

NEW ZEALAND BROADCASTING SERVICE,
RECEIVING STATION, Quartz Hill,
MAKARA.

24 April, 1952.

SOLAR NOISE BURSTS OBSERVED AT QUARTZ HILL.

Attached is a list of the Solar Noise bursts observed at Quartz Hill from January, 1947 to December, 1950, together with comments regarding each burst. More general information is given below:-

1. The bursts have only been observed during periods of high sunspot activity.
2. The majority of the bursts listed were associated with solar flares.
3. In general, the greatest intensity of noise during each burst was centred about 11.5 Mc/s and this intensity diminished as the frequency increased. The noise was seldom heard above 17 Mc/s and each burst had a clearly defined lower cut-off frequency coinciding with the F₂ layer critical frequency.
4. The bursts were usually steep-fronted and sounded like rapid ignition interference. The initial pulse of each burst was usually greater than 40 DB above the ambient noise. Each burst had a surging characteristic and normally two pulses of noise followed the initial high intensity pulse. There appeared to be three bursts in a group, the groups lasting from a few minutes to a few hours.
5. It has been the impression that bursts are of shorter duration on the higher frequencies but no quantitative measurements were made. Co-incident bursts of noise on very low frequencies (80 kc/s) were however noted to last about three minutes as compared with the usual half minute of the bursts on 10 Mc/s.
6. The ambient noise level usually remained high for some hours following a high intensity burst. Where the burst had been directly associated with a solar flare, this high level of remaining noise coincided with the remaining bright H α flocculi of the flare.
7. In daylight hours, the noise level on frequencies between 1 and 5 Mc/s appeared dependent on the angular distance of active sunspot regions from the centre of the solar disc.

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Engineer-in-Charge.

SOLAR NOISE OBSERVED AT QUARTZ HILL, WELLINGTON,

1947 - 1952.

The following comments on Solar Noise observed between the years 1947 - 1952 have been taken from the Quartz Hill Disturbance Reports and Log Books:-

<u>Date:</u>	<u>Time:</u> <u>G.M.T.</u>	<u>Comment.</u>
6.1.47	0012	"Signals disappeared for 30 seconds beneath a loud rushing noise. The strength of the stations appeared to remain unchanged and the effect was noticeable from 9 to 12 Mc/s."
2.3.47	1046	"A loud rushing noise obliterated signals between 11 & 12 Mc/s for 10 to 15 seconds. It was not possible to check other frequencies"
8.3.47	2245	"Three times between 2245 and 2300 signals disappeared under a loud rushing noise for 10 to 15 seconds." (Observations confined to 11 Mc/s band.)
9.3.47	0201	"A loud rushing noise obliterated signals between 6 and 15 Mc/s for 10 seconds."
7.4.47	0113	"A loud rushing noise obliterated signals on 11 Mc/s for approx. 15 seconds."
7.8.47	1345- 1415	"Surges of noise predominate from 17 to 18 Mc/s. Just audible at 15 Mc/s."
7.8.47	2127	"High level surge of noise obliterated all signals between 7 and 11.5 Mc/s. Noise appeared to peak at 8.5 Mc/s."
31.8.47	1456	"From 1456 to 1520 GMT all European signals were obliterated by a very high noise. This noise rose 30 dB in a few seconds and started to decrease at 1520. The noise level was normal again at 1530. All frequencies between 6 and 21 Mc/s were affected."
9.9.47	1441- 1447	"For six minutes, commencing at 1441, noise surges of approx 40 dB occurred at approx. 30 second intervals. The noise was similar to very fast ignition interference and lasted for periods of a few seconds to one minute.
9.9.47	1620- 1628	As above.
10.11.47	2125	"Sudden surge of noise between 9 and 15 Mc/s. Duration one minute."
22.11.47	0047- 0050	"Extremely high surge of noise lasting two minutes noticed on 11 Mc/s."
20.1.48	2335- 2336	"One minute burst of high intensity noise which peaked at 11.5 Mc/s and cut off sharply at 9.6 Mc/s. observed. The noise intensity fell off gradually towards the high frequencies and was not audible above

21.1.48 0016

"Three bursts of high intensity noise similar to above noted. Details are:-

0016-0016‡ Not audible below 9.3 Mc/s.
0019-0020‡ Not audible below 9.3 Mc/s.
0124-0125 Not audible below 9 Mc/s.

The cut-off frequencies were not greatly different from the F₂ critical frequency."

22.1.48 0116

" Three bursts of noise in similar to the above were observed as under:-

0116-0116‡ Not audible below 10 Mc/s.
0119-0119‡ Not audible below 10 Mc/s.
0249-0249‡ Not audible below 10.4 Mc/s.

30.1.48 2250-
2250‡

" Short burst of noise peaking at 12 Mc/s. and cutting off at 10.4 Mc/s observed".

1.2.48 2305-
2306‡

"Burst of heavy noise from 6 to 11 Mc/s. Highest intensity at 11 Mc/s."

3/2.48 0021-
0022

"Burst of heavy noise from 9.6 to 12 Mc/s. Highest intensity at 10.6 Mc/s".

8.5.48 0500-
0503

"Several ~~next~~ short duration burst of high intensity noise between 6.7 and 17 Mc/s."

13.5.48 1118-
1235

"A prolonged surge of high level noise on all frequencies between 6 & 17 Mc/s."

16.12.48 0040 &
0043

"Two short bursts of high level noise."

25.12.48 -
28.12.48

"Many bursts of high level noise were observed. The main ones were as under:-

25.12.48 2145-2146,
2152-2152‡,
2153-2153‡.

26.12.48 0035-0036.
0220-0222.

27.12.48 2157-2158
2359-2359‡.

28.12.48 0016-0017
0043-0044‡
0134-0135
0159-0159‡
0248-0249
0356-0356.

All the above burst appeared to have a peak in intensity at approx. 11 Mc/s. "

19.1.49 2216

"Sharp burst of high intensity noise lasting 45 seconds followed by other bursts of 20 second duration between 10.5 and 16 Mc/s."

30.1.49 2355-
2358

"Extremely steep-fronted burst of noise gradually diminishing over a period of three minutes"

31.1.49	0128- 0129	"Sharp burst of noise."
	0245- 0246.	"sharp burst of noise."
5.2.49	0025- 0027	"A severe burst of noise lasting two minutes followed by another at 0114 which lasted 30 seconds."
6.2.49	2328- 2329	"A severe burst of noise"
	2355- 2357	"A severe burst of noise"
6.2.49	0013	"A severe burst of noise asting two minutes."
	0108	"A burst of noise lasting 30 seconds."
7.2.49	252x	"Severe bursts of noise each lasting 30 seconds occurred at 0005 and 0106."
10.3.49	2330- 2358	"Many periodic surges of high level noise each lasting 30 - 45 seconds."
22.3.49	0700- 1100	"Exceptionally high noise on and about 11 Mc/s with periodic bursts of short duration extending up to 16.5 Mc/s."
5.8.49	0745- 1900	"Many bursts of high intensity noise, especially between 0745 and 0946."
30.8.49	0110- 0140	"Very severe bursts of noise between 7 and 17 Mc/s obliterated all signals."
	0200- 0210	"Severe bursts of noise as above"
31.8.49	0715- 0800	"Many periodic bursts of high level noise each burst lasting from 30seconds to two minutes."
23.10.49	2216- 2219	"A very high intensity burst of noise lasting three minutes affected all frequencies between 8.6 and 15.5 Mc/s. Noise intensity peaked at 11.7 and 14.5 Mc/s."
16.11.49	2207- 2212	"A severe noise burst, steep frented and gradually decreasing in intensity over a period of five minutes."
9.12.49	2150	" A severe burst of noise similar to above but lasting only two minutes."
11.12.49	0001	"A very severe burst of noise lasting one minute followed by several MCRs of much shorter duration for the next 20 minutes."
4.1.50	2130- 2245	"Many severe bursts of noise of short duration between 6.5 and 17 Mc/s."
30.1.50	0010- 0020	"Four high intensity noise bursts between 8.5 and 16 Mc/s each lasting from 45 to 90 seconds."

- 21.2.50 2137 & "Noise bursts each of 15 seconds duration.
2238
- 9.12.50 0115- "A severe burst of high intensity noise
0118 peaked at 11.75Me/s"

No noise bursts that could be associated with solar activity have been observed since December 1950. One group of noise bursts not listed occurred on the 21st. October, 1948, between 2306 and 2315 GMT. During this nine minute period there was a steady background of high level noise with very high intensity bursts superimposed thereon as under:-

- 2306-2310 A high intensity burst cutting off sharply at a lower limit of 12.5 Me/s which fell to 11.9 Me/s at 2308.
- 2311 $\frac{1}{2}$ -2312 A sharp burst cutting off sharply at a lower limit of 12.5 Me/s.
- 2312 $\frac{1}{2}$ -2313 As above.
