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ON
STRONG-MOTION RECORDS
No.4 (1969)

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STRONG-MOTION EARTHQUAKE RECORDS
FROM
PUBLIC WORKS IN JAPAN(1969)
土木構造物における強震記録(1969)

MARCH 1971

昭和46年3月

THE PUBLIC WORKS RESEARCH INSTITUTE
MINISTRY OF CONSTRUCTION

建設省土木研究所



PUBLICATIONS ON STRONG-MOTION RECORDS

The Public Works Research Institute has published the following reports on strong-motion earthquake records reproduced in full size. In the reports there are three kinds of series, ANNUAL REPORT, SPECIAL REPORT, and SUMMARIZED REPORT.

(I) ANNUAL REPORT: These reports are series of general ones published annually and contain almost all strong-motion records obtained during the period indicated in the title of each report.

No. 1 STRONG-MOTION EARTHQUAKE RECORDS FROM PUBLIC WORKS IN JAPAN (1961-1966), Technical Memorandum of P.W.R.I., No. 217, December, 1966.

No. 2 STRONG-MOTION EARTHQUAKE RECORDS FROM PUBLIC WORKS IN JAPAN (1967), Technical Memorandum of P.W.R.I., No. 341, February, 1968.

No. 3 STRONG-MOTION EARTHQUAKE RECORDS FROM PUBLIC WORKS IN JAPAN (1968), Technical Memorandum of P.W.R.I., No. 430, April, 1969.

(II) SPECIAL REPORT: These reports are series of special ones on specified earthquakes or quake swarms published immediately after each quake. Usually these records are also contained in ANNUAL REPORT, but sometimes they are not contained.

No. 1 STRONG-MOTION EARTHQUAKE RECORDS FROM PUBLIC WORKS IN JAPAN (THE MATSUSHIRO QUAKE SWARM, 9th DECEMBER 1965-28th FEBRUARY 1966, THE OCHIAI BRIDGE), Technical Memorandum of P.W.R.I. No. 163, April, 1966.

No. 2 STRONG-MOTION EARTHQUAKE RECORDS FROM PUBLIC WORKS IN JAPAN (THE MATSUSHIRO QUAKE SWARM, 1st MARCH-22nd JUNE 1966, THE OCHIAI BRIDGE), Technical Memorandum of P.W.R.I. No. 194, July, 1966.

No. 3 STRONG-MOTION EARTHQUAKE RECORDS FROM PUBLIC WORKS IN JAPAN (THE MATSUSHIRO QUAKE SWARM, 25th JUNE-1st DECEMBER 1966, THE OCHIAI BRIDGE), Technical Memorandum of P.W.R.I. No. 254, March, 1967.

No. 4 STRONG-MOTION EARTHQUAKE RECORDS FROM PUBLIC WORKS IN JAPAN (THE MATSUSHIRO QUAKE SWARM, 27th MAY - 23rd OCTOBER 1966, THE SUSOBANA DAM) Technical Memorandum of P.W.R.I. No. 263, March, 1967.

No. 5 STRONG-MOTION EARTHQUAKE RECORDS FROM PUBLIC WORKS IN JAPAN (THE MATSUSHIRO QUAKE SWARM, 8th OCTOBER 1966 - 2nd FEBRUARY 1967, THE CHIKUMAGAWA EMBANKMENT) Technical Memorandum of P.W.R.I. No. 236, March, 1967.

(III) SUMMARIZED REPORT: These reports are series of summarized reports on especially major strong-motion records published occasionally

(mostly every four years). These records are extracted from both ANNUAL REPORTS and SPECIAL REPORTS.

No. 1 STRONG-MOTION EARTHQUAKE RECORDS FROM PUBLIC WORKS IN JAPAN (1961-1971), expected to be published in 1971.

REFERENCES

The following references are available for utilization and evaluation of the records

- 1) Earthquake Resistant Structure Section: "Digitized Data of Strong-Motion Earthquake Records (No. 1)", (in Japanese)
Technical Memorandum of the Public Works Research Institute, No. 317, March, 1968.
- 2) Earthquake Resistant Structure Section: "Digitized Data of Strong-Motion Earthquake Records (No. 2)", (in Japanese)
Technical Memorandum of the Public Works Research Institute, No. 318, 1968.
- 3) Structure Section: "Examination on the Characteristics of a SMAC-B2 Accelerograph and an Underground Seismograph", (in Japanese)
Technical Memorandum of P.W.R.I., No. 399, March, 1968.
- 4) Eiichi Kuribayashi, Toshio Iwasaki. "Observed Earthquake Responses of Bridges", 4th WCEE, Chile, January, 1969.
- 5) Earthquake Resistant Structure Section: "Digitized Data of Strong-Motion Earthquake Records (No. 3)", (in Japanese)
Technical Memorandum of the Public Works Research Institute, No. 461, May, 1969.

ERRATUM

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**STRONG-MOTION EARTHQUAKE RECORDS
FROM
PUBLIC WORKS IN JAPAN(1969)**

MARCH 1971

**THE PUBLIC WORKS RESEARCH INSTITUTE
MINISTRY OF CONSTRUCTION**

Abstract

This memorandum reports strong-motion earthquake records of ground motions and responses of engineering structures such as highway bridges, tunnels, dams, and embankments administrated by Ministry of Construction, Public Corporations, Hokkaido Development Bureau and Regional Governments.

The photographs of major record traces of strong earthquakes occurred in and around Japan in 1969 are reproduced in full size. Also the maximum amplitudes of all seismograph records are presented.

Preface

Strong-motion earthquake record is most helpful to establish reasonable design methods of structures subjected to earthquake motions.

In 1960 the Public Works Research Institute proposed a recommendation to the Ministry of Construction on project of survey of ground motions and structural responses during strong-motion earthquakes. In response to the recommendation the Ministry gave the approval. Since then the project has obliged it to install instruments, to consult the way of installing and instrumentation, and to analyze and publish the records obtained.

Total number of SMAC type accelerographs (three component accelerometer) operated is one hundred and forty two and total number of the accelerometers is four hundred and twenty six. Meanwhile, total number of electro-magnetic type accelerometers is two hundred and four.

Several reports reproducing record traces in full size have already published as shown inside front cover of this report. And some analyses have been done and these typical reports are shown in References.

The present report reproduces strong-motion seismograph records obtained from public works in Japan--such as highway bridges, tunnels, dams, and embankments--and on grounds near the structures during the year of 1969, and summarizes their maximum acceleration values.

The structures which served strong-motion seismographs are administrated by Ministry of Construction, Public Corporations, Hokkaido Development Bureau and Regional Governments.

March 1971

compiled by

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Acknowledgements

The present network of strong-motion instrumentation on public works in Japan is due to efforts of the staff of the Public Works Research Institute that have installed the instruments and serviced instrumentation since 1960. The purchase of the instruments has been a cooperative effort of the Regional Construction Bureaus of the Ministry of Construction, Regional Governments throughout Japan, Public Corporations (such as Japan Highway, Tokyo Expressway, Hanshin Expressway, and Water Resources Development), and Hokkaido Development Bureau under the general direction of the Public Works Research Institute.

We should mention the skill and care which has been put into the design and fabrication of the instruments by the members of SMEOC (Strong-Motion Earthquake Observation Committee established in 1951 in Japan) and the manufacturing companies.

The members dealing with field work made notable contributions to the success of the surveys.

Table 1. Strong-Motion Seismograph Stations for SMAC-Type Accelerographs,
Including Stations Expected in Future

as of March, 1970

Station Number	Station (Name of Structure)	Number of Instruments	Seismograph Type	Location	Year & Month Installed
101	Shinkatsushika Bridge	2 (Ground 1, Pier 1)	SMAC-B2	Matsudo-City, Chiba-Pref.	1966-3
102	Yoneyama "	3 (Ground 1, Pier 2)	" "	Kashiwazaki-City, Niigata-Pref.	66-2, 66-5
103	Nakagawa "				*
104	Shintonegawa "	2 (Ground 1, Pier 1)	SMAC-B2	Kurihashi-Cho, Saitama-Pref.	1967-2
105	Takasaki "				*
106	Soka "	2 (Ground 1, Pier 1)	SMAC-B2	Soka-City, Saitama-Pref.	1968-3
107	Oiso "				*
108	Himekawa "				*
109	Kisogawa "				*
110	Hijiyama "				*
111	Mimitsu "				*
112	Kinokawa "	2 (Ground 1, Pier 1)	SMAC-B2	Wakayama-City, Wakayama-Pref.	1967-3
113	Wagagawa "	2 (" ")	SMAC-B2, D	Waga-Gun, Waga-Cho, Iwate-Pref.	69-3, 70-3
114	Amagasaki "	2 (" ")	SMAC-B2, C2	Amagasaki-City, Hyogo-Pref.	1963-3
115	Sakuragawa "				*
201	Oya "	2 (Ground 1, Pier 1)	SMAC-B2	Aizuwakamatsu-City, Fukushima-Pref.	1965-3
202	Uonuma "	2 (" ")	" "	Ojiya-City, Niigata-Pref.	1965-12
203	Yokokurasawa "	2 (" ")	" "	Yokokura, Sakae-Mura, Nagano-Pref.	1965-10
204	Shinyawata "	2 (" ")	" "	Chita-Cho, Aichi-Pref.	1965-11
205	Ishiseto "	2 (" ")	" "	Nojiri-Cho, Miyazaki-Pref.	1965-3
206	Bosyu "				*
207	Takatsu "	2 (Ground 1, Pier 1)	SMAC-B2	Masuda-City, Shimane-Pref.	1967-3
208	Turusaki "				*
301	Yuhei "	2 (Ground 1, Pier 1)	SMAC-B2	Jumonji-Cho, Akita-Pref.	1966-12
302	Kaihoku "	2 (" ")	" "	Ishinomaki-City, Miyagi-Pref.	1966-3
303	Kahoku "	2 (" ")	" "	Sagae-City, Yamagata-Pref.	1965-3
304	Date "	2 (" ")	" "	Date-Cho, Fukushima-Pref.	1965-10
305	Minato "	2 (" ")	" "	Tsuiyama, Toyooka-City, Hyogo-Pref.	1965-3
306	Myoken "	2 (" ")	" "	Nishisono-Cho, Izumo-City, Shimane-Pref.	66-3, 67-3
307	Godaisan "	2 (" ")	" "	Godaisan, Kochi-City, Kochi-Pref.	1966-3

Note: Stations with star-mark * are expected in future.

Table 1. (Continued)

Station Number	Station (Name of Structure)	Number of Instruments	Seismograph Type	Location	Year & Month Installed
308	Itajima Bridge	2 (Ground 1, Pier 1)	SMAC-B2	Uwajima-City, Ehime-Pref.	1966-3
309	Otome "	2 (" ")	" "	Otome, Mifune-Cho, Kumamoto-Pref.	1965-3
310	Hirai "	3 (Ground 1, Pier 2)	" "	Hirai, Edogawa-Ku, Tokyo	1965-8
311	Toyohama "	2 (Ground 1, Pier 1)	" "	Ise-City, Mie-Pref.	1966-9
312	Akagi "	2 (" ")	" "	Higashikumanogawa-Cho, Wakayama-Pref.	1966-9
313	Ishizuchi "	2 (" ")	" "	Ishizuchi, Komatsu-Cho, Ehime-Pref.	1967-3
314	Kiyokawa "	2 (" ")	" "	Kiyokawa, Tachikawa-Cho, Yamagata-Pref.	68-10, 69-3
315	Shinpo "				*
316	Nagadoro "	2 (Ground 1, Pier 1)	SMAC-D	Nakazato-Cho, Aomori-Pref.	1970-3
317	Sezume "	2 (" ")	SMAC-B2	Yamakawa-Cho, Tokushima-Pref.	1967-3
318	Shinden "				*
319	Shitoku "	2 (" ")	SMAC-D	Shitoku, Nakagawa-Mura, Nagano-Pref.	1966-12
401	Biwako "	1 (Box girder)	SMAC-B2	Katada-Cho, Shiga-Pref.	1964-9
402					*
501	Tokyo Bay (Futtu Cape)	1 (Ground)	SMAC-B2	Futtu-Cho, Chiba-Pref.	1965-10
502	Kanmon Bridge	2 (Ground 2)	" "	Yamaguchi-Pref. & Fukuoka-Pref.	1965-10
503	Tokyo Bay (Kannonzaki)	1 (Ground)	" "	Yokosuka-City, Kanagawa-Pref.	1967-3
601	Muromaki Dam	1 (Dam)	SMAC-B2	Yatsuo-Cho, Nei-Gun, Toyama-Pref.	1961-8
602	Yokoyama "	2 (Rock 1, Dam 1)	" "	Fujihashi-Mura, Gifu-Pref.	1964-6
603	Sarutani "	1 (Ground)	SMAC-A	Oto-Mura, Yoshino-Gun, Nara-Pref.	1958-3
604	Amagase "	1 (Dam)	SMAC-B2	Ujikaneido, Uji-City, Kyoto-Pref.	1964-8
605	Susobana "	2 (Rock 1, Dam 1)	SMAC-B2, D	Konabe, Nagano-City, Nagano-Pref.	66-5, 69-12
606	Turuta "	2 (Ground 1, Dam 1)	SMAC-D	Tsuruta-Cho, Kagoshima-Pref.	1968-12
607	Kanayama "				*
608	Shijushida "				*
609					*
610	Koshibu "	2 (Rock 1, Dam 1)	SMAC-D	Nakagawa-Mura, Nagano-Pref.	1968-12
611	Saigawa "				*
612	Kimigano "				*
613	Shimouke "				*

Table 1. (Continued)

Station Number	Station (Name of Structure)	Number of Instruments	Seismograph Type	Location	Year & Month Installed
614	Yahagi Dam				*
701	Yodogawa Embankment	2 (Ground 1, Emb. 1)	SMAC-B2	Shin-Machi, Hirakata-City, Osaka-Pref.	1966-3
702	Tokyo "				*
703					*
704	Okayama "				*
705					*
801	Ariake Sea Embankment	1 (Ground)	SMAC-B2	Daijugarami, Higashiyoka*Cho, Saga-Pref.	1965-8
802	Aomori				*
803	Toyama				*
804	Kanazawa				*
805	Okayama				*
806					*
901	P.W.R.I., Chiba Branch	1 (Ground)	SMAC-B2	Anagawa, Chiba-City, Chiba-Pref.	62-3 (67-3)
902	Nishiarai Bridge	3 (Ground 1, Pier 2)	" "	Nishiarai-Cho, Adachi-Ku, Tokyo	1962-3
903	Showa "	2 (" Pier 1)	" "	Niigata-City, Niigata-Pref.	1965-1
904	Shintenryugawa "	2 (" ")	" "	Toyoda-Mura, Iwate-Gun, Shizuoka-Pref.	1964-12
905	Ochiai "	3 (Ground 2, ")	" "	Nagano-City, Nagano-Pref.	1965-12
906	P.W.R.I., Kashima	1 (Ground)	" "	Kashima-Gun, Ibaragi-Pref.	1967-3
907	Taira Bridge	2 (Ground 1, Pier 1)	" "	Taira, Iwaki-City, Fukushima-Pref.	1968-1
908	Honjo "				*
909	Miyako				*
910	Hachinohe				*
911	Takamatsu				*
912	Miyazaki				*
1001	Ajigawa Bridge	3 (Ground 1, Pier 2)	SMAC-B2	Benten-Cho, Minato-Ku, Osaka	1963-3
1002	Fujikawa "	2 (Ground 1, Pier 1)	" "	Fuji-City, Shizuoka-Pref.	1967-3
1003	Hamanako "	2 (" ")	SMAC-D	Inase-Gun, Shizuoka-Pref.	68-12, 69-3
1004	Sakaigawa "	2 (" ")	SMAC-B2	Uenohara-Cho, Yamanashi-Pref.	1967-3
1005	Ubakubo "	2 (" ")	" "	Ubakubo, Hino-City, Tokyo	1967-3
1006	Tsurukawa "	2 (" ")	" "	Uenohara-Cho, Yamanashi-Pref.	1967-3

Table 1. (Continued)

Station Number	Station (Name of Structure)	Number of Instruments	Seismograph Type	Location	Year & Month Installed
1007	Toyokawa Bridge	2 (Ground 1, Pier 1)	SMAC-B2	Ichinomiya-Cho, Hoi-Gun, Aichi-Pref.	1968-3
1008	Kisogawa "				*
1009	Sakawagawa "	2 (Ground 1, Pier 1)	SMAC-D	Ashigarakami-Gun, Kanagawa-Pref.	1969-3
1101	Iwamoto-Cho (Route 1)				*
1102	Shibakaigandori (")				*
1103	Morigasaki-Cho (")				*
1104	Aoyamatakagi-Cho (Route 3)				*
1105	Ikebukuro (Route 5)				*
1106	Tsutsumidori (Route 6)				*
1107	Oshima-Cho (Route 7)				*
1108	Ichinohashi Bridge	2 (Ground 1, Pier 1)	SMAC-B2	Azabu, Minato-Ku, Tokyo	1967-7
1109	Haneda Undersea Tunnel	3 (Ground 1, Tunnel 2)	" "	Omoriminami-Cho, Ota-Ku, Tokyo	1968-2
1201	Nishiyokobori Bridge	2 (Ground 1, Pier 1)	SMAC-B2	Minamisumiya-Machi, Minami-Ku, Osaka	1965-3
1202	Ikue-Cho, Asahi-Ku				*
1203	Minamitsumori Bridge	2 (Ground 1, Pier 1)	SMAC-D	Tsumori-Cho, Nishinari-Ku, Osaka	1970-3
1301	Civil Engineering Research Institute				moved
1302	Chiyoda Bridge	3 (Ground 1, Pier 2)	SMAC-B2	Makubetsu-Cho, Nakagawa-Gun, Tokachi	1966-11
1303	Shin-ishikari "	2 (Ground 1, Pier 1)	" "	Tsuishikari, Ebetsu-City, Ishikari	67-8, 68-11
1304	Otanoshike "	2 (" ")	" "	Otanoshike, Kushiro-City, Kushiro	1967-10
1305	Horoman "	2 (" ")	" "	Horoman, Samani-Cho, Samani-Gun, Hidaka	1967-12
1306	Asahikawa "	2 (" ")	" "	Kamui-Cho, Asahikawa-City, Kamikawa	68-11, 69-3
1307	Shichiho "	2 (" ")	" "	Yunosato, Shiriuchi-Cho, Kamiiso-Gun, Oshima	1968-11
1308	Ishikarikako "	3 (Ground 1, Pier 2)	" "	Yausuba, Ishikari-Cho, Ishikari-Gun, Ishikari	1970-3
1309	Muine "	2 (Ground 1, Pier 1)	SMAC-D	Jozankei, Sapporo-City, Ishikari	1969-10
1310	Syari "	1 (Ground)	" "	Toyokura, Syari-Cho, Syari-Gun, Abashiri	1970-1
1401	Tonegawa Estuary Dam	2 (Ground 1, Dam 1)	SMAC-D	Omigawa-Cho, Katori-Gun, Chiba-Pref.	1969-3

Table 2. Strong-Motion Seismograph Stations with Electro-Magnetic Type Seismographs

as of March, 1970

Station Number	Station (Name of Structure)	Number of Components	Location	Year Installed
01	Yuda Dam	6, (Accelerometer)	Waga-Cho, Waga-Gun, Iwate-Pref.	
02	Minase "	6, (")	Minase-Mura, Okachi-Gun, Akita-Pref.	
03	Narugo "	8, (Displacementmeter)	Narugo-Cho, Tamazukuri-Gun, Miyagi-Pref.	
04	Kawamata "	10, (Accelerometer)	Kuriyama-Mura, Shioya-Gun, Tochigi-Pref.	1964
05	Muromaki "	12, (9 Acc. and 3 Disp.)	Yatsuo-Cho, Nei-Gun, Toyama-Pref.	1961
06	Sasaogawa "	10, (4 Acc. and 6 Disp.)	Nishitani-Mura, Ono-Gun, Fukui-Pref.	
07	Yokoyama "	12, (7 Acc. and 5 Disp.)	Fujihashi-Mura, Ibi-Gun, Gifu-Pref.	1962
08	Amagase "	12, (Accelerometer)	Ujikaneido, Uji-City, Kyoto	1964
09	Sarutani "	5, (2 Acc. and 3 Disp.)	Oto-Mura, Yoshino-Gun, Nara-Pref.	1957
10	Ayakita "	6, (Accelerometer)	Suki-Mura, Nishimorokata-Gun, Miyazaki-Pref.	1961
11	Shinkatsushkika Bridge	6, (3 Acc. and 3 Earth-pressure)	Matsudo-City, Chiba-Pref.	1967
12	Suruga "	6, (Accelerometer)	Minamiabe, Shizuoka-City, Shizuoka-Pref.	1959
13	Yoshida "	6, (")	Toyohashi-City, Aichi-Pref.	1959
14	Honshu-shikoku (Tarumi)	3, (")	Tarumi-Ku, Kobe-City, Hyogo-Pref.	1962
15	" " (Shamijima)	3, (")	Sakaide-City, Kagawa-Pref.	1962
16	Biwako Bridge	6, (2 Acc. and 4 Disp.)	Katada-Cho, Shiga-Pref.	1963
17	Wakato "	18, (Accelerometer)	Wakamatsu-Ku, Kitakyushu-City, Fukuoka-Pref.	1961
18	Ariake-Sea Embankment (Oyano Jima)	3, (")	Oyano-Cho, Amakusa-Gun, Kumamoto-Pref.	1963
19	Toyokawa "	8, (4 Acc. and 4 Disp.)	Toyohashi-City, Aichi-Pref.	1966
20	Tonegawa "	9, (6 Acc. and 3 Disp.)	Kurihashi-Cho, Saitama-Pref.	1968
21	Otagawa "	8, (4 Acc. and 4 Disp.)	Hiroshima-City, Hiroshima-Pref.	1965
22	Nagano (Under ground)	9, (Accelerometer)	Nagano-City, Nagano-Pref.	1966
23	Hirai Bridge	8, (5 Acc. and 3 Earth-pressure)	Hirai, Edogawa-Ku, Tokyo	1967
24	Shijushida Dam	9, (Accelerometer)	Shimokuriyagawa, Morioka-City, Iwate-Pref.	1967
25	Onomichi Bridge	11, (")	Mukaihigashi-Cho, Mitsugi-Gun, Hiroshima-Pref.	1968
26	Saigawa Dam	10, (")	Futamatashin-Machi, Kanazawa-City, Ishikawa-Pref.	1968
27	Yahagi "	13, (")	Asahi-Mura, Higashikamo-Gun, Aichi-Pref.	1970-3
28	Futtu Cape (Under ground)	9, (")	Futtu-Cho, Kimitsu-Gun, Chiba-Pref.	1970-2
29	Ukishima Park (")	12, (")	Ukishima-Cho, Kawasaki-City, Kanagawa-Pref.	1970-3
30	Kamafusa Dam	6, (")	Kawasaki-Cho, Shibata-Gun, Miyagi-Pref.	1970-3

Table 3. Number of Strong-Motion Seismograph Stations
and that of Instruments in Relation to the Groups Defined by Sponsorship

Operated as of March, 1970

Group (Administrative Sponsor)	Type Period	Strong-Motion Accelerograph, SMAC									Electro-Magnetic Type Seismograph	
		Number of Station	Number of Instruments								Number of Station	Number of Instruments
			before 1963	1964	1965	1966	1967	1968	1969	Total		
I	First National Highway Section, Road Bureau (道路局国道一課)	7	2	0	3	6	2	1	1	15	3	15A 3E
II	Second National Highway Section, Road Bureau (道路局国道二課)	6	0	4	6	2	0	0	0	12	0	0
III	Local Road Section, Road Bureau (道路局地方道課)	17	0	6	12	13	0	2	2	35	1	5A 3E
IV	Toll Road Section, Road Bureau (道路局有料道路課)	1	0	1	0	0	0	0	0	1	1	2A 4D
V	Planning Section, Road Bureau (道路局企画課)	3	0	0	3	1	0	0	0	4	4	27A
VI	Development Section, River Bureau (河川局開発課)	7	4	1	0	1	0	4	1	11	14	100A 25D
VII	River Improvement Section, River Bureau (河川局治水課)	1	0	0	2	0	0	0	0	2	2	8A 8D
VIII	Seacoast Section, River Bureau (河川局海岸課)	1	0	0	1	0	0	0	0	1	1	3A
IX	Public Works Research Institute (土木研究所)	7	4	4	2	2	2	0	0	14	2	15A 3D
X	Japan Highway Public Corporation (日本道路公団)	8	3	0	0	8	2	4	0	17	2	29A
XI	Tokyo Expressway Public Corporation (首都高速道路公団)	2	0	0	0	0	5	0	0	5	0	0
XII	Hanshin Expressway Public Corporation (阪神高速道路公団)	2	0	2	0	0	0	0	2	4	0	0
XIII	Hokkaido Development Bureau (北海道開発局)	9	1	0	0	3	4	5	6	19	0	0
XIV	Water Resources Development Corporation (水資源開発公団)	1	0	0	0	0	0	2	0	2	0	0
Total		72	14	18	29	36	15	18	12	142	30	204A, 6E, 40D

Note 1) Each SMAC has three accelerometers (One Vertical and two Horizontal).

2) A, E and D in the extremely right column mean Accelerometers, Earth-pressure-meters and Displacement-meters, respectively.

Fig. 1.

Sites of Strong-Motion Seismograph Stations for SMAC-Type Accelerographs - Observation Network of Ground Motions and Earthquake Responses of Highway Bridges, Tunnels, Dams, and Embankments -

as of March, 1970

Legend

- Station Operated as of March, 1970
- Station Expected in future

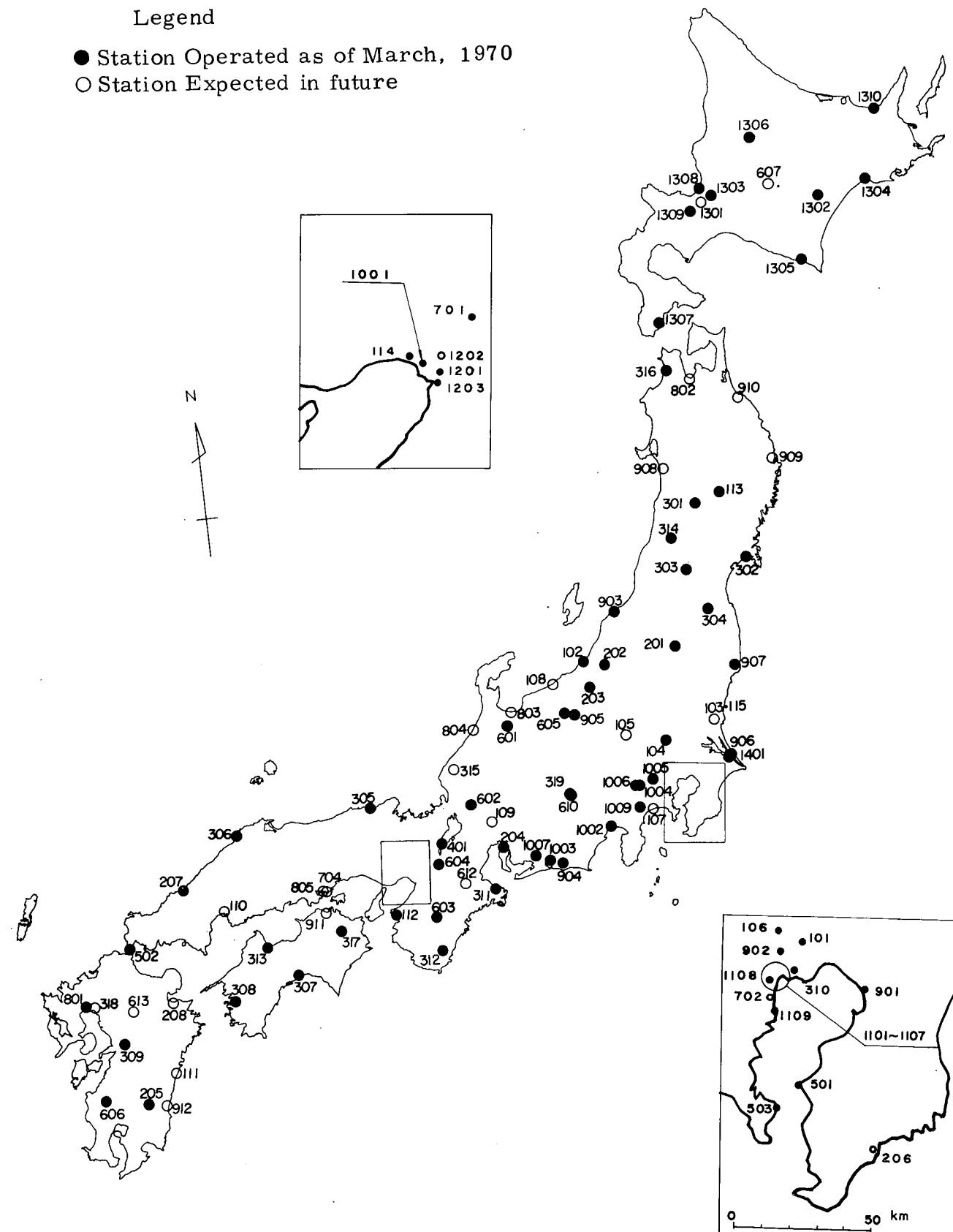


表 I SMAC型強震計配置計画一覧表

建設省土木研究所 (1970.3.31現在)

№	観測所名	型式	台数	設置箇所	県名	維持管理	設置年月	№	観測所名	型式	台数	設置箇所	県名	維持管理	設置年月
1. 国道一課								8. 海岸課							
101	新葛飾橋	SMAC-B2	2	地盤・橋脚	千葉	首都圏道	41-3	801	有明海	SMAC-B2	1	地盤	佐賀	筑後川工事	40-8
102	米山大橋	"	2	地盤・橋脚	新潟	長岡工事	41-3	802	青森	"	1	地盤	青森	"	37-3
103	那珂川橋	"	2	地盤・橋脚	茨城	宇都宮国道	42-2	803	富山	"	1	地盤	富山	"	40-12
104	新利根川橋	SMAC-B2	2	地盤・橋脚	埼玉	宇都宮国道	42-2	804	金沢松任	"	1	地盤	石川	"	40-12
105	高崎高架橋	"	2	地盤・橋脚	埼玉	宇都宮国道	43-3	805	岡山	"	1	地盤	岡山	"	40-12
106	草加	SMAC-B2	2	地盤・橋脚	埼玉	宇都宮国道	43-3	806							
107	大磯	"	2	地盤・橋脚	神奈川			9. 土木研究所							
108	姫川橋	"	2	地盤・橋脚	新潟			901	土研千葉支所	SMAC-B2	1	地盤	千葉	土研(千葉)	37-3
109	木曾川橋	"	2	地盤・橋脚	岐阜			902	西新井橋	"	3	地盤・橋脚2	東京	"	37-3
110	秋山橋	"	2	地盤・橋脚	広島			903	昭和橋	"	2	地盤・橋脚	新潟	"	40-12
111	美々津橋	"	2	地盤・橋脚	宮崎			904	新天竜川橋	"	2	地盤・橋脚	静岡	"	39-12
112	紀ノ川大橋	SMAC-B2	2	地盤・橋脚	和歌山	和歌山工事	42-3	905	清合橋	"	3	地盤2・橋脚	長野	"	40-12
113	和賀川第一橋	" B2,D	2	"	岩手	岩手工事	43-3	906	土研鹿島試験所	"	1	地盤	茨城	鹿島試験所	42-3
114	尼崎高架橋	" B2,C	2	"	兵庫	兵庫国道	38-3	907	平大橋	"	2	地盤・橋台	福島	土研(千葉)	43-1
115	板川橋	"	2	地盤・橋脚	茨城			908	本庄大橋	"	2	地盤・橋台	秋田	"	40-12
116								909	宮古市	"	2	地盤・橋脚	岩手	"	40-12
2. 国道二課								910	八戸市	"	2	地盤・橋脚	青森	"	40-12
201	小谷橋	SMAC-B2	2	地盤・橋脚	福島	若松土木	40-3	911	高松市	"	2	地盤・橋脚	香川	"	40-12
202	魚沼橋	"	2	地盤・橋脚	新潟	小千谷土木	40-12	912	宮崎市	"	2	地盤・橋脚	宮崎	"	40-12
203	横倉沢橋	"	2	地盤・橋脚	長野	飯山建設	40-10	913							
204	新八幡橋	"	2	地盤・橋脚	愛知	西知多道路	40-11	10. 日本道路公団							
205	石瀬戸橋	"	2	地盤・橋脚	宮崎	小林土木	40-3	1001	安治川大橋	SMAC-B2	3	地盤・橋脚2	大阪	大阪支社	36-3
206	房州大橋	"	2	地盤・橋脚	千葉			1002	東名富士川橋	"	2	地盤・橋脚	静岡	静岡局	42-3
207	高津大橋	SMAC-B2	2	地盤・橋脚	島根	益田土木	42-3	1003	東名浜名湖橋	SMAC-D	2	地盤・橋脚	"	"	43-12
208	鶴崎橋	"	2	地盤・橋脚	大分			1004	境川橋	SMAC-B2	2	地盤・橋脚	山梨	八王子局	42-3
209								1005	姥久保橋	"	2	地盤・橋脚	東京	"	42-3
3. 地方道路								1006	鶴川橋	"	2	地盤・橋脚	山梨	名古屋局	42-3
301	雄平橋	SMAC-B2	2	地盤・橋脚	秋田	平鹿土木	41-12	1007	東名豊川橋	"	2	地盤・橋脚	愛知	名古屋局	43-3
302	開北橋	"	2	地盤・橋脚	宮城	石巻土木	41-3	1008							
303	河北橋	"	2	地盤・橋脚	山形	寒河江建設	40-3	1009	東名酒匂川橋	SMAC-D	2	地盤・橋脚	神奈川	"	44-3
304	伊達橋	"	2	地盤・橋脚	福島	保原土木	40-10	11. 首都高速道路公団							
305	港大橋	"	2	地盤・橋脚	兵庫	豊岡土木	40-3	1101	千代田区岩本町	"	2	地盤・橋脚	1号線	"	
306	妙見橋	"	2	地盤・橋脚	島根	出雲土木	41-3	1102	港区芝海岸通	"	2	地盤・橋脚	"	"	
307	五台山橋	"	2	地盤・橋脚	高知	高知土木	41-3	1103	太田区森ヶ崎町	"	2	地盤・橋脚	"	"	
308	板島橋	"	2	地盤・橋脚	愛媛	宇和島土木	41-3	1104	港区青山高樹町	"	2	地盤・橋脚	3号線	"	
309	乙女橋	"	2	地盤・橋脚	熊本	矢部土木	40-3	1105	豊島区池袋	"	2	地盤・橋脚	5号線	"	
310	平井大橋	"	2	地盤・橋脚2	東京	第5建設	40-8	1106	墨田区堤通町	"	2	地盤・橋脚	6号線	"	
311	豊浜大橋	"	2	地盤・橋脚	三重	伊勢土木	41-9	1107	江東区大島町	"	2	地盤・橋脚	7号線	"	
312	赤木橋	"	2	地盤・橋台	和歌山	新宮土木	41-9	1108	一ノ橋高架橋	SMAC-B2	2	地盤・橋脚	2号線	工務部	42-7
313	石鎚橋	"	2	地盤・橋脚	愛媛	丹原土木	42-3	1109	羽田海底トンネル	"	3	地盤・トンネル2	1号線	"	43-2
314	清川橋	"	2	地盤・橋脚	山形	酒田建設	42-10	1110							
315	新保橋	"	2	地盤・橋脚	福井			1111							
316	長泥橋	SMAC-D	2	地盤・橋脚	青森	五所川原土木	45-3	12. 阪神高速道路公団							
317	瀬詰大橋	SMAC-B2	2	地盤・橋脚	徳島	川島土木	42-3	1201	西横堀高架橋	SMAC-B2	2	地盤・橋脚	1号線	管理部保全課	40-5
318	新田橋	"	2	地盤・橋脚	福岡			1202	旭区生江町	"	2	地盤・橋脚	3号線	"	
319	四徳大橋	SMAC-B2	2	地盤・橋脚	長野	伊那建設	41-12	1203	南津守高架橋	SMAC-D	2	地盤・橋脚	4号線	管理部保全課	45-3
320								1204							
4. 有料道路課								1205							
401	琵琶湖大橋	SMAC-B2	1	橋脚	滋賀	大津土木	39-9	13. 北海道開発局							
402								1301	土木試験所	"	0	地盤・橋脚	石狩	開発局	41-11
403								1302	千代田橋	SMAC-B2	3	地盤・橋脚	石狩	"	41-11
5. 道路企画課								1303	新石狩大橋	"	2	地盤・橋脚	石狩	"	42-10
501	東京湾(富津岬)	SMAC-B2	1	地盤	千葉	東京湾岸道路	40-10	1304	大桑毛橋	"	2	地盤・橋脚	石狩	"	42-10
502	関門架橋	"	2	地盤・橋脚	福岡	北九州国道	40-10	1305	梶崎橋	"	2	地盤・橋脚	石狩	"	42-12
503	東京湾(観音崎)	"	1	地盤	神奈川	東京湾岸道路	42-3	1306	旭川大橋	"	2	地盤・橋脚	石狩	"	43-11
504								1307	七峠橋	"	2	地盤・橋脚	石狩	"	43-12
6. 開発課								1308	石狩河口橋	"	3	地盤・橋脚	石狩	"	45-3
601	室牧ダム	SMAC-B2	1	堤体	富山	管理所(県)	36-8	1309	無意根大橋	SMAC-D	2	地盤・橋脚	石狩	"	44-10
602	横山ダム	"	2	地盤・堤体	岐阜	"(建)	37-7	1310	斜里大橋	"	1	地盤・橋脚	石狩	"	45-3
603	猿谷ダム	SMAC-A	1	地盤	奈良	"(県)	33-3	1311							
604	天ヶ瀬ダム	SMAC-B2	1	堤体	京都	"(県)	39-8	1312							
605	梶花ダム	" B2,D	2	地盤・堤体	長野	"(県)	41-12	1313							
606	鶴田ダム	SMAC-D	2	地盤・堤体	鹿児島	"(建)	43-12	1314							
607	金山ダム	"	1	地盤・堤体	北海道										
608															
609															
610	小沢ダム	SMAC-D	2	地盤・堤体	長野	小沢ダム工事	43-12								
611															
612	君ヶ野ダム	"	1	地盤・堤体	三重										
613	下釜ダム	"	2	地盤・堤体	熊本										
7. 治水課								14. 水資源開発公団							
701	淀川堤防	SMAC-B2	2	地盤・本体	大阪	淀川工事	41-3	1401	利根川河口堤	SMAC-D	2	堤体	2千	利根川工事	44-3
702	東京高潮堤	"	1	地盤・本体	東京			1402							
703								1403							
704	岡山	"	1	地盤・本体	岡山										
705															

設置年月欄が空白の場所は未設置である。

Fig.2. Sites of Strong-Motion Seismograph Stations for Electro-Magnetic Type Seismographs
 - Observation Network of Ground Motions and Earthquake Responses of Highway Bridges, Dams, and Embankments -
 as of March, 1970



Table 4. Number of Strong-Motion Seismograph Stations
 and that of Instruments in Relation to the Variety of Structures
 Operated as of March, 1970

Variety of Structure		Number of Stations		Number of Instruments		
		SMAC	Electro-Magnetic-type Seismograph	Number of SMAC		Number of Components of Electro-Magnetic-type Seismograph
				Ground	Structure	
Bridge		57	7	58	61	61
Tunnel		1	-	1	2	-
Dam	Concrete	7	12	5	6	110
	Fill-type	-	2	-	-	15
Embankment	River	2	3	1	3	25
	Coast	-	-	-	-	-
Future Structure Site		3	5	3	-	30
Others		2	1	2	-	9
Total		72	30	70	72	250

別表 所有者別・会計別にみた強震計台数

会計 所有者	一般会計	道特会	路特会	海岸特会	治水特会	都 県	公 団	北海道 開発局	合 計
地 方 建設局	-	19	1	11	-	-	-	-	31
土 木 研究所	8	6	-	-	-	-	-	-	14
都 県	-	-	-	-	-	50	-	-	50
4 公団	-	-	-	-	-	-	28	-	28
北海道 開発局	-	-	-	-	-	-	-	19	19
合 計	8	25	1	11	50	28	19	19	142

Table 5. Number of Records Obtained from Stations with Strong-Motion Accelerographs, SMAC in 1969

Station-Number	Station	Number of Instruments		Total Number of Records			Number of Records Printed in this Report		
		Ground	Structure	Ground	Structure	Total	Ground	Structure	Total
101	Shinkatsushika Bridge	1	1	2	0	2	1	0	1
104	Shintonegawa "	1	1	3	1	4	1	1	2
106	Soka "	1	1	2	2	4	1	1	2
204	Shinyawata "	1	1	6	1	7	1	0	1
205	Ishiseto "	1	1	1	1	2	1	1	2
301	Yuhei "	1	1	1	0	1	0	0	0
302	Kaihoku "	1	1	5	7	12	1	3	4
303	Kahoku "	1	1	1	0	1	0	0	0
304	Date "	1	1	1	1	2	1	1	2
305	Minato "	1	1	1	0	1	1	0	1
307	Godaisan "	1	1	2	3	5	0	2	2
308	Itajima "	1	1	0	2	2	0	1	1
309	Otome "	1	1	2	1	3	2	1	3
311	Toyohama "	1	1	1	1	2	1	1	2
312	Akagi "	1	1	1	0	1	0	0	0
313	Ishizuchi "	1	1	1	1	2	0	0	0
319	Shitoku "	1	1	1	1	2	1	1	2
401	Biwako "	0	1	-	1	1	-	1	1
501	Tokyo Bay (Futtu Cape)	1	0	8	-	8	1	-	1
503	Tokyo Bay (Kannonzaki)	1	0	3	-	3	1	-	1
602	Yokoyama Dam	1	1	1	1	2	1	1	2
801	Ariake-Sea Embankment	1	0	1	-	1	0	0	0
901	P. W. R. I., Chiba Branch	1	0	5	-	5	3	-	3
904	Shintenryugawa Bridge	1	1	0	1	1	0	1	1
905	Ochiai "	2	1	4	10	14	3	10	13
906	Kashima Experiment Lab.	1	0	1	-	1	0	-	0
907	Taira Bridge	1	1	15	5	20	7	3	10
1001	Ajigawa "	1	2	1	0	1	1	0	1
1201	Nishiyokobori Bridge	1	1	2	0	2	1	0	1
1304	Otanoshike "	1	1	1	0	1	1	0	1
1305	Horoman "	1	1	1	1	2	0	0	0
Total		31	27	74	41	115	31	29	60

Note) Each instrument has 3 components: 1 vertical and 2 horizontal.

Table 6. Strong-Motion Seismograph Results

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity	
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth			
1961	1	9	12:28	Off Chiba-Pref.	140°09'	34°57'	60km	4.2	II: Yokohama, Oshima	

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
501	Tokyo Bay (Futtu Cape)		501-Gr-40	2.5	*	2.5						

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity	
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth			
1969	1	19	16:02	NE off Hokkaido	143°29'	44°33'	260km		W: Kushiro, Hachinohe	

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
1304	Otanoshike Bridge	25	1304-Gr-3	12.5	2.5	12.5						
1305	Horoman Bridge		1305-Gr-10	2.5	*	2.5		1305-P-4	*	*	*	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity	
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth			
1969	1	23	23:02	SW part of Ibaraki-Pref.	139°59'	36°14'	60km	3.8	II: Utsunomiya	

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
106	Soka Bridge		106-Gr-16	*	*	*		106-P-16	4.0	*	4.5	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity	
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth			
1969	2	5	15:09	Ariakekai	130°14'	33°00'	10km	4.2	II: Fukuoka	

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
309	Otome Bridge	26	309-Gr-15	15.0	10.0	7.5						
801	Ariake-Sea Embankment		801-Gr-4	*	*	*						

* Not measurable

Table 6. (Continued)

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity	
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth			
1969	2	17	16:29	Coast of Fukushima-Pref.	141°02'	37°27'	80km		II: Sendai, Fukushima	

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
302	Kaihoku Bridge		302-Gr-17	*	*	*		302-P-20	5.0	*	5.0	
907	Taira Bridge	26	907-Gr-23	10.0	2.5	9 0						

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity	
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth			
1969	3	11	00:52	Off Ibaraki-Pref.	140°43'	36° 25'	60km	4.3	III: Mito	

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
907	Taira Bridge		907-Gr-24	*	*	*						

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity	
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth			
1969	3	16	17:35	SW Part of Ibaraki-Pref.	139°59'	35°56'	50km	3.2		

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
907	Taira Bridge		907-Gr-25	*	*	*						

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity	
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth			
1969	3	17	00:54	Off Miyagi-Pref.	142°59'	38°32'	70km		III: Ishinomaki, Sendai	

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
302	Kaihoku Bridge		302-Gr-18	5.0	*	7.5	27	302-P-21	20.0	4.0	10.0	
907	Taira Bridge		907-Gr-26	7.5	4.0	6.0						

* Not measurable

Table 6. (Continued)

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	3	17	00:57	Off Miyagi-Pref.	142°52'	38°26'	50km	5.2	II: Ofunato

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
302	Kaihoku Bridge		302-Gr-19	*	*	*		302-P-22	5.0	*	4.0	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	4	1	04:26	Middle of Japan Sea	134°34'	38°34'	420km		III: Tokyo, Onahama

Station Number	Station (Name of Structure)	Ground						Structure				A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
204	Shinyawata Bridge		204-Gr-1	*	*	*						
501	Tokyo Bay (Futt Cape)		501-Gr-41	*	*	*						
503	Tokyo Bay (Kannonzaki)		503-Gr-12	*	*	*						
907	Taira Bridge		907-Gr-27	*	*	*	27	907-A-6	10.0	2.5	5.0	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	4	6	01:36	Near Matsushiro	138°15'	36°31'	00km	4.5	III: Matsushiro

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
905	Ochiai Bridge	28	905-C-117	47.5	15.0	52.5						
905	Ochiai Bridge	28	905-B-264	160.0	27.5	37.5	29	905-A-414	97.5	25.0	27.5	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	4	9	21:57	Middle of Tochigi-Pref.	139°46'	36°47'	100km		III: Tokyo, Utsunomiya

Station Number	Station (Name of Structure)		Ground				Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori.A	Vertical	Hori.B			Hori.A	Vertical	Hori.B	
101	Shinkatsushika Bridge	30	101-Gr-11	14.0	4.0	16.0						
104	Shintonegawa Bridge	31	104-Gr-12	42.5	10.0	70.0	32	104-P-10	59.0	7.5	25.0	

(Continued on next page.)

* Not measurable

Table 6. (Continued)

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	4	9	21:57	Middle of Tochigi-Pref.	139°46'	36°47'	100km		III: Tokyo, Utsunomiya

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
106	Soka Bridge	33	106-Gr-17	15.0	4.0	12.5	34	106-P-17	24.0	*	14.0	
204	Shinyawata Bridge		204-Gr-2	*	*	*						
501	Tokyo Bay (Futtu Cape)		501-Gr-42	2.5	*	5.0						
503	Tokyo Bay (Kannonzaki)	35	503-Gr-13	10.0	*	7.5						
901	The P.W.R.I., Chiba Branch	36	901-Gr-38	10.0	2.5	7.5						
906	The P.W.R.I., Kashima		906-Gr-9	7.5	*	5.0						
907	Taira Bridge	37	907-Gr-28	10.0	4.0	15.0						

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	4	10	20:51	Near Matsushiro	138°08'	36°30'	10km	4.2	

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
905	Ochiai Bridge						37	905-A-415	17.5	5.0	7.5	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	4	21	16:19	Hyuganada	132°07'	32°09'	10km	6.5	IV: Miyazaki, Nobeoka

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
205	Ishiseto Bridge	38	205-Gr-7	15.0	*	10.5	38	205-P-19	23.0	*	19.5	
309	Otome Bridge	39	309-Gr-16	12.5	7.5	15.0	39	309-P-17	12.5	5.0	45.0	

* Not measurable

Table 6. (Continued)

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	4	26	03:49	Near Matsushiro	138°07'	36°26'	10km	4.0	

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
905	Ochiai Bridge						40	905-A-416	22.5	2.5	5.0	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	5	13	23:19	Kashimanada	140°40'	36°28'	50km	5.2	III: Onahama, Choshi

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
104	Shintonegawa Bridge		104-Gr-13	4.0	*	5.0						
907	Taira Bridge	40	907-Gr-29	10.0	5.0	15.0						

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	5	15	10:56	SE off Chiba-Pref.	140°06'	34°54'	70km		III: Oshima, Tateyama

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
501	Tokyo Bay (Futtu Cape)		501-Gr-43	4.0	*	7.5						

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	5	20	15:36	Off Miyagi-Pref.	141°50'	38°21'	60km	4.8	III: Ishinomaki

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
907	Taira Bridge		907-Gr-30	9.0	5.0	7.5						

* Not measurable

Table 6. (Continued)

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity		
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth				
1969	5	22	02:55	Near Matsushiro	138°06'	36°25'	0km	4.4			

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
905	Ochiai Bridge						41	905-A-417	45.0	5.0	10.0	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity		
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth				
1969	6	10	19:53	Near Matsushiro	138°06'	36°26'	10km	4.5			

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
905	Ochiai Bridge						41	905-A-418	17.5	2.5	7.5	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity		
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth				
1969	6	20	15:41	Off Miyagi-Pref.	142°12'	38°25'	70km		III: Miyako, Ishinomaki		

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
302	Kaihoiku Bridge		302-Gr-20	2.5	*	2.5	42	302-P-23	25.0	5.0	17.5	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity		
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth				
1969	6	23	14:57	Off Fukushima-Pref.	141°40'	37°18'	50km	5.2	II: Fukushima, Mito		

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
907	Taira Bridge	42	907-Gr-31	7.5	4.0	10.0						

* Not measurable

Table 6. (Continued)

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity	
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth			
1969	7	23	22:14	Off Fukushima-Pref.	141°45'	37°14'	40km	5.5	III: Onahama, Shirakawa	

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
302	Kaihoku Bridge							302-P-24	*	*	*	
907	Taira Bridge	43	907-Gr-32	20.0	10.0	17.5	43	907-A-7	10.0	2.5	7.5	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity	
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth			
1969	7	26	23:39	E of Kanagawa-Pref.	139°40'	35°28'	40km	4.2	II: Tokyo, Chiba	

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
101	Shinkatsushika Bridge		101-Gr-12	5.0	*	5.0						

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity	
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth			
1969	8	6	03:34	E of Fukushima-Pref.	140°49'	37°22'	110km		III: Fukushima	

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
907	Taira Bridge	44	907-Gr-33	15.0	10.0	17.5		907-A-8	7.5	2.5	7.5	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity	
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth			
1969	8	11	12:31	Middle of Chiba-Pref.	140°12'	35°34'	80km		III: Chiba	

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
501	Tokyo Bay (Futtu Cape)		501-Gr-44	*	*	*						
901	The P. W. R. I., Chiba Branch	44	901-Gr-39	10.0	4.0	6.0						

* Not measurable

Table 6. (Continued)

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	8	12	06:28	E off Hokkiado	148°11'	43°06'	30km	7.8	IV: Nemuro, Kushiro

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
907	Taira Bridge		907-Gr-34	*	*	*						

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	8	13	02:46	Middle of Tochigi-Pref.	139°44'	36°38'	10km	4.2	II: Utsunomiya

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
104	Shintonegawa Bridge		104-Gr-14	5.0	*	5.0						

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	8	22	01:28	Near Matsushiro	138°18'	36°32'	10km	4.0	

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
905	Ochiai Bridge						45	905-A-419	20.0	2.5	10.0	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	9	7	09:24	Iyo-Nada	131°48'	33°37'	100km		III: Oita

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
308	Itajima Bridge						46, 47	308-P-7	17.5	*	15.0	

* Not measurable

Table 6. (Continued)

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	9	9	14:15	Middle of Gifu-Pref.	137°04'	35°47'	00	6.6	V: Mitake

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
204	Shinyawata Bridge	48	204-Gr-3	45.0	23.0	40.0		204-P-1	(41.0)	(12.5)	(25.0)	204-P-1 (Only maximum)
305	Minato Bridge	49	305-Gr-5	10.5	10.0	14.0						
308	Itajima Bridge							308-P-8	*	*	7.5	
311	Toyohama Bridge	49	311-Gr-5	12.5	2.5	10.0	50	311-P-6	27.5	5.0	32.5	
312	Akagi Bridge		312-Gr-1	*	*	*						
313	Ishizuchi Bridge		313-Gr-4	4.0	*	2.5		313-P-5	4.0	*	4.0	
319	Shitoku Bridge	51	319-Gr-4	17.5	14.0	27.5	52	319-P-4	72.5	10.0	42.5	
401	Biwako Bridge						53, 54	401-P-1	145.0	10.0	75.0	
501	Tokyo Bay (Futtu Cape)		501-Gr-45	*	*	*						
503	Tokyo Bay (Kannonzaki)		503-Gr-14	*	*	*						
602	Yokoyama Dam	55	602-Gr-1	12.5	10.0	17.5	55	602-D-1	57.5	15.0	35.0	
901	The P. W. R. I., Chiba Branch		901-Gr-40	*	*	*						
904	Shintenryugawa Bridge						56	904-P-2	49.0	5.0	40.0	
1001	Ajigawa Bridge	57	1001-Gr-2	12.5	2.5	17.5						
1201	Nishiyokobori Bridge	58	1201-Gr-6	10.0	2.5	10.0						
610	Koshibu Dam						59, 60	610-D-1	144.0	notes	34.0	Vertical Component is Indistinct.
701	Yodogawa Embankment		701-Gr-6	8.0	2.5	9.0						

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	9	11	01:02	Middle of Gifu-Pref.	137°06'	35°45'	10km	4.9	II: Gifu, Nagoya

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
204	Shinyawata Bridge		204-Gr-4	*	*	*						

* Not measurable

Table 6. (Continued)

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity	
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth			
1969	9	11	03:18	Middle of Gifu-Pref.	137°06'	35°44'	00km	4.8	II: Gifu, Nagoya	

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
204	Shinyawata Bridge		204-Gr-5	4.0	*	5.0						

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity	
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth			
1969	9	14	23:31	Middle of Gifu-Pref.	137°05'	35°46'	10km	4.8	II: Nagoya, Takayama	

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
204	Shinyawata Bridge		204-Gr-6	*	*	*						

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity	
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth			
1969	9	22	08:21	Near Matsushiro	138°09'	36°30'	00km	4.5		

Station Number	Station (Name of Structure)			Ground			Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
905	Ochiai Bridge		905-C-118	2.5	*	*	61	905-A-420	72.5	10 0	20.0	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity	
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth			
1969	10	3	21:03	Middle of Chiba-Pref.	140°03'	35°18'	40km	4.5	III: Chiba, Katsuura	

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
501	Tokyo Bay (Futtu Cape)	61	501-Gr-46	17.5	*	15.0						
901	The P.W.R.I., Chiba Branch	62	901-Gr-41	15.0	5.0	19.0						

* Not measurable

Table 6. (Continued)

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	10	10	15:38	S of Miyagi-Pref.	140°44'	38°07'	10km	4.6	II: Fukushima, Sendai

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
302	Kaihoku Bridge							302-P-25	*	*	*	
907	Taira Bridge		907-Gr-35	*	*	*						

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	10	18	10:14	S of Iwate-Pref.	141°39'	39°13'	130km		IV: Morioka

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
301	Yuhei Bridge		301-Gr-5	*	*	*						
302	Kaihoku Bridge	62	302-Gr-21	9.0	4.0	12.5	63	302-P-26	50.0	7.5	17.5	
303	Kahoku Bridge		303-Gr-13	*	*	*						
304	Date Bridge	63	304-Gr-20	10.0	*	7.5	64	304-P-27	5.0	*	16.0	
907	Taira Bridge	64	907-Gr-36	12.5	7.5	7.5	65	907-A-9	10.0	2.5	5.0	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	10	23	20:23	Near Matsushiro	138°13'	36°34'	10km		

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
905	Ochiai Bridge						65	905-A-421	25.0	5.0	7.5	

* Not measurable

Table 6. (Continued)

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	11	2	12:30	Near Mito	140°38'	36°26'	50km	4.0	II: Mito

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
907	Taira Bridge		907-Gr-37	*	*	*		907-A-10	*	*	*	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	11	9	12:50	Near Matsushiro					II: Nagano

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
905	Ochiai Bridge						66	905-A-422	15.0	2.5	5.0	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	11	13	03:23	E off Chiba-Pref.	141°10'	35°24'	50km	4.9	III: Choshi

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
501	Tokyo Bay (Futtu Cape)		501-Gr-47	*	*	*						

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	11	30	01:43	W of Ehime-Pref.	132°24'	33°20'	40km	5.1	III: Uwajima, Oita

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
307	Godaisan Bridge		307-Gr-2	*	*	*	66	307-P-11	12.5	*	*	

* Not measurable

Table 6. (Continued)

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	11	30	13:12	W of Ehime-Pref.	132°24'	33°15'	40km	5.1	III: Matsuyama

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
307	Godaisan Bridge		307-Gr-3	*	*	*	67	307-P-13	17.5	2.5	5.0	

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	11	30	21:49	S off Chiba-Pref.	140°00'	34°43'	100km		III: Tateyama

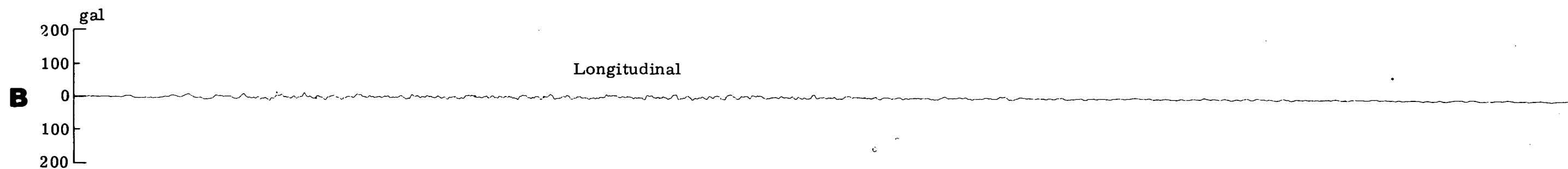
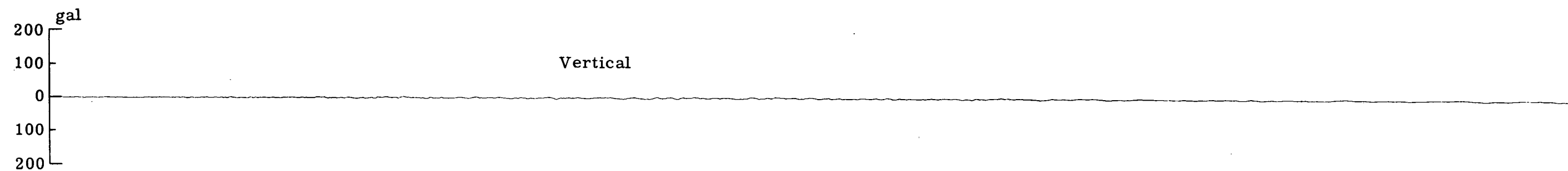
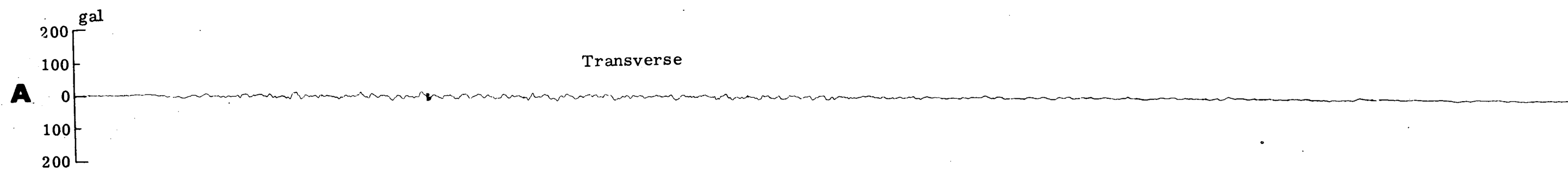
Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
901	The P.W.R.I., Chiba Branch		901-Gr-42	*	*	*						

Earthquake Time and Date				Location of Epicenter				Magnitude	Maximum Intensity
Year	Month	Day	Time	Epicentral Region	Longitude	Latitude	Depth		
1969	12	3	21:19	Near Matsushiro	138°10'	36°30'	10km	4.4	III: Matsushiro, Nagano

Station Number	Station (Name of Structure)	Ground					Structure					A Remarks Column
		Page	Record Number	Max. Amplitude (gals)			Page	Record Number	Max. Amplitude (gals)			
				Hori. A	Vertical	Hori. B			Hori. A	Vertical	Hori. B	
905	Ochiai Bridge	68	905-B-265	70.0	10.0	14.0	69	905-A-423	52.5	14.0	14.0	

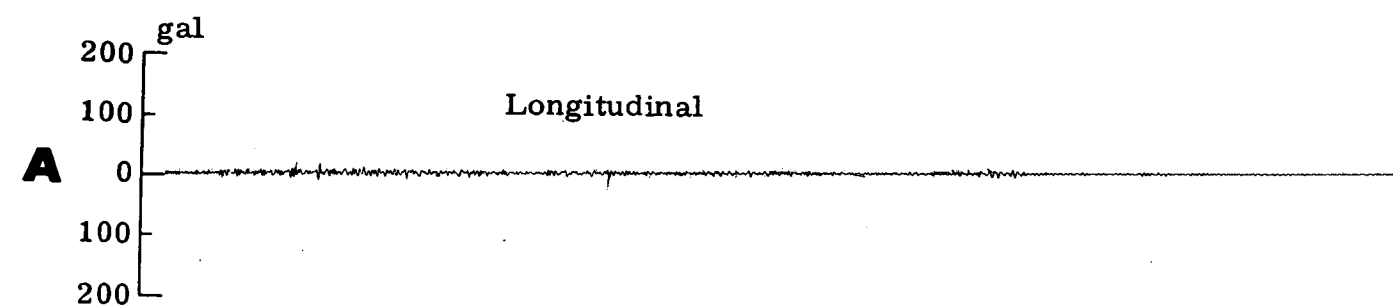
* Not measurable

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Otanoshige Bridge 1304-Gr-3
1969 1.19 16:02

1sec

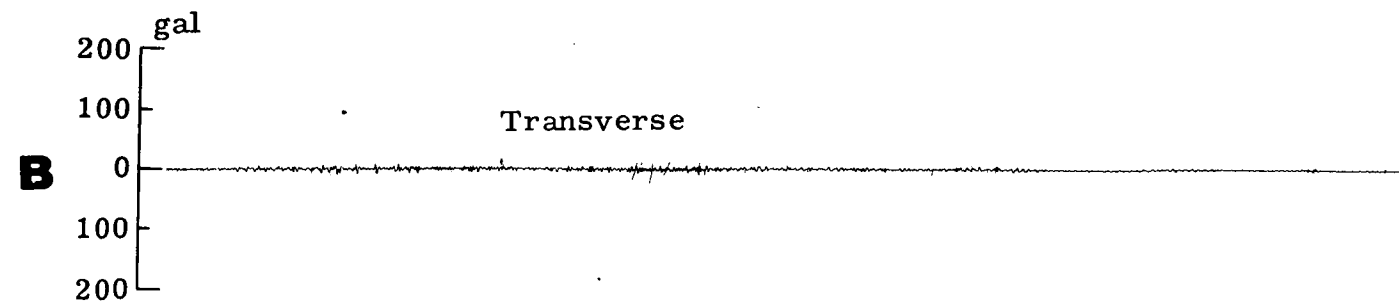
Otome Bridge 309-Gr-15
1969 2.5 15:09



gal

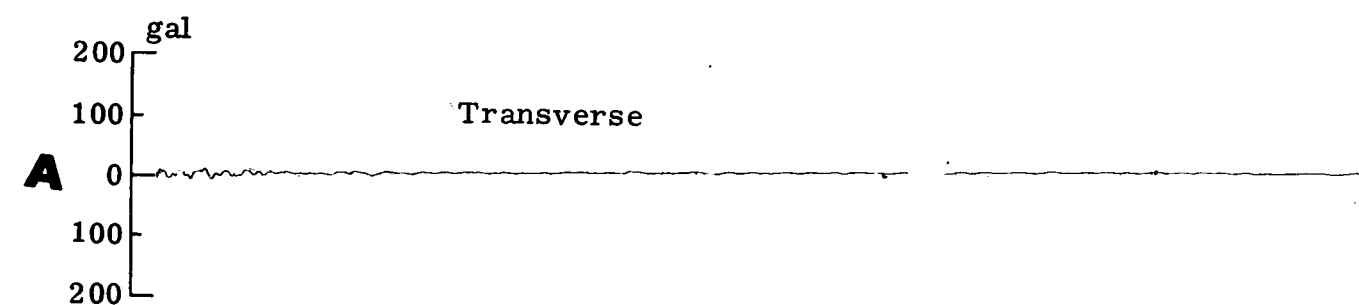


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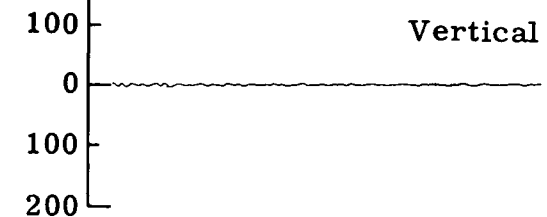


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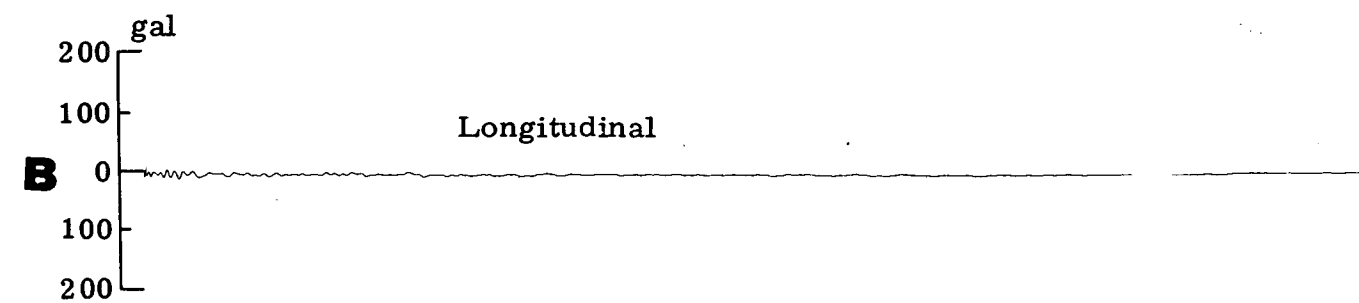
Taira Bridge 907-Gr-23
1969 2.17 16:29



gal

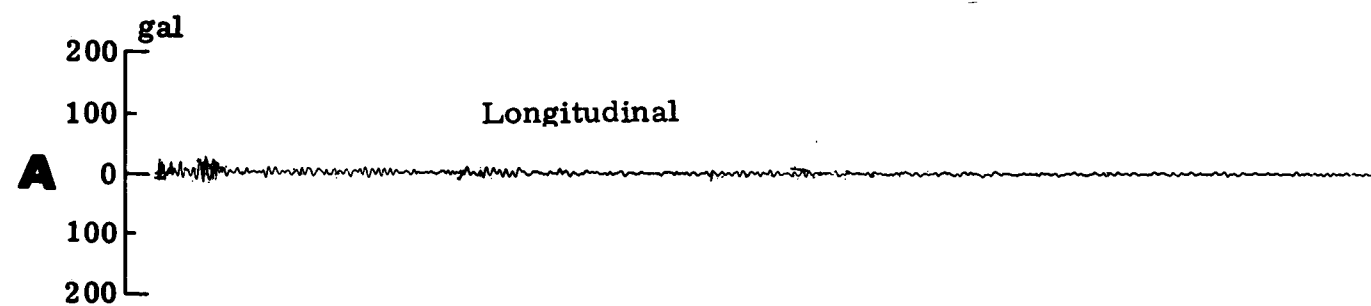


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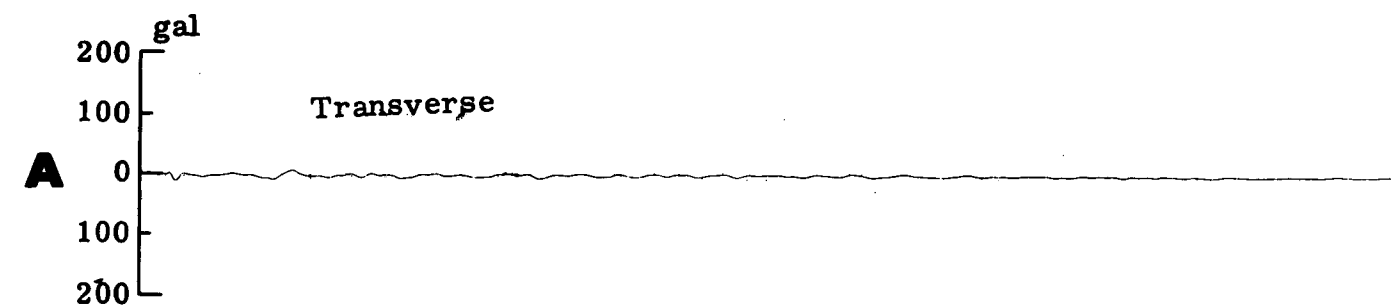
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Kaihoku Bridge 302-P-21
1969 3.17 00:54

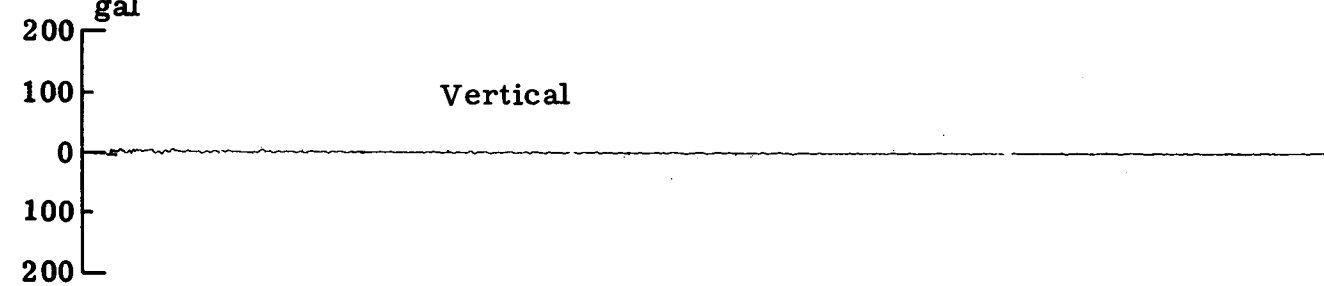


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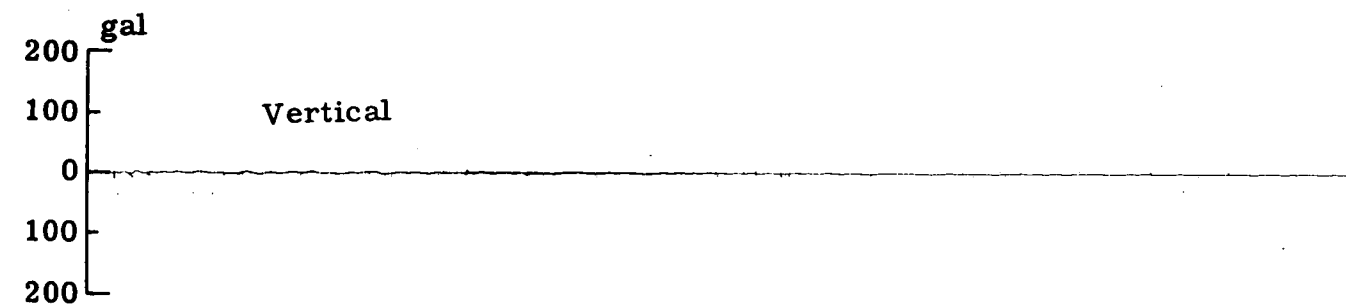
Taira Bridge 907-A-6
1969 4.1 04:26



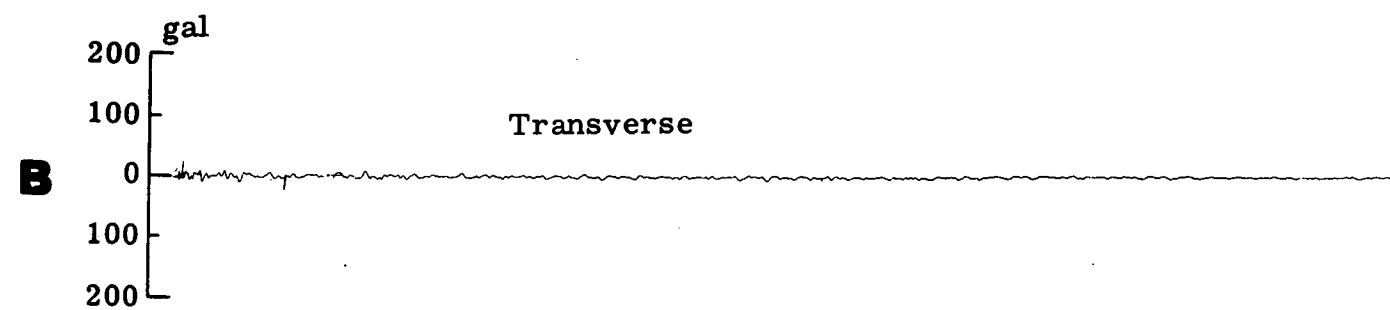
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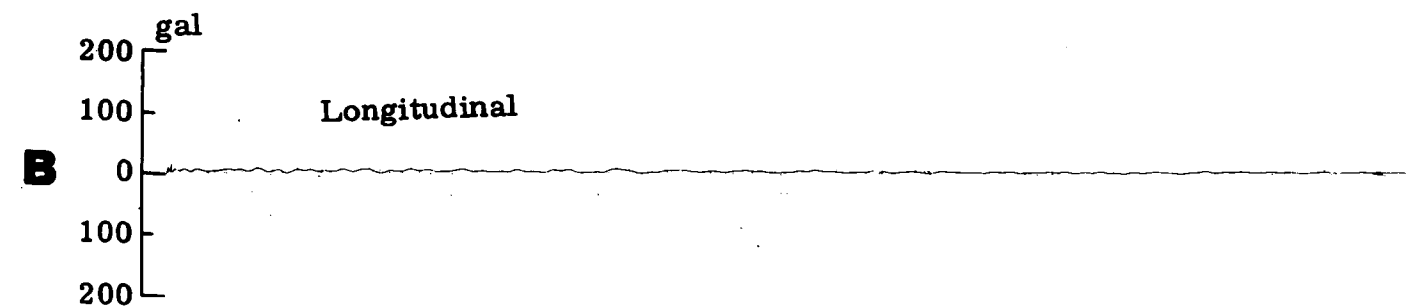
gal



gal

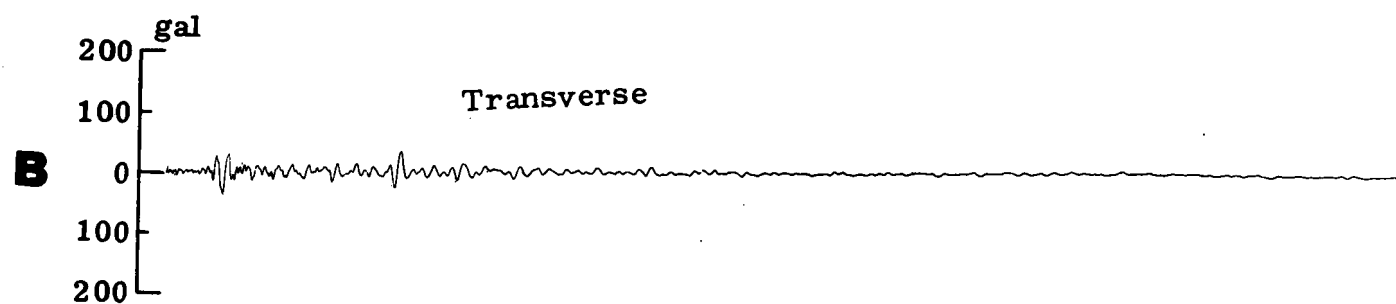
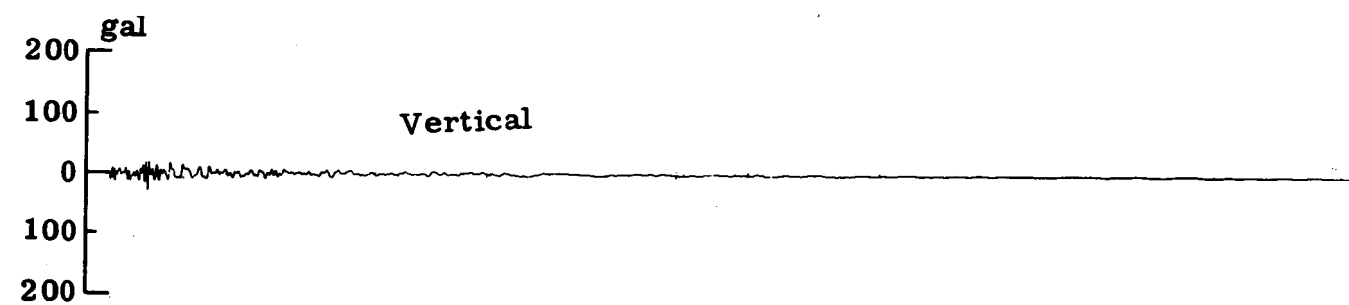
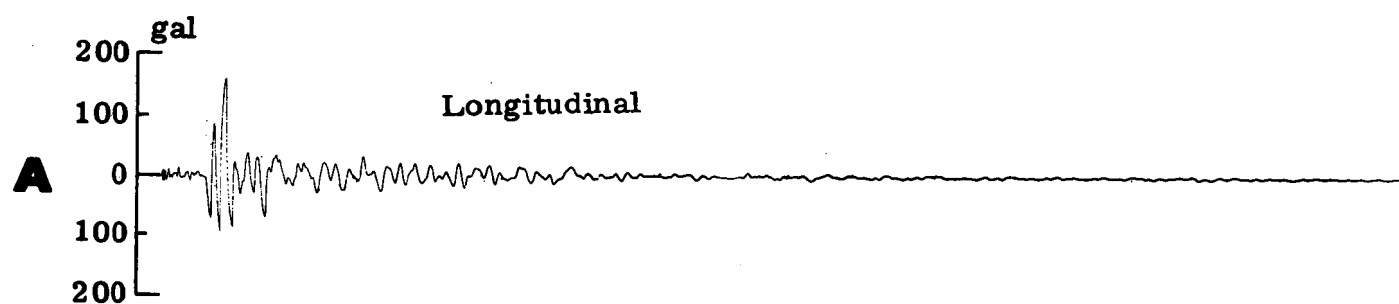


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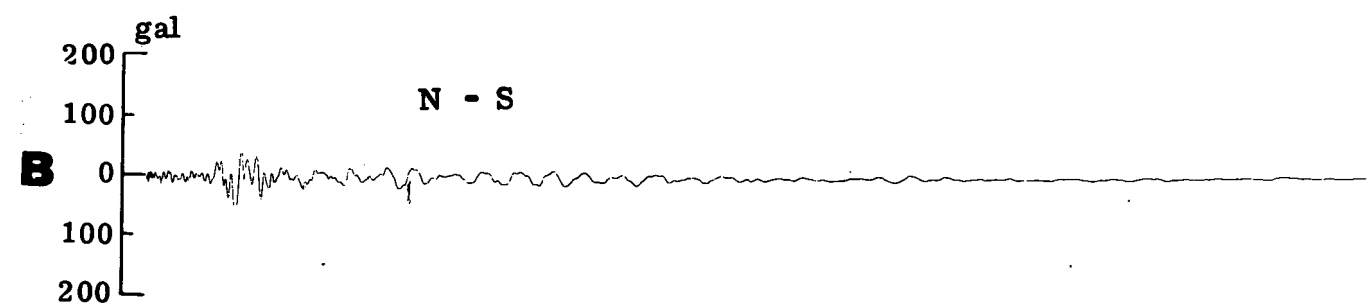
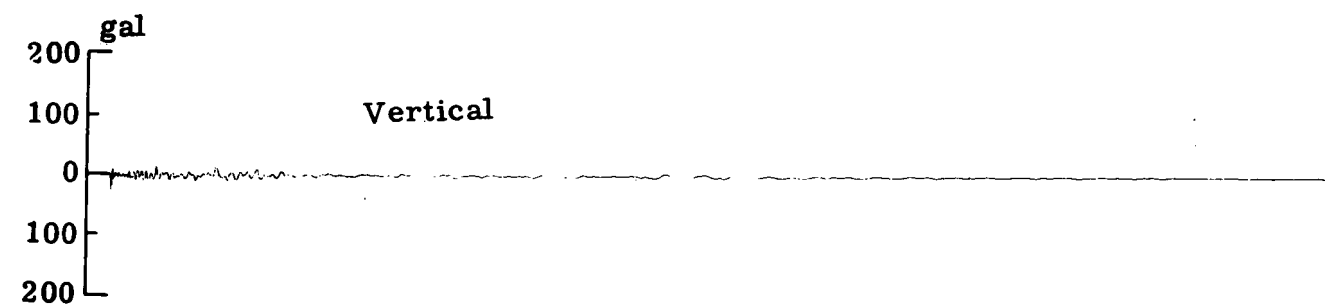
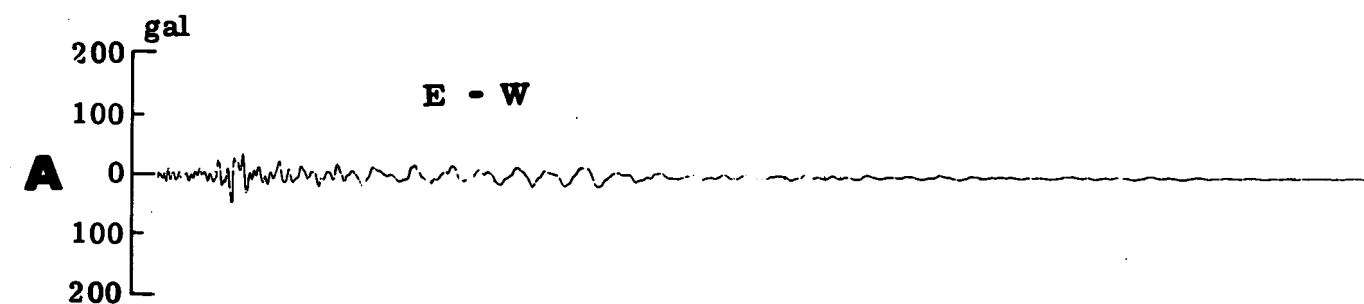
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Ochiai Bridge 905-B-264
1969 4.6 01:36



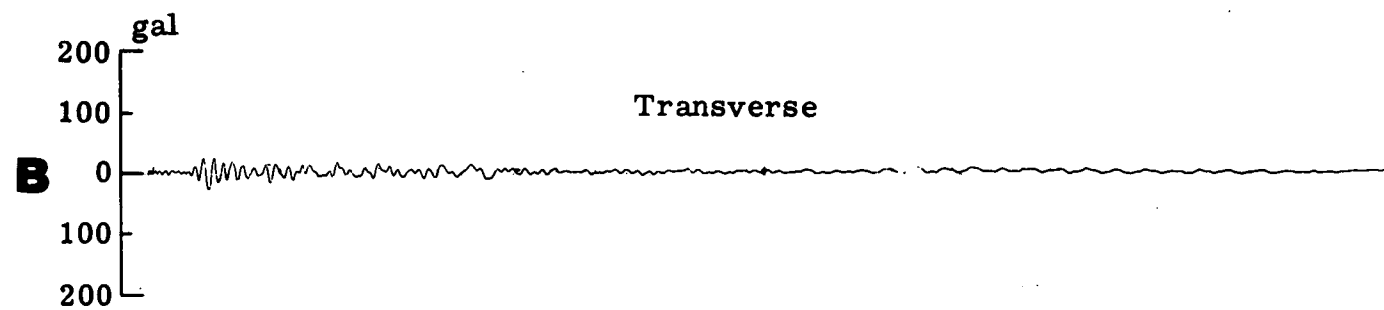
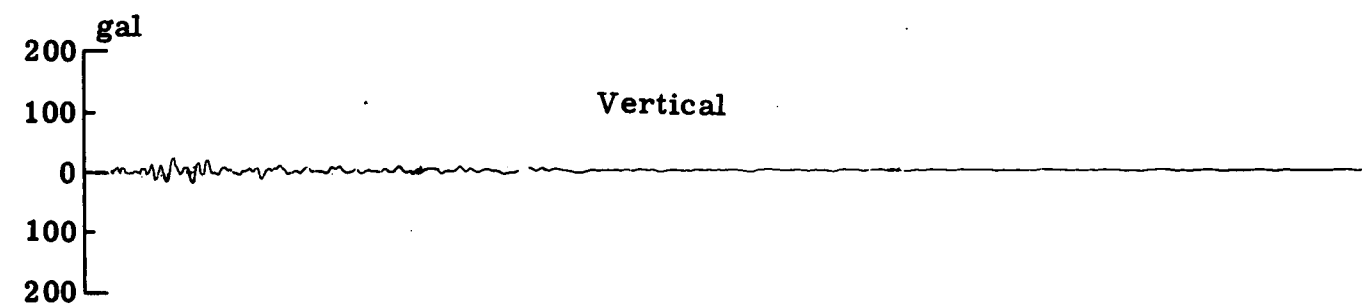
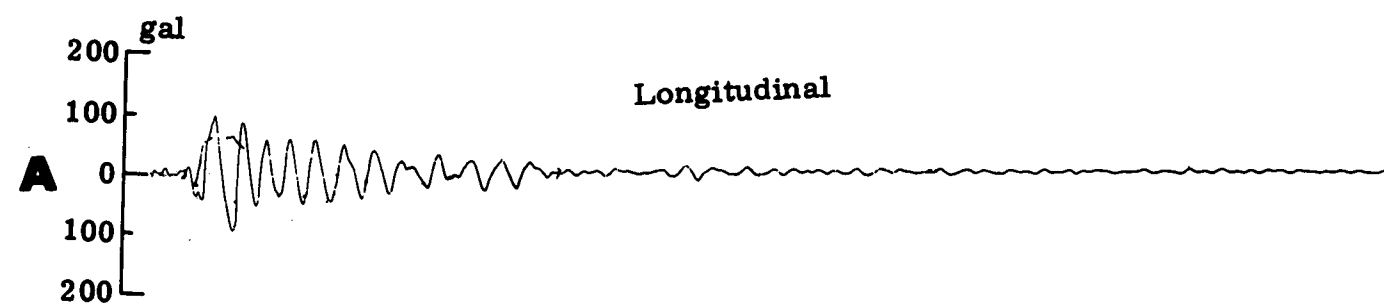
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Ochiai Bridge 905-C-117 Nagano City
1969 4.6 01:36



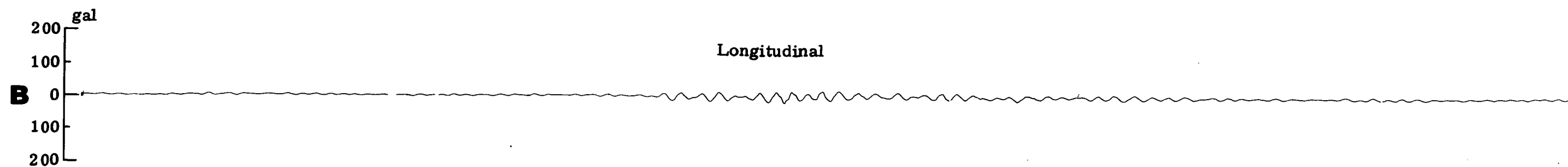
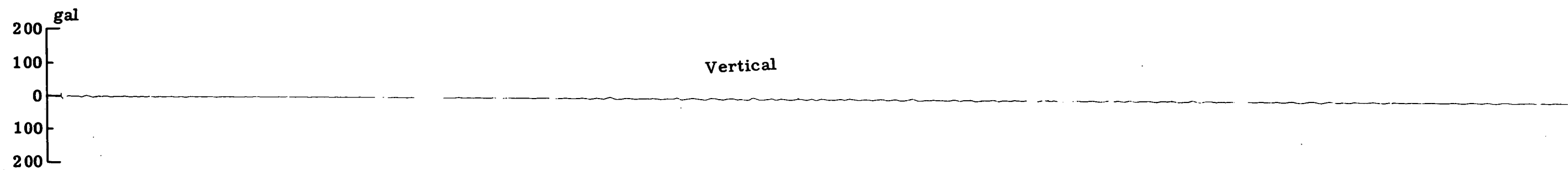
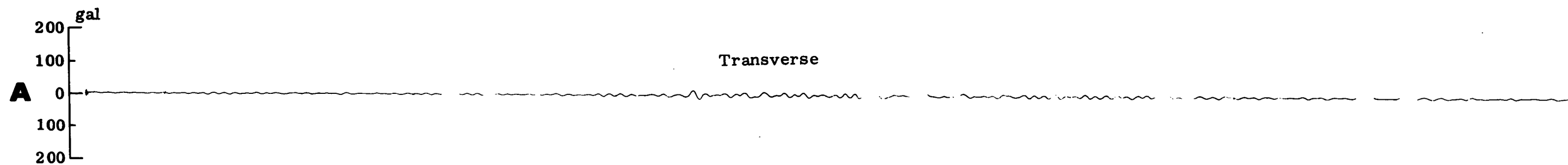
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Ochiai Bridge 905-A-414
1964 4.6 01:36



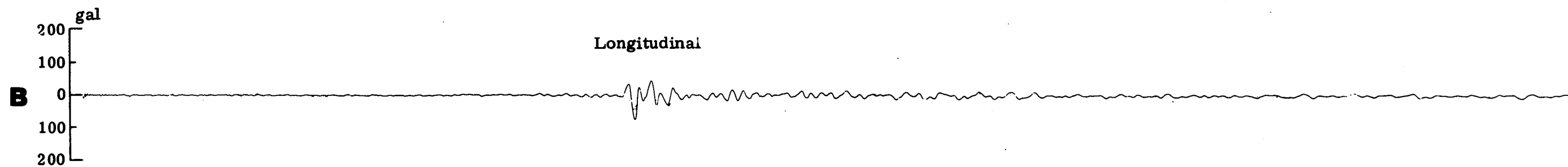
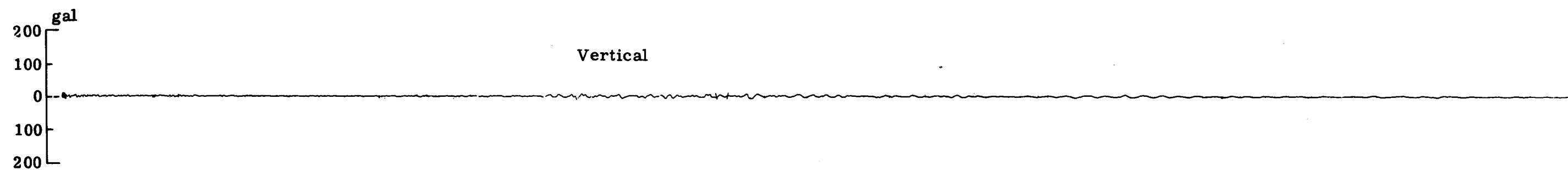
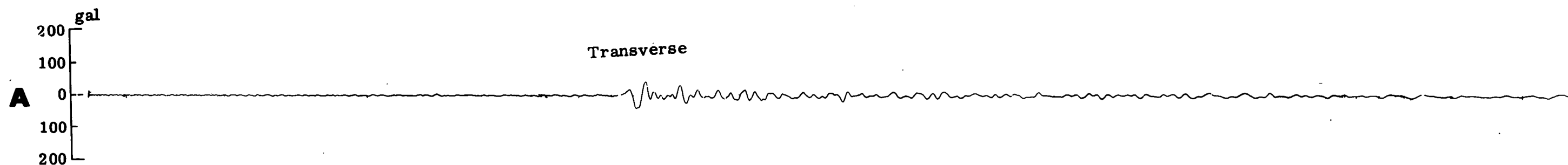
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Shinkatsushika Bridge 101-Gr-11
1969 4.9 21:57



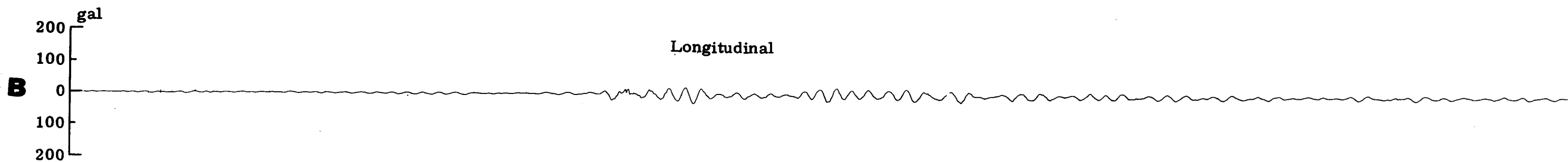
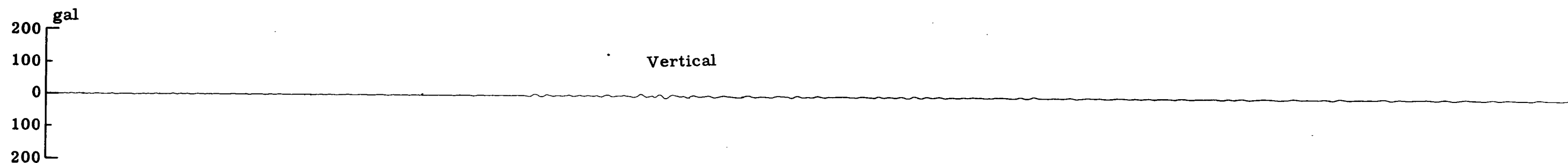
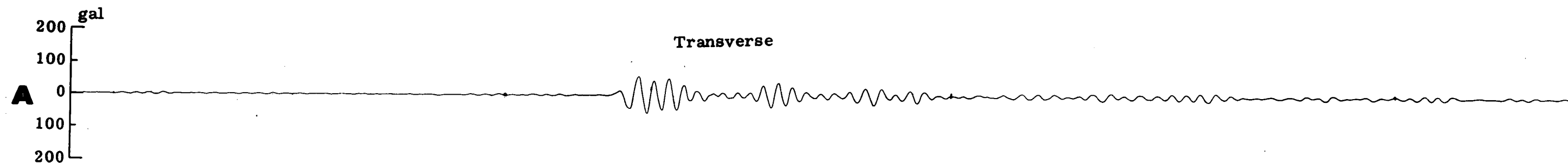
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Shintonegawa Bridge 104-Gr-12
1969 4.9 21:57



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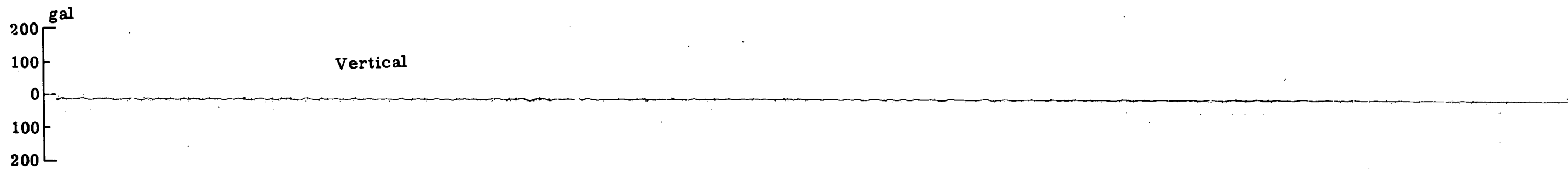
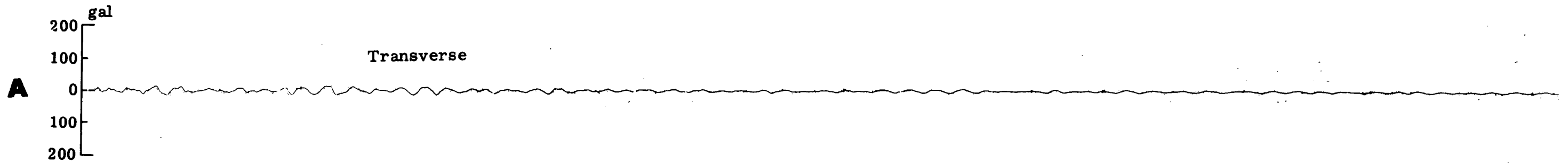
Shintonegawa Bridge 104-P-10
1969 4.9 . 21:57



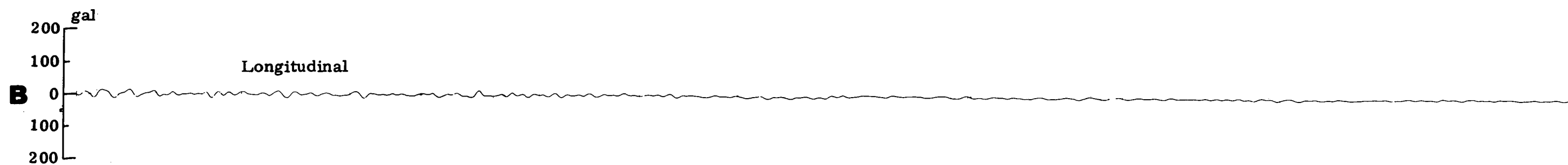
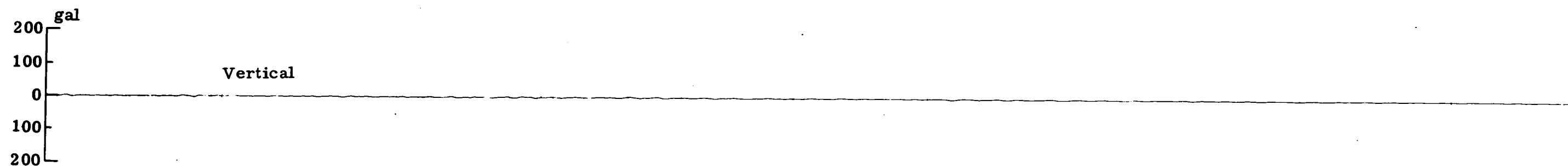
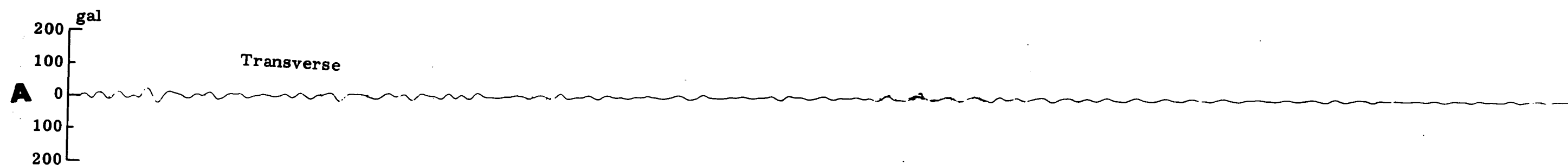
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Soka Bridge 106-Gr-17

1969 4.9 21:57

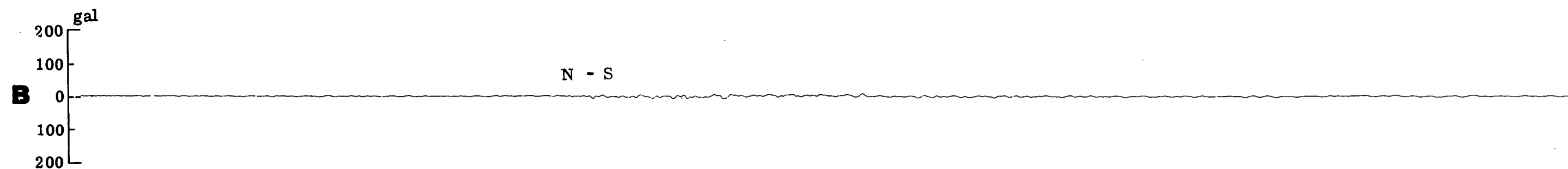
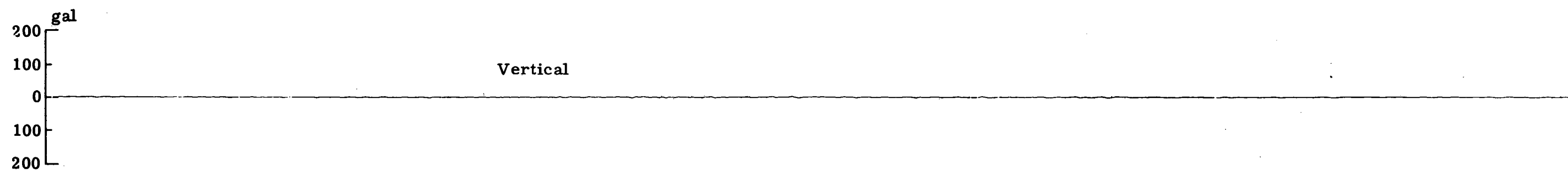
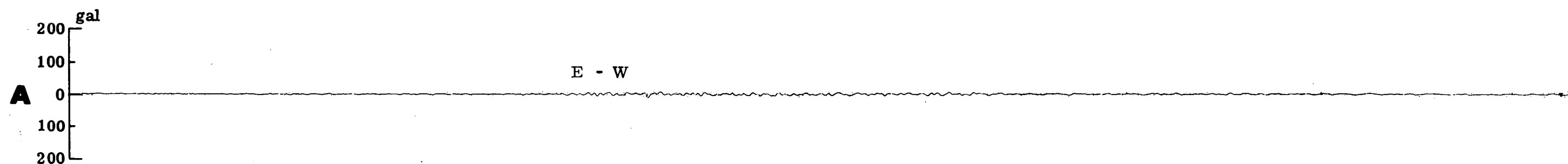


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Soka Bridge 106-P-17
1969 4.9 21:57

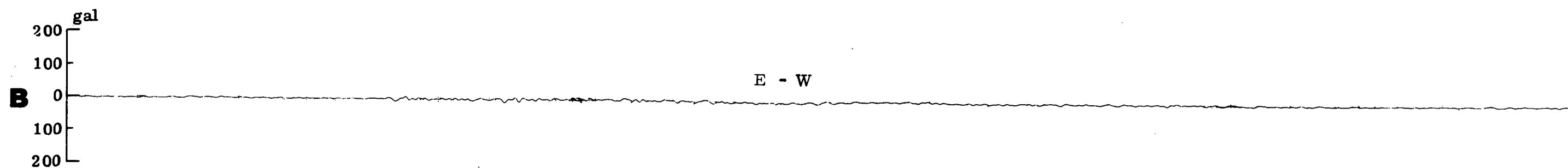
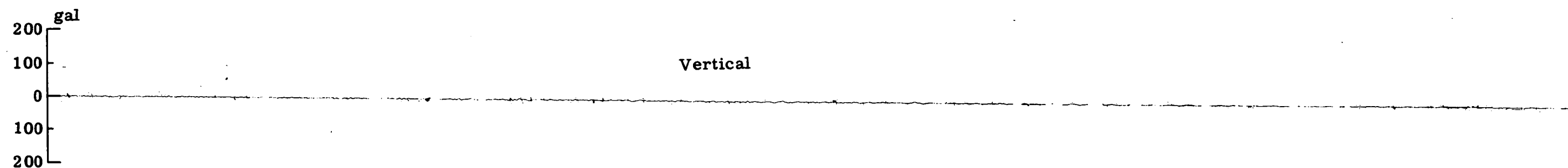
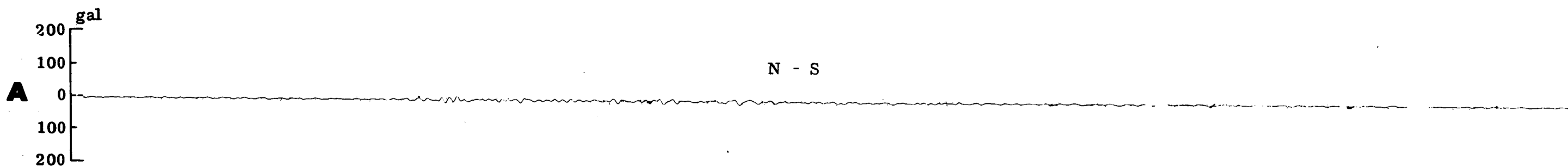
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Tokyo Bay (Kannonzaki)
503-Gr-13 1969 4.9 21:57



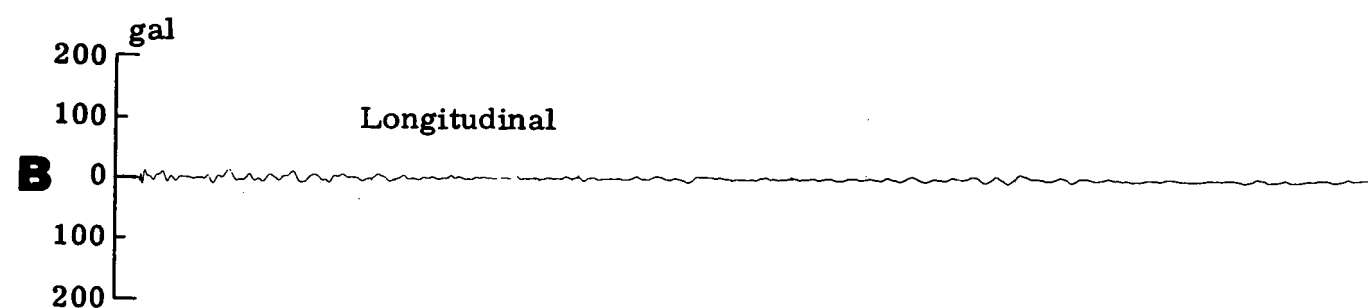
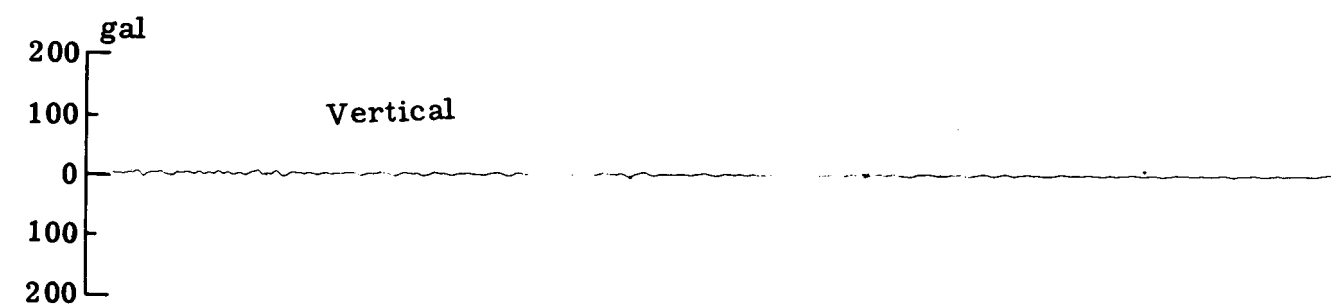
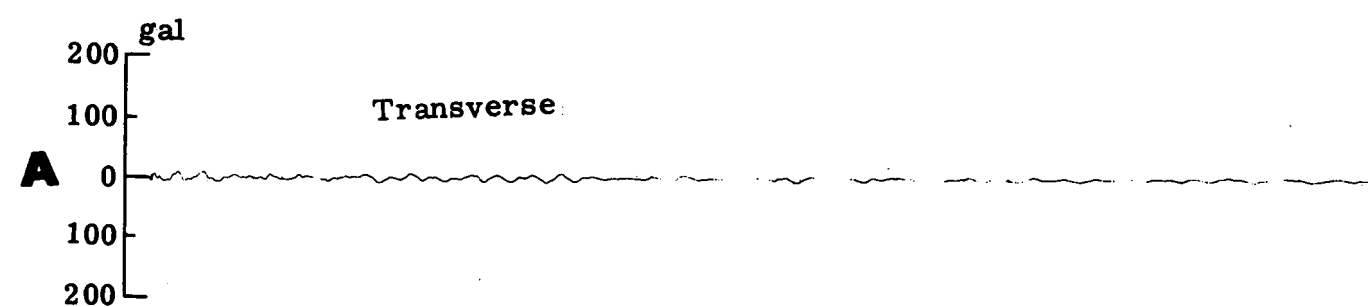
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The Public Works Research Institute,
Chiba Branch 901-Gr-38
1969 4.9 21:57

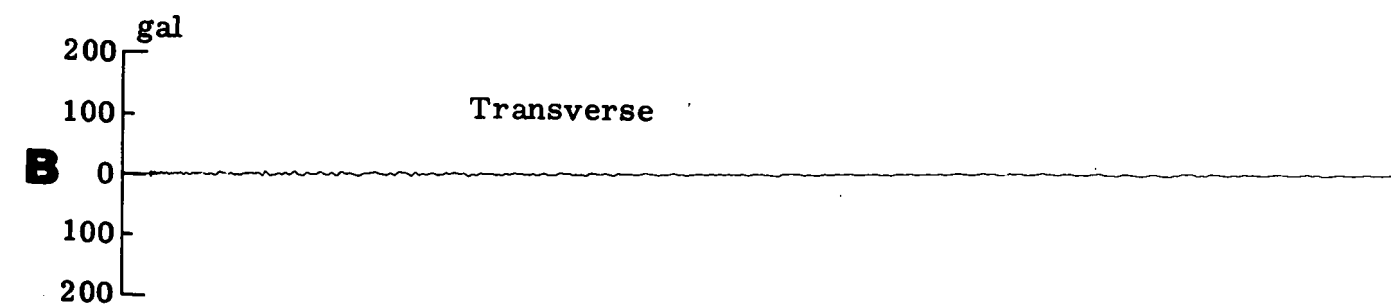
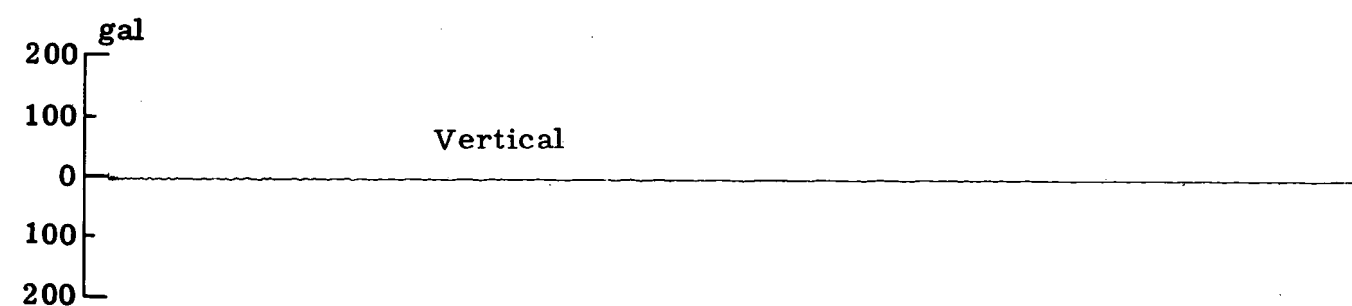
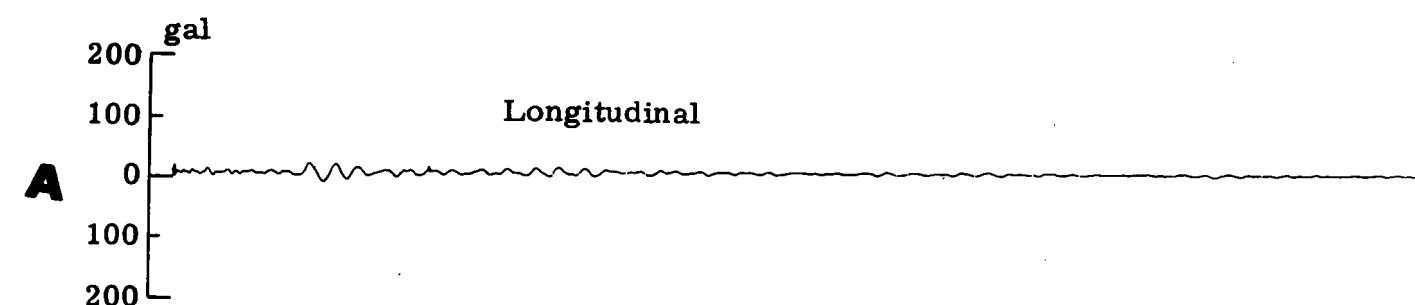




Taira Bridge 907-Gr-28
1969 4.9 21:57

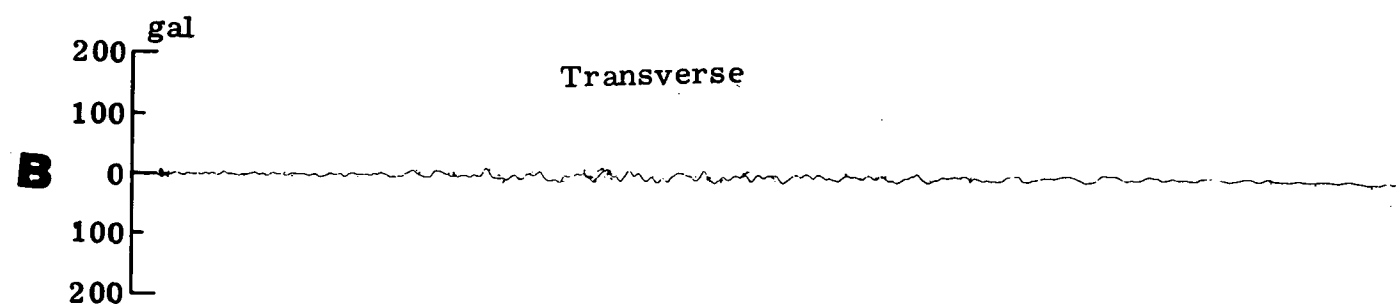
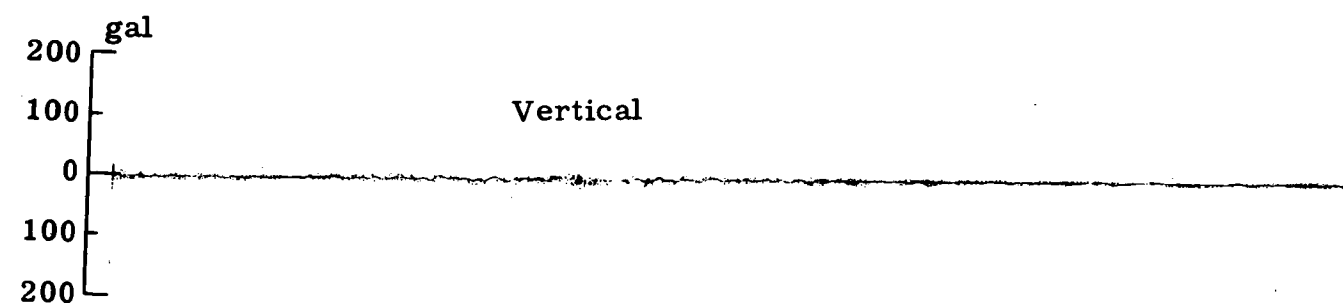
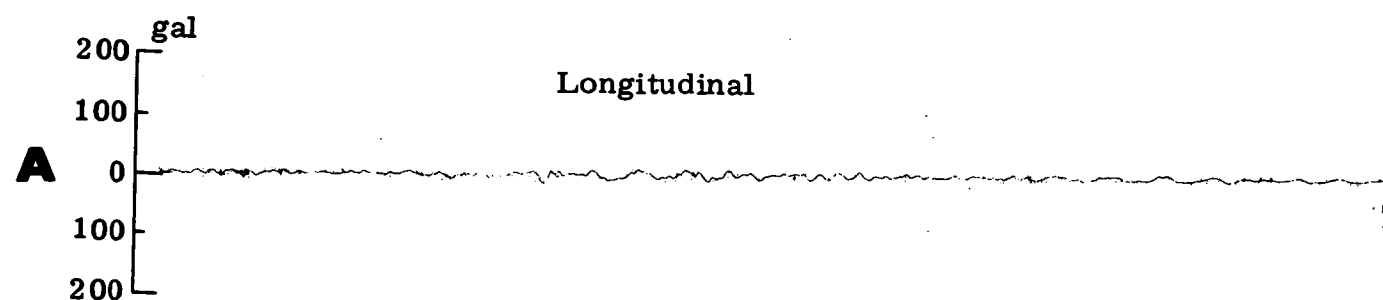


Ochiai Bridge 905-A-415
1969 4.10 20:51



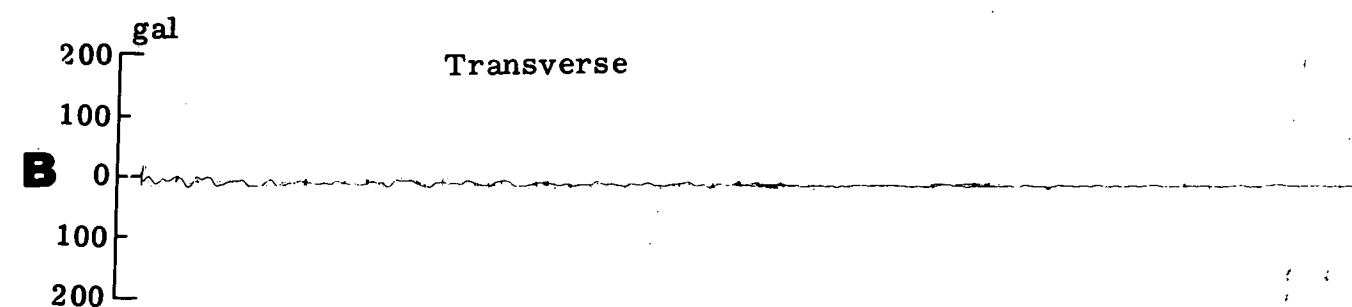
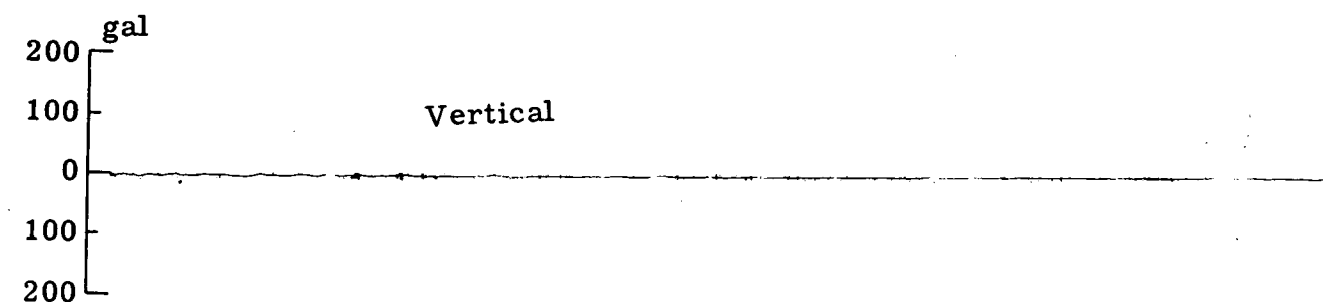
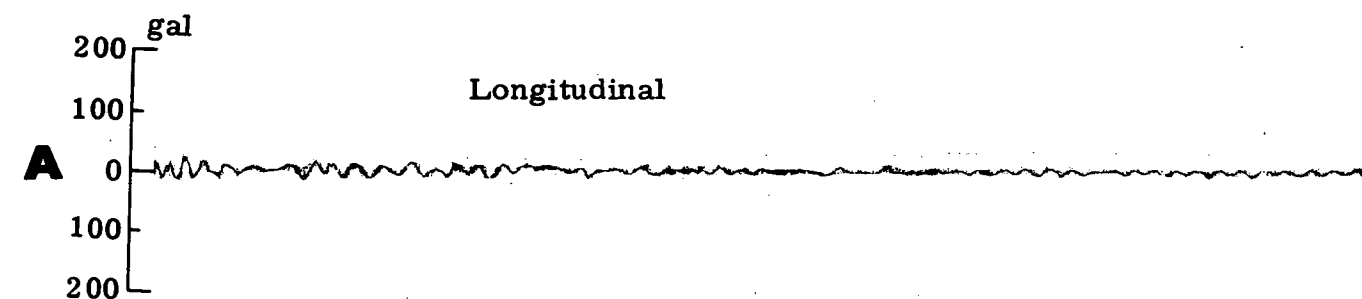
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Ishiseto Bridge 205-Gr-7
1969 4.21 16:19



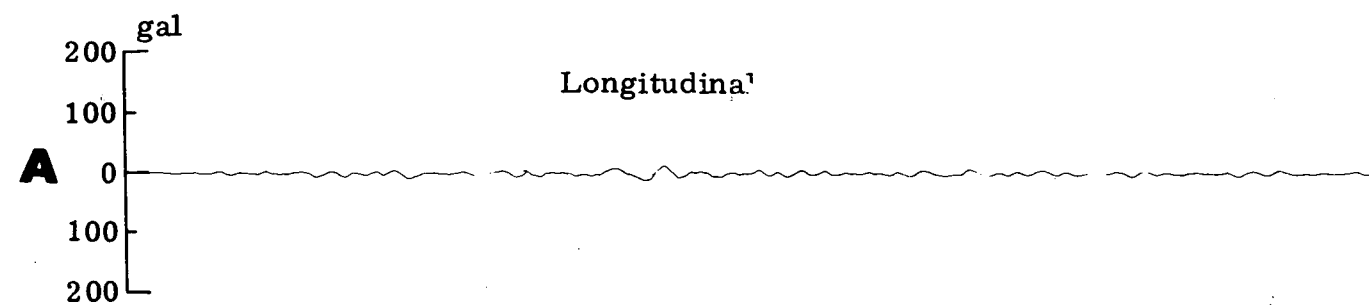
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Ishiseto Bridge 205-P-19
1969 4.21 16:19



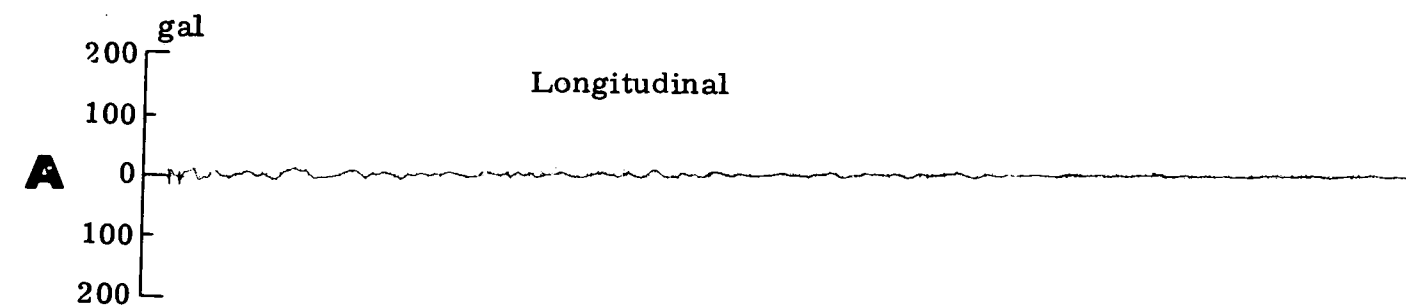
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Otome Bridge 309-Gr-16
1969 4.21 16:19



1sec

Otome Bridge 309-P-17
1969 4.21 16:19

gal

200

100

0

100

200

Vertical

gal

200

100

0

100

200

B

Transverse

gal

200

100

0

100

200

Vertical

gal

200

100

0

100

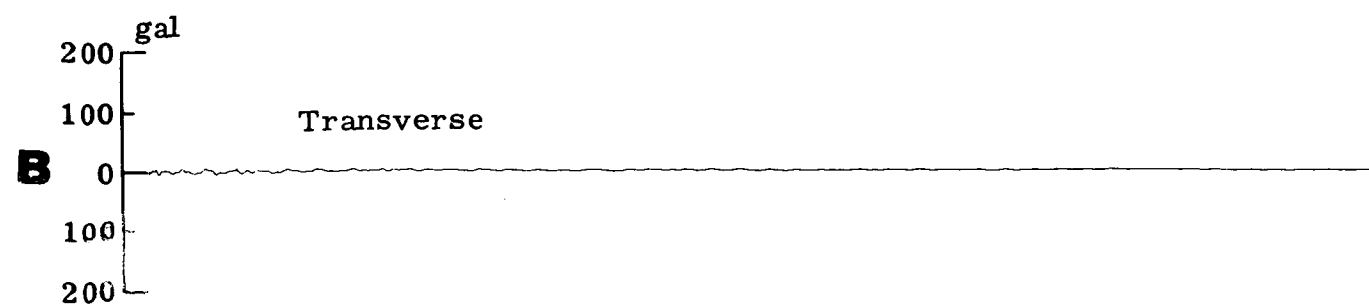
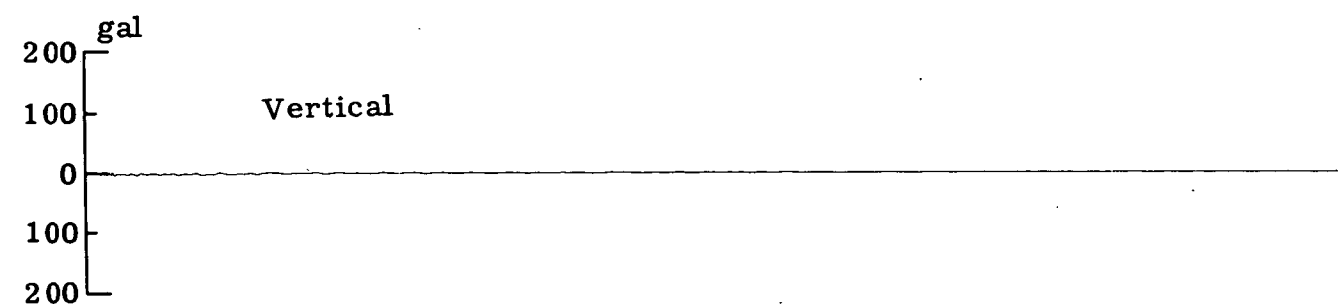
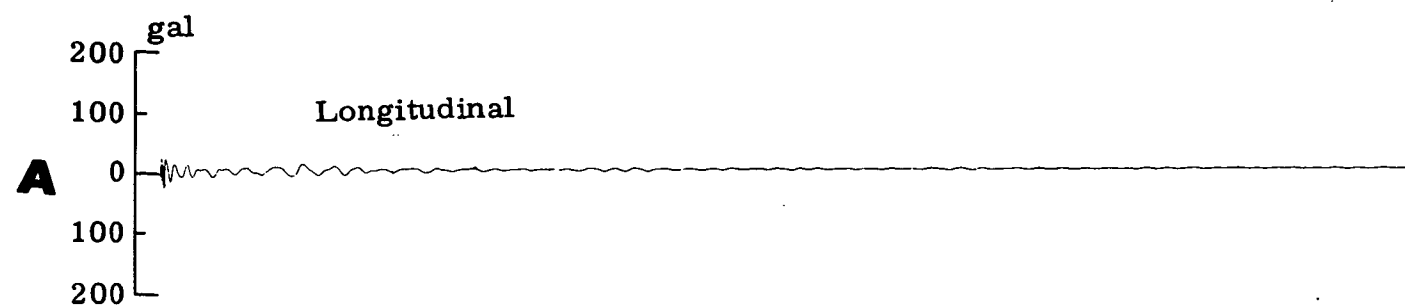
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B

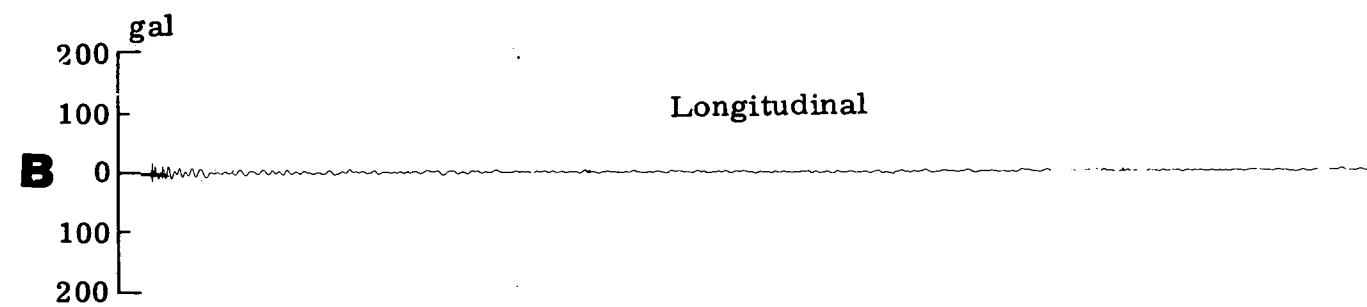
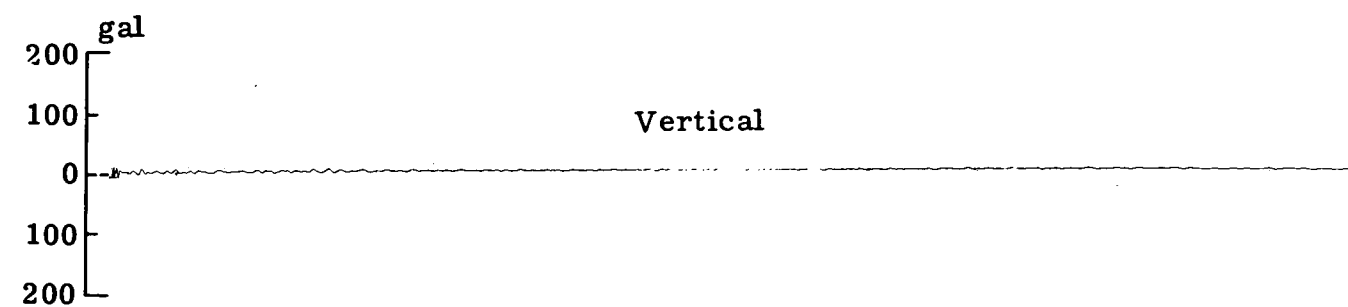
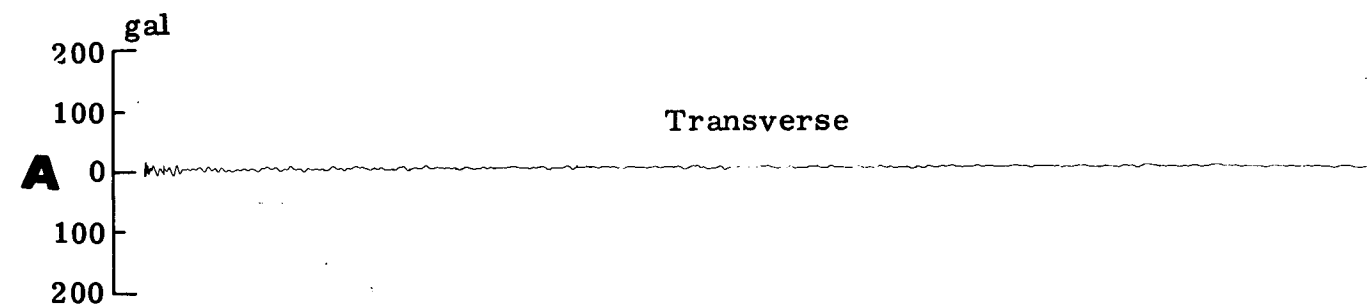
Transverse



Ochiai Bridge 905-A-416
1969 4.26 03:49

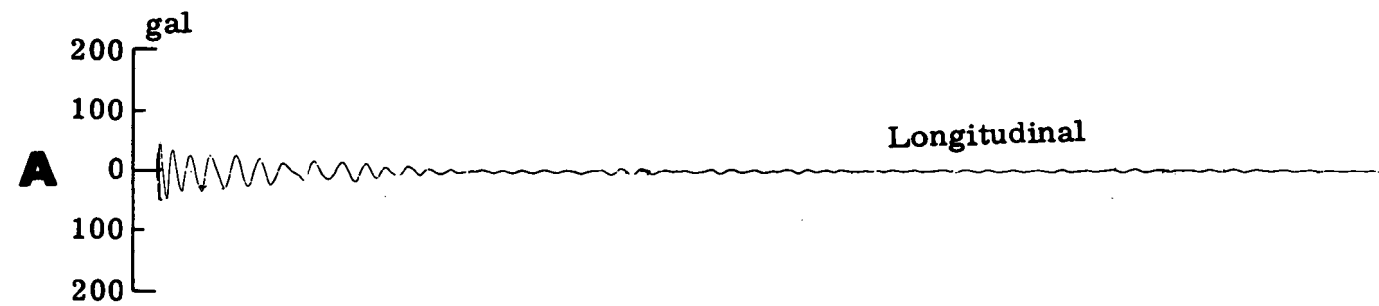


Taira Bridge 907-Gr-29
1969 5.13 23:19

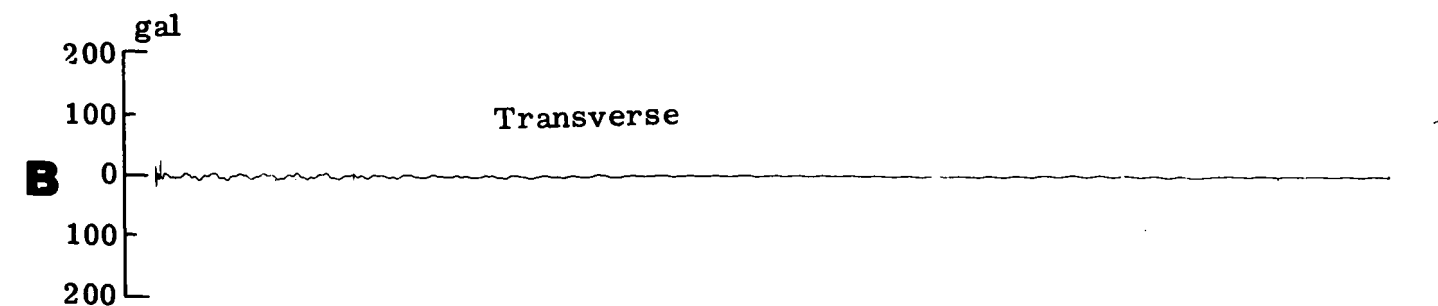
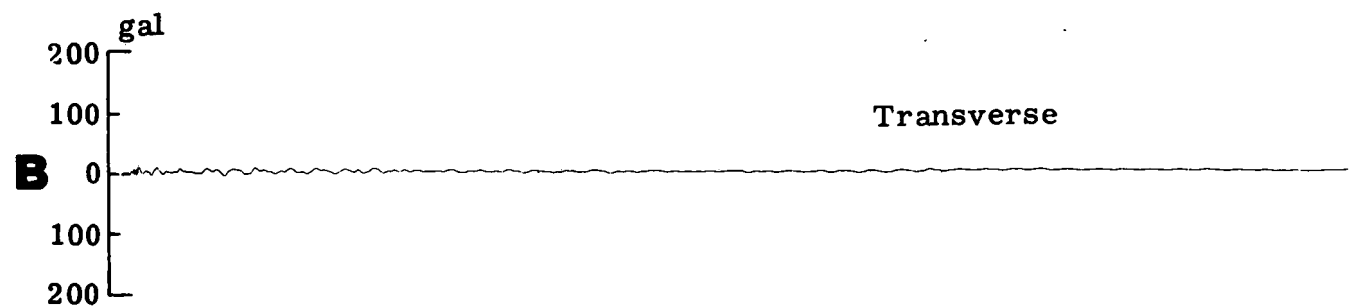
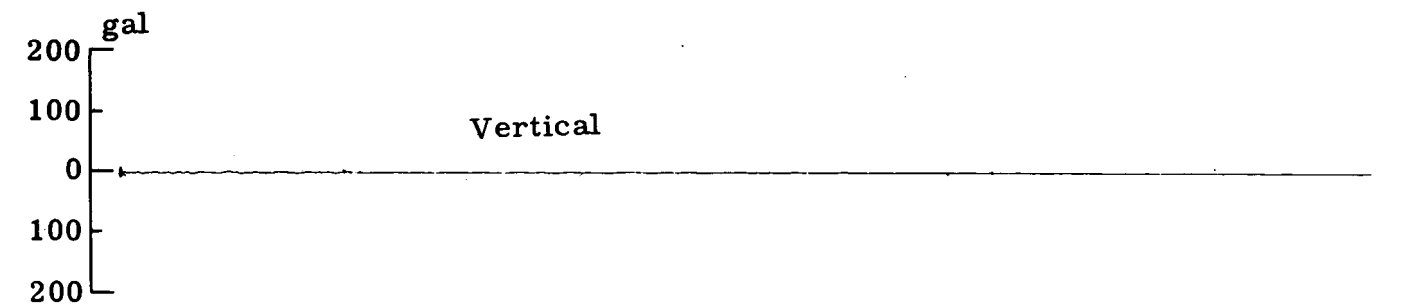
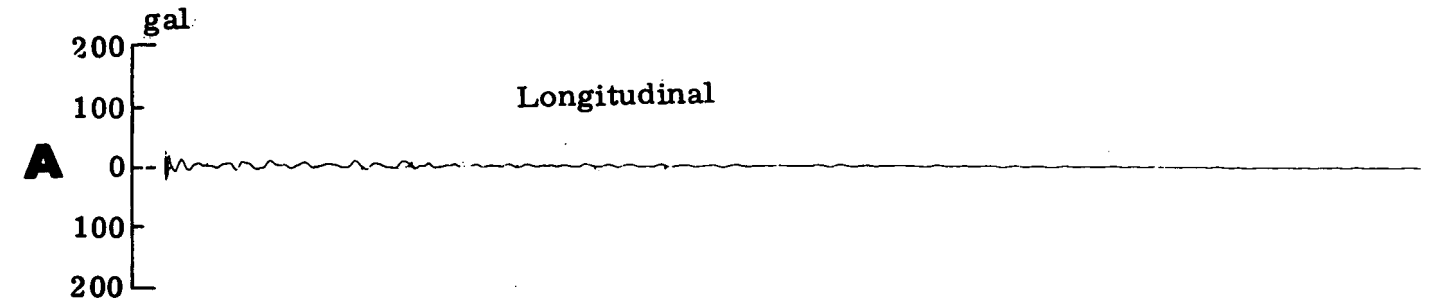


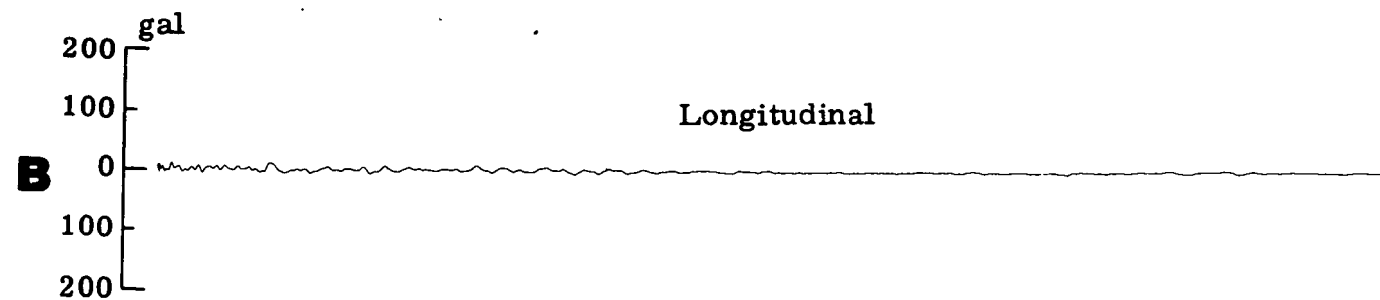
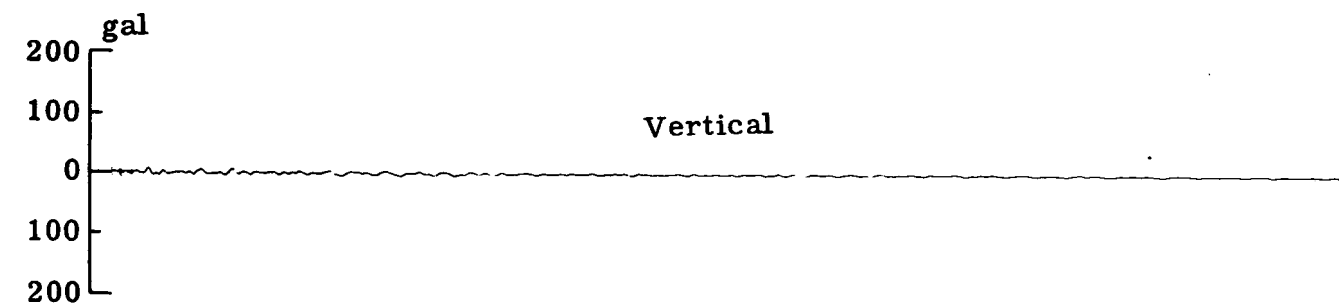
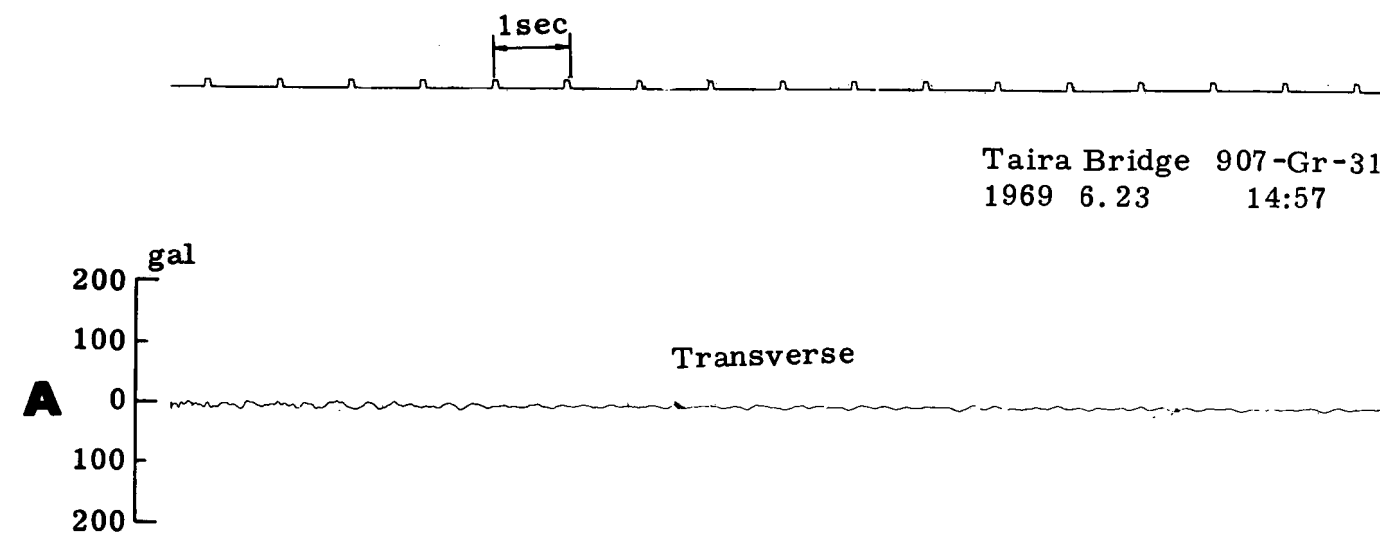
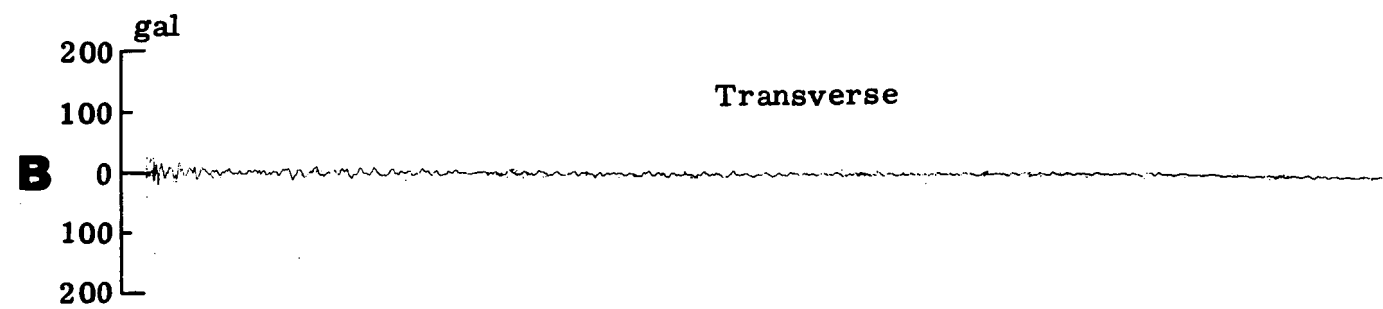
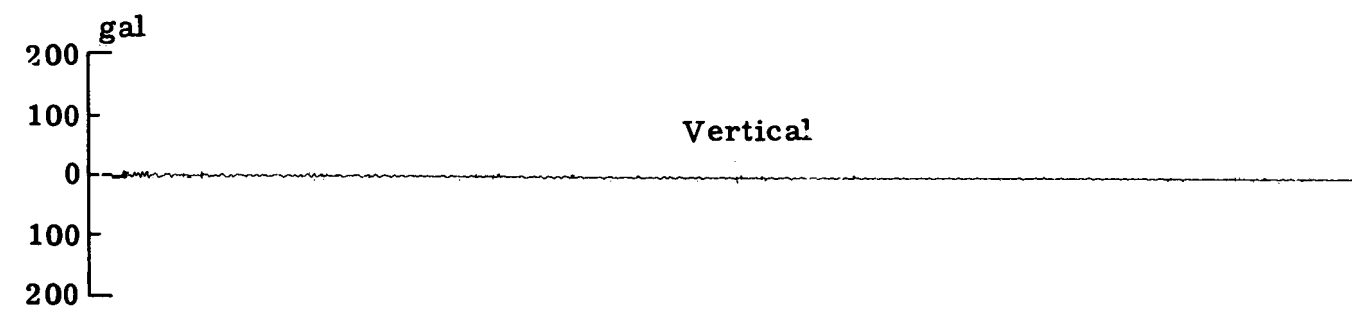
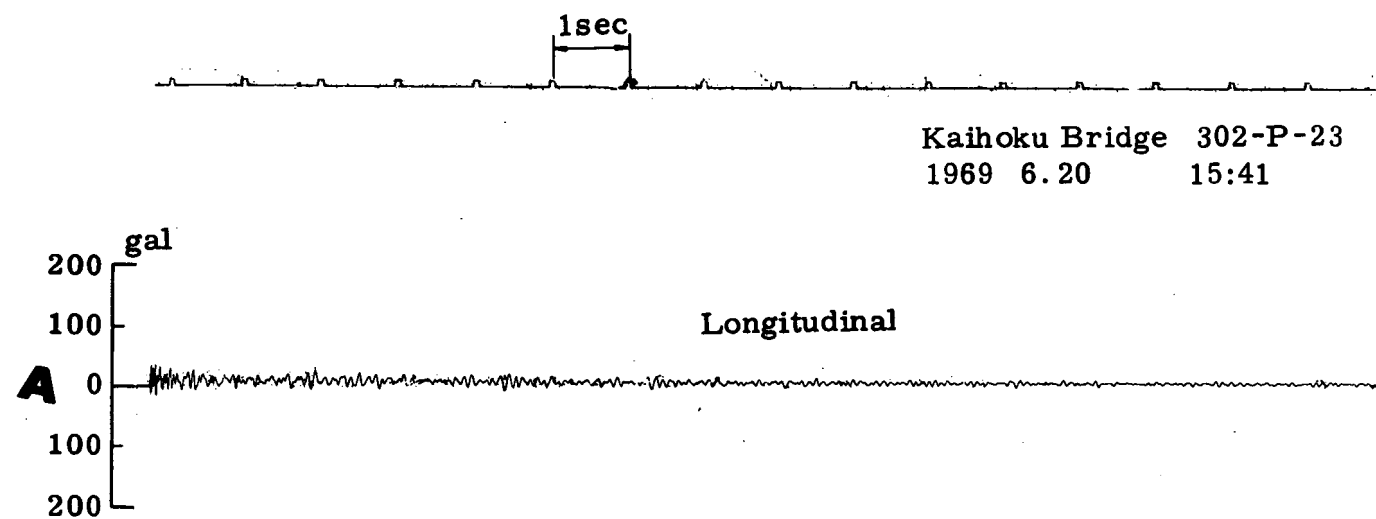


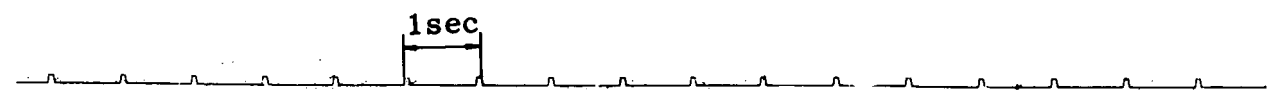
Ochiai Bridge 905-A-417
1969 5.22 02:55



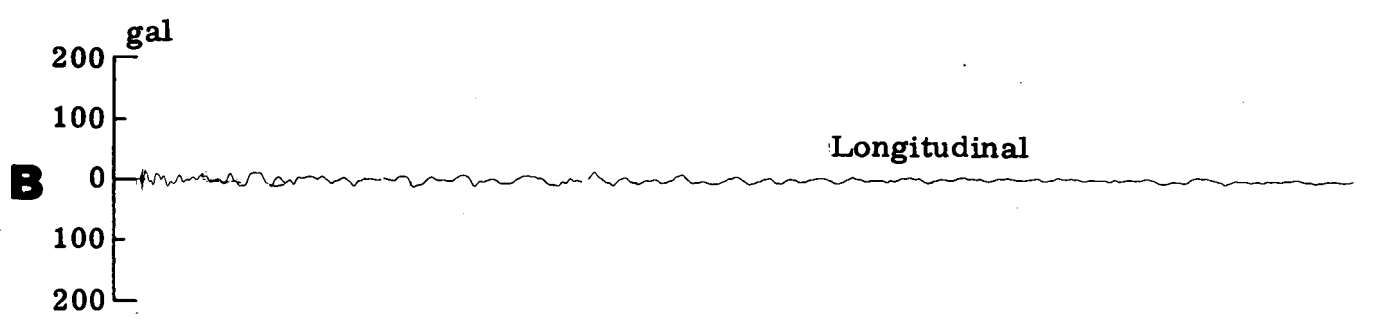
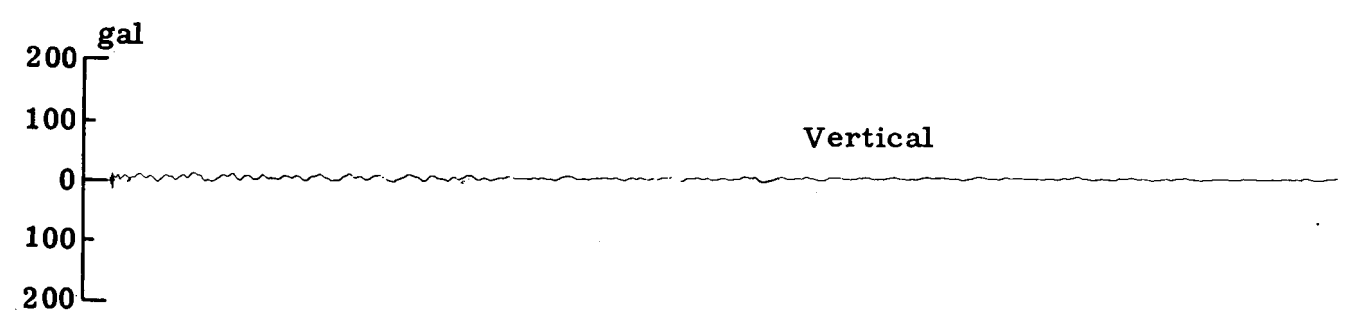
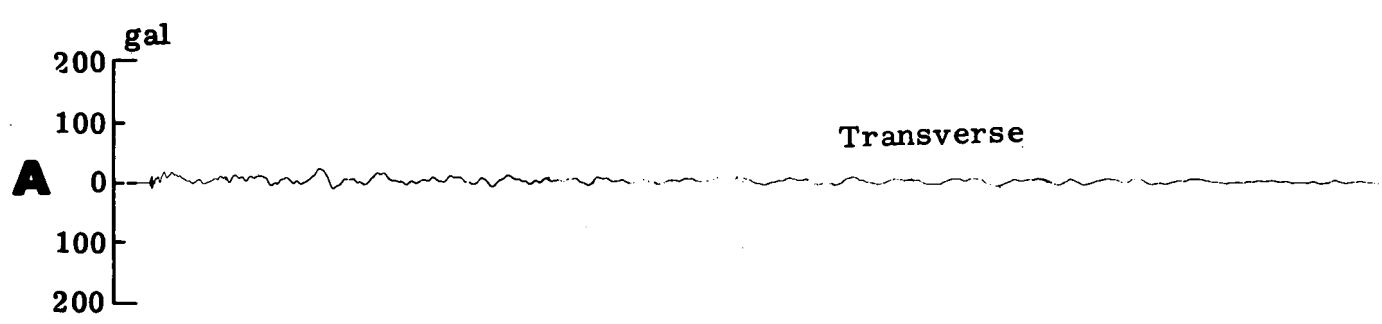
Ochiai Bridge 905-A-418
1969 6.10 19:53



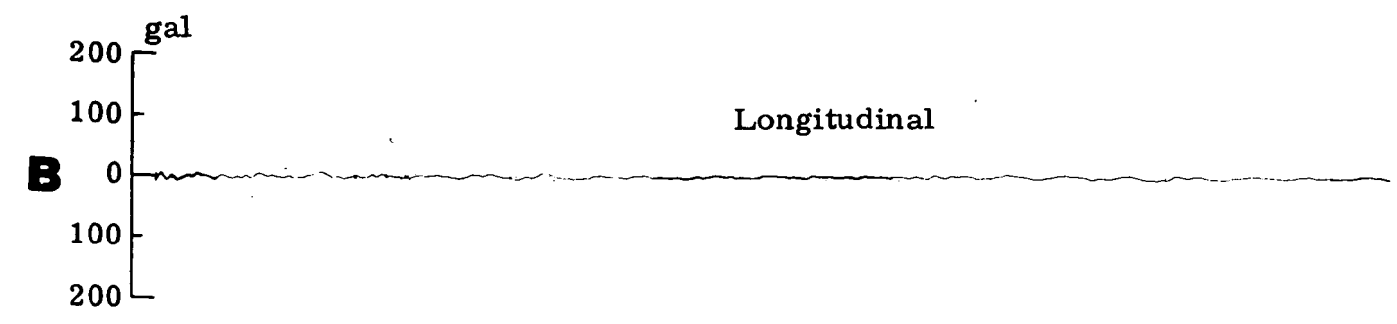
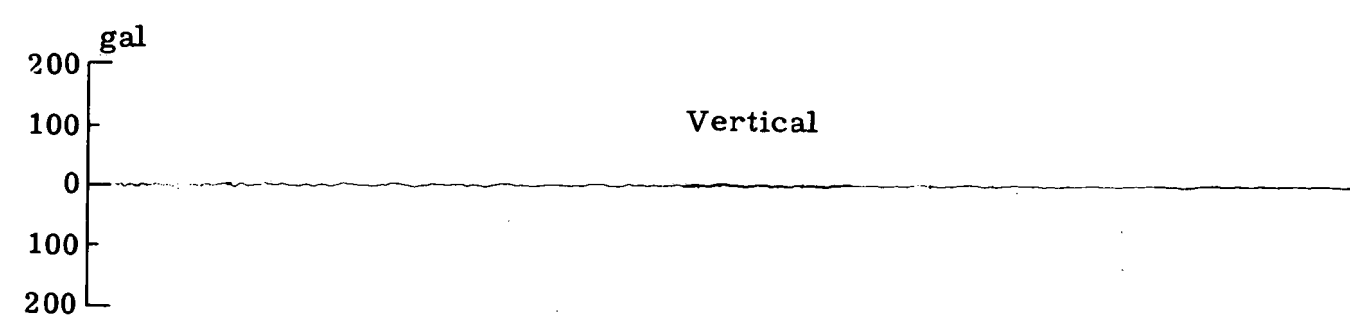
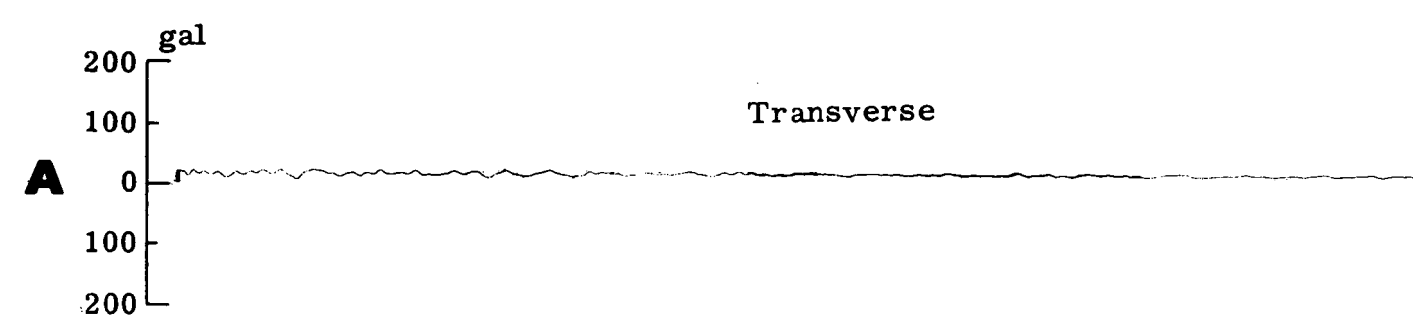


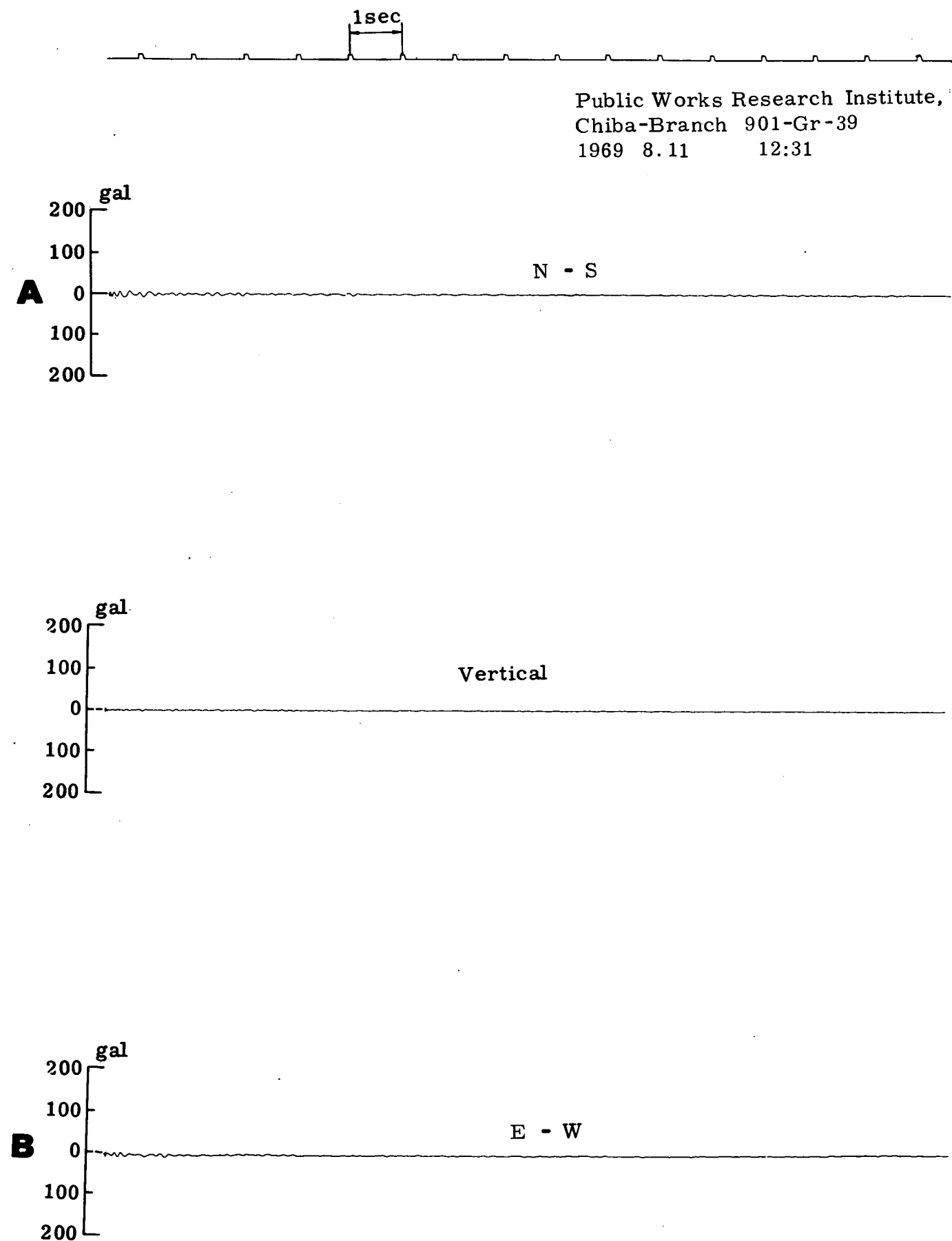
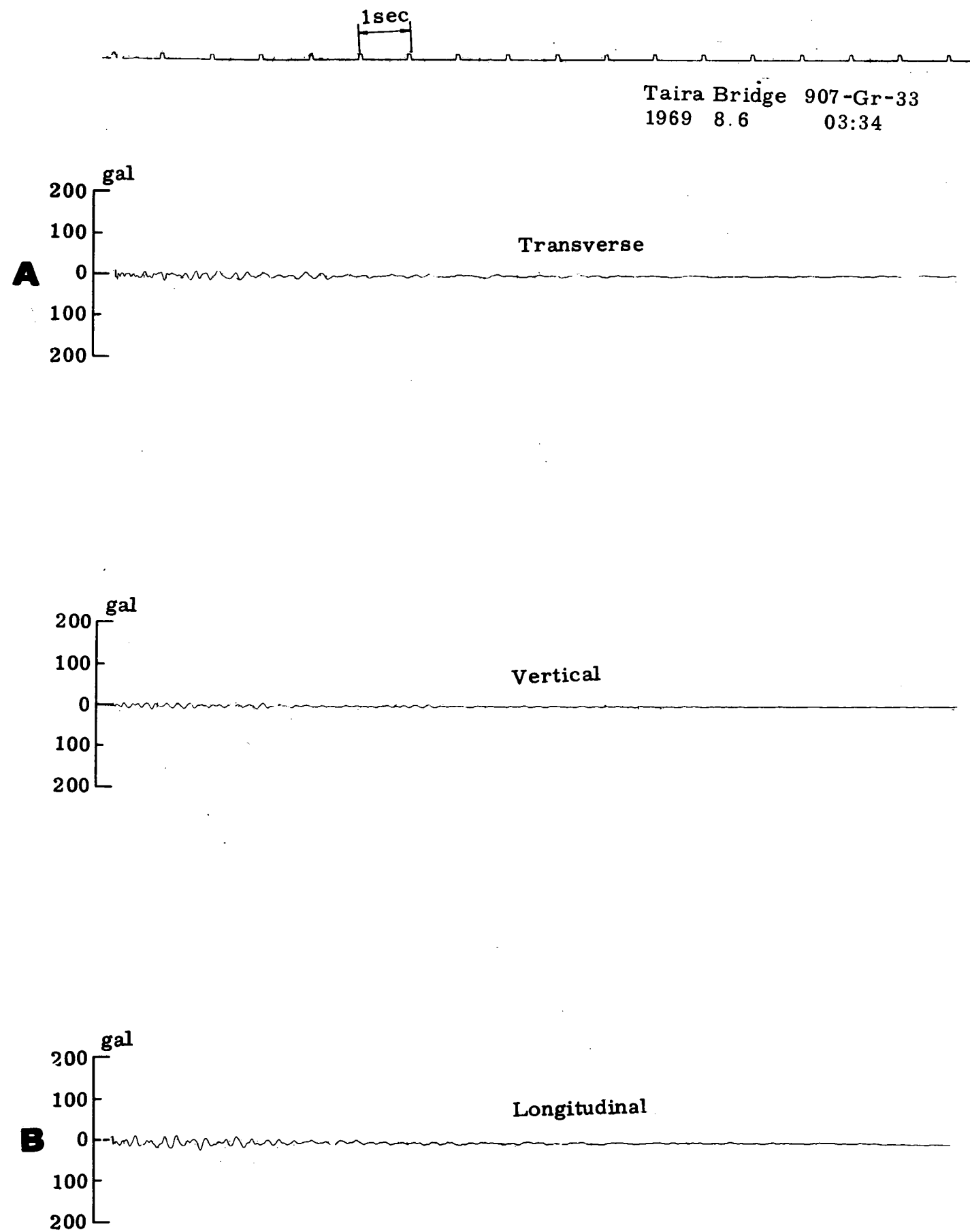


Taira Bridge 907-Gr-32
1969 7.23 22:14



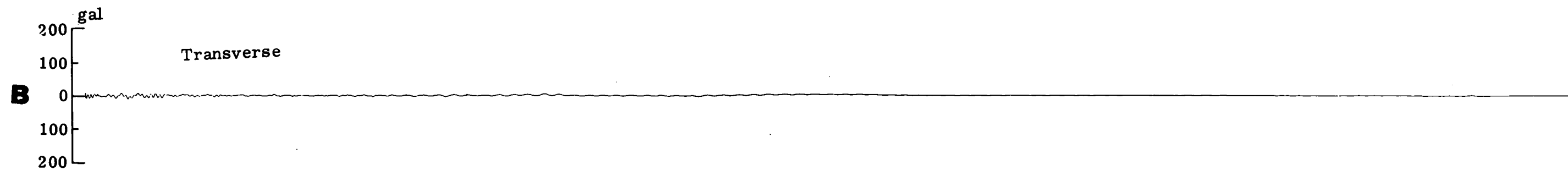
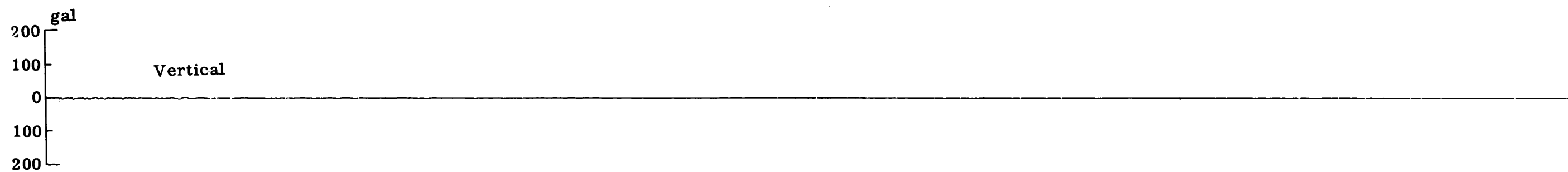
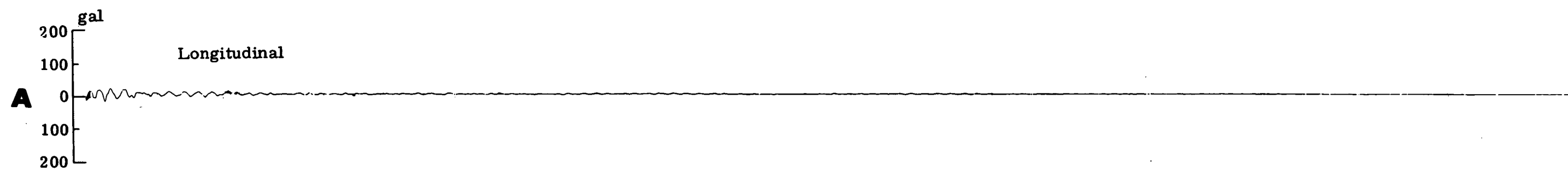
Taira Bridge 907-A-7
1969 7.23 22:14





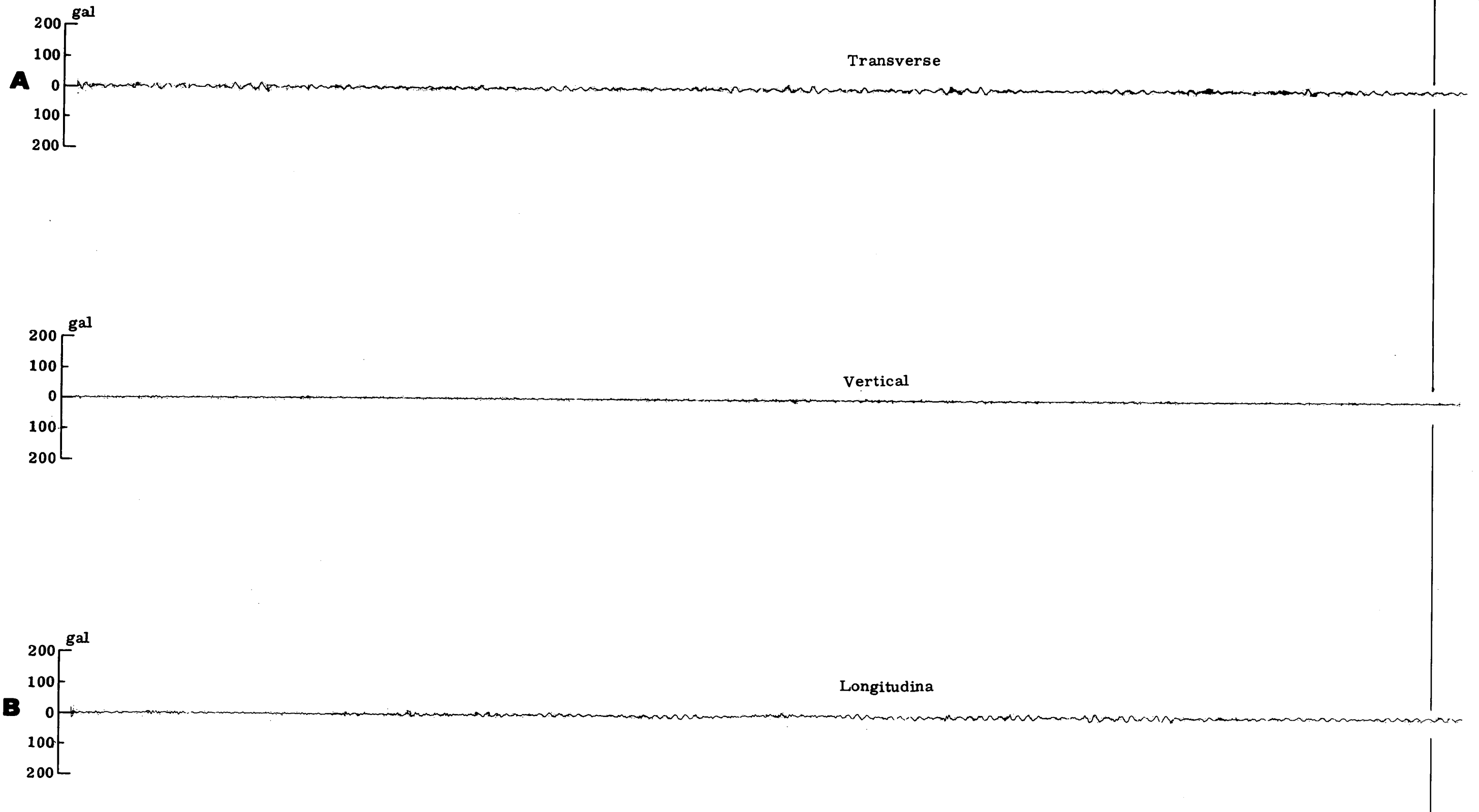
1sec

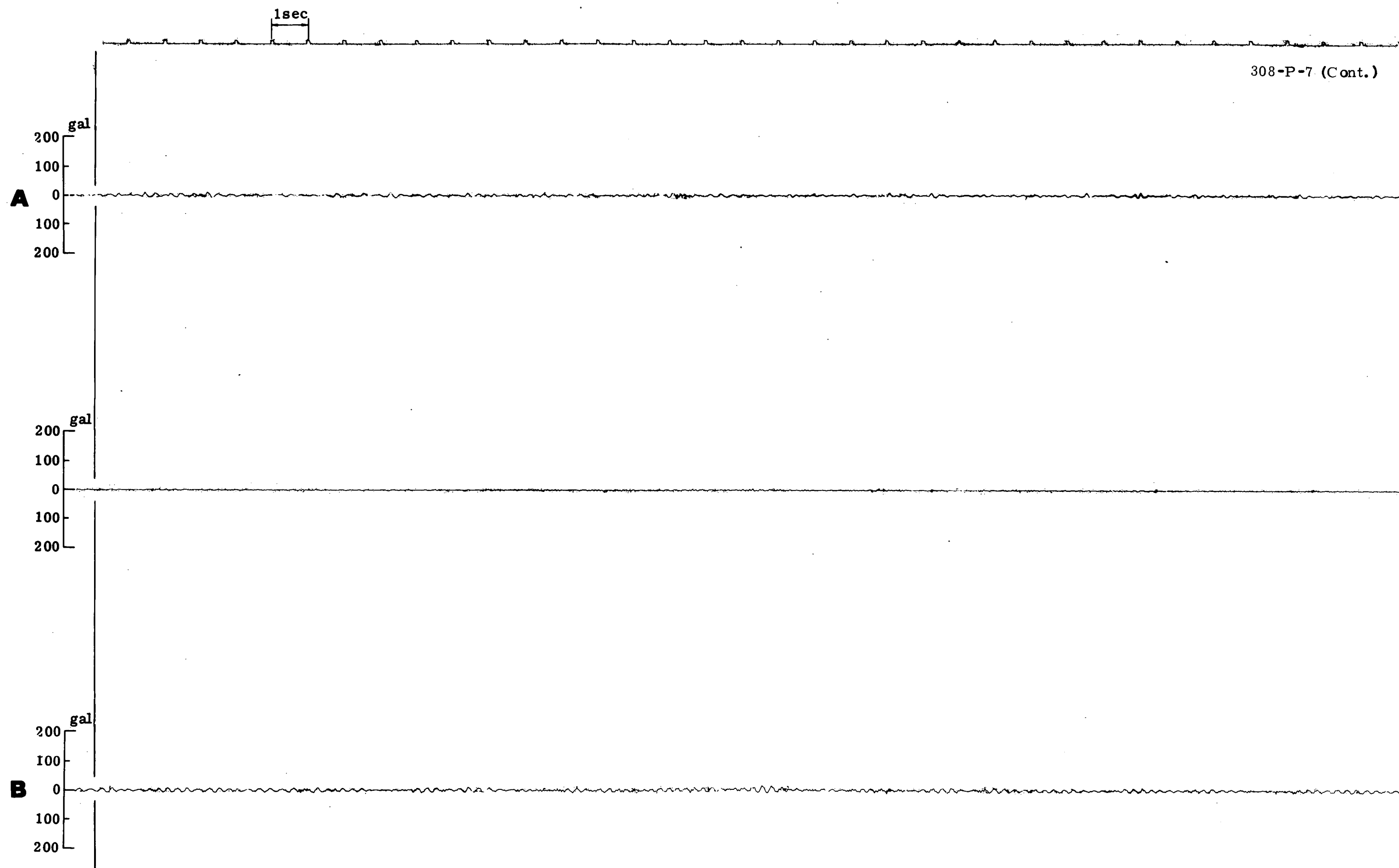
Ochiai Bridge 905-A-419
1969 8.22 01:28



1sec

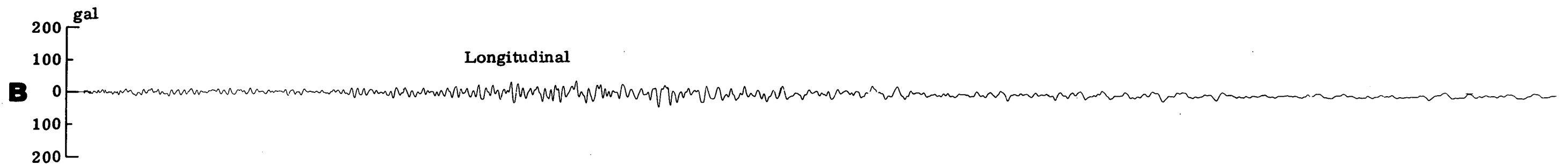
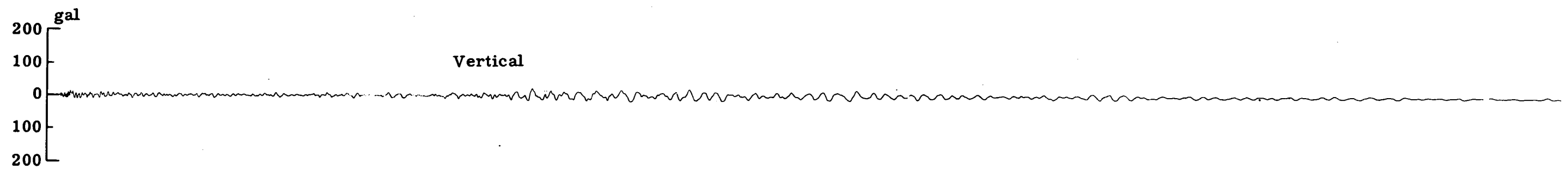
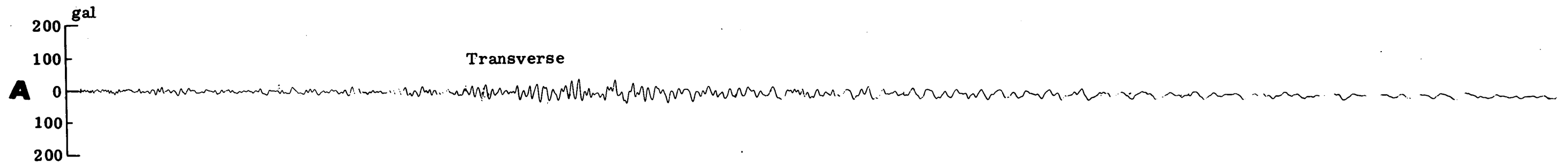
Itajima Bridge 308-P-7
1969 9.7 9:24





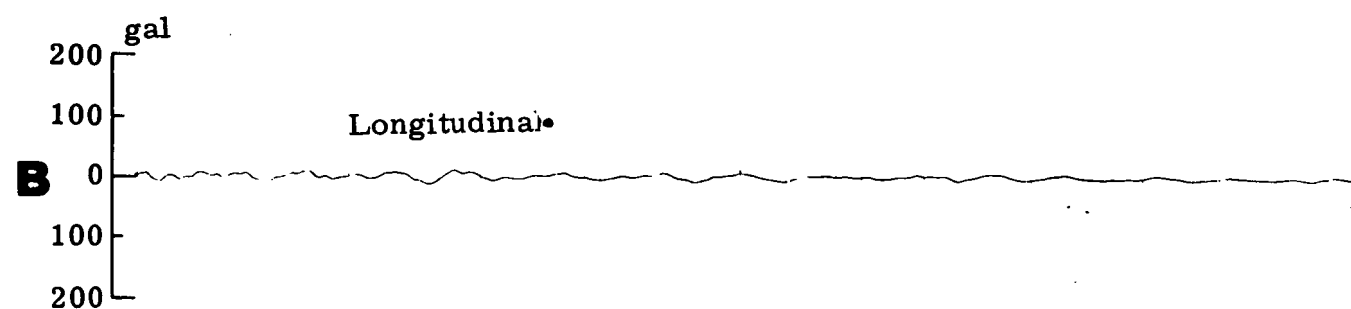
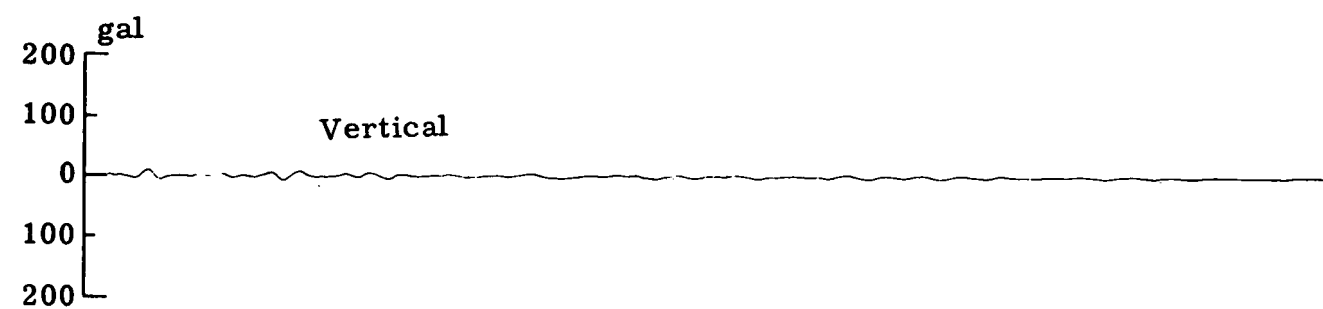
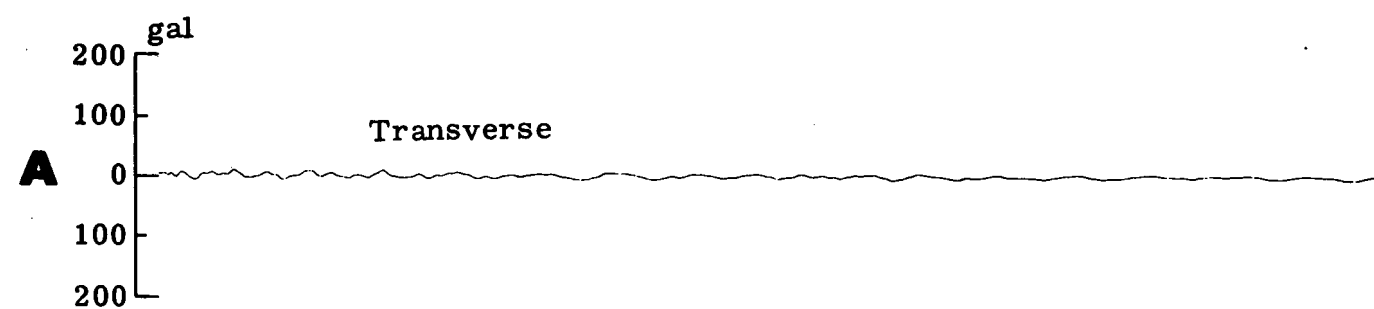
1sec

Shinyawata Bridge 204-Gr-3
1969 9.9 14:15

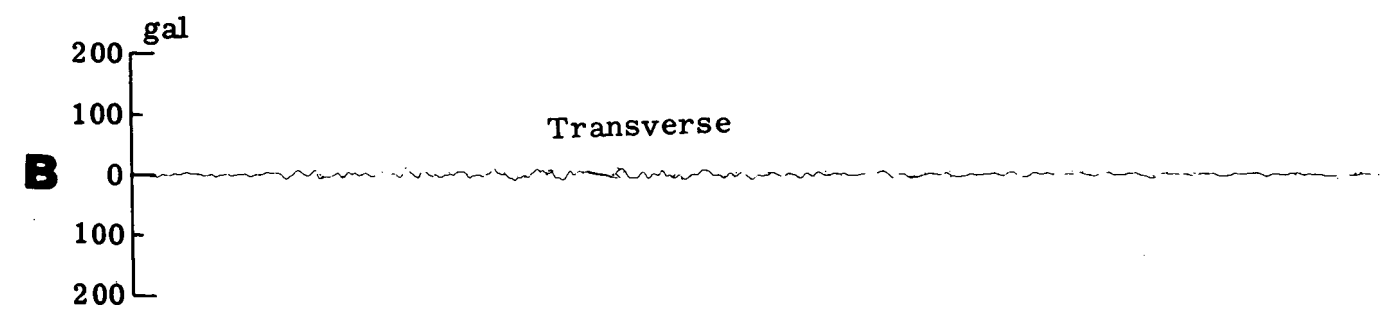
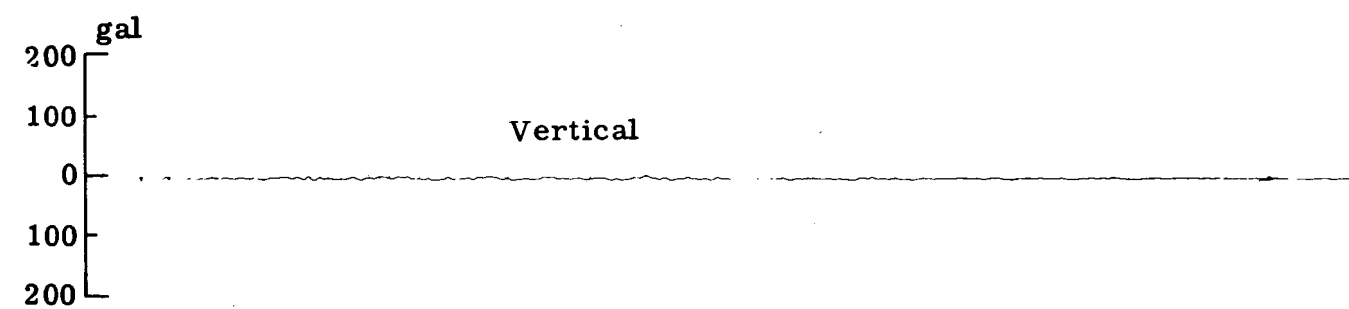
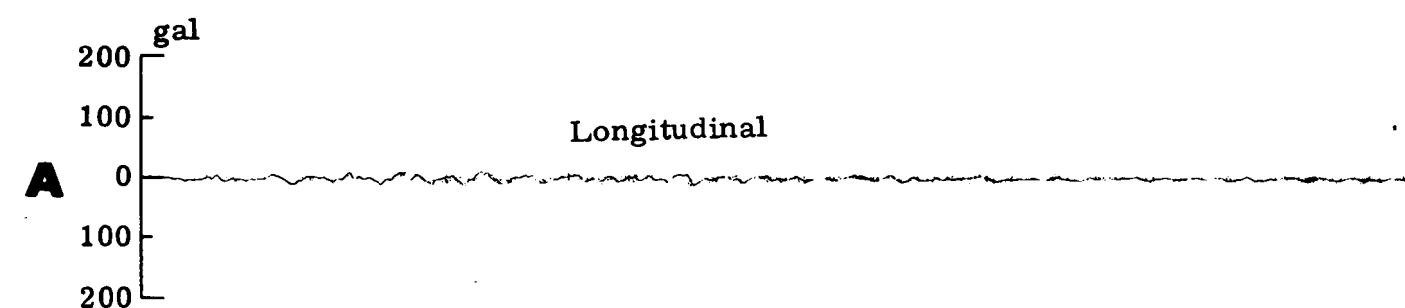




Minato Bridge 305-Gr-5
1969 9.9 14:15

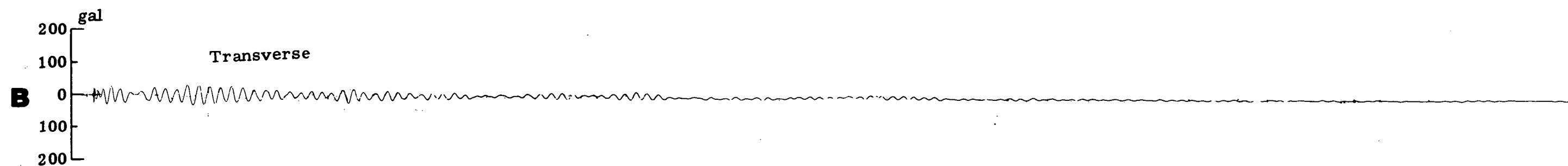
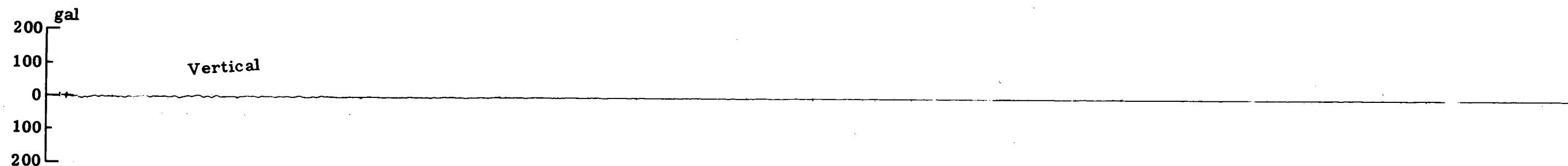
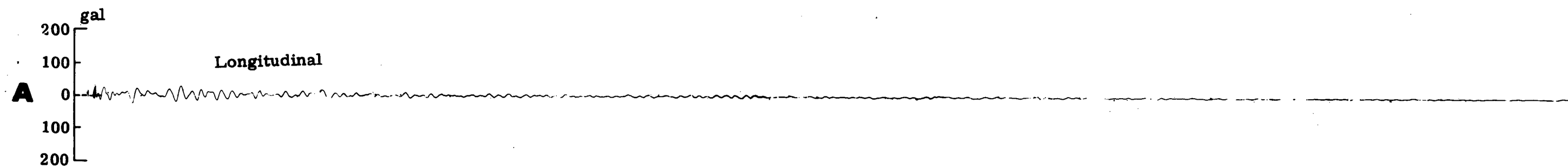


Toyohama Bridge 311-Gr-5
1969 9.9 14:15



1sec

Toyohama Bridge 311-P-6
1969 9.9 14:15



1sec

Shitoku Bridge 319-Gr-4
1969 9.9 14:15

gal
200
100
0
100
200

Transverse

gal
200
100
0
100
200

Vertical

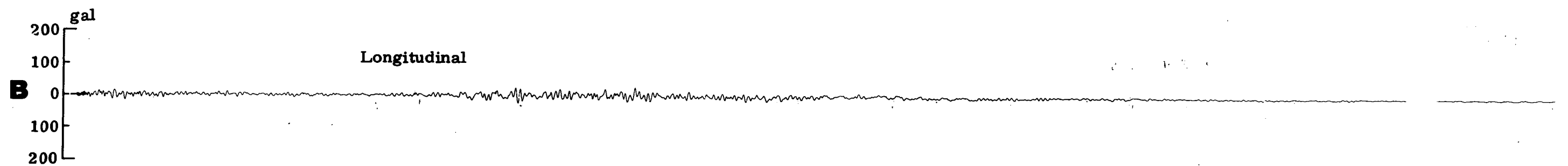
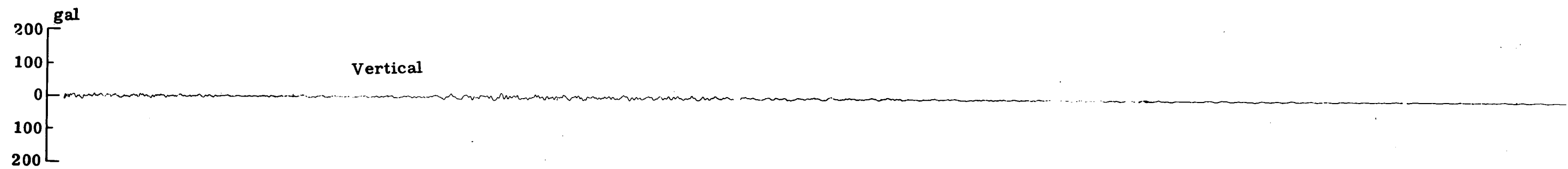
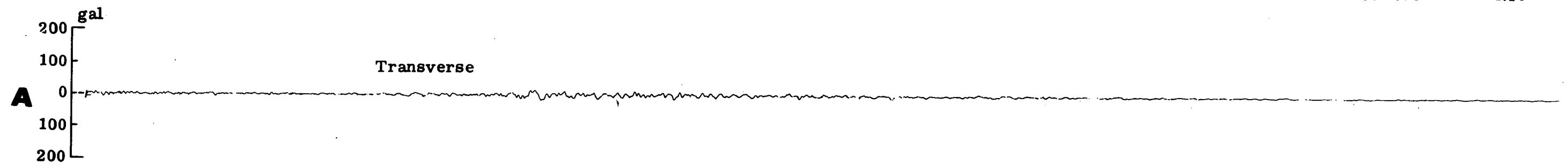
gal
200
100
0
100
200

Longitudinal

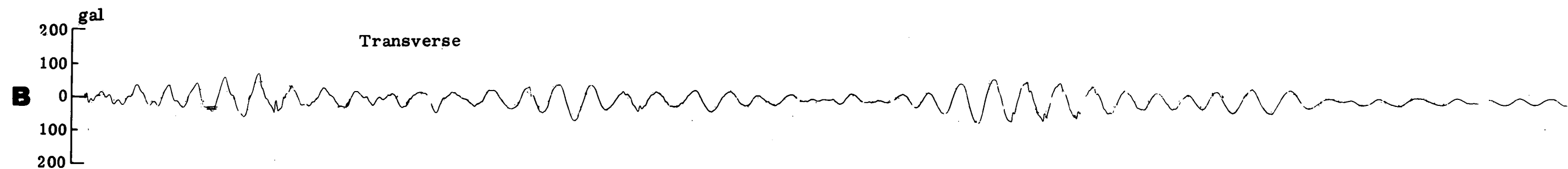
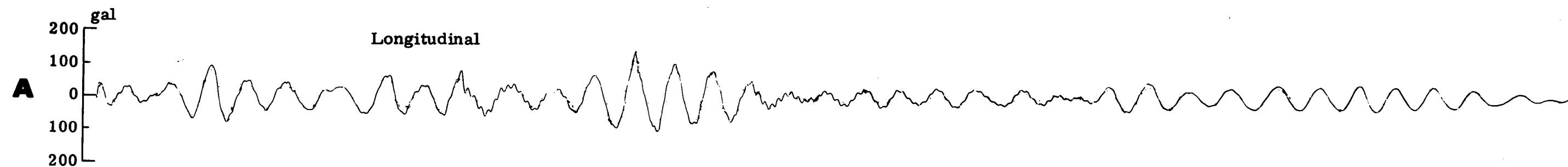
B

1sec

Shitoku Bridge 319-P-4
1969 9.9 14:15



1sec

Biwako Bridge 401-P-1
1969 2.18

1sec

401-P-1 (Cont.)

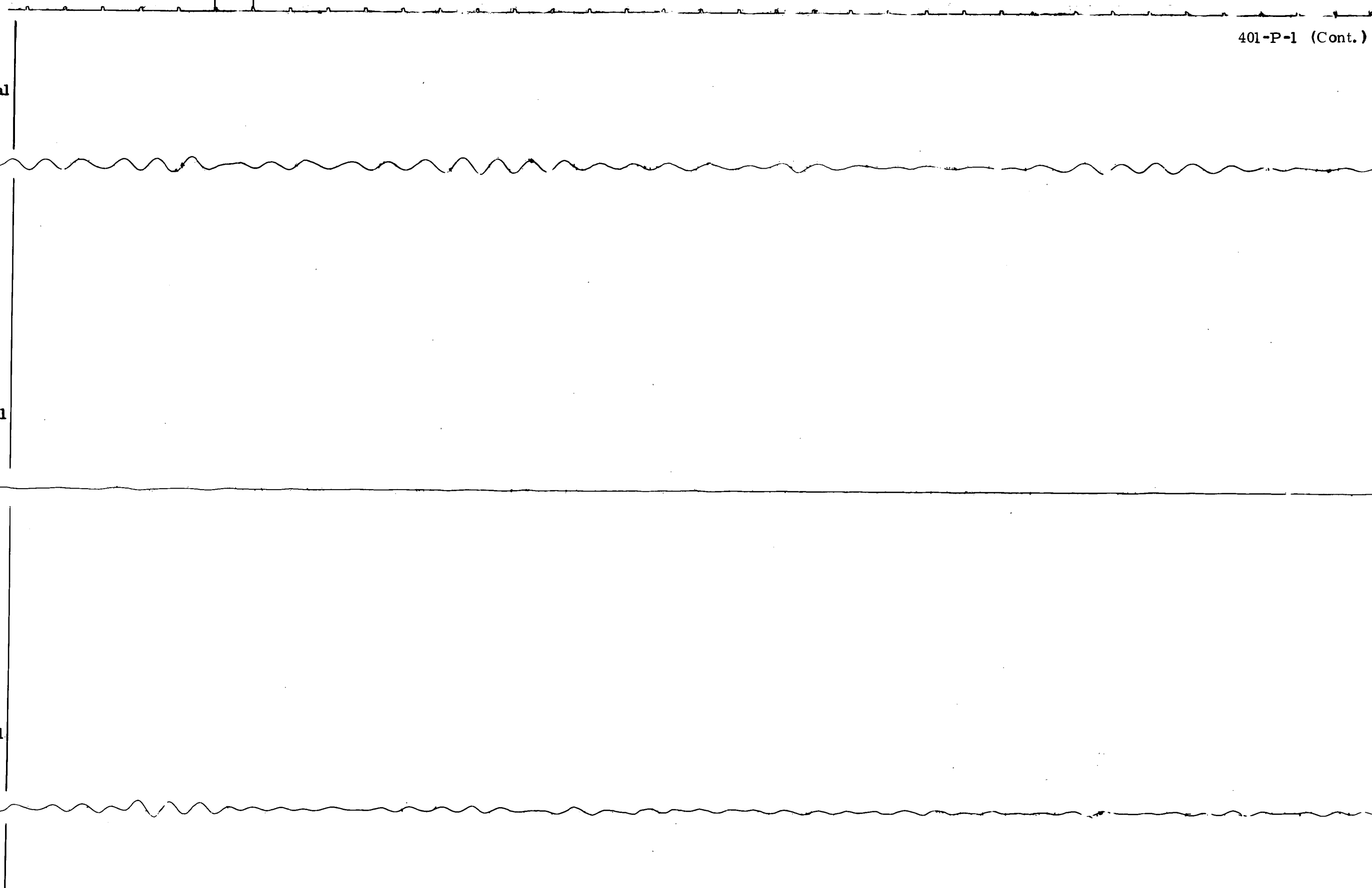
A

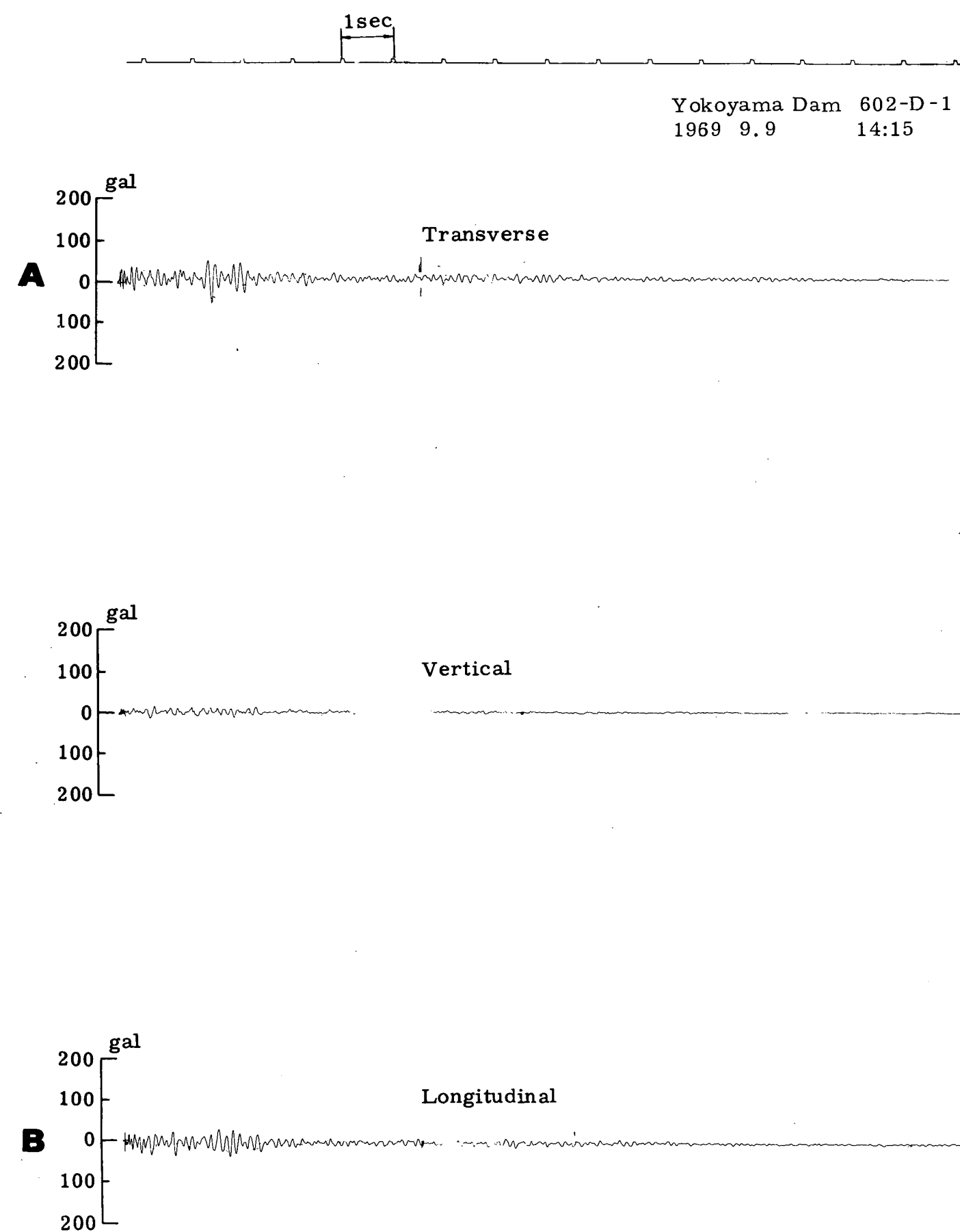
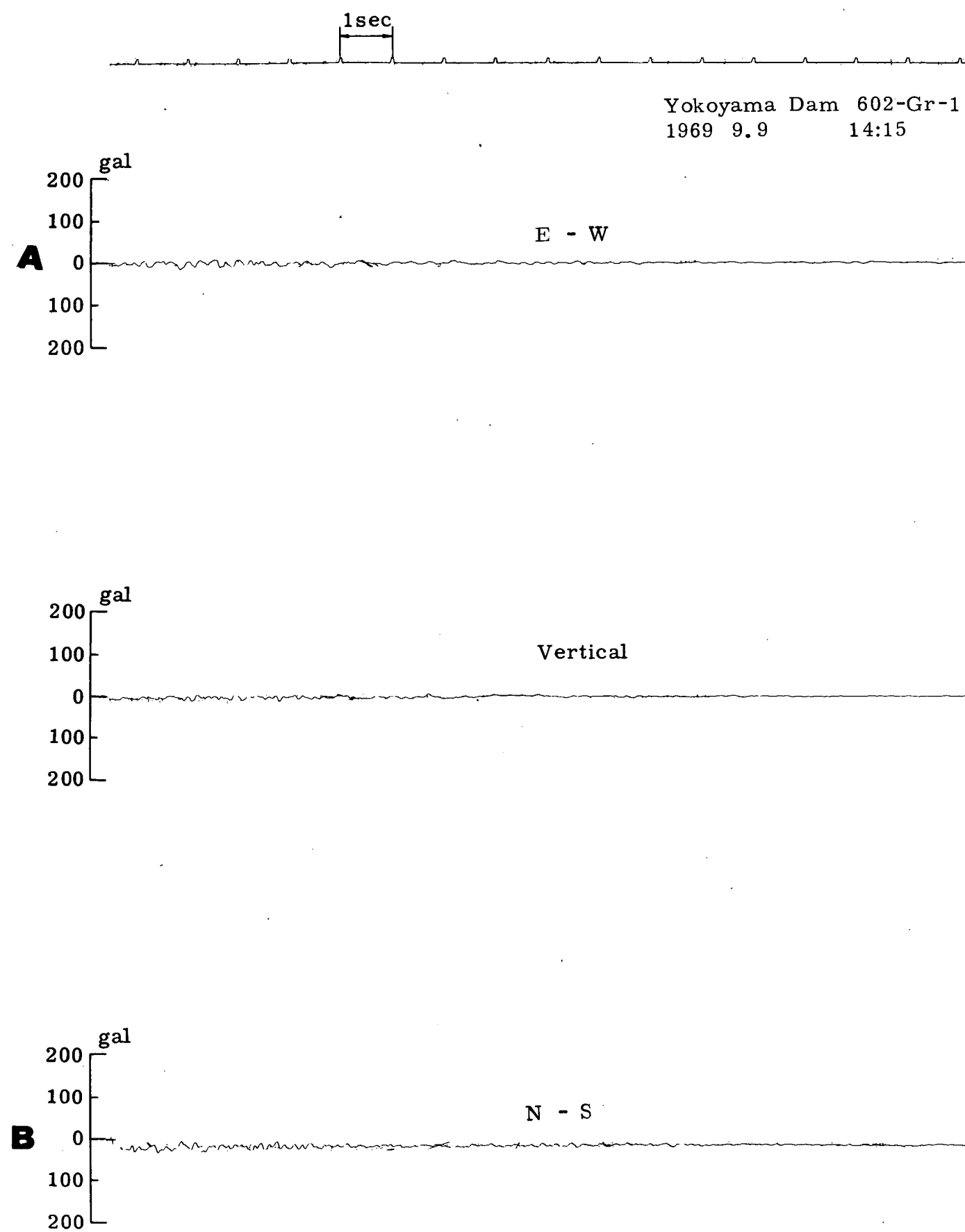
gal
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100
0
100
200

gal
200
100
0
100
200

B

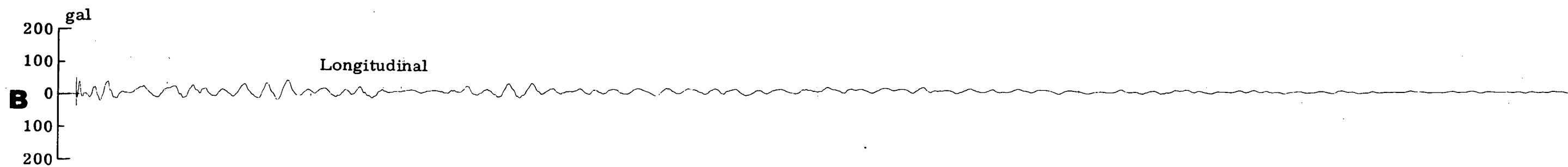
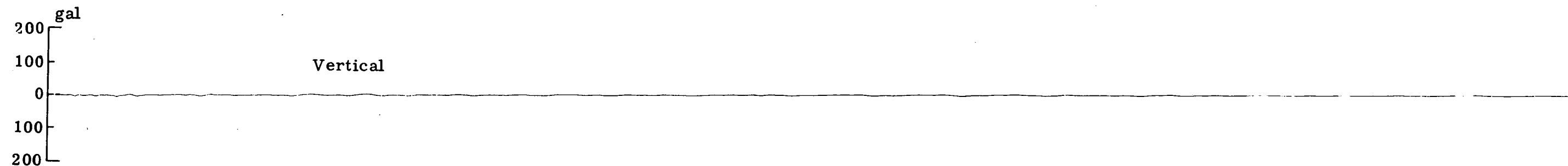
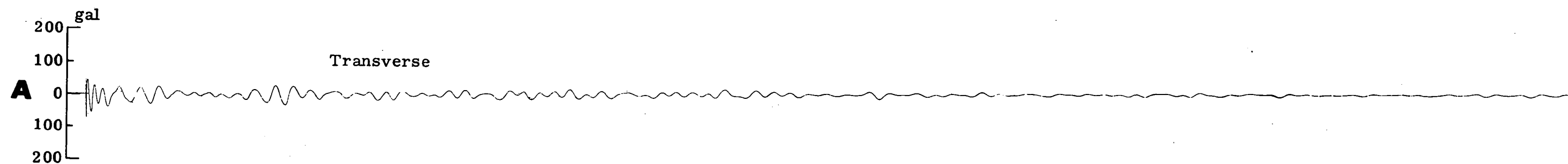
gal
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100
200



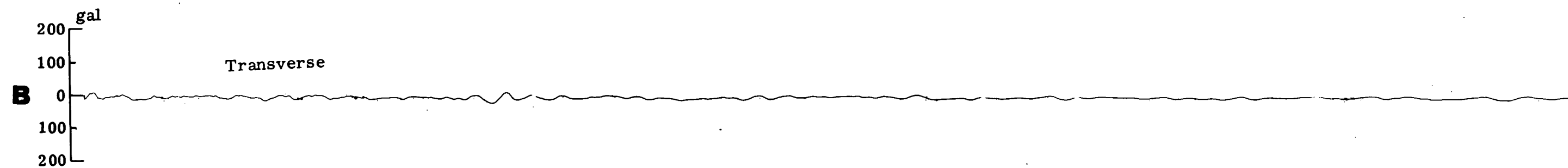
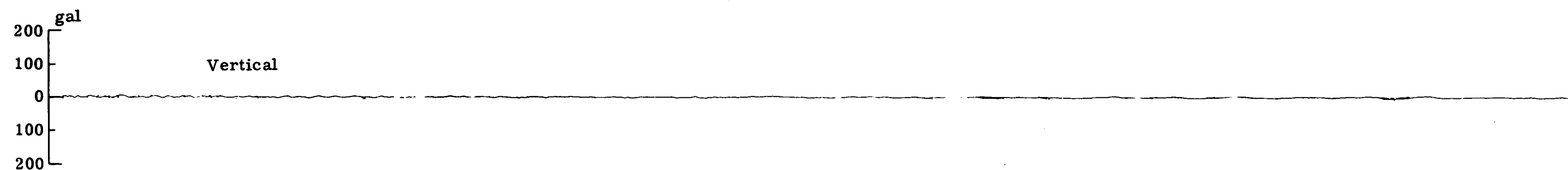
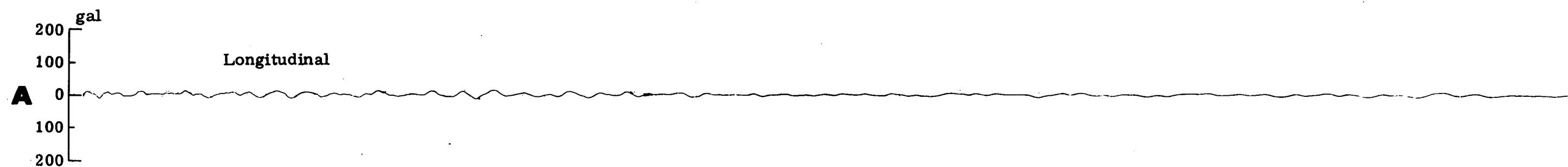


1sec

Shintenryugawa Bridge 904-P-2
1969 9.9 14:15

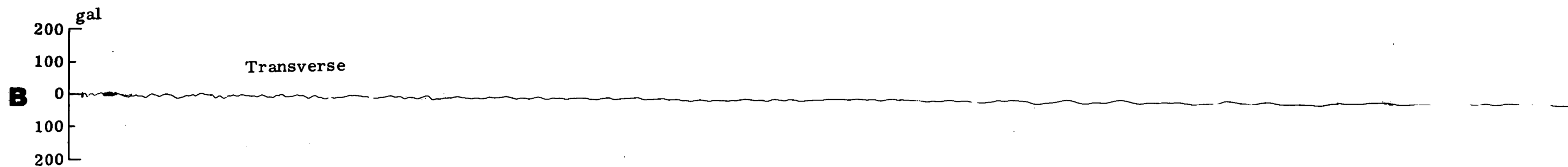
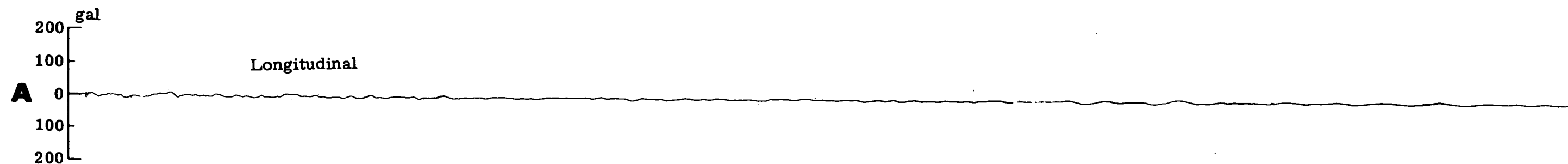


1sec

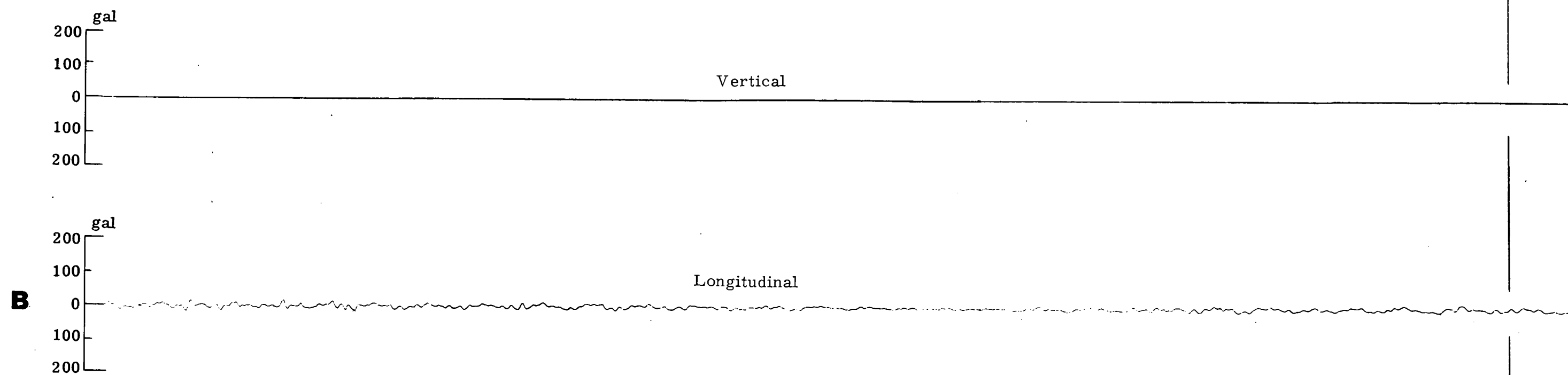
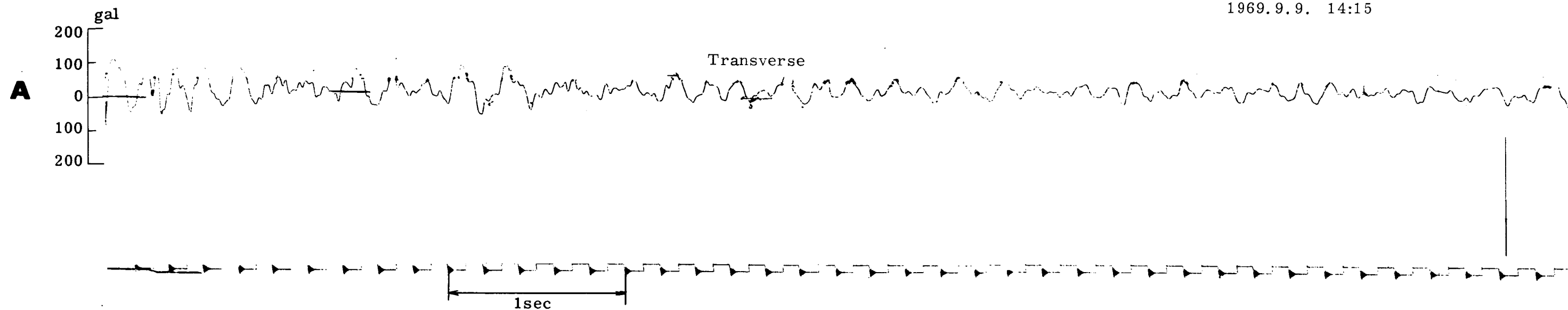
Ajigawa Bridge 1001-Gr-2
1969 9.9 14:15

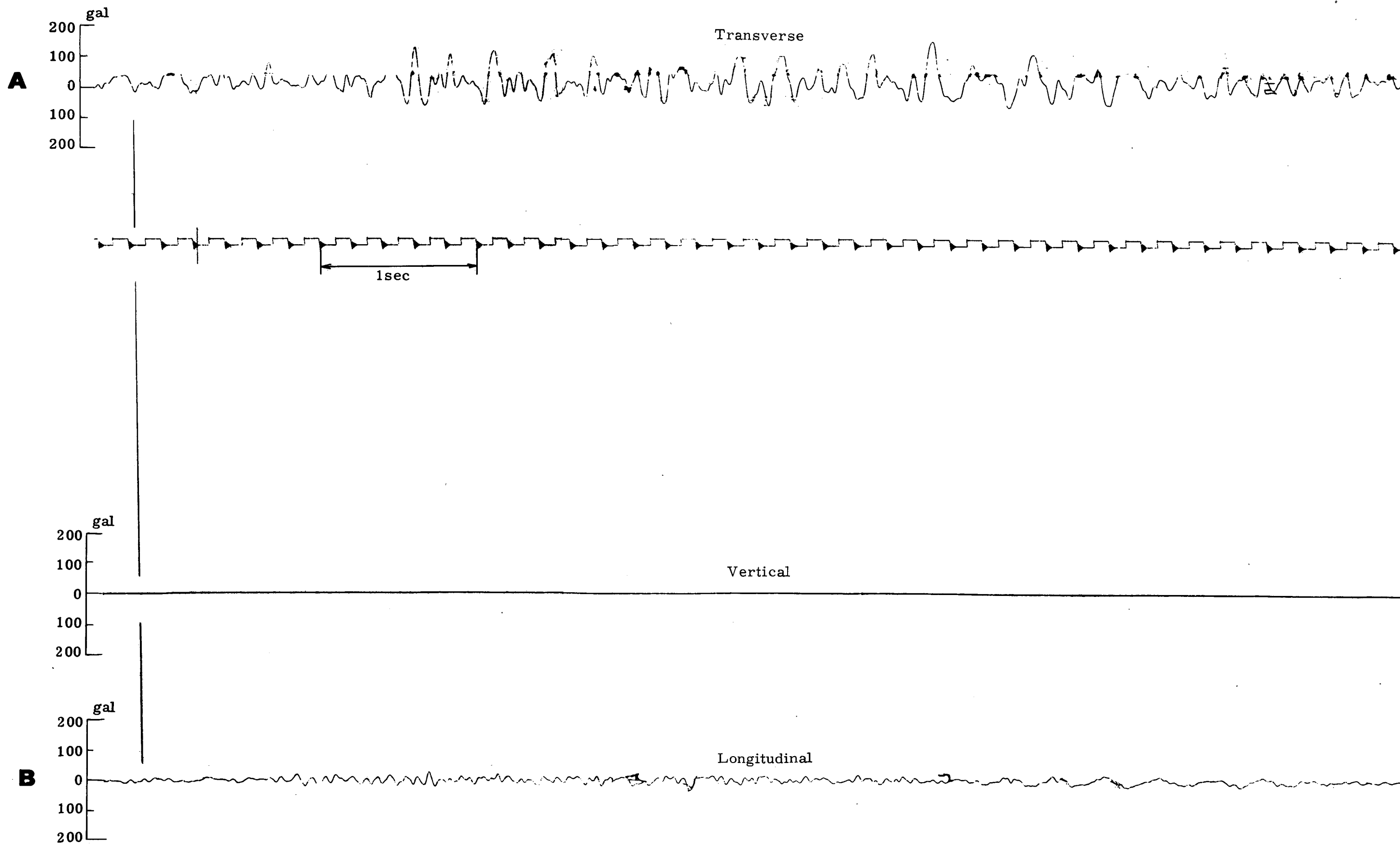
1sec

Nishiyokibori Bridge 1201-Gr-6
1969 9.9 14:15



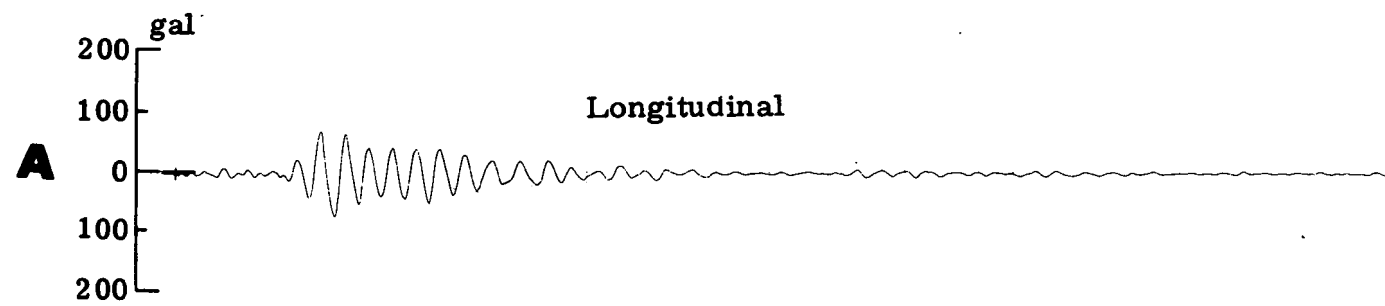
Koshiu Dam 610-D-1
1969.9.9. 14:15



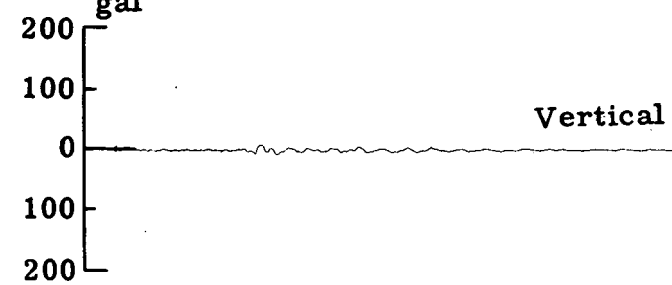


1sec

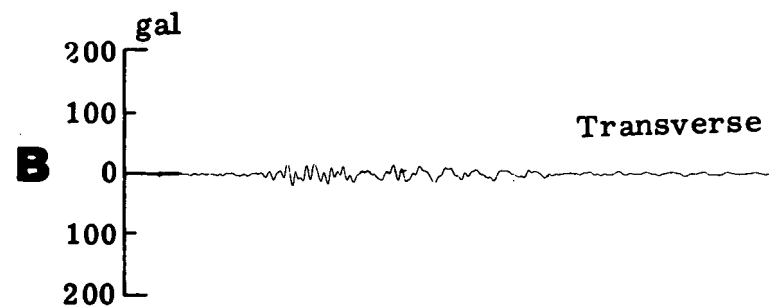
Ochiai Bridge 905-A-420
1969 9.22 08:21



gal

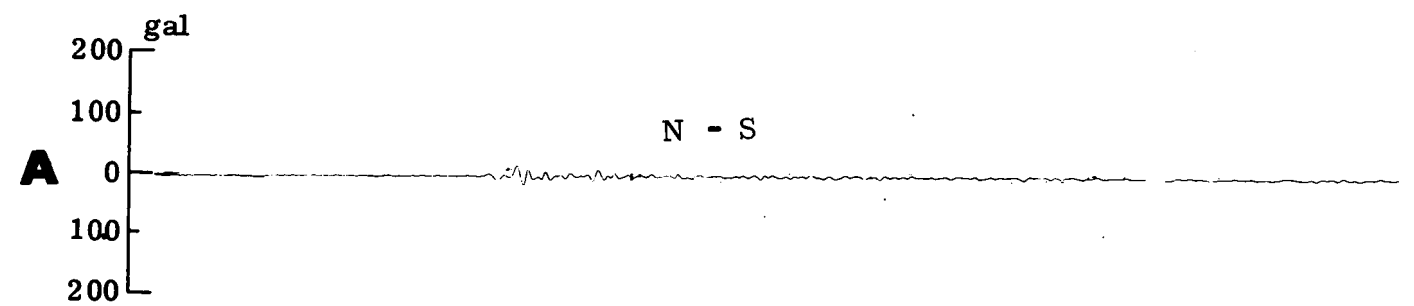


gal

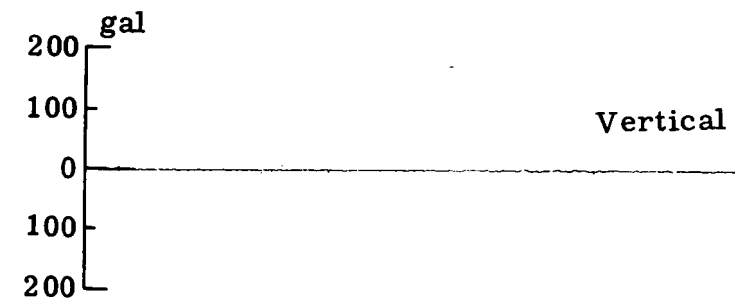


1sec

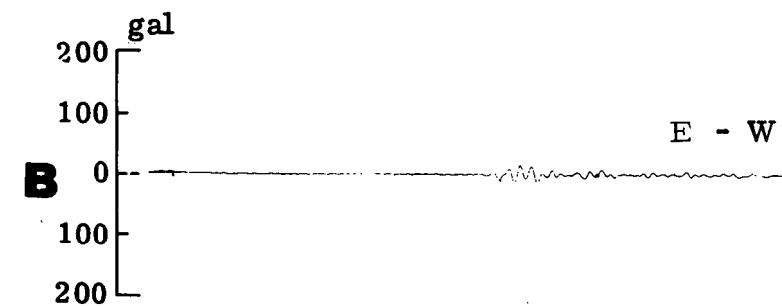
Tokyo Bay (Futtu-Cape) 501-Gr-46
1969 10.3 21:03



gal

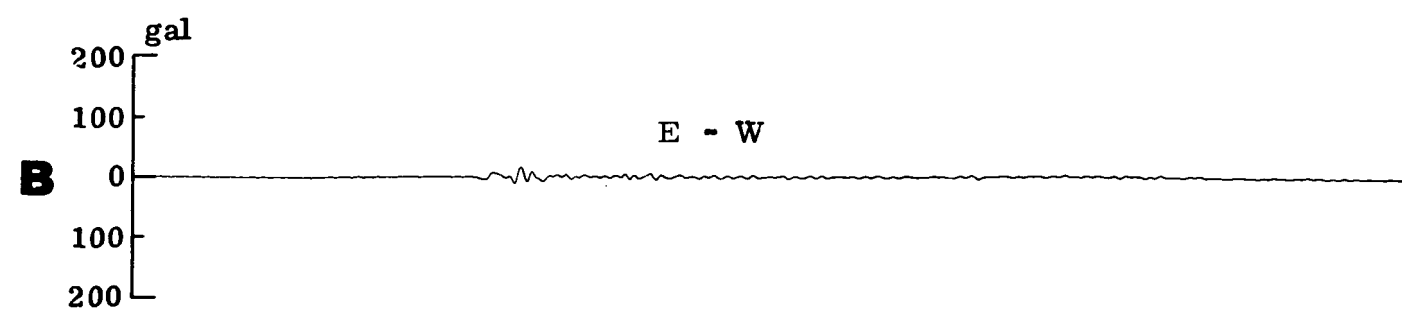
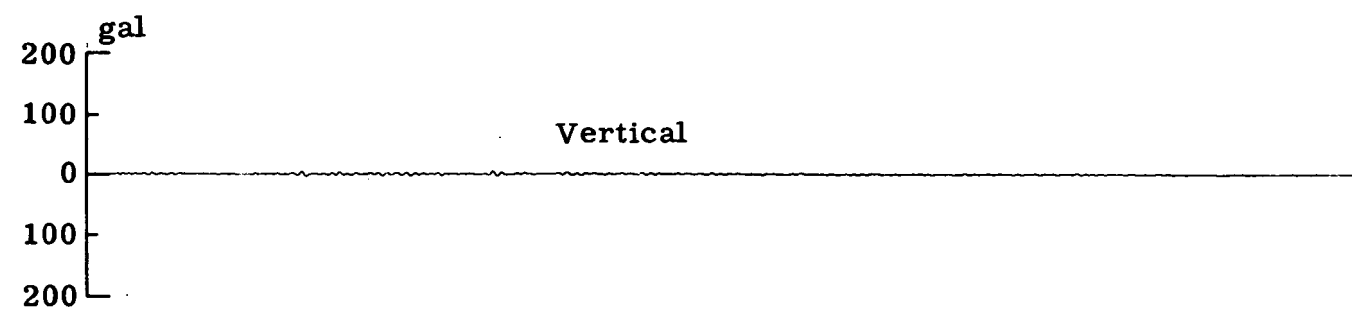
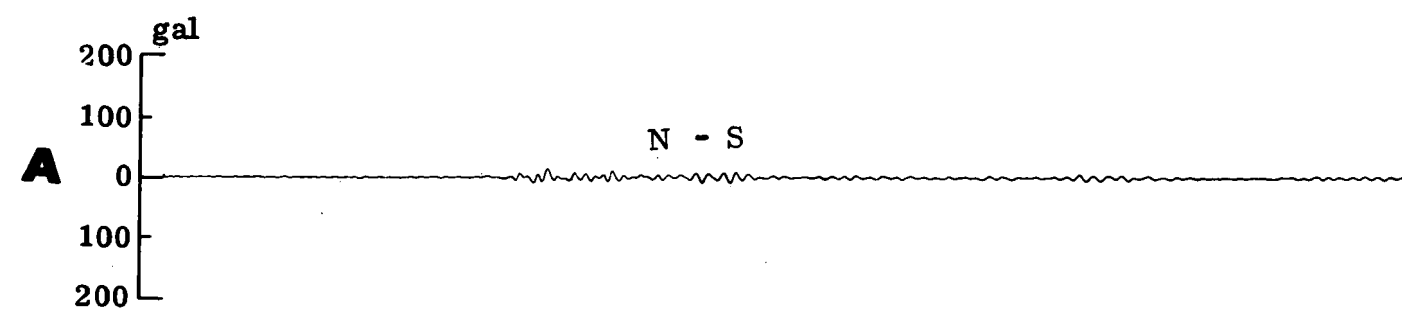


gal



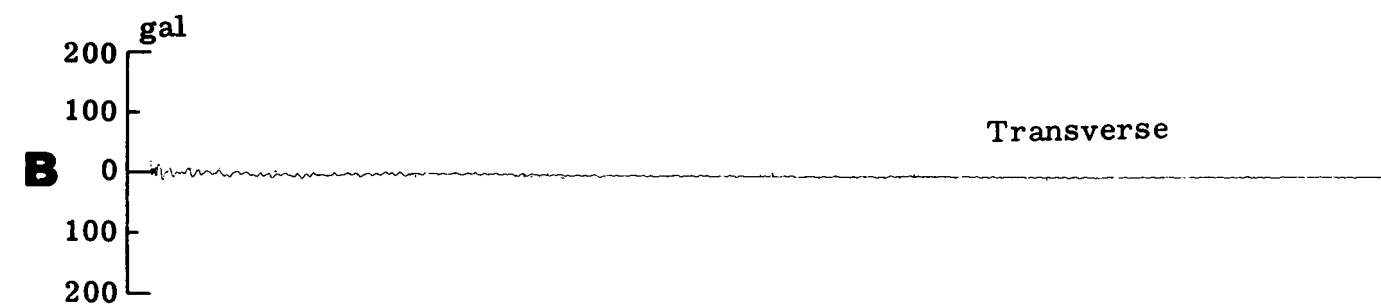
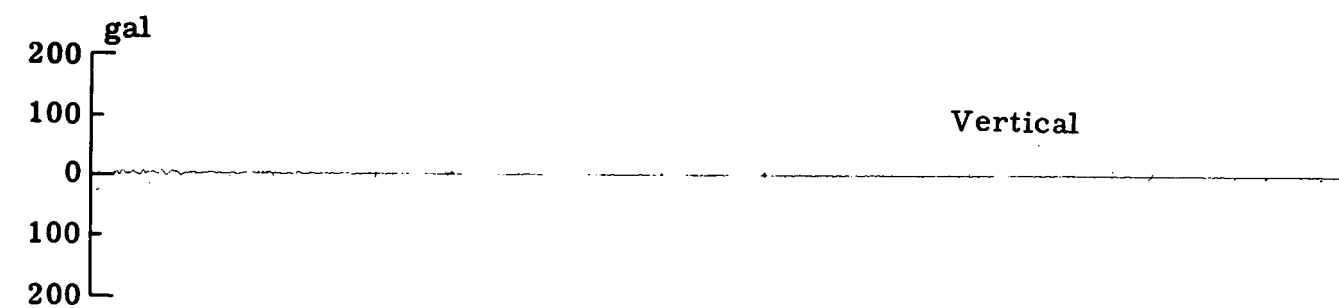
1sec

P.W.R.I.Chiba-Branch 901-Gr-41
1969 10.3 21:03



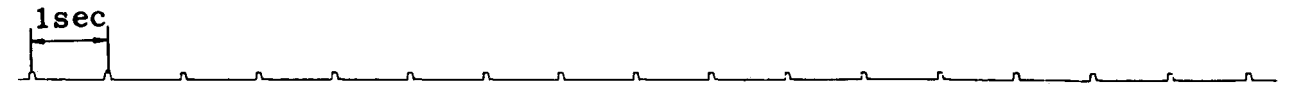
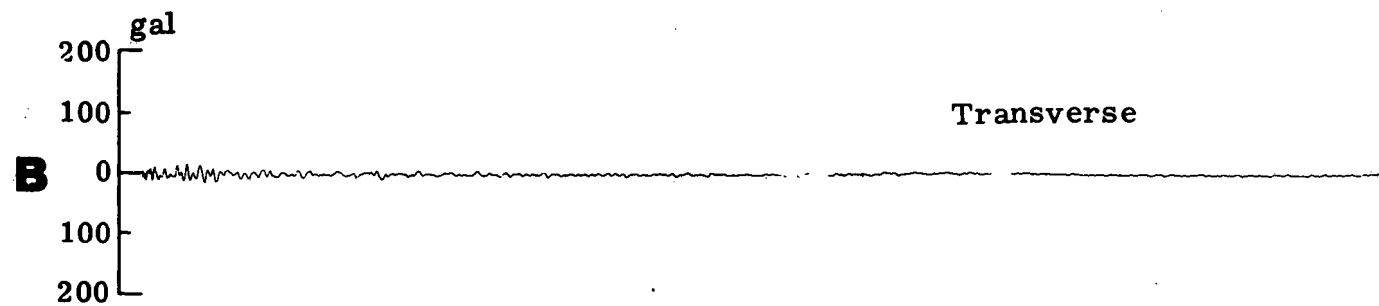
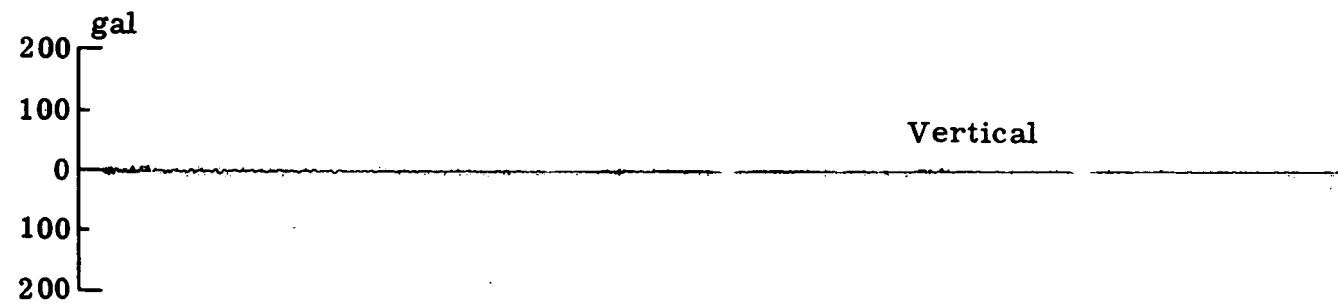
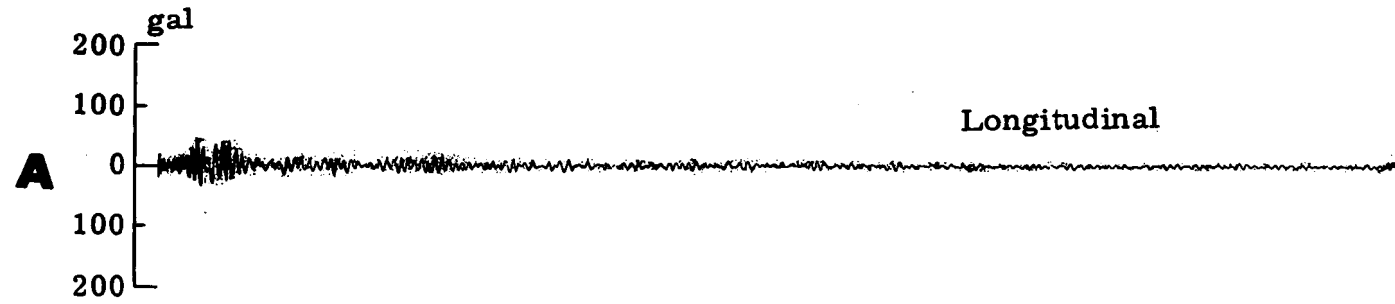
1sec

Kaihoku Bridge 302-Gr-21
1969 10.18 10:14

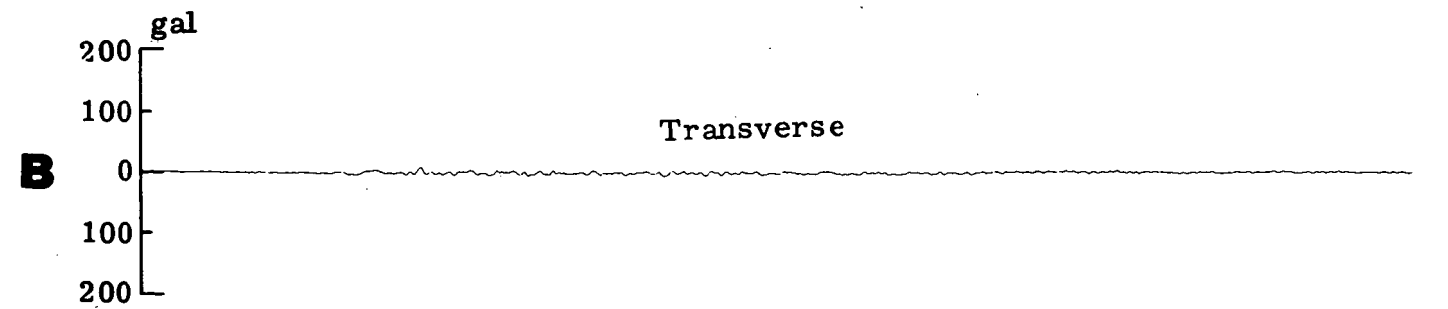
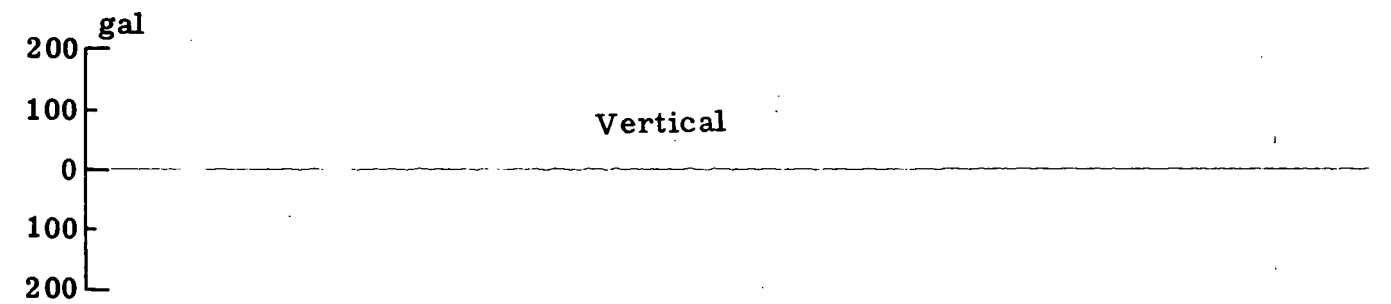
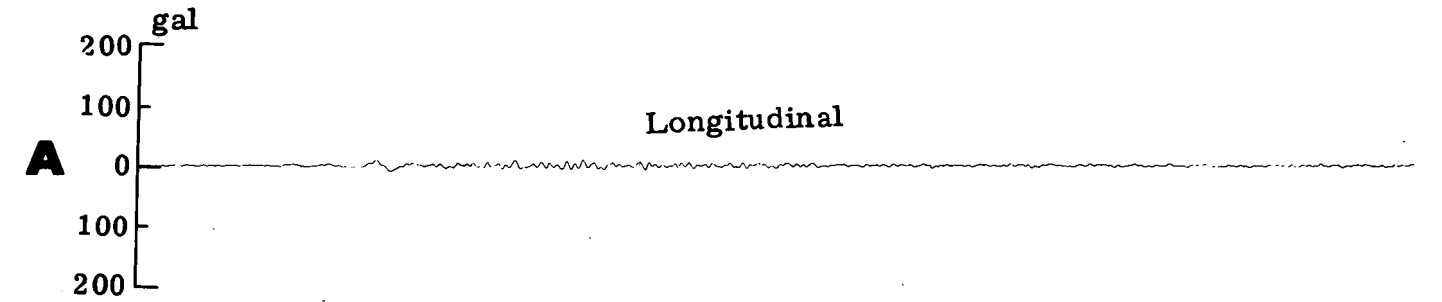




Kaihoku Bridge 302-P-26
1969 10.18 10:14

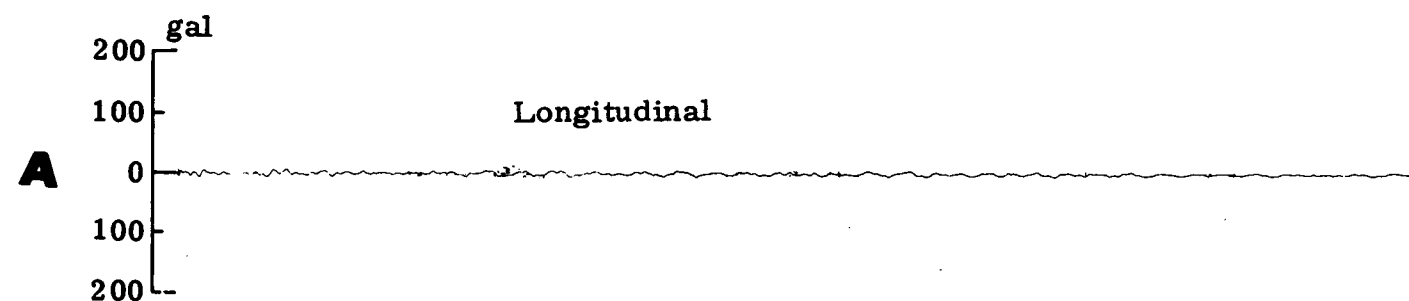


Date Bridge 304-Gr-20
1969 10.18 10:14

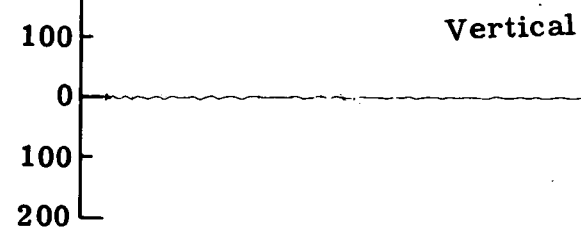


1sec

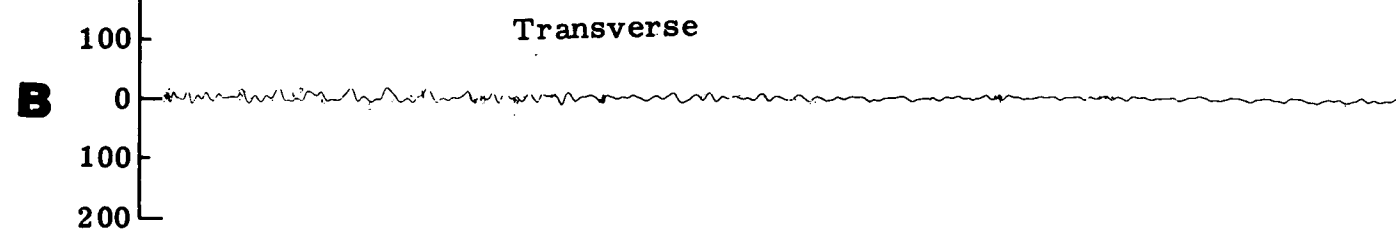
Date Bridge 304-P-27
1969 10.18 10:14



gal

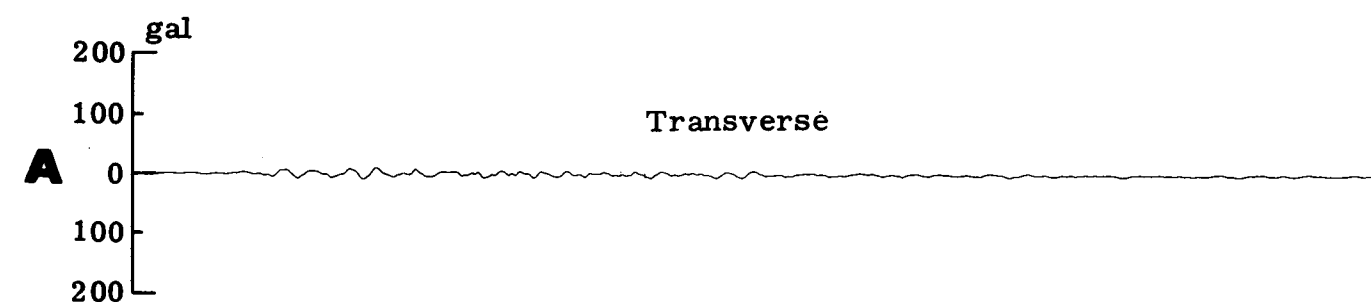


gal

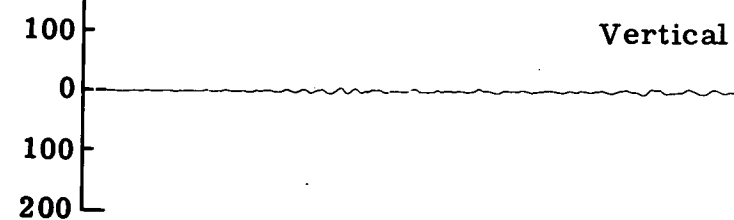


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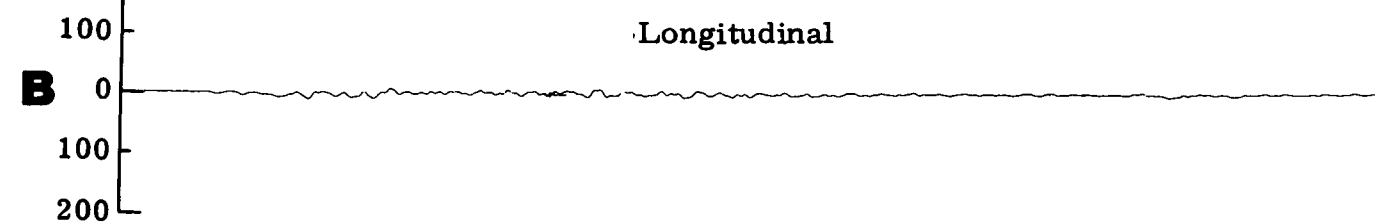
Taira Bridge 907-Gr-36
1969 10.18 10:14



gal

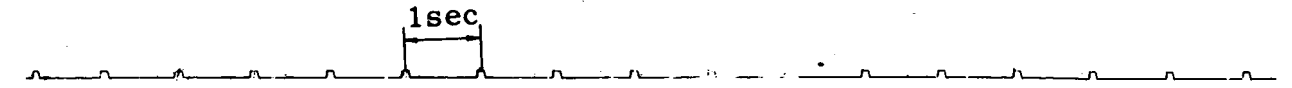
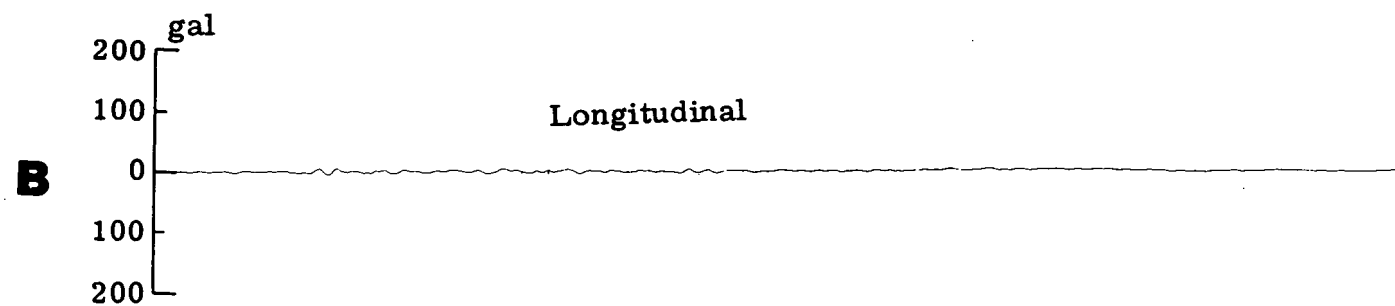
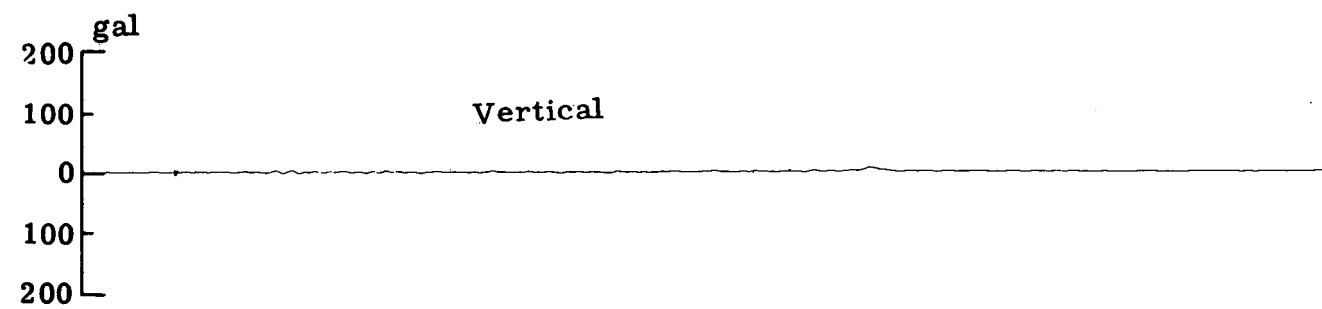
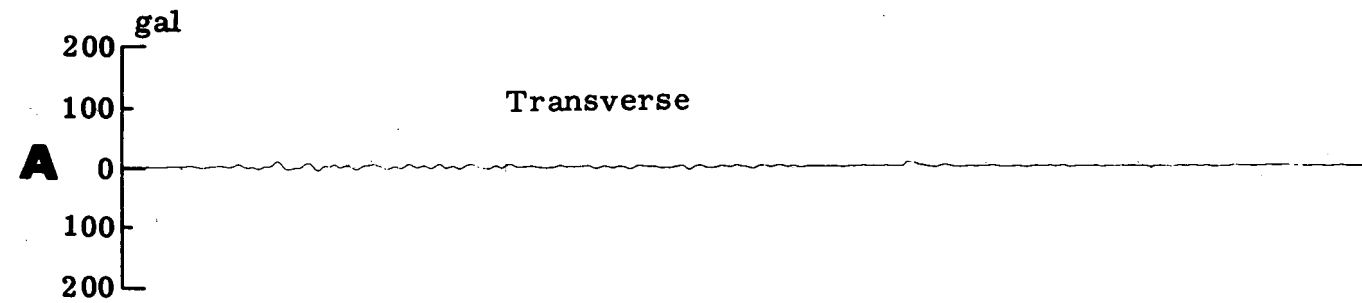


gal

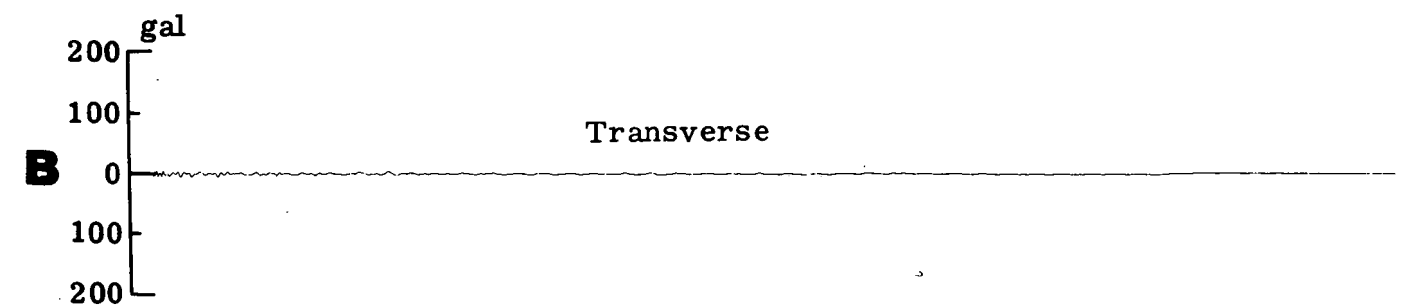
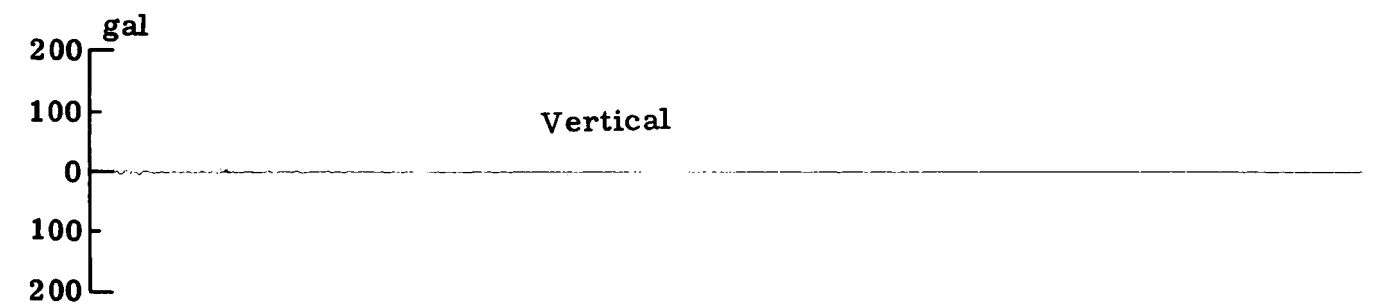
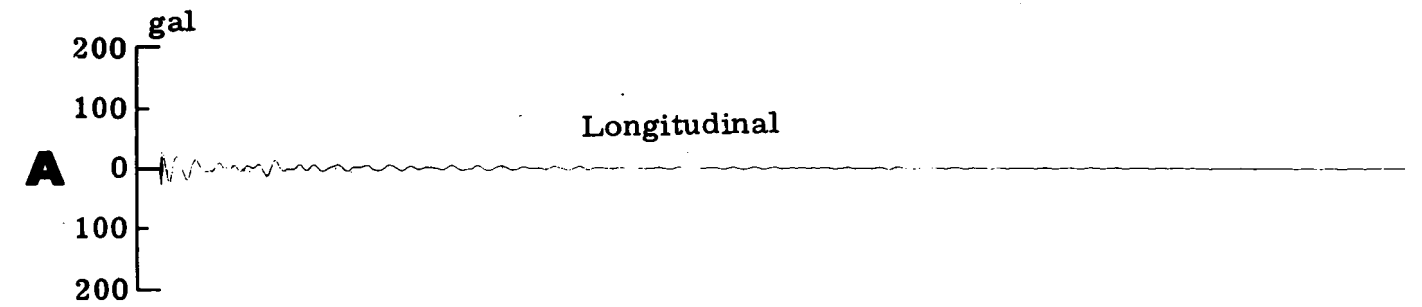




Taira Bridge 907-A-9
1969 10.18 10:14

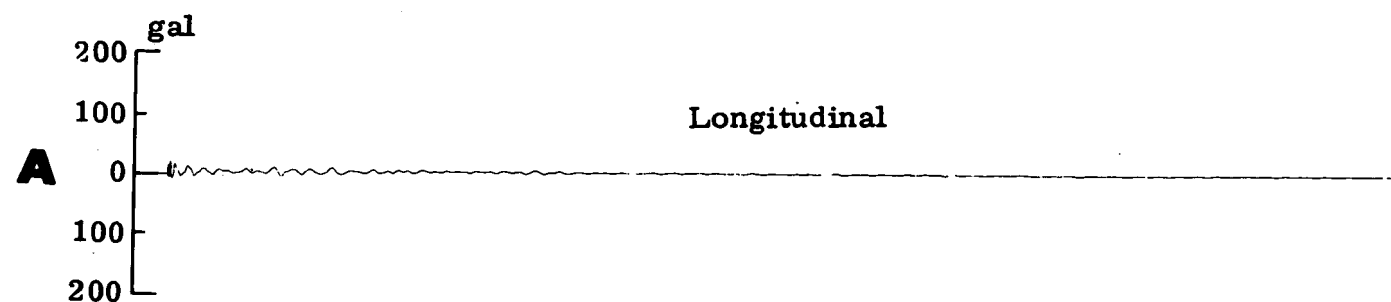


Ochiai Bridge 905-A-421
1969 10.23 20:23

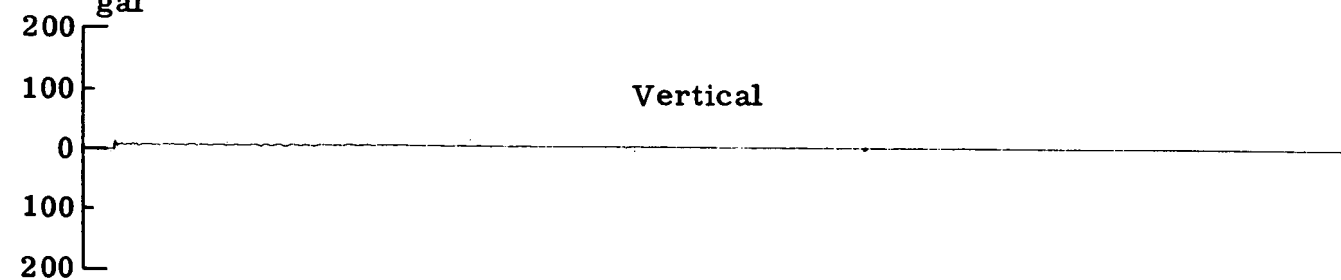


1sec

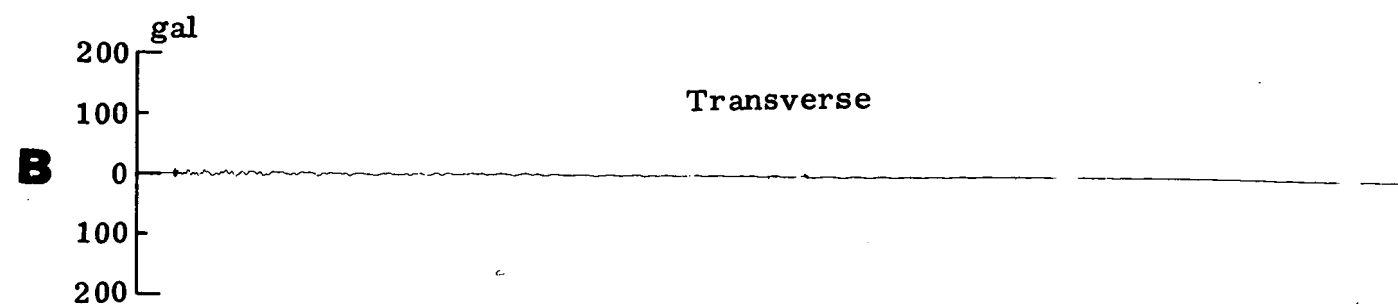
Ochiai Bridge 905-A-422
1969 11.9 12:50



gal

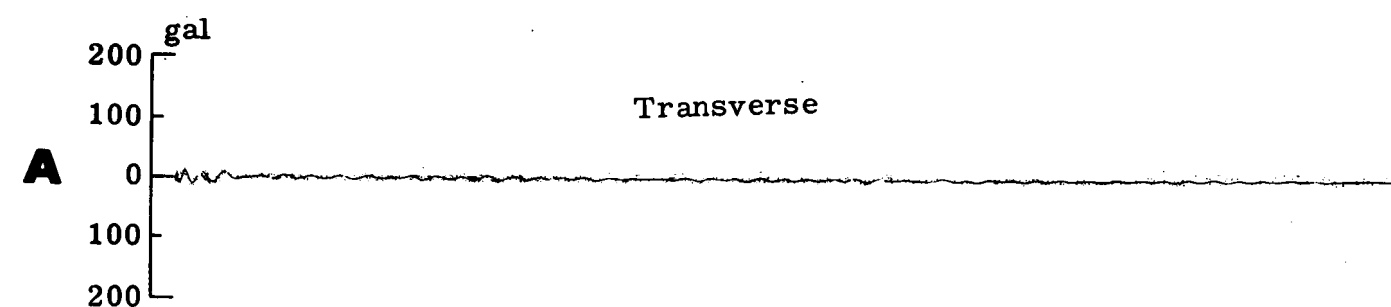


gal

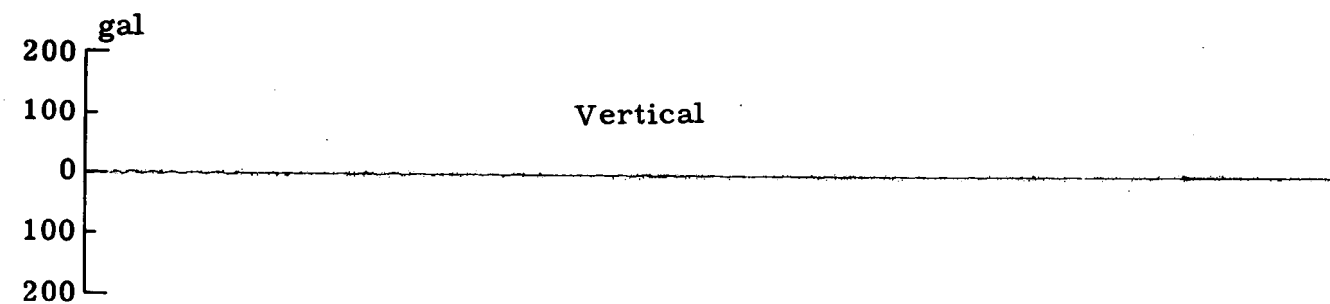


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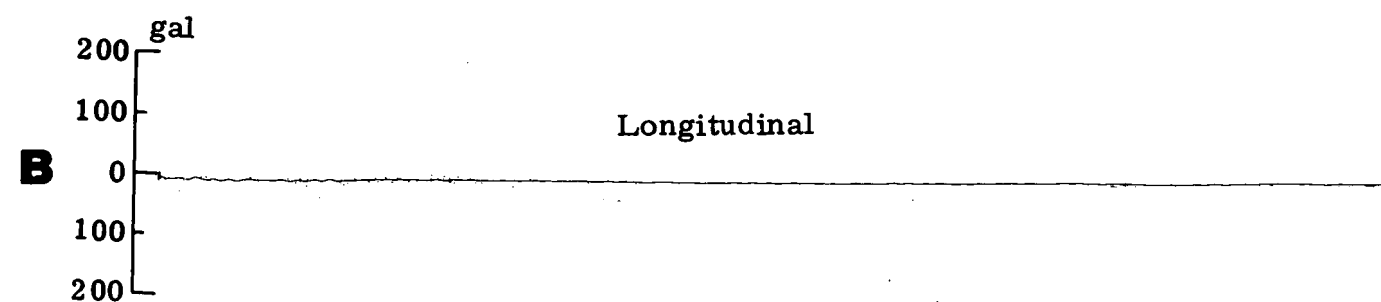
Godaisan Bridge 307-P-11
1969 11.30 01:43



gal

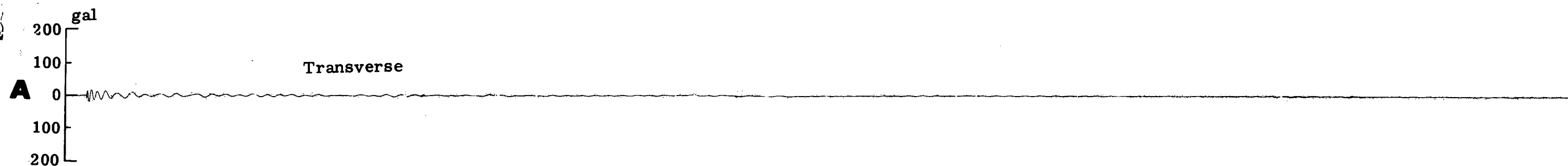


gal



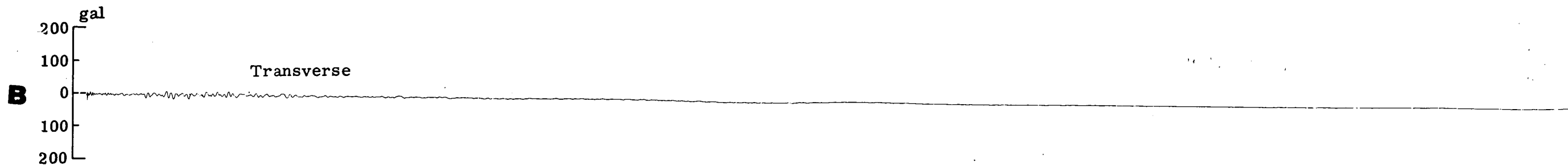
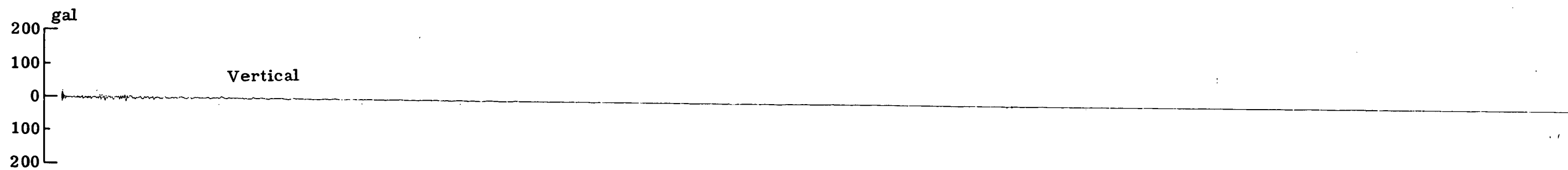
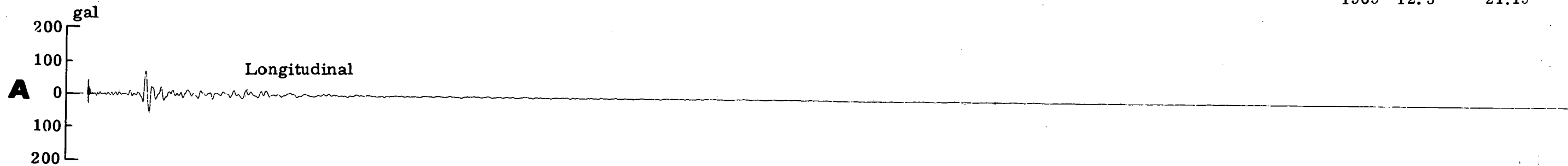
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Godiasan Bridge 307-P-13
1969 11.30 13:12



1sec

Ochiai Bridge 905-B-265
1969 12.3 21:19



1sec

Ochiai Bridge 905-A-423
1969 12.3 21:19

