HIGH LATITUDE GEOPHYSICAL DATA

30 Mc/s COSMIC NOISE RECORDS — OCT - DEC, 1964

N-S TELLURIC CURRENT RECORDS — OCT - DEC, 1964

N-S TELLURIC AMPLITUDE ACTIVITY — OCT - DEC, 1964

TELLURIC FLUCTUATION ACTIVITY — OCT - DEC, 1964

TELLURIC MICROPULSATION ACTIVITY, pc 1 — OCT - DEC, 1964

GEOMAGNETIC ACTIVITY, K, Ak, C — OCT - DEC, 1964

DECEMBER, 1964

GEOPHYSICAL INSTITUTE
UNIVERSITY OF ALASKA

COLLEGE, ALASKA

"High Latitude Geophysical Data" is published by the Institute with the objective of presenting current geophysical data related to polar ionospheric activity. Because of the research nature of the Institute's program, the type of material presented and the experimental and scaling methods may be novel and are subject to change. Thus the methods are described in sufficient detail to assure correct interpretation of data.

V. P. Hessler, Editor

30 MC/S COSMIC NOISE LEVEL

R. Parthasarathy
Assoc. Professor of Physics

This section consists of reproductions of the cosmic radio noise level at 30 Mc/s, monitored at College, Alaska (64.65°N, 256.56°E, geomagnetic).

The zenith directed antenna is a pair of crossed, 3-element Yagis, responding to the noise in the right circular mode. The beam has approximate rotational symmetry, with about 60 degrees between half-power points. The power linear receiver system is calibrated daily by a noise diode, in steps of 0, 2.0, 4.0, and 6.0 milliamps of the diode plate current.

The variation of the noise level at College is primarily due to the variation of the precipitating auroral particles. It is known that the energies of these primary particles (electrons and protons) that are of immediate relevance to the luminosity of the auroral displays are about a few kilovolts, and that the integral energy spectrum of the flux expressed as a power law of the energy is characterized by an exponent, minus γ, the γ varying from about two to five. It is also known from observations at 37 Mc/s with antenna beams comparable to the angular dimensions of the displays (i.e., a few degrees in the meridian plane) that, in general, the radiowave absorption in any direction is only poorly specified by the luminosity of the display. The radiowave absorption at a single frequency is not capable of specifying the height distribution of ionization responsible for the absorption, and hence the energies of the primary particles. Simultaneous absorption data in a number of frequencies in the HF and VHF band have, therefore, been utilized in the past for deriving the ionization profile as a function of height over College. The derived profiles are compatible with the primary particle energies a few orders higher than the energies essentially responsible for the luminosity of the aurora.

In seeking the relationship between the radiowave absorption and the outer radiation belt by means of the College data at 30 Mc/s, it may be cautioned that the station is known to be associated with the magnetic field line which defines the outer region, rather than the maximum-flux region, of the radiation belt; further, the rapid variability in the absorption as well as the typical localization in latitude, would require a very detailed knowledge of the flux distribution in the radiation belt, in time and space, before meaningful comparisons could be made. The problem is, however, less difficult in the case of the polar cap events, because of the spatial and temporal near-uniformity of absorption in the polar region.

It is thought that this publication may contribute to a somewhat greater understanding of the inter-relationship between the solar, magnetospheric and auroral phenomena than have been possible by means of the many decades of magnetic data.

This publication is financially supported by the National Aeronautics and Space Administration under Contract NAS5-3595.

30 MC/S COSMIC NOISE

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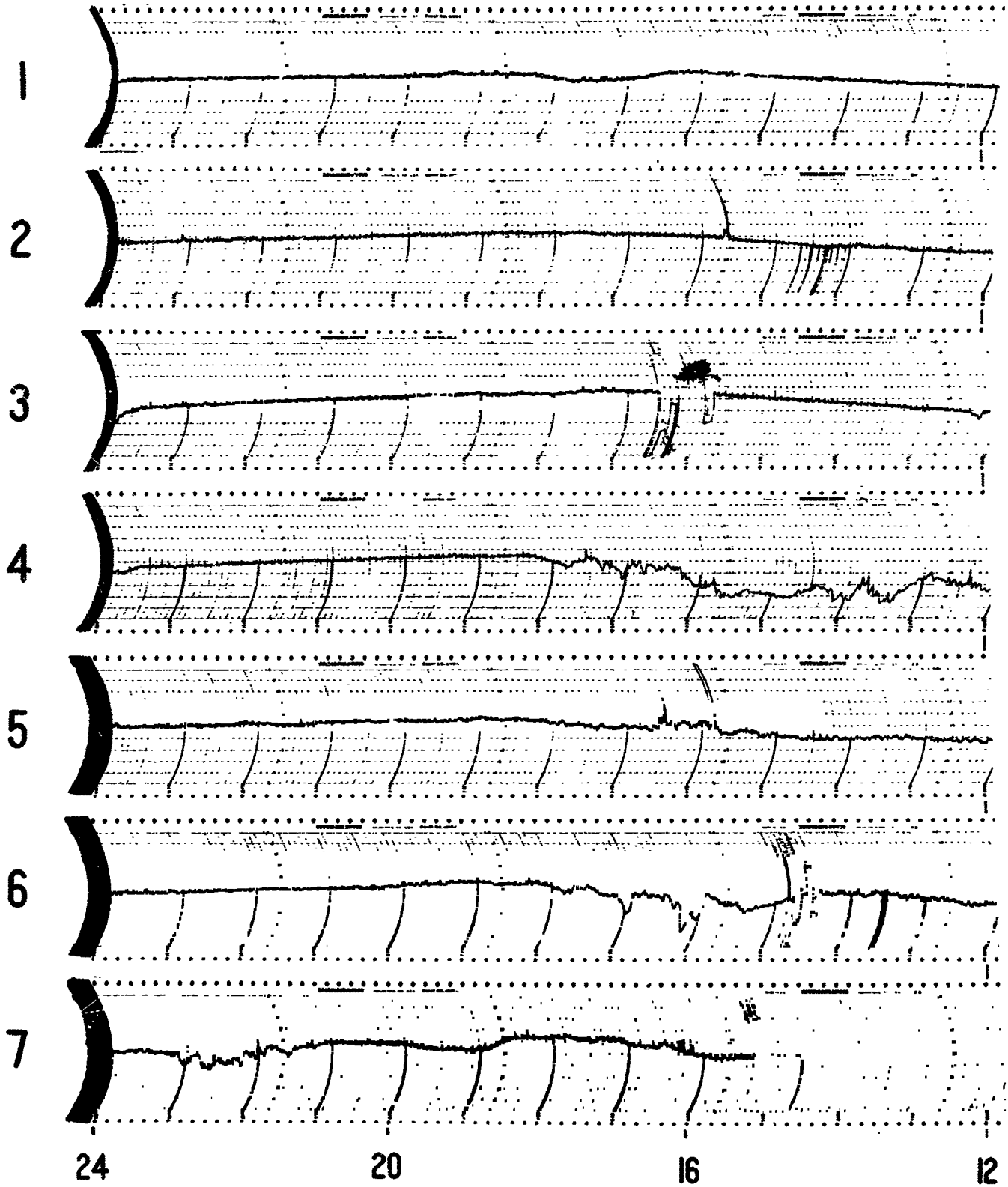

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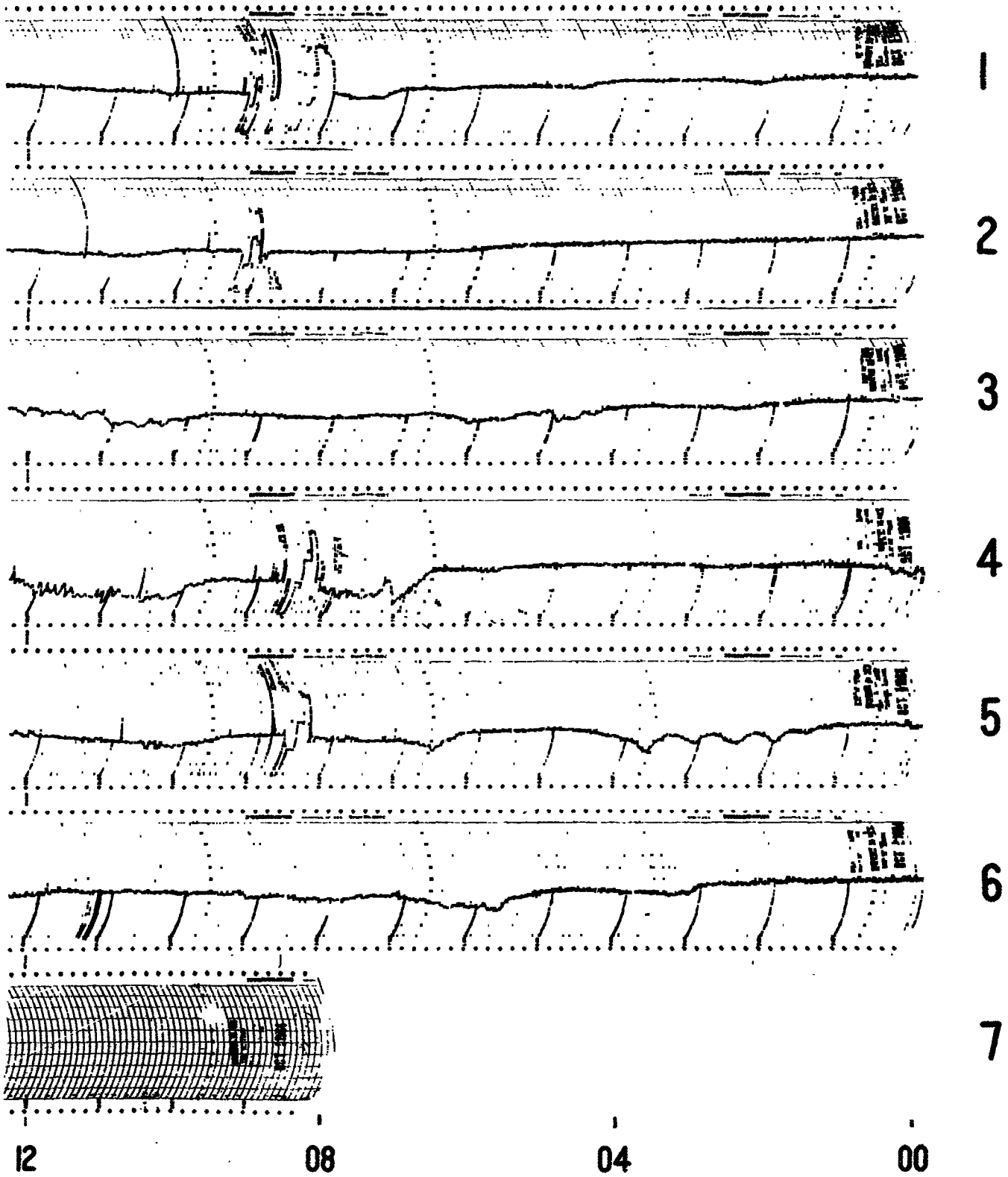

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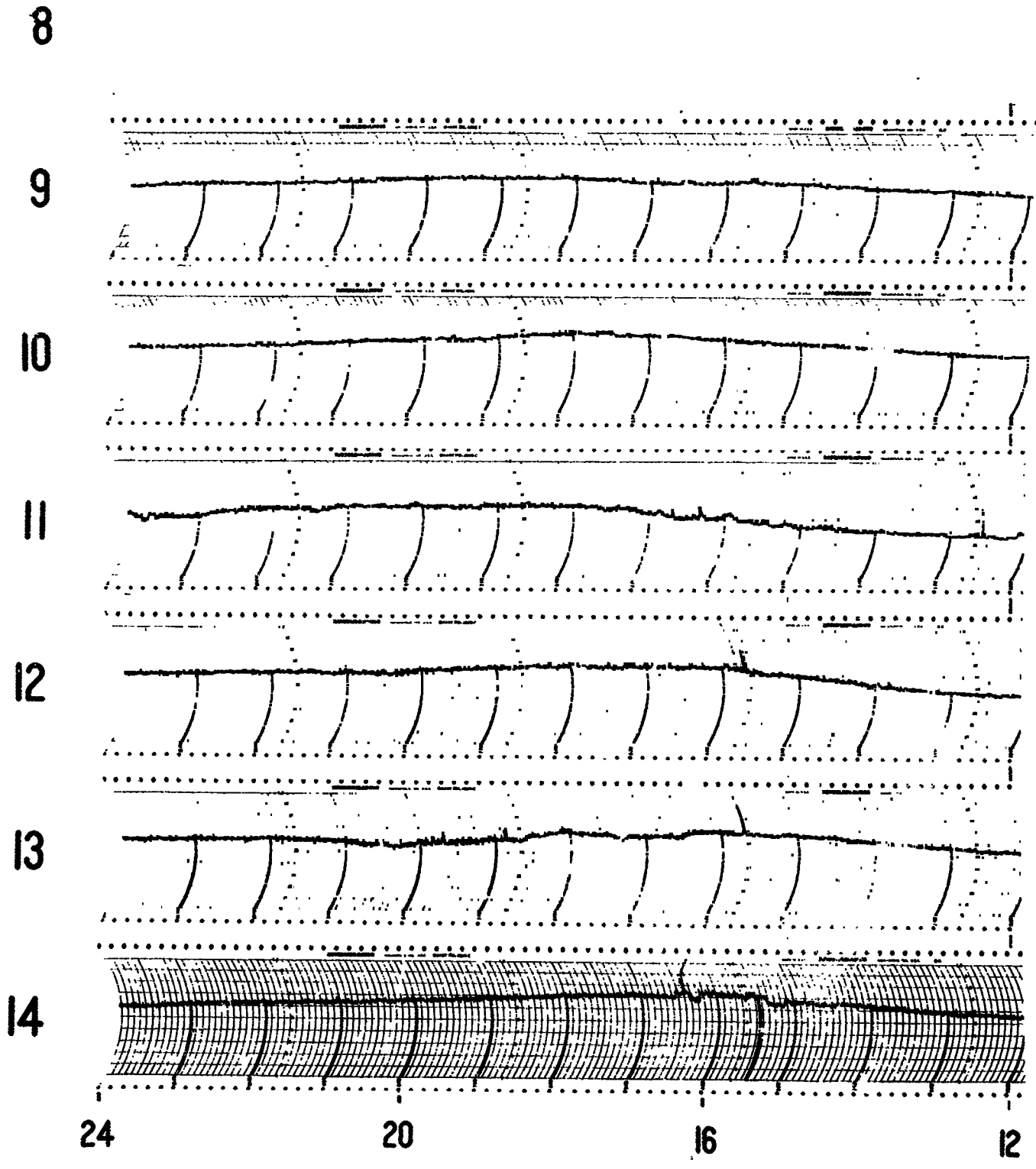

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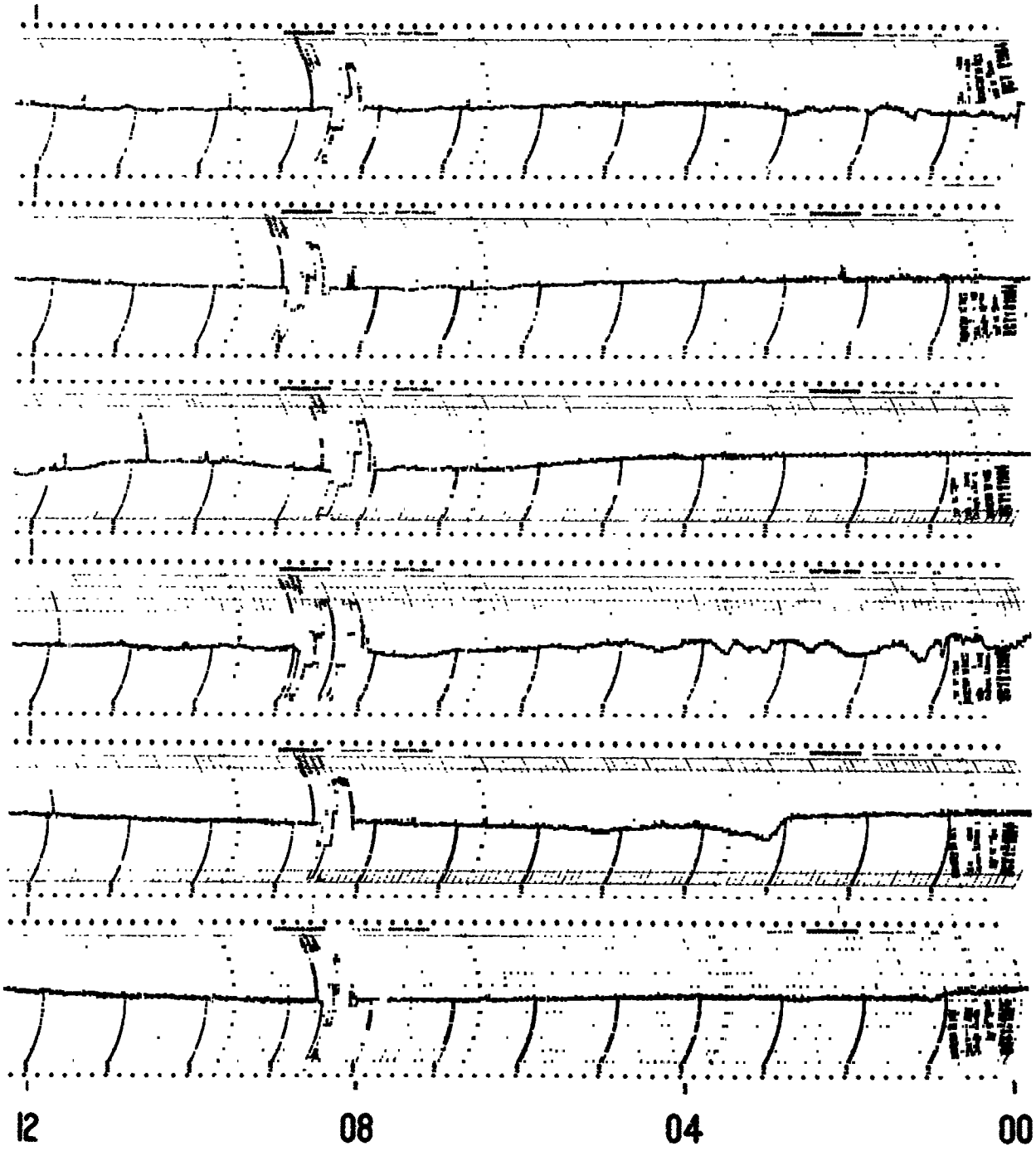

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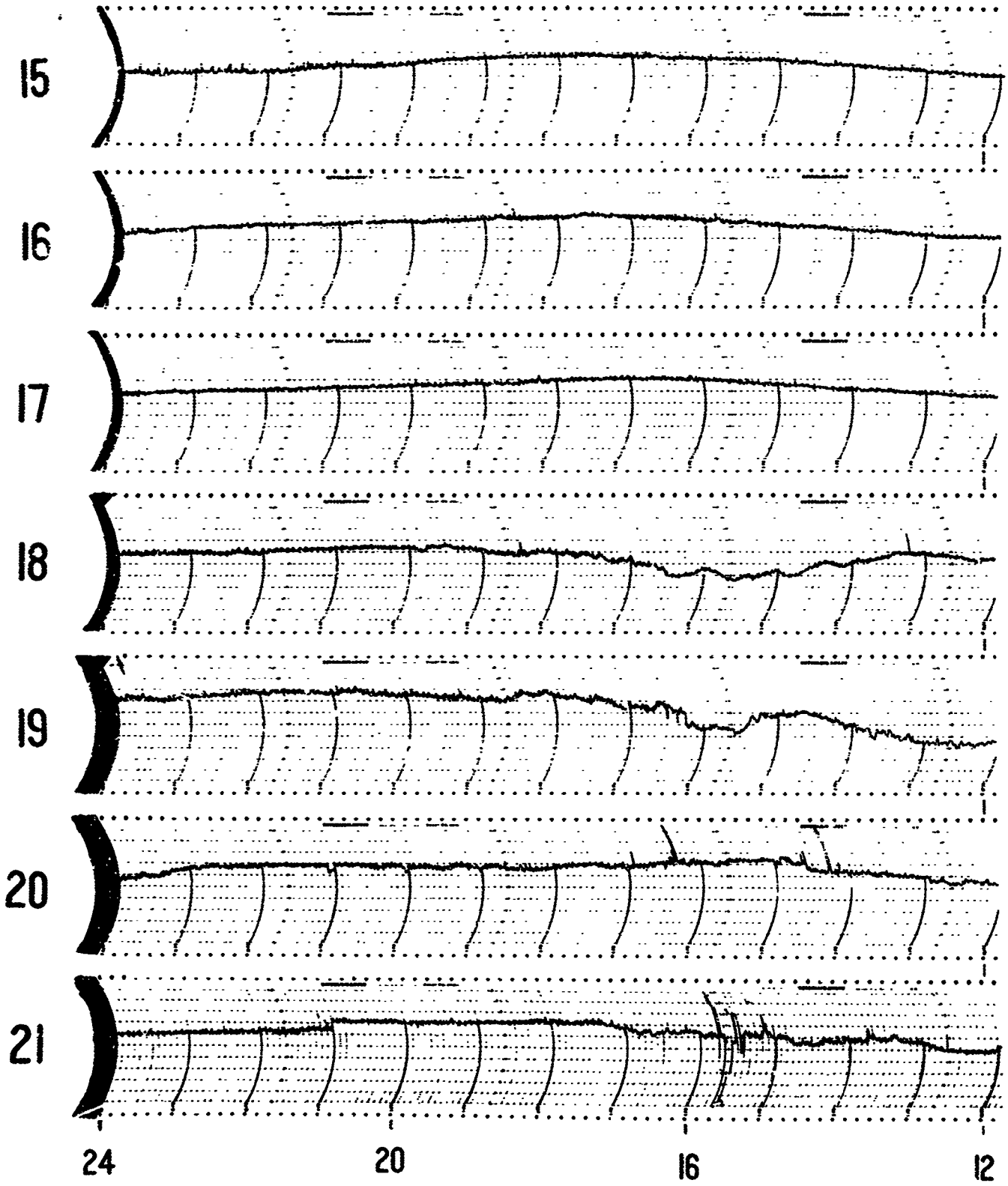

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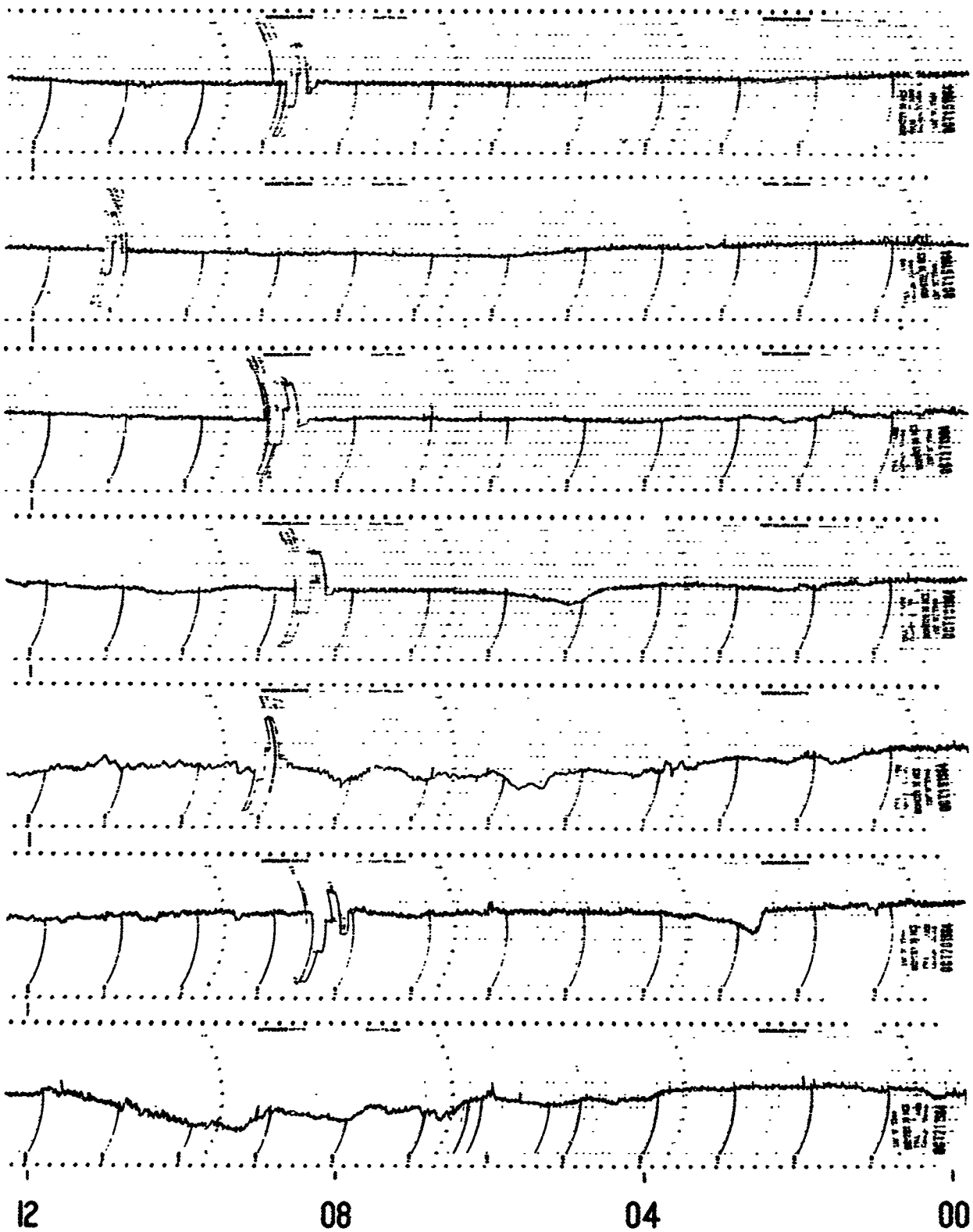

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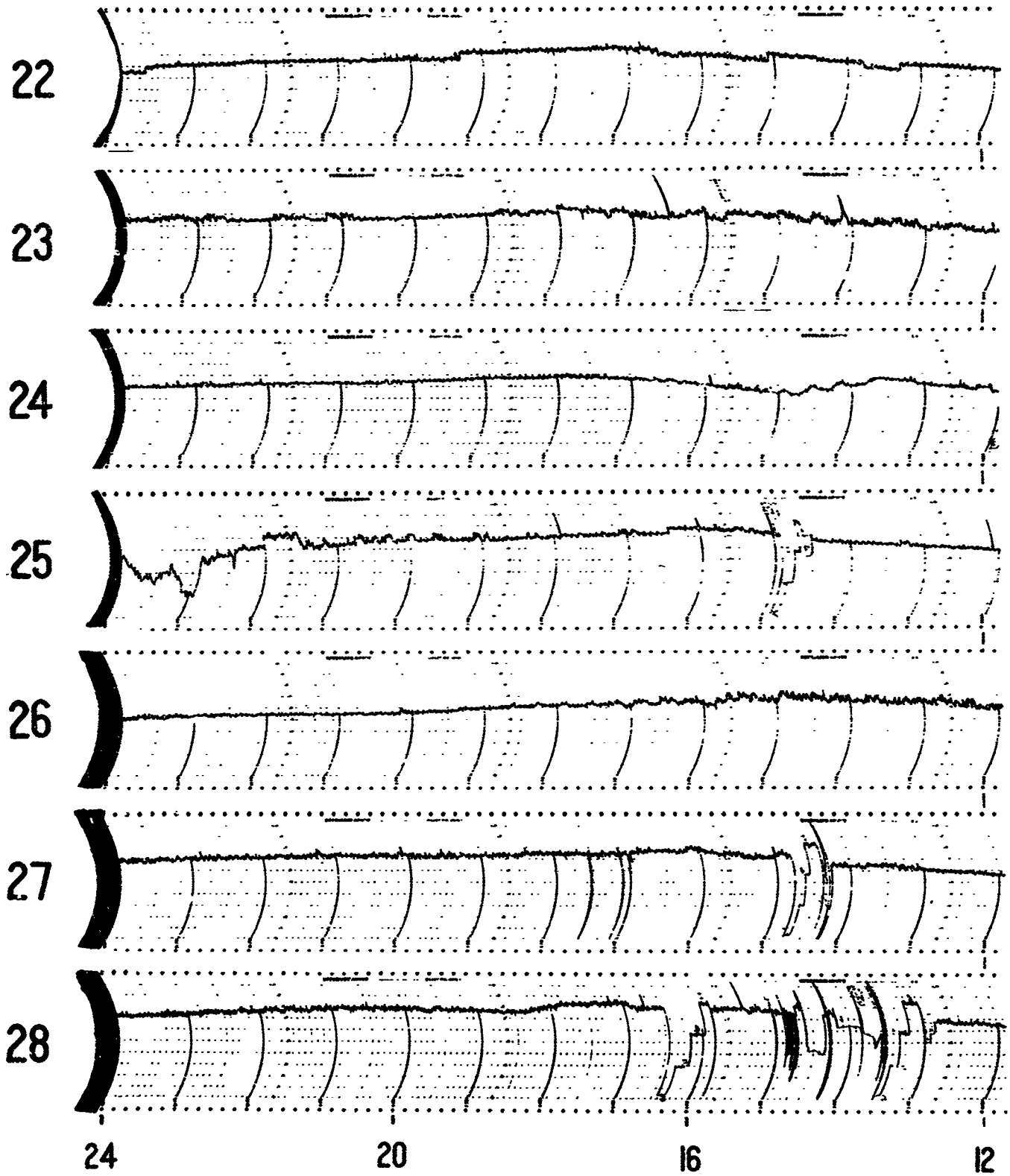

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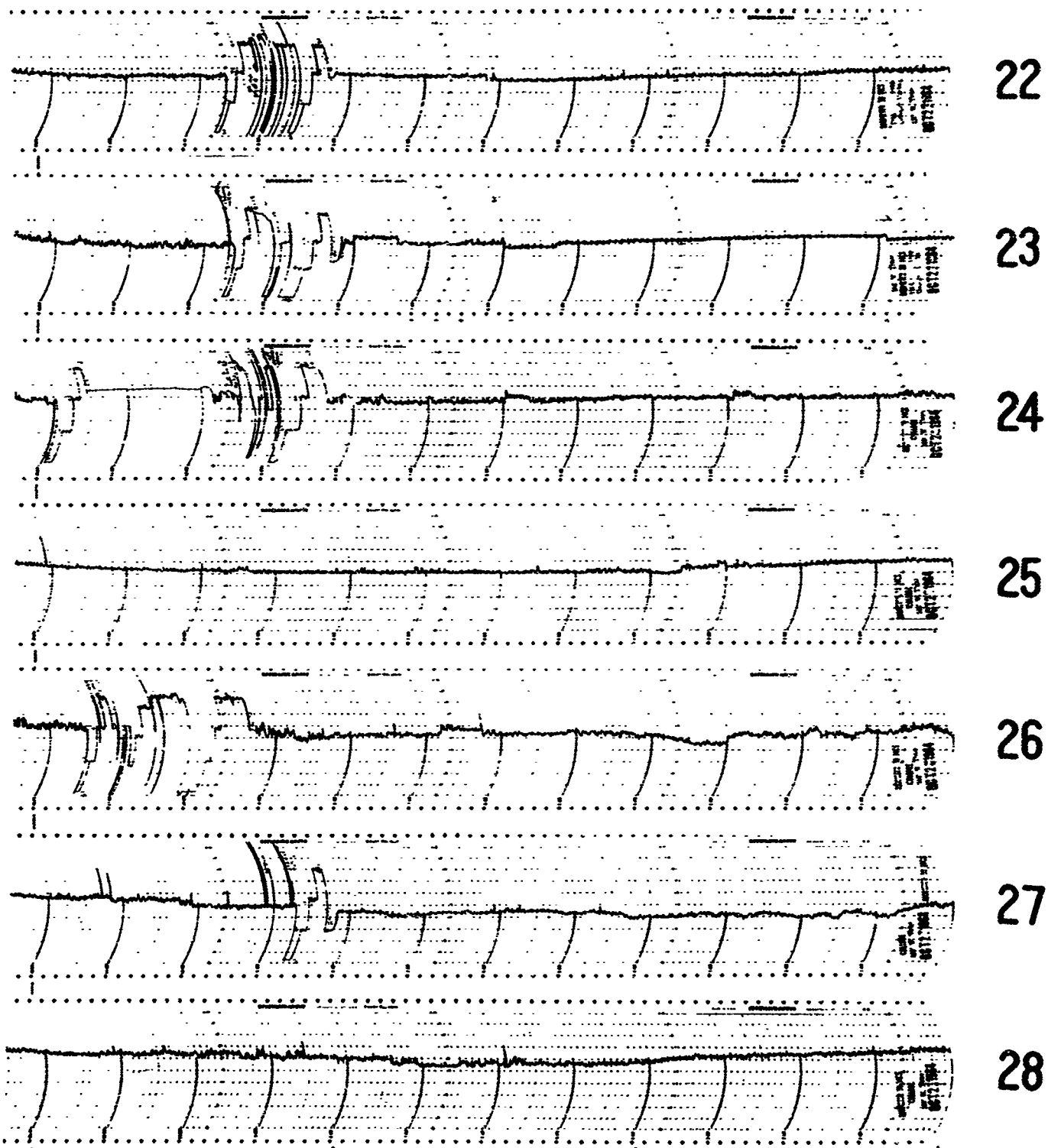

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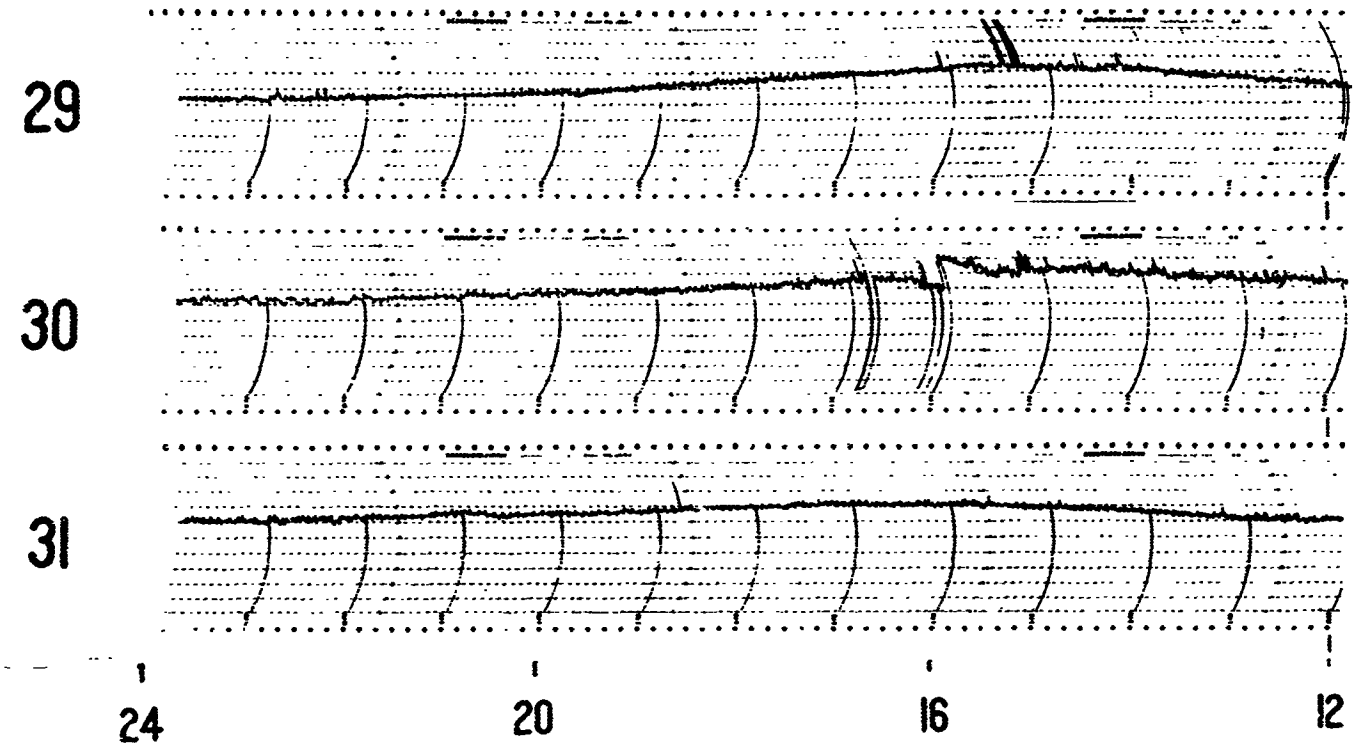

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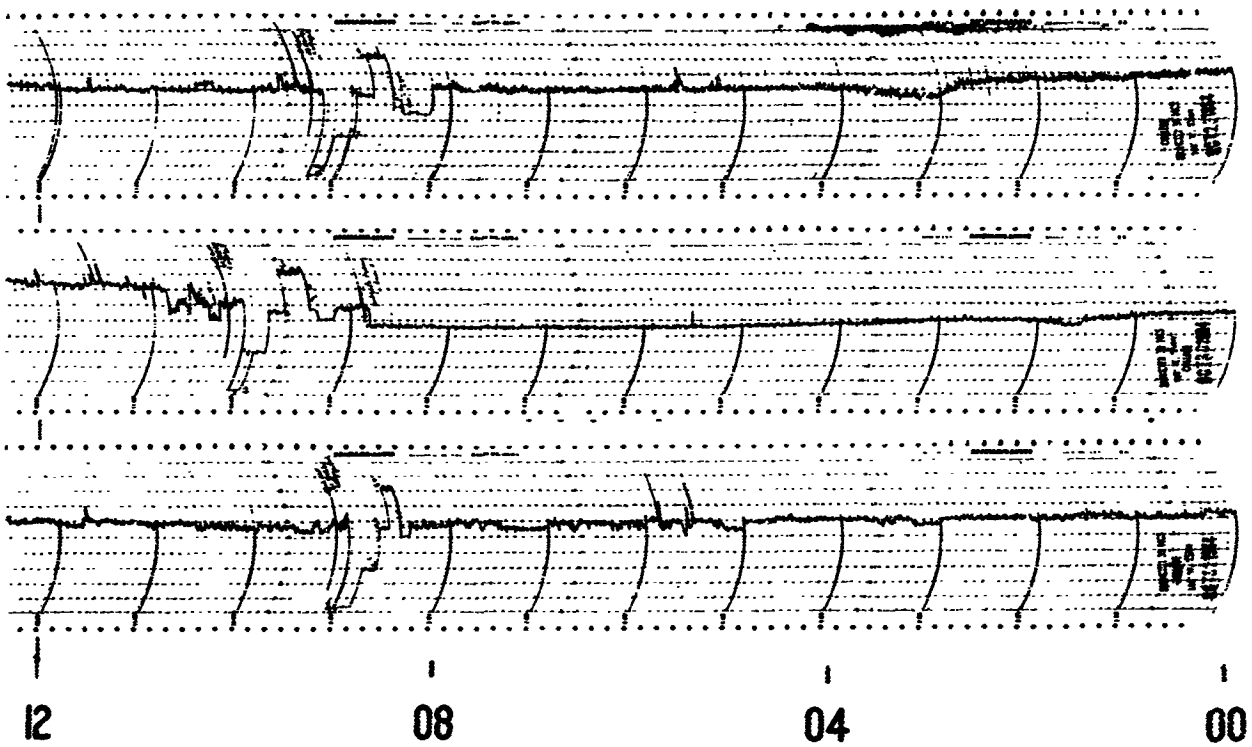

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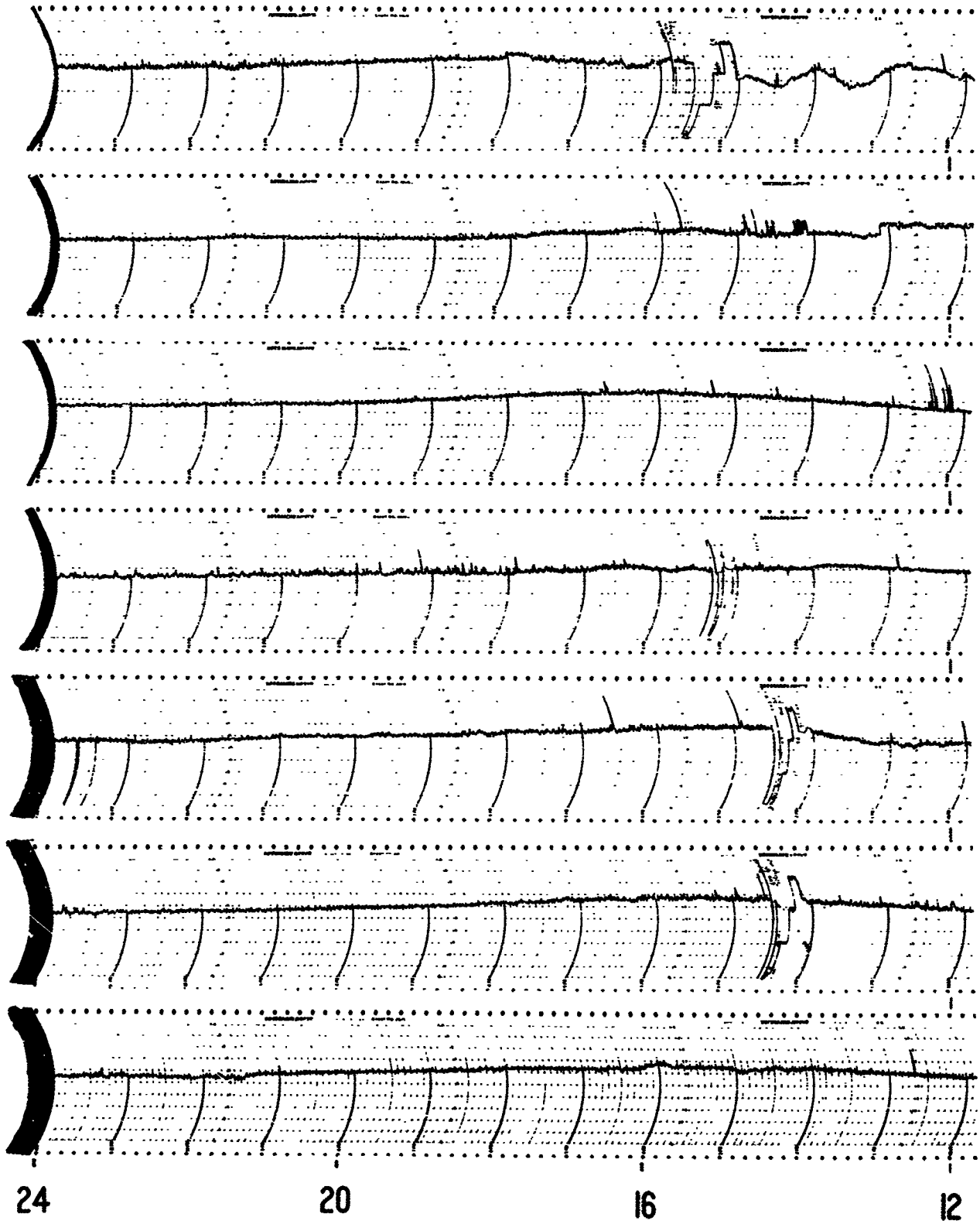

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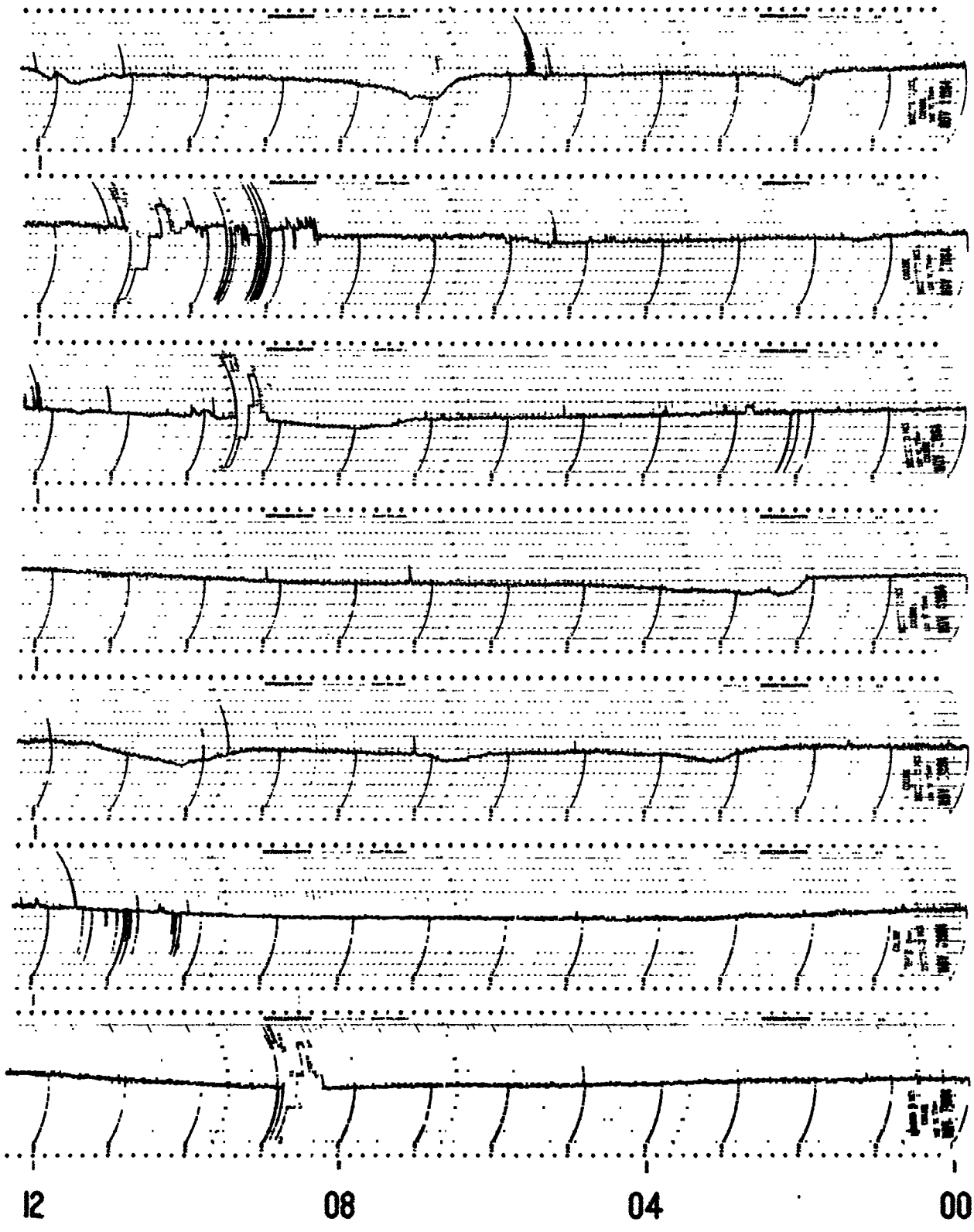

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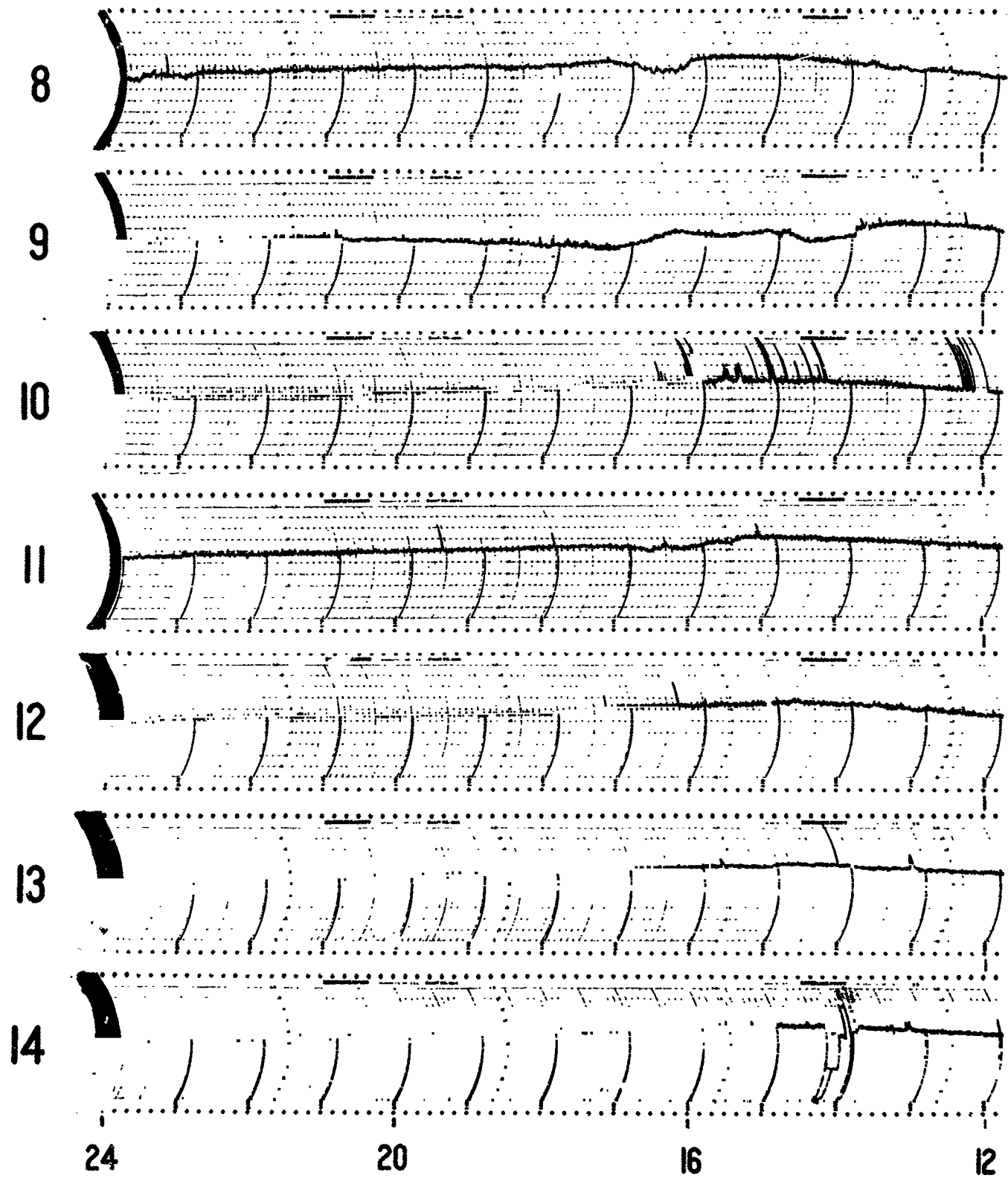

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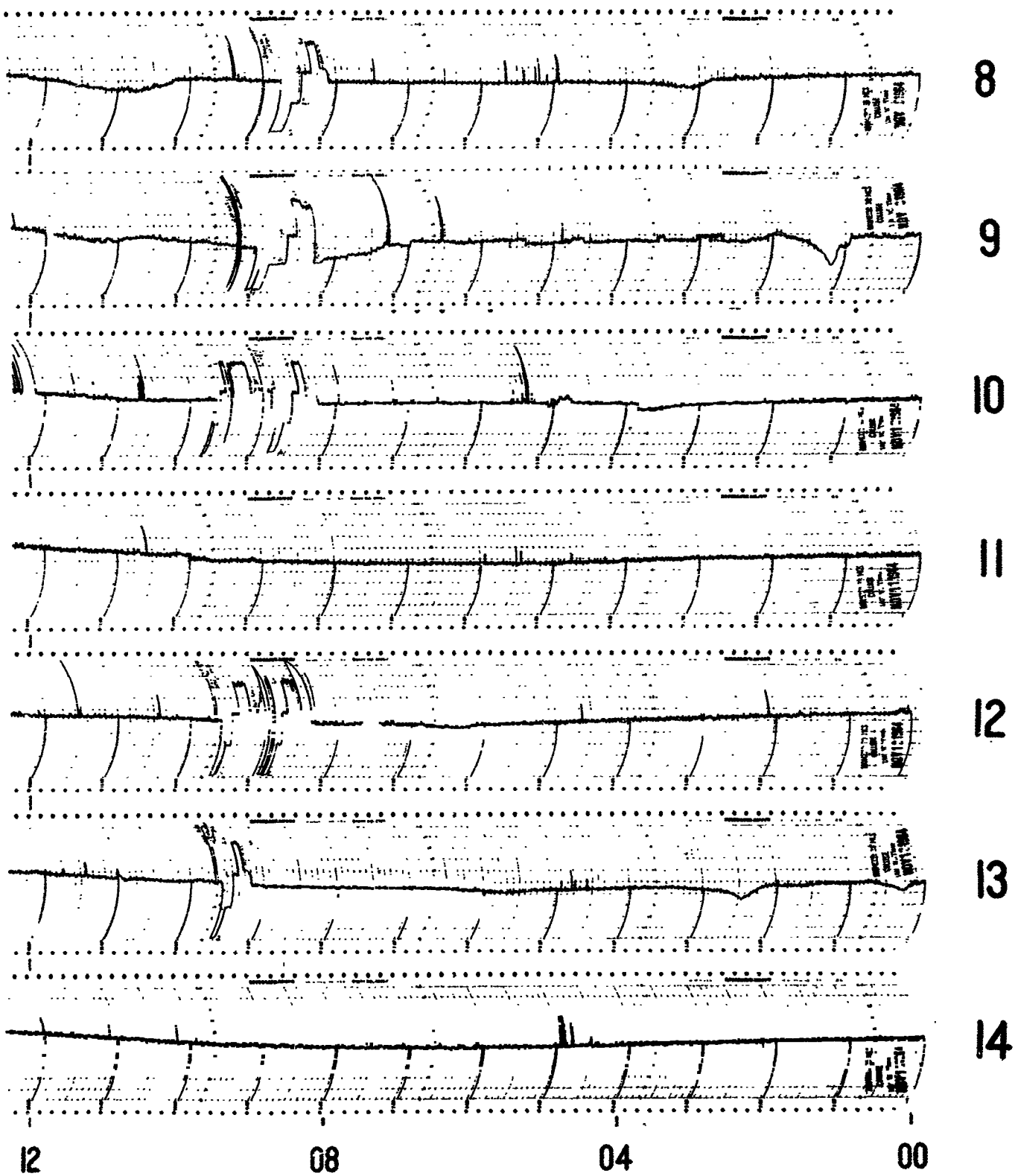

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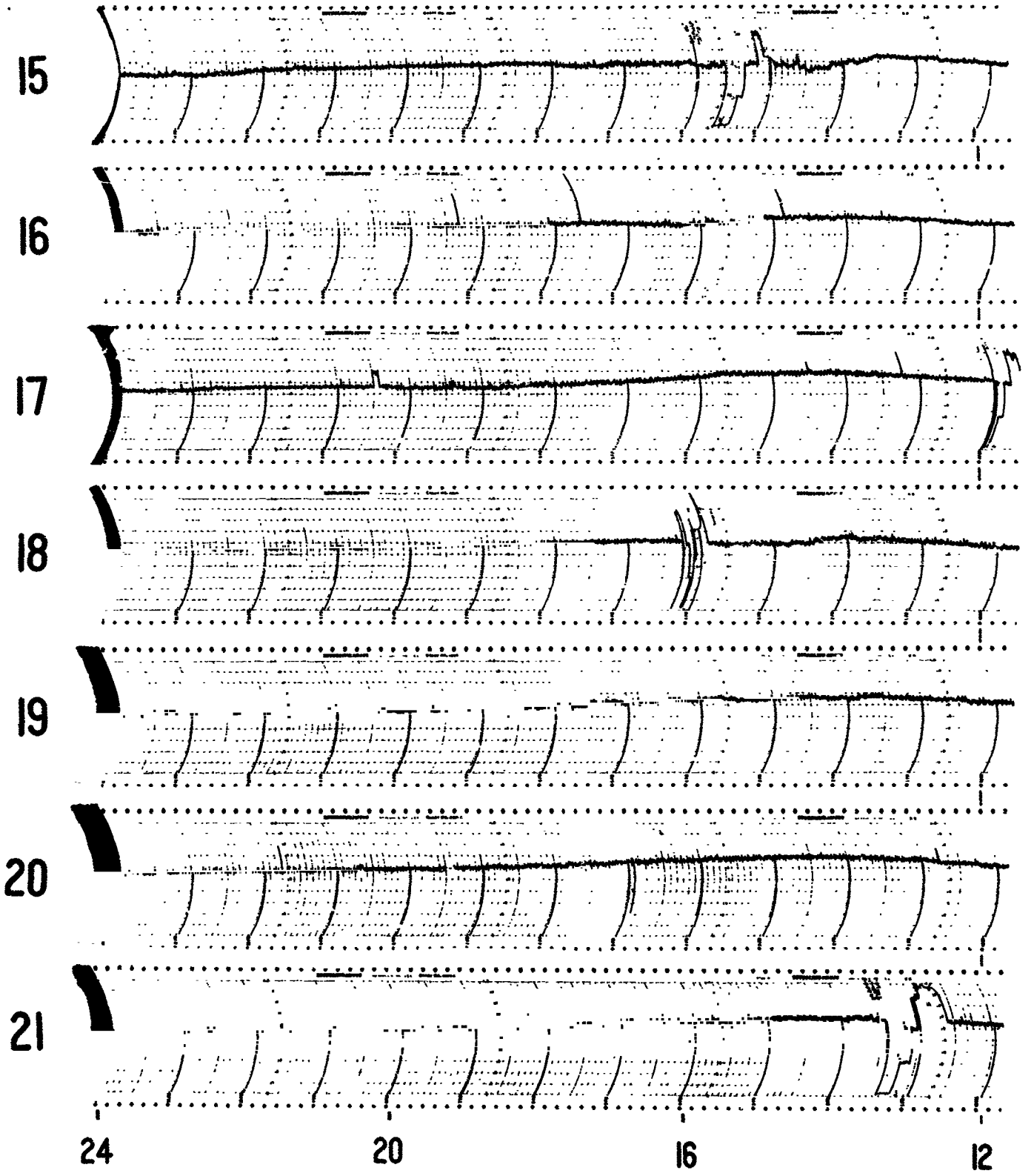

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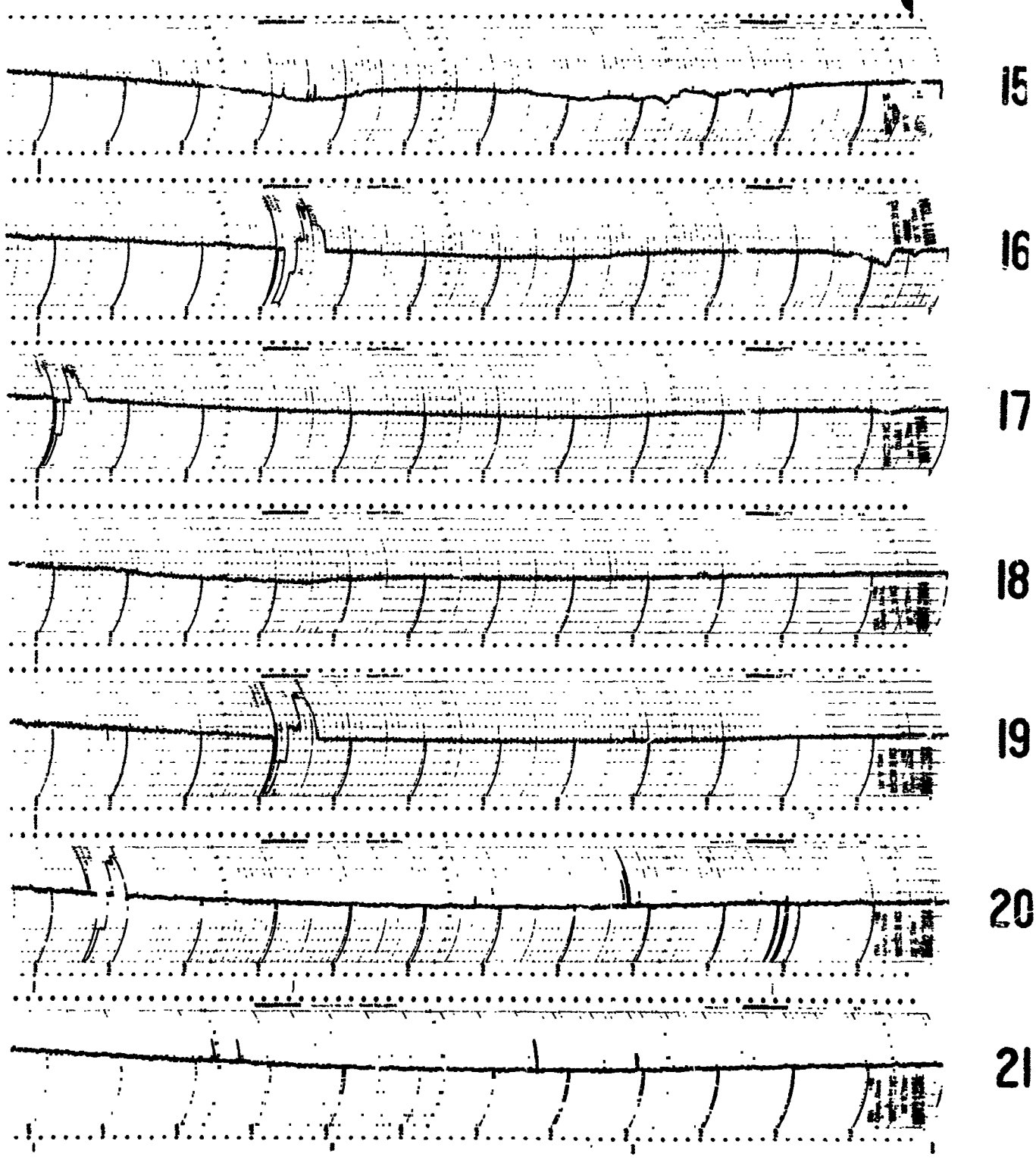

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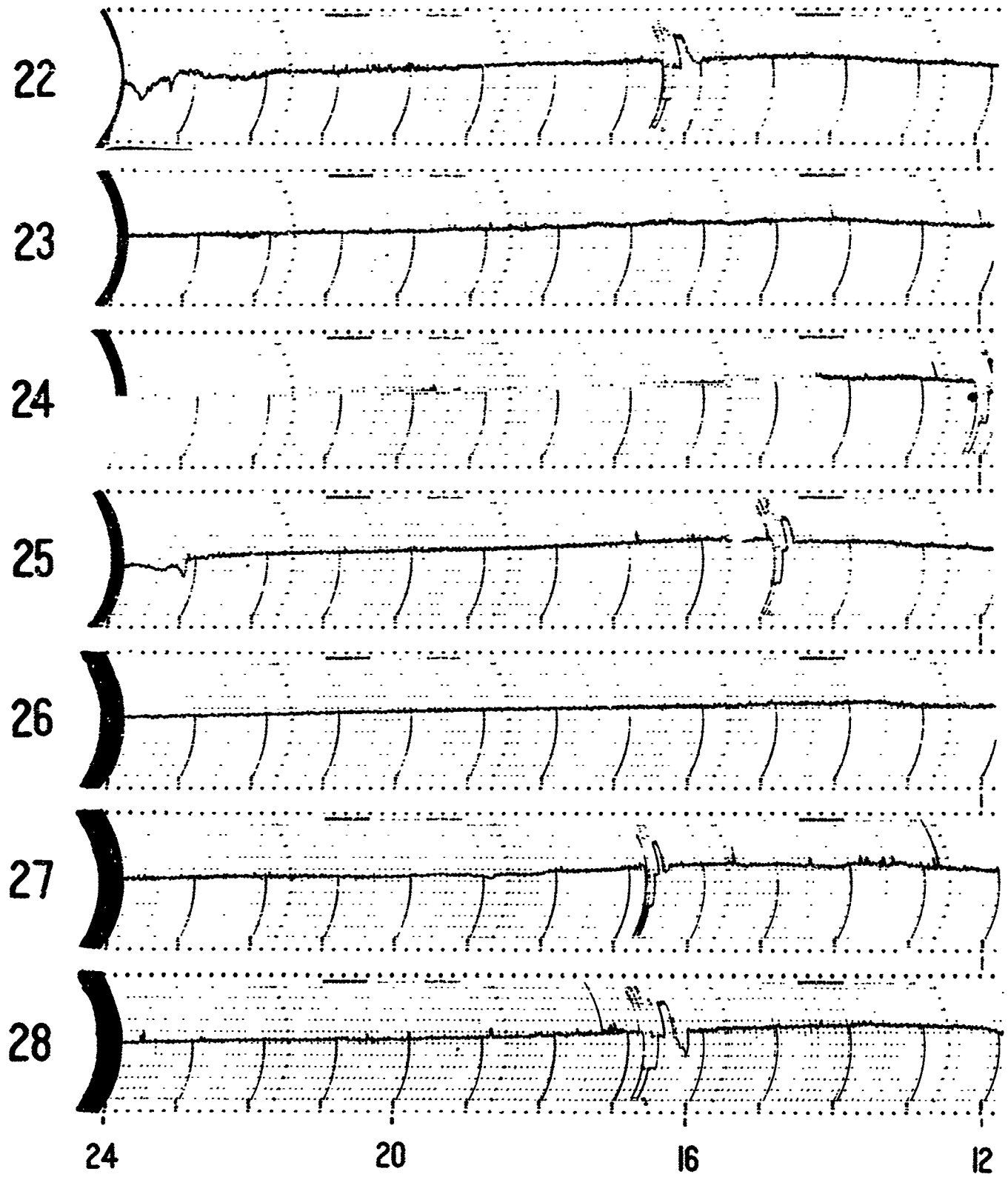

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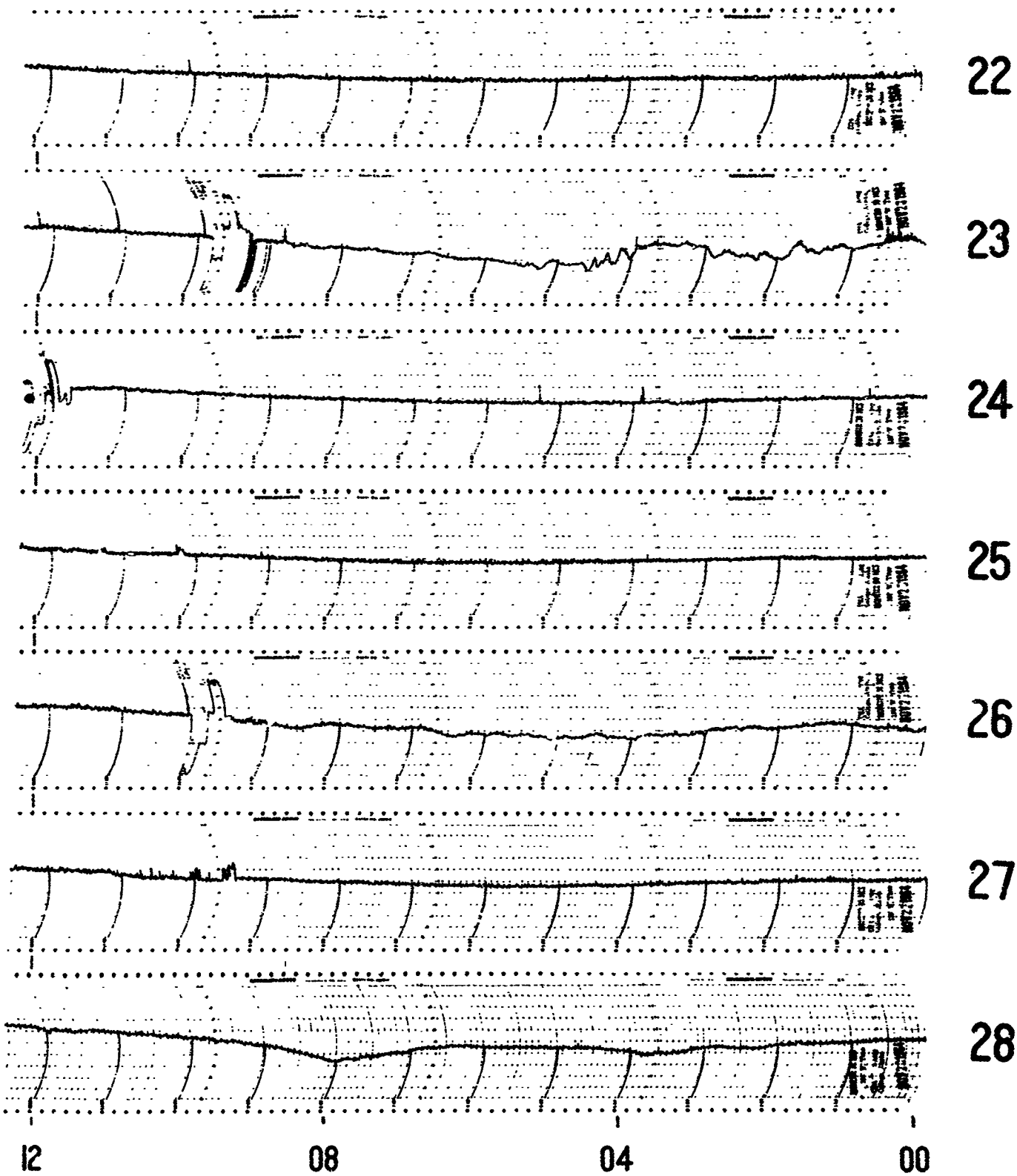

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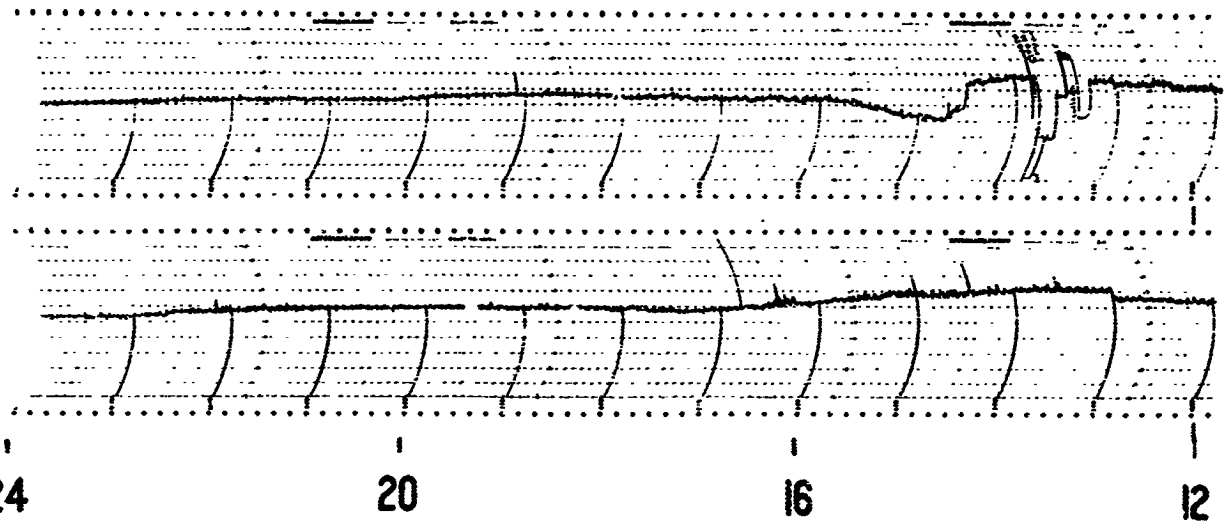

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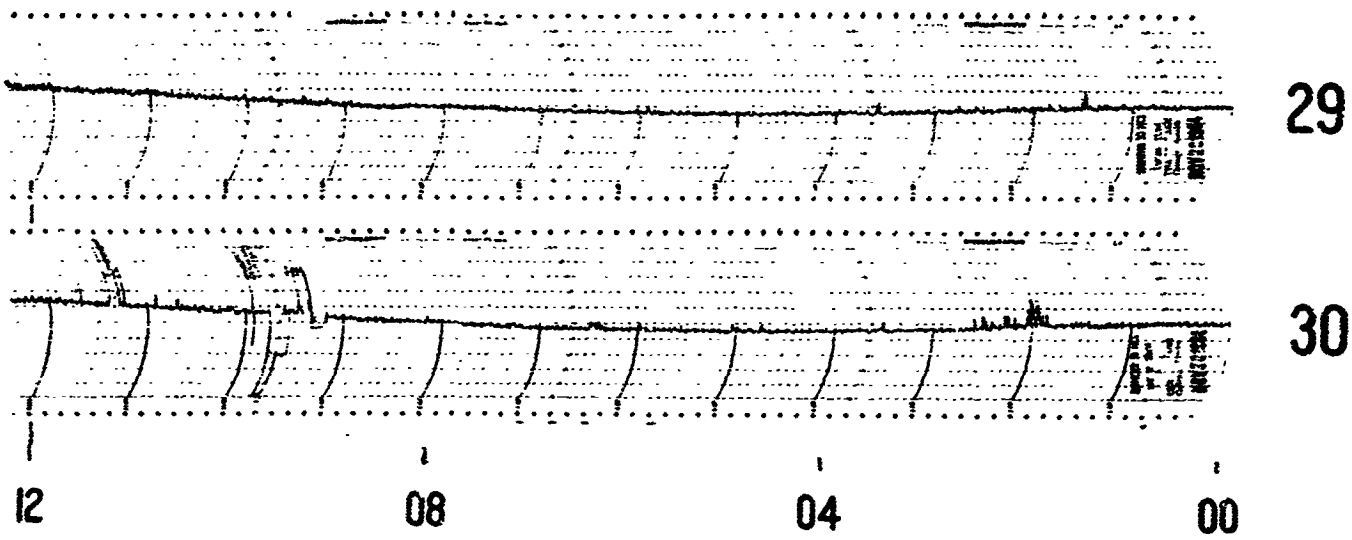

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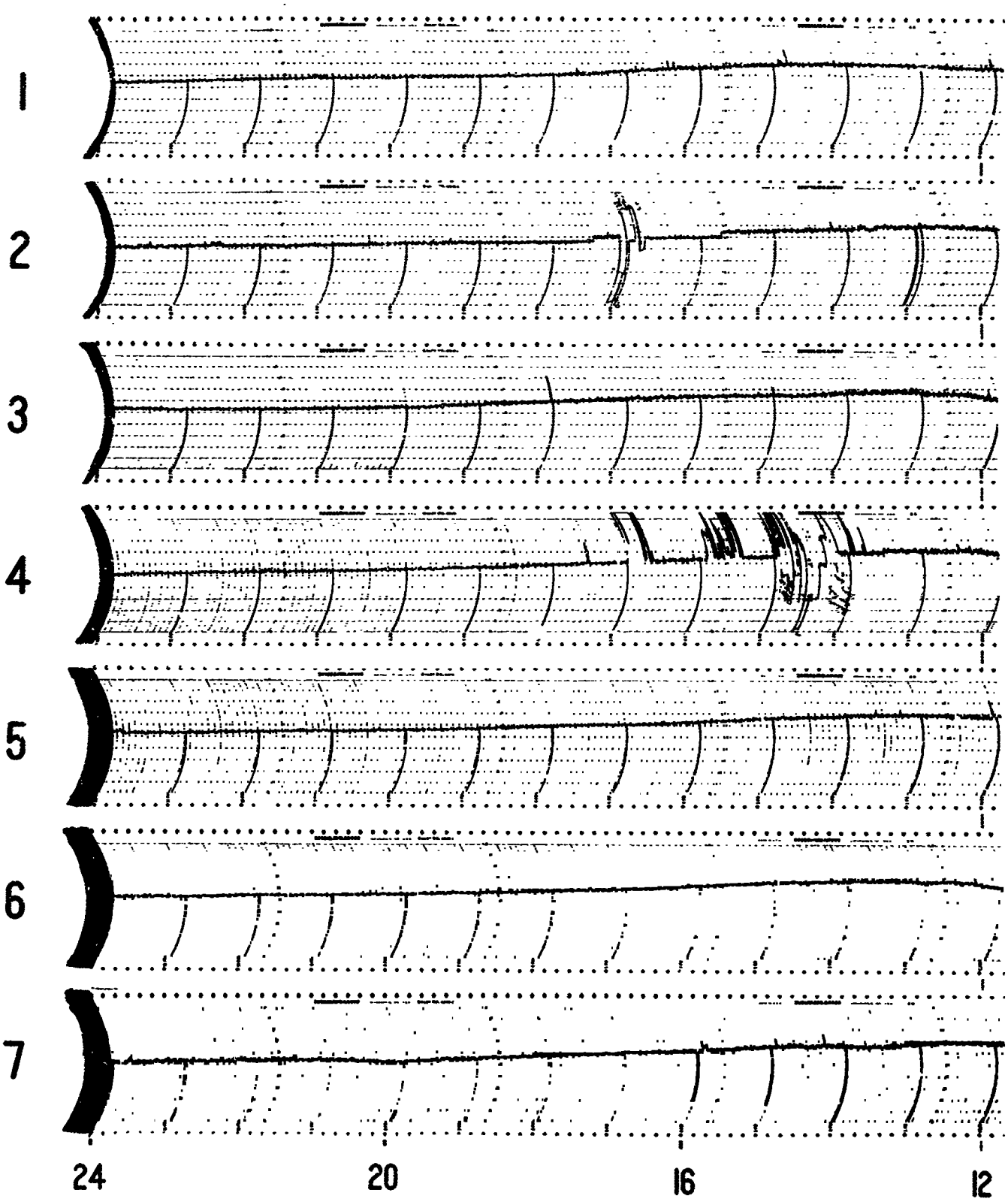

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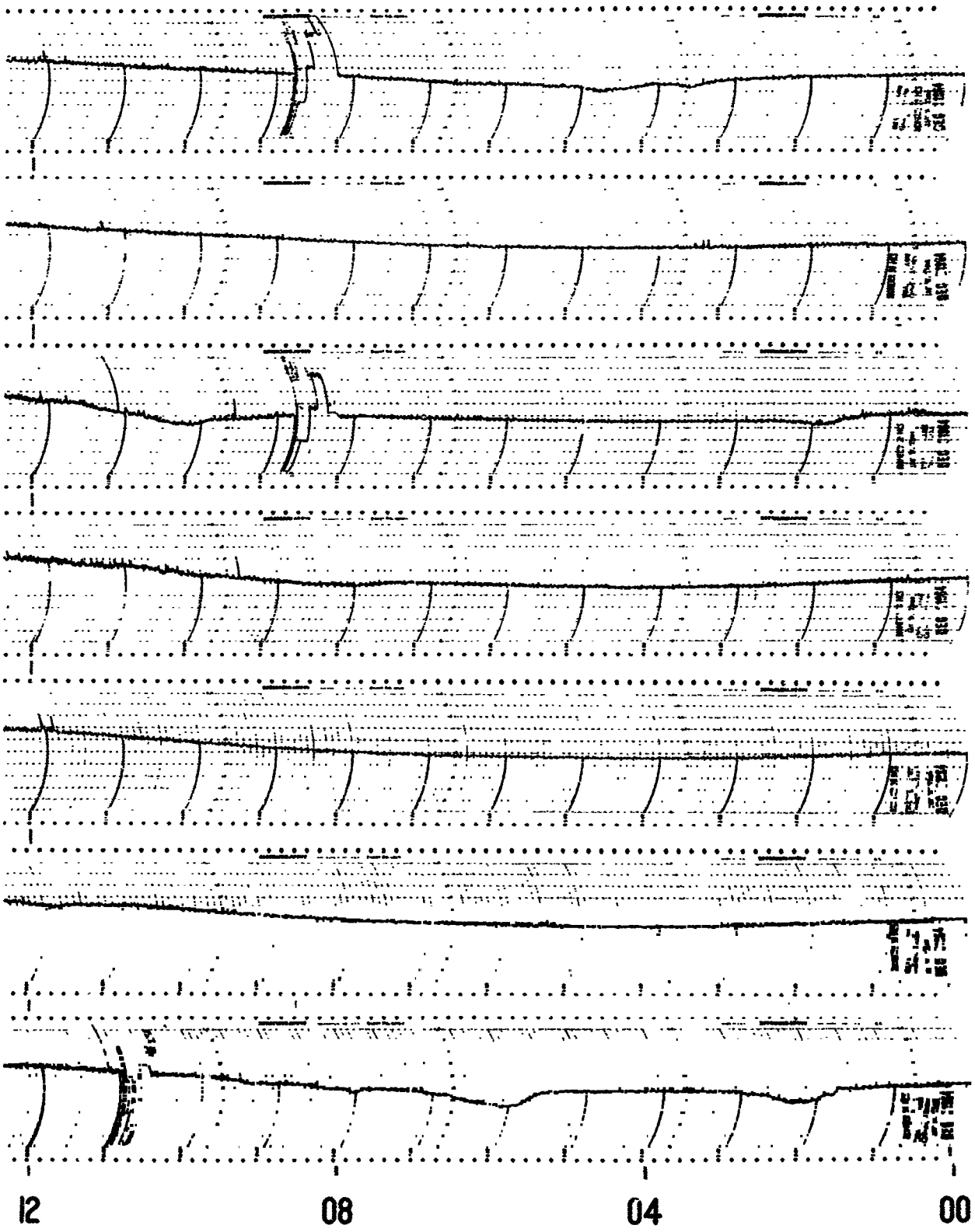

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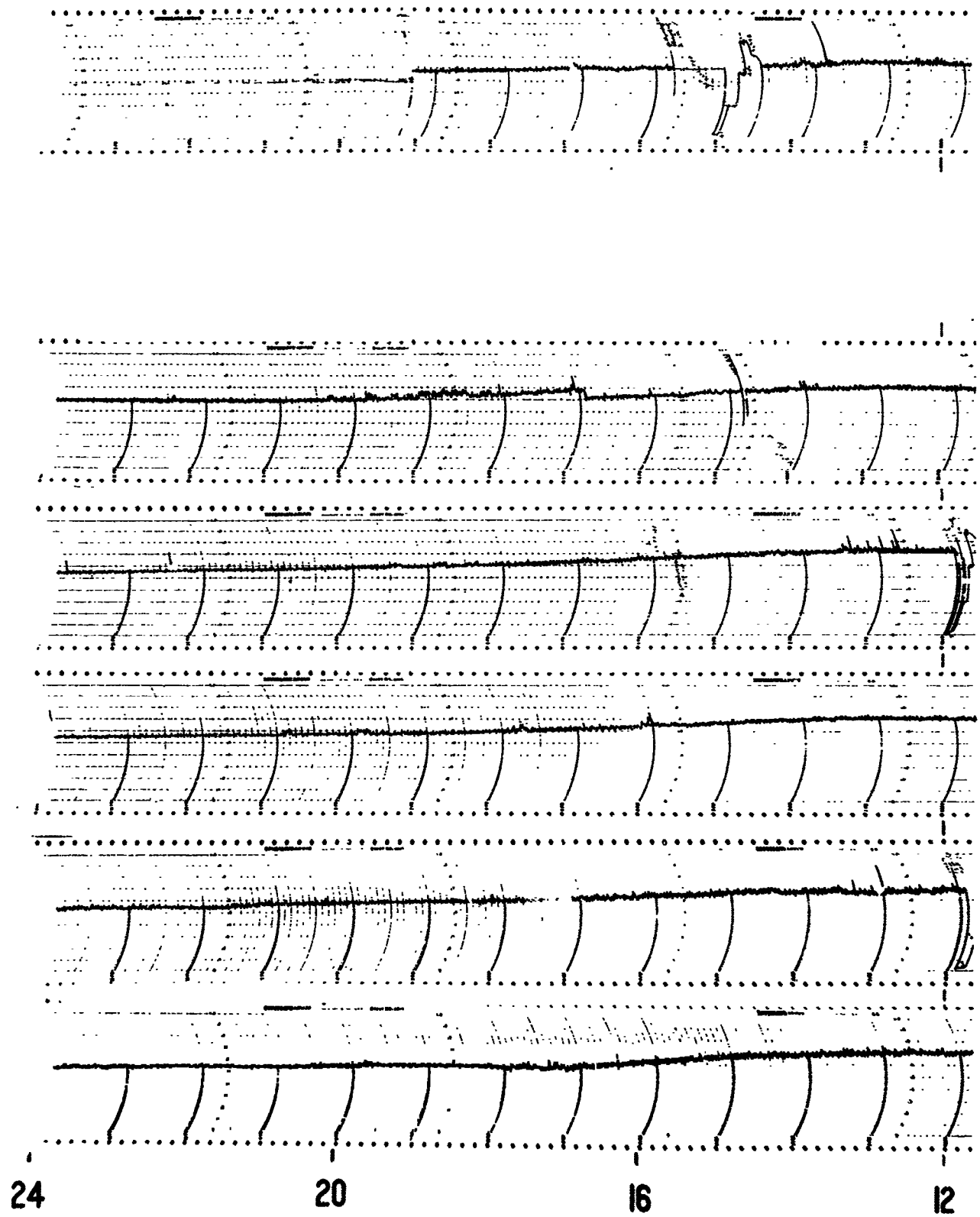

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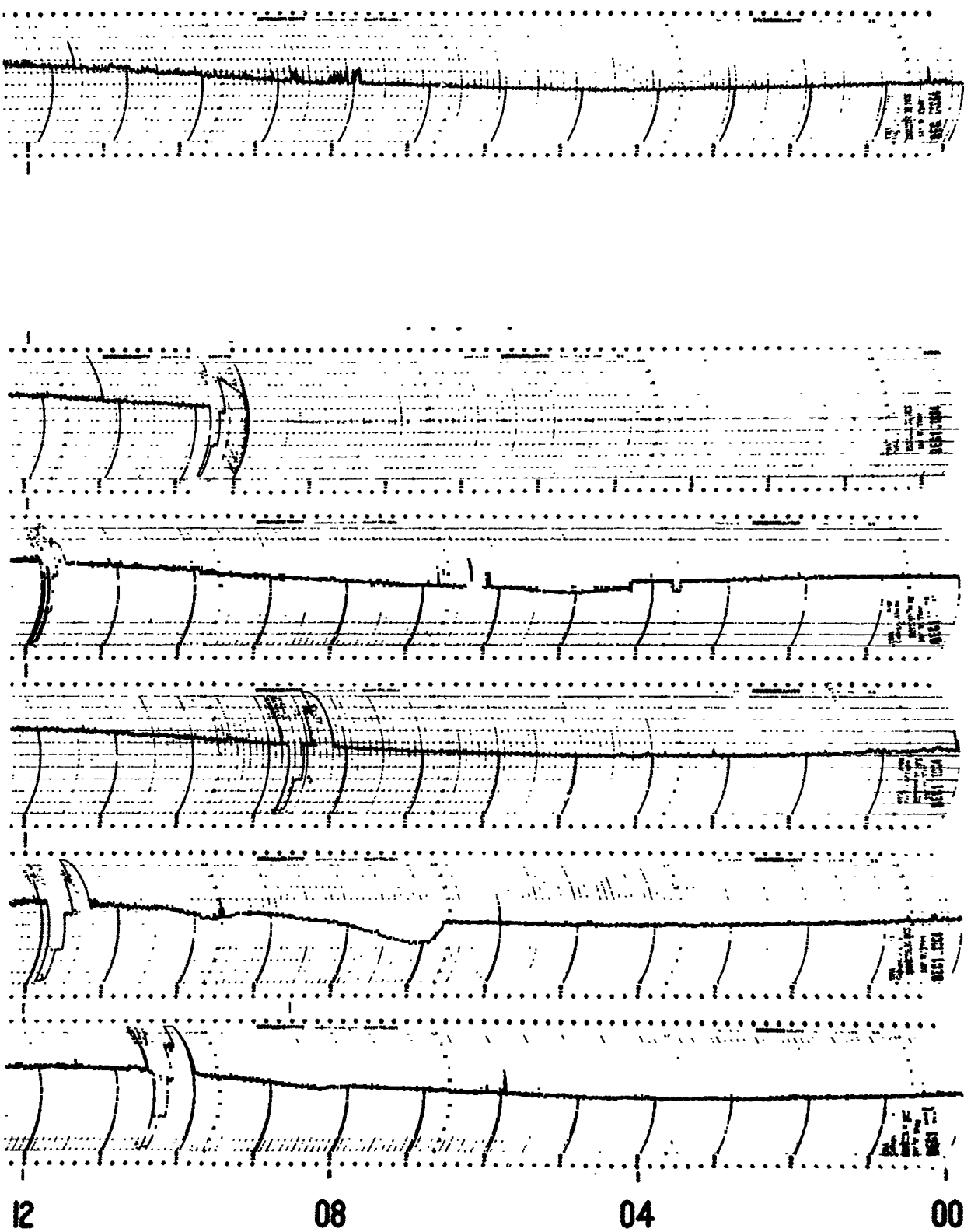

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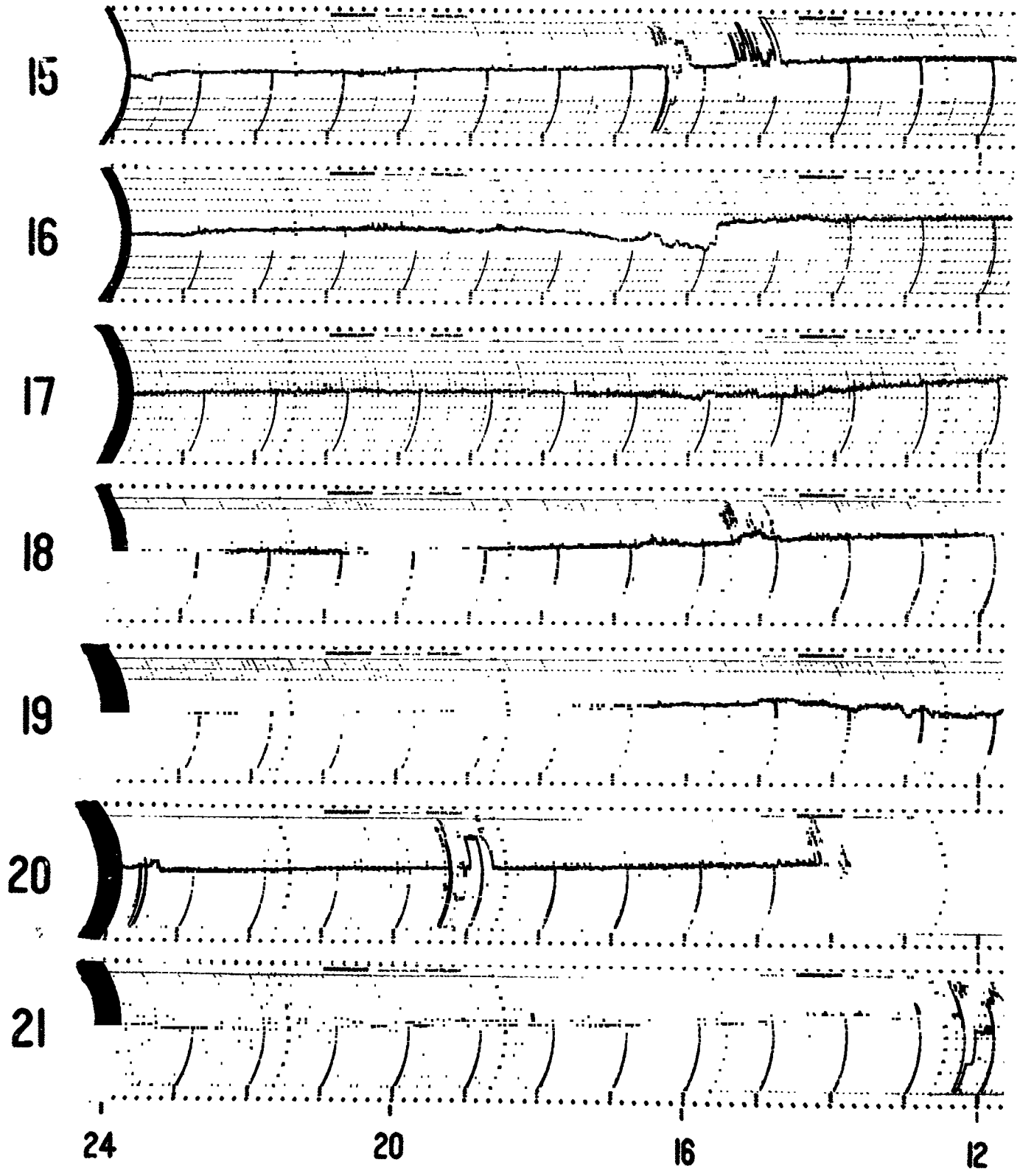

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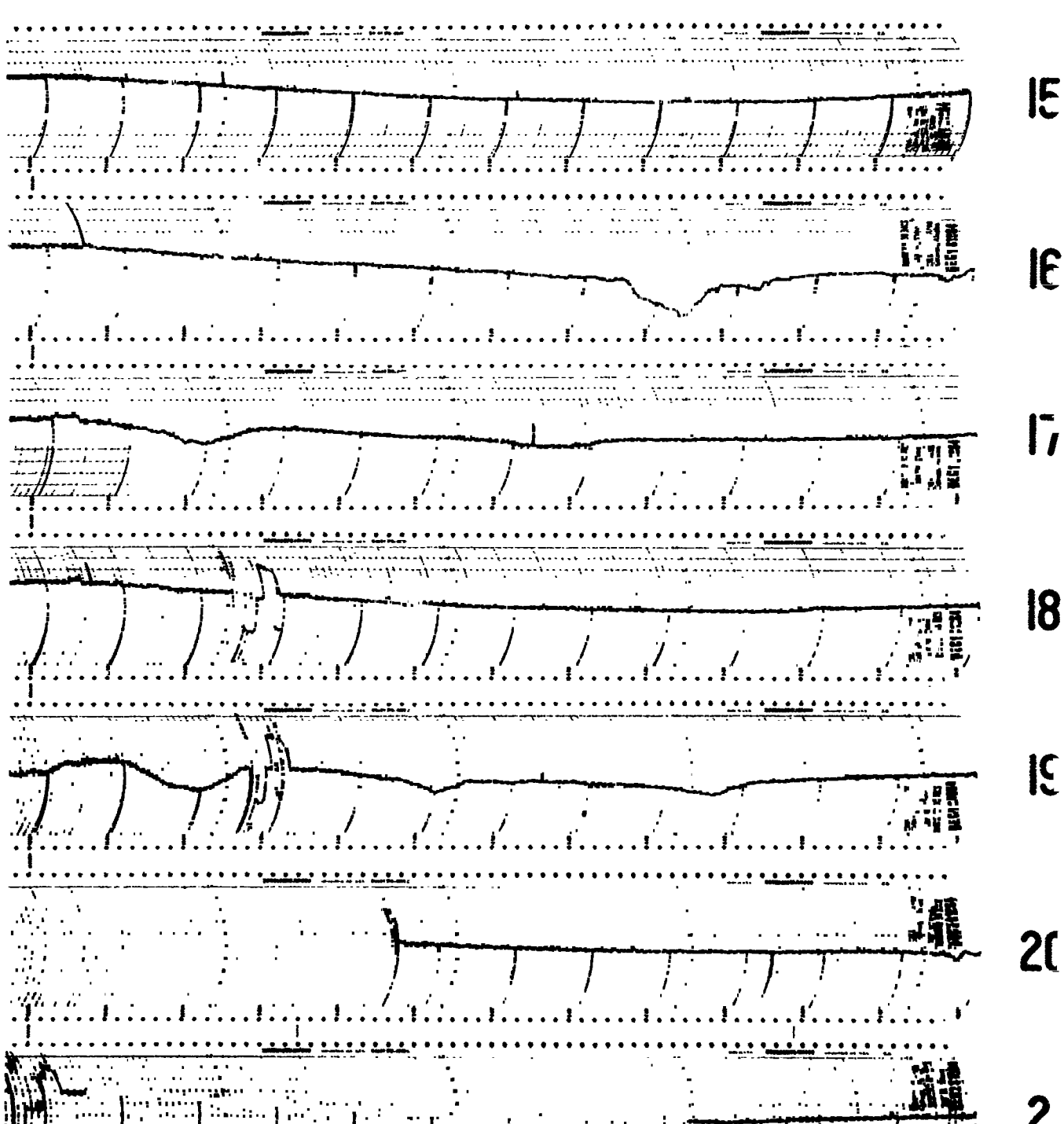

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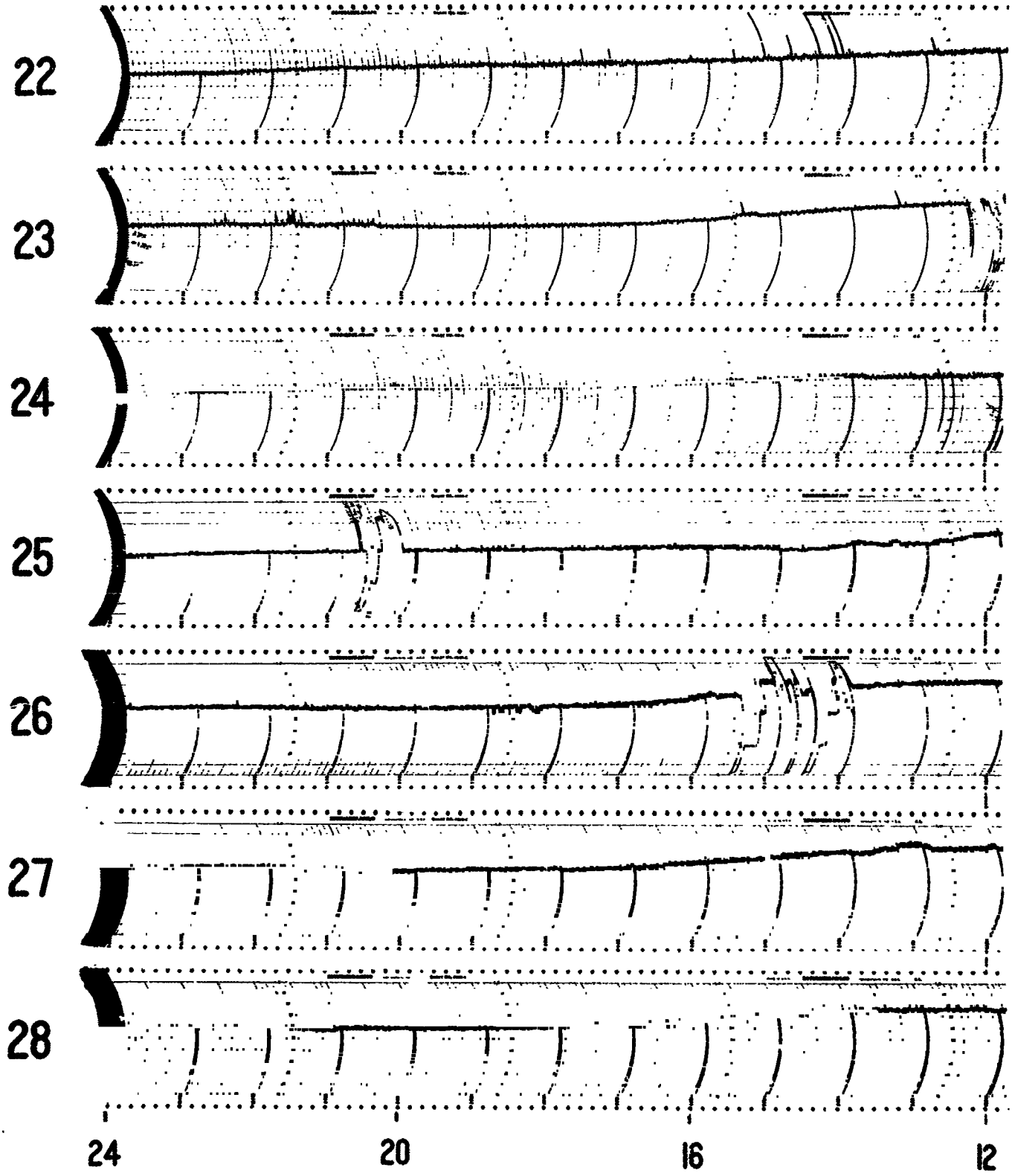

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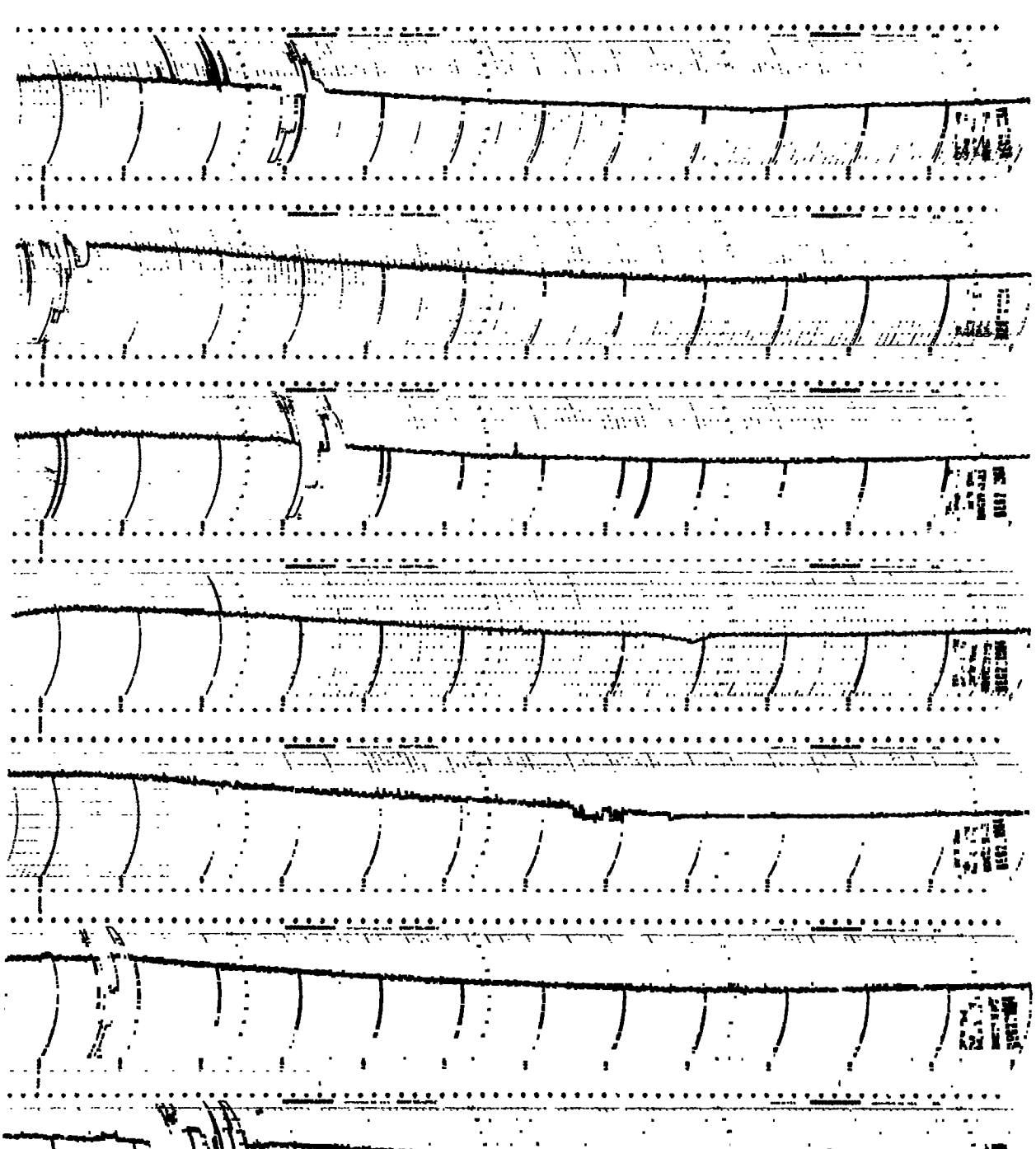

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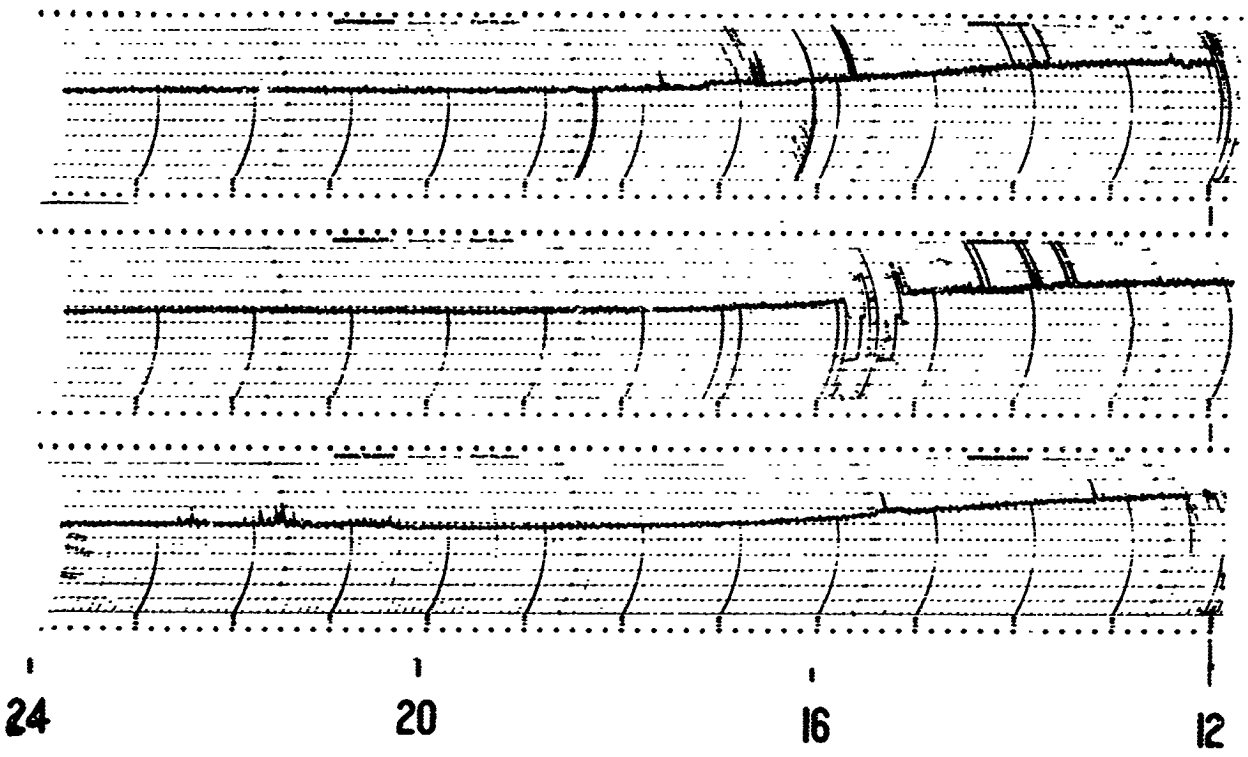

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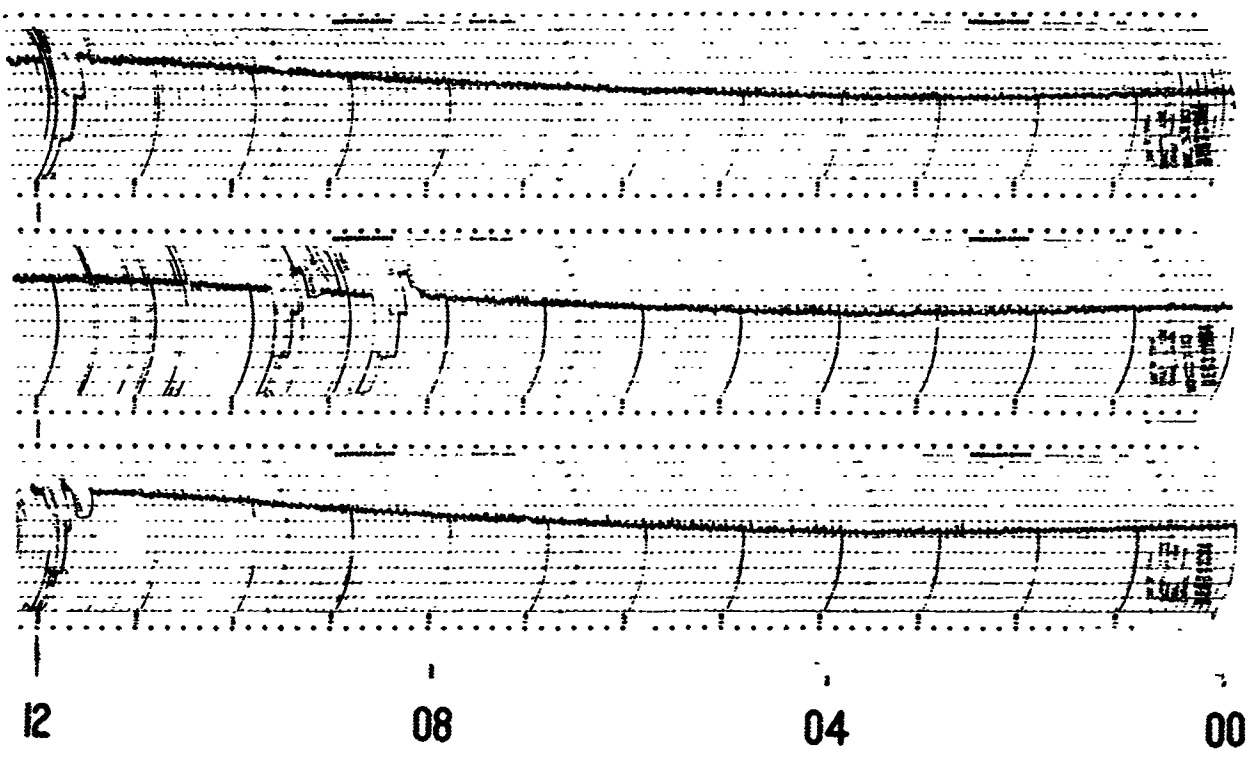


30 MC/S COSMIC NOISE

TELLURIC CURRENT ACTIVITY

V. P. Hessler
Professor of Geophysics

The electrode field is located south of the Geophysical Institute Ballaine Lake Field site (64°51'N and 147°50'W geographic and 64°37'N and 256°30'E geomagnetic). The 200 meter spaced electrodes are aligned in the N-S geographic meridian.

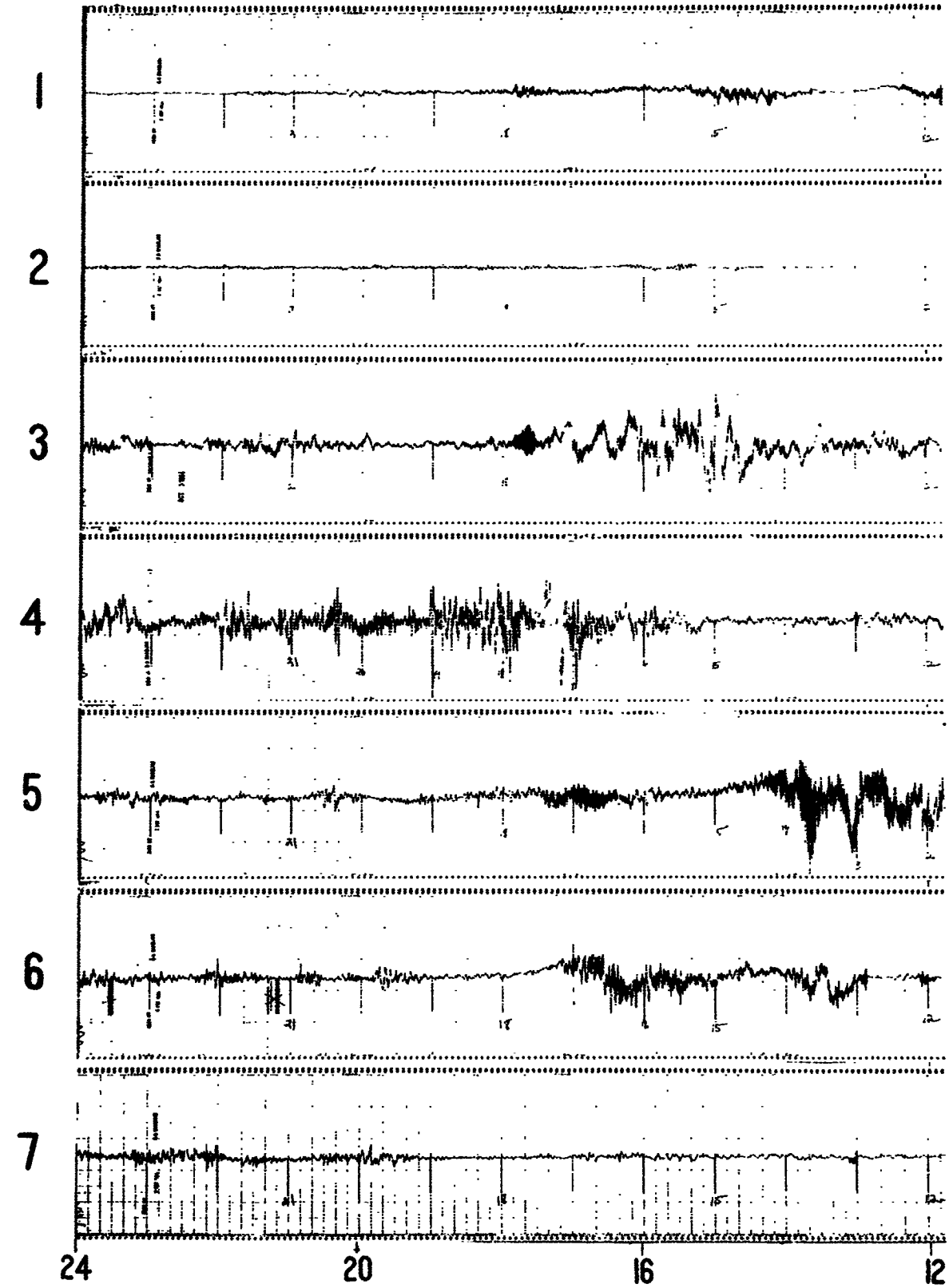
N-S telluric current records. These records are made on an L&N Speedomax recorder, with a 5 second full scale response rate, at 3 in/hr and at 1000 mv/km full scale range. Since the telluric perturbation vector tends to be linearly polarized (N 35° W geographic at this site) the N-S trace alone gives a good indication of the total activity. These telluric records always carry much more fine structure than the corresponding magnetograms and thus are a more sensitive indicator of ionospheric activity. Note: The normal recording system was out of order during the epoch 23-31 December, and thus a set of Esterline Angus records have been substituted. Since the transistor amplier gain varied the range must be determined from the hour marks, according to the formula: Range in mv/km = 165/length of hour mark in fraction of full scale.

N-S telluric amplitude activity. The N-S telluric trace is scaled for hourly values of arithmetic range in a manner similar to that used in scaling magnetic K-indices. By range is meant the difference between the greatest positive and negative departure from an arbitrarily assigned zero trace (the diurnal variation at College is negligible in comparison with the disturbance phenomena). Monthly correlation coefficients between magnetic A figures and telluric amplitude scalings are always close to 0.95. Thus the telluric amplitude activity scalings presented herein are an index of ionospheric activity similar to the K-indices, but in more detail since the scalings are arithmetic and hourly in contrast to the 3-hourly quasi-logarithmic K-indices.

Telluric fluctuation activity. The fluctuation count is made on the same recorder as the N-S trace. The equipment consists of a 10-point stepping relay, a clutch driven microswitch, and an operations pen attached to the recorder. The switch is closed as the pen starts upscale and opens as it starts downscale. Thus within the sensitivity of the equipment the stepping relay advances one step for each cycle of fluctuations regardless of amplitude or pen position. At a recorder full scale range of 1000 mv/km the equipment will record fluctuations down to 5 mv/km. The data serve as an index of micropulsations activity showing diurnal, seasonal and sunspot cycle variations. The nighttime fluctuations are closely correlated with aurorally associated cosmic noise absorption. An indication of the micropulsation period in seconds can be obtained by dividing 3600 by the cycle per hour value.

The collection, analysis, and publication of these telluric current records and scalings is supported in part by the Air Force Cambridge Research Laboratories, Office of Aerospace Research under Contract No. AF 19(628)-1695, monitored by Mr. Elwood Maple.

N-S TELLURIC CURRENT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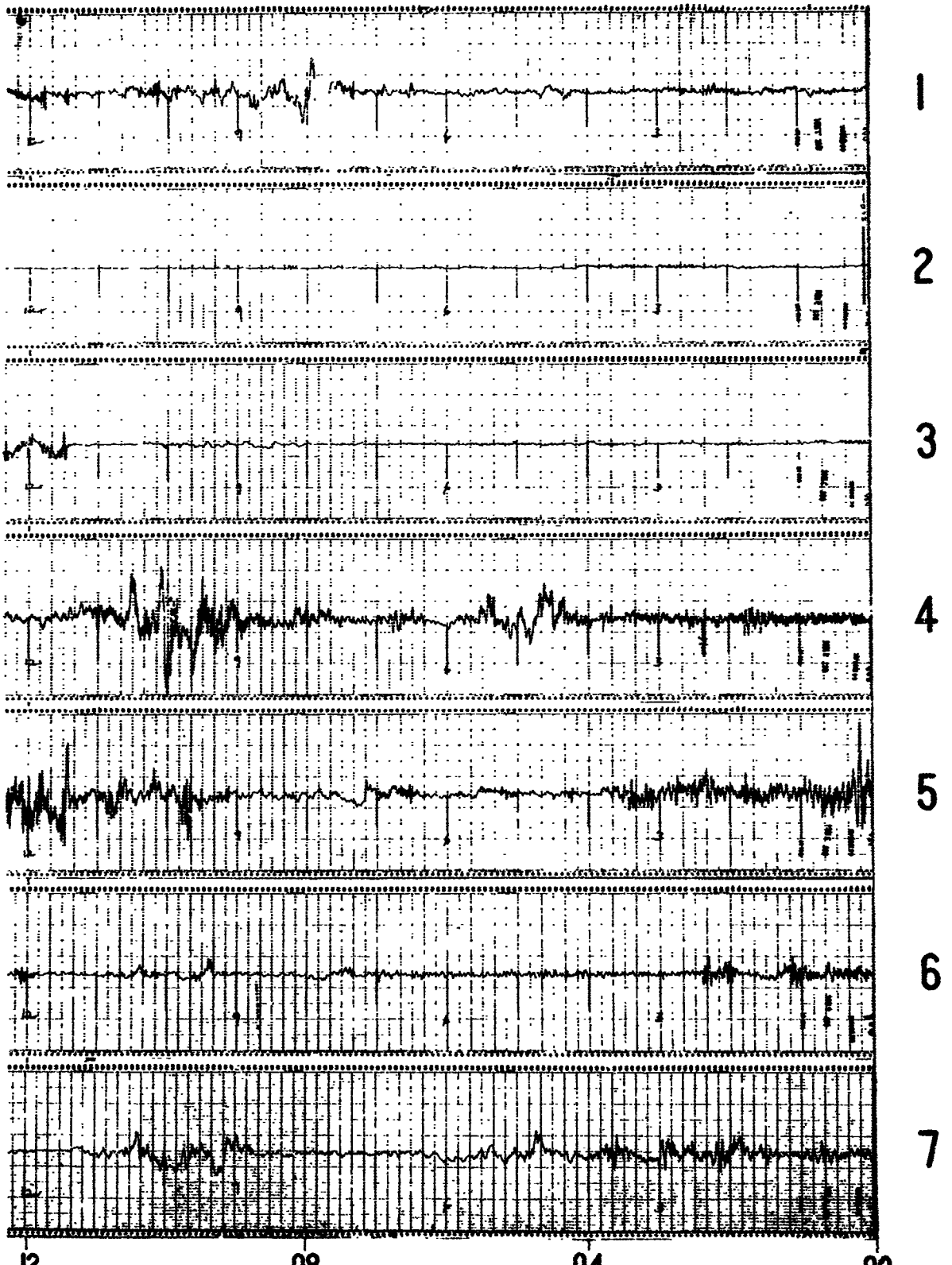

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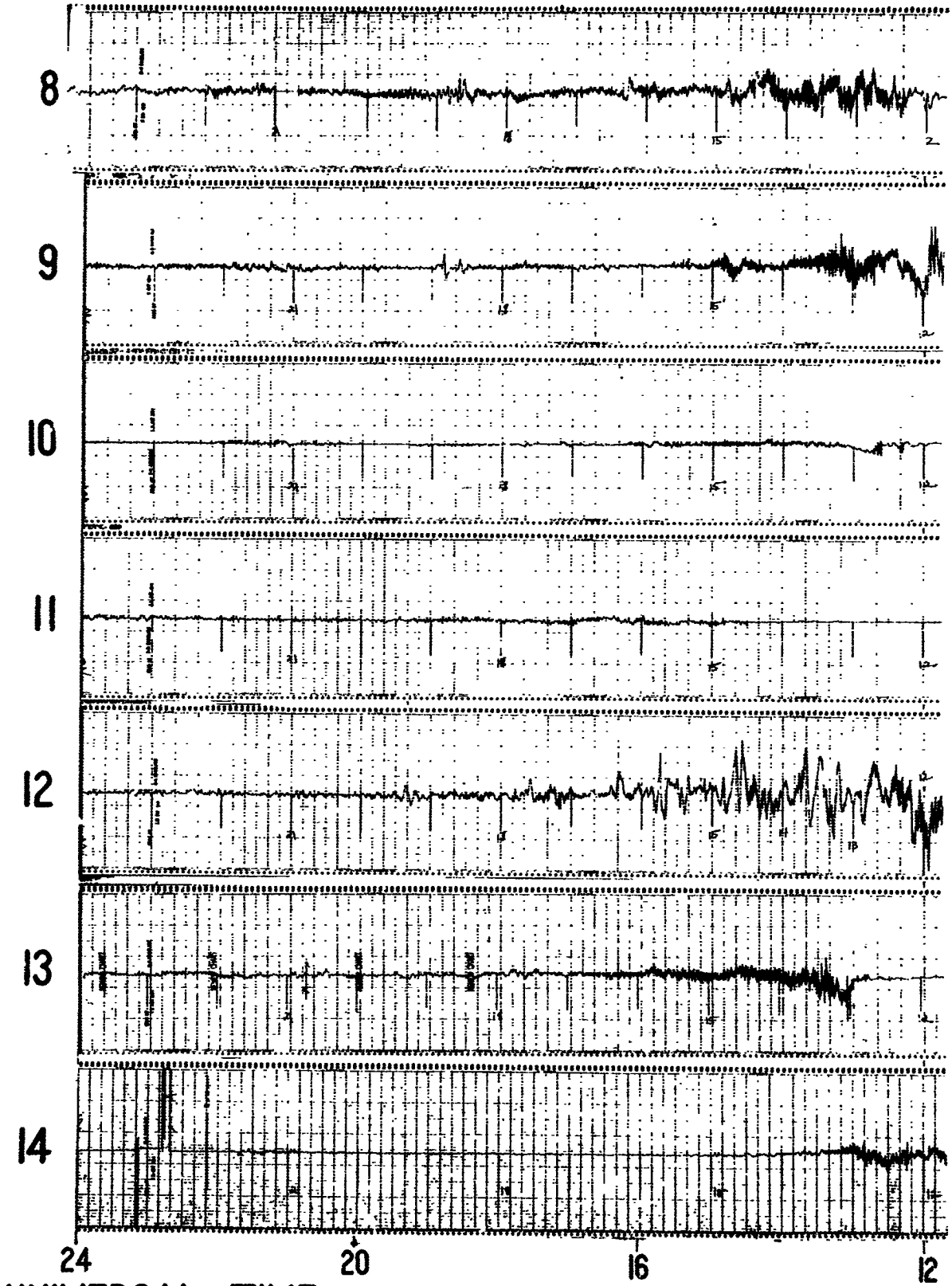

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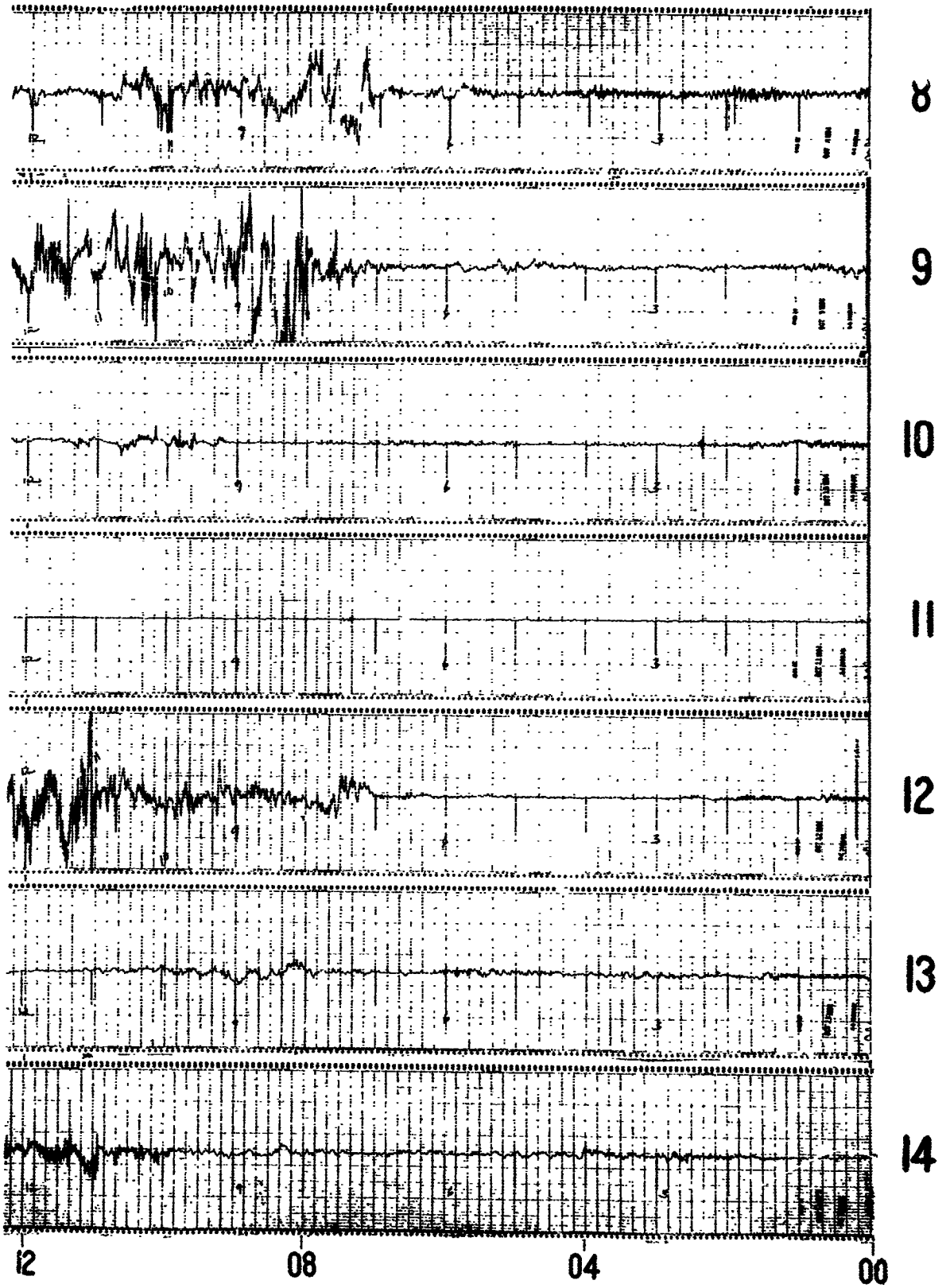

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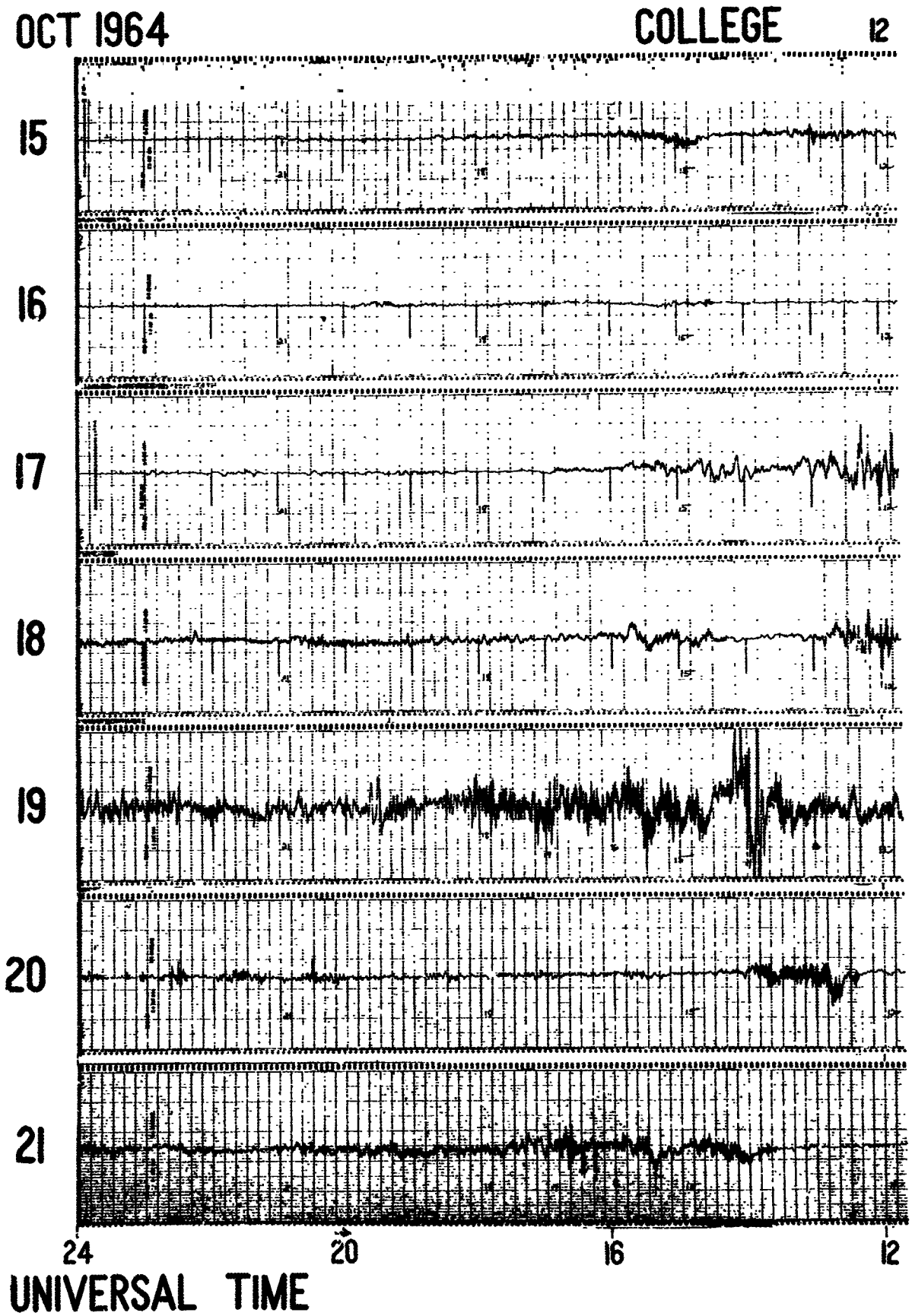
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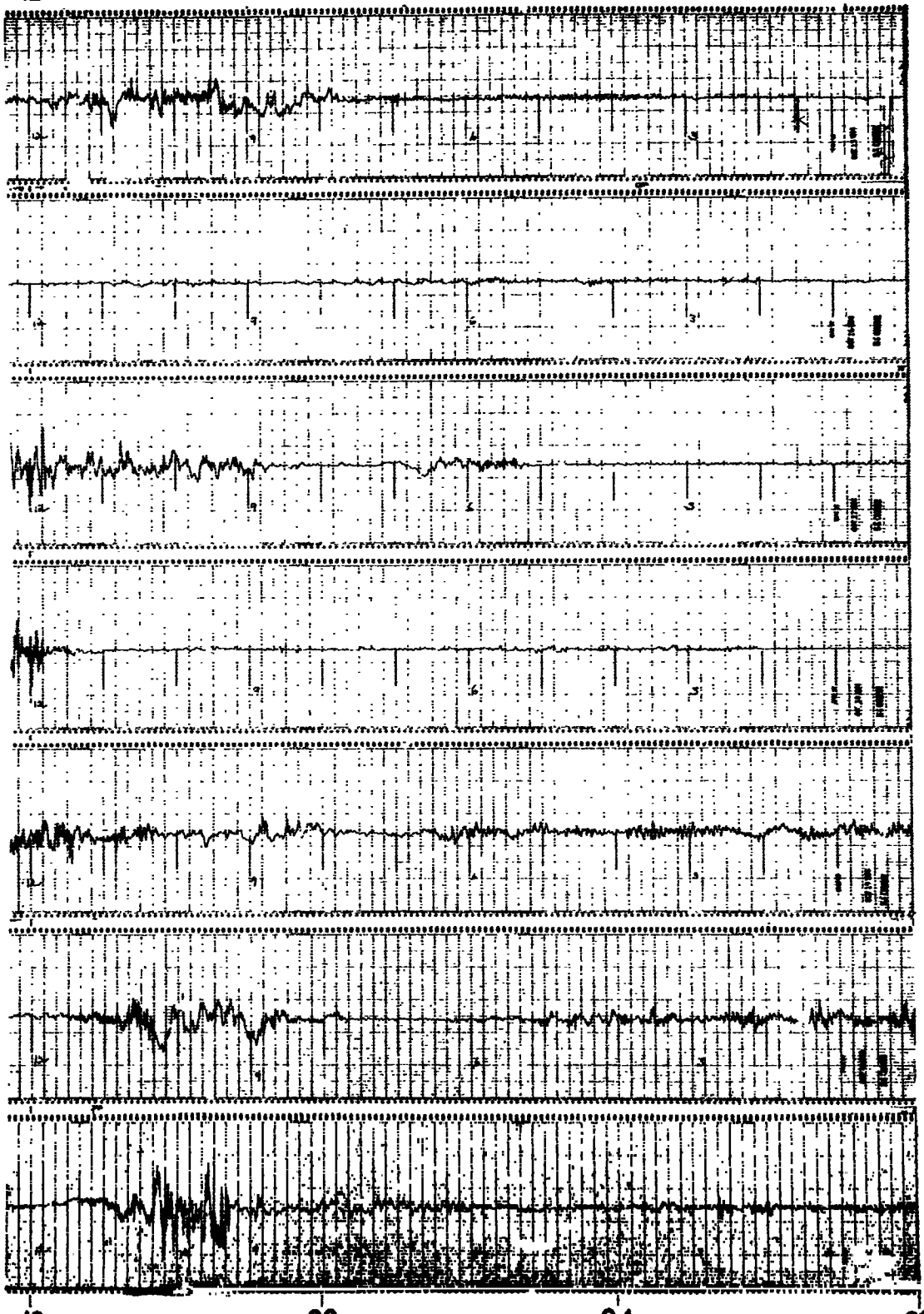

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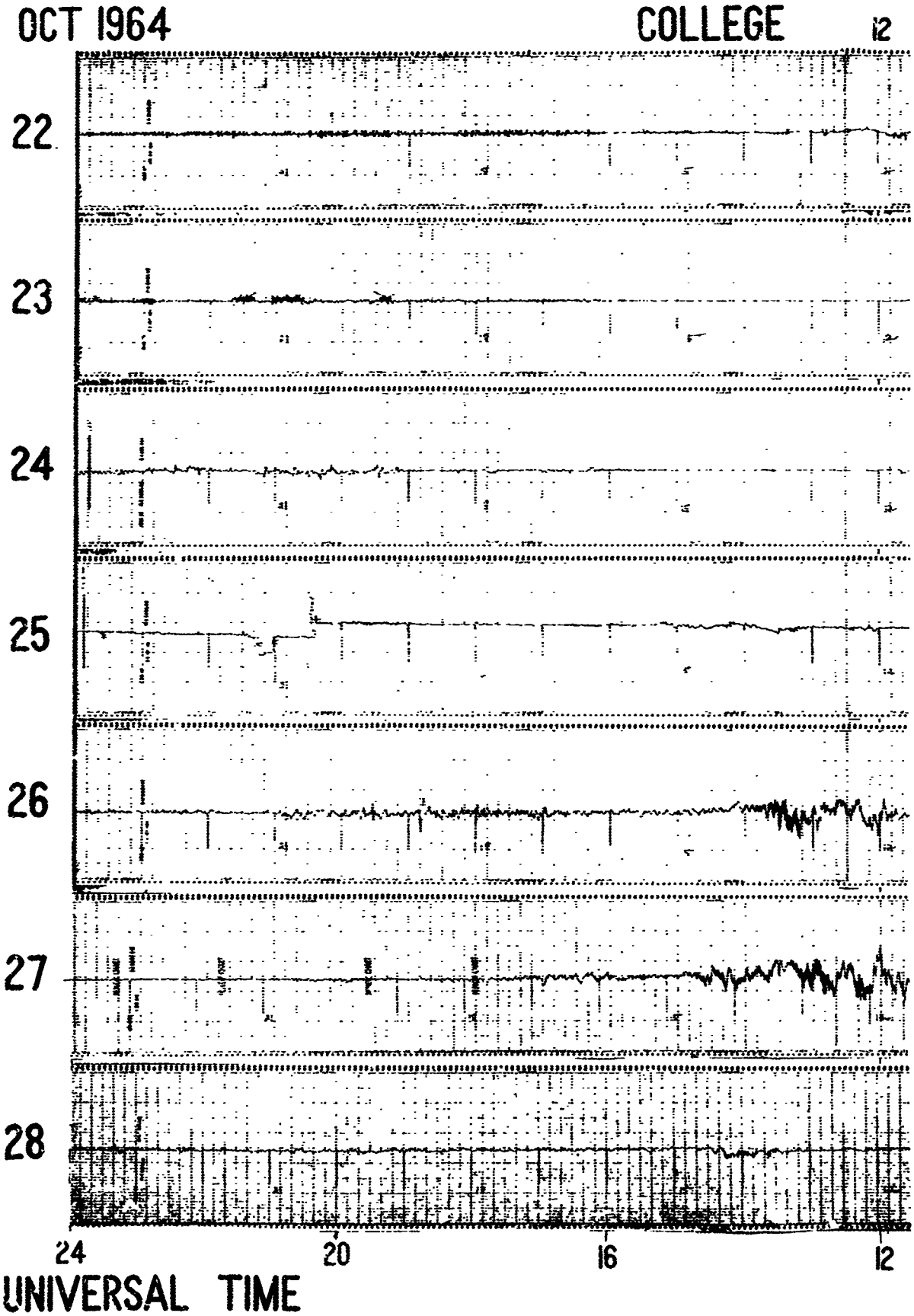
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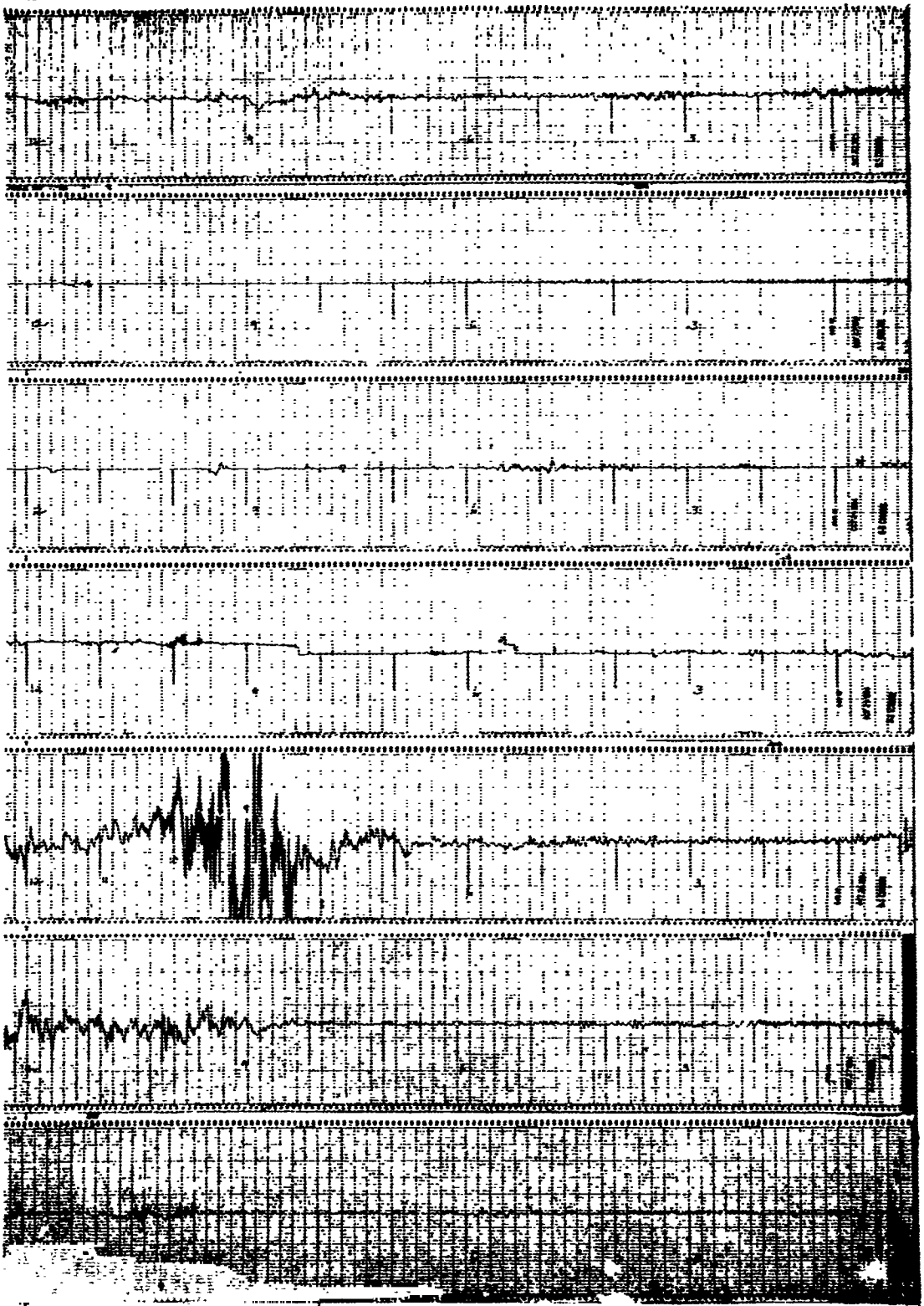

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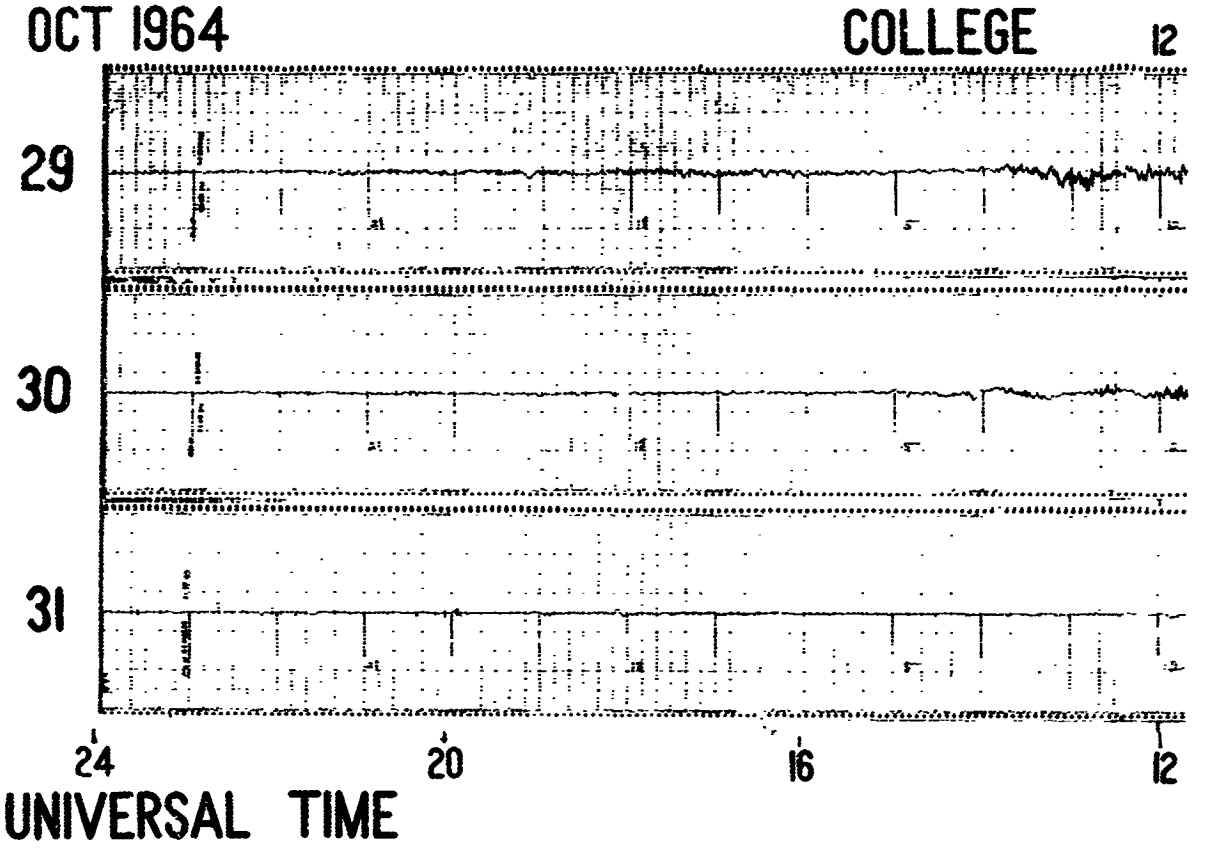
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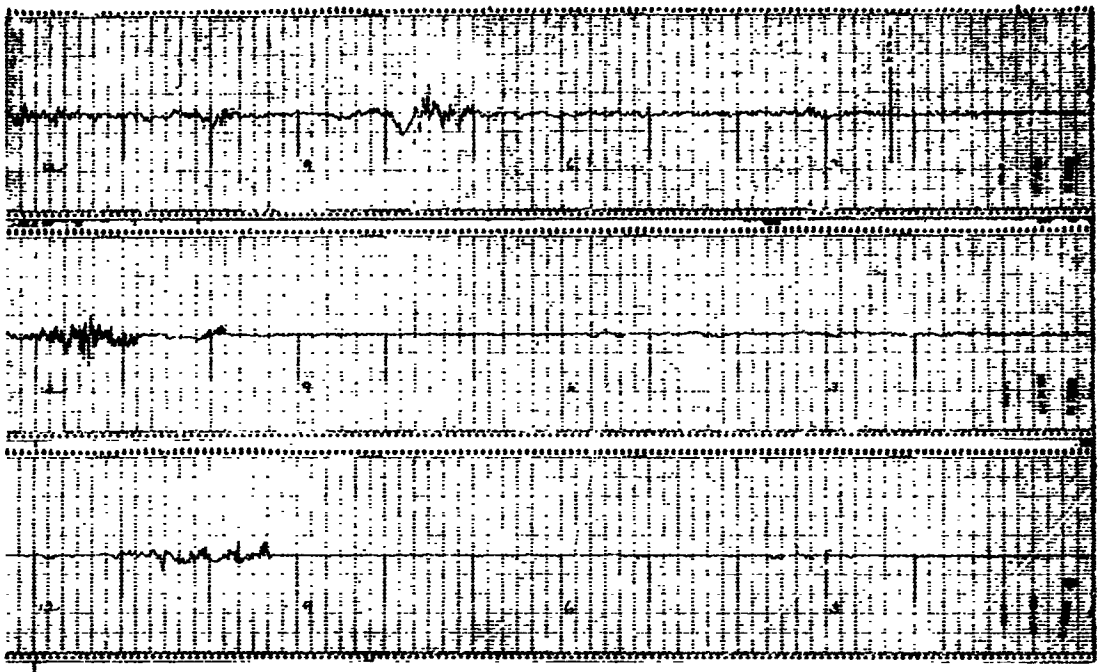

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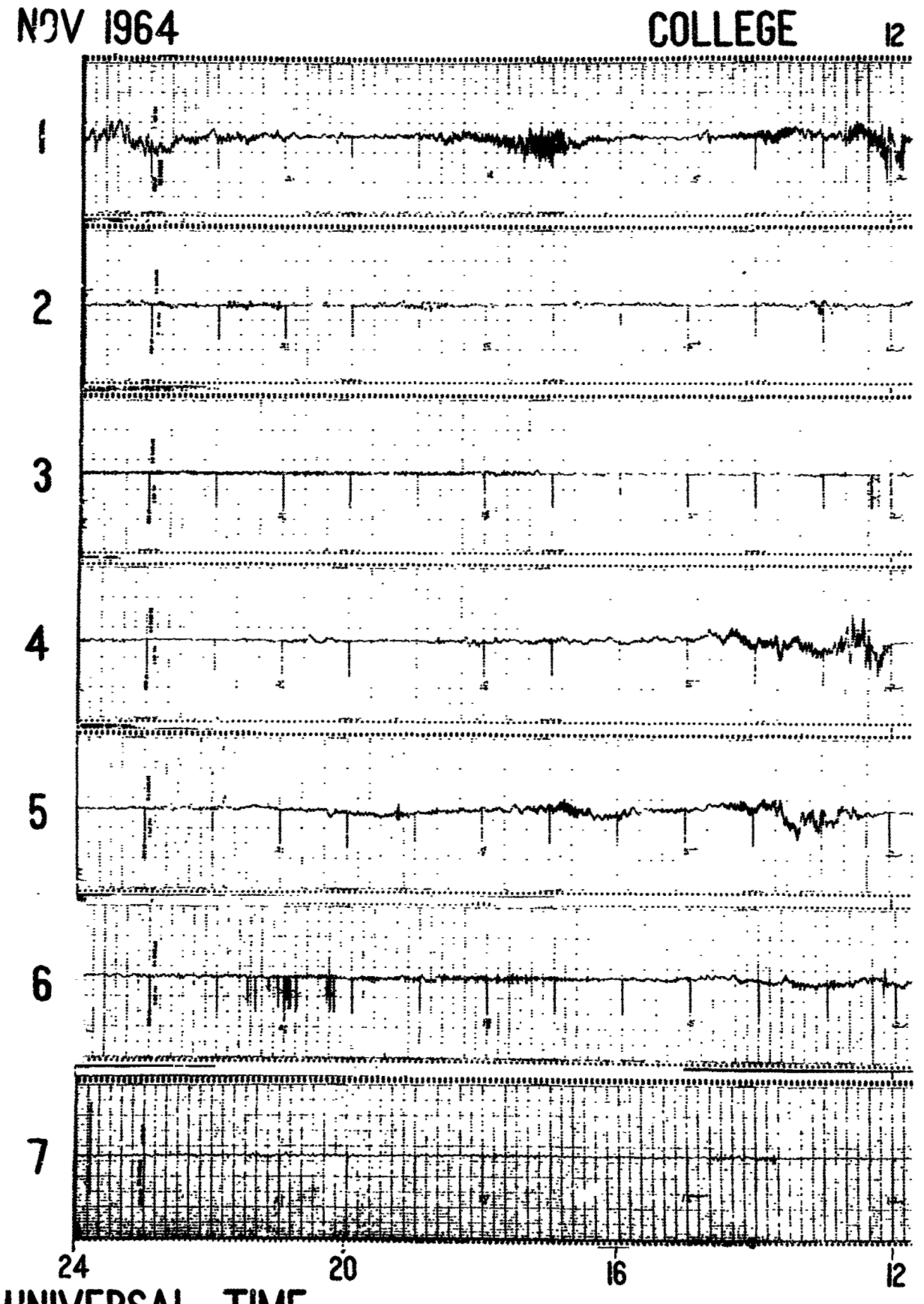
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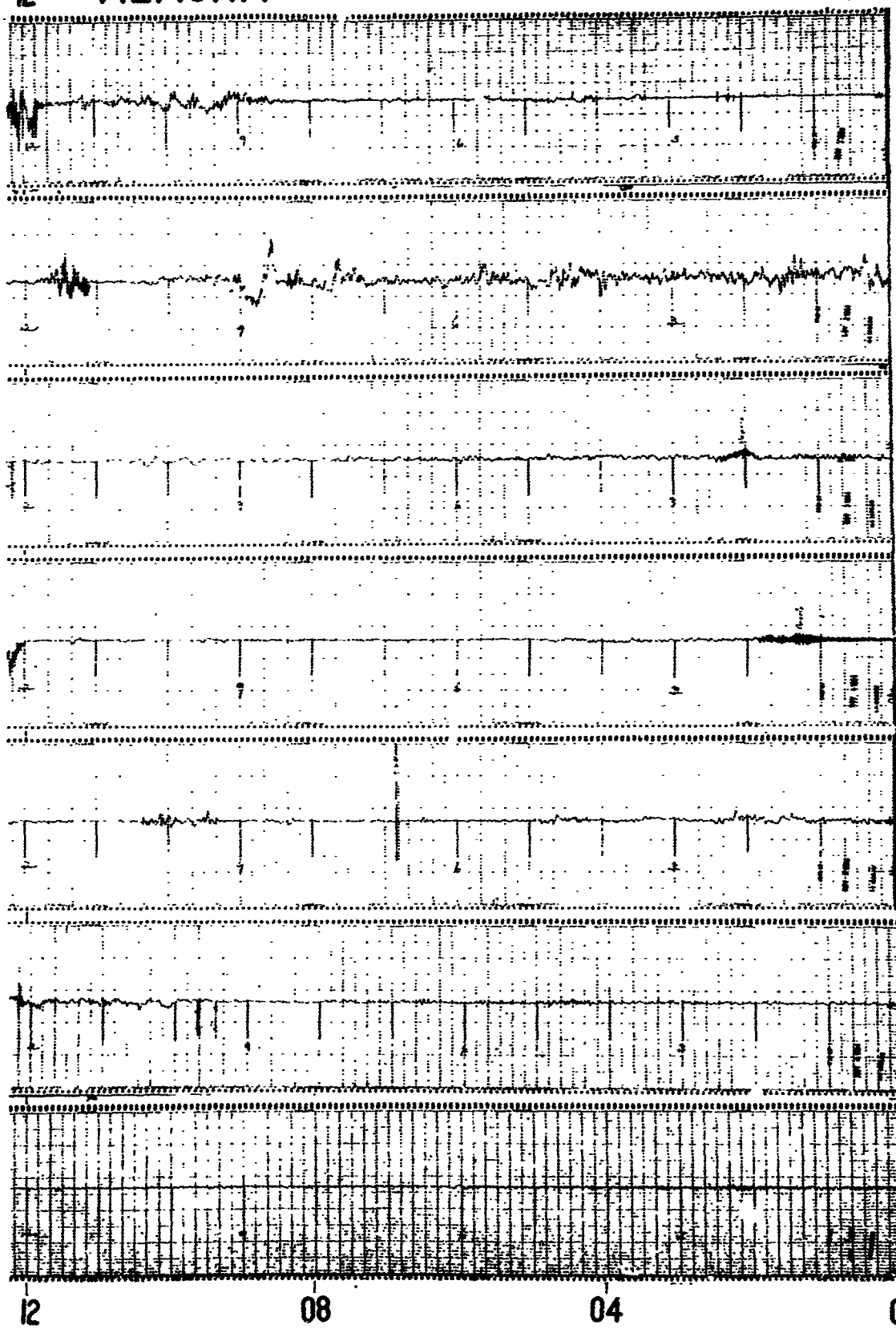

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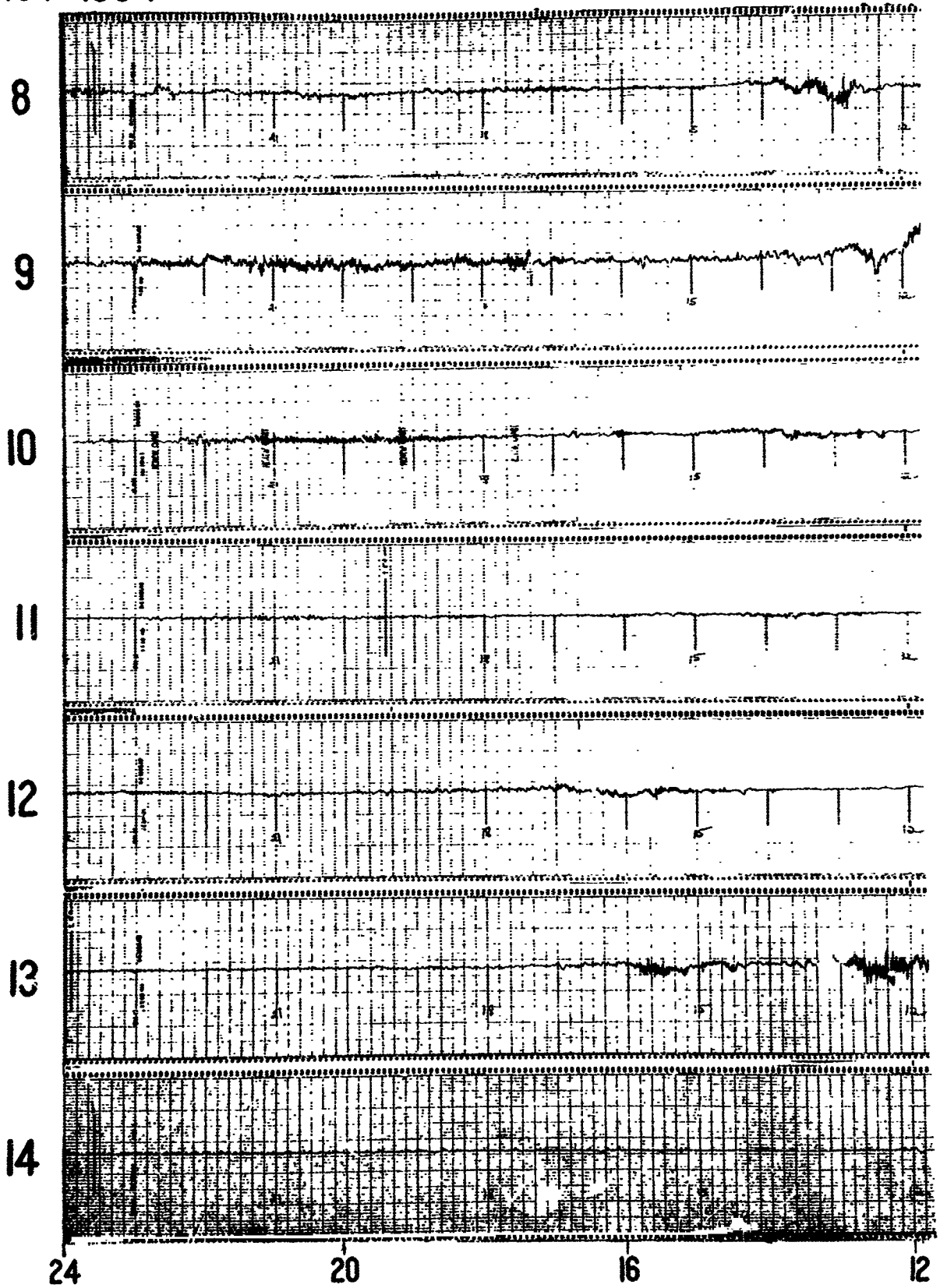

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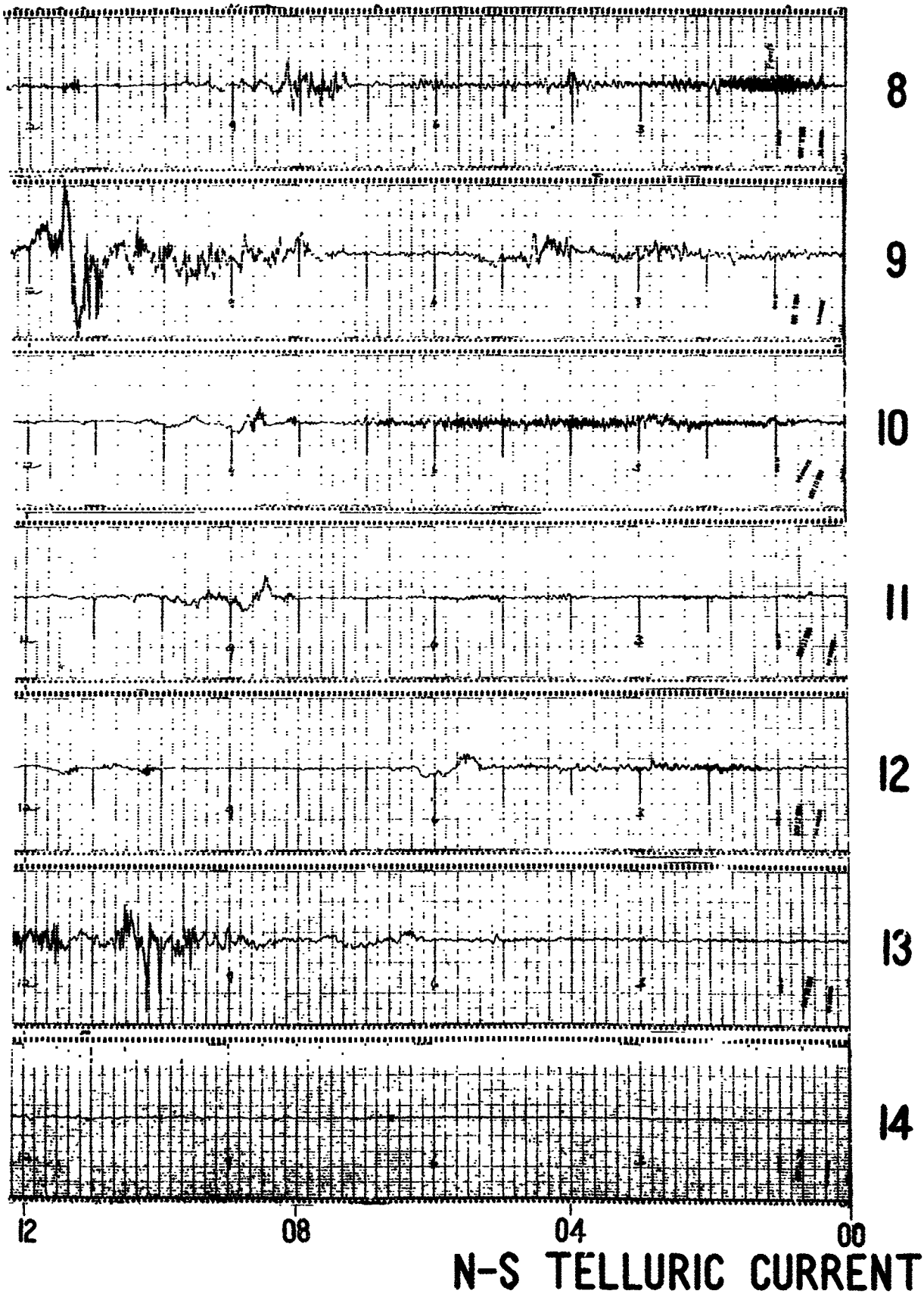
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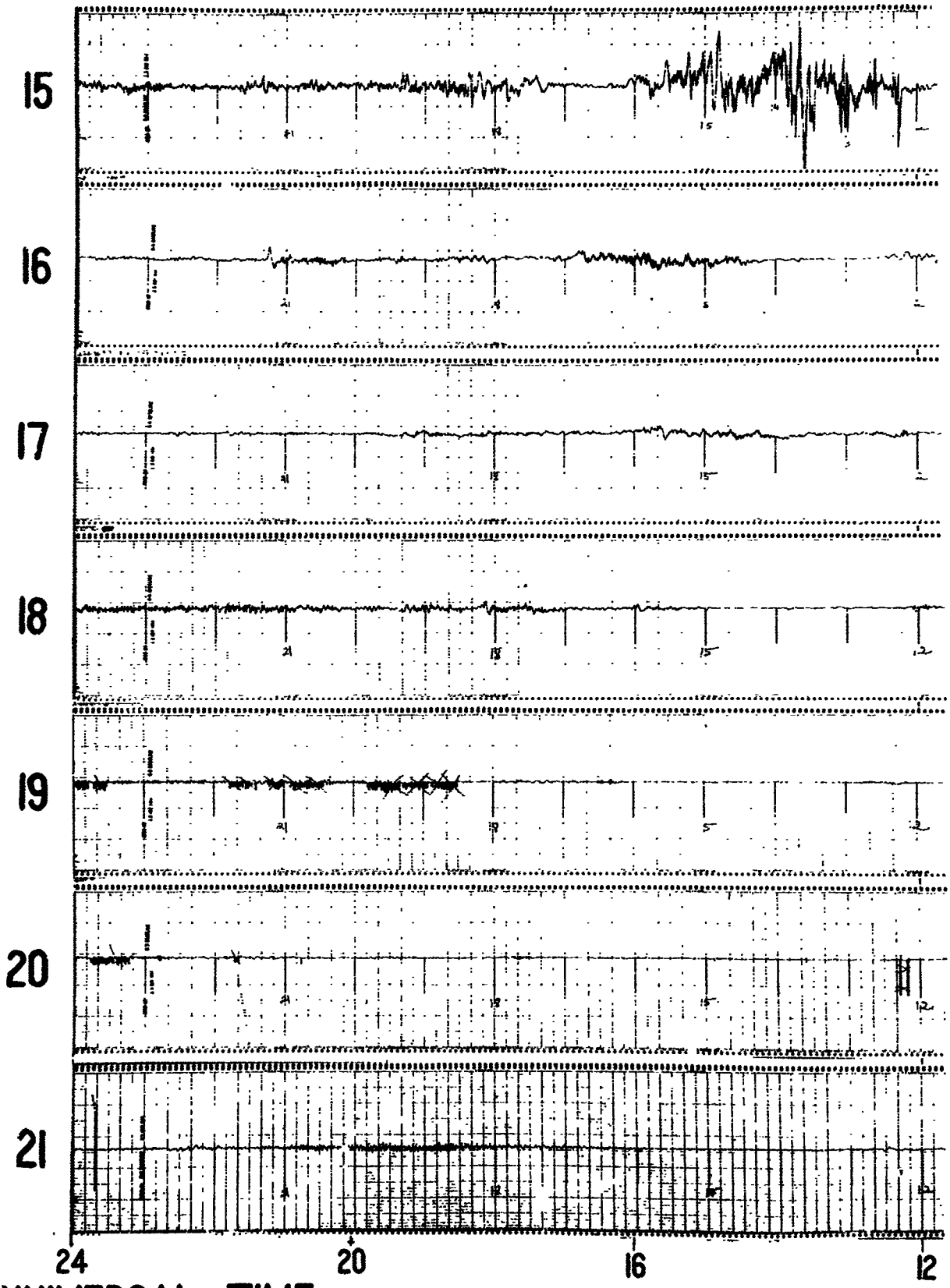
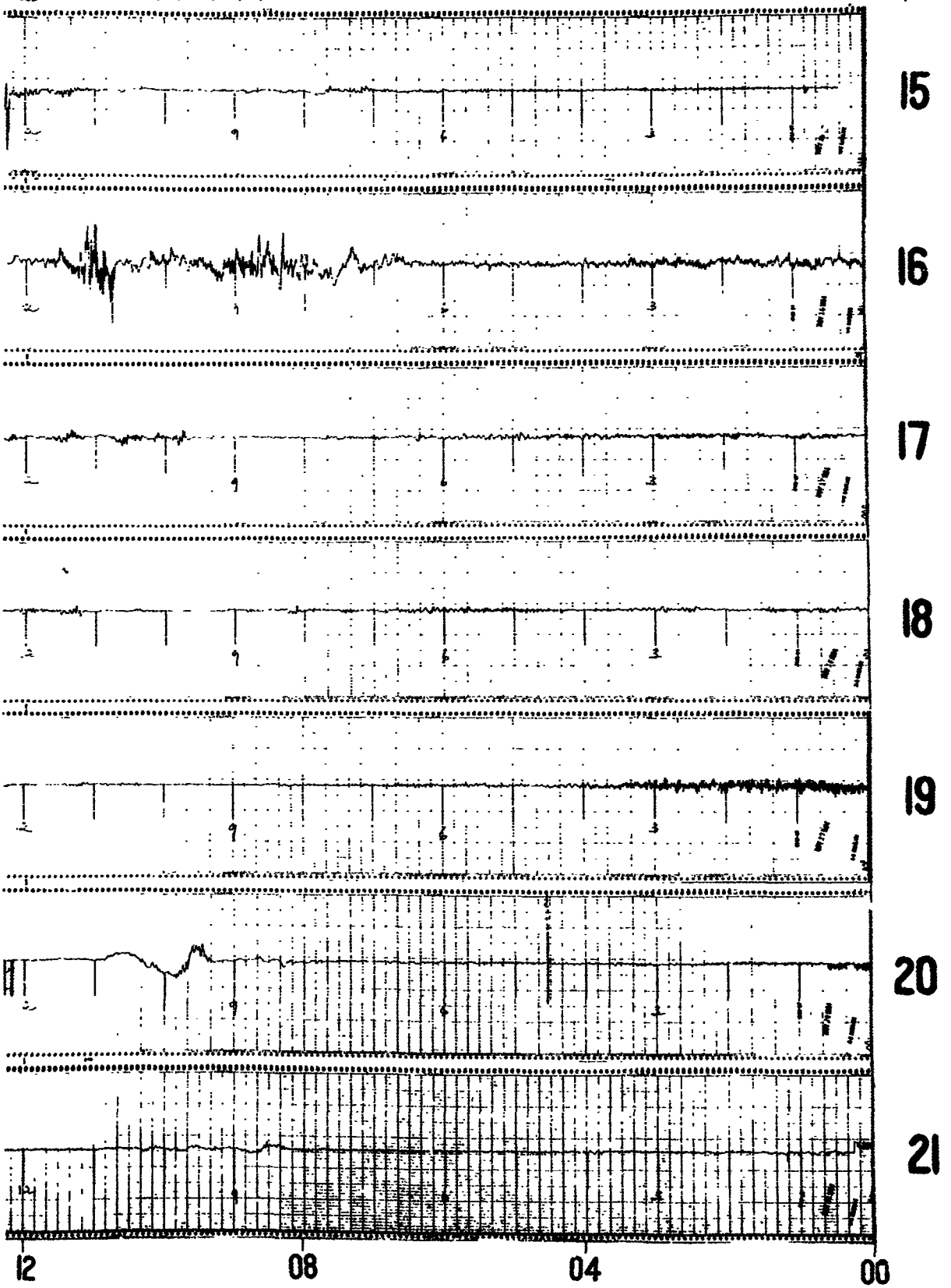
14
12
08
04
00
N-S TELLURIC CURRENT

NOV 1964 COLLEGE 12

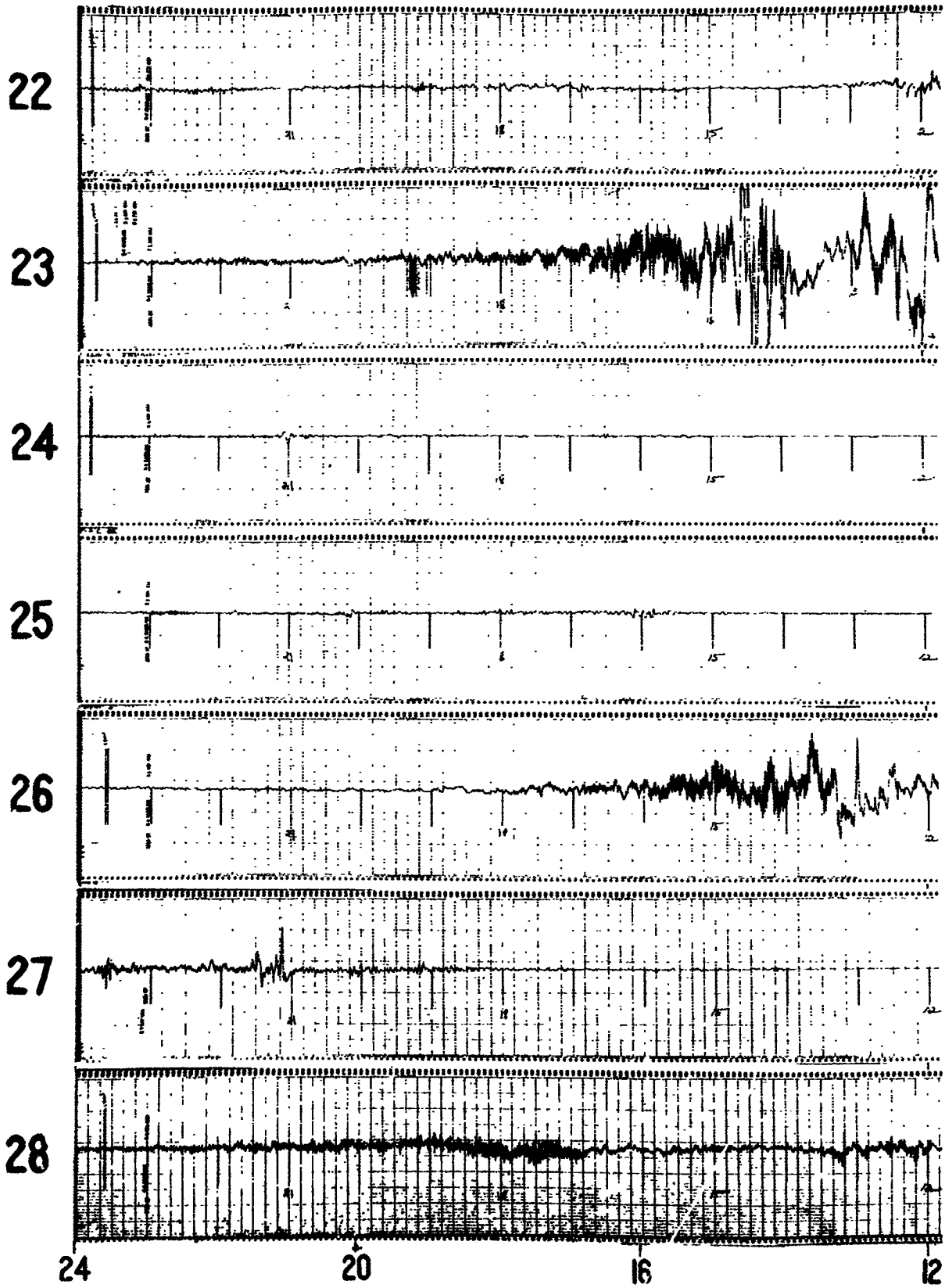


12 ALASKA NOV 1964

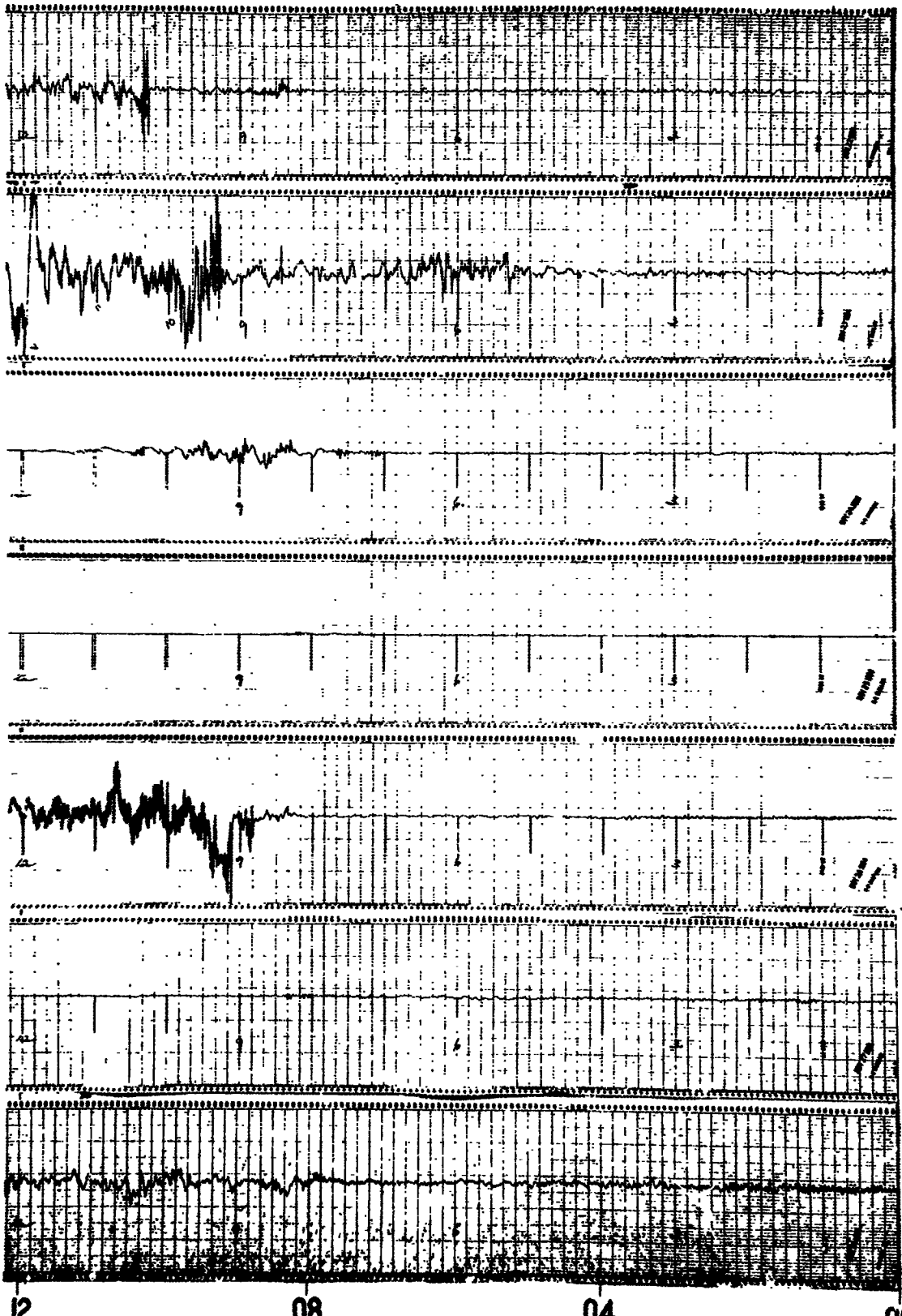


N-S TELLURIC CURRENT

NOV 1964 COLLEGE 12

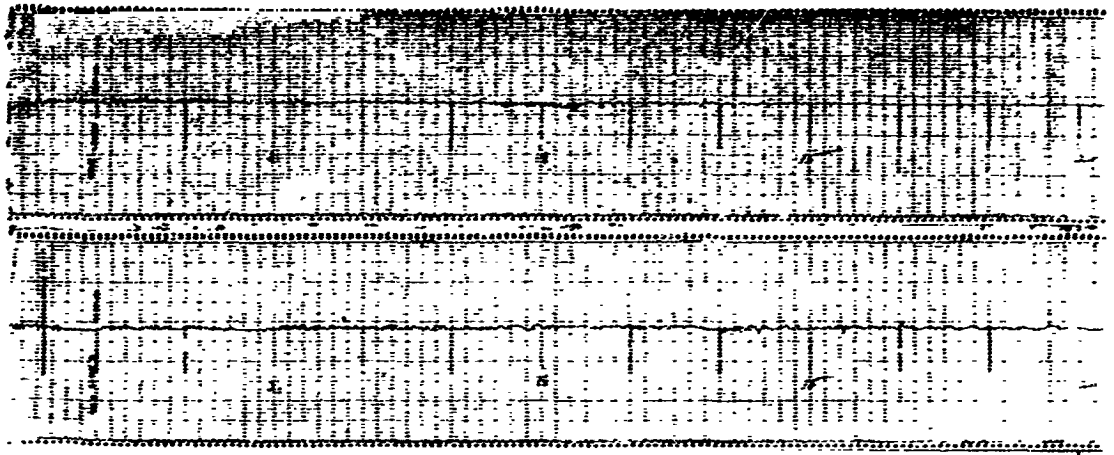


12 ALASKA NOV 1964



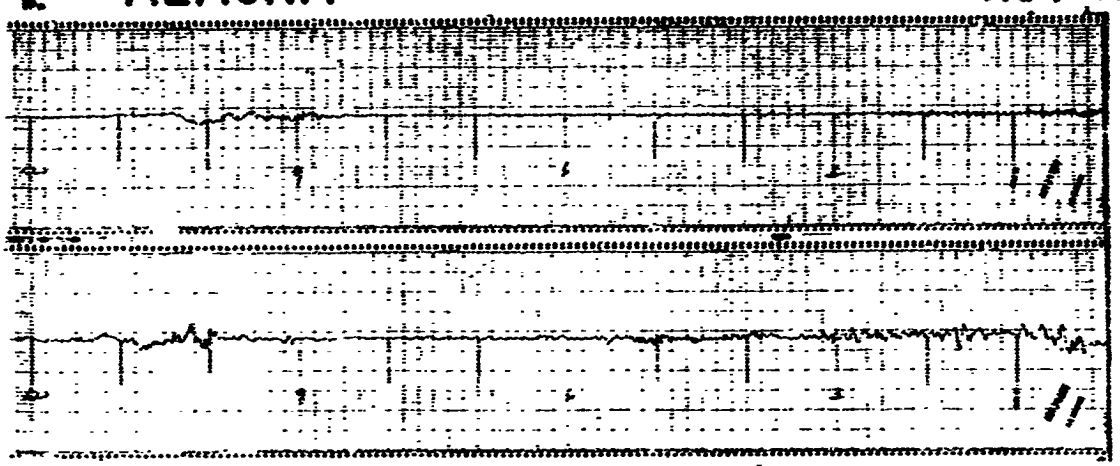
N-S TELLURIC CURRENT

NOV 1964 COLLEGE 12



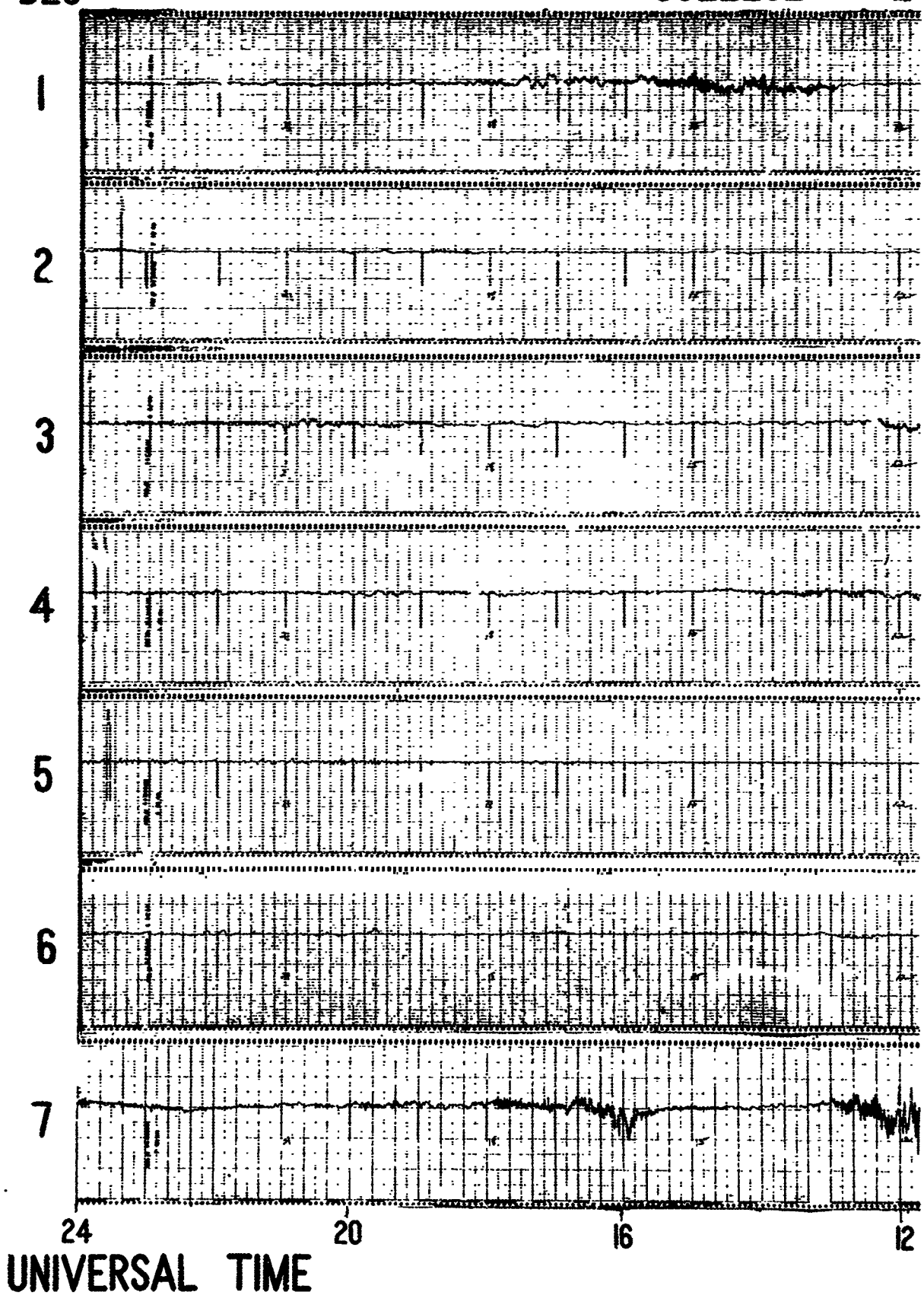
UNIVERSAL TIME

12 ALASKA NOV 1964



12 08 04 00

N-S TELLURIC CURRENT


DEC 1964
COLLEGE
1
2
3
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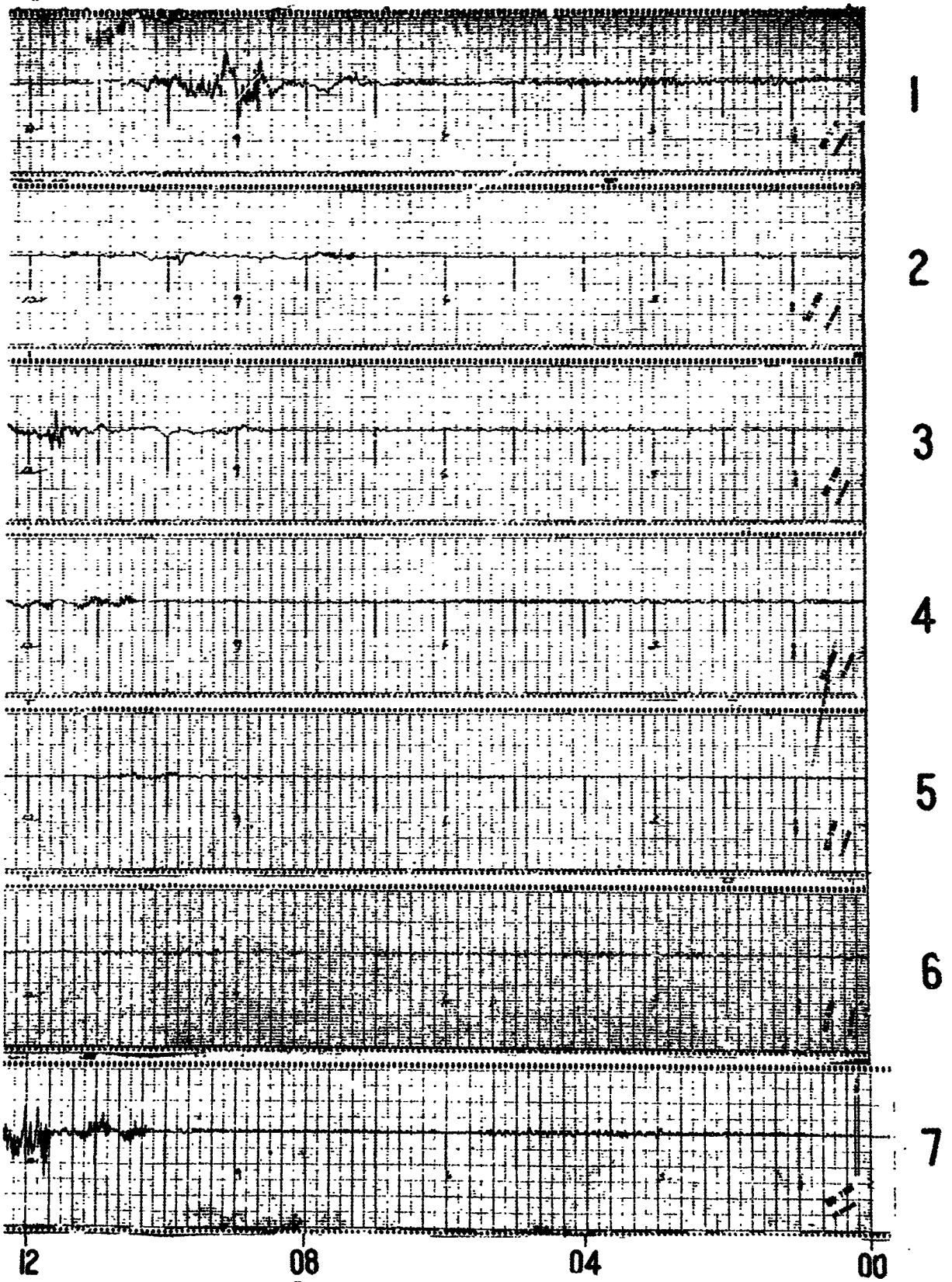
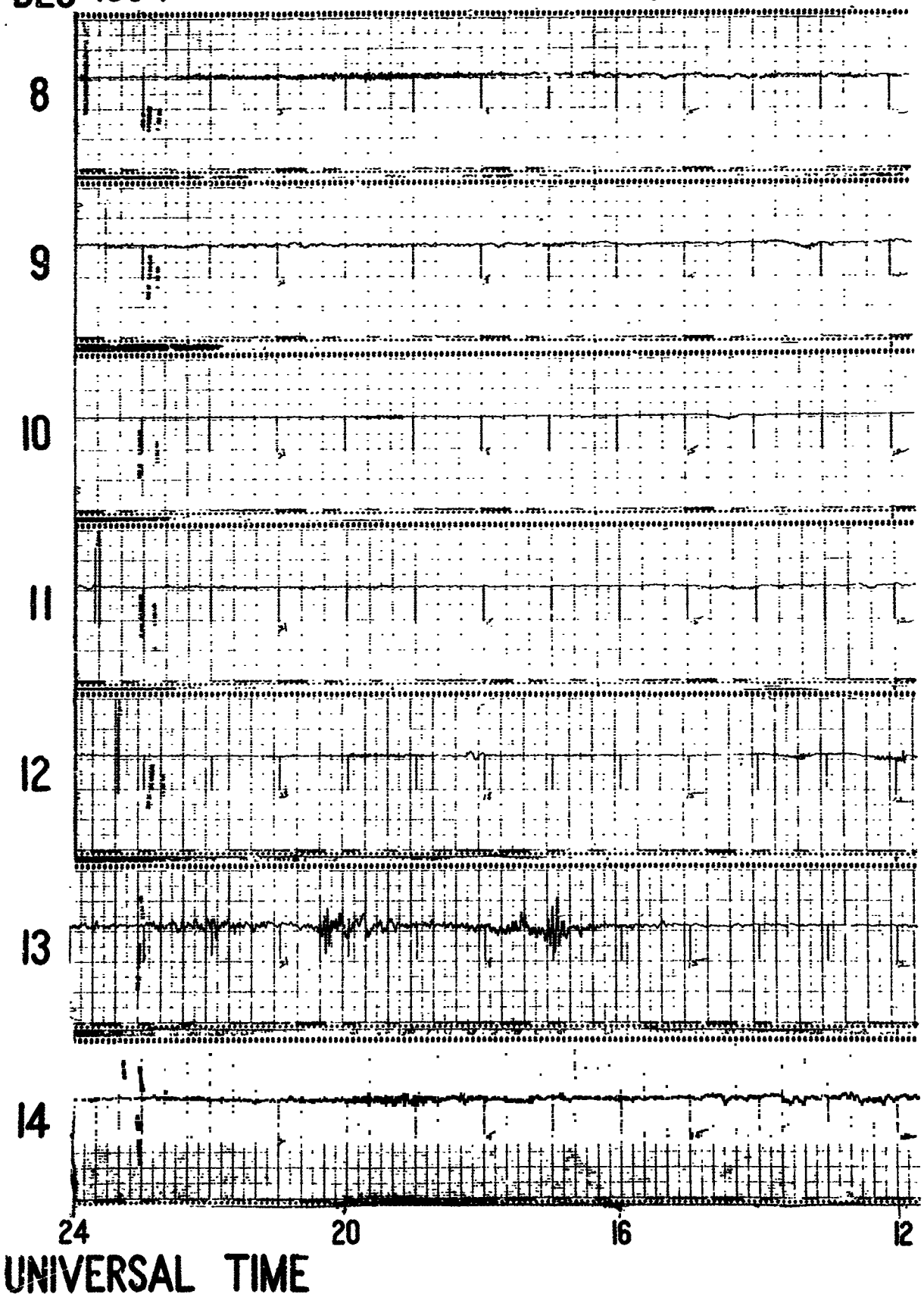
24
20
16
12
UNIVERSAL TIME

12 ALASKA DEC 1964



N-S TELLURIC CURRENT


DEC 1964
COLLEGE
12
8
9
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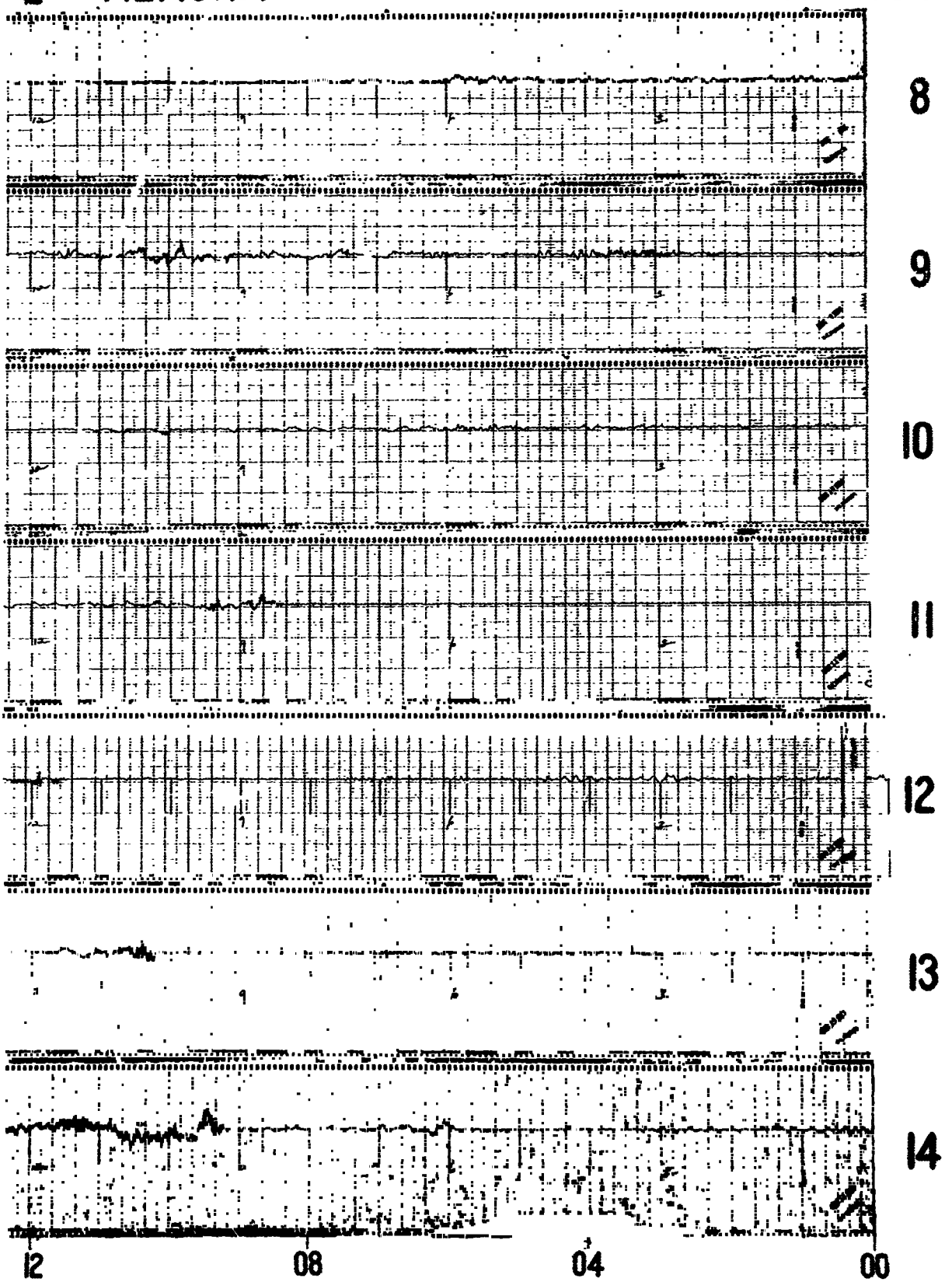
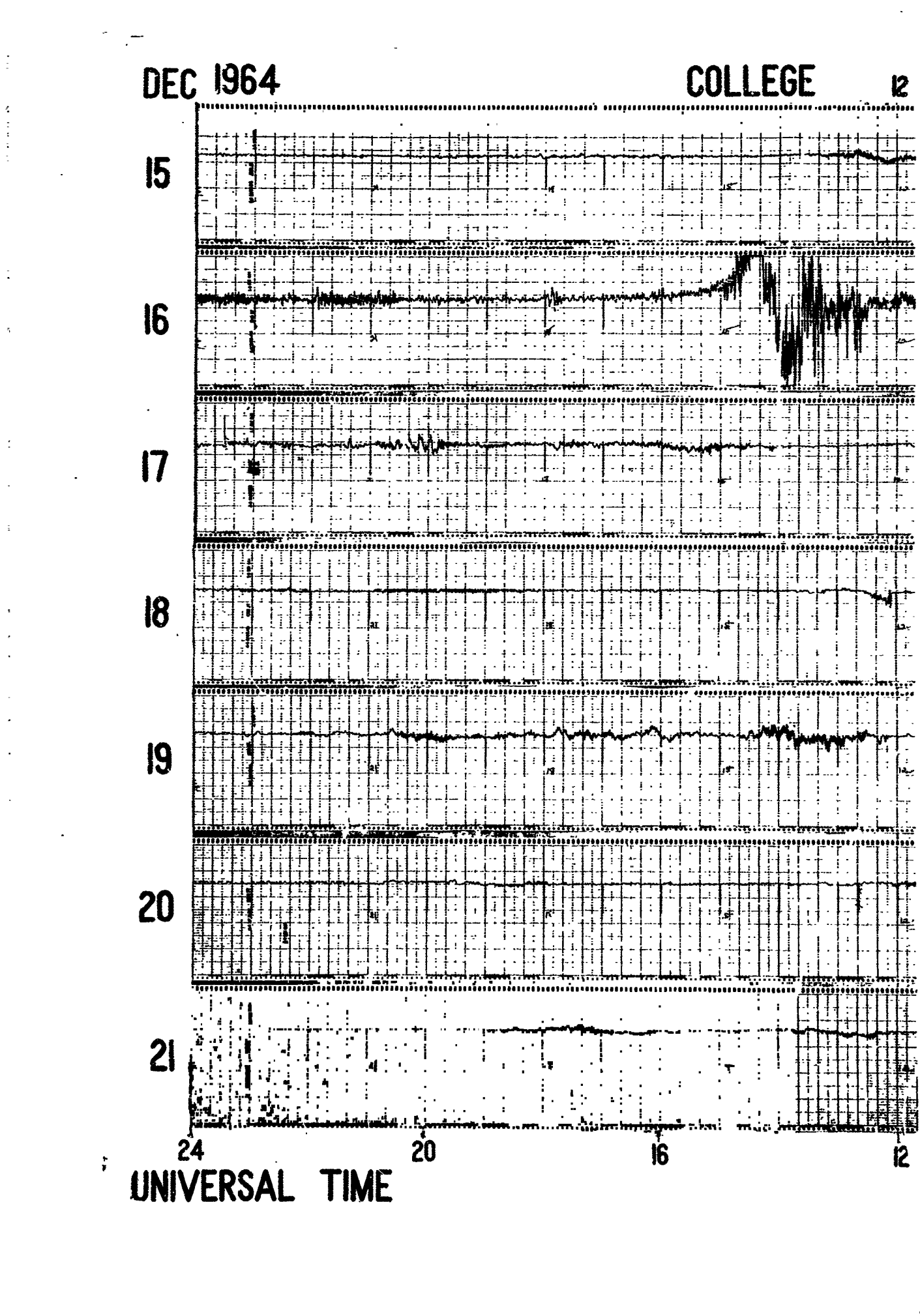
13
14
24
20
16
12
UNIVERSAL TIME

12 ALASKA DEC 1964



N-S TELLURIC CURRENT


DEC 1964
COLLEGE
12
15
16
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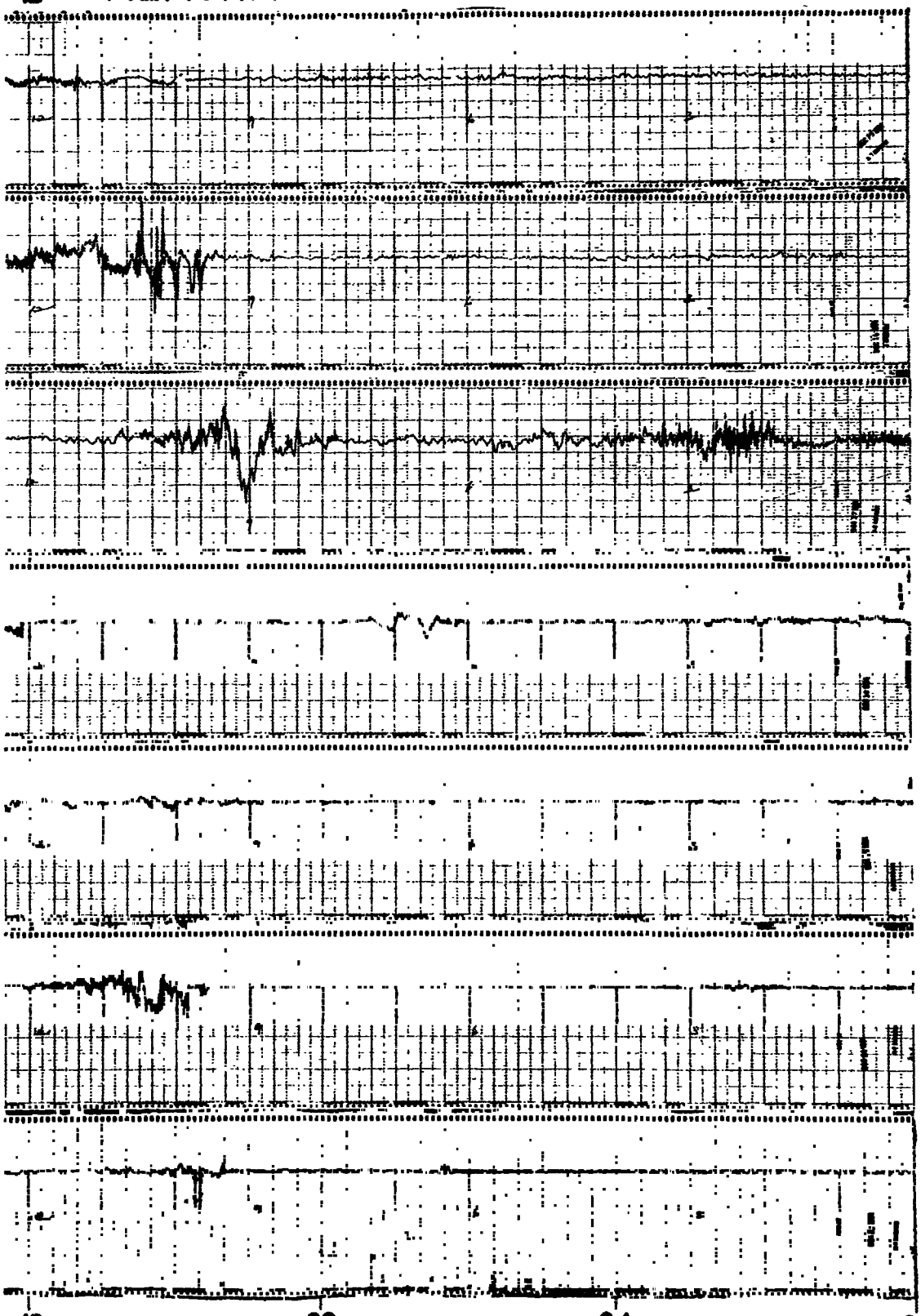
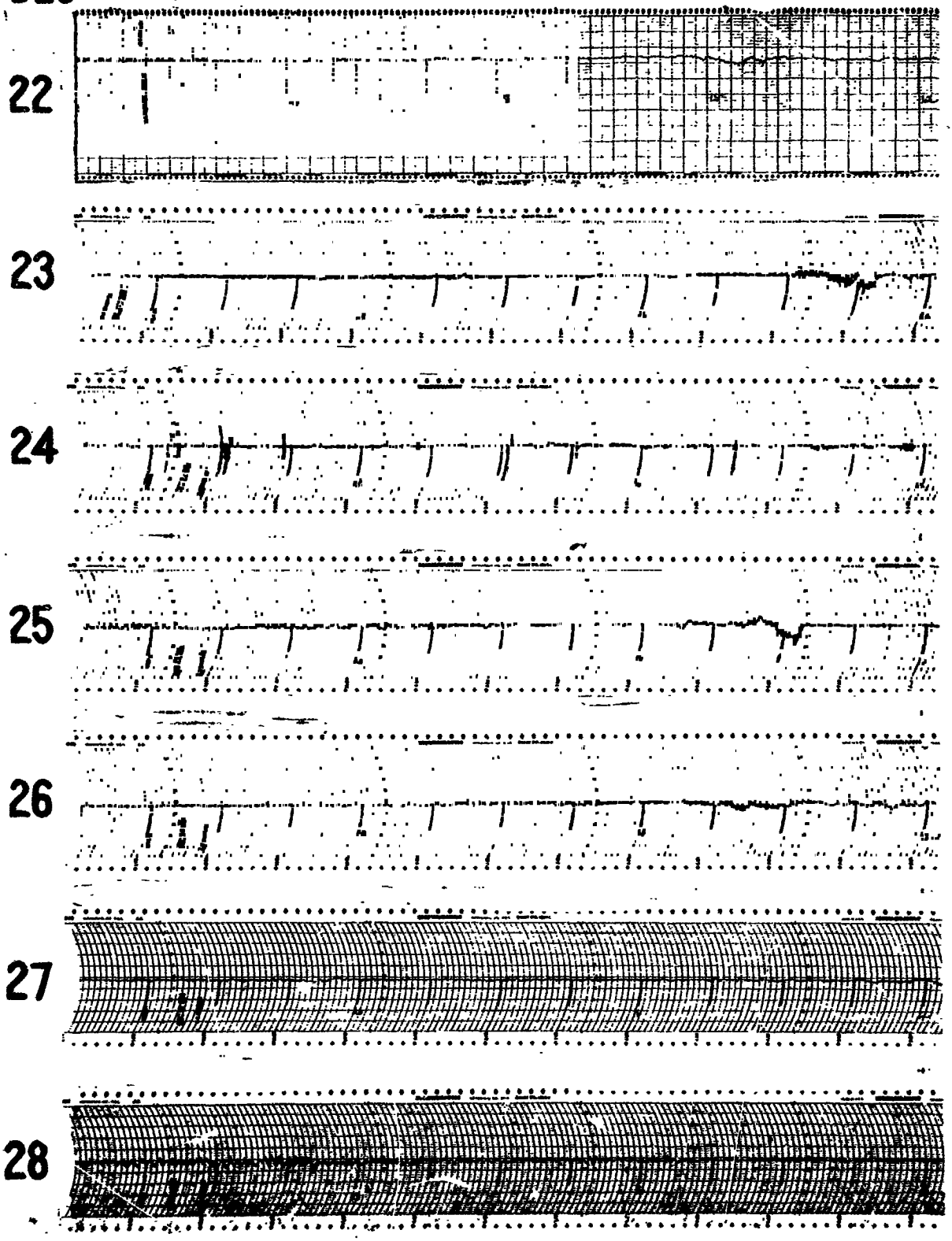
12
UNIVERSAL TIME

12 ALASKA DEC 1964

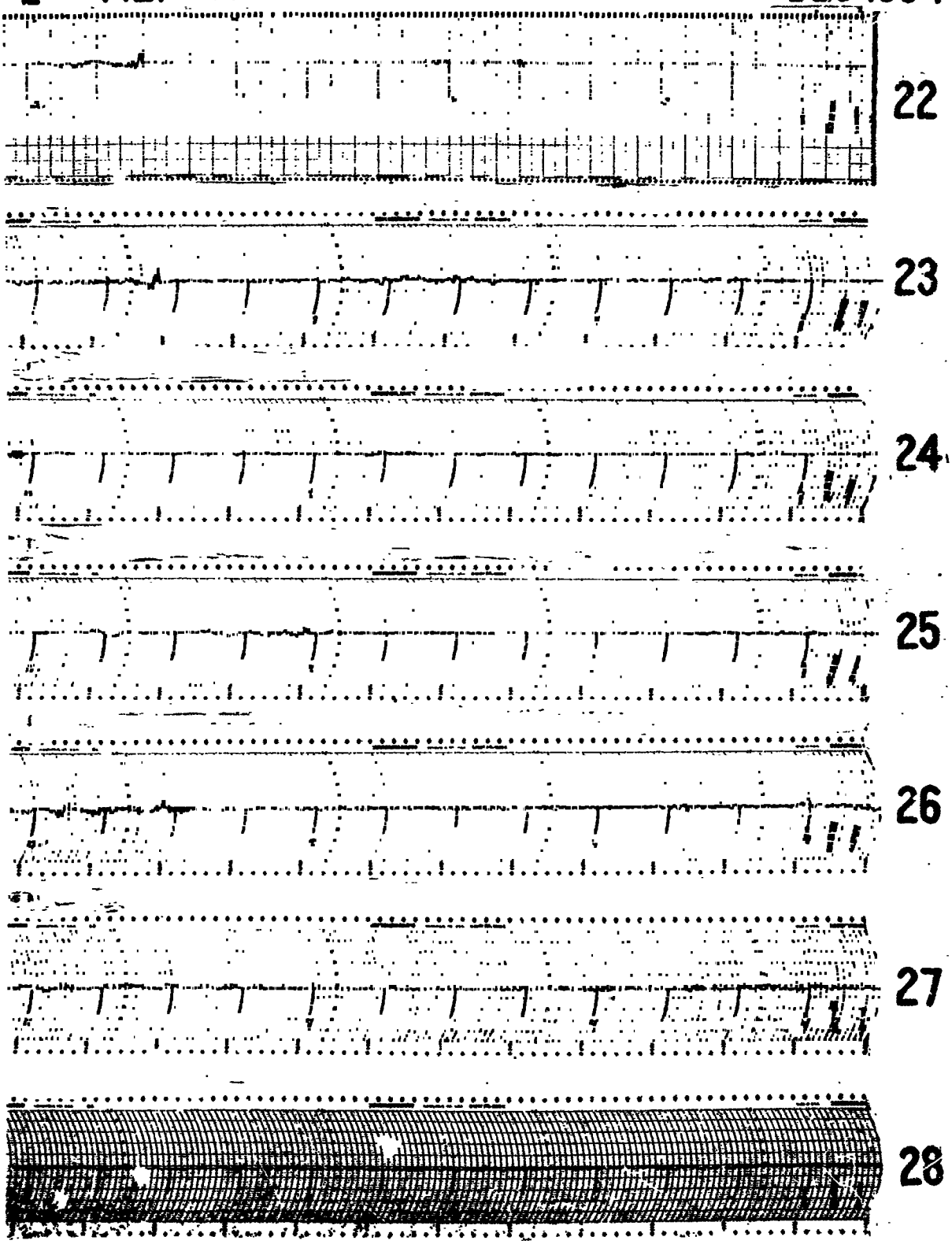


N-S TELLURIC CURRENT

DEC 1964 COLLEGE 12



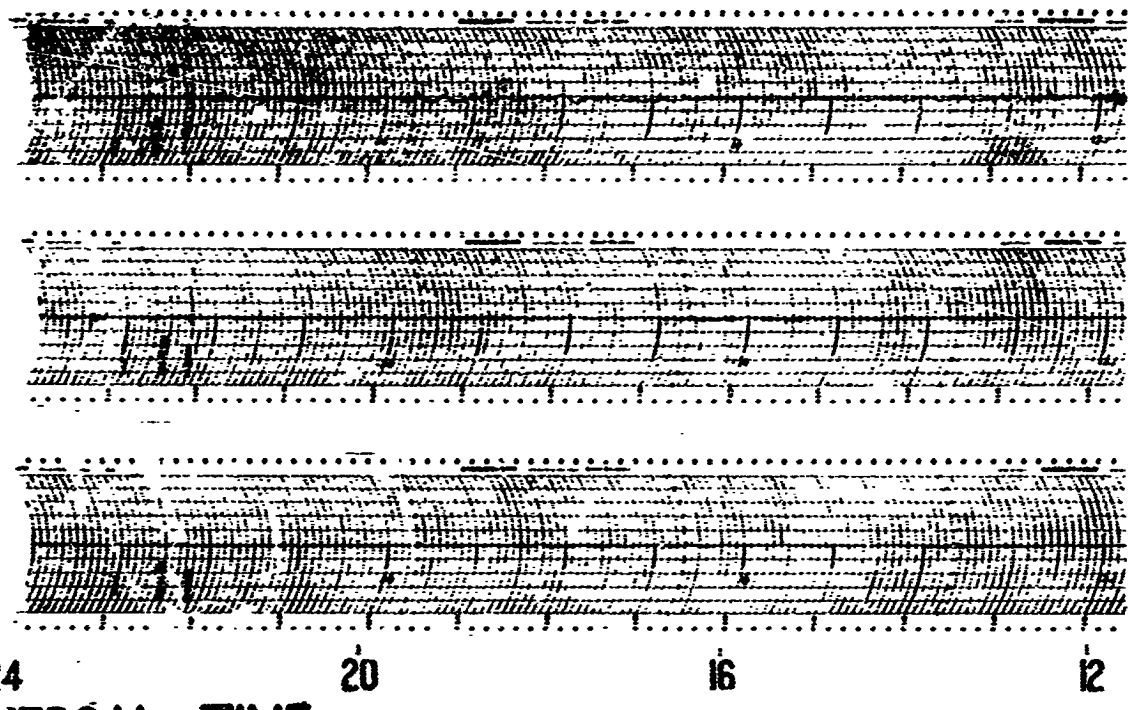
12 ALASKA DEC 1964



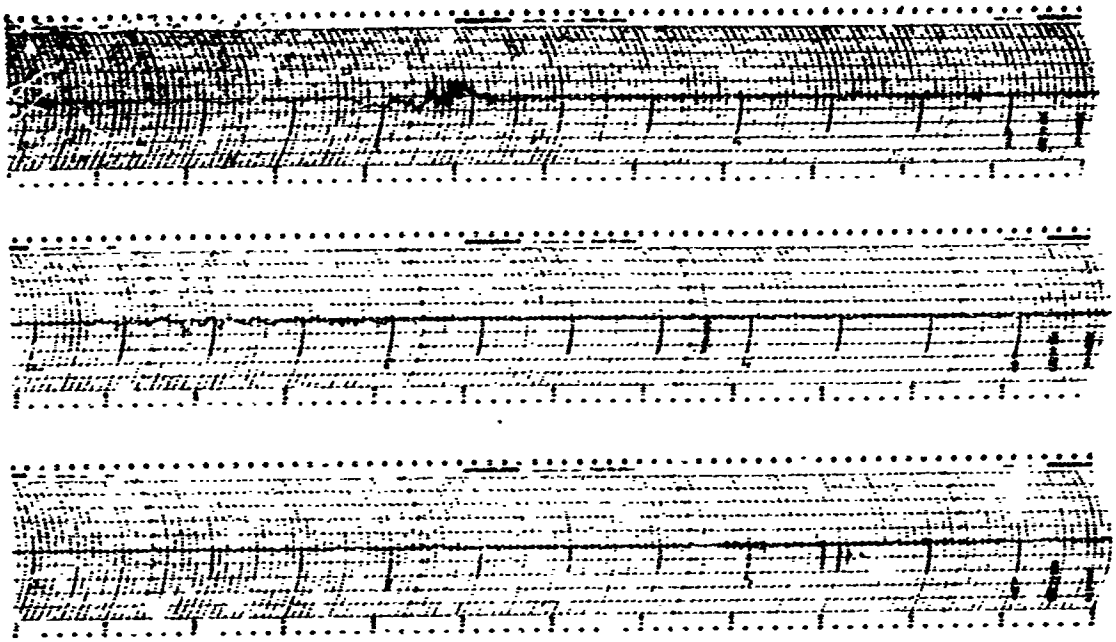
12 08 04 00

N-S TELLURIC CURRENT

DEC 1964 COLLEGE 12



12 ALASKA DEC 1964



N-S TELLURIC CURRENT

N-S TELLURIC CURRENT AMPLITUDE ACTIVITY - MV/KM

Month: October 1964 — Hour (Universal Time) — Observatory: College

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Avg
1	70	60	80	40	90	60	100	330	300	170	170	160	90	70	150	90	70	100	40	40	50	40	20	20	100
2	30	20	20	20	20	10	10	20	30	20	10	10	10	20	30	40	30	40	40	30	30	30	20	30	24
3	30	20	20	20	30	20	20	20	50	40	40	170	200	280	580	580	580	240	100	130	190	160	110	160	158
4	90	180	130	110	400	290	160	130	220	630	780	180	120	90	50	240	560	770	510	230	450	390	160	310	300
5	680	210	230	200	100	80	120	170	100	390	320	650	470	>870	210	130	230	160	150	80	170	70	100	140	251
6	130	20	190	50	60	60	90	90	30	140	90	40	140	310	160	270	420	240	50	160	170	120	200	130	139
7	150	190	290	290	250	160	110	70	300	370	310	240	70	90	80	100	90	50	20	130	80	90	150	130	158
8	80	110	80	100	70	120	100	640	440	300	610	140	330	300	280	140	150	100	160	100	180	110	60	80	199
9	110	40	60	40	80	100	80	400	>1060	550	>920	630	330	310	180	170	60	60	160	40	50	70	40	50	233
10	70	50	130	30	20	40	30	20	20	130	190	70	90	60	50	50	30	40	20	20	40	50	20	10	53
11	10	10	10	10	10	10	10	30	20	10	10	10	10	10	50	70	60	40	40	40	30	30	30	40	25
12	59	40	30	20	20	30	40	278	168	387	416	>1060	545	574	506	436	178	188	69	139	59	40	50	50	224
13	40	50	40	50	40	59	50	59	158	109	59	30	110	400	130	120	50	70	50	50	70	40	40	50	80
14	30	30	70	60	70	40	40	40	80	60	280	250	180	70	20	20	10	10	20	10	30	30	10	10	61
15	20	20	30	40	40	30	80	10	190	220	30	130	140	70	100	100	40	40	30	20	30	20	20	20	61
16	20	10	20	20	40	50	40	30	20	50	40	30	20	20	50	50	40	40	30	40	10	20	20	20	30
17	30	20	20	20	20	90	120	30	130	170	240	430	440	160	190	110	40	20	30	40	30	50	30	30	104
18	10	20	30	40	30	40	20	20	40	30	20	350	360	60	130	20	60	70	80	100	100	50	100	70	74
19	140	110	130	110	80	120	120	50	170	110	180	290	280	>1040	800	700	460	460	370	400	220	220	270	240	294
20	220	180	150	120	120	70	30	70	230	290	340	80	290	170	80	60	50	80	70	40	70	130	200	80	134
21	80	100	130	60	40	50	110	140	160	520	570	60	30	130	210	280	250	180	80	-	100	70	90	120	155
22	110	80	40	70	60	40	40	80	140	60	40	90	60	50	30	30	50	60	50	50	60	60	50	40	60
23	40	30	30	20	30	20	20	20	10	10	10	40	10	10	10	20	30	30	30	40	30	30	30	30	25
24	10	20	30	50	80	50	20	50	20	80	10	30	10	30	10	20	50	30	30	110	100	70	90	50	44
25	60	30	40	40	30	20	30	10	20	80	60	50	50	70	60	40	20	20	20	30	20	30	20	20	36
26	70	40	50	70	70	80	140	280	>1070	>1070	230	170	260	300	100	60	80	110	230	130	70	40	40	40	200
27	60	50	40	50	40	20	30	20	110	270	220	330	280	200	180	70	100	40	30	40	30	20	20	20	95
28	30	30	20	30	20	60	30	20	30	100	140	30	20	70	80	40	20	20	50	40	30	30	40	60	4[illegible]
29	30	20	40	50	30	30	40	198	59	99	69	109	149	129	40	30	50	50	50	50	30	30	20	20	5[illegible]
30	20	20	30	20	30	30	10	10	10	59	89	258	69	69	59	30	20	20	20	20	30	20	10	10	4[illegible]
31	10	10	20	30	10	20	20	20	10	109	119	30	30	20	20	20	20	20	40	20	20	20	20	10	28
Avg	84	59	72	61	66	61	60	108	174	213	210	198	167	195	149	133	125	109	86	79	83	70	68	68	11[illegible]

Selected Days: Five quiet 2-11-16-23-31 Five disturbed 4-5-9-12-19

N-S TELLURIC CURRENT AMPLITUDE ACTIVITY - MV/KM

Month: November 1964 — Hour (Universal Time) — Observatory: College

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Avg
1	20	20	20	40	40	30	30	30	79	139	109	248	386	129	89	40	208	278	109	40	79	109	198	248	113
2	228	238	119	178	178	129	89	208	436	119	59	307	99	109	40	40	50	30	59	69	40	69	50	50	124
3	40	70	80	40	50	50	30	40	40	50	70	30	30	30	10	20	30	60	30	30	40	30	30	30	40
4	30	50	30	30	20	10	10	20	10	20	20	40	200	200	170	70	50	50	70	30	60	30	10	20	50
5	60	70	80	40	50	20	30	20	40	100	80	20	150	260	100	100	150	70	50	110	70	110	50	20	77
6	20	20	20	20	30	30	40	20	20	20	60	70	200	100	60	40	40	70	70	50	40	30	50	30	48
7	20	30	30	20	20	20	20	10	10	20	10	30	10	51	30	20	20	30	30	30	30	30	20	20	23
8	111	111	81	232	172	71	71	232	313	71	30	101	192	162	61	30	40	51	51	51	51	51	101	91	105
9	81	101	141	121	232	101	40	202	263	283	636	>990	202	111	61	91	51	242	101	111	131	152	111	71	193
10	51	71	131	111	101	101	71	61	182	91	40	30	71	91	51	30	51	30	61	81	81	71	71	30	73
11	50	30	30	30	50	50	20	20	238	129	59	30	30	30	40	30	20	20	30	30	40	40	30	20	46
12	30	69	79	59	59	149	79	20	10	20	89	59	20	30	40	80	89	40	40	50	30	40	30	40	52
13	30	20	30	20	40	69	109	89	109	268	673	258	218	89	69	119	50	30	30	40	20	20	20	20	102
14	20	20	20	10	10	20	30	20	20	30	20	30	10	10	10	40	20	20	30	20	20	20	20	10	20
15	10	20	20	20	20	20	20	51	20	20	30	71	556	>859	525	313	71	162	202	121	81	111	71	91	144
16	111	101	81	71	51	61	101	253	364	222	495	424	51	30	81	121	91	40	51	51	81	141	30	30	130
17	40	51	40	40	51	40	51	30	20	101	81	81	51	51	71	91	30	30	40	51	30	30	30	30	48
18	40	30	40	30	40	40	40	40	51	20	20	71	40	20	20	51	30	71	81	61	61	71	61	61	46
19	121	101	111	71	30	30	40	20	20	10	20	30	20	10	10	10	20	20	10	30	40	20	30	20	35
20	20	20	20	20	20	20	20	20	61	202	141	20	10	10	10	10	10	20	10	20	20	20	30	20	32
21	20	20	20	20	20	10	10	30	71	30	30	10	30	10	10	20	20	30	61	61	51	30	30	20	28
22	20	30	40	30	30	20	20	20	121	61	505	182	121	40	20	30	61	51	51	71	30	40	51	40	70
23	51	30	40	51	91	263	313	152	263	>>1071	303	>879	>909	626	>>1071	495	343	152	101	121	71	61	51	40	314
24	20	20	20	20	10	20	10	61	192	141	61	30	20	10	10	20	30	20	20	30	30	51	30	30	38
25	10	20	20	20	10	10	10	10	20	10	-	-	10	10	20	61	61	30	30	20	51	20	30	20	23
26	20	20	20	30	30	20	20	20	280	>700	500	220	330	670	420	240	130	100	50	20	20	30	20	20	164
27	20	30	30	10	20	20	20	20	30	10	10	10	10	10	30	20	20	20	50	80	80	370	100	200	51
28	49	88	59	59	49	59	29	78	118	147	196	118	186	206	59	78	127	176	167	118	98	78	59	39	102
29	39	29	29	29	29	29	29	29	38	69	59	29	10	10	20	20	29	49	29	20	29	29	59	20	32
30	157	137	69	59	39	49	20	20	39	59	137	39	29	49	39	39	29	20	29	29	39	29	29	59	52
Avg	51	56	52	51	53	52	47	62	116	141	157	154	146	134	108	79	66	67	58	55	52	65	50	48	80

Selected Days: Five quiet 7-14-21-25-29 Five disturbed 9-15-16-23-26

N-S TELLURIC CURRENT AMPLITUDE ACTIVITY - MV/KM

ıth: December 1964 — Hour (Universal Time) — Observatory: College

y	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Avg
	30	69	69	79	59	20	40	139	366	307	109	30	59	158	158	109	79	99	30	40	40	30	30	30	91
	29	29	20	20	10	10	10	59	29	69	49	39	10	10	20	10	10	20	29	29	39	20	20	39	26
	20	20	20	20	20	20	10	20	60	70	100	260	80	40	30	20	60	50	40	50	90	90	40	40	53
	40	20	30	80	40	50	30	30	10	10	90	90	70	60	30	20	30	30	30	50	30	30	50	50	41
	30	70	20	20	20	50	60	40	50	50	50	20	20	20	20	20	20	30	20	40	40	30	40	50	35
	40	20	40	40	30	20	40	20	20	40	40	20	20	20	10	20	20	20	20	50	20	40	40	20	28
	30	30	60	50	50	40	20	10	10	30	180	>370	330	50	50	220	150	110	50	70	40	40	50	80	92
	40	30	50	40	40	70	40	30	20	10	10	20	40	40	50	50	40	40	50	70	50	50	30	20	39
	19	19	47	65	65	37	56	75	56	131	131	65	37	65	28	19	37	37	28	19	47	28	28	37	49
	37	28	28	28	37	47	37	28	28	37	47	19	9	9	37	19	9	9	19	28	19	9	9	9	24
	9	9	9	9	9	9	9	19	93	74	46	28	37	28	28	19	19	19	19	28	28	28	28	37	27
	38	19	57	47	38	19	28	28	9	19	19	94	57	38	19	9	19	19	66	28	19	19	19	19	31
	19	19	19	19	19	28	19	19	9	9	123	76	19	19	28	57	368	264	85	151	202	132	104	66	78
	47	19	38	19	19	28	113	19	47	236	170	104	85	76	76	38	57	66	104	85	57	38	47	28	67
	19	28	28	28	38	57	38	47	47	47	57	94	123	38	19	38	38	38	47	28	19	28	19	28	41
	38	47	38	38	28	28	38	28	47	312	736	217	>491	>897	>746	170	113	208	76	76	142	198	104	123	206
	113	179	378	217	142	123	66	113	463	595	113	57	28	28	57	94	57	85	57	151	132	85	66	76	145
	66	57	66	28	19	26	170	94	28	38	9	19	160	38	19	19	28	9	38	47	47	19	38	38	47
	38	19	28	28	19	28	28	9	28	57	104	57	142	217	132	94	123	104	85	85	94	47	38	38	69
	19	28	57	19	19	9	9	9	9	217	283	104	47	28	9	19	19	28	47	47	38	38	28	28	48
	19	19	19	19	19	19	47	9	19	113	57	19	66	47	28	38	38	85	38	19	19	9	9	9	33
	9	9	9	9	28	19	28	9	9	28	104	47	28	19	57	38	19	19	19	9	9	19	28	19	25
	9	19	28	19	28	47	38	38	19	19	104	28	104	104	19	28	19	9	28	19	19	28	19	9	33
	9	9	9	9	9	19	19	19	19	19	9	9	47	38	19	28	38	38	19	28	28	19	19	19	21
	28	28	19	9	9	9	9	28	57	38	38	38	9	132	113	57	19	19	28	47	38	38	28	38	36
	38	57	57	38	38	28	19	19	28	47	85	76	38	38	47	28	28	19	28	19	9	19	19	19	35
	19	37	28	19	28	19	19	9	19	19	28	37	19	9	28	19	19	19	19	9	37	19	19	19	21
	19	19	28	28	19	19	19	19	9	9	9	9	9	9	9	19	56	28	37	46	56	83	46	46	27
	28	46	37	28	19	28	83	130	56	28	9	74	46	28	19	19	28	37	56	46	28	28	19	19	39
	28	19	19	9	9	9	9	9	46	46	65	28	9	19	9	28	28	9	19	19	19	19	19	28	22
	28	37	56	46	46	19	37	46	19	9	9	19	28	28	19	19	28	19	37	19	28	28	37	28	29
g	31	34	46	36	31	31	38	38	56	88	96	70	73	76	62	45	55	51	41	47	48	42	35	35	50

Selected Days: Five quiet 10-22-24-27-30 Five disturbed 1-7-13-16-17

TELLURIC CURRENT FLUCTUATIONS - CYCLES PER HOUR

onth: October 1964 — Hour (Universal Time) — Observatory: College

ay	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	30	60	40	10	20	10	10	40	50	40	40	50	90	20	240	170	110	180	50	60	30	40	0	0
2	30	10	0	10	0	10	0	0	0	0	0	0	0	10	0	20	20	30	40	20	20	30	60	30
3	40	30	10	10	0	0	10	0	10	10	0	40	220*	240	250	300	290	130	100	140	160	160	100	170
4	170	150	150	100	160*	90	40	80	100	120	280	90	80	80	40	110	150	350	170	150	300	120	110	180
5	150	100	180*	30	20	10	40	20	30	80	70	120	310	370	260	110	330	180	50	70	90	60	70	110
6	120	70	60	30	20	30	30	30	20	20	40	20	30	260	140	280	270	60	50	80	80	90	90	120
7	100	150	330*	330*	90*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	70	70	80	40*
8	170*	720*	240*	80	40	30	30	80	80	90	130	60	250	360	290	230	180	210	170	270	110	120	90	70
9	110	40	40	20	40	50	60	80	210	130	170	190	290	270	220	100	70	50	60	40	60	80	80	70
0	90	80	30	20	0	30	30	10	0	40	50	20	30	110	90	30	30	20	30	10	30	50	20	120*
1	-*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	50	60	10	0	0	10	10	50	60	70	120	>210	320	180	240	190	140	110	80	50	60	60	60	40
3	80	60	30	10	10	20	0	10	20	30	20	0	10	320	300	280	150	60	60	40	40	50	70	60
4	10	10	80	50	20	10	0	10	10	10	60	240	260	110	0	0	0	0	20	0	20	40	10	10
5	20	30	0	40	40	10	20	20	30	220	90	70	170	170	130	240	40	40	20	0	20	0	10	10
6	0	10	10	0	10	10	10	0	10	0	10	0	10	0	20	10	10	0	0	30	0	50*	150*	10
7	30*	40*	10	10	0	70	10	0	10	70	70	60	150	80	130	110	20	0	20	0	0	10	10	10
-	0	0	10	10	10	0	0	0	10	10	10	90	120	40	100	280	110	90	90	110	80	80	30	120
9	100	70	60	40	40	70	30	10	40	20	80	160	310	320	250	310	300	290	160	130	150	220	210	120
0	90	60	70	70	50	20	0	10	30	70	200	150	140	280	60	40	40	30	40	40	70	90	60	60
1	50	40	50	20	30	30	30	20	30	110	190	70	0	50	260	230	230	170	-	-	120	60	100	100
2	120	40	20	40	0	20	0	10	20	10	10	40	10	20	70	200*	50	40	30	30	40	40	30	30
3	40	60	40	10	10	10	0	10	0	0	0	10	10	0	0	10	40	20	10	60	30	20	400*	330*
4	10	20	40	10	40	10	0	10	10	10	0	0	0	0	0	20	100*	0	0	20	70	10	20	10
5	20	0	10	0	10	0	10	0	20	30	40	30	30	40	50	0	20	10	10	20	0	20	0	10
6	140*	320*	130*	10	70*	20	50	60	130	300	160	60	230	260	50	20	50	50	40	30	30	0	30	30
7	40	40	0	0	0	0	10	0	20	60	80	190	320	250	180	60	70	40	20	10	0	10	0	10
8	30	40	40	10	0	30	10	0	0	40	50	10	10	60	90	10	10	0	30	20	20	30	30	60
9	20	40	20	0	10	0	0	50	10	20	20	30	130	150	10	10	80	70	20	10	20	20	10	0
0	10	10	0	0	0	0	10	0	0	10	30	90	40	70	20	0	10	0	0	0	10	10	10	0
-	10	0	0	10	0	0	0	0	0	30	40	10	0	0	0	10	0	10	10	20	10	-	-	-

*Pearl-type (pc 1) act

TELLURIC CURRENT FLUCTUATIONS - CYCLES PER HOUR

onth: November 1964 — Hour (Universal Time) — Observatory: College

ay	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	20	10	10	0	20	0	10	0	60	60	30	40	200	130	60	20	160	290	100	20	40	110	130	160
2	60	120*	160*	60	80	30	10	50	80	30	10	100	10	30	10	10	0	10	30	40	20	60	50	40*
3	20*	190*	350*	10	10	10	0	0	0	0	0	0	10	0	0	0	10	20	10	30	40	210*	190*	250*
4	780*	1107*	10	0	0	0	0	0	0	0	0	0	110	240	210	50	20	30	30	10	30	10	0	10
5	70*	30	0	10	10	0	0	10	0	20	30	0	40	270	170	110	170	110	40	110	70	50	20	10
6	10	10	0	0	30	10	10	0	0	20	20	20	50	110	80	50	30	40	40	50	20	20	30	20
7	20	120*	230*	10	10	10	0	0	0	0	10	0	0	10	20	0	10	20	0	0	10	0	0	50*
8	1300*	1630*	1060*	90*	30	10	30	90	50	0	10	10	50	210	60	20	180*	210*	30	30	90	40	10	40
9	10	20	100*	30	130*	10	0	30	70	70	70	>280*	160	70	90	80	80	200	120	120	100	100	110	80
0	110	110	90	50	70	50	40	0	30	20	10	0	20	70	50	10	10	10	70	70	80	50	20	20
1	30	40	50	10	20	20	10	0	40	20	20	10	20	20	10	0	10	0	0	10	20	30	30	10
2	20	190*	160*	30	20	20	0	0	10	0	20	10	0	0	30	100	110	30	60	20	10	20	20	30
3	20	10	0	0	10	0	30	10	20	60	90	120	260	100	100	140	30	0	10	10	0	0	10	0
4	0	10	0	10	0	0	0	0	0	10	10	0	0	0	0	10	0	20	10	0	0	0	10	0
5	0	10	0	10	10	0	0	0	10	0	0	20	120	230	210	>230	20	130	180	90	110	120	80	130
6	90	90	90	60	10	10	10	60	80	80	100	100	0	0	60	200	100	0	20	20	60	30	30	10
7	60	50	70	20	20	10	0	0	0	20	40	30	20	20	140	70	10	10	50	20	10	10	20	30
8	40	40	10	10	40	60	10	10	10	0	0	20	10	0	0	70	30	60	50	30	90*	60	80	90
9	40	60	80	50	10	0	10	0	0	0	10	0	0	0	10	0	10	0	0	10	0	10	50	30
0	20	20	0	10	0	10	0	0	0	20	20	10	0	0	0	10	0	10	0	10	10	10	10	20
1	0	10	10	0	0	10	0	0	0	10	0	0	0	0	0	10	0	20	30	40	40	30	20	20
2	0	10	0	10	0	0	0	10	10	10	90	70	10	0	0	10	10	20	10	10	10	0	10	10
3	20	0	10	0	20	60	70	30	40	150	210	190	320	190	260	330	280	250	120	90	90	60	50	20
4	10	10	10	0	0	10	10	10	120	80	30	20	20	0	10	0	10	10	10	20	20	30	20	40
5	10	20	0	0	0	10	0	0	0	0	0	0	0	10	0	0	10	10	0	0	10	0	70*	10
6	40	50*	0	0	0	0	0	10	30	250	280	210	150	340	350	320	240	110	10	10	0	10	0	0
7	10	10	0	0	0	0	0	0	10	0	0	0	0	0	10	0	10	10	20	30	50	70	80	80
8	130	90	40	10	10	0	0	10	40	30	50	60	180	170	70	70	130	250	160	60	90	70	40	70
9	50	30	20	0	0	0	10	0	10	20	20	0	10	0	10	10	20	20	10	10	30	10	10	30
0	30	50*	70*	20	30	20	20	10	0	20	40	20	10	20	10	20	30	30	20	20	40	30	10	40

Pearl-type (pc 1) activity

TELLURIC CURRENT FLUCTUATIONS - CYCLER PER HOUR

Month: December 1964 — Hour (Universal Time) — Observatory: College

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	30	20	40	50	30	20	20	20	50	110	70	10	0	150	220	170	60	60	50	30	50	40	60	50
2	30	30	10	10	20	0	10	20	0	20	30	30	10	40	60	20	10	0	30	20	10	20	20	50
3	30	0	0	10	0	10	0	0	10	20	10	60	80	10	0	0	0	10	20	60	40	40	30	30
4	30	20	20	40	60	40	20	20	10	0	40	40	110	130	40	10	10	30	30	30	30	10	20	20
5	20	10	20	0	20	30	0	10	10	10	30	10	10	10	10	10	40	30	20	30	20	20	10	50
6	30	20	30	30	-	-	-	-	-	-	-	-	-	-	-	-	-	60	10	10	30	20	20	0
7	30	40	-	-	-	110	20	0	10	20	120	>80	240	50	50	180	220	180	50	70	50	40	50	190
8	60	40	30	20	30	30	30	10	20	10	10	0	30	50	50	60	50	40	50	60	-	-	-	-
9	20	10	40	30	20	10	20	10	10	40	30	40	10	40	0	10	20	10	0	10	20	30	30	20
10	10	10	20	20	10	10	10	10	10	0	30	0	10	0	10	10	0	0	0	40	0	0	10	0
11	10	0	0	10	0	0	0	10	20	20	20	10	0	0	10	10	0	10	0	40	30	40	30	40
12	40	10	10	20	10	20	20	10	0	10	10	20	10	0	10	10	20	20	10	60	20	20	10	10
13	10	0	0	10	10	10	10	0	10	0	80	30	0	20	20	10	50	100	90	50	40	50	40	60
14	40	20	20	10	10	10	10	10	20	60	120	250	140	150	150	40	50	50	80	60	50	60	50	20
15	10	20	20	20	30	30	10	20	10	20	20	140	250	60	20	40	30	40	20	30	10	40	40	10
16	20	20	30	20	10	10	10	20	20	70	170	260	>250	>200	>290	120	30	40	40	70	100	110	110	130
17	140	80	70	30	30	10	20	20	50	190	80	40	10	20	80	130	100	70	70	120	90	40	40	50
18	50	50	30	20	30	10	40	10	10	10	10	0	70	20	10	0	20	0	50	70	50	30	60	40
19	30	20	30	10	10	10	0	10	0	20	30	20	60	310	180	150	190	210	80	160	90	20	40	10
20	10	10	20	0	10	0	10	0	10	20	170	200	50	0	0	30	20	30	40	40	10	20	10	10
21	0	10	10	0	10	10	10	0	10	30	20	10	70	130	20	20	70	110	50	0	10	0	0	10
22	0	10	0	0	10	10	0	0	0	10	20	20	10	10	40	10	10	0	0	0	0	10	10	0
23	10	10	10	10	0	10	20	10	0	0	40	10	50	140	60	10	0	0	20	20	20	20	30	10
24	0	10	0	0	10	10	10	0	10	10	0	10	20	10	10	20	30	20	10	20	10	50	80	40
25	70	70	30	10	10	0	0	20	20	10	10	10	0	30	40	20	0	10	10	20	20	40	20	20
26	20	10	30	20	10	10	0	20	10	10	30	30	10	10	80	50	20	10	0	10	0	10	0	10
27	10	10	40	30	20	0	0	0	60	10	10	20	10	0	10	10	0	20	0	20	10	20	20	10
28	10	10	30	20	20	10	0	20	20	0	0	10	0	0	0	10	10	20	10	30	70	40	30	40
29	30	20	30	20	10	10	20	40	10	0	10	20	20	10	10	0	10	20	20	30	30	40	10	10
30	20	10	10	10	10	0	10	10	50	10	20	10	10	10	10	10	30	0	20	30	10	30	40	60
31	30	50	60	50	30	10	10	10	20	10	0	20	60	10	10	0	10	0	10	20	40	50	40	40

TELLURIC MICROPULSATION ACTIVITY - pc 1

R. R. Heacock
Assistant Geophysicist

Instrumentation. The sensing elements are 200 meter spaced telluric current electrodes aligned north-south geographically. The recording system consists of a low pass LC 60 cps rejection filter, a 50k voltage divider gain control, a Tektronix type 122 preamplifier (X1000, h.f. cutoff 50 cps, l.f. cutoff 0.8 cps), a second 60 cps rejection filter, a Kronhite electronic band-pass filter with h.f. cutoff at 2 cps and l.f. cutoff at 0.02 cps, and an Esterline-Angus 1 ma recorder operating at a chart speed of 3/4" per min. Time mark signals furnished by the Institute operated NASA Minitrack station are accurate to a millisecond.

The instrumentation has a rather flat response peak from 1 through 5 sec period, essentially the period range of pearl-type micropulsations at College. Micropulsations are also being recorded continuously on tape, and the taped record has been inspected for evidence of pearl-type events at frequencies higher than 2 cps, with none being found to date.

Scaling procedures. The charts are inspected for half-hourly occurrences of pearl-type micropulsations. The criteria used for identification of pearls are a) a rather smooth "pearl"-like envelope, b) a rather constant pulse period in the range 0.5-6 secs, and c) a non-impulsive character (i.e. a small dynamic range). In addition, the events are inspected for repeating patterns in the pearls, and the repetition period is listed along with the average pulse period and the peak-to-peak amplitude of the pearl envelope.

Sonagrams are made of the more prominent pearl events, and the repetition periods of pearl patterns are checked against the repetition periods in the structure as seen on the sonagram, insuring a good accuracy in this scaling. Pulse periods scaled from the charts are also checked against the pulse periods shown on the frequency scale of the sonagrams.

Amplitudes are measured peak-to-peak for the envelope (not including isolated pulses or spikes) at the time of largest amplitudes in the half-hour interval.

There is an uncertain dividing line between pearl-type micropulsations and the more irregular disturbance-type (pi 1) micropulsations. However, the uncertain cases included in the following scalings tend to have longer pulse periods (T > 3 secs), tend to occur in the late afternoon or evening (2-8 U.T.), tend to occur only when Kp > 2, and are unstructured. Beginning with the July 1964 data, the more extreme of these intermediate cases are identified by "I" in the column headed Pattern Spacing.

This micropulsation recording and analysis program is supported by the Air Force Cambridge Research Laboratories, Office of Aerospace Research, under contract No. AF 19(628)-1695, monitored by Mr. Elwood Maple.

TYPE pc 1 (pearl) MICROPULSATIONS ACTIVITY
College N-S Telluric Currents

October 1964

Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km	Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km
1	2100	2.9		2	11	0130	3.3		2
1	2300	2.5		2	11	0200	3.7	.5	2
1	2330	2.3		2	11	0230	1.8	2.0	3
2	0000	2.2		4	11	0230	3.0	3.5	2
2	0030	2.5		4	12	0700	3.2	I	3
2	0100	2.1		3	12	0730	2.5	I	3
3	0000	1.8		2	13	0100	2.6		2
3	0100	1.4		2	14	0000	1.5		7
3	0130	2.0	2.0	8	14	0030	1.5		3
3	0200	1.7		2	14	0100	1.5		3
3	0230	1.7		2	14	0330	2.0		5
3	1230	1.3	1.5	15	14	0330	6.2		12
4	0000	1.2		3	14	0400	1.8		3
4	0030	1.5		2	15	0200	1.6	2.1	3
4	0200	1.8	I	3	15	0230	1.7	2.4	3
4	0400	3.0		12	15	0300	2.0		2
4	0500	2.0		2	16	0000	2.9		3
5	0030	4.2	I	5	16	1100	1.7	3.0	3
5	0200	3.6	I	17	16	1130	1.7	3.0	2
5	0230	4.0	I	20	16	1200	2.2	3.0	3
6	0030	1.7		2	16	1230	2.0	3.0	3
6	0230	4.8		4	16	1300	1.7	3.0	2
6	0900	1.9	I	4	16	1330	1.9	3.0	2
6	1300	1.7	2.0	3	16	1400	2.0	3.0	3
7	0130	3.4	I	20	16	1430	1.8	3.0	2
7	0200	3.3		30	16	1500	1.9	3.0	2
7	0230	2.9		20	16	1700	2.4	3.0	2
7	0300	3.1	4.4	9	16	1900	2.5	3.8	4
7	0330	2.6		8	16	1930	2.9	3.8	3
7	0400	2.9		2	16	2000	2.9		3
7	0430	1.9		6	16	2030	3.3		4
7	1900	2.0		2	16	2100	3.3		4
7	2300	3.4		9	16	2130	2.9		7
7	2330	3.4	2.9	9	16	2200	2.6	4.5	7
8	0000	3.6	2.9	9	16	2230	2.9	4.5	4
8	0030	3.6		6	16	2300	2.6		3
8	0100	2.9	3.4	30	16	2330	2.8	4.5	5
8	0130	2.6	3.4	18	17	0000	3.8		2
8	0200	3.1	3.4	12	17	0030	2.6		8
8	0930	1.9	I	6	17	0100	2.9	3.8	8
8	1000	2.1	I	6	17	0400	5.0		2
8	2130	3.6		2	17	0530	4.0	I	3
10	0000	2.6		2	17	0600	2.5	3.0	4
10	0100	2.0		4	17	0630	2.5	3.0	3
10	0130	2.2		2	17	1800	1.4	2.3	4
10	2300	2.3		3	17	1830	1.9	2.3	7
10	2330	1.6	1.9	14	17	1900	2.1	2.3	2
11	0000	1.7	2.0	17	17	1930	1.7	2.2	2

TYPE pc 1 (pearl) MICROPULSATION ACTIVITY (Cont'd.)

Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km	Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km
				October 1964					
17	2230	1.5		2	23	2330	2.0	2.1	8
17	2300	1.5		2	24	0000	2.1		3
18	0000	1.5		2	24	0030	2.3		5
18	0200	1.5		3	24	0100	2.2		4
18	0230	1.5		3	24	0130	2.4		7
18	0300	1.6		2	24	0200	2.4		4
19	0030	3.6	I	3	24	0230	2.9		3
19	0200	4.8		3	24	0300	2.8	3.0	3
19	0300	4.8		2	24	0400	2.5		2
19	0530	4.5	I	5	24	1500	1.9	2.2	3
20	0030	2.2	I	4	24	1530	1.8	2.2	4
20	0100	2.1	I	3	24	1600	1.7	2.1	11
20	0130	5.0		3	24	1700	2.0		3
20	0200	5.3		3	24	1730	2.0		3
20	0230	5.0		3	24	1930	3.3		2
20	0300	5.3		3	24	2000	1.5	2.5	2
20	0330	5.0		3	24	2000	2.9	3.6	4
20	0400	4.3		4	24	2030	3.1	3.6	4
21	0000	1.5		3	24	2100	3.2	3.7	3
21	0030	1.5		4	24	2230	2.0	2.7	4
21	0430	3.1	2.5	3	24	2300	2.7		3
21	0500	3.2	2.5	2	26	0000	2.4		8
22	1230	1.8		2	26	0030	2.5	3.2	11
22	1300	1.8		2	26	0100	2.9	3.6	12
22	1400	1.5	2.4	3	26	0130	2.5	3.2	8
22	1430	1.7	2.4	6	26	0200	2.5	3.7	11
22	1500	2.0	2.4	11	26	0230	2.9	3.7	5
22	1530	2.1	2.3	11	26	0300	2.9	3.7	3
23	0100	2.6	3.2	2	26	0400	2.9	I	4
23	0130	2.4	3.2	3	26	0430	2.4	I	8
23	0200	2.5	3.2	3	26	0500	4.2	I	2
23	1200	2.0	2.0	3	26	0730	1.9	2.3	2
23	1300	1.7	2.6	2	26	1130	5.0		4
23	1330	1.7	3.0	2	28	1500	2.0	2.5	*
23	1400	1.8		2	28	1530	2.0	2.5	*
23	1430	1.4	2.5	7	28	2130	1.8	2.7	*
23	1500	1.7	2.5	2	28	2200	1.8	2.7	*
23	2200	2.2	2.8	6	31	2300	1.7	3.5	*
23	2230	2.3	2.8	36	31	2330	1.7	3.5	*
23	2300	2.3	2.7	24					

*No amplitude information was obtained. This data is from sonagrams.

TYPE pc 1 (pearl) MICROPULSATION ACTIVITY (Cont'd.)

Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km	Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km
				November 1964					
1	0900	2.5		2	7	0200	3.1	5.0	8
1	1400	5.0		4	7	0230	3.3	5.0	4
1	1430	2.0		4	7	0300	3.0		2
1	1500	1.7		3	7	2230	2.5		2
1	1530	2.8		2	7	2300	2.5		6
1	1600	2.9		2	7	2330	2.0		10
1	2200	3.3		4	8	0000	2.0		44
1	2230	4.0		5	8	0030	1.7		72
1	2300	4.0		6	8	0100	1.9		72
2	0030	4.0		4	8	0130	2.2	4.0	68
2	0100	3.8		6	8	0200	2.1	4.0	35
2	0130	4.0		12	8	0230	1.8	4.0	34
2	0200	3.3		14	8	0300	2.1	4.0	14
2	0230	3.2		3	8	0330	2.6	4.0	2
2	0300	3.3		4	8	0400	2.1	4.0	4
2	0330	2.0		5	8	0430	2.1	4.0	4
2	0430	4.5		5	8	0730	3.8	I	4
3	0030	1.8	3.0	10	8	0800	2.0		2
3	0100	2.1	3.7	10	8	1600	1.6	3.0	2
3	0130	2.2	3.7	30	8	1630	1.8	3.0	17
3	0200	3.2	3.7	28	8	1700	2.0	3.0	14
3	0330	5.3	4.5	4	8	1730	1.7	3.0	2
3	0400	4.8	4.5	4	8	1800	1.7	3.0	2
3	0430	4.8		3	9	0230	2.8	3.7	9
3	0600	4.8	4.3	3	9	0300	3.1		5
3	2100	2.2	4.0	2	9	0400	2.5		3
3	2130	2.5	4.0	18	9	0430	1.8		8
3	2200	2.4	4.0	9	9	0500	1.4		2
3	2230	2.4		7	9	1100	5.0		24
3	2300	2.9		8	9	2330	2.5		3
3	2330	2.4	3.3	16	10	0030	3.0		3
4	0000	2.1	3.5	24	10	0100	2.8		2
4	0030	2.1		30	10	0300	3.3		2
4	0100	2.0	3.5	90	11	0130	3.4		3
4	0130	2.0	3.2	64	11	0200	4.0	3.7	3
4	0200	2.3	3.8	4	11	0230	4.3	3.7	2
4	0230	2.5		3	11	0430	4.5	3.7	2
4	2330	1.7	3.5	3	11	0500	4.3	3.7	2
5	0000	1.7	3.5	5	12	0030	4.3		4
5	0030	1.9	3.5	10	12	0100	3.6		8
5	0100	1.8	3.5	8	12	0130	3.6	5.0	7
5	0130	2.5	3.5	2	12	0200	4.3	5.0	6
5	0200	2.6	3.5	2	12	0230	4.5	5.0	2
7	0000	4.0		2	15	1100	2.5		2
7	0030	4.0		2	15	1400	3.3		4
7	0100	4.0	5.0	4	15	1500	4.0		4
7	0130	3.4	5.0	7	15	1530	2.6		3

TYPE pc 1 (pearl) MICROPULSATION ACTIVITY (Cont'd.)

Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km	Day	Hour U.T.	Pulse Period (sec)	Pattern Spacing (min)	Amplitude mv/km
				November 1964					
15	1600	1.6	2.1	3	25	0330	1.0	1.8	3
15	1630	1.2		2	25	0400	1.1	1.7	2
15	2230	2.9		2	25	0530	1.9		2
15	2330	1.5		4	25	0600	1.9		2
16	0030	2.5		2	25	2200	1.4		2
17	0000	2.9		2	25	2230	1.3	1.9	7
17	0030	2.5		2	25	2300	1.3	1.9	6
18	1330	2.9	3.3	2	26	0100	2.0	3.0	12
18	1400	2.9		2	26	0130	2.1	3.0	2
18	1430	2.9	3.7	2	27	2100	2.3		2
18	1500	3.1	3.7	3	28	0200	2.7		3
18	1530	2.9	3.7	4	28	0330	3.3		2
18	1930	2.8	4.0	2	28	0430	4.0		2
18	2000	2.9	4.0	4	29	2130	2.2		2
18	2030	3.1	3.8	10	29	2200	2.5	5.8	2
22	0000	3.2		2	29	2230	2.5	5.8	2
22	1730	2.9		2	29	2300	2.5		2
22	2300	2.9		3	29	2330	2.8		3
23	0630	2.3		3	30	0000	2.9		3
24	0800	5.3		3	30	0030	2.5	3.5	6
24	0830	4.2		4	30	0100	2.0		12
24	0900	3.2	3.0	4	30	0130	1.9		18
24	0930	2.9		2	30	0200	1.7	5.0	22
25	0000	1.0	1.7	2	30	0230	1.7		4
25	0030	1.0	1.7	2	30	0530	2.5		4
25	0200	1.0	1.8	2	30	0600	2.0		3
25	0230	1.0	1.8	2	30	1600	2.0	2.7	4
25	0300	1.0	1.8	2	30	1630	2.2	2.7	4
					30	2330	2.5		2
				December 1964					
1	0200	2.5	3.0	4	13	1400	2.0		2
1	0230	2.6	3.0	4	13	1430	1.7		2
4	0100	4.5	4.6	4	13	1500	1.8		2
4	0130	4.8	4.6	3	13	1530	1.8		2
4	0200	4.8	4.6	4	13	1600	2.5		2
4	0230	5.0		3	13	1630	2.0		3
6	0130	3.8	4.6	2	13	1730	2.5		3
6	0200	3.8	4.6	2	13	1830	2.9		2
6	1130	3.0	7.0	1	13	2000	2.9		2
7	0100	3.6		2	17	0000	1.7		2
7	2200	2.9		3	17	0030	1.7		3
7	2230	2.8		3	18	0330	4.3		4
7	2300	2.5	I	4	18	0400	4.3		5
7	2330	2.1	I	4	18	0430	4.5		4
8	2230	3.2		2	22	1730	2.8	4.2	2
9	0100	3.6		2	22	1800	2.8	4.5	2
9	0130	4.0	4.6	4	22	1830	2.8	5.0	2
No records available for Dec.23-31.					22	1900	2.8	5.0	2

GEOMAGNETIC ACTIVITY, K, Ak, C

J. B. Townshend, Observer in Charge
College Magnetic Observatory, U.S.C.&G.S.

The K, Ak and C-indices for College are assigned at the Coast & Geodetic Survey's College Magnetic & Seismological Observatory located at the University of Alaska.

The K-index. The K-index is an indication of the intensity of the solar particle-radiation effects for each eight intervals beginning 00-03, 03-06...21 to 24 U.T. It is defined as, the difference between the highest and lowest deviation from a smooth curve to be expected for a component on a magnetically quiet day, within a three hour interval, according to the season, the sunspot cycle, and the phase of the moon. The K-indices are scaled from the Normal and Storm magnetograms, D and H traces and are based on the most disturbed component. The Z component is no longer used for determining K. The schedule for K-indices vs gamma range for College is as follows:

Gamma Range	K-index
0 < 25	0
25 < 50	1
50 < 100	2
100 < 200	3
200 < 350	4
350 < 600	5
600 < 1000	6
1000 < 1650	7
1650 < 2500	8
2500 +	9

The Equivalent Daily Amplitude, Ak. The K-index is converted into an equivalent range, ak which is near the center of the limiting gamma ranges for a given grade of K. The average of the eight values ak is called the equivalent daily amplitude Ak. For College the equivalent ak for K is:

K =	0	1	2	3	4	5	6	7	8	9	
ak =	0	3	7	15	27	48	80	140	240	400	(10Y)

The unit 10Y has been chosen so as not to give the illusion of an accuracy not justified. The table for the re-conversion of K into an equivalent amplitude ak is conventional and differs somewhat from the values adopted for the center of the limiting gamma ranges. The difference is of importance only in special studies, therefore, the conventional re-conversion of K into ak is used.

The Magnetic Daily Character-Figure C. To each Universal day a character is assigned on the basis C=0, if it is quiet; C=1; if it is normal or moderately disturbed; C=2, if it is greatly disturbed. The method used to assign characters at the College Observatory is based on Ak as follows:

Ak range	C
0 < 11	0
11 < 50	1
50 +	2

Reference: Annals of the IGY, IV, pp. 227-236, 1957.

MAGNETIC ACTIVITY

October 1964

K-indices, Whole-day Character, and Equivalent Daily Amplitude, A_K

Observatory, U.S. Coast and Geodetic Survey, College, Alaska.

	K-indices										
	Hours UT										
Date	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	Sum	Whole-day Character	A_K
1	2	2	3	3	3	3	0	0	16	1	09
2	1	0	0	0	0	1	0	0	02	0	01
3	1	0	1	3	5	6	2	2	20	1	20
4	3	4	4	6	3	6	3	3	32	1	34
5	4	2	3	5	5	3	2	2	26	1	22
6	2	1	2	2	4	5	2	2	20	1	14
7	3	3	3	3	1	1	2	2	18	1	10
8	1	2	4	5	4	3	2	2	23	1	18
9	2	2	6	5	4	1	1	1	22	1	22
10	1	0	0	2	2	1	0	1	07	0	03
11	0	0	0	0	1	2	0	1	04	0	02
12	1	1	3	7	6	4	2	1	25	1	35
13	1	1	2	2	4	3	1	1	15	0	09
14	1	2	2	4	3	0	0	0	12	0	07
15	0	1	2	3	3	3	1	0	13	0	07
16	0	1	0	0	0	1	0	0	02	0	01
17	0	2	3	5	4	3	0	0	17	1	14
18	1	1	0	3	4	4	2	2	17	1	11
19	3	3	4	4	6	6	3	3	32	1	34
20	3	2	2	4	4	2	1	1	19	1	12
21	1	1	3	5	4	5	3	2	24	1	21
22	2	1	2	3	2	0	0	0	10	0	05
23	0	0	0	0	0	0	0	0	00	0	00
24	0	1	0	1	0	1	1	1	05	0	02
25	1	1	0	1	2	0	0	0	05	0	02
26	1	2	7	7	4	1	2	0	24	1	41
27	1	1	2	5	5	2	0	0	16	1	15
28	0	1	0	2	3	1	1	1	09	0	04
29	1	1	2	3	3	1	1	0	12	0	06
30	1	1	0	4	2	1	0	0	09	0	05
31	0	0	0	2	0	0	0	0	02	0	01

	D	H	Z
Lower limit for K = 9	2530	2490	2500

MAGNETIC ACTIVITY

November 1964

K-indices, Whole-day Character, and Equivalent Daily Amplitude, A_K

Observatory, U.S. Coast and Geodetic Survey, College, Alaska.

	K-indices										
	Hours UT										
Date	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	Sum	Whole-day Character	A_K
1	0	1	2	4	4	4	3	3	21	1	15
2	4	3	3	3	2	2	1	1	19	1	12
3	1	1	1	1	0	1	0	0	05	0	02
4	0	0	0	0	5	1	1	1	08	0	07
5	2	2	0	1	4	2	2	2	15	0	08
6	0	0	0	2	3	0	1	1	07	0	04
7	0	0	0	0	0	0	0	0	00	0	00
8	2	1	3	2	4	0	1	2	15	0	09
9	3	4	3	6	4	3	2	2	27	1	24
10	2	2	2	2	2	0	1	1	12	0	05
11	0	1	3	2	1	0	0	0	07	0	04
12	2	3	1	1	1	2	1	1	12	0	06
13	0	1	3	5	4	3	0	0	16	1	14
14	0	0	0	0	0	0	0	0	00	0	00
15	0	0	1	3	5	4	3	2	18	1	14
16	2	1	3	5	3	3	1	2	20	1	14
17	1	1	0	2	3	3	0	0	10	0	05
18	1	0	0	1	0	1	1	1	05	0	02
19	1	1	0	0	0	0	0	1	03	0	01
20	0	0	1	3	0	0	0	0	04	0	02
21	0	0	1	1	0	0	0	0	02	0	01
22	0	0	2	4	3	1	0	0	10	0	07
23	1	4	4	7	6	6	2	1	31	1	46
24	0	0	2	2	0	0	0	1	05	0	02
25	0	0	0	0	0	1	1	0	02	0	01
26	0	0	3	6	5	4	1	1	20	1	22
27	0	0	0	0	0	0	1	3	04	0	02
28	1	1	2	3	3	3	3	1	17	0	10
29	0	0	0	1	0	0	0	1	02	0	01
30	3	1	0	2	0	0	0	1	07	0	04

	D	H	Z
Lower limit for K = 9	2530	2490	2500

MAGNETIC ACTIVITY

December 1964

K-indices, Whole-day Character, and Equivalent Daily Amplitude, A_K

Observatory, U.S. Coast and Geodetic Survey, College, Alaska.

	K-indices										
	Hours UT										
Date	00-03	03-06	06-09	09-12	12-15	15-18	18-21	21-24	Sum	Whole-day Character	A_K
1	1	1	4	4	3	3	0	0	16	1	11
2	0	0	2	1	0	0	0	0	03	0	01
3	0	0	1	3	3	1	1	1	10	0	05
4	0	1	0	2	2	1	0	1	07	0	03
5	0	0	0	1	0	0	0	0	01	0	00
6	0	0	0	1	1	0	1	1	04	0	02
7	0	0	0	4	5	4	2	2	17	1	15
8	1	2	1	0	1	2	0	0	07	0	03
9	0	0	2	2	2	0	0	0	06	0	03
10	0	0	1	1	0	0	0	0	02	0	01
11	0	0	1	1	1	0	0	1	04	0	02
12	0	0	0	1	1	0	0	0	02	0	01
13	0	0	0	2	1	3	2	2	10	0	05
14	1	0	2	4	3	1	1	0	12	0	07
15	0	1	1	2	2	0	0	0	06	0	03
16	0	1	1	5	7	3	1	1	19	1	27
17	3	3	3	4	2	3	3	1	22	1	14
18	2	1	2	0	2	0	0	0	07	0	03
19	0	0	0	2	3	3	2	1	11	0	06
20	0	0	0	4	1	0	2	0	07	0	05
21	0	0	1	2	2	2	0	0	07	0	03
22	0	0	0	1	2	2	0	0	05	0	02
23	0	1	1	2	3	0	0	0	07	0	04
24	0	0	0	0	1	1	0	0	02	0	01
25	0	0	0	1	3	1	0	1	06	0	03
26	2	0	0	1	2	1	0	0	06	0	03
27	0	0	0	0	0	0	0	0	00	0	00
28	0	0	0	0	0	0	0	1	01	0	00
29	0	0	2	1	1	0	0	0	04	0	02
30	0	0	0	1	0	0	0	0	01	0	00
31	0	0	0	0	1	0	0	0	01	0	00
							D		H	Z	
Lower limit for K = 9							2530		2490	2500	