: JOHNSTONEBRIDGE, D & G
Quality: C

Table with 12 columns: STAT, CO, DIST, PHAS, WT, P, HrMn, SECS, AMPL, PERI. Rows include stations like BHH, BHH.

PHASE DATA : 1993

TABLE 5 (cont'd)

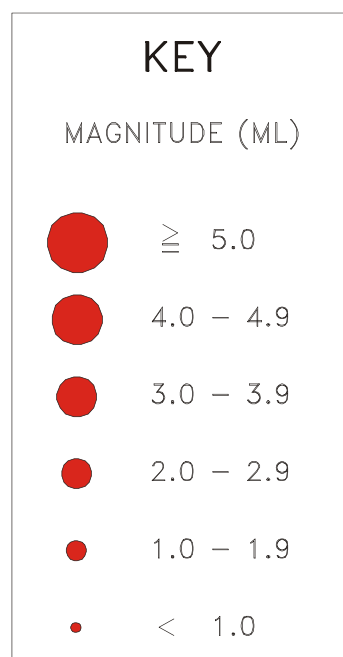
MCH	SE	60	ES	2		21:21	16.22		
MCH	SE	60				21:21	19.17	54	0.10
MCH	SZ	60	IP	1	C	21:21	08.82		
SBD	SZ	147	EP	2		21:21	22.77		
HAE	SZ	87	EP	1		21:21	13.25		
HCG	SZ	80	EP	2		21:21	12.25		
HGH	SZ	55	IP	1	D	21:21	08.25		
HTR	SZ	58	IP		C	21:21	08.54		
HLM	SZ	113	EP	3		21:21	17.45		
SMD	SZ	69	EP	2		21:21	10.36		
SWK	SZ	107	EP	2		21:21	16.80		
SSW	SZ	127	EP	2		21:21	20.20		

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 (Lleyrn)	0.00	5.40	1.68
	2.00	6.05	
	3.00	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

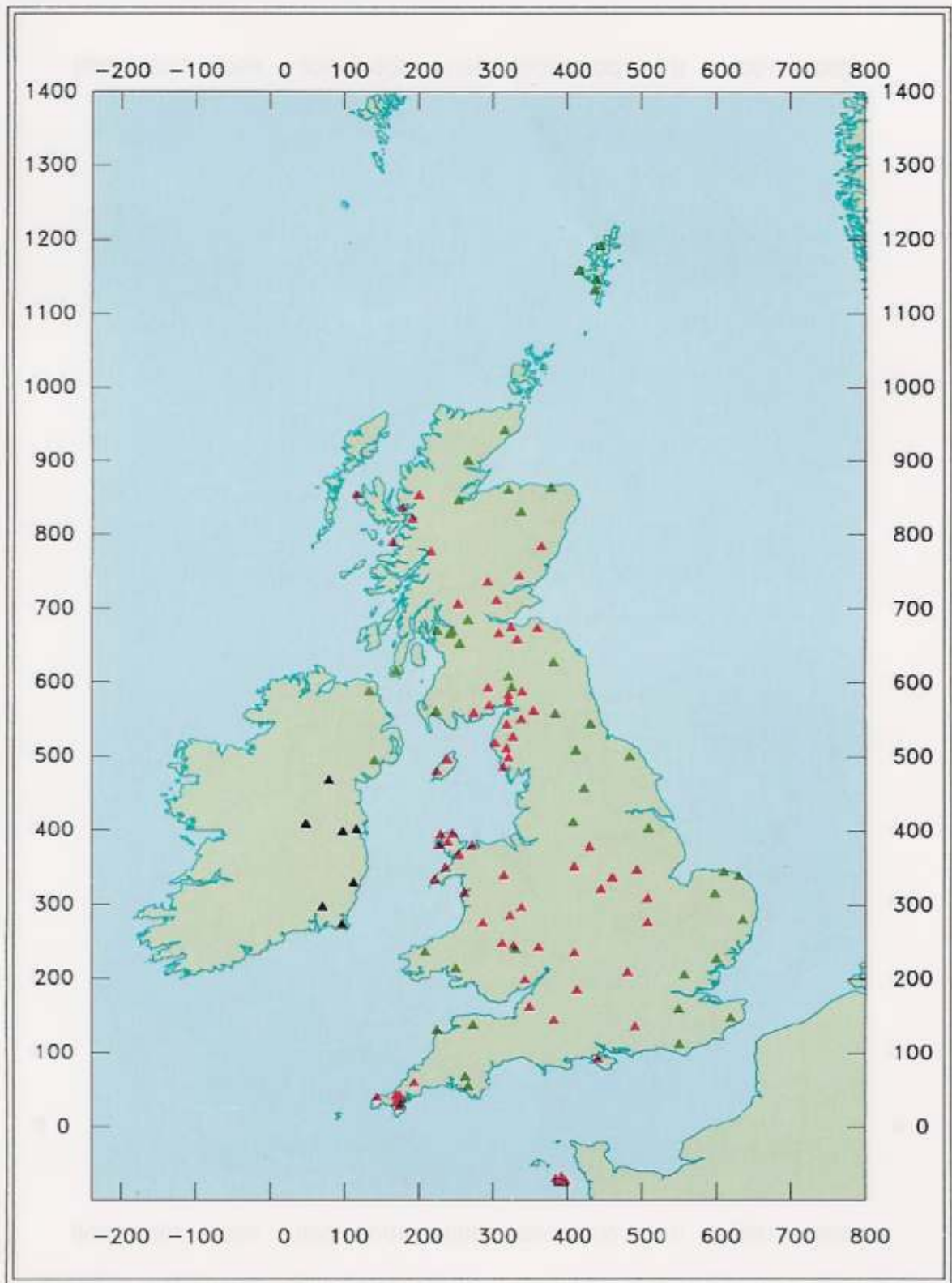


Figure 1. Seismograph network operational in December 1993. Colour coding shows the standard stations (green), rapid access stations (red) and DIAS stations (black).

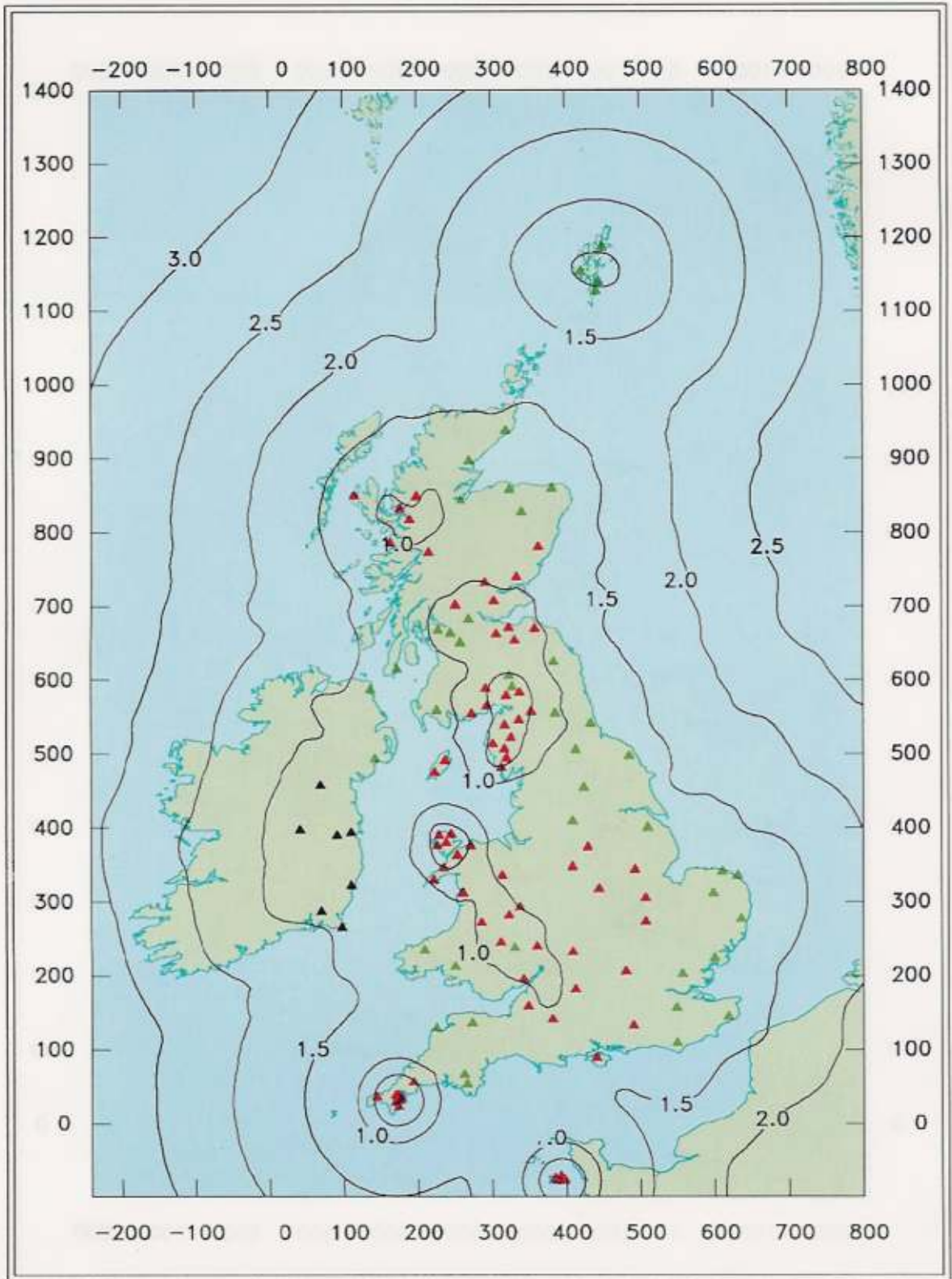


Figure 2. Earthquake detection capability in December 1993. Contour values are Richter local magnitude (ML) for 4 nanometres of noise (average) and S-wave amplitudes twice that at the fourth nearest station.

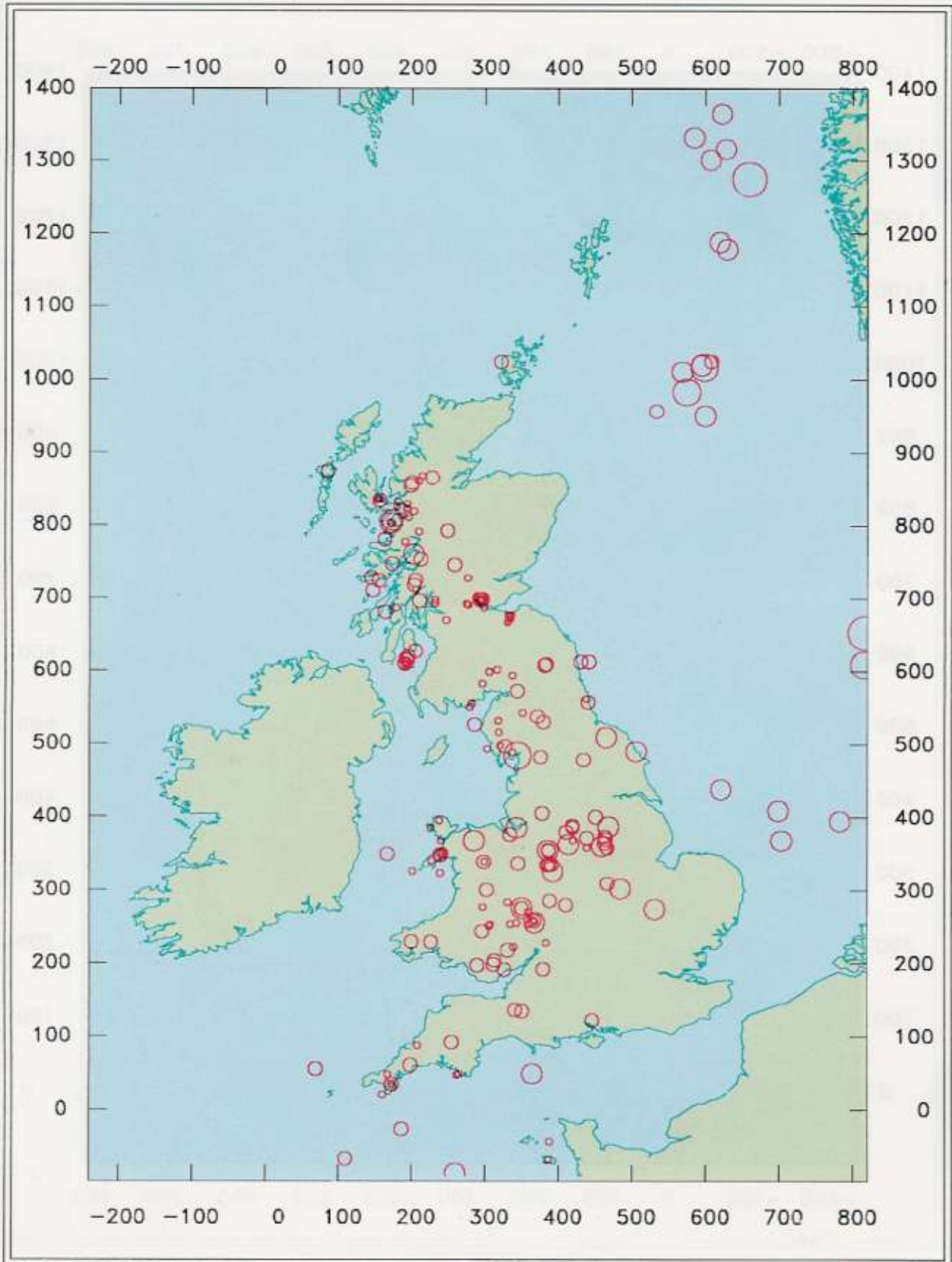


Figure 3. Epicentres of all UK earthquakes located in 1993.

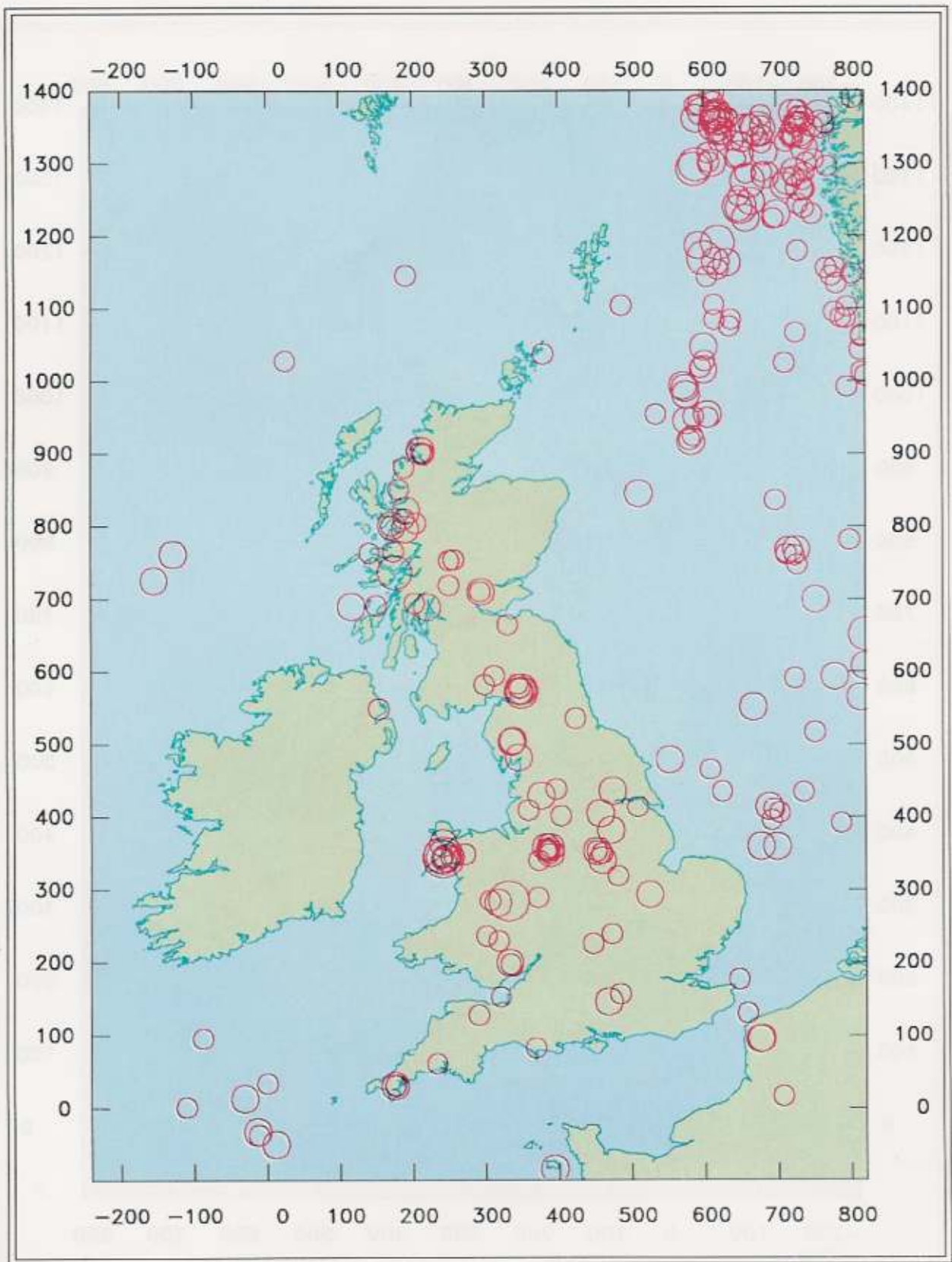


Figure 4. Epicentres of earthquakes with magnitudes 2.5 ML or greater, for the period 1979 to 1993.

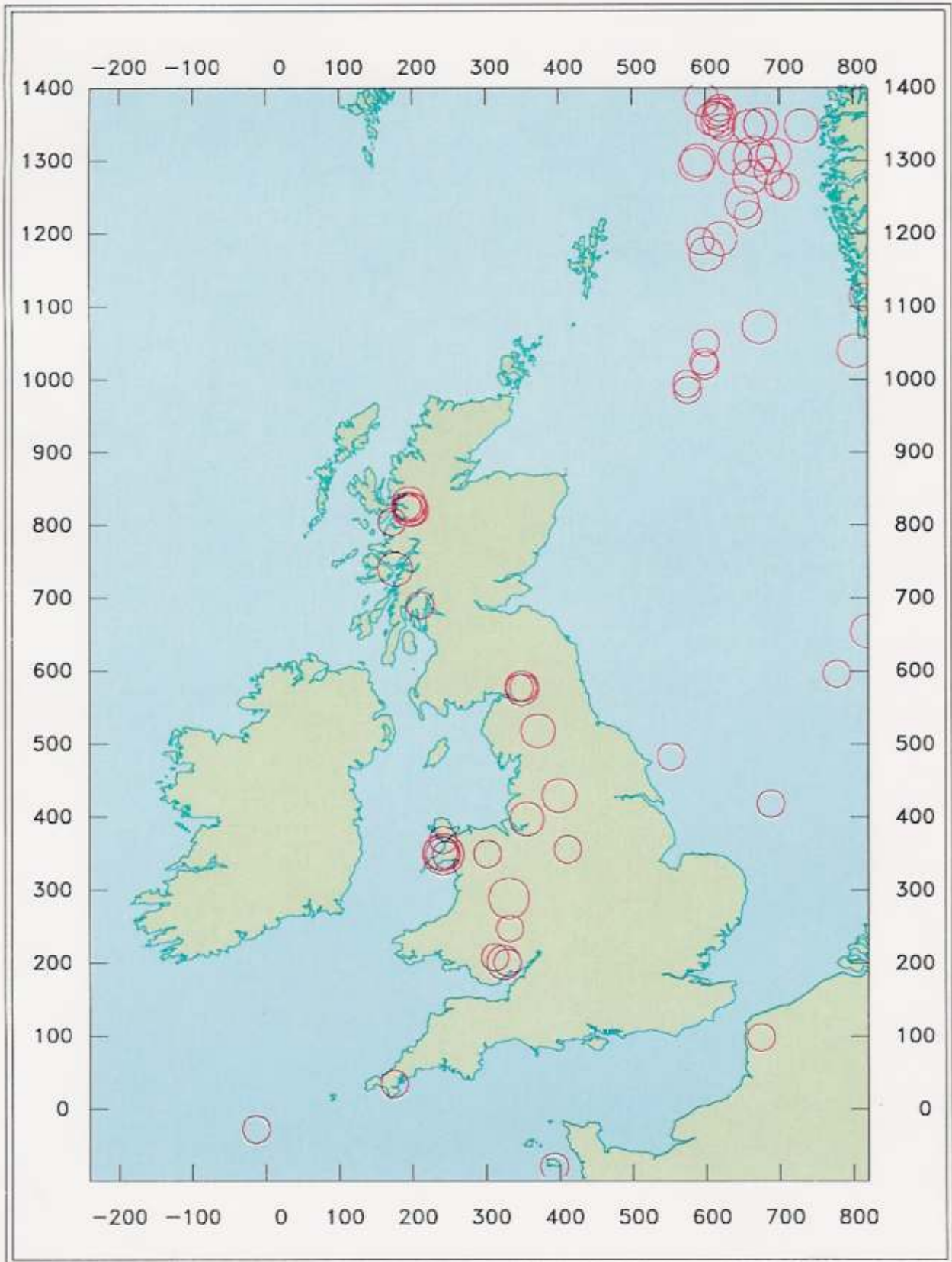


Figure 5. Epicentres of earthquakes with magnitudes 3.5 ML or greater, for the period 1970 to 1993.

APPENDIX A

SIGNIFICANT EARTHQUAKES IN 1993

APPENDIX A1

GRANGE-OVER-SANDS EARTHQUAKE, 26 JUNE 1993

PARAMETERS

Date:	26 June 1993
Origin Time:	05:42 20.0 UTC
Latitude and longitude:	54.21° N 2.86° W
Grid Reference:	344.1 km E 479.3 km N
Depth:	8.3 km
Magnitude:	3.0 ML
Hypo Solution Quality:	C (B*C)
Epicentral Error (1 std. dev.):	1.4 km
Depth Error (1 std. dev.):	5.8 km

Discussion

With a magnitude of 3.0 ML, the Grange-Over-Sands earthquake of 26 June 1993 was the largest of the year. Seismograms of the event from BGS monitoring networks in the Borders and North Wales are shown in Figure A1.1. The fault plane solution is poorly constrained, but three main groups of planes can be seen in Figure A1.2. The most prominent group of planes (55 in total) represents strike-slip faulting with a small component of reverse faulting, and movement on either a plane striking N-S and dipping steeply to the west or a near vertical plane striking E-W. A second group of planes represent dominant reverse faulting with a small component of strike-slip faulting, with movement on either a N-S striking plane dipping to the west or a NE-SW striking plane dipping to the SE. The final group of planes also represents dominant reverse faulting with a small component of strike-slip faulting, with movement on either a plane striking N-S and dipping to the east or a plane striking NE-SW and dipping to the NW. All three mechanisms are consistent with a NW-SE maximum compressive stress direction. A macroseismic survey was undertaken for this event and over 900 responses were received. The event was felt over an area of 2,700 km², with a maximum intensity near the epicentre of 5 MSK (Figure A1.3).

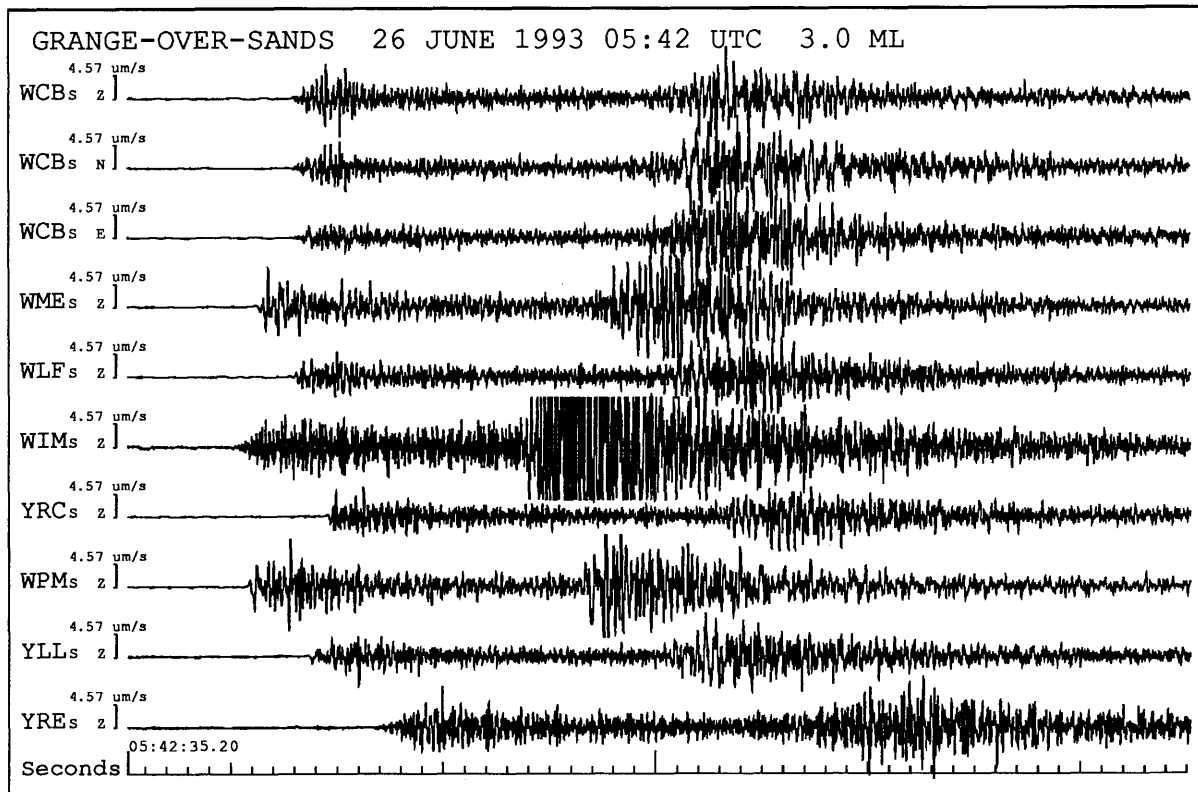
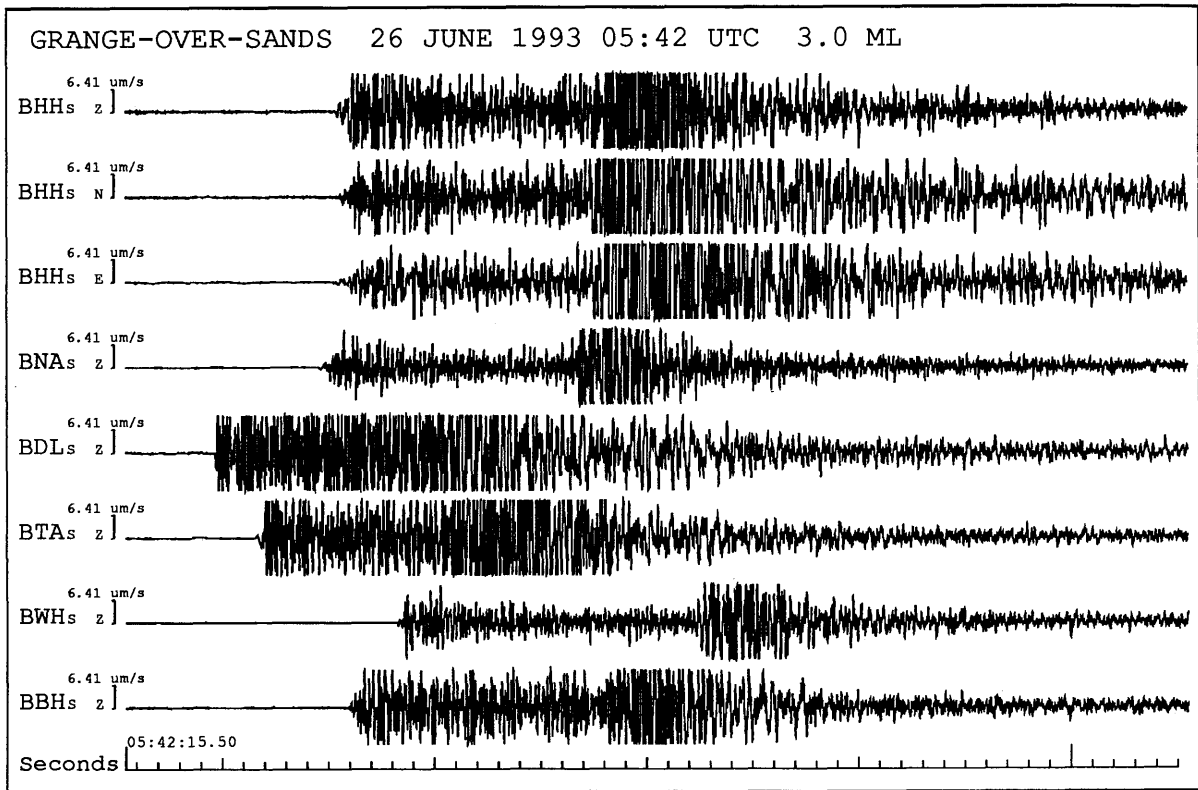
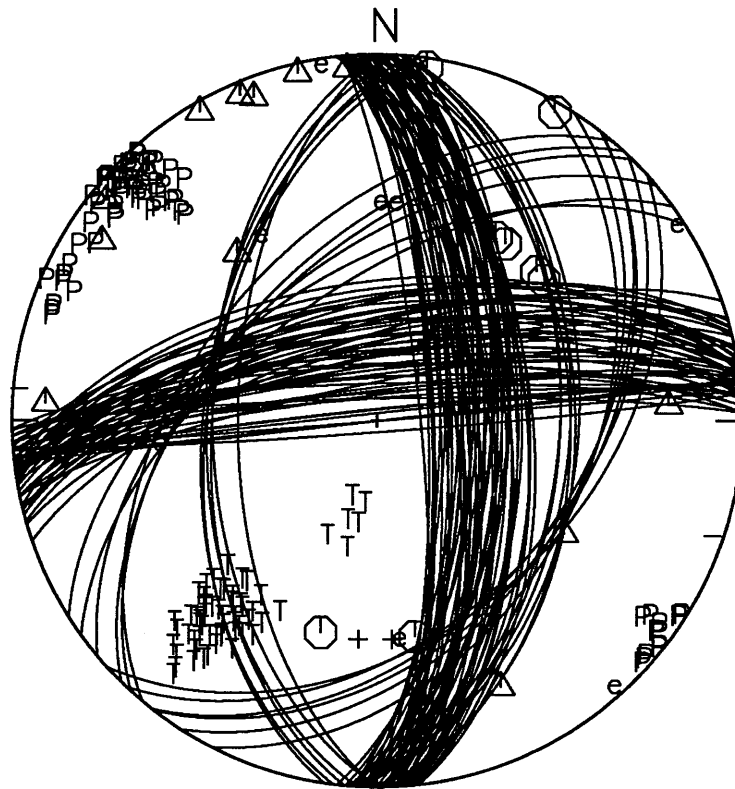


Figure A1.1. Seismograms of the Grange-Over-Sands earthquake 26 June 1993 05:42 UTC 3.0 ML recorded on the Borders and North Wales networks.

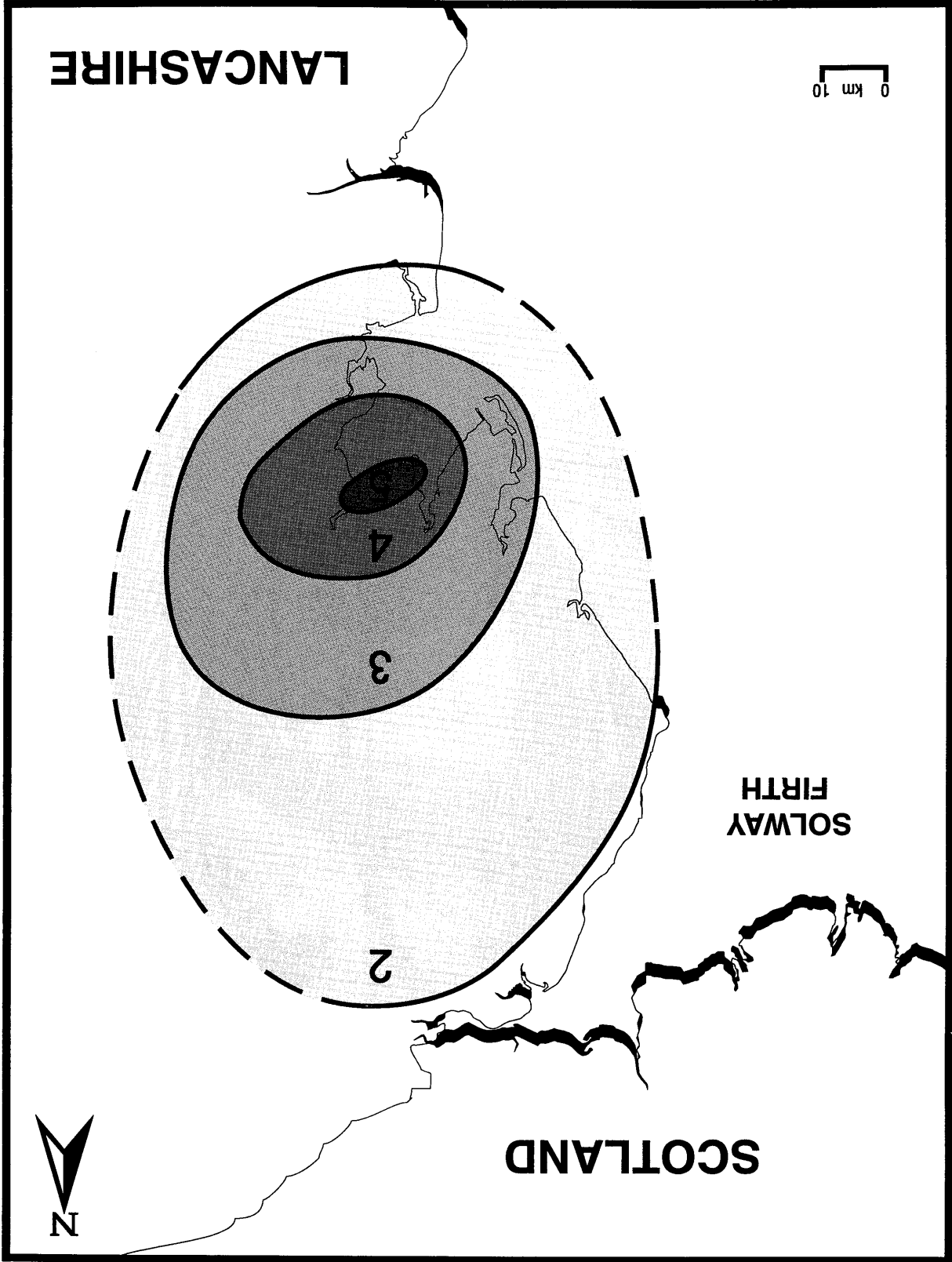
FAULT PLANE SOLUTION : GRANGE-OVER-SANDS EARTHQUAKE



Compression	⊕
Dilatation	△
SV/P ratio	×
Emergent polarity (compression)	+
Emergent polarity (dilatation)	-
Emergent arrival	e

Figure A1.2. Equal area projection of the upper focal hemisphere for the Grange-Over-Sands earthquake 26 June 1993 05:42 UTC 3.0 ML. The axes of maximum and minimum compressive stress are denoted by P and T respectively.

Grange-Over-Sands Earthquake 26th June 1993, 05:42 UTC (3.0ML) - MSK intensities



APPENDIX A2

LUDLOW EARTHQUAKE, 17 SEPTEMBER 1993

PARAMETERS

Date:	17 September 1993
Origin Time:	01:39 54.4 UTC
Latitude and longitude:	52.32° N 2.73° W
Grid Reference:	350.3 km E 269.0 km N
Depth:	14.5 km
Magnitude:	2.3 ML
Hypo Solution Quality:	B (B*B)
Epicentral Error (1 std. dev.):	1.3 km
Depth Error (1 std. dev.):	4.8 km

Discussion

The event on 17 September was the largest of three small events located near Ludlow in that month. They all had mid-crustal depths of around 14 km. Seismograms of the earthquake from the BGS networks in Hereford and North Wales are shown in Figure A2.1. The fault plane solution (Figure A2.2), shows strike-slip faulting with a small component of thrust faulting and is in agreement with a NW-SE maximum compressive stress direction observed for Britain.

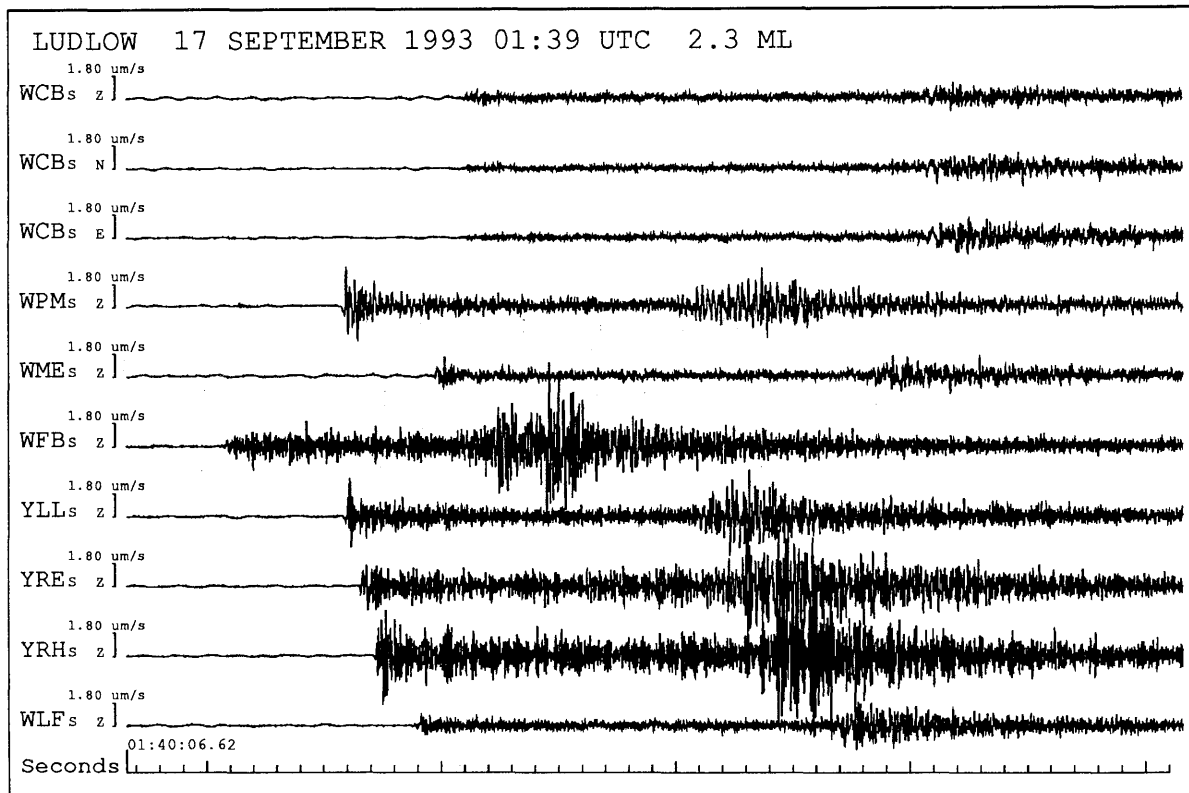
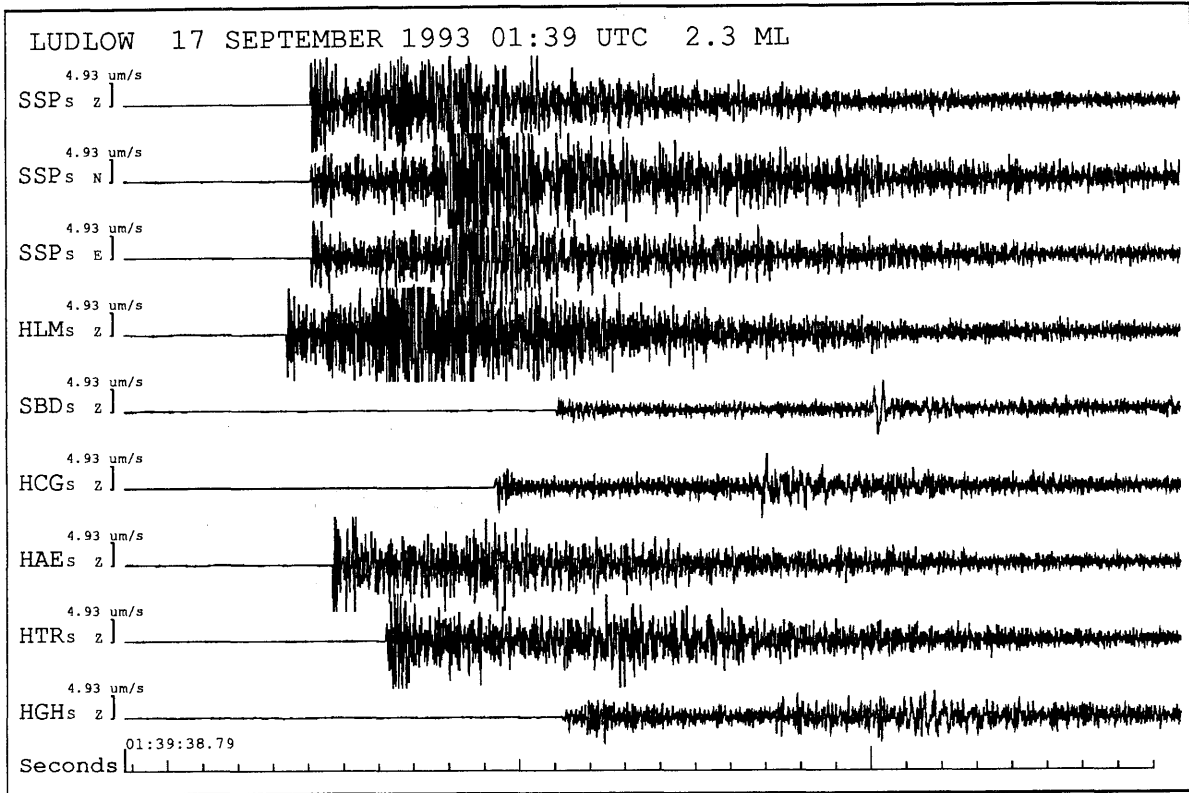


Figure A2.1. Seismograms of the Ludlow earthquake 17 September 1993 01:39 UTC 2.3 ML recorded on the Hereford and North Wales networks.

FAULT PLANE SOLUTION : LUDLOW EARTHQUAKE

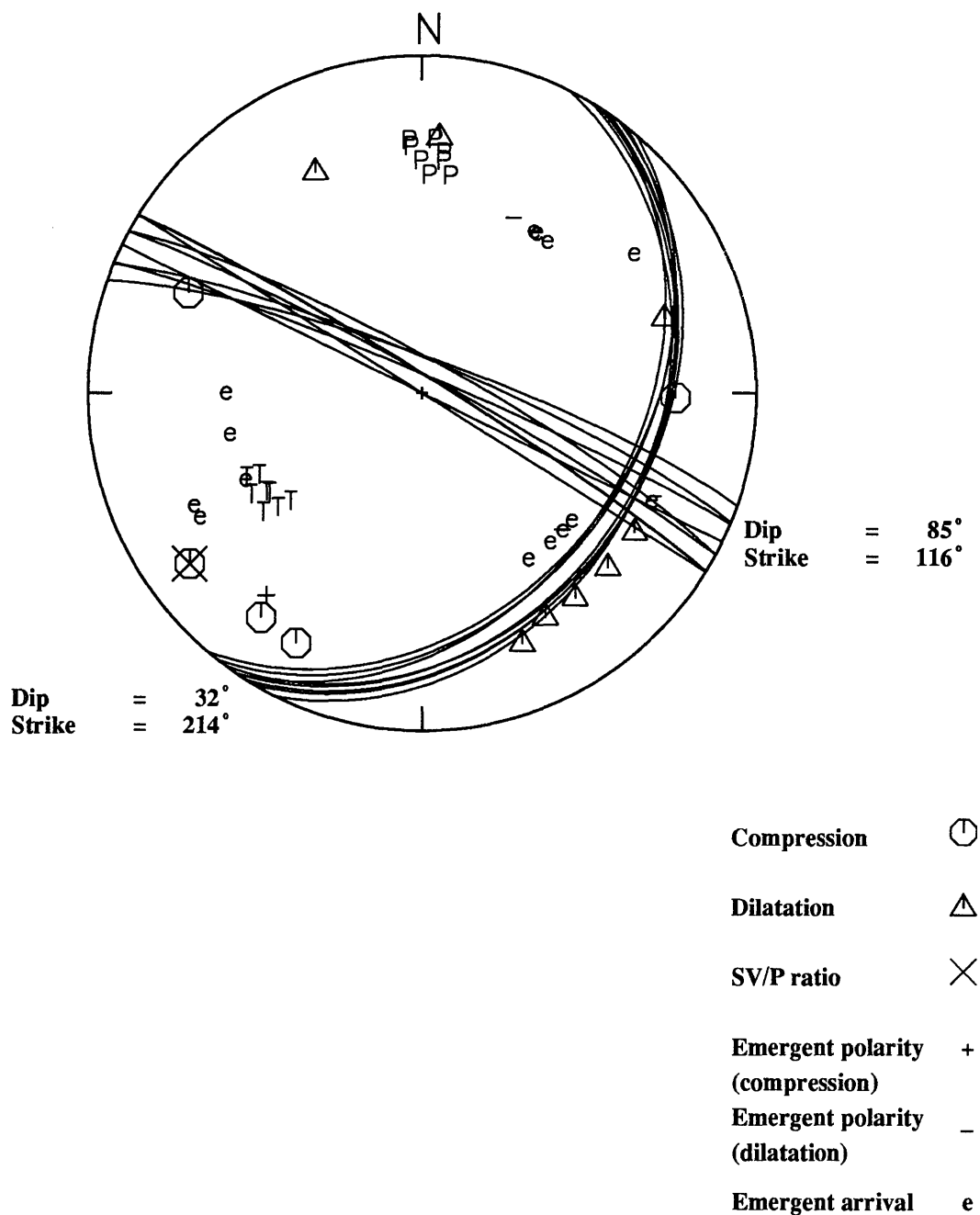


Figure A2.2. Equal area projection of the upper focal hemisphere for the Ludlow earthquake 17 September 1993 01:39 UTC 2.3 ML. The axes of maximum and minimum compressive stress are denoted by P and T respectively.

APPENDIX A3

BETWS-Y-COED EARTHQUAKE, 11 OCTOBER 1993

PARAMETERS

Date:	11 October 1993
Origin Time:	09:43 34.0 UTC
Latitude and longitude:	53.14° N 3.73° W
Grid Reference:	284.6 km E 361.9 km N
Depth:	9.3 km
Magnitude:	2.3 ML
Hypo Solution Quality:	B (B*B)
Epicentral Error (1 std. dev.):	2.1 km
Depth Error (1 std. dev.):	5.2 km

Discussion

BGS received only a few felt reports from the Betws-y-Coed and Nantbh areas for this magnitude 2.3 ML event. No macroseismic survey was initiated. Seismograms recorded by the BGS networks in Hereford and North Wales are shown in Figure A3.1. The fault plane solution (Figure A3.2), although apparently rather poorly constrained by stations to the north east, has been improved by the use of five amplitude ratios, and shows dominant normal faulting, with a small component of strike-slip faulting. The P and T axes, while not horizontal, show general agreement with the directions of others obtained from fault plane solutions of previous North Wales earthquakes and with those from the remainder of Great Britain.

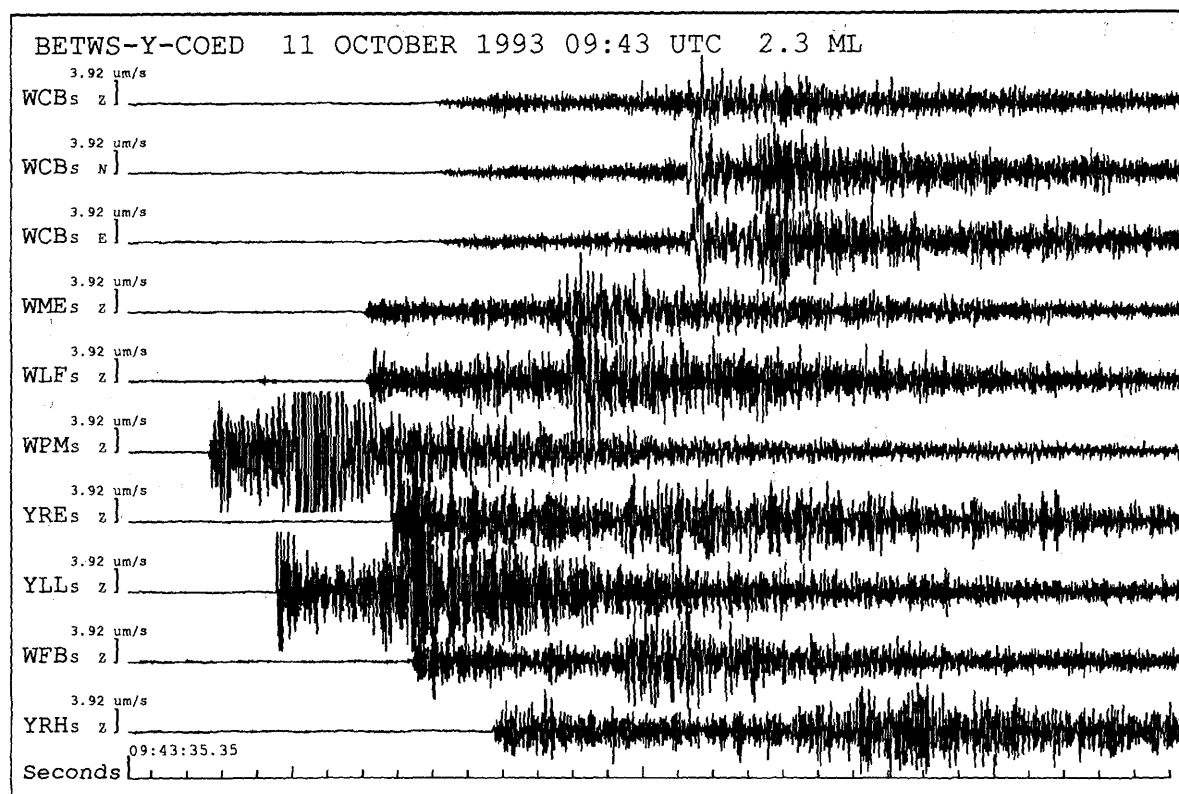
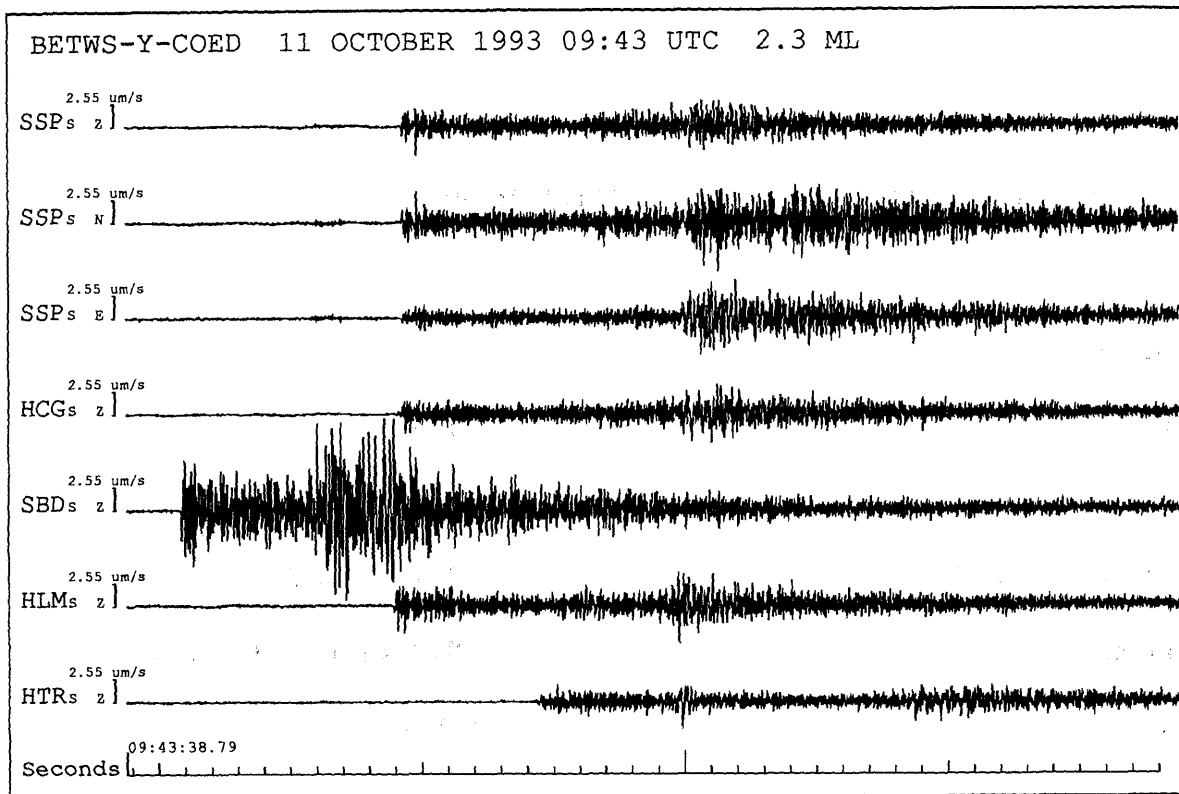


Figure A3.1. Seismograms of the Betws-Y-Coed earthquake 11 October 1993 09:43 UTC 2.3 ML recorded on the Hereford and North Wales networks.

FAULT PLANE SOLUTION : BETWS-Y-COED EARTHQUAKE

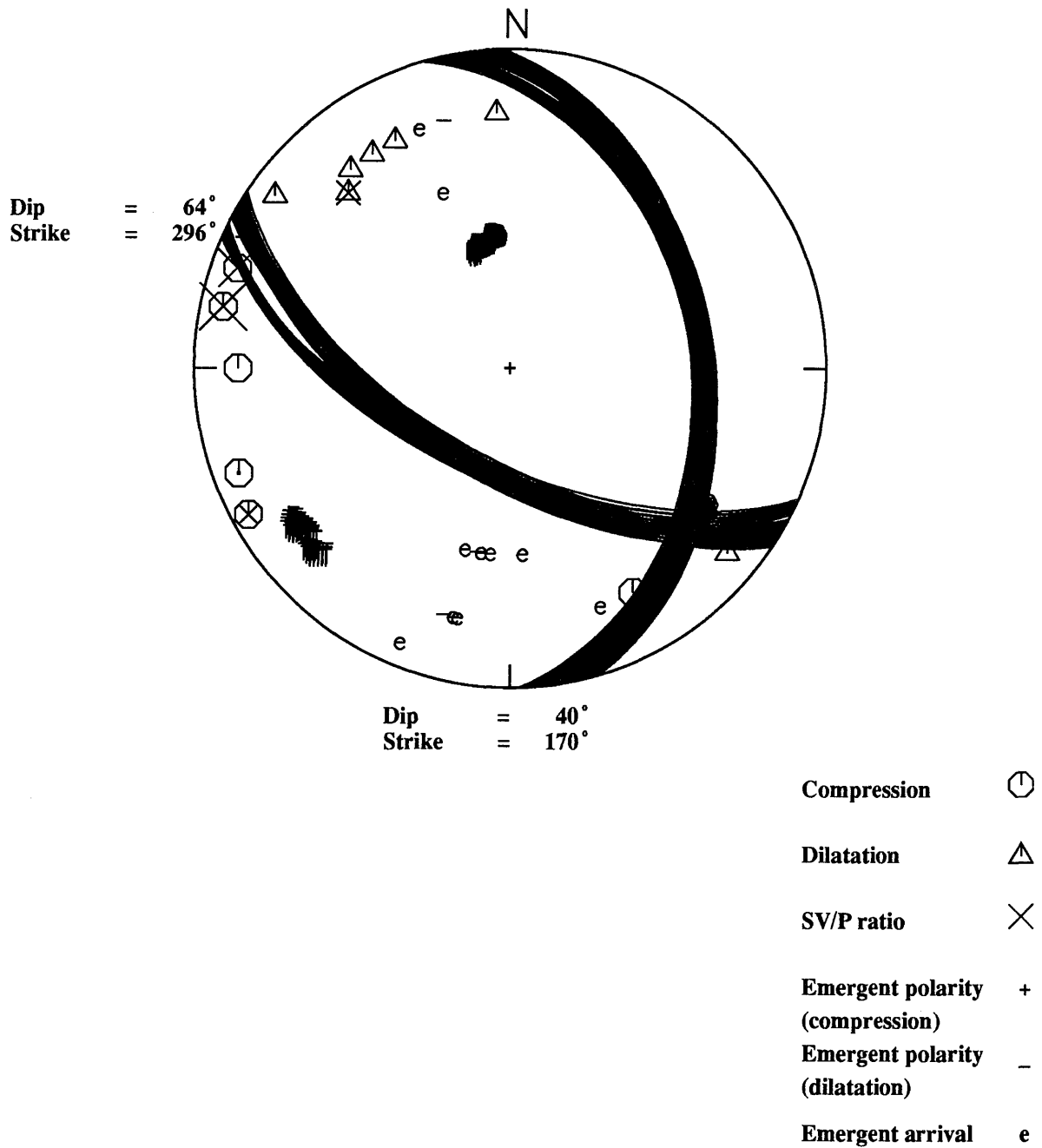


Figure A3.2. Equal area projection of the upper focal hemisphere for the Betws-Y-Coed earthquake 11 October 1993 09:43 UTC 2.3 ML. The axes of maximum and minimum compressive stress are denoted by P and T respectively.

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. £64.00 for first hour and £32.00 for each additional ½ hour. Note: charges can be waived for the public, media and schools.	£64.00 + VAT
A search and interpretation of raw macroseismic data (felt reports) for a specific region for an individual earthquake.	£90.00 + VAT

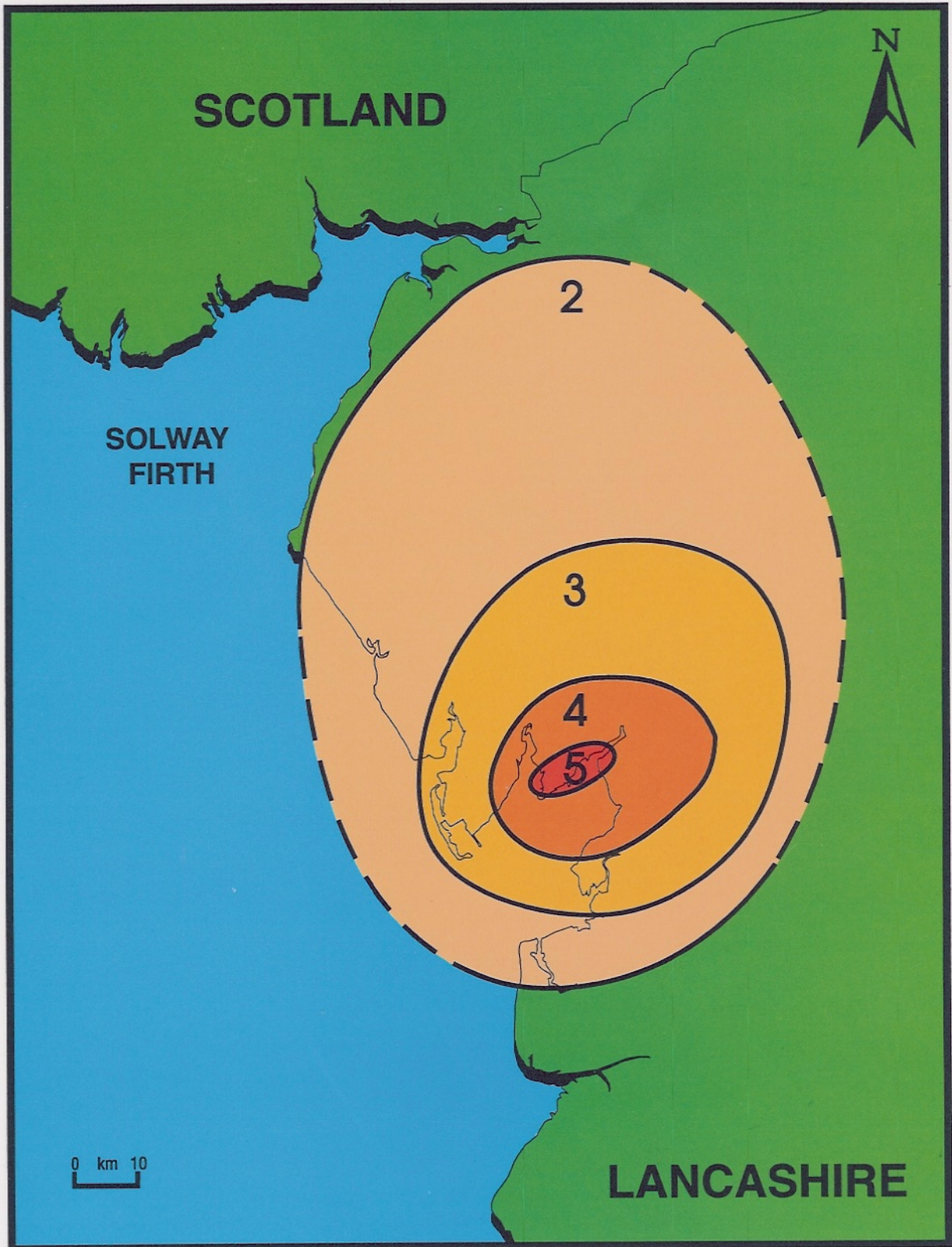
For more information on the above and other services available please contact Ms A B Walker at the Global Seismology Research Group, Murchison House, West Mains Road, Edinburgh, EH9 3LA.

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
Turbitt, T., et al., 1988. Bulletin of British Earthquakes 1986 . BGS Global Seismology Report No. WL/88/11.	£10 + pp
Turbitt, T., et al., 1989. Bulletin of British Earthquakes 1987 . BGS Global Seismology Report No. WL/89/09.	£10 + pp
Turbitt, T., et al., 1990. Bulletin of British Earthquakes 1988 . BGS Global Seismology Report No. WL/90/03	£10 + pp

BULLETIN OF BRITISH EARTHQUAKES: PRICE LIST	COST (£)
Turbitt, T., et al., 1990. Bulletin of British Earthquakes 1989. BGS Global Seismology Report No. WL/90/49	£12.50 + pp
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Grange-Over-Sands Earthquake 26th June 1993, 05:42 UTC (3.0ML) - MSK intensities