UNION RADIO - SCIENTIFIQUE INTERNATIONALE

INTERNATIONAL SCIENTIFIC RADIO UNION

URSI

BULLETIN MENSUEL — MONTHLY BULLETIN

MARS 1940 — MARCH 1940

D O C U M E N T S - T R A V A U X

D O C U M E N T S - W O R K S

Les documents suivants ont été reçus au Secrétariat Général pendant le mois de Février.

Les Membres des Comités Natio-naux désireux d'obtenir ces do-cuments en communication, sont priés de s'adresser au Secréta-riat Général.

The General Secretary's Offi-ce has received the following papers during February.

Members of National Commit-tees wishing to receive these papers in communication, are requested to ask them to the General Secretary's Office.

COMITE NATIONAL AMERICAIN

AMERICAN NATIONAL COMMITTEE

Publications from the Massachusetts Institute of Technology.

Department of Electrical Engineering

Breakdown Studies in Compressed Gases, Alvin H. Howell, Amer. Inst. Electr.Eng. Trans. 58, 193-204, 1939.

The electrical breakdown strength of air, nitrogen, and helium-nitrogen mixtures, were studied for pressures up to 600 pounds per square inch, for direct voltages up to 450,000 volts, and for several electrode configurations. The work goes beyond previous studies in the range of voltage covered and in the practical usefulness of the electrode configurations tested. Anomalies are noted and reasonable explanations given in the light of current theories of breakdown. An extensive critical bibliographical table showing the scope of former works is included.

The Light Field by A. Gershun. Translated by Parry Moon and G.S. Timoshenko. Jour. of Math. and Phys., Vol.XVIII, 51-151,1939.

A translation of Gershun's book which appeared in Russian in 1936. The work gives a highly original exposition of photometric theory based on the idea of a vector field of light.

A Feedback Micromicroammeter. Shepard Roberts. Rev. Sci.Inst. Vol.10, 181-3, 1939.

Low input resistance, high stability of calibration, and high current sensitivity are desirable properties of vacuum tube elec-trometer circuits used for measuring direct current. It is shown that with the use of negative feedback, stability of calibration

can be improved and input resistance can be reduced several hundredfold while retaining high current sensitivity, all in a low cost instrument.

Electromagnetic Horn Design. L.J.Chu and W.L. Barrow. Amer.Inst. Electr.Eng. Trans. 58, 333-8, 1939.

The electromagnetic horn is capable of concentrating radio waves into a beam of almost any sharpness, and hence of providing an effective power at the receiver that is many hundredfold greater than that attainable with a nondirective antenna. For optimum directivity with horns, the lengths of the sides and the angle between them are critical, as is the disposition of the exciting antenna at the throat. Date are presented in the form of curves that permit the correct design of horns of sectoral and pyramidal shapes to meet given specifications.

An electronic Control Circuit for Resistance Welders. T.S.Gray and J. Breyer. Amer. Inst. Electr.Eng. Trans.,58, 361-4, 1939.

A control circuit utilizing cold-cathode gas-filled tubes of the strobotron and band-igniter types is described, which, upon operation of a pushbutton, will deliver to a welder a predetermined adjustable fractions of half-cycles of current. Desirable features are : (1) the precision of the timing, (2) the simplicity of construction of the cold-cathode tubes, (3) the elimination of the need for cathode heating, and its attendant delay, and (4) the economic practibility of the circuit.

The Design of Photoelectric Flicker Photometers. Parry Moon and D.P. Severance. I.E.S. Trans. 34, 801-25, 1939.

The basic features to be considered in the design and application of photoelectric flicker photometers are discussed, and the errors of such instruments are analyzed. It is shown that these instruments can be used successfully in measuring the candlepower of periodically flickering sources, such as fluorescent lamps operated on alternating current.

Diffraction Theory of Electromagnetic Waves. J.A. Stratton and L.J. Chu. Phys. Rev. 56, 99-107, 1939.

The diffraction of electromagnetic waves cannot be calculated accurately by the classical Kirchoff formula when the wave length is comparable to the dimensions of the opening, since this formula takes into account neither the vector character of the field nor the effect of charges along the contour of the opening. In this paper the field equations are integrated directly and the results are applied to the calculation of the diffraction of electromagnetic waves from a rectangular slit in a screen of infinite conductivity. The results are compared with an exact solution.

An acoustic Transmission Line for Impedance Measurement. William M. Hall, J.A.S.A. 11, 140-6-1939.

Rapid and precise measurements of acoustic impedance are possible with the aid of an acoustic transmission line which is essentially a tube along which a small microphone can be moved. Just

as the impedance of the termination of an electric transmission line can be determined from the voltage distribution along the line, so the acoustic impedance of any device used to terminate this tube can be determined from the sound pressure distribution along the tube. The line is extremely useful in the study of horns, acoustic filters, and loudspeakers, and in the measurement of sound absorption coefficients and attenuation.

Measurements on Eliminators and the Development of a New Type for Use at High Gas Velocities. H.G. Houghton and W.H. Radford, A.I.C.E. Trans. 34, 427-32, 1939.

A new type of apparatus for the local dissipation of natural fog required an eliminator to remove fine spray from air moving at a velocity of 3,000 feet per minute. Tests on conventional eliminators showed sharp decreases in collection efficiencies as air velocities were raised beyond critical values lying between 1,500 and 2,000 feet per minute. The new eliminator comprises staggered rows of vertical bars of streamlined cross section. Its efficiency is constant over wide ranges of velocity and it offers less flow resistance, for the same collection efficiency, than any of the other types tested.

Values of the Bessel Functions ber x and bei x and their Derivatives. H.B. Dwight, Amer. Inst.Electr.Eng.Trans. Supp.787-90, 1939.

The functions whose values are tabulated in this paper are used frequently in the calculation of current distribution in conductors of large cross section at power frequencies and in wires of smaller cross section at radio frequencies. This paper extends the tabulation of available values for arguments ranging from 0 to 10 to arguments ranging from 10 to 20. The complex values are given in both the rectangular and polar forms, and are carried to five significant figures.

An Amplifier-Wattmeter Combination for the Accurate Measurement of Watts and Vars. G.S. Brown and E.F. Cahoon, A.I.E.E. Trans. 58, 593-7, 1939.

The accurate measurement of electrical quantities in a low power network such as that of a network analyzer requires instruments of low burden, and for rapid measurement the time of response of these instruments should be small. Criteria are given for determining the allowable burdens of ammeters and voltmeters in a particular analyzer network, and the design is given of an instrument which measures rapidly and accurately watts and vars in this network. The instrument comprises an electrodynamic wattmeter, a negative-feedback amplifier, and a phase-shifting network. The assembly may be operated with the same facility as a portable instrument.

A Table of Fresnel Reflection. Parry Moon. Jour.Math. and Phys. 19, 1-33, 1940.

The Fresnel formula for the amount of light reflected from polished, nonconducting surfaces has many practical applications in optics and illuminating engineering. In the past, calculations dealing with reflected light have been hampered by the lack of tables. This difficulty is eliminated by the present paper.

Polarized Light for Motor Vehicles. Henry T.Gibbs. Journ. Franklin Inst. 288, 719-31, 1939.

The probable effect on visibility of using polarized headlights on motor vehicles has been much discussed but few actual test data have been obtained. The purpose of this investigation was to determine quantitatively the effect on visibility of changing the headlight candlepower over a wide range, both with and without polarization. The results show that it is desirable to increase the candlepower of present systems; but that little, if anything, is gained by the introduction of polarization with lamps of the candlepower used at present.

The Science of Balancing an Impedance Bridge. George B.Hoadley Journ. Franklin Inst.228, 733-54, 1939.

It is shown that the design and operation of impedance bridges can be approached more intelligently with the aid of locus diagrams. By means of these diagrams the process of balancing can be followed in detail graphically, and the difficulties in balancing certain types of bridges can be easily understood. A test is developed whereby the ease with which a particular bridge will balance may be predicted from the balance equation.

The Electrical Breakdown Strength of Ionic Crystals as a Function of Temperature. R.C. Buehl and A. von Hippel. Phys. Rev.56, 941-7, 1939.

It has been generally believed that the breakdown strengths of insulators are constant in the lower temperature range and decrease rapidly at high temperatures, indicating thermal breakdown. The authors show that, at least in ionic crystals like potassium bromide, a very steep increase of breakdown strength with temperature is recorded in the lower range. This new phenomenon is apparently analogous to the temperature coefficient of resistance in metals; that is, at the higher temperatures the vibrations of the crystal lattice hinder the acceleration of the conducting electrons. The new effect has important theoretical significance.

Design and Construction of Experimental Vacuum Tubes in Engineering School Laboratories. Truman S.Gray. Journ. Eng.Educ.30, 372-81, 1939.

The design and construction of experimental tubes as a means of instruction in the field of engineering electronics is desirable because of the rapid development of the art, the continuing discovery of new fundamental phenomena, and the difficulty of accurate theoretical prediction of tube characteristics. The methods of instruction in a typical laboratory are outlined, and the details of the written instructions furnished the students are included. It is emphasized that vocational training is not an appropriate objective, and that it is avoided.

The Atomphysical Interpretation of Lichtenberg Figures and Their Application to the Study of Gas Discharge Phenomena. F.H. Merrill and A. von Hippel. Journ.App. Phys.10, 873-87, 1939.

Two-dimensional electrical discharges can be made to photograph themselves directly on the surface of photographic plates. These Lichtenberg figures can be made to present detailed record of the early stages of discharge phenomena. The interpretation of such records in terms of electronic ionization, space charge, plasma formation, and neutralization of charges is presented. A new camera has been developed for use in the pressure range between vacuum and thirty atmospheres. The results obtained with it aid in understanding the different stages of gas breakdown, and show how corona effects may be suppressed by the presence of electro-negative gases.

Biconical Electromagnetic Horns. W.L. Barrow, L.J. Chu and J.J. Jansen. I.R.E.27, 769-79, 1939.

A further development of the horn-type antenna for ultra-short waves is described in which two rotationally symmetrical conductors, such as two metal cones, disposed tip to tip are employed, with connection to the driving apparatus being made near the tip. This " biconical " horn is able to transmit or receive with equal effectiveness in all directions in a plane, but poorly or not at all in other directions. Simplicity and broad frequency response are other features. These characteristics indicate possible applications to broadcast-transmission services at ultra-high frequencies. The paper presents the theory of operation of the horn and the results of an experimental investigation.

A Compact Pressure-Insulated Electrostatic X-Ray Generator. J.G. Trump and R.J. Van de Graaff, Phys. Rev.55, 1160-5, 1939.

This paper describes a 1,250 kilovolt pressure-insulated electrostatic X-ray generator developed for scientific and medical purposes. A major object of the development was the investigation, with a small and thus flexible machine, of the principles and design factors involved in pressure-insulated electrostatic generators, having in view the subsequent development of higher voltages in compact apparatus. The relative insulating values of air and of freon as a function of pressure are presented. The machine as developed will be used for cancer therapy at the Massachusetts General Hospital.

U R S I G R A M M E S

U R S I G R A M S

COMITE NATIONAL AMERICAIN

AMERICAN NATIONAL COMMITTEE

PROGRAMME - CODE

Voir Bulletin Mensuel . See Monthly Bulletin

N° 10, Oct. 1938, p. 6.

M.A.G.

U.S. Coast and Geodetic Survey, Cheltenham, Md.

Date	Ursigrams	Date	Ursigrams
1940 Jan.		1940 Jan.	
7	159XX	26	63XXX
8	259XX	27	73XXX
9	33XXX	28	13XXX
10	4593X 1020X	29	23XXX
11	559XX	30	3593X 1400X
12	6595X 2200X	31	459XX
13	73XXX	Feb.	
14	13XXX	1	559XX 5K445 44345
15	23XXX	2	6595X 2100X 6K434 33333
16	33XXX	3	7597X 1500X 7K413 34453
17	4593X 0200X		1800X
18	5595X 2200X	4	13XXX 1K011 11322
19	63XXX	5	23XXX 2K211 22223
20	73XXX	6	33XXX 3K222 33233
21	13XXX	7	43XXX 4K423 12223
22	23XXX	8	5593X 2312X 5K322 21133
23	33XXX	9	6595X 0600X 6K342 21202
24	43XXX	10	73XXX 7K211 01233
25	5577X 0100X 1700X		

NOTE: Two final MAG groups with K as second digit give eight indices for geomagnetic activity for three-hour periods successi--vely during 24 hours ending 24 GMT, 7 p.m. EST, Greenwich of week day indicated by figure before K, usually day preceding is--suance. Indices range from zero very quiet to 9 extremely distur--bed. Magnetic storm characterized by 5 or higher. K index descri--bed Journal Terrestrial Magnetism Atmospheric Electricity, Dece--ber 1939.

MAGNETIC CHARACTER FIGURES

Revised figures for the week Dec.30, 1939 to Jan.5, 1940.
(February Monthly Bulletin, n°26, page 9)

Date	Oh - 12h	12h - 24h	Date	Oh - 12h	12h - 24h.
1939 Dec. 30	0.0	0.1	1940 Jan. 2	0.4	0.2
31	0.0	0.0	3	0.6	1.5
1940 Jan. 1	0.0	0.0	4	0.6	1.0
			5	0.7	0.3

Average of data from the magnetic observatories of the U.S. Coast and Geodetic Survey located at Cheltenham, Md.; Tucson, Arizona; Sitka, Alaska; Honolulu, Hawaii; and San Juan, Puerto Rico, and from the magnetic observatories of the Department of Terrestrial Magnetism located at Watheroo, Western Australia, and Huancayo, Peru.

Each observatory rates the magnetic activity of each half-day with the character-figure 0.0, 0.5, 1.0, 1.5, or 2.0; 2.0 signifying the greatest degree of magnetic disturbances and 0.0 signifying the least degree of or no magnetic disturbance.

Date	Oh - 12h	12h - 24h	Date	Oh - 12h	12h - 24h.
1940 Jan. 6	0.5	0.8	1940 Jan. 13	0.2	0.0
7	0.4	0.9	14	0.0	0.0
8	0.4	0.2	15	0.0	0.1
9	0.0	0.6	16	0.5	0.6
10	0.3	1.3	17	0.4	0.6
11	0.7	1.1	18	0.4	1.3
12	0.9	0.7	19	0.6	0.3

Date	0h - 12h	12h - 24h	Date	0h - 12h	12h - 24h
1940 Jan. 20	0.1	0.4	1940 Feb. 1	0.9	1.1
21	0.0	0.1	2	0.5	0.4
22	0.1	0.5	3	0.1	0.6
23	0.3	0.4	4	0.0	0.1
24	0.4	0.5	5	0.0	0.3
25	0.5	0.4	6	0.3	0.6
26	0.0	0.1	7	0.5	0.4
27	0.1	0.2	8	0.3	0.4
28	0.0	0.0	9	0.4	0.1
29	0.0	0.5			
30	0.6	0.9			
31	0.8	1.1			

S.O.L.

U.S. Naval Observatory

Date	Groups	Spots	Area Sq. Degrees
1940 Jan.			
7	--	--	--
8	--	--	--
9	4	48	50
10	3	30	43
11	--	--	--
12	--	--	--
13	--	--	--
14	--	--	--
15	5	62	10
16	6	74	10
17	5	40	15
18	--	--	--
19	5	32	13
20	7	53	10
21	5	31	9
22	6	30	7
23	--	--	--
24	4	36	9
25	3	9	7
26	4	23	22
27	5	44	36
28	3	32	31
29	3	37	31
30	5	17	36
31	6	28	36
Feb.			
1	6	29	32
2	5	44	35
3	5	20	31
4	--	--	--
5	4	20	28
6	--	--	--
7	5	42	18
8	9	67	17
9	7	32	16
10	--	--	--

K.H.L.

National Bureau of Standards

For Jan. 10

3417X	40024	34171
25011	54025	02033
29011	62026	02040
31014	70027	06035
31517	78028	06056
32027	86029	10039
32523	98032	14047
33022	98038	160XX
36023	KHL	

For Jan.17.

3417X	62025	
25012	70026	
29013	78027	
31014	94028	
31515	KHL	
32023	34171	
32522	02030	
34021	02036	
38021	04031	
40025	04040	
42026	08034	
46025	12043	
54025	140XX	

For Jan.24.

3417X	39024
25013	41026
29014	44026
310XX	63027
32524	77029
35022	

For Jan.31

3417X	50025
25012	62025
30013	70026
31014	78027
31516	82028
32024	86030
32520	86034
34021	88030
38023	88040
40025	92034
42027	96047
46027	980XX

For. Feb. 7

3417X	36033	96031
25013	37022	96038
28013	42025	KHL
30013	46026	34171
31014	54027	00033
32024	70028	00043
33018	86030	04035
34016	92030	08053
35028	92035	100XX

JAPANESE URSIGRAMS

From Tokyo Station JAU2 7327.5 Kc, received by the RCA San Francisco Station.

S.O.L.

1940

Jan. 13 : 50583 60465 70620 10280 20259 30341 40444
Saturday add 100 to number of spots Friday Central Meridian Passage of large groups of spots visible with naked eyes.

Jan. 20 : 50430 60322 70429 10440 20545 30451 40455

Jan. 27 : 50464 60447 70568 10656 20655 30632 40449

Feb. 3 : 50529 60544 70652 10344 20348 30241 40545

Feb. 10 : 50557 60458 7XXXX 10549 20656 3XXXX 40745
Thursday Central Meridian passage of a large group of spots visible with naked eyes.

P.R.O.

1940

Jan. 13 : 54232 64231 73232 1XXXX 24232 33210 44131

Jan. 20 : 54242 64141 74151 12021 24221 3XXXX 41042

Jan. 27 : 54243 63253 74251 13142 22132 31031 42152

Feb. 3 : 54141 63241 75251 1XXXX 22121 33133 44143

Feb. 10 : 5XXXX 6XXXX 7XXXX 13231 23130 3XXXX 42120

M.A.G.

1940

Jan. 13 : 80421 22112

Jan. 20 : 81122 10012

Jan. 27 : 81821 00111

Feb. 3 : 82510 10122

Feb. 10 : 80111 11111

K.H.I.

1940				
Jan. 13 :	70903	00125	26328	455XX
Jan. 20 :	71603	XX100	26328	345XX
Jan. 27 :	72303	00126	29335	005XX
Feb. 3 :	73003	25227	28430	347XX
Feb. 10 :	70603	XX127	29333	005XX

F.A.D.

1940
Jan. 13 : Nil

Jan. 20 : Nil

Jan. 27 : Nil

Feb. 3 : Nil

Feb. 10 : Nil

MANILA URSIGRAMS

M.A.G.

received at Navy Department

For January 1 to 15, 1940 :

Jan. 1 : 259XX 257XX 577XX 653XX 757XX 153XX 259XX 357XX
477XX 577XX 657XX 759XX 13XXX 259XX

For January 16 to 31, 1940 :

Jan. 16: 357XX 479XX 573XX 659XX 759XX 159XX 257XX 355XX
457XX 557XX 659XX 759XX 159XX 255XX 375XX 477XX

COMBINED MANILA URSIGRAMS

M.A.G. for October, November, December 1939, transmitted by Miguel Selga, Director, Weather Bureau, The Government of the Philippine Islands, Department of Agriculture and Commerce, Weather Bureau, Central Office, Manila.

October : 159XX 259XX 377XX 477XX 573XX 677XX 759XX
159XX 277XX 359XX 455XX 559XX 675XX 775XX
175XX 253XX 359XX 453XX 559XX 659XX 759XX
159XX 273XX 359XX 459XX 559XX 659XX 753XX
159XX 259XX 33XXX

November: 459XX 53XXX 659XX 73XXX
159XX 259XX 357XX 459XX 559XX 659XX 759XX
179XX 277XX 357XX 459XX 53XXX 659XX 759XX
159XX 259XX 359XX 43XXX 555XX 655XX 753XX
155XX 259XX 359XX 459XX 559XX

December : 659XX 759XX
159XX 259XX 373XX 479XX 575XX 677XX 777XX
159XX 259XX 359XX 459XX 53XXX 657XX 759XX
159XX 23XXX 33XXX 457XX 559XX 677XX 759XX
159XX 259XX 359XX 475XX 553XX 659XX 759XX
159XX

COMITE NATIONAL ITALIEN

ITALIAN NATIONAL COMMITTEE

PROGRAMME - CODE

Voir Bulletin Mensuel . See Monthly Bulletin

N° 9, Sept. 1938, p. 19.

M.A.G.

Observations de l'Observatoire Magnétique de Gênes

URSIGRAMMES

du 7 au 13.2.1940 :	10723	23332	21118	30570	41123	20020
	50118	20480	60188	88190		
du 14 au 20.2.1940 :	11422	22123	71123	20480		
du 21 au 27.2.1940 :	12132	33822	11188	88170	31119	20480
	41188	88480	51188	88230		
du 28.2 au 6.3.1940:	12823	22222	21115	00170		

TRADUCTION

Date	Observations relevées
Fév. 7	Perturbation de faible étendue
8	Agité
9	Perturbation de faible étendue
10	Agité
11	Agité
12	Agité
13	Perturbation de faible étendue

1940 Fév.	
14	Perturbation de faible étendue
15	Perturbation de faible étendue
16	Perturbation de faible étendue
17	Perturbation de faible étendue
18	Presque calme
19	Perturbation de faible étendue
20	Agité
21	Agité
22	Perturbation de faible étendue
23	Agité
24	Agité
25	Perturbation modérée avec début vague
26	Perturbation de faible étendue
27	Perturbation de faible étendue
28	Perturbation de faible étendue
29	Agité
Mars 1	Perturbation de faible étendue
2	Perturbation de faible étendue
3	Perturbation de faible étendue
4	Perturbation de faible étendue
5	Perturbation de faible étendue
6	Perturbation de faible étendue

S.O.L.

Observations de l'Observatoire Royal d'Arcetri-Catania

URSIGRAMMES

du 8 au 14.2.1940 : 52XX2 X85X6 XXXXX 63XX1 123X6 XXXXX
73XX3 111X9 X3X42 12XX3 X91X8 X6X71
22XX3 101X6 X8X97 32XX1 148X5 XXXXX
42XX3 148X7 XXXXX

du 15 au 21.2.1940 : 52212 153X6 X8101 63XX2 118X6 XXXXX
72XX2 X88X5 XXXXX 12112 X62X5 X5X45
22113 X73X6 X8X78 32XX1 122X7 X7X52
42223 11710 11X88

du 22 au 28.2.1940 : 52223 X87X7 X9104 62112 X76X6 X8X92
72XX3 X69X6 X8219 12XX3 X46X4 XXXXX
22XX3 117X8 XXXXX 32XX3 X53X7 X5X84
42XX1 109X7 XXXXX 24 Febbraio imponente
Protuberanza 10°Sud Lembo Orientale.

du 29.2.au 5.3.1940: 53231 142X5 X4X26 63233 13410 X9X54
73233 118X7 X8X51 13233 167X7 XXXXX
23XX3 180X5 XXXXX 33XX3 130X5 X6X75
43XX3 114X3 XXXXX

TRADUCTION

ACTIVITE SOLAIRE

Date	Activité générale	Activité d'après les plages faculaires brillantes	Activité d'après les filaments	Variation de l'activité générale
1940 Féb. 8	Moyenne	=	=	Décroissante
9	Grande	=	=	Croissante

1940 Feb. 10	Grande	=	=	Constante
11	Moyenne	=	=	Constante
12	Moyenne	=	=	Constante
13	Moyenne	=	=	Croissante
14	Moyenne	=	=	Constante
15	Moyenne	Peu intense	Faible	Décroissante
16	Grande	=	=	Décroissante
17	Moyenne	=	=	Décroissante
18	Moyenne	Faible	Faible	Décroissante
19	Moyenne	Faible	Faible	Constante
20	Moyenne	=	=	Croissante
21	Moyenne	Peu intense	Peu intense	Constante
22	Moyenne	Peu intense	Peu intense	Constante
23	Moyenne	Faible	Faible	Décroissante
24	Moyenne	=	=	Constante
25	Moyenne	=	=	Constante
26	Moyenne	=	=	Constante
27	Moyenne	=	=	Constante
28	Moyenne	=	=	Croissante
29 Mars 1	Grande	Peu intense	Assez intense	Croissante
2	Grande	Peu intense	Assez intense	Constante
3	Grande	Peu intense	Assez intense	Constante
4	Grande	=	=	Constante
5	Grande	=	=	Constante
6	Grande	=	=	Constante

TACHES ET PROTUBERANCES

Date	Nombres relatifs de taches	Nombres relatifs de plages faculaires visibles sur le disque	Nombre de protubérances sur le bord	Superficie totale des protubérances
1940 Févr. 8	85	6	=	=
9	123	6	=	=
10	111	9	3	420
11	91	8	6	710
12	101	6	8	970
13	148	5	=	=
14	148	7	=	=
15	153	6	8	1010
16	118	6	=	=
17	88	5	=	=
18	62	5	5	450
19	73	6	8	720
20	122	7	7	520
21	117	10	11	880
22	87	7	9	1040
23	76	6	8	920
24	69	6	8	2190
25	46	4	=	=
26	117	8	=	=

1940 Févr. 27	53	7	5	840
28	109	7	"	"
29	142	5	4	260
Mars 1	134	10	9	540
2	118	7	8	510
3	167	7	"	"
4	180	5	"	"
5	130	5	6	750
6	114	3	"	"

NOTE

24.2.1940 - Importante protubérance 10° Sud bord Est.

K.H.L.

Observations du Centre Radioélectrique Expérimental G. Marconi

URSIGRAMMES

du 6.2.1940 : 10611 13115 16230 31333 35435 35536 386XX

du 14.2.1940: 11411 14116 16200 25227 29329 29429 29531
326XX

du 21.2.1940: 12111 13115 26228 30331 31433 33533 346XX

du 28.2.1940: 12811 10110 23228 30331 31431 33533 356XX

TRADUCTION

Fréquence	Hauteurs (Km.)			
Mc/S.	6.2.1940	14.2.1940	21.2.1940	28.2.1940
2,5	130	140	130	100
3	150	160	150	100
3,5	160	160 250	260	230
4	300	= 270	280	280
4,5	310	290	300	300
5	330	290	310	310
5,5	350	290	310	310
6	350	290	330	310
6,5	350	290	330	330
7	360	310	330	330
7,5	380	320	340	350

F.A.D.

17.2.1940 : 70930

TRADUCTION

Date	Fréquences K H Z	Début T.M.G.	Disparition totale des signaux R.T.	Retour des signaux	Rétablissement des communications normales
1940 Févr. 17	16345	9h 30m	peu après	9h 44m	9h 47m
	15450	9h 30m	peu après	9h 40m	9h 47m
	13380	9h 30m	peu après	9h 40m	9h 47m
	10235	9h 30m	peu après	9h 38m	9h 47m