



DURHAM UNIVERSITY OBSERVATORY, ENGLAND

Position:- 54° 46'N, 01° 35'W, height above M.S.L. 103 metres.

SEISMOLOGICAL BULLETIN FOR JANUARY 1969

Instruments:- Wilson-Lamison seismometer free period 1 sec. coupled to G.E. galvanometer free period 3.4 sec., recording vertical component of velocity.
Milne-Shaw free period 12 sec., damping ratio 20:1, magnification 250, recording N and E component displacements.

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
2	iPKPZ	10 45 26	-	-	168°	H 10 25 23 .02 deep (USCGS)
2	iPZ	15 23 22	-	-	29°	H 15 17 31 (BCIS)
2	iPKPZ ipPKPZ	17 39 27 41 46	-	-	143°	H 17 21 15 .10 deep (USCGS)
3	iPZ	03 24 26	-	-	43°	H 03 16 42 (BCIS)
3	iPZ	13 39 52	-	-	74°	H 13 28 13 (USCGS)
3	iPKPZ ipPKPZ	14 10 16 11 16	-	-	149°	H 13 50 24 .03 deep (USCGS)
5	iPKPZ iPPE iPKSE iSSE ME ME	13 45 52 48 11 49 15 14 05 43 14 32 14 47	- - + - 30 20	- - + - 40 22	131°	H 13 26 40 (USCGS)
6	iPKPZ eSKKSE ME	15 50 12 16 00 38 16 56	- - 20	- - 8	155°	H 15 30 30 .02 deep (USCGS)
6	iPKPZ	15 58 21	-	-	135°	H 15 39 01 .03 deep (USCGS)

refid = 16803

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sheet 2, 1969 January

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
19	iPZ	07 13 32	-	-	76°	H 07 02 04
	ipPZ	14 38	-	-		.03 deep (USCGS)
	iSE	22 55	-	-		
	iSKSE	24 00	-	-		
	isSE	24 21	+	+		
	isSE	27 50	+	+		
19	iPKPZ	19 10 10	+	+	139°	H 18 50 52
	iSKSE	16 51	+	+		.02 deep (USCGS)
20	iPZ	14 31 25	-	-	70°	H 14 20 11
	iSE	40 16	-	-		(USCGS)
24	iPKPZ	02 51 41	-	-	147°	H 02 33 03
	iPKPZ	51 45	-	-		.10 deep (USCGS)
	ipPKPZ	54 04	-	-		
	iPPZ	54 27	-	-		
	isSE	03 13 24	+	+		
	isSSE	17 12	+	+		
27	iPZ	11 08 22	-	-	51°	H 10 59 27
						(USCGS)
27	iPZ	14 53 16	-	-	94°	H 14 39 58
						(USCGS)
29	iPKPZ	18 04 06	-	-	142°	H 17 44 31
						(USCGS)
30	iXZ	10 47 32	+	+	107°	H 10 29 40
	iPKPZ	48 33	-	-		.01 deep (USCGS)
	iPPZ	48 47	+	+		
	iXZ	49 33	-	-		
	iSKSE	55 15	-	-		
	iXE	55 51	-	-		
	iSE	56 52	-	-		
	iXE	57 58	+	+		
	isSE	11 03 21	+	+		
	ME	11 28	20	180		
	ME	11 34	22	215		
	MZ	11 34	22			

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DURHAM UNIVERSITY OBSERVATORY, ENGLAND

Position:- 54° 46'N, 01° 35'W, height above M.S.L. 103 metres.

SEISMOLOGICAL BULLETIN FOR FEBRUARY 1969

Instruments:- Wilson-Lamison seismometer free period 1 sec. coupled to G.E. galvanometer free period 3.4 sec., recording vertical component of velocity.
Milne-Shaw free period 12 sec., damping ratio 20:1, magnification 250, recording N and E component displacements.

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
3	iPKPZ	08 10 08	-	-	151°	H 07 51 25 .10 deep (USCGS)
3	iPPZ	22 00 26	-	-	107°	H 21 41 42 (USCGS)
	iSKSE	06 14	+	+		
	iXE	06 33	-	-		
	iXE	06 48	-	-		
	iSE	07 30	+	+		
	iXE	08 03	-	-		
	iPSE	09 41	+	+		
	isSE	15 35	+	+		
	ME	22 40	20	16		
	ME	22 46	22	8		
4	iSE	04 34 02	+	+	90°	H 04 10 13 (USCGS)
10	ePKPZ	23 16 34	+	+	148°	H 22 58 06
	iPKPZ	16 35	-	-		.11 deep (USCGS)
	ipPKPZ	19 08	-	-		
	iPPZ	20 18	+	+		
	iSKSE	24 17	+	+		
	iSKKSE	25 56	-	-		
	isSKKSE	27 20	+	+		
	isSE	38 29	+	+		
10	iPKPZ	23 21 32	+	+	148°	H 23 02 57
	iXZ	26 31	-	-		.11 deep (USCGS)
	iXZ	26 58	-	-		
11	iPZ	22 18 11	+	+	53°	H 22 08 55 (USCGS)
	iPPZ	20 22	-	-		
	iSE	26 01	-	-		
	isSE	29 37	+	+		
	ME	22 43				
11	PrP iPZ	22 34 19	-	-	117°	H 22 16 13 .07 deep

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sheet 2, February 1969

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
	iPPZ	00 56 10		+	110°	H 00 36 57 (USCGS)
	iSKSN	01 02 15		-		
	iSN	03 42		+		
	iXN	05 33		-		
	iSSN	11 36		-		
	MN	01 41	21	105		
	MN	01 44	19	62		
	MN	01 49	19	35		
	MZ	01 49	19			
5	eFN	01 30 19			09° .5	H 01 28 01 (BCIS)
	iXZ	31 21		+		
	eSN	32 09				
	eXE	33 23				
8	ePZ	02 45 04			20°	H 02 40 33 (BCIS)
	iPZ	45 07		+		
	iSN	48 37				
	MN	03 01	14	400		
	ME	03 03	18	800		
	MN	05 56	20	35		
	MZ	05 56	20			
88	iPZ	04 30 07		+	20°	H 04 25 35 (BCIS)
	iPPZ	30 32		-		
	iXN	34 02		+		
888	eFN	10 04 18			20°	H 09 59 50 (BCIS)
	iSN	07 54		+		

19th September, 1969

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DURHAM UNIVERSITY OBSERVATORY, ENGLAND

Location:- 54° 46'N, 01° 35'W, height above M.S.L. 103 metres.

SEISMOLOGICAL BULLETIN FOR MARCH 1969

Instruments:- Wilson-Lamison seismometer free period 1 sec. coupled to G.E. galvanometer free period 3.4 sec., recording vertical component of velocity.
Milne-Shaw free period 12 sec., damping ratio 20:1 magnification 250, recording N and E component displacements.

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
	iPKPZ	14 14 37		-	150°	H 13 56 05 .07 deep (USCGS)
	iPZ	01 04 33		+	25°	H 00 59 14 (BCIS)
	eSE	08 48				
	iPZ	15 01 01		+	72°	H 14 49 28 (USCGS)
	eSN	10 13				
	MN	15 41	15			
	iPZ	01 53 10		-	29°	H 01 47 29 (BCIS)
	iPKPZ	06 42 12		-	149°	H 06 23 23 .09 deep (USCGS)
	iXZ	43 20		-		
	iPZ	19 42 09		+	51°	H 19 33 23 .03 deep (USCGS)
	ipPZ	42 55		+		
	iPoPZ	43 19		+		
	iPPZ	44 51		+		
	iXZ	45 14		-		
	iSN	49 09		+		
	isSN	50 30		+		
	iSoSN	51 37		-		
	iSSE	53 09		+		
	iXE	54 59		+		
6	iPZ	19 28 15		-	20°	H 19 23 43 (BCIS)
7	iPZ	08 35 30		-	47°	H 08 27 00 (BCIS)
9	iPZ	11 46 30		-	74° .5	H 11 35 30 .06 deep (USCGS)
9	MN	14 50	25	18	119°	H 13 47 59 (USCGS)

Sheet 2, March 1969

Station	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
	iPZ	04 05 32		+	76°	H 03 53 42 (USCGS)
	eSN	15 33				
	MN	04 40				
	iPZ	05 08 12		-	76°.5	H 04 56 20 (USCGS)
	eSN	18 34				
	MN	05 38	19			
	iPZ	06 46 20		+	76°.5	H 06 34 22 (USCGS)
	eSN	56 40				
	MN	07 21	18			
	ePZ	10 22 06			76°.5	H 10 10 11 (USCGS)
	eSN	32 23				
	iPZ	12 36 02		-	76°.5	H 12 24 00 (USCGS)
	iPZ	05 01 27		-	50°	H 04 52 33 (USCGS)
	eSN	08 43				
	iPZ	21 14 13		-	25°.5	H 21 08 41 (BCIS)
	iXZ	14 30		-		
	iPPPZ	15 16		-		
	iSE	18 42		+		
	iXE	18 56		+		
	iSSN	19 47		+		
	MN	21 26	12	16		
	iPZ	02 05 02		-	25°.5	H 01 59 31 (BCIS)
	iSN	09 32		+		
	eSSE	10 31				
	MN	02 17				
	iPZ	09 14 21		-	76°.5	H 09 02 32 (USCGS)
	iPZ	11 40 01		-	25°.5	H 11 34 32 (BCIS)
	iPKPZ	13 32 16		-	149°	H 13 13 01 .05 deep (USCGS)
	iPZ	13 27 01		-	26°	H 13 21 35 (BCIS)
	iXZ	27 27		+		
	iSN	31 34		-		
	iXN	31 42		+		
	MN	13 46	10	15		
	MN	13 49	11	17		

Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
ePZ	12 55 55			107°	H 12 41 36 (USCGS)
iPPZ	13 00 22		+		
iXN	00 27		-		
iSKSE	06 29		-		
iSKSE	06 54		-		
iPPSN	10 00		+		
iSSN	14 58		+		
MN	13 38	35	50		
ME	13 40	29	48		
MN	13 45	22	32		
MN	13 55	19	17		
MZ	13 55	19			
iPZ	01 54 05		-	26°	H 01 48 29 (BCIS)
iPPE	54 57		+		
iPcPE	57 34		-		
iSE	58 46		-		
iSSE	02 00 02		-		
MN	02 03	20	150		
ME	02 06	11	50		
MZ	02 06	11			
ePZ	10 07 45			26°	H 10 02 17 (BCIS)
iXZ	08 20		-		
eSE	12 22				
ePZ	01 47 31			18°.5	H 01 43 38 (BCIS)
iPZ	09 25 18		-	55°	H 09 16 00 (BCIS)
iPcPE	26 19		-		
iSE	32 57		+		
iScSE	35 08		+		
iSSE	36 41		-		
MN	09 54	11	10		
iPZ	11 14 18		-	55°	H 11 04 58 (BCIS)
iPcPZ	15 06		-		
iSN	21 59		-		
iScSN	24 13		+		
MN	11 44	12	6		
iPZ	11 16 54		-	55°	H 11 07 30 (USCGS)
iPcPZ	17 59		-		
iSE	24 37		-		
iScSE	26 54		+		
iPZ	13 59 27		-	64°	H 13 48 58 (USCGS)
iPZ	07 23 07		+	38°	H 07 15 51 (BCIS)

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DURHAM UNIVERSITY OBSERVATORY, ENGLAND

Location:- 54° 46'N, 01° 35'W, height above M.S.L. 103 metres.

SEISMOLOGICAL BULLETIN FOR APRIL, 1969

Instruments:- Wilson-Lamison seismometer free period 1 sec. coupled to G.E. galvanometer free period 3.4 sec., recording vertical component of velocity.
Milne-Shaw free period 12 sec., damping ratio 20:1, magnification 250, recording N and E component displacements.

Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
iPZ	01 42 09		-	20°	H 01 38 01 .03 deep (BCIS)
iPZ	22 16 58		+	20°.5	H 22 12 24 (USCGS)
iXE	24 14		-		
MN	22 26	10	8		
iPZ	08 56 55		-	74°.5	H 08 45 19 (USCGS)
ePZ	16 28 29			80°	H 16 16 17 (USCGS)
iPZ	02 27 59		+	55°	H 02 18 30 (USCGS)
iSN	35 38		+		
i3oSN	37 51		-		
iSSN	39 26		-		
MN	02 57	15	12		
iPnZ	19 11 08		-	05°.5	H 19 09 47 (BCIS)
iP ^x Z	11 15		+		
iPgZ	11 17		-		
eSE	12 20				
ePZ	23 38 52			85°	H 23 26 11 (USCGS)
iSE	49 15		+		
ME	24 09	24			
iPZ	03 54 58		-	25°.5	H 03 49 33 (BCIS)
eSN	59 26				
MN	04 04	10	5		
iPZ	17 01 11		-	54°.5	H 16 51 52 (BCIS)
eSE	08 58				
iPKPZ	23 38 29		-	146°	H 23 19 46 .08 deep (USCGS)

Sheet 2 April 1969

Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
iPZ	13 22 04		-	49°	H 13 13 22 (USCGS)
iPKPZ	01 41 54		-	124°	H 01 22 47 (USCGS)
iPPZ	43 39		-		
iSSN	02 00 53		-		
MN	02 27	30	16		
iPKPZ	06 26 13		-	143°	H 06 08 03 .10 deep (USCGS)
iPZ	07 31 58		-	85°	H 07 19 27 (USCGS)
iPPN	35 16		-		
iSN	42 19		-		
iSSE	43 48		-		
MN	08 05	22	33		
MN	08 15	15	43		
MZ	08 15	15			
iPZ	03 46 29		-	78°	H 03 34 18 (USCGS)
iSN	56 24		+		
iSKSE	06 23 50		+	104°	H 05 58 49 (USCGS)
iSE	24 51		-		
ME	07 00	18	4		
eSKSE	06 27 46		+	104°	H 06 02 49 (USCGS)
iSE	28 46		+		
MN	07 04	18	6		
iPKPZ	07 44 41		+	147°	H 07 25 30 .05 deep (USCGS)
ipPKPZ	46 13		-		
iPZ	23 32 35		-	75°.5	H 23 20 43 (USCGS)
iSE	42 22		-		
MN	24 04	14			
iPZ	04 45 56		+	45°.5	H 04 37 41 (USCGS)
eSN	52 35				
iPZ	20 26 04		+	26°	H 20 20 30 (BCIS)
eSN	30 35				
MN	20 35				

rd October, 1969

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DURHAM UNIVERSITY OBSERVATORY, ENGLAND

Position:- 54° 46'N, 01° 35'W, height above M.S.L. 103 metres.

SEISMOLOGICAL BULLETIN FOR MAY 1969

Instruments:- Wilson-Lamison seismometer free period 1 sec. coupled to G.E. galvanometer free period 3.4 sec., recording vertical component of velocity.
Milne-Shaw free period 12 sec., damping ratio 20:1, magnification 250, recording N and E component displacements.

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
II 1	iPKPZ	03 31 36		+	146°	H 03 11 58. (USCGS)
I 1	iPZ iSN	18 08 33 13 20		- -	29°	H 18 02 16. (BCIS)
I 1	iPKPZ	19 24 31		+	142°	H 19 05 25 .03 deep (USCGS)
II 1	ePN eSE MN	20 12 33 17 44 20 26			29°	H 20 06 36 (BCIS)
4 4	iPKPZ	07 26 29		-	143°	H 07 08 01 .10 deep (USCGS)
5 5	iPZ iXZ iPPZ iSN iSSE	05 38 52 39 08 39 15 42 32 42 56		- + + -	20°	H 05 34 25 (BCIS)
5 5	ePN eSN iXZ iXE ME	21 50 59 54 00 54 22 55 45 21 57	10	+ - + 15	14° .5	H 21 47 30 (BCIS)
7 7	iPZ eSN	13 56 30 14 05 36		+	72° .5	H 13 45 00 (USCGS)
9 9	ePZ	07 14 44			22° .5	H 07 09 44 (USCGS)
10 10	iPZ	21 15 06		-	20°	H 21 10 33 (USCGS)

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sheet 2, May 1969

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
3	iPZ ipPZ ePPE eSE eSSN ME	14 29 05 29 18 31 38 38 37 43 35 15 03	20	+ - 8	77° .5	H 14 16 53 .01 deep (USCGS)
4	ePE eXE ePPE eSE MN	10 11 12 12 02 12 14 16 07 10 24			29°	H 10 05 15 .01 deep (BCIS)
4	ePZ iPZ iPPZ iSN iSSE ME MN MZ	19 44 31 44 35 47 16 54 06 59 06 20 24 20 26 20 26	20 20 20	- - - + 15 28	74°	H 19 32 54 (USCGS)
15	eSE	12 16 03			29°	H 12 05 52 .01 deep (BCIS)
15	iPE iSE ME	20 53 41 21 01 38 21 12		- + -	59°	H 20 43 33 .01 deep (USCGS)
16	iPZ	04 11 31		-	46° .5	H 04 03 00 (BCIS)
16	iPZ iSN	07 32 00 36 04		- +	22° .5	H 07 26 58 (BCIS)
18	ePN eSE	08 54 25 09 02 41			62°	H 08 44 04 (USCGS)
21	iSKSE iSE MN ME	03 21 12 22 11 03 53 04 02		- + -	101°	H 02 56 49 (USCGS)
23	ePN eSE	13 15 58 25 05			71°	H 13 04 37 (USCGS)

sheet 3, May 1969

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
28	ePZ iPZ iSKSN iSE	13 42 15 42 18 52 21 52 27			83°	H 13 30 09 .03 deep (USCGS)
29	iPKPZ	07 36 45			140°	H 07 17 27 (USCGS)
29	iPKPZ	17 12 18			145°	H 16 52 32 (USCGS)
30	iPKPZ	15 34 48			146°	H 15 16 11 .10 deep (USCGS)
30	ePPN eSSN ME	16 19 44 39 31 16 27	18		157°	H 15 55 37 (USCGS)
30	ePKPZ iPKPZ iPPN eSKKSN eSSE MN	16 42 39 43 17 46 50 53 41 17 06 39 17 54	19		157°	H 16 22 48 (USCGS)
31	iPZ	11 19 27			83°	H 11 07 17 .03 deep (USCGS)
31	iPKPZ iSSN	24 14 39 33 19			127°	H 23 56 22 .07 deep (USCGS)

6th November, 1969

International
Seismological
Centre

DURHAM UNIVERSITY OBSERVATORY, ENGLAND.

Position:- 54° 46'N, 01° 35'W, height above M.S.L. 103 metres.

SEISMOLOGICAL BULLETIN FOR JUNE 1969

Instruments:- Wilson-Lamison seismometer free period 1 sec. coupled to G.E. galvanometer free period 3.4 sec., recording vertical component of velocity. Milne-Shaw free period 12 sec., damping ratio 20:1, magnification 250, recording N and E component displacements.

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
1	iPKPZ	20 13 06			157°	H 19 53 12 (USCGS)
3	iPZ eSE eSSE	04 10 32 20 41 26 24			83°	H 03 58 01 (USCGS)
6	iPZ	16 27 58			77°.5	H 16 16 02 (USCGS)
7	iPZ eSE	15 36 11 40 12			23°	H 15 31 12 (BCIS)
8	iPZ	15 00 47			71°	H 14 49 32 (USCGS)
8	ePKPZ	21 59 16			150°	H 21 40 13 .07 deep (USCGS)
9	ePKPZ iPKPZ	22 12 44 12 50			148°	H 21 53 02 (USCGS)
10	ePZ	03 53 22			77°	H 03 41 33 (USCGS)
10	iPZ eSE ME	17 29 04 40 47 18 27	16		97°	H 17 15 29 (USCGS)
10	iPZ eSE	23 39 38 46 43			52°	H 23 30 46 .03 deep (BCIS)
11	ePZ eSE MN	01 08 38 17 03 01 35	15	1	62°	H 00 58 10 (USCGS)
12	ePZ	07 53 28			81°	H 07 41 25 (USCGS)

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Sheet 2, June 1969

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
13	iPZ	01 29 16		-	27° .5	H 01 23 15 (BCIS)
13	iPZ eSN MN	09 00 05 09 34 09 41	20	- 10	75°	H 08 48 29 .01 deep (USCGS)
14	iPKPZ iXZ iFPZ	03 42 06 42 22 44 18		- + -	131°	H 03 22 57 .01 deep (USCGS)
14	ePZ	17 51 31			32°	H 17 45 03 (BCIS)
16	iPZ iSN	16 11 19 15 25		+ +	23°	H 16 06 25 (BCIS)
17	iPZ iSKSE iSE eSSN ME	19 39 31 50 40 51 18 58 29 20 20	20	- + +	102°	H 19 26 29 .03 deep (USCGS)
17	iPE eSE	23 31 12 36 39		+ -	32°	H 23 24 41 (BCIS)
17	ePKPZ ePPE iSKKSE eSSE ME ME	24 19 20 23 15 29 39 45 14 25 31 25 42	22 20	+ 7 7	168° .5	H 23 58 10 (USCGS)
19	iPZ	06 58 21		-	28°	H 06 52 33 (USCGS)
19	iPKPZ	13 55 22		-	143°	H 13 36 46 .09 deep (USCGS)
20	iPZ eSN eSKSE	02 49 08 58 27 58 57		-	71°	H 02 37 51 (USCGS)
22	iPZ eSE	01 43 37 52 05		-	60° .5	H 01 33 24 (USCGS)
22	ePZ	02 45 29			75°	H 02 33 53

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Sheet 3, June 1969

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
29	ePKPZ iPKPZ	10 54 13 54 37		+ -	155°	H 10 34 07 (USCGS)
29	ePKPZ eSKKSE ME	17 29 23 41 24 18 48	18		170°	H 17 09 14 (USCGS)

16th December, 1969

Seismological Centre

DURHAM UNIVERSITY OBSERVATORY, ENGLAND

Position:- 54°46'N, 01°35'W, height above M.S.L. 103 metres.

SEISMOLOGICAL BULLETIN FOR JULY, 1969

Instruments:- Wilson-Lamison seismometer free period 1 sec. coupled to G.E. galvanometer free period 3.4 sec., recording vertical component of velocity.
Milne-Shaw free period 12 sec., damping ratio 20:1, magnification 250, recording N and E component displacements.

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
2	iPZ eSE	07 59 22 08 02 19		-	16°	H 07 55 45 (BCIS)
4	iPZ	02 55 32		+	47°	H 02 47 00 (BCIS)
4	iPKPZ	07 08 08		-	145°	H 06 49 35 .11 deep (USCGS)
4	iPZ	11 27 55		-	79°	H 11 16 01 (USCGS)
5	iPZ	05 08 07		-	87°	H 04 55 34 (USCGS)
7	iPZ	04 57 52		-	105°	H 04 43 15 (USCGS)
X 8	iPZ iPPZ iSN iSSN	08 14 24 15 00 18 28 19 09		+ - + +	25°	H 08 09 15 (BCIS)
10	ePZ	19 25 12			75°	H 19 13 21 (USCGS)
12	iSN ME	13 22 27 13 52		+	77°	H 13 00 37 (USCGS)
12	iPKPZ iPKPZ	13 35 57 36 00		- +	152°	H 13 16 55 .10 deep (USCGS)
12	ePZ eSE MN	19 29 04 39 06 20 07			81°	H 19 16 32 (USCGS)

July, 1969, sheet 2

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
18	P iPZ iPoPN iPPZ iPPPZ iSN iSKSE iSSE MN ME ME MZ	05 36 36 36 54 39 31 41 09 46 09 46 46 51 09 06 10 06 11 06 14 06 14			75°	H 05 24 48 (USCGS)
19	iPZ iPPZ iSKSE iSE iSSE MN ME	05 08 10 11 53 18 44 19 10 25 53 05 46 05 50		+	94°	H 04 54 54 (USCGS)
19	iPKPZ	05 30 20		+	147°	H 05 11 43 .10 deep (USCGS)
20	ePE eSN	15 57 04 16 01 04			23°	H 15 51 57 .01 deep (BCIS)
21	eSE ME	17 49 56 17 55	10		32°	H 17 38 20 (BCIS)
22	iPKPZ	17 33 27		-	136°	H 17 14 13 .02 deep (USCGS)
23	iPKPZ	08 20 42		+	149°.5	H 08 01 51 .09 deep (USCGS)
24	iPZ ePPZ iSKSE iSN iPPSE ME	03 12 32 16 02 23 10 23 32 24 40 03 48	20	+	90°	H 02 59 21 (USCGS)
24	ePZ iXZ	12 55 45 55 59		-	105°	H 12 41 40 (USCGS)

Seismological Centre

July 1969, sheet 3

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
25	eSE ME	13 15 13 13 44	20	6	72°	H 12 54 28 (USCGS)
25	MN	23 38	18	6	85° .5	H 22 49 41 (USCGS)
27	iPKPZ	02 33 25	-	-	143°	H 02 14 28 .01 deep (USCGS)
27	ePZ eSN eSoSE eSSN MN	21 32 18 40 48 42 18 45 07 21 59	15	4	62° .5	H 21 21 41 (USCGS)
27	iPZ eSKSE	22 39 24 49 31	-	-	87°	H 22 26 54 .02 deep (USCGS)
28	iPZ MN	13 16 13 14 00	-	-	86°	H 13 03 18 (USCGS)
28	ePKPZ	14 23 19	-	-	147°	H 14 04 49 .10 deep (USCGS)
31	iPZ eSN ME	11 34 31 43 49 12 13	-	-	72°	H 11 23 01 (USCGS)

16th January, 1970

DURHAM UNIVERSITY OBSERVATORY, ENGLAND

Position:- 54°46'N, 01°35'W, height above M.S.L. 103 metres.

SEISMOLOGICAL BULLETIN FOR AUGUST 1969

Instruments:- Wilson Lamison seismometer free period 1 sec. coupled to G.E. galvanometer free period 3.4 sec. recording vertical component of velocity.
Milne-Shaw free period 12 sec., damping ratio 20:1, magnification 250, recording N and E component displacements.

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
1	iPKPZ	12 24 58	-	+	149°	H 12 05 35 .03 deep (USCGS)
1	iPZ iXZ eSN iSKSE MN	23 55 37 56 49 24 05 28 05 40 24 34	20	-	77°	H 23 43 45 (USCGS)
2	iPZ	00 46 12	-	+	77°	H 00 34 17 (USCGS)
3	iPKPZ eSKSE	00 41 38 48 30	-	+	125° .5	H 00 22 32 .01 deep (USCGS)
3	iPZ iPcPZ iPPZ	08 00 10 00 23 03 10	-	+	77°	H 07 48 11 (USCGS)
4	eSN	10 44 35	-	-	73° .5	H 10 23 29 (USCGS)
4	iPKPZ iPPZ eSKSE eSKKSE iSPZ ePSE iSSE	17 37 05 38 28 42 44 44 18 46 55 48 15 53 25	-	+	116°	H 17 19 20 .09 deep (USCGS)
5	iPKPZ iPPZ iSKSE iSKKSE iPSN iSSN ME	02 31 28 32 32 38 29 39 13 41 39 47 40 03 19	22	-	110°	H 02 13 10 (USCGS)

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August 1969 sheet 2

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
8	ePPPN iSE ME	11 29 00 34 07 11 58	20	-	103°.5	H 11 08 15 (USCGS)
8	ePZ iPZ ePPZ iSKSE isSKSE eSSE	21 02 47 02 51 03 59 09 16 10 36 19 36		+ + + +	117°	H 20 44 21 .03 deep (USCGS)
11	ePE eSE	13 58 30 14 00 58			14°.5	H 13 55 09 (BCIS)
11	iPZ iSN	21 38 37 48 32		- -	78°	H 21 26 38 (USCGS)
11	iPZ iSE	21 39 28 49 22		- +	78°	H 21 27 26 (USCGS)
11	iPZ iSE ME MZ ME	21 39 39 49 32 22 20 22 20 24 34	20 20 20	- + 1000	78°	H 21 27 39 (USCGS)
11	iPKPZ iPPZ	24 11 16 12 25		- -	110°	H 23 52 57 (USCGS)
12	iPZ eSE	03 45 38 55 26		- +	78°	H 03 33 38 (USCGS)
	ME	05 48	25	+		(USCGS)
	ME	05 55	20	33		
	MZ	05 56	16	20		
12	iPZ eSE	06 05 30 15 29		-	78°	H 05 53 27 (USCGS)
12	iPZ eSE	09 37 41 47 37		-	78°	H 09 25 39 (USCGS)
12	iPZ	09 45 35		-	78°	H 09 33 43 (USCGS)
12	iPZ iSE ME	11 33 22 43 15 12 06	22	+ - 20	79°	H 11 21 22 (USCGS)

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August 1969 sheet 3

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
13	eSE	04 15 13			23°	H 04 06 02 (BCIS)
13	iPZ iSN	08 43 31 53 21		+ -	79°	H 08 31 32 (USCGS)
13	iPZ iSN eSSE MN ME	23 09 06 19 02 24 08 23 48 23 50	20 18	+ + 7 3	79°	H 22 57 07 (USCGS)
14	iPZ iSE MN MZ	14 31 05 40 58 15 12 15 12	17 17	+ - 47	79°	H 14 19 02 (USCGS)
15	iPZ iPcPZ eSN iScSN MN	04 44 05 44 19 54 00 54 06 05 25	17	- - - - 9	79°	H 04 32 00 (USCGS)
15	iPZ iPPZ iSKSE eSN iSN	08 54 57 59 00 09 05 03 05 57 07 15		+ - + - -	97°	H 08 41 55 .05 deep (USCGS)
15	eSE MN	10 24 22 10 56	15	4	79°	H 10 02 18 (USCGS)
15	iPKPZ ipPKPZ	19 23 00 25 03		- +	149°	H 19 04 09 .08 deep (USCGS)
16	ePZ eSN	09 15 14 25 17			79°	H 09 03 14 (USCGS)
16	iPZ eSN iXN MN	15 27 33 37 22 37 31 16 08		- - -	79°	H 15 15 33 (USCGS)
16	iPZ iXZ eSE	17 25 47 26 00 34 26		- -	79°	H 17 13 44 (USCGS)
17	iPZ	12 06 40		-	77°	H 11 54 55 (USCGS)

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August 1969 sheet 4

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
17	iPZ	20 27 09		-	80°	H 20 14 59 (USCGS)
	eSN	37 08				
	eSKSE	37 30				
	eSSN	42 10				
	MN	20 54	20			
	MN	21 00	15			
	MZ	21 00	15			
17	iPZ	20 39 32		-	80°	H 20 27 25 (USCGS)
18	iPKPZ	01 23 48		-	148°	H 01 04 05 (USCGS)
	iPKPZ	24 02		-		
	iPPN	27 02		+		
	iSSN	46 21		+		
	ME	02 27	19			
18	iPKPZ	03 15 13		-	148°	H 02 55 31 (USCGS)
18	ePN	03 34 05			79°	H 03 21 54 (USCGS)
	eSE	44 09				
	MN	04 04	17	3		
18	iPZ	04 07 05		+	79°	H 03 54 50 (USCGS)
18	iPZ	11 55 30		-	78°	H 11 43 30 (USCGS)
	eSE	12 05 28				
19	iPZ	09 01 54		+	78°	H 08 49 55 (USCGS)
	iPcPZ	02 06		+		
	iPPPZ	06 44		-		
	iSN	11 49				
	eSSN	17 00				
	MN	09 42	18	23		
20	iPZ	08 01 44		+	75°	H 07 50 05 (USCGS)
	iSE	11 17		+		
21	iPZ	14 38 15		-	82°	H 14 25 51 (USCGS)
	eSE	48 26				
	eSKSE	48 53				
22	ePN	10 16 56			81°	H 10 04 36 (USCGS)
	eSE	27 11				
	MN	11 48	20	2		

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August 1969 sheet 5

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
28	ePPE	14 18 08			156°	H 13 54 11 (USCGS)
	eSKKSE	25 04				
	MN	15 38	20			
28	ePN	21 47 17			78°	H 21 35 23 (USCGS)
	iSE	57 17		+		
30	iPZ	07 23 40		-	78°	H 07 11 39 (USCGS)
	iSE	33 35		-		
	iSKSN	33 56		-		
	MN	08 04	17	17		
30	iPZ	08 06 48		-	78°	H 07 54 29 (USCGS)
	eSE	16 47				
30	iPZ	08 40 19		-	78°	H 08 28 07 (USCGS)
	iSE	50 17		+		
	MN	09 20	18	10		

13th March, 1970

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DURHAM UNIVERSITY OBSERVATORY, ENGLAND

Position:- 54°46'N, 01°35'W, height above M.S.L. 103 metres.

SEISMOLOGICAL BULLETIN FOR SEPTEMBER, 1969

Instruments:- Wilson-Lamison seismometer free period 1 sec. coupled to G.E. galvanometer free period 3.4 sec., recording vertical component velocity.
Milne-Shaw free period 12 sec., damping ratio 20:1, magnification 250, recording N and E component displacements.

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
3	iPZ iSN MN	16 33 15 44 04 17 22	22	- + -	87°	H 16 20 21 (USCGS)
4	iPZ eSE MN	03 20 41 30 30 04 00	17	- 8	77°	H 03 08 52 (USCGS)
4	iPZ iSN MN	21 24 34 34 25 22 05		- -	77°	H 21 12 39 (USCGS)
5	iPZ eSE MN MN	11 55 15 12 06 00 12 33 12 40	19	- 6 5	89°	H 11 42 14 (USCGS)
6	iPZ eSN	07 55 31 08 05 21		+ -	78°	H 07 43 30 (USCGS)
6	iPZ iSE iSSE	14 35 03 38 34 39 12		- + +	19°	H 14 30 35 (BCIS)
6	ePKPZ	15 09 15			131°	H 14 49 56 (USCGS)
6	iPKPZ eSSE	17 27 19 47 15		+ -	131°	H 17 08 03 (USCGS)
8	iPZ	05 06 39		-	31°.5	H 04 59 55 (BCIS)
8	ePKPZ	13 04 38		-	126°	H 12 45 35 (USCGS)
9	iPZ eSN	05 28 07 38 30			83°	H 05 15 38 (USCGS)

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September, 1969, sheet 2

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
12	iSE MN	09 18 16 09 50	18	- 18	74°	H 08 57 07 (USCGS)
13	iPZ eSE	12 04 27 14 26		+ -	78°	H 11 52 15 (USCGS)
14	ePN eSE	14 55 29 15 02 53			51°	H 14 46 21 (BCIS)
14	ePE iSN MN	16 24 29 31 51 16 43		- -	51°	H 16 15 25 (BCIS)
15	iSN	15 06 33		-	73°	H 14 45 42 (USCGS)
16	iPZ iPcPZ iPPZ eSE iSSN MN	14 41 30 41 49 44 10 50 38 55 19 15 14	14	- - - - 1	72°	H 14 30 00 (USCGS)
17	iPZ iPcPZ iSN iScSN MN MN MZ	18 53 25 53 37 19 03 46 04 11 19 35 19 37 19 37	20	+ - - - 22 19	85°	H 18 40 46 (USCGS)
17	iPKPZ iPPZ	19 02 27 03 21		- -	113°	H 18 43 49 (USCGS)
19	MN	02 31		-	105°	H 01 29 37 .01 deep (USCGS)
-			17°	H 01 07 36 (BCIS)	20	iPZ 01 11 38
-			17°	H 01 13 00 (BCIS)	20	iPZ 01 17 06
-			17°	H 05 08 54 (BCIS)	20	iPZ 05 12 54 iPPZ 13 24

September, 1969, sheet 3

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
23	ePZ	22 50 01			84°	H 22 37 23
	eSN	23 00 35				(USCGS)
	MN	23 19	20			
24	iPZ	04 03 03		-	18°.5	H 03 58 50
	iSN	06 33		-		(BCIS)
24	iPZ	04 03 08		-	18°.5	H 03 58 55
	iPPZ	03 34		-		(BCIS)
	iXE	05 23		+		
	iSE	06 37		-		
	iSSN	07 25		-		
	MN	04 09	11	13		
24	iPZ	04 25 01		-	18°.5	H 04 20 48
	iPPZ	25 35		-		(BCIS)
	iSN	28 31		-		
	iSSN	29 21		-		
	MN	04 31	11	7		
24	iPZ	18 12 36		+	52°	H 18 03 19
	iPPE	14 39		-		(USCGS)
	iXE	15 21		+		
	iSN	19 51		-		
	ME	18 28	10	20		
	MN	18 30	18	36		
26	iSN	05 10 59		-	51°	H 04 54 37
						(BCIS)
29	MN	20 56	15	14	90°	H 20 03 33
	MN	21 01	15	15		(USCGS)
30	MN	19 40			157°	H 17 51 42
						(USCGS)

DURHAM UNIVERSITY OBSERVATORY, ENGLAND

Position:- 54°46'N, 01°35'W, height above M.S.L. 103 metres.

SEISMOLOGICAL BULLETIN FOR OCTOBER 1969

Instruments:- Wilson-Lamison seismometer free period 1 sec. coupled to G.E. galvanometer free period 3.4 sec., recording vertical component of velocity.
Milne-Shaw free period 12 sec., damping ratio 20:1, magnification 250, recording N and E component displacements.

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
1	iSKSN	05 29 48		+	90°	H 05 05 43
	iSN	30 18		+		(USCGS)
	MN	05 48	27	14		
1	iPE	17 23 34		+	86°	H 17 10 57
	eSKSN	34 04		+		(USCGS)
	iSE	34 17		-		
	iSSE	40 07		+		
	iXE	40 56		+		
1	iPPE	20 13 08		+	117°	H 19 53 16
	iSSN	29 35		-		(USCGS)
1	iPKPZ	20 50 04		-	152°	H 20 30 23
	iPKPZ	50 28		-		(USCGS)
2	iPZ	22 17 35		-	74°	H 22 06 00
						(USCGS)
3	iPZ	02 03 16		-	72°	H 01 51 55
	iSE	12 40		+		.01 deep (USCGS)
5	ePKPZ	13 29 22			146°	H 13 10 43
						.09 deep (USCGS)
5	iPKPZ	21 06 01			147°	H 20 46 33
						.02 deep (USCGS)
6	iPZ	06 49 51		+	90°	H 06 36 45
						(USCGS)
8	ePZ	14 41 30			73°	H 14 30 00
						(USCGS)
12	iPZ	13 39 01		-	20°.5	H 13 34 20
	iPPZ	39 34		-		(BCIS)

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October, sheet 2

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
13	iPKPZ	07 15 08		-	144°	H 06 56 02
	iPKPZ	15 10		+		.04 deep
	ipPKPZ	16 18		+		(USCGS)
	iXZ	16 48		+		
	iPPZ	18 33		-		
	iSSE	36 55		-		
	MN	08 06	20			
14	iPZ	07 06 12		-	29°.5	H 07 00 06
	iPPZ	07 08		-		(BCIS)
	iPPPZ	07 23		-		
17	iPZ	01 36 42		+	75°	H 01 25 12
	ipPZ	37 14		-		.02 deep
	iPcPZ	37 28		-		(USCGS)
	iPPZ	39 11		-		
	ipPPPZ	39 31		-		
	iSN	46 04		-		
	isSN	47 10		-		
20	iPZ	13 22 46		+	70°	H 13 11 33
	iPPZ	25 19		-		(USCGS)
20	iPZ	15 32 27		+	78°	H 15 20 37
	iSE	42 13		-		.01 deep
						(USCGS)
21	iPZ	21 05 19		-	73°.5	H 20 53 47
						(USCGS)
22	iPKPZ	06 17 07		-	127°	H 05 58 49
						(USCGS)
22	iPKPZ	07 31 03		-	126°	H 07 12 08
						(USCGS)
22	iPZ	13 02 52		+	65°	H 12 52 22
	ipPZ	03 12		-		.01 deep
						(USCGS)
22	iPZ	23 03 27		+	77°	H 22 51 33
	MN	23 36				(USCGS)
26	iPZ	15 40 37		-	16°	H 15 36 50
	iXZ	40 40		-		(BCIS)
	iPPE	40 58		-		
	iSZ	43 34		-		
	iXE	43 40		-		
	iPcPZ	45 42		-		

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October, sheet 3

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
27	ePZ	08 14 37			16°	H 08 10 56
	iXZ	14 46		-		(BCIS)
	iPPZ	14 55		+		
	iSE	17 29		+		
	eXN	17 38		+		
	iSSN	17 55		-		
	iPcPZ	19 47		-		
	MN	08 21	10	115		
31	iPZ	06 55 13		+	77°	H 06 43 17
						(USCGS)
31	iPZ	11 44 40		+	75°	H 11 33 05
	iPPZ	47 35		-		(USCGS)
	eXN	54 08				
	iSN	54 25		-		
	iSKSN	55 05		+		
	iSSN	59 25		-		
	MN	12 24	18	15		

13th April, 1970

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DURHAM UNIVERSITY OBSERVATORY, ENGLAND

Position:- 54°46'N, 01°35'W, height above M.S.L. 103 metres.

SEISMOLOGICAL BULLETIN FOR NOVEMBER 1969

Instruments:- Wilson-Lamison seismometer free period 1 sec. coupled to G.E. galvanometer free period 3.4 sec., recording vertical component of velocity.
Milne-Shaw free period 12 sec., damping ratio 20:1, magnification 250, recording N and E component displacements.

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
1	iPZ	11 20 41		-	80°	H 11 08 21 (USCGS)
	iSN	30 46		-		
	iSKSN	31 02		-		
	iSSN	35 43		+		
	MN	11 55	15	65		
	ME	11 56	15	37		
5	eFN	18 06 07		-	77°	H 17 54 14 (USCGS)
	iPPE	08 59		-		
	iSN	16 02		-		
	iSSN	21 03		-		
	MN	18 38	16	6		
6	iFN	20 31 14		-	73°.5	H 20 20 19 (USCGS)
	MN	21 10		-		
7	iPZ	18 43 04		+	52°	H 18 34 07 .02 deep (BCIS)
	iPcPZ	44 29		-		
	iPPZ	45 12		-		
	iSN	50 16		+		
	iScSN	52 43		+		
13	iSSE	08 17 05		+	102°	H 07 51 29 (USCGS)
14	iPKPZ	07 56 59		+	145°	H 07 37 46 .03 deep (USCGS)
21	iPZ	02 18 45		-	92°	H 02 05 35 (USCGS)
	iPPE	22 26		+		
	iSKSE	29 13		+		
	iSN	29 41		-		
	iSSN	35 34		-		
	MN	02 59	22	220		

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November 1969 sheet 2

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
24	iPZ	17 32 14		+	51°	H 17 23 16 .02 deep (BCIS)
	ipPZ	32 43		-		
	iSE	39 02		-		
	isSE	39 47		-		
	eSSE	42 46		-		
24	iSSSE	44 22		+		
24	iPKPZ	21 49 45		-	143°.5	H 21 31 18 .10 deep (USCGS)
	ipPKPZ	52 29		+		
24	iPZ	23 02 41		-	66°	H 22 51 50 (USCGS)
	eSE	11 38		-		
30	iPZ	03 41 29		-	47°	H 03 33 03 (BCIS)

20th May, 1970

DURHAM UNIVERSITY OBSERVATORY ENGLAND

Position - 54°46'N, 01°35'W, height above M.S.L. 103 metres

SEISMOLOGICAL BULLETIN FOR DECEMBER 1969

Instruments:- Wilson-Lamson seismometer free period 1 sec. coupled to G.E. galvanometer free period 3.4 sec., recording vertical component of velocity.
Milne-Shaw free period 12 sec., damping ratio 20:1, magnification 250, recording N and E component displacements.

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
1	iPKFZ	02 35 02		-	143°.5	H 02 16 43 .10 deep (USCGS)
1	ePE eSE	20 23 23 28 12			27°	H 20 17 58 (BCIS)
1	iPZ	22 24 07		+	58°.5	H 22 13 53 (USCGS)
4	iPZ	09 02 34		-	81°	H 08 50 22 (USCGS)
6	iPZ eSE	07 10 14 16 07		-	38°	H 07 03 00 (BCIS)
10	ePKFZ MN	20 13 35 21 17	20	5	139°.5	H 19 53 58 (USCGS)
18	iPZ ipPZ iSN iSKSN	13 43 12 44 13 52 38 53 02		- + - +	75°	H 13 32 05 .06 deep (USCGS)
24	iPZ	05 09 14		-	20°	H 05 04 45 (BCIS)
25	iPZ iPcPZ iSN iScSE LN MN ME MZ	21 42 30 43 25 50 36 52 25 56 47 21 58 22 03 22 03		+ + - + + 20 19 19	59°	H 21 32 27 (USCGS)
25	iSE	22 44 29		-	59°	H 22 26 12 (USCGS)

December 1969, sheet 2

Date	Phase and component	Time G.M.T.	Period sec.	Amplitude microns and direction	Epicentral distance	Notes
31	iPZ MN	13 22 18 13 28		-	16°	H 13 18 32 (BCIS)
31	iPZ iSKSN iSE iXE MN MZ	19 14 44 25 00 25 17 26 24 19 59 19 59		- - - - 13 13	87°	H 19 01 56 (USCGS)

5th June, 1970