

Phase (GCT)	Date and Station	Phase (GCT)
h m s	Dec. 20	h m s
56 35	NEL eP	10 36 59
50 52	Dec. 20	
50 21	BC eP	12 03 56
40 18	MONT eP	12 00 41
42 12	NEL eP	12 03 53
42 43	TUC eP	12 03 42
50 02.1	Dec. 20	
50 23.4	HH eP	12 32 19
50 40.5	Dec. 20	
46 56	COL 1P	12 43 37
49 35	epP	45 42
50 01	HH eP	12 43 46
49 19	NEL 1P	12 43 12.6
29 37	TUC 1P	12 43 21
31 52	Dec. 20	
29 51	NEL 1P	13 58 52
31 33	i	59 48
31 43	Dec. 20	
29 54	NEL eP	14 31 13
32 21	e	31 45
28 45	Dec. 20	
28 48	NEL eP	15 32 02
28 55	Dec. 20	
29 59	BOZ e(P)	15 51 34
28 52	BUT eP	15 50 28
30 30	e	51 30
30 34	e(S)	52 33
30 04	eL	52 54
30 09	HH eP	15 51 22
27 55	eL	54 06
50 04	NEL 1P	15 50 00.0
50 42	Dec. 20	
06	COL eP	16 48 15
7 37	HH e(P)	16 49 22
7 38	Dec. 20	
00 56	BOZ e(P)	17 38 46
47 53.4	1P	39 08
47 49	IS	41 06
47 52.4	1L	41 19
	BUT eP	17 38 40
	IS	40 43
	eL	40 52
	COL eP	17 43 17
	HH eP	17 39 02
	i	39 38

8-4297-4

Date and Station	Phase (GCT)
h m s	
HH 1L	17 41 29
LOG eP	17 38 07
i	38 24
1L	39 25
MONT eP	17 48 46
SLC eP	17 38 02
eS	39 45
eL	39 51
TUC eP	17 39 11
i	39 44
1L	42 53
Dec. 20	
BC 1P	17 48 21.0
i	48 24.8
BOZ eP	17 49 04
COL 1P	17 49 03
HH eP	17 48 59
MONT eP	17 49 19
NEL eP	17 48 13
1P	48 20.0
i	48 38.8
i	48 54.3
i	49 05.9
TUC eP	17 48 24
Dec. 20	
COL 1P	19 03 34
Dec. 20	
NEL eP	20 27 52
Dec. 20	
COL 1P	20 52 21
HH 1P	20 54 38
Dec. 20	
HH e(P)	21 50 20
Dec. 20	
COL 1P	23 14 04
Dec. 20	
COL 1P	23 18 45
NEL eP	23 22 40
Dec. 21	
COL 1P	01 33 46
HH e(P)	01 35 49
Dec. 21	
COL eP	02 59 23
Dec. 21	
COL eP	04 25 50

Date and Station	Phase (GCT)
h m s	
Dec. 21	
HH 1P	04 54 00
NEL 1P	04 54 31.4
Dec. 21	
COL eP	05 16 15
NEL eP	05 20 46
Dec. 21	
HH e(P)	05 31 34
Dec. 21	
COL eP	06 32 11
e	33 08
Dec. 21	
COL eP	08 39 25
Dec. 21	
BC 1P	10 12 16.4
BOZ e(P)	10 13 03
COL 1P	10 16 30
e	16 48
1pP	17 07
HH e(P)	10 13 31
MONT 1P	10 13 57
NEL 1P	10 12 14.9
i	12 21.1
i	12 29.4
SLC eP	10 12 31
TUC eP	10 11 32
Dec. 21	
HH eP	10 15 38
e	15 55
NEL eP	10 15 10
e	15 30
Dec. 21	
COL 1P	12 09 46
HH 1P	12 11 06
i	14 25
MONT eP	12 16 48
NEL 1P	12 11 05
SJ eP	12 17 00
Dec. 21	
HH e(P)	12 52 17
eL	54 13
Dec. 21	
BH eP	17 44 10
IS	44 52

Date and Station	Phase (GCT)
h m s	
Dec. 21	
NEL eP	18 18 06
Dec. 21	
NEL eP	18 40 07
Dec. 21	
COL 1P	19 28 43
Dec. 21	
BH eP	20 05 25
BC 1P	19 58 35.50
i	59 11.7
1L	20 00 34.0
BOZ 1P	19(58)(44)D
eS	20(00)(33)
eL	(00)(40)
BUT 1P	19 58 50D
1(S)	20 00 40
1L	00 48
CHI 1P	20 02 08E
ePP	02 53
eS	06 35
e	07 00
1L	08 13
COL 1P	20 02 17C
IS	06 58
1L	07 48
COLU 1P	20 03 13C
1PP	04 20
eS	08 34
IS	08 35
eL	11 05
HONC eP	20 03 21
1PcP	05 40
eS	08 55
eL	11 46
Tpp = 4 sec. A = 2.5mm.	
Ts = 6 sec. A = 2.5mm.	
TL = 13 sec. Amax. = 19mm.	
HH 1P	19 58 57C
LOG 1P	19 58 45C
1L	20 01 26
MONT 1P	20 08 45C
ePP	11 46
eP'P'	35 28
NEL 1P	19 58 37.8C
i	58 38.8
PHIL 1P	20 03 29E
ePP	04 42
eS	08 59
eL	12 20
SLC 1P	19 58 44D
1(S)	20 00 30

Date and Station	Phase (GCT)
h m s	
SLC 1L	20 00 39
SJ 1P	20 05 52C
eS	13 26
eScS	15 42
eSS	17 16
eL	18 20
SIT eP	20 00 32
1P	00 35 N,W
IS	04 05
1L	05 00
TUC 1P	19 59 45C
1(S)	20 02 25
1L	03 12
UK 1P	19 56 58
i	57 16
Dec. 21	
BC 1P	21 18 53.0
i	19 13.9
NEL 1P	21 19 00.3
Dec. 21	
BC 1P	22 16 34.8
BUT eP	22 16 25
COL 1P	22 14 14
HH 1P	22 16 15
MONT eP	22 23 42
NEL 1P	22 16 34.7
i	16 54.1
i	17 08.9
Dec. 21	
NEL 1P	22 56 20.1
Dec. 21	
HH eP	23 34 39
1L	37 15
TUC eP	23 35 20
Dec. 22	
HH e(P)	00 06 25
Dec. 22	
HH e(P)	00 33 24
Dec. 22	
BH 1P	01 06 39
IS	07 20
HH e(P)	01 14 35
SJ e(P)	01 10 15
Dec. 22	
COL 1P	01 50 25

8-4297-4

Depth, and Remarks

Peru.
Mexico.
chatka.
a. h about 100 km.
ndanao, Philippine Islands.
Mag. $6\frac{1}{2}$.
minican Republic.
lled, several injured and extensive
about 60 km. Mag. $6\frac{1}{4}$ - $6\frac{1}{2}$.
chatka.
ndanao, Philippine Islands.
aska.
a about 100 km.
 $6\frac{1}{4}$ - $6\frac{1}{2}$.
Mag. $6\frac{1}{2}$.
ls.
liak Island.

Date 1954	Origin Time G. C. T.	Lat.	Long.	Region, Focal Depth and Remarks
Dec. 13	h m s 09 20 09*	7 N.	126 $\frac{1}{2}$ E.	Near east coast of Mindanao, Philippine Islands. Felt at Davao and Hinatuan.
13	12 45 02*	13 $\frac{1}{2}$ S.	173 $\frac{1}{2}$ W.	Samoa Islands.
13	16 10 10*	19 N.	101 W.	Guerrero, Mexico.
13	20 38 50*	27 N.	93 E.	Assam.
13	22 38 43*	2 N.	126 E.	Molucca Passage.
14	01 51 55**			Tonga Islands.
15	23 35 59**			Near west coast of Greece.
16	06 57 57*	24 S.	175 W.	Tonga Islands region.
16	11 07 12	39.3 N.	118.0 W.	Near Fallon, Nevada. Moderate property damage. Mag. 7.4
16	11 11 29**			Fallon aftershock. Felt. Mag. 7.1
16	12 56 55**			Near east coast of Crete.
16	13 15 03*	39 $\frac{1}{2}$ N.	118 W.	Fallon aftershock. Mag. 5.0
16	14 16 57*	39 $\frac{1}{2}$ N.	118 W.	Fallon aftershock. Mag. 5.8
16	15 09 42*	39 $\frac{1}{2}$ N.	118 W.	Fallon aftershock. Mag. 5.1
18	01 45 36**			Fallon aftershock.
18	14 47 49**			Northern Burma.
19	10 23 40*	23 S.	66 $\frac{1}{2}$ W.	Jujuy province, Argentina. Felt in northern Chile. h about 250 km. Mag. 6-1/2 - 6-3/4.
20	01 38 01**			Central Argentina-Chile border. h about 100 km.
20	12 31 58*	17 S.	178 $\frac{1}{2}$ W.	Fiji Islands. h about 600 km.
20	17 35 54*	24 S.	175 W.	Tonga Islands region.
20	17 36 47*	40 N.	118 W.	Fallon aftershock. Mag. 5.0
21	01 22 17*	20 N.	121 $\frac{1}{2}$ E.	Off north coast of Luzon, Philippine Islands.
21	10 06 10**			Near coast of Guatemala. h about 150 km.
21	11 57 19*	3 $\frac{1}{2}$ S.	145 $\frac{1}{2}$ E.	Bismarck Sea.
21	19 56 27.5	40.9 N.	123.9 W.	Humboldt County, California. Several injured and extensive property damage. Mag. 6-1/2 - 6-3/4.
21	22 04 05*	22 $\frac{1}{2}$ N.	146 E.	Marianas Islands region.
22	04 18 16*	5 $\frac{1}{2}$ S.	154 $\frac{1}{2}$ E.	Solomon Islands.
23	16 27 16*	38 N.	21 E.	Near west coast of Greece. Minor property damage.
24	00 56 17**			Santa Cruz Islands. h about 150 km.
24	02 34 53**			Bonin Islands.
24	12 26 11*	16 $\frac{1}{2}$ N.	96 W.	Oaxaca, Mexico.
26	03 41 01*	30 N.	141 $\frac{1}{2}$ E.	South of Honshu, Japan. h about 200 km.
26	09 55 15**			Southern Gulf of California.
26	18 10 35**			El Salvador. h about 200 km.

The instrumental results of the following stations are tabulated in this report.

- | | |
|---|------------------------------------|
| **Balboa Heights, C. Z. (BH) | **Logan, Utah (LOG) |
| The Panama Canal | Utah State Agricultural College |
| *Boulder City, Nev. (BC) | *Montezuma, Chile (DMT) |
| Bureau of Reclamation | Smithsonian Institution |
| *Bozeman, Mont. (BOZ) | Nelson, Nev. (NEL) |
| Montana State College | **New Kensington, Pa. (NK) |
| **Burlington, Vt. (BUR) | Private station, Fred Keller, Sr. |
| University of Vermont | **Philadelphia, Pa. (PHIL) |
| *Butte, Mont. (BUT) | The Franklin Institute |
| Montana School of Mines | **Rapid City, S. Dak. (RC) |
| *Chicago, Ill. (CHI) | South Dakota State School of Mines |
| University of Chicago and U. S. Weather | *Salt Lake City, Utah (SLC) |
| Bureau | University of Utah |
| College, Alaska (COL) | San Juan, Puerto Rico (SJ) |
| *Columbia, S. C. (COLU) | Sitka, Alaska (SIT) |
| University of South Carolina | Tucson, Ariz. (TUC) |
| Honolulu, T. H. (HONO) | Ukiah, Calif. (UK) |
| *Hungry Horse, Mont. (HH) | International Latitude Observatory |
| Bureau of Reclamation | Washington, D. C. (WASH) |
| *Lincoln, Nebr. (LIN) | |
| Nebraska Wesleyan University | |

- *Indicates a station maintained by a local institution in cooperation with the U. S. Coast and Geodetic Survey.
 **Indicates a station operating on an independent basis.
 Other stations are observatories of the U. S. Coast and Geodetic Survey.

All seismogram interpretations are made or revised at Washington except those for Balboa Heights. All magnitude determinations are by Pasadena unless otherwise stated. Minor earthquakes are listed at the end of the bulletin.

One asterisk (*) following an origin time indicates probable error of one-tenth minute. Two asterisks (**) following an origin time indicate probable error of one-quarter minute. All origin times and locations are determined from P data only. For Pasadena epicenters the time is given in one-tenth minute.

All seismograms are on file in the U. S. Coast and Geodetic Survey, except those from Balboa Heights, Burlington, Logan, and New Kensington which may be obtained on loan by addressing the Seismograph Station Director: - Meteorological and Hydrographic Office, Panama Canal Company, Balboa Heights, Canal Zone; University of Vermont, Burlington, Vermont; Utah State Agricultural College, Logan, Utah; 508 Pershing Drive, New Kensington, Pennsylvania.

SEISMOLOGICAL BULLETIN

December, 1954

MSI - 168

CONTENTS

List of stations.....	1
Provisional epicenters.....	2
Seismogram interpretations.....	5
Local and minor earthquakes.....	23

U. S. DEPARTMENT OF COMMERCE

Sinclair Weeks, Secretary

U. S. COAST AND GEODETIC SURVEY—WASHINGTON

R. F. A. Studds, Director

FOR OFFICIAL USE