

21 NOV 1932

*Library*

FOR OFFICIAL USE.

POST OFFICE ENGINEERING DEPARTMENT.

Radio Report No. 233.

CALIBRATION OF THE RADIO DIRECTION FINDER.

NITON RADIO STATION.

233



OFFICE OF THE ENGINEER-IN-CHIEF,  
(RADIO SECTION),  
GENERAL POST OFFICE (ALDER HOUSE),  
LONDON, E.C.1.

31 JAN 1933

*Library*

FOR OFFICIAL USE.

POST OFFICE ENGINEERING DEPARTMENT.

---

Radio Report No. 234

FREQUENCY VARIATION OF POST OFFICE

SHORT WAVE TRANSMITTERS

APRIL-JUNE 1932.

234



OFFICE OF THE ENGINEER-IN-CHIEF,  
(RADIO SECTION),  
GENERAL POST OFFICE,  
LONDON, E.C.1.

RADIO REPORT NO. 234.

FREQUENCY VARIATION OF POST OFFICE.  
SHORT WAVE TRANSMITTERS APRIL - JUNE 1932.

Report made by:- F.E. Nancarrow and E.J.C. Dixon.

at:- Dollis Hill.

date:- August, 1932.

A.J. Gill.  
for Engineer-in-Chief.

Date: 8. 12. 32.

Radio Section,  
Engineer-in-Chief's Office,  
G.P.O.,  
LONDON, E.C.1.

Rota 3724/32.

FREQUENCY VARIATION OF POST OFFICE,  
SHORT WAVE TRANSMITTERS,  
APRIL - JUNE 1932.

Summary.

The frequency records for the period January to March 1932 are given in Radio Report No.230. The present report gives the records for the period April to June, 1932 in a similar manner. The frequency measurements recorded are accurate to  $\pm 15$  parts in a million.

Post Office Short Wave Transmitters.

A. Oxford Radio Station - Telegraphy.

During the period under review the channels GIA and GIC were transferred from the old No.1 transmitter to the reconstructed No.2 transmitter. No.3 transmitter dealt with Channel GIH and GIK and No.4 (experimental) transmitter took GIF pending the reconstruction of the old No.1 transmitter.

B. Rugby Radio Station - Telephony.

The transmitters operated normally on their assigned channels, an exception being the occasional use of No.1 transmitter on GDS channel. In the case of Nos.2 and 6 transmitters Standard Telephone Type crystals were substituted for Post Office crystals following suspected faults but the faults were not traced to the crystals and the Post Office crystals were replaced in circuit. In No.5 transmitter GAA spare crystal was in use for most of the period while the crystals for the GAQ channel have yet to be adjusted accurately to allocation.

C. Portishead Radio Station - Ship Telegraphy.

One crystal controlled channel was in use during the period under review. The transmitter was built by the Post Office and uses "X" cut crystals in air gap holders temperature controlled by a selenium thermostat.

Frequency Measurements.

The routine measurements made by the Post Office interception station at Colney Heath provide the data for the curves attached to this report. The curves are all plotted to the same scale and lines indicating half the C.C.I.R. recommended tolerance of  $\pm .02$  per cent are drawn. Changes of crystal in use are indicated on the curves.

Analysis/

Analysis of Results.

Table 1 attached gives particulars of the transmitters and the worst deviations from allocated frequencies. Table 2 gives the number of times the transmitter exceeded the quoted tolerances of  $\pm 100$  in a million and  $\pm 200$  in a million (i.e. .01 and .02 per cent respectively). No curves are drawn on this basis as a strict comparison is not possible unless all channels carry an equal number of measurements at equal intervals of time. The reasons for major deviations from allocated frequencies are given in the "Remarks" column.

Conclusions.

Apart from the experimental transmitter the recommended C.C.I.R. tolerance is not exceeded by Post Office Short Wave transmitters except where channels are interchanged between transmitters or where crystals incorrectly adjusted to allocated frequency are used, e.g. some spares and some new channels. Arrangements are in hand to adjust all crystals to allocated frequency and bring all thermostat ovens as far as possible to a common temperature so as to avoid variations of frequency when channels are interchanged between transmitters. The normal performance of all types of frequency control at present in use is within the narrower tolerance of  $\pm 100$  parts in a million.

Rota 3724/32.

TABLE 1.

FREQUENCY VARIATION OF S/W TRANSMITTERS APR. - JUN. 1932.

## A. OXFORD RADIO STATION.

Transmitter	Call Sign	Allocated Frequency kc/sec.	Crystal Cut, Holder and Thermostat	No. of Mea- sure- ments	Max. deviation from Allocation		Max. Total Varia- tion. parts in a million	Max. deviation from Allocation
					+kc/sec	-kc/sec.		
No.1	GIA	19640	Y. Type 2. None	9	3.6	-2.0	82	183
"	GIC	8640	Y. " 2. "	4	-2.7	3.3	70	394
No.2	GIA	19640	X. Type 2A SR	20	3.0	-1.0	102	153
"	GIC	8640	X " 2A "	38	0.9	0.1	115	105
No.3	GIH	10650	X " 2A BM	68	0.6	0.0	56	56
"	GIK	5325	X " 2A "	3	0.3	0.0	56	56
No.4	GIF	9220	X " 2A SR	60	2.8	3.8	715	412

## B. RUGBY RADIO STATION.

No.1	GAU	18620	Y. S. BM	9	2.2	1.0	172	107
	GBU	12290	Y. S. BM	66	0.3	1.7	153	138
	GCU	9950	Y. S. BM	16	1.9	0.8	272	191
	GDS	6905	Y. S. BM	17	-2.0	9.0	1010	1300
No.2	GAS	18310	X. Type 2A. FR	21	1.2	0.0	66	66
	GBS	12150(1)	X " 2A FR	51	1.1	0.2	107	91
	GBS	12150(2)	Y S. FR	4	-2.5	3.2	58	263
	GCS	9020	X Type 2A. FR	53	1.9	0.0	210	210
	GDS	6905	X " 2A FR	20	0.2	1.3	218	188
No.3	GBW	14440	Y. S. BM	58	1.7	0.8	173	118
	GCW	9790	Y. S. BM	17	1.0	1.1	215	113
No.4	GBP	10770	X. Type 2A BM	72	0.1	0.5	56	46
No.5	GAA	20380(1)	Y. S. BM	10	1.7	0.5	108	84
	GAA	20380(2)	Y. S. BM	50	-0.1	4.2	201	205
	GAQ	18970	Y. S. BM	69	-2.3	6.2	205	327
No.6	GBB	13585(1)	X. Type 2A. BM	22	0.8	1.7	66	125
	GBB	13585(2)	Y. S. BM	18	-1.3	2.6	96	191

## C. PORTISHEAD RADIO STATION.

No.2	GKT	8210	X. Type 2A. SR	29	2.6	-0.5	255	317
------	-----	------	----------------	----	-----	------	-----	-----

NOTE:-  HOLDERS. S = Standard Telephone Type.

2A = Post Office 'air gap' Type.

 Thermostats.

BM = Bimetallic Helix.

SR = Selenium Resistance.

FR = Foster Instrument Co.'s type.

TABLE 2.

4.

## DEVIATIONS FROM FREQUENCY ALLOCATION OF S/W TRANSMITTERS APR.--JUN. 1932.

## A. OXFORD RADIO STATION.

Transmitter	Call Sign	Allocated Frequency kc/sec.	Number of Measurements	Times Exceeding $\pm 100/10^6$	Times Exceeding $\pm 200/10^6$	Remarks
Nos. 1 and 4	GIA	19640	29	10	-	Major deviations due to old No. 1 Transmitter
"	GIC	8640	42	5	4	
No. 3.	GIH	10650	68	-	-	Experimental thermostat.
"	GII	5325	3	-	-	
No. 4.	GIF	9220	60	13	11	

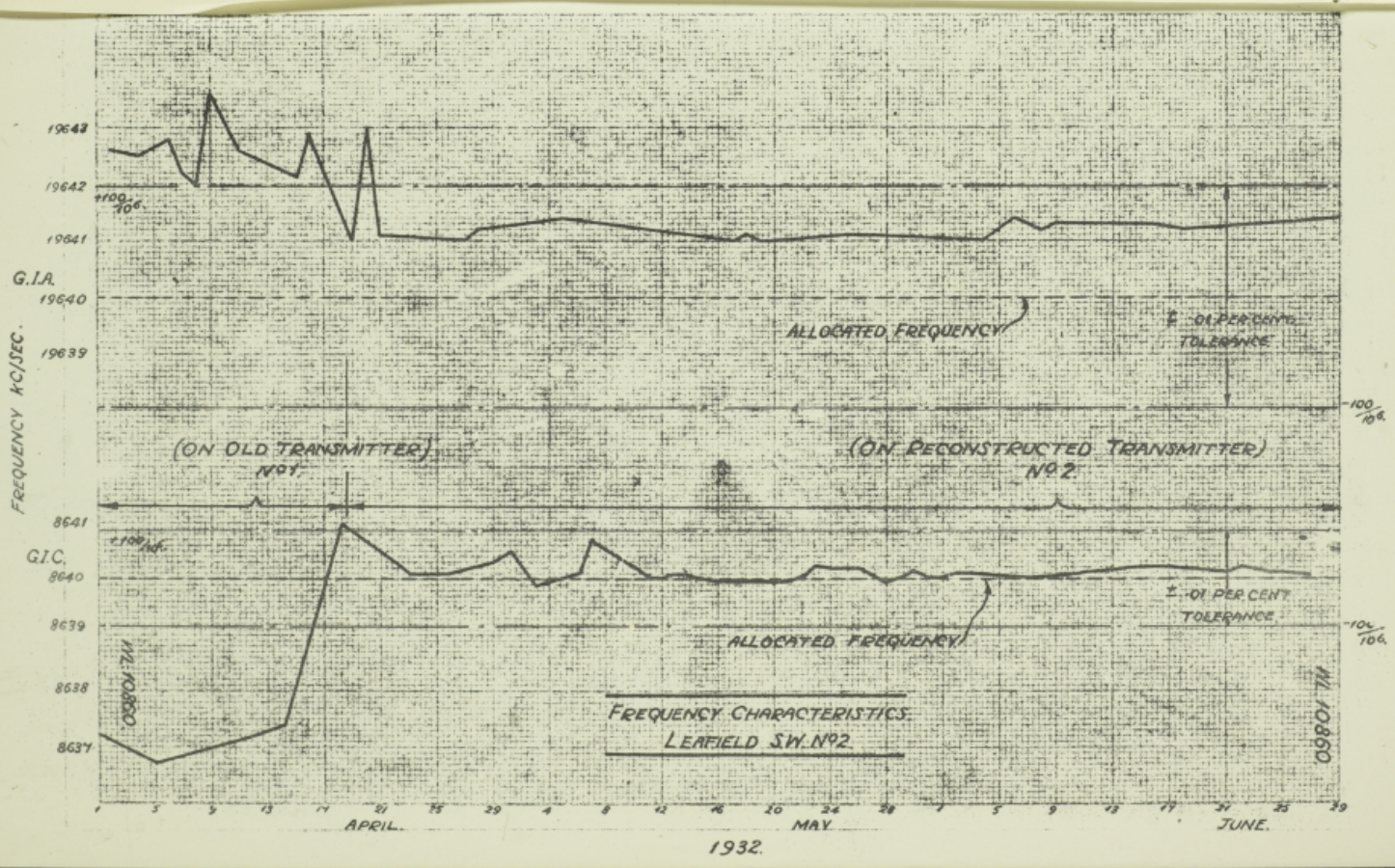
## B. RUGBY RADIO STATION.

No. 1	GAU	18620	9	1	-	Deviations due to intermittent fault on thermostat
"	GBU	12290	66	1	-	
"	GCU	9950	16	4	-	
No. 2	GAS	18310	21	-	-	Due to use of spare crystal.
"	GBS	12150	55	4	4	
"	GCS	9020	53	3	1	Major deviations ascribed to No. 1 Transmitter.
Nos. 1 and 2	GDS	6905	37	23	17	
No. 3	GBW	14440	53	3	-	Due to use of spare crystal
"	GCT	9790	17	2	-	
No. 4	GBP	10770	72	-	-	
No. 5	GAA	20380	60	36	-	Mean frequency 5 kc low.
"	GAQ	18970	69	69	66	
No. 6	GBB	13585	40	18	-	Due to use of spare crystal.

## C. FORTISHEAD RADIO STATION.

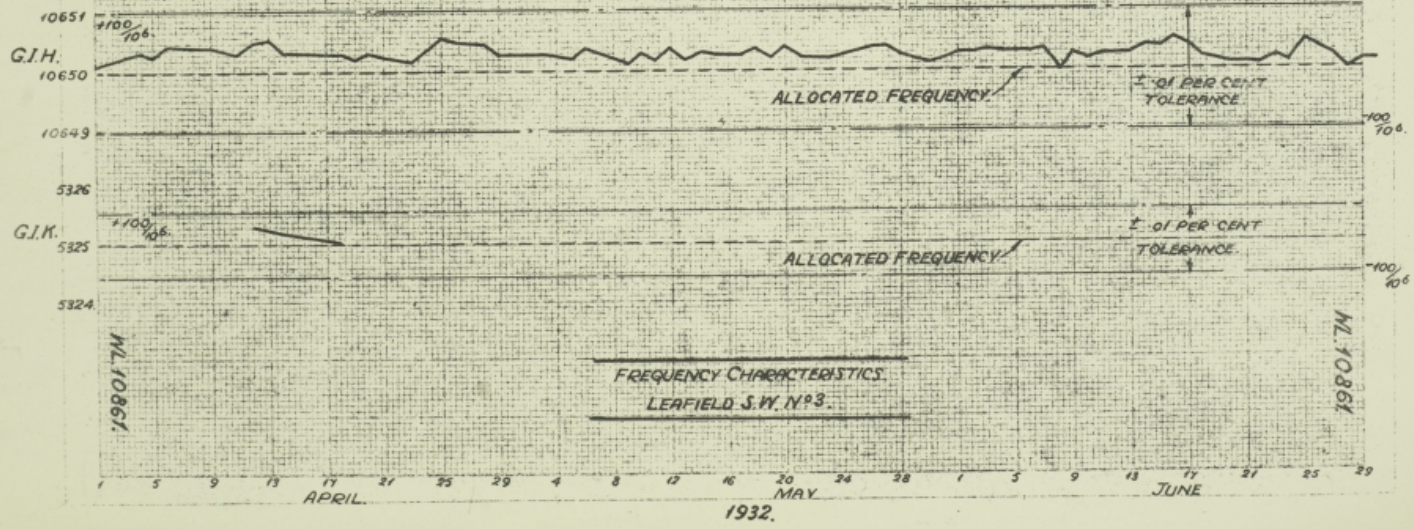
No. 2	GXT	8210	29	4	3	Fault on thermostat
-------	-----	------	----	---	---	---------------------

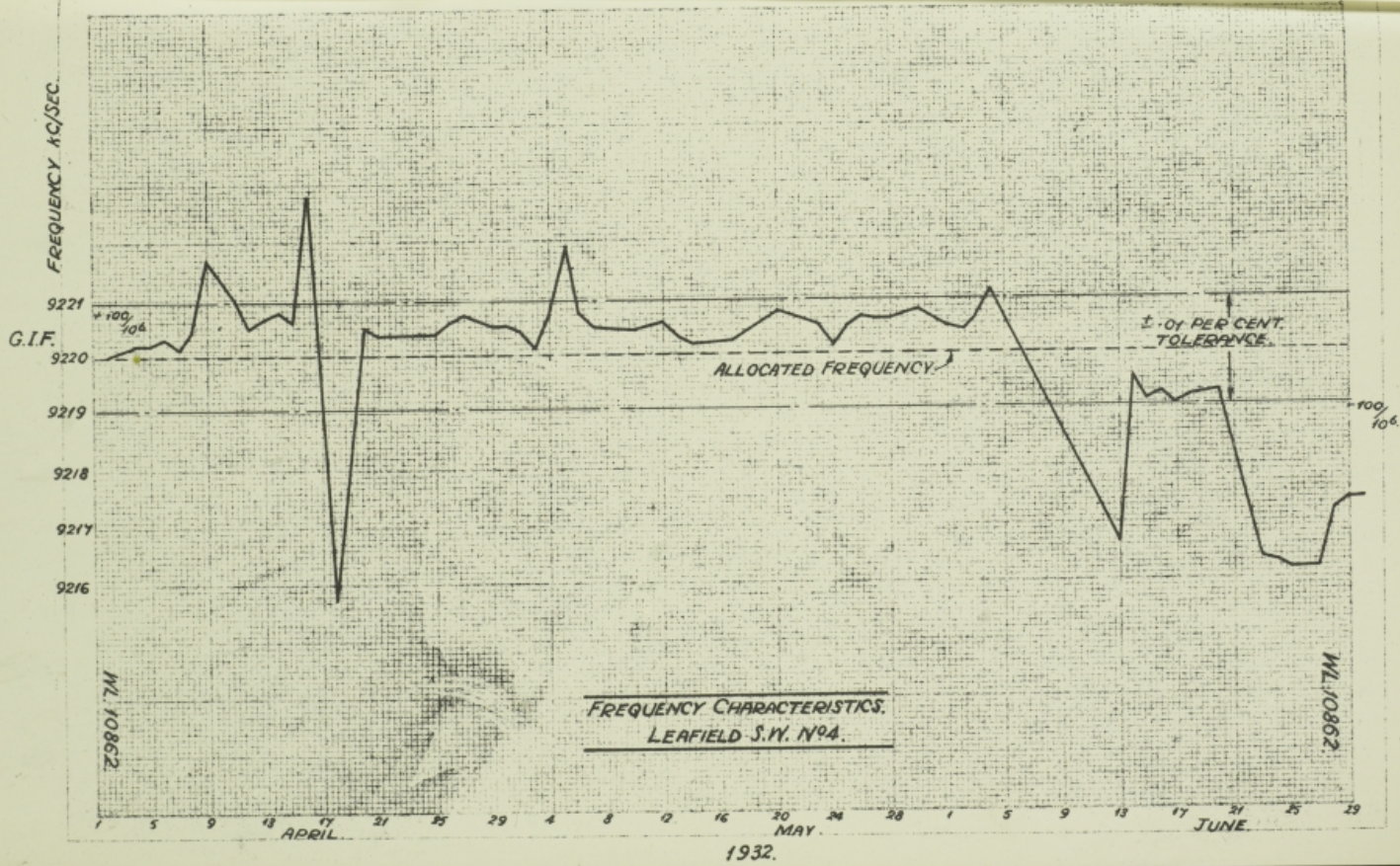
Rota 3724/32.

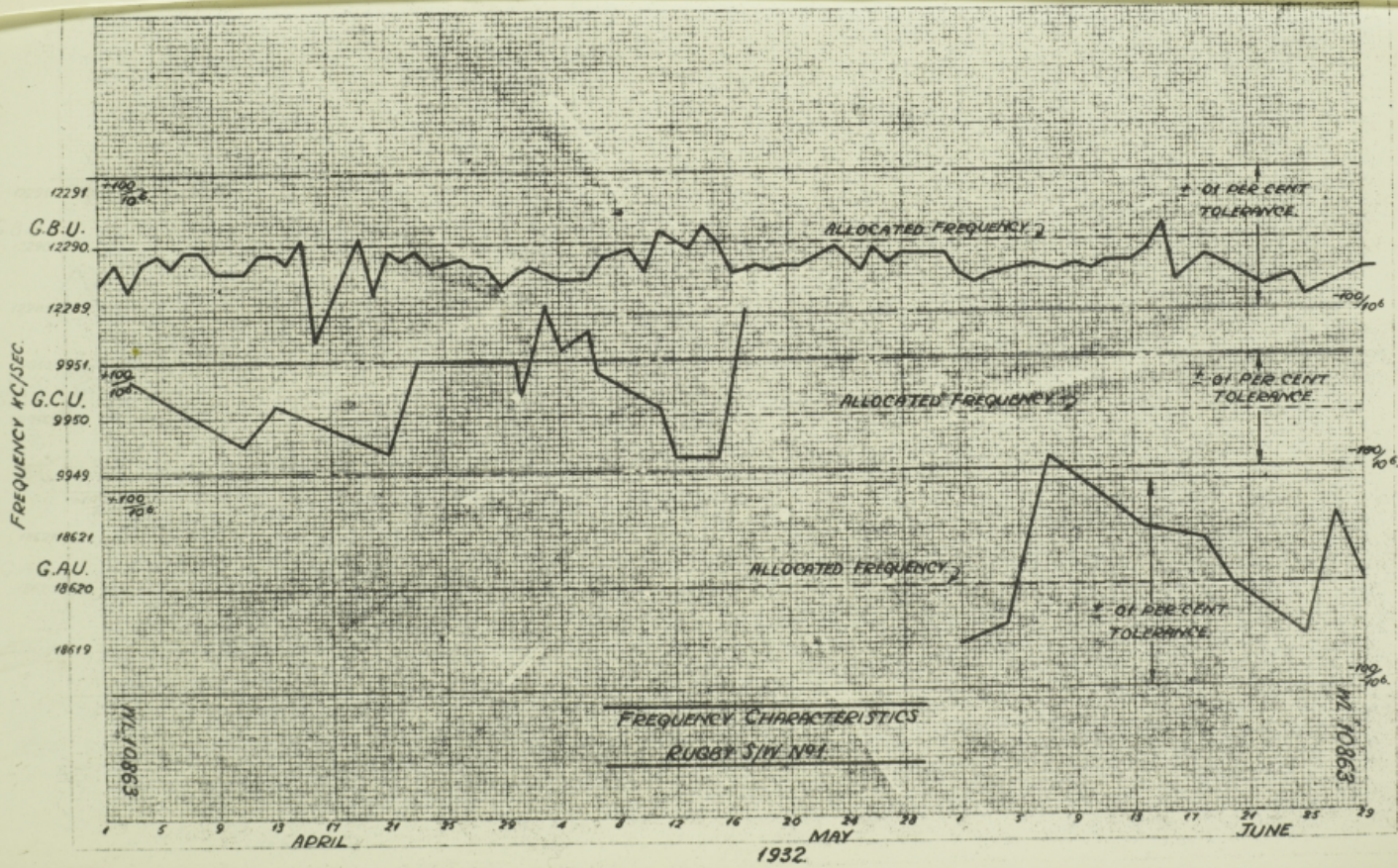


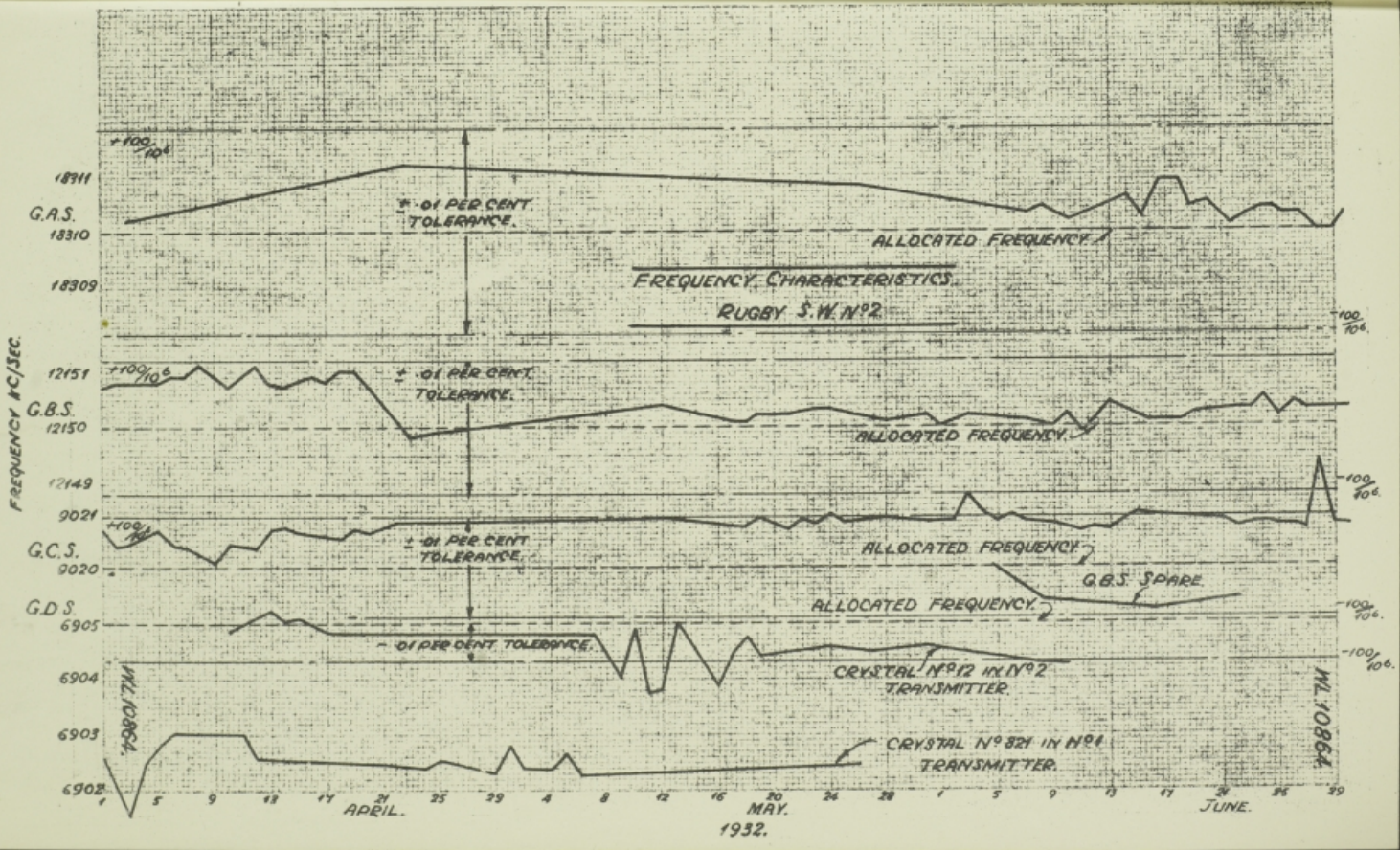


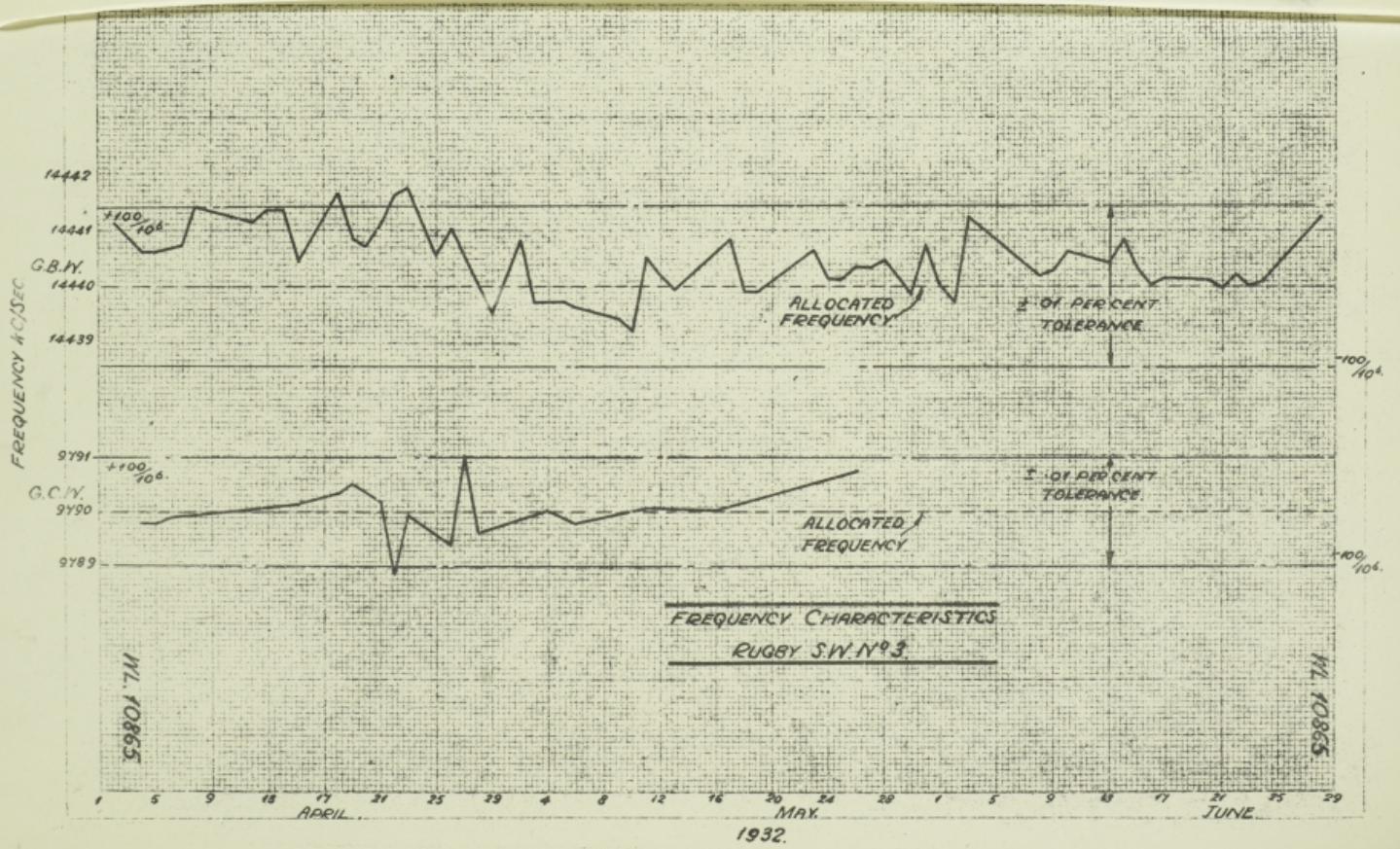
FREQUENCY KC/SEC

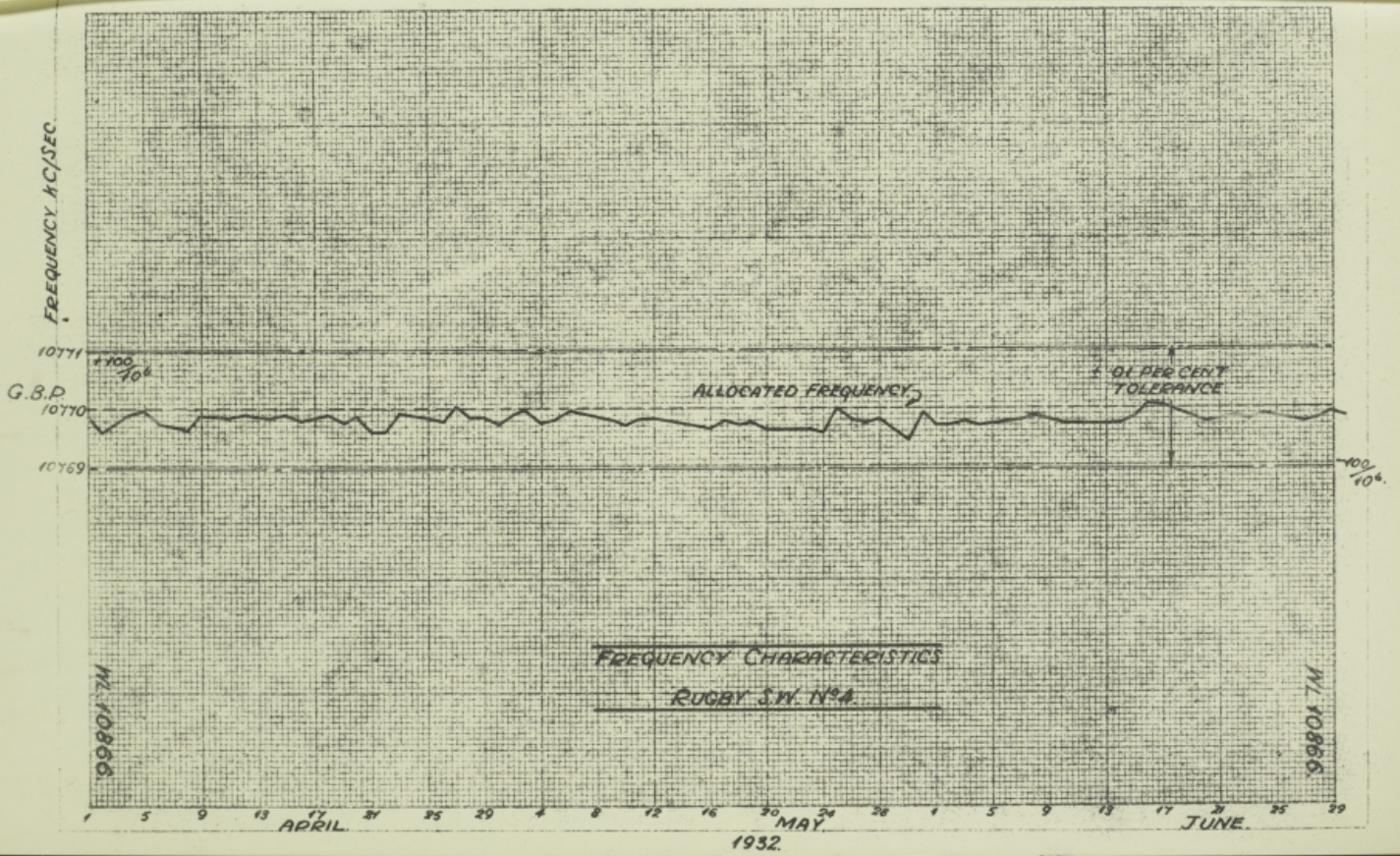


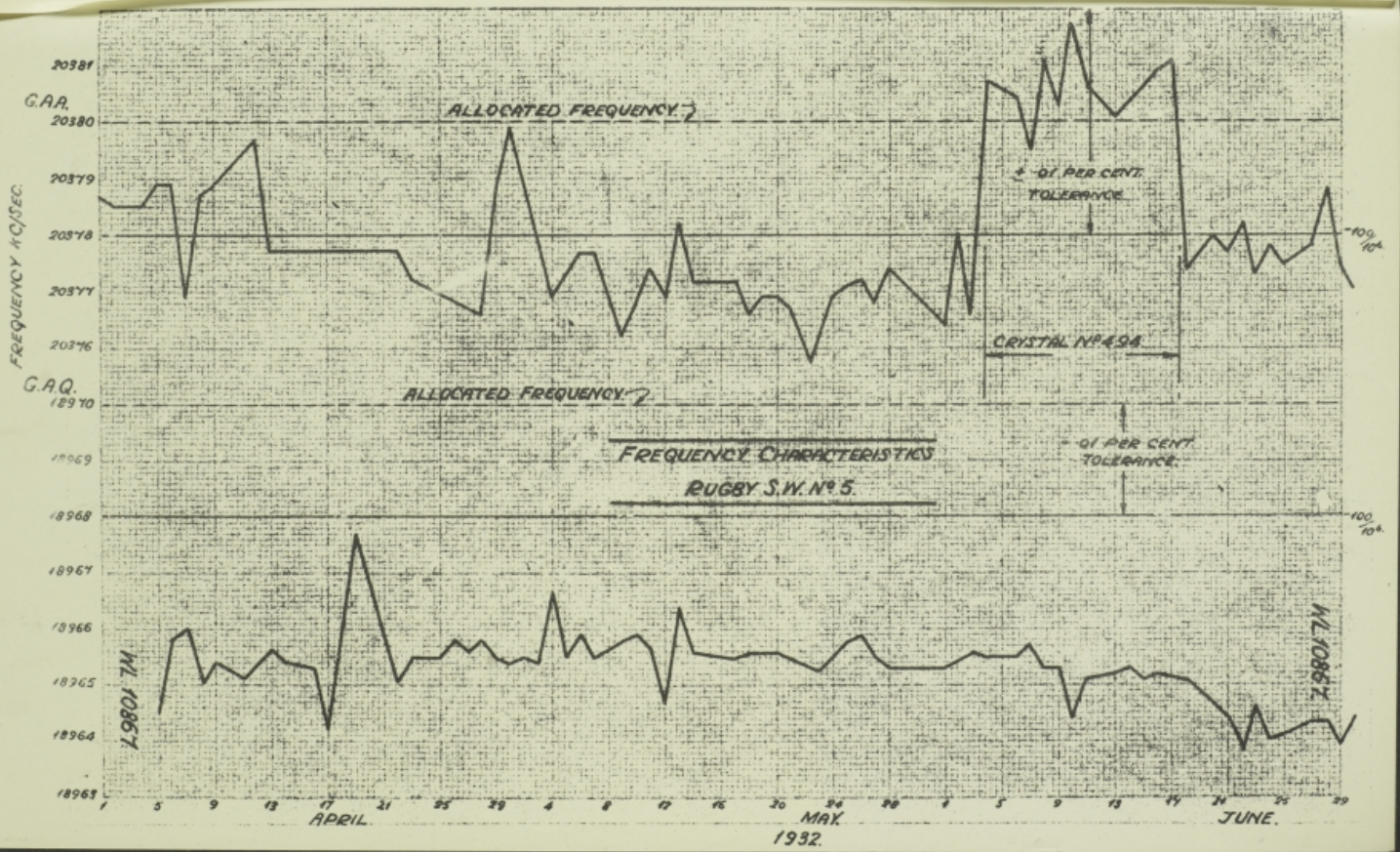


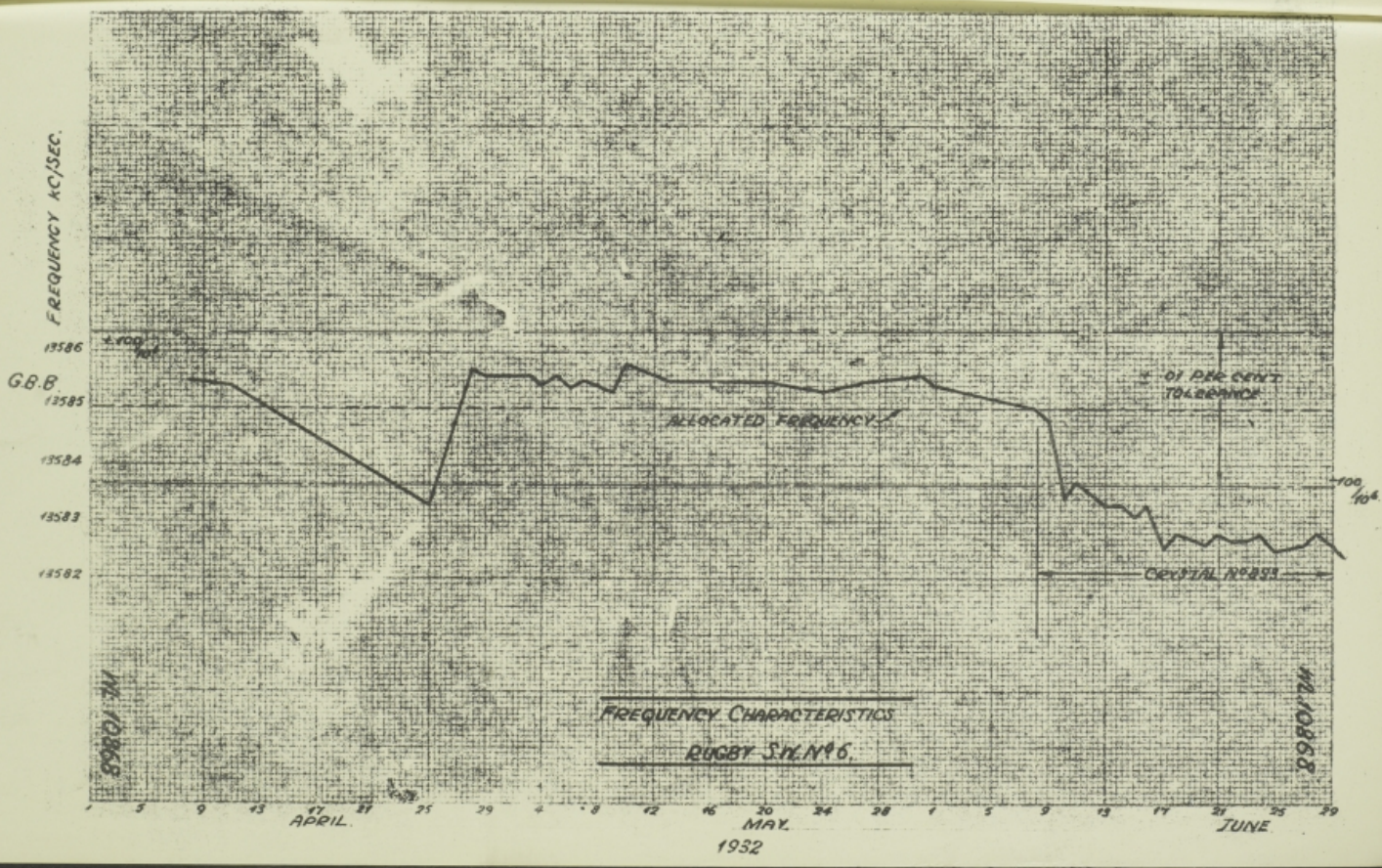












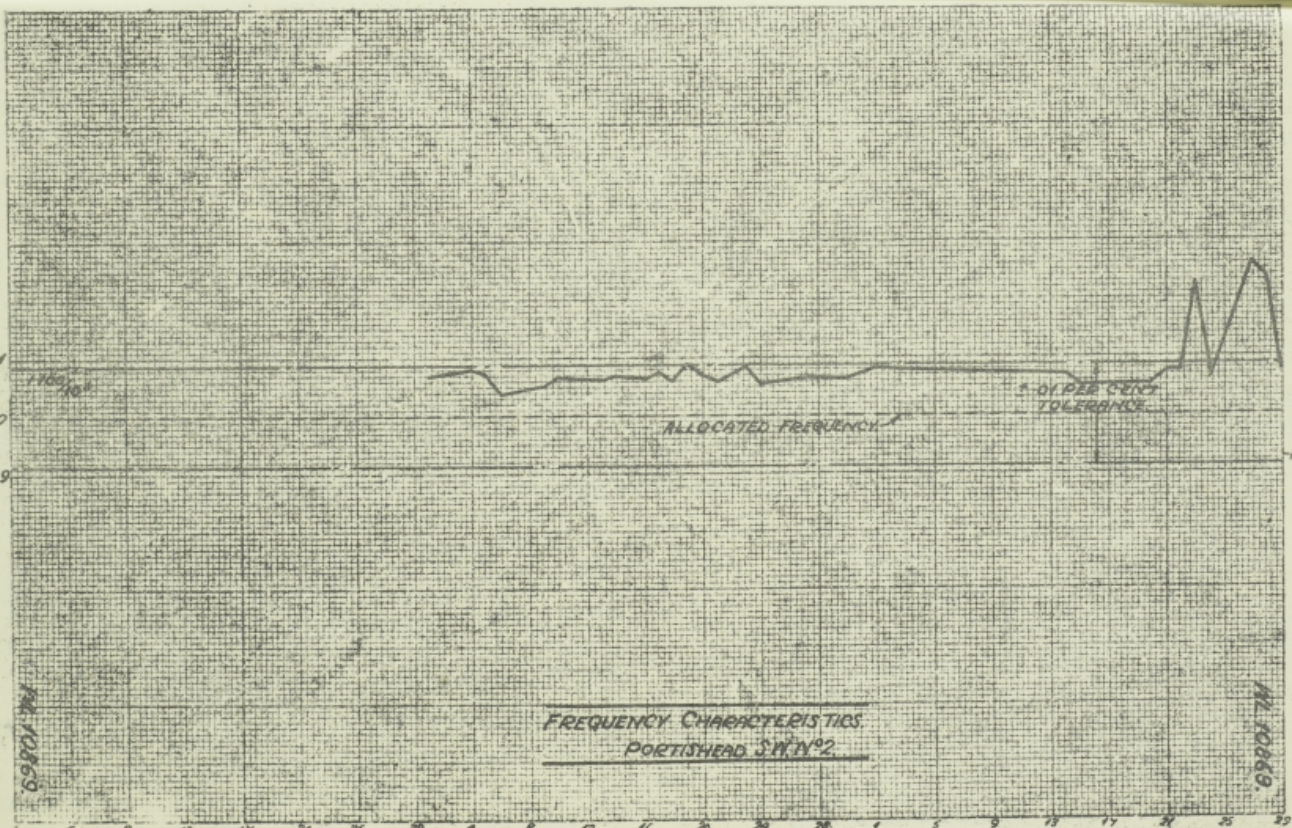
298017M

298017M



FREQUENCY KC/SEC  
G.H.T.

8211  
8210  
8209



PA 10859

PA 10859

APRIL MAY JUNE  
1932