

MONTHLY TELESEISMIC BULLETIN of SZGRF-ERLANGEN - June 1999

H. Aichele, K. Klinge, R. Hohl

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date          distance backazimut
station time   phase   comp per[s] ampl[nm] magn
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SZGRF or NEIC-QED LOCATION

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1999-06-01      D152.7
  GRA1 03:24:33.2 e PKPdf Z
  GRA1 03:24:44.8 e PKPab Z

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1999-06-01      D152.5
  GRA1 03:28:50.0 e PKPdf Z
  GRA1 03:28:59.5 e PKPab Z
NEIC: OT 03:08:52.7 56S 124W dep 10km mb4.8
SOUTHERN EAST PACIFIC RISE

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1999-06-01      D 82.2
  GRA1 08:40:22.8 e P      Z      mb5.1
  BEAM 08:40:22.8          T1.9  A27
  GRA1 08:40:28.9 e pP     Z

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1999-06-01      D 44.0 AZ 84
  GRA1 12:57:26.2 i P      c Z      mb5.0
  BEAM 12:57:26.2          T1.3  A36
  GRA1 12:57:46.6 i pP     d Z
  GRA1 12:57:54.0 e (sP)   Z
  GRA1 13:06:29.5 e L      Z T20.5 A158 MS3.9
SZGRF: OT 12:49:27.9 37N 70E dep 81km
HINDU KUSH REGION

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1999-06-01      D 4.7 527km
  GRA1 14:58:52.1 e Pg      Z      M13.7
  GRA1 14:59:58.5 e Sg      E
SZGRF: OT 14:57:27.0 50N 19E dep 1km
CZECHOSLOVAKIA

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1999-06-01      D 85.9

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GRA1 15:30:44.1 e P Z mb4.9  
BEAM 15:30:44.1 T1.7 A15  
GRA1 16:13:36.8 e L Z T18.7 A136 MS4.4  
NEIC: OT 15:18:01.6 32N 115W dep 5km mb5.1  
CALIF.-BAJA CALIF. BORDER REGION

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1999-06-01 D148.8  
GRA1 16:46:47.6 e PKPbc Z  
GRA1 16:46:53.7 e PKPab Z

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1999-06-01  
GRA1 18:18:00.1 e (PKPdf) Z  
GRA1 18:18:09.4 e pPKPdf Z  
NEIC: OT 17:59:49.2 7S 130E dep173km mb5.0  
BANDA SEA

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1999-06-02 D 23.9 AZ356  
GRA1 00:36:57.3 e P Z T1.4 A15 mb4.3  
GRA1 00:37:03.6 e (pP) Z  
GRA1 00:37:13.7 e Z  
GRA1 00:45:11.5 e L Z T21.6 A202 MS3.6  
SZGRF: OT 00:31:46.2 73N 6E dep 25km  
GREENLAND SEA

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1999-06-02 D104.1  
GRA1 00:41:24.0 e Pdiff Z  
GRA1 00:41:31.1 e Z  
GRA1 00:42:08.8 e pPdiff Z  
GRA1 01:23:47.7 e L Z T21.2 A205 MS4.6  
NEIC: OT 00:23:19.1 N 124E dep161km mb5.8  
MINAHASSA PENINSULA, SULAWESI

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1999-06-02 D 79.4 AZ 26  
GRA1 03:04:40.0 i P c Z mb4.9  
ALIGN 03:04:40.0 T1.1 A14  
GRA1 03:58:53.4 e L Z T20.8 A115 MS4.2

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1999-06-02 D150.0  
GRA1 07:53:17.0 e PKPdf Z  
GRA1 07:53:22.7 i PKPbc d Z  
GRA1 07:53:32.2 e PKPab Z  
NEIC: OT 07:34:38.8 21S 179W dep606km mb5.0  
FIJI ISLANDS REGION

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1999-06-02 D 11.0 AZ171  
GRA1 10:39:41.4 e P Z  
BEAM 10:39:41.4 T1.0 A6

GRA1 10:44:38.1 e L Z T18.3 A328 MS3.3  
 NEIC: OT 10:37:07.8 39N 14E dep 59km mb3.6  
 TYRRHENIAN SEA

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 1999-06-02 D 79.8 AZ 89  
 GRA1 13:31:10.4 e P Z mb4.6  
 BEAM 13:31:10.4 T1.3 A10  
 NEIC: OT 13:19:04.1 9N 94E dep 33km mb4.6  
 NICOBAR ISLANDS, INDIA

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 1999-06-02 D128.5  
 GRA1 22:40:33.7 e PKPdf Z  
 GRA1 22:40:40.3 e Z  
 GRA1 23:28:07.5 e L Z T22.0 A121 MS4.5  
 NEIC: OT 22:21:29.3 38S 93W dep 10km mb4.6  
 WEST CHILE RISE

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 1999-06-03 D148.4  
 GRA1 03:50:04.5 e PKP Z

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 1999-06-03 D 62.4  
 GRA1 11:20:07.2 e P Z mb4.7  
 BEAM 11:20:07.2 T1.4 A7

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 1999-06-03 D123.8  
 GRA1 13:37:21.2 e PKPdf Z  
 GRA1 14:46:04.6 e L Z T20.5 A250 MS4.9

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 1999-06-03 D 86.9  
 GRA1 14:30:27.2 e P Z mb4.5  
 BEAM 14:30:27.2 T1.0 A4  
 GRA1 15:03:32.3 e L Z T21.7 A145 MS4.3

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 1999-06-03 D 84.9 AZ 59  
 GRA1 16:24:08.5 i P c Z mb5.6  
 ALIGN 16:24:08.5 T1.2 A48  
 GRA1 16:24:14.2 e pP d Z  
 GRA1 16:27:22.9 e PP Z  
 GRA1 17:09:43.2 e L Z T21.9 A173 MS4.4  
 SZGRF: OT 16:11:35.7 24N 122E dep 20km  
 TAIWAN REGION

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 1999-06-03 D 45.3  
 GRA1 18:06:07.2 e P Z mb4.4  
 BEAM 18:06:07.2 T1.4 A8

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1999-06-03          D 86.5  AZ 39
  GRA1 19:43:06.9  e P          Z          mb4.6
  ALIGN 19:43:06.9                T0.8   A4
SZGRF: OT 19:30:28.5 34N   143E  dep 33km
  OFF EAST COAST OF HONSHU, JAPAN
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1999-06-04          D 77.1
  GRA1 04:37:46.6  e P          Z          mb5.5
  ALIGN 04:37:46.6                T1.2   A46
  GRA1 04:38:08.9  e pP         Z
  GRA1 04:38:18.0  e sP         Z
  GRA1 05:13:35.2  e L          Z  T21.3  A776  MS5.0
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1999-06-04          D 26.9
  GRA1 09:18:28.6  e P          Z          mb5.4
  ALIGN 09:18:28.6                T1.4   A119
  GRA1 09:21:51.4  e PcP        Z
  GRA1 09:21:57.7  e            Z
  GRA1 09:33:59.1  e L          Z  T19.0  A1122  MS4.4
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1999-06-04          D145.7
  GRA1 12:15:47.7  e PKPbc      Z
  GRA1 12:16:00.2  e pPKPbc    Z
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1999-06-04
  GRA1 20:41:55.7  e PKPbc      Z
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1999-06-05          D 77.6
  GRA1 01:09:18.1  e P          Z          mb4.5
  BEAM 01:09:18.1                T1.0   A4
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1999-06-05          D 13.9
  GRA1 06:22:46.0  e P          Z
  BEAM 06:22:46.0                T1.5   A19
  GRA1 06:28:41.3  e L          Z  T19.3  A392  MS3.5
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1999-06-05          D 77.3
  GRA1 09:23:21.0  e P          Z          mb4.8
  ALIGN 09:23:21.0                T1.1   A8
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1999-06-05 D 86.3  
 GRA1 19:23:26.2 e P Z mb4.8  
 BEAM 19:23:26.2 T1.7 A14  
 GRA1 19:23:43.4 e Z  
 GRA1 19:56:08.6 e L Z T21.8 A526 MS4.9

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 1999-06-05 D146.3  
 GRA1 09:19:26.7 e PKP Z

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 1999-06-05 D 78.3 AZ 26  
 GRA1 10:51:42.2 i P c Z mb5.1  
 ALIGN 10:51:42.2 T1.2 A18  
 NEIC: OT 10:39:37.7 45N 151E dep 33km mb4.9  
 KURIL ISLANDS

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 1999-06-06 D 75.4 AZ123  
 GRA1 04:45:21.6 i P c Z mb5.0  
 ALIGN 04:45:21.6 T1.3 A20  
 GRA1 04:45:25.8 e pP Z  
 SZGRF: OT 04:33:37.3 9S 66E dep 14km  
 MID-INDIAN RISE

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 1999-06-06 D 87.4 AZ 39  
 GRA1 04:59:30.6 e P Z mb4.8  
 BEAM 04:59:30.6 T1.2 A9  
 GRA1 04:59:44.7 e pP Z  
 GRA1 05:45:06.3 e L Z T18.2 A452 MS4.9

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 1999-06-06 D 87.6  
 GRA1 05:15:25.5 e P Z mb5.2  
 BEAM 05:15:25.5 T2.0 A27  
 NEIC: OT 05:02:28.7 32N 142E dep 41km mb4.7  
 SOUTH OF HONSHU, JAPAN

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 1999-06-06 D 86.3 AZ288  
 GRA1 07:20:49.3 i P d Z mb5.5  
 ALIGN 07:20:49.3 T1.8 A68  
 GRA1 07:21:06.9 e (pP) Z  
 GRA1 07:21:09.9 e Z  
 GRA1 07:21:15.6 e sP Z  
 GRA1 07:56:26.3 e L Z T22.0 A7113 MS6.0  
 SZGRF: OT 07:08:15.3 14N 90W dep 65km  
 GUATEMALA

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 1999-06-06 D125.2  
 GRA1 13:37:26.7 e PKPdf Z

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1999-06-07 D 98.9  
GRA1 07:59:30.1 e Pdiff Z  
GRA1 08:48:42.0 e L Z T21.8 A1097 MS5.3

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1999-06-07 D 23.7 AZ357  
GRA1 09:07:08.9 e P Z mb4.6  
BEAM 09:07:08.9 T1.2 A22  
SZGRF: OT 09:02:00.0 73N 7E dep 33km  
GREENLAND SEA

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1999-06-07 D 23.6 AZ357  
GRA1 09:29:01.9 e P Z mb3.8  
BEAM 09:29:01.9 T1.1 A4  
SZGRF: OT 09:23:54.6  
GREENLAND SEA

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1999-06-07 D 23.7  
GRA1 14:46:14.8 e P Z mb4.3  
BEAM 14:46:14.8 T1.8 A20

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1999-06-07 D 23.9 AZ356  
GRA1 16:15:44.7 i P c Z mb5.7  
ALIGN 16:15:44.7 T2.1 A513  
GRA1 16:24:04.2 e L Z T22.5 A3285  
SZGRF: OT 16:10:34.4 73N 6E dep 33km  
GREENLAND SEA

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1999-06-07 D 23.9 AZ358  
GRA1 16:22:44.3 e P Z mb4.1  
BEAM 16:22:44.3 T1.4 A9  
SZGRF: OT 16:17:33.4  
GREENLAND SEA

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1999-06-07 D 23.8 AZ356  
GRA1 16:31:15.7 i P d Z mb4.8  
ALIGN 16:31:15.7 T1.2 A39  
SZGRF: OT 16:26:05.7 73N 6E dep 33km  
GREENLAND SEA

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1999-06-07 D 23.7 AZ356  
GRA1 16:40:58.7 i P c Z mb5.3  
BEAM 16:40:58.7 T1.4 A146  
GRA1 16:49:23.2 e L Z T24.1 A3036 MS4.7  
SZGRF: OT 16:35:49.7 73N 6E dep 33km  
GREENLAND SEA

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1999-06-07 D 23.6 AZ356  
GRA1 17:25:15.2 e P Z mb4.3  
BEAM 17:25:15.2 T1.1 A11  
SZGRF: OT 17:20:07.3 73N 6E dep 33km  
GREENLAND SEA

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1999-06-07 D 14.2  
GRA1 23:58:35.5 e Pn Z  
GRA1 23:58:45.5 e (PnPn) Z  
GRA1 00:05:29.0 e L Z T17.2 A977 MS4.0  
NEIC: OT 23:55:20.3 38N 21E dep 87km mb4.5  
SOUTHERN GREECE

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1999-06-08 D 67.0  
GRA1 12:14:48.5 i P c Z mb5.4  
ALIGN 12:14:48.5 T1.3 A30  
GRA1 12:14:51.0 e Z  
GRA1 12:15:06.6 e pP Z  
GRA1 12:15:11.6 e (pX) Z  
GRA1 12:15:15.0 e sP Z  
GRA1 12:23:42.4 e S Z  
GRA1 12:39:23.8 e L Z T20.0 A3224 MS5.5

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1999-06-08  
GRA1 12:43:37.4 e PKPdf Z

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1999-06-08 D 85.9 AZ 43  
GRA1 21:40:27.7 i P d Z mb4.9  
ALIGN 21:40:27.7 T0.9 A8  
NEIC: OT 21:27:18.7 26N 142E dep 33km mb4.7  
BONIN ISLANDS REGION

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1999-06-09 D149.5  
GRA1 00:21:53.0 e PKPab Z  
GRA1 01:29:10.8 e L Z T20.0 A1045 MS5.6

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1999-06-09 D149.4  
GRA1 00:28:18.2 e PKPbc Z

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1999-06-09 D 22.2  
GRA1 00:33:24.2 e P Z

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1999-06-09 D 51.7 AZ 79

GRA1 00:40:07.7 e P Z mb4.1  
BEAM 00:40:07.7 T1.1 A3

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1999-06-09 D 99.1 AZ 63  
GRA1 01:19:15.6 e P Z mb5.3  
BEAM 01:19:15.6 T1.1 A6  
GRA1 02:08:14.7 e L Z T20.6 A683 MS5.1  
NEIC: OT 01:05:32.4 9N 126E dep 33km mb5.0  
MINDANAO, PHILIPPINE ISLANDS

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1999-06-09 D113.3  
GRA1 04:20:41.9 e Pdiff Z  
GRA1 04:25:05.3 e PP Z  
GRA1 05:10:39.1 e L Z T19.0 A1558 MS5.6  
NEIC: OT 04:05:43.8 53S 47W dep 10km mb5.5  
SOUTH ATLANTIC OCEAN

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1999-06-09 D 74.3 AZ 19  
GRA1 07:19:25.1 i P d Z mb5.3  
ALIGN 07:19:25.1 T1.0 A28  
GRA1 07:19:42.0 e Z  
GRA1 07:20:25.1 e sP Z  
GRA1 07:59:21.6 e L Z T18.0 A365 MS4.7  
SZGRF: OT 07:08:08.5 53N 160E dep172km  
NEAR EAST COAST OF KAMCHATKA

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1999-06-09 D145.3  
GRA1 12:47:25.1 e PKPbc Z  
GRA1 12:47:30.7 e pPKPbc Z  
SZGRF: OT 12:27:45.0 50S 114W dep 10km  
EASTER ISLAND CORDILLERA

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1999-06-09  
GRA1 13:12:54.9 e PKPab Z  
GRA1 14:09:50.5 e L Z T21.2 A315

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1999-06-09 D148.2  
GRA1 17:16:26.2 e PKPbc Z  
GRA1 17:16:32.9 e PKPab Z

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1999-06-09 D 98.8 AZ246  
GRA1 23:38:16.1 i P c Z mb5.9  
ALIGN 23:38:16.1 T1.2 A27  
NEIC: OT 23:24:57.8 23S 66W dep215km mb5.2  
JUJUY PROVINCE, ARGENTINA



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1999-06-09      D147.4
  GRA1 23:41:45.2 e PKPdf Z
  GRA1 23:42:19.4 e pPKPdf Z

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1999-06-10      D 98.1
  GRA1 01:20:08.9 e Pdiff Z
NEIC: OT 01:06:41.1 7S 106E dep104km mb5.2
      JAWA, INDONESIA

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1999-06-10      D147.8
  GRA1 06:10:48.9 e PKP      Z

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1999-06-10      D 84.6
  GRA1 07:30:30.7 e P          Z          mb4.9
  BEAM 07:30:30.7              T1.1    A9
  GRA1 07:30:50.4 e (pP)      Z
  GRA1 08:11:42.8 e L          Z T18.8  A108  MS4.3

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1999-06-10      D151.2
  GRA1 07:52:39.7 e PKPdf    Z

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1999-06-10      D 73.7  AZ356
  GRA1 09:19:33.8 e P          Z          mb5.0
  BEAM 09:19:33.8              T0.8    A12
  GRA1 09:20:28.9 e (pP)      Z
SZGRF: OT 09:08:27.7 57N 162W dep235km
      BRISTOL BAY

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1999-06-10      D 23.7  AZ356
  GRA1 13:43:31.0 e P          c Z          mb4.7
  ALIGN 13:43:31.0              T1.4    A36
  GRA1 13:51:44.1 e L          Z T24.1  A544  MS3.9
SZGRF: OT 13:38:19.8 73N 6E  dep 10km
      GREENLAND SEA

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1999-06-10      D 45.1  AZ 84
  GRA1 15:15:26.4 i P          c Z          mb5.7
  ALIGN 15:15:26.4              T1.1    A122
  GRA1 15:15:51.8 e pP          Z
  GRA1 15:16:03.6 e sP          Z
  GRA1 15:17:04.9 e PcP        Z
  GRA1 15:17:12.1 e PP          Z
  GRA1 15:37:46.0 e L          Z T18.5  A254  MS4.2
SZGRF: OT 15:07:22.3 36N 71E  dep108km
      PAKISTAN

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1999-06-10 D 21.7  
 GRA1 23:30:11.7 e P Z mb3.9  
 BEAM 23:30:11.7 T1.3 A7  
 GRA1 23:30:20.1 e Z  
 GRA1 23:40:21.1 e L Z T18.6 A118 MS3.3

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1999-06-11 D 37.0  
 GRA1 03:12:33.9 e P Z  
 BEAM 03:12:33.9 T1.2 A7  
 NEIC: OT 03:05:26.0 29N 52E dep 36km mb4.6  
 SOUTHERN IRAN

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1999-06-11 D 20.9  
 GRA1 05:29:59.9 i P c Z mb4.6  
 BEAM 05:29:59.9 T1.5 A49  
 GRA1 05:30:41.2 e Z  
 GRA1 05:39:21.8 e L Z T20.9 A396 MS3.8

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1999-06-11 D 14.1  
 GRA1 07:53:27.8 e Pn Z  
 GRA1 07:55:57.5 e (Sn) Z  
 GRA1 08:00:10.8 e L Z T23.9 A1310 MS3.9

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1999-06-11  
 GRA1 16:20:34.8 e (PKPdf) Z

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1999-06-11 D 82.9  
 GRA1 22:55:42.9 e P Z mb4.4  
 ALIGN 22:55:42.9 T1.2 A3  
 GRA1 22:55:54.6 e pP Z  
 GRA1 22:56:02.7 e sP Z  
 NEIC: OT 22:43:24.3 37N 142E dep 78km mb4.7  
 NR E CST HONSHU, JAPAN

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1999-06-12 D 38.3 AZ 6  
 GRA1 00:02:22.9 i P c Z mb5.2  
 BEAM 00:02:22.9 T1.6 A82  
 GRA1 00:02:29.4 e (pP) Z  
 GRA1 00:16:58.4 e L Z T21.4 A107 MS3.6  
 NEIC: OT 23:54:51.8 86N 84E dep 10km mb5.0  
 NORTH OF SEVERNAYA ZEMLYA

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1999-06-12 D 36.7 AZ108  
 GRA1 00:46:35.9 e P Z mb4.0

BEAM 00:46:35.9 T0.7 A2  
SZGRF: OT 00:39:32.1 30N 52E dep 33km  
SOUTHERN IRAN

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1999-06-12 D 16.9  
GRA1 04:16:19.1 e P Z  
GRA1 04:23:54.6 e L Z T18.6 A135 MS3.2

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1999-06-12 D 39.5  
GRA1 05:50:26.6 e P Z  
GRA1 05:50:34.7 e pP Z  
GRA1 05:50:39.2 e sP Z

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1999-06-12 D 76.4  
GRA1 09:56:57.3 i P c Z mb5.3  
ALIGN 09:56:57.3 T0.9 A23  
NEIC: OT 09:45:12.9 48N 153E dep118km mb4.7  
KURIL ISLANDS

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1999-06-12 D 80.5  
GRA1 13:51:20.7 e P Z mb4.4  
BEAM 13:51:20.7 T1.3 A7  
GRA1 13:51:31.0 e pP Z

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1999-06-12 D 16.5 AZ149  
GRA1 17:24:32.3 e P Z  
GRA1 17:24:36.0 e Z  
GRA1 17:24:38.3 e Z  
GRA1 17:27:55.8 e S Z  
GRA1 17:32:40.2 e L Z T18.0 A280 MS3.5

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1999-06-12 D 15.0 AZ149  
GRA1 17:54:34.8 e P Z

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1999-06-12  
GRA1 22:56:31.0 e PKPdf Z

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1999-06-12 D 38.2 AZ 7  
GRA1 23:03:14.1 e P Z mb4.3  
BEAM 23:03:14.1 T1.5 A10  
SZGRF: OT 22:55:58.7  
NORTH OF SEVERNAYA ZEMLYA

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1999-06-12 D 78.8  
 GRA1 23:09:07.6 i P c Z mb4.7  
 ALIGN 23:09:07.6 T0.8 A7

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 1999-06-13 D 46.5 AZ134  
 GRA1 04:26:04.8 e P Z mb4.3  
 BEAM 04:26:04.8 T1.5 A5  
 GRA1 04:26:23.6 e Z  
 SZGRF: OT 04:17:40.1  
 ETHIOPIA

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 1999-06-13 D151.1  
 GRA1 11:50:05.6 e PKPdf Z  
 GRA1 11:50:10.2 i PKPbc d Z  
 GRA1 11:50:17.9 e PKPab Z

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 1999-06-13 D 55.6  
 GRA1 12:00:47.9 e P Z mb4.5  
 ALIGN 12:00:47.9 T1.1 A6  
 GRA1 12:26:29.9 e L Z T18.9 A170 MS4.2  
 NEIC: OT 11:51:13.0 56N 110E dep 10km mb4.7  
 LAKE BAYKAL REGION, RUSSIA

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 1999-06-13 D125.0  
 GRA1 12:36:38.3 e PKPdf Z  
 GRA1 12:36:48.4 e pPKPdf Z  
 GRA1 13:36:18.2 e L Z T19.8 A94 MS4.5  
 NEIC: OT 12:17:39.3 5S 152E dep 33km mb5.1  
 NEW BRITAIN REGION, P.N.G.

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 1999-06-13 D 2.3 255km  
 GRC1 17:25:08.8 e Pn Z M12.7  
 GRA1 17:25:16.4 e Pn Z M12.8  
 GRA1 17:25:26.3 e Pg Z  
 GRA1 17:26:04.1 e Sg E  
 SZGRF: OT 17:24:31.8 47N 10E dep 10km  
 NORTHERN ITALY

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 1999-06-13 D 15.0 AZ132  
 GRA1 17:30:42.7 e P Z

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 1999-06-13  
 GRA1 17:34:43.1 e PKPab Z

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 1999-06-13 D 94.1 AZ 59

GRA1 18:00:06.4 e P Z mb4.6  
BEAM 18:00:06.4 T1.2 A4  
GRA1 18:00:23.1 e pP Z  
NEIC: OT 17:47:18.9 19N 121E dep 33km mb4.9  
PHILIPPINE ISLANDS REGION

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1999-06-13

GRA1 20:47:06.7 e PKPdf Z  
GRA1 20:47:17.2 e (pPKPdf) Z

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1999-06-13 D 98.3

GRA1 20:53:36.4 e P Z mb5.1  
BEAM 20:53:36.4 T1.0 A4  
GRA1 20:54:01.3 e (pP) Z

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1999-06-13 D154.9

GRA1 21:25:34.1 e PKPdf Z  
GRA1 21:25:41.9 e PKPbc Z  
GRA1 21:25:56.8 e PKPab Z

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1999-06-13

GRA1 22:31:32.6 e PKPab Z

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1999-06-13 D 58.4 AZ256

GRA1 22:58:36.7 e P Z mb4.3  
BEAM 22:58:36.7 T0.9 A3  
GRA1 23:20:56.0 e L Z T20.8 A168 MS4.1  
SZGRF: OT 22:48:44.3 16N 48W dep 33km  
NORTH ATLANTIC OCEAN

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1999-06-14 D146.8

GRA1 09:36:10.4 e PKPdf Z

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1999-06-14 D160.5

1999-06-15 D 71.7 AZ351

GRA1 00:51:21.7 e P Z mb4.5  
BEAM 00:51:21.7 T0.9 A3  
SZGRF: OT 00:40:04.9 58N 153W dep 33km  
KODIAK ISLAND REGION

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1999-06-15 D 71.9 AZ350

GRA1 00:51:31.0 i P c Z mb5.1

ALIGN 00:51:31.0 T1.0 A14  
 GRA1 01:21:31.3 e L Z T21.8 A81 MS3.9

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 1999-06-15

GRA1 01:53:49.6 e (PKPab) Z

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 1999-06-15 D160.2

GRA1 03:48:02.6 e PKPab Z

GRA1 03:48:12.2 e pPKPab Z

NEIC: OT 03:27:34.9 31S 178W dep118km mb4.6

KERMADEC ISLANDS REGION

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 1999-06-15 D 79.5

GRA1 07:59:40.1 i P c Z mb5.4

ALIGN 07:59:40.1 T1.2 A65

GRA1 07:59:49.0 e pP Z

GRA1 08:37:48.3 e L Z T18.5 A425 MS4.8

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 1999-06-15 D146.5

GRA1 11:37:30.9 e PKPbc d Z

GRA1 11:37:35.7 e pPKPbc Z

GRA1 12:46:34.3 e L Z T20.1 A154 MS4.8

NEIC: OT 11:17:50.6 16S 173W dep 33km mb4.9

TONGA ISLANDS

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 1999-06-15 D160.0

GRA1 19:18:49.8 e PKPab Z

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 1999-06-15 D 87.1 AZ296

GRA1 20:54:48.1 e P Z mb6.4

ALIGN 20:54:48.1 T1.5 A445

GRA1 20:55:12.5 e pP Z

GRA1 20:55:20.0 e sP Z

GRA1 20:58:16.5 e PP Z

GRA1 21:12:36.8 e PKKP Z

GRA1 21:20:40.8 e PKPPKP Z

GRA1 21:27:00.2 e L Z T32.0 A56646 MS6.8

SZGRF: OT 20:42:13.2 19N 97W dep 88km

VERA CRUZ, MEXICO

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 1999-06-16 D 3.7 409km

GRA1 07:57:07.7 e Pn Z M13.8

GRA1 07:58:06.7 e Sg N

SZGRF: OT 07:56:10.0 52N 16E dep 1km

POLAND

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1999-06-16 D159.0  
GRA1 17:41:54.9 i PKPab c Z  
NEIC: OT 17:21:42.7 31S 179W dep225km mb4.8  
KERMADEC ISLANDS REGION

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1999-06-16 D147.3  
GRA1 18:55:36.0 e PKPdf Z  
GRA1 18:55:37.5 e PKPbc Z  
GRA1 18:55:48.5 e PKPab Z  
GRA1 18:55:57.9 e pPKPdf Z  
GRA1 18:56:01.1 e pPKPbc Z  
GRA1 18:56:12.6 e pPKPab Z  
GRA1 19:55:32.0 e L Z T20.5 A305 MS5.1  
NEIC: OT 18:36:01.6 17S 173W dep100km mb5.5  
TONGA ISLANDS

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1999-06-16 D144.5  
GRA1 19:52:07.7 e PKPdf Z  
GRA1 20:57:22.0 e L Z T21.9 A1243 MS5.6  
NEIC: OT 19:32:32.8 15S 176W dep 33km mb5.1  
SAMOA ISLANDS REGION

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1999-06-16 D145.1  
GRA1 20:58:38.0 e PKPdf Z

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1999-06-16 D144.6  
GRA1 22:08:58.9 i PKPdf c Z

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1999-06-17 D 73.5 AZ 19  
GRA1 00:44:14.4 e P Z mb4.1  
BEAM 00:44:14.4 T1.1 A2  
GRA1 00:44:26.7 e pP Z  
GRA1 00:44:34.7 e sP Z  
SZGRF: OT 00:32:48.7 54N 159E dep 47km  
NEAR EAST COAST OF KAMCHATKA

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1999-06-17 D 16.5 AZ133  
GRA1 04:28:05.2 e P Z  
GRA1 04:28:08.7 e Z  
NEIC: OT 04:24:10.4 38N 28E dep 10km mb4.2  
TURKEY

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1999-06-17 D 19.9  
GRA1 10:22:33.4 e P Z

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1999-06-17 D 27.8  
GRA1 14:29:02.8 e P Z mb4.3  
BEAM 14:29:02.8 T1.5 A8  
GRA1 14:29:18.5 e pP Z

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1999-06-17 D 48.3  
GRA1 15:10:59.0 i P c Z mb5.5  
ALIGN 15:10:59.0 T1.1 A45  
GRA1 15:11:02.8 e pP Z  
GRA1 15:32:04.8 e L Z T13.4 A1178 MS5.0  
NEIC: OT 15:02:19.4 42N 82E dep 33km mb5.2  
SOUTHERN XINJIANG, CHINA

-----  
1999-06-17 D 48.4  
GRA1 15:17:17.7 i P c Z mb5.5  
ALIGN 15:17:17.7 T1.6 A65  
GRA1 15:17:22.6 e pP Z  
GRA1 15:19:10.0 e PP Z  
GRA1 15:38:22.9 e L Z T13.7 A1619 MS5.2  
NEIC: OT 15:08:38.7 42N 82E dep 33km mb5.1  
SOUTHERN XINJIANG, CHINA

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1999-06-18 D102.0  
GRA1 11:09:18.1 i Pdiff c Z  
GRA1 11:09:30.2 e pPdiff Z  
GRA1 11:13:30.6 e PP Z  
GRA1 12:00:03.4 e L Z T21.2 A9493 MS6.3

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1999-06-18 D148.0  
GRA1 14:46:10.2 i PKPbc d Z  
GRA1 14:46:16.0 e pPKPbc Z  
GRA1 14:46:19.8 e PKPab Z  
GRA1 14:46:23.7 e pPKPab Z

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1999-06-18 D148.4  
GRA1 14:48:56.2 e PKP Z

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1999-06-18 D 39.5  
GRA1 19:54:57.8 i P d Z mb5.4  
ALIGN 19:54:57.8 T1.8 A168  
GRA1 19:55:04.7 e pP Z  
GRA1 19:55:09.7 e sP Z  
GRA1 20:01:05.5 e S Z  
GRA1 20:08:52.9 e L Z T26.8 A679 MS4.4



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 1999-06-18 D 46.3 AZ134  
 GRA1 21:30:03.6 e P Z mb4.4  
 BEAM 21:30:03.6 T0.8 A4  
 NEIC: OT 21:22:50.9 28N 52E dep 33km mb4.4  
 SOUTHERN IRAN  
 -----

1999-06-19 D 43.5 AZ 81  
 GRA1 00:12:53.0 i P d Z mb4.5  
 ALIGN 00:12:53.0 T1.0 A10  
 NEIC: OT 00:05:01.5 39N 71E dep100km mb4.6  
 TAJIKISTAN  
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1999-06-19 D147.0  
 GRA1 00:29:11.5 i PKPbc c Z  
 GRA1 00:29:15.8 e PKPab Z  
 NEIC: OT 00:10:34.9 18S 179W dep626km mb4.5  
 FIJI ISLANDS REGION  
 -----

1999-06-19 D122.3  
 GRA1 09:21:39.7 e PKP Z  
 GRA1 10:17:45.6 e L Z T19.1 A173 MS4.7  
 NEIC: OT 09:03:09.8 5S 147E dep211km mb5.1  
 EASTERN NEW GUINEA REG., P.N.G.  
 -----

1999-06-19 D130.4  
 GRA1 16:09:36.2 e PKPdf Z  
 -----

1999-06-19 D 2.5 283km  
 GRC1 20:18:53.8 e Pn Z M13.8  
 GRA1 20:19:03.2 e Pn Z M13.9  
 GRA1 20:19:14.2 e Pg Z  
 GRA1 20:19:56.8 e Sg E  
 SZGRF: OT 20:18:13.4 47N 13E dep 10km  
 NORTHERN ITALY  
 -----

1999-06-19 D 39.8 AZ 5  
 GRA1 21:51:37.3 e P Z mb4.1  
 BEAM 21:51:37.3 T1.3 A7  
 GRA1 21:51:44.5 e pP Z  
 -----

1999-06-19 D 4.8 539km  
 GRA1 23:03:18.1 e Pn Z M13.7  
 GRA1 23:04:37.0 e Sg N  
 SZGRF: OT 23:02:03.8 50N 19E dep 1km  
 POLAND  
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1999-06-20 D 76.9  
GRA1 02:37:42.4 e P Z mb4.9  
ALIGN 02:37:42.4 T1.0 A10  
GRA1 02:38:38.2 e pP Z  
NEIC: OT 02:26:13.0 44N 140E dep212km mb4.4  
EASTERN SEA OF JAPAN

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1999-06-20 D 93.7 AZ157  
GRA1 07:51:31.4 e P Z mb5.4  
ALIGN 07:51:31.4 T1.2 A27  
GRA1 07:51:37.4 e (pP) Z  
GRA1 07:55:20.6 e PP Z  
GRA1 08:34:13.4 e L Z T21.7 A201 MS4.5  
SZGRF: OT 07:38:14.4 40S 41E dep 20km  
ATLANTIC-INDIAN RISE

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1999-06-20 D124.1  
GRA1 08:31:08.9 e PKPdf Z  
NEIC: OT 08:12:30.9 5S 152E dep179km mb4.6  
NEW BRITAIN REGION, P.N.G.

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1999-06-20 D147.8  
GRA1 17:58:48.9 e PKPbc Z  
GRA1 17:58:52.1 e PKPab Z  
GRA1 18:24:23.3 e L Z T20.3 A64 MS4.4

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1999-06-20 D 38.2 AZ 6  
GRA1 18:56:22.8 e P Z mb4.2  
BEAM 18:56:22.8 T1.3 A6  
SZGRF: OT 18:49:04.4  
NORTH OF FRANZ JOSEF LAND

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1999-06-21 D149.5  
GRA1 13:29:30.9 e PKPbc Z  
GRA1 13:29:35.7 e PKPab Z  
GRA1 13:29:45.9 e (pPKPab) Z  
GRA1 14:37:16.1 e L Z T20.6 A311 MS5.1

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1999-06-21 D 79.8  
GRA1 17:04:41.4 i P c Z T1.1 A30 mb5.1  
GRA1 17:04:45.8 e Z  
GRA1 17:04:53.8 e Z  
GRA1 17:04:57.9 e Z  
GRA1 17:42:48.6 e L Z T21.3 A102 MS4.1

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1999-06-21 D 44.4

GRA1 17:45:17.6 i P c Z T0.9 A104 mb5.6  
 GRA1 17:46:26.1 e pP Z  
 GRA1 17:46:56.0 e PcP Z  
 GRA1 17:47:04.1 e PP Z  
 GRA1 17:47:08.3 e sP Z  
 GRA1 17:48:05.7 e Z  
 NEIC: OT 17:37:29.4 36N 71E dep253km mb5.3  
 HINDU KUSH REGION, AFGHANISTAN

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1999-06-21 D 89.9 AZ299  
 GRA1 17:55:59.2 i P d Z mb6.1  
 ALIGN 17:55:59.2 T1.7 A231  
 GRA1 17:56:18.7 e pP Z  
 GRA1 17:59:33.6 e PP Z  
 GRA1 18:31:08.6 e L Z T30.6 A10146 MS6.1

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1999-06-22 D150.3  
 GRA1 01:06:21.4 e (PKPbc) Z  
 GRA1 01:06:27.5 e PKPab Z

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1999-06-22 D 90.1  
 GRA1 01:24:33.6 e P c Z mb5.0  
 BEAM 01:24:33.6 T1.1 A10

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1999-06-22 D 83.7 AZ 93  
 GRA1 07:23:54.3 e P c Z mb5.1  
 ALIGN 07:23:54.3 T1.0 A14  
 SZGRF: OT 07:11:28.5 3N 95E dep 33km  
 OFF W. COAST OF NORTHERN SUMATERA

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1999-06-22 D145.5  
 GRA1 10:45:59.6 e PKPdf Z  
 GRA1 10:46:26.4 e pPKPdf Z

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1999-06-22 D110.1  
 GRA1 19:07:08.6 e PP Z  
 GRA1 19:47:31.7 e L Z T21.9 A138 MS4.5  
 NEIC: OT 18:48:17.6 56S 28W dep 96km mb5.4  
 SOUTH SANDWICH ISLANDS REGION

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1999-06-22 D148.5  
 GRA1 22:31:52.5 e PKP Z

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1999-06-23 D152.2

GRA1 08:50:38.1 e PKPab Z  
 GRA1 08:50:46.9 e pPKPab Z

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 1999-06-23 D 39.7  
 GRA1 10:58:54.9 e P Z mb4.2  
 BEAM 10:58:54.9 T1.3 A9  
 GRA1 10:59:02.5 e pP Z

-----  
 1999-06-23 D 39.7  
 GRA1 12:41:20.0 e P d Z mb4.5  
 ALIGN 12:41:20.0 T1.4 A19  
 GRA1 12:41:28.0 e pP Z  
 GRA1 12:55:44.5 e L Z T24.5 A226 MS3.9

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 1999-06-23 D149.6  
 GRA1 17:52:46.1 e PKPbc Z  
 GRA1 17:52:51.5 e PKPab Z

-----  
 1999-06-23 D100.5  
 GRA1 19:50:59.3 i P d Z mb5.4  
 ALIGN 19:50:59.3 T1.3 A17  
 GRA1 19:51:29.0 e pP Z  
 GRA1 19:51:39.1 e sP Z  
 GRA1 19:55:07.5 e PP Z  
 GRA1 20:40:02.6 e L Z T19.5 A532 MS5.1

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 1999-06-23 D 7.9  
 GRA1 20:55:18.3 e Pn Z  
 GRA1 20:56:44.4 e (Sn) Z

-----  
 1999-06-24 D 36.5 AZ 8  
 GRA1 02:20:10.9 e P Z mb4.3  
 BEAM 02:20:10.9 T1.2 A6  
 GRA1 02:20:17.3 e pP Z  
 SZGRF: OT 02:13:08.8  
 NORTH OF FRANZ JOSEF LAND

-----  
 1999-06-24 D 59.9 AZ228  
 GRA1 07:40:50.5 e P Z mb5.1  
 BEAM 07:40:50.5 T1.7 A36  
 GRA1 07:40:54.9 e pP Z  
 GRA1 07:49:04.7 e S Z  
 GRA1 08:03:27.7 e L Z T21.2 A255 MS4.3

SZGRF: OT 07:30:44.4 N 29W dep 16km  
CENTRAL MID-ATLANTIC RIDGE

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1999-06-25 D148.8  
GRA1 00:02:31.3 e PKPbc Z  
GRA1 00:02:41.4 e pPKPbc Z

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1999-06-25 D147.3  
GRA1 07:18:60.0 e PKPdf Z

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1999-06-25 D 14.1  
GRA1 07:45:42.4 e P Z  
BEAM 07:45:42.4 T1.5 A16  
GRA1 07:52:27.7 e L Z T18.3 A408 MS3.6

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1999-06-25 D 87.4  
GRA1 10:02:34.4 e P c Z mb5.0  
BEAM 10:02:34.4 T1.2 A14  
GRA1 10:37:10.9 e L Z T20.9 A176 MS4.4

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1999-06-25 D103.2  
GRA1 11:26:26.6 e Pdiff Z  
GRA1 11:27:56.6 e (PP) Z  
GRA1 12:16:26.9 e L Z T20.3 A587 MS5.1  
NEIC: OT 11:12:29.0 4N 126E dep 33km mb5.4  
TALAUD ISLANDS, INDONESIA

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1999-06-25 D 83.5  
GRA1 14:59:21.5 i P c Z mb5.1  
ALIGN 14:59:21.5 T0.8 A11

-----  
1999-06-25  
GRA1 17:27:49.8 e PKPdf Z

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1999-06-26 D 86.5 AZ 58  
GRA1 01:27:40.8 e P Z mb4.3  
BEAM 01:27:40.8 T1.2 A3  
NEIC: OT 01:15:04.7 21N 120E dep 33km mb4.6  
TAIWAN REGION

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1999-06-26 D146.4  
GRA1 03:17:30.3 i PKPdf d Z  
GRA1 04:28:20.3 e L Z T18.4 A135 MS4.8

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1999-06-26 D 64.9 AZ230  
GRA1 10:41:29.6 e P Z mb4.9  
BEAM 10:41:29.6 T1.4 A11  
GRA1 10:41:40.2 e pP Z  
GRA1 10:41:47.7 e (sP) Z  
GRA1 10:49:35.7 e (S) Z  
GRA1 11:02:11.4 e L Z T21.8 A180 MS4.2  
SZGRF: OT 10:30:53.4 3S 33W dep 42km  
SOUTH ATLANTIC OCEAN

---

1999-06-26 D 79.0  
GRA1 11:31:45.2 i P c Z mb4.8  
BEAM 11:31:45.2 T1.6 A18  
GRA1 11:31:55.7 e (pP) Z

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1999-06-26 D 77.1 AZ105  
GRA1 12:34:21.7 e P Z mb4.3  
BEAM 12:34:21.7 T0.9 A2  
SZGRF: OT 12:22:30.8  
NORTH INDIAN OCEAN

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1999-06-26  
GRA1 19:56:39.7 e PKPdf Z

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1999-06-26 D147.2  
GRA1 21:13:21.3 i PKPdf c Z  
GRA1 21:13:23.1 e PKPbc Z

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1999-06-26 D 47.6 AZ 90  
GRA1 22:02:45.7 i P c Z mb5.6  
ALIGN 22:02:45.7 T1.3 A62  
GRA1 22:02:58.7 e pP Z  
GRA1 22:03:02.7 e (sP) Z  
GRA1 22:10:03.1 e S Z  
GRA1 22:26:36.1 e L Z T19.3 A1810 MS5.1

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1999-06-26 D146.5  
GRA1 22:13:00.0 e PKPdf Z

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1999-06-26 D147.3  
GRA1 22:24:04.8 i PKPdf d Z  
GRA1 22:24:08.9 i PKPbc d Z

GRA1 22:24:12.5 e PKPab Z  
GRA1 22:26:25.7 e pPKPbc Z  
GRA1 22:28:06.7 e Z  
NEIC: OT 22:05:29.8 18S 178W dep591km mb5.3  
FIJI ISLANDS REGION

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1999-06-26

GRA1 22:28:06.7 e PKP Z

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1999-06-26 D147.5

GRA1 22:32:05.3 e PKPbc Z

GRA1 22:32:16.9 e pPKPbc Z

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1999-06-27 D 37.3

GRA1 05:51:37.2 e P c Z mb4.6

BEAM 05:51:37.2 T1.0 A12

GRA1 06:10:09.8 e L Z T14.2 A155 MS3.9

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1999-06-27 AZ140

GRA1 08:45:39.3 e Pn Z

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1999-06-27 D148.3

GRA1 11:28:52.8 e PKPdf Z

GRA1 11:28:55.4 i PKPbc d Z

GRA1 11:29:11.9 e pPKPbc Z

GRA1 12:32:27.9 e L Z T18.8 A99 MS4.6

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1999-06-27 D 41.8

GRA1 12:33:40.7 e P Z mb4.0

BEAM 12:33:40.7 T1.0 A3

NEIC: OT 12:25:57.3 40N 70E dep 63km mb4.3

TAJIKISTAN

1999-06-27 D141.2

GRA1 14:21:29.1 i PKPdf c Z

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1999-06-27 D148.0

GRA1 17:35:50.7 e PKPdf Z

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1999-06-28 D148.2

GRA1 00:29:32.9 e PKPbc d Z

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1999-06-28      D 17.1  AZ263
  GRA1 01:27:17.9 e P      Z                mb4.0
  ALIGN 01:27:17.9                T1.4  A16
SZGRF: OT 01:23:19.9 45N    13W    dep 33km
  NORTH ATLANTIC OCEAN
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1999-06-28      D150.2
  GRA1 02:18:27.6 e PKPdf  Z
  GRA1 02:18:34.0 i PKPbc d Z
  GRA1 02:18:43.1 e PKPab  Z
  GRA1 02:20:47.6 e pPKPbc Z
NEIC:  OT 01:59:51.5 21S    179W    dep626km  mb4.7
  FIJI ISLANDS REGION
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1999-06-28      D146.8
  GRA1 03:14:14.3 i PKPdf c Z
NEIC:  OT 02:55:34.9 18S    179W    dep591km  mb4.3
  FIJI ISLANDS REGION
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1999-06-28      D 95.3
  GRA1 08:41:52.6 e P      Z                mb5.1
  BEAM 08:41:52.6                T0.9  A6
  GRA1 09:27:43.1 e L      Z                MS4.4
NEIC:  OT 08:28:27.4 11N    122E    dep 33km  mb4.9
  PANAY, PHILIPPINE ISLANDS
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1999-06-28      D152.2
  GRA1 09:53:44.3 e PKPdf  Z
  GRA1 09:53:56.8 e PKPab  Z
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1999-06-28      D 25.0  AZ275
  GRA1 16:14:55.3 e P      Z                mb4.5
  BEAM 16:14:55.3                T1.1  A10
NEIC:  OT 09:34:51.1 24S    179E    dep569km  mb4.8
  SOUTH OF FIJI ISLANDS
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1999-06-28      D123.7
  GRA1 21:42:25.4 e PKPdf  Z
NEIC:  OT 21:23:56.9 4S     152E    dep253km  mb4.8
  NEW IRELAND REGION, P.N.G.
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1999-06-28      D 73.1
  GRA1 23:49:57.7 e P      Z                mb4.9
  BEAM 23:49:57.7                T0.9  A10
NEIC:  OT 23:38:27.6 21N    100E    dep 33km  mb4.8
  MYANMAR-CHINA BORDER REGION
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1999-06-29 D 45.1 AZ 91  
GRA1 01:06:32.1 i P c Z mb4.9  
ALIGN 01:06:32.1 T1.3 A21  
GRA1 01:30:31.2 e L Z T20.0 A226 MS4.1  
NEIC: OT 00:57:55.8 30N 69E dep 33km mb4.9  
PAKISTAN

---

1999-06-29 D 46.0 AZ 85  
GRA1 03:44:04.1 i P d Z mb4.9  
ALIGN 03:44:04.1 T0.9 A12  
GRA1 03:44:27.9 e pP Z  
NEIC: OT 03:35:58.4 36N 71E dep103km mb4.6  
AFGHANISTAN-TAJIKISTAN BORD REG.

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1999-06-29 D126.4  
GRA1 06:09:10.0 e PKPdf Z  
GRA1 06:09:14.5 e (pPKPdf)Z  
GRA1 06:11:06.3 e PP Z  
GRA1 07:07:59.1 e L Z T20.0 A802 MS5.4

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1999-06-29 D 44.5  
GRA1 08:12:15.0 i P c Z mb5.2  
ALIGN 08:12:15.0 T1.1 A32  
GRA1 08:29:53.4 e L Z T28.5 A931 MS4.6  
NEIC: OT 08:04:02.2 38N 73E dep 33km mb5.1  
TAJIKISTAN

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1999-06-29 D 44.4  
GRA1 10:22:25.8 e P Z mb4.3  
BEAM 10:22:25.8 T0.9 A6  
GRA1 10:42:03.5 e L Z T18.7 A76 MS3.6  
NEIC: OT 10:14:10.5 38N 73E dep 33km mb4.5  
TAJIKISTAN

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1999-06-29 D 97.7  
GRA1 11:08:35.1 i P c Z mb5.8  
BEAM 11:08:35.1 T1.1 A20  
NEIC: OT 10:55:11.7 16S 72W dep118km mb4.8  
SOUTHERN PERU

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1999-06-29 D 13.5  
GRA1 15:13:24.9 e P Z  
GRA1 15:19:08.9 e L Z T18.3 A1143 MS4.0

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1999-06-29 D 44.7  
GRA1 23:26:02.2 i P c Z mb6.7  
ALIGN 23:26:02.2 T1.0 A996

GRA1 23:27:02.4 e pP Z  
GRA1 23:28:48.7 e Z  
GRA1 23:37:29.5 e L Z T18.5 A940 MS4.7

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1999-06-30 D102.9  
GRA1 06:17:08.9 e Pdiff Z  
GRA1 06:21:00.3 e PP Z  
GRA1 07:07:54.1 e L Z T20.8 A160 MS4.5  
NEIC: OT 06:02:54.1 5N 127E dep 83km mb5.7  
TALAUD ISLANDS, INDONESIA

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1999-06-30  
GRA1 08:24:07.1 e PKPdf Z

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1999-06-30  
GRA1 14:07:55.4 e PKPbc Z  
GRA1 14:08:05.9 e PKPab Z

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1999-06-30 D 4.4 491km  
GRA1 19:13:05.8 e Pn Z M14.1  
GRA1 19:14:17.7 e Sg E  
SZGRF: OT 19:11:57.8 45N 12E dep 10km  
NORTHERN ITALY

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1999-06-30 D152.5  
GRA1 22:54:26.0 i PKPbc d Z  
GRA1 22:54:35.9 e PKPab Z  
GRA1 22:54:49.3 e pPKPbc Z  
NEIC: OT 22:34:48.5 15S 173W dep 33km mb4.7  
TONGA ISLANDS

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