

# RESULTS OF THE RFI SURVEY IN 100-600 MHz BAND AT GMRT SITE

Venkatasubramani. T. L., Somasekhar. R., Pakhatkar. S.

The survey was conducted at the GMRT site on June 26-27, 1992.

## Test Setup:

The set up consisted of a Log Periodic Dipole Array (LPDA) followed by a Low Noise Amplifier (LNA), feeding a Spectrum Analyser through a 15m of cable. The LPDA was mounted horizontal, facing Pune, at a height of ~15m above ground level.

## Specifications:

- LPDA: An available LPDA designed to cover a frequency range of 300 to 700MHz with a gain of 8 dB.
- LNA: Two stage broadband amplifier using MiniCircuits Lab make MAR-6 with a Noise Figure of 2.8dB and a measured gain of  $37 \pm 2$  dB in the frequency range of 100 to 600MHz.
- Spectrum Analyser: Tektronix 2710 Spectrum Analyser with a sensitivity of -107 dBm at the 30 kHz resolution bandwidth used.

## Assumptions:

The LPDA was assumed to offer an effective collecting area of  $0.1 \text{ m}^2$  over the band of 100 to 600 MHz.

## Calibration:

The effective gain of the LNA with the cable was measured using Hewlett Packard Signal Generator Model 8344 and the Spectrum Analyser and is given below in Column 2. The noise floor (and hence the sensitivity level of measurement) of the complete set up, as read on the Spectrum Analyser screen is given in Column 3.

Frequency (in MHz)	Gain of the amplifier (dB)	Noise floor at Spec.Ana. RBW : 30KHz (dBm)	Computed noise floor at LNA i/p (dBm)	Computed sensitivty referred to Antenna i/p (dBm/m <sup>2</sup> ) (5)=4-(10dB)
(1)	(2)	(3)	(4) = 3-2	(5)=4-(10dB)
200	39	-87	-126	-116
300	38	-96	-134	-124
400	37	-100	-137	-127
500	35	-105	-140	-130

### Measurements:

Snapshot of the Spectrum Analyser screen were stored in it's internal memory and transferred to a computer through GPIB. The plots were made off-line.

The Y axis scale on the left- and right- hand side of the plots correspond to columns (4) & (5) of the calibration chart. The titles of the plots are self-explanatory.

In addition, the following specific lines were recorded from 1400 hrs on June 26, 92 to 0200 hrs on June 27, 92:

(a) 311.406 MHz, with a carrier level at  $-115 \text{ dBm/m}^2$  and 3.8 kHz side bands. The carrier was present for most of the evening, with frequent turning ON and OFF of the modulation. This line was not noticed after 1700 hrs.

(b) 389.5 MHz, occasional occurrence with a level of  $-120 \text{ dBm/m}^2$ .

(c) 354.2 MHz,  $-122 \text{ dBm/m}^2$ .

(d) Transmissions with varying structures in 253-254 and 258-259 MHz.

(e) 233.5528 MHz at  $-105 \text{ dBm/m}^2$  appearing consistently and with occasional side bands.

(f) 407.5 MHz, with a lot of fluctuation in the carrier power, centre frequency and modulation format.

The frequencies mentioned above are based on the readout on the spectrum analyser screen.

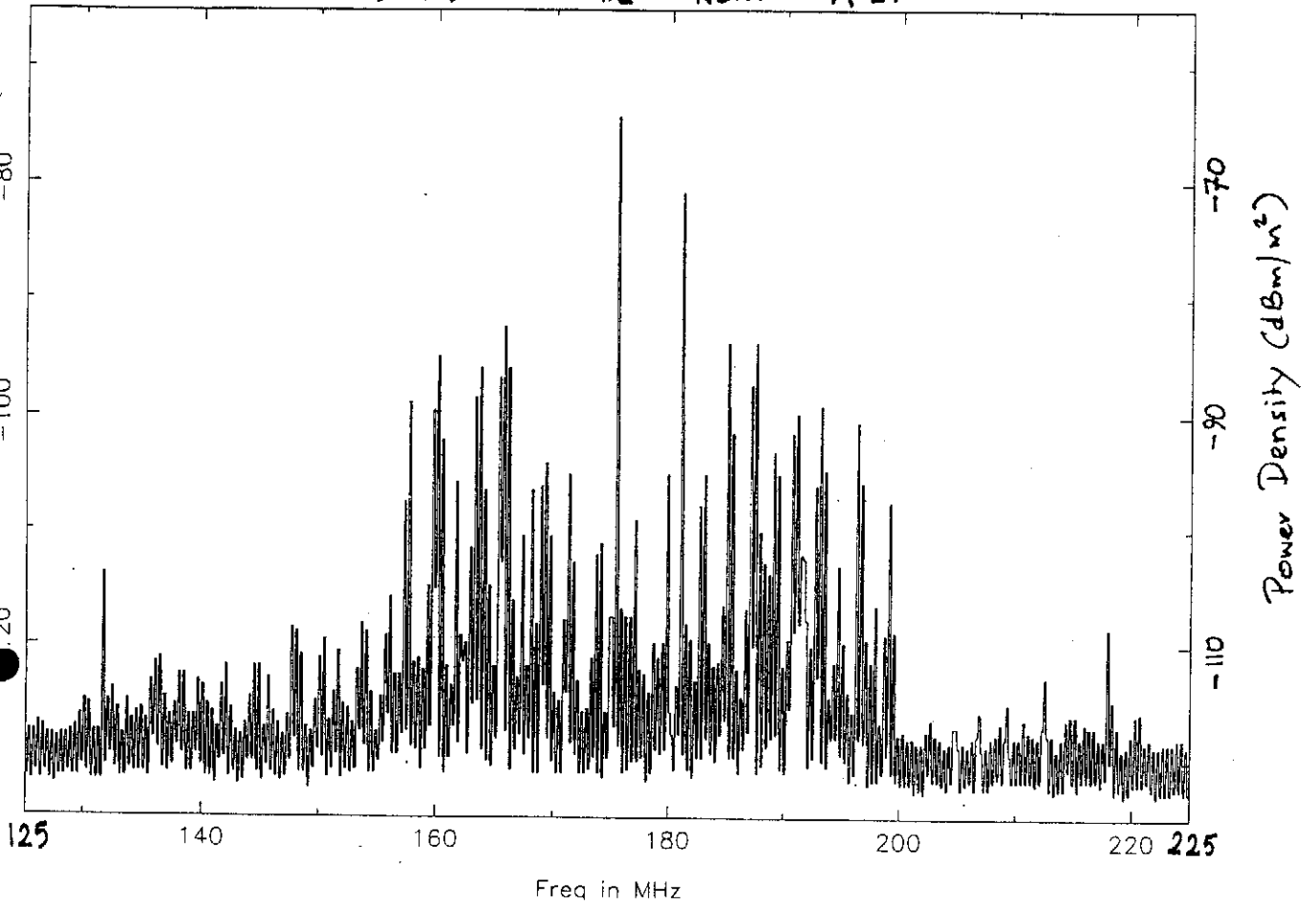
### Conclusion:

It appears that the band from 125 MHz to 225MHz gets quite clean when TV Transmissions are off.

The source of the line seen at 233.5528 MHz has to be investigated in view of the use of 230-235 MHz band by GMRT.

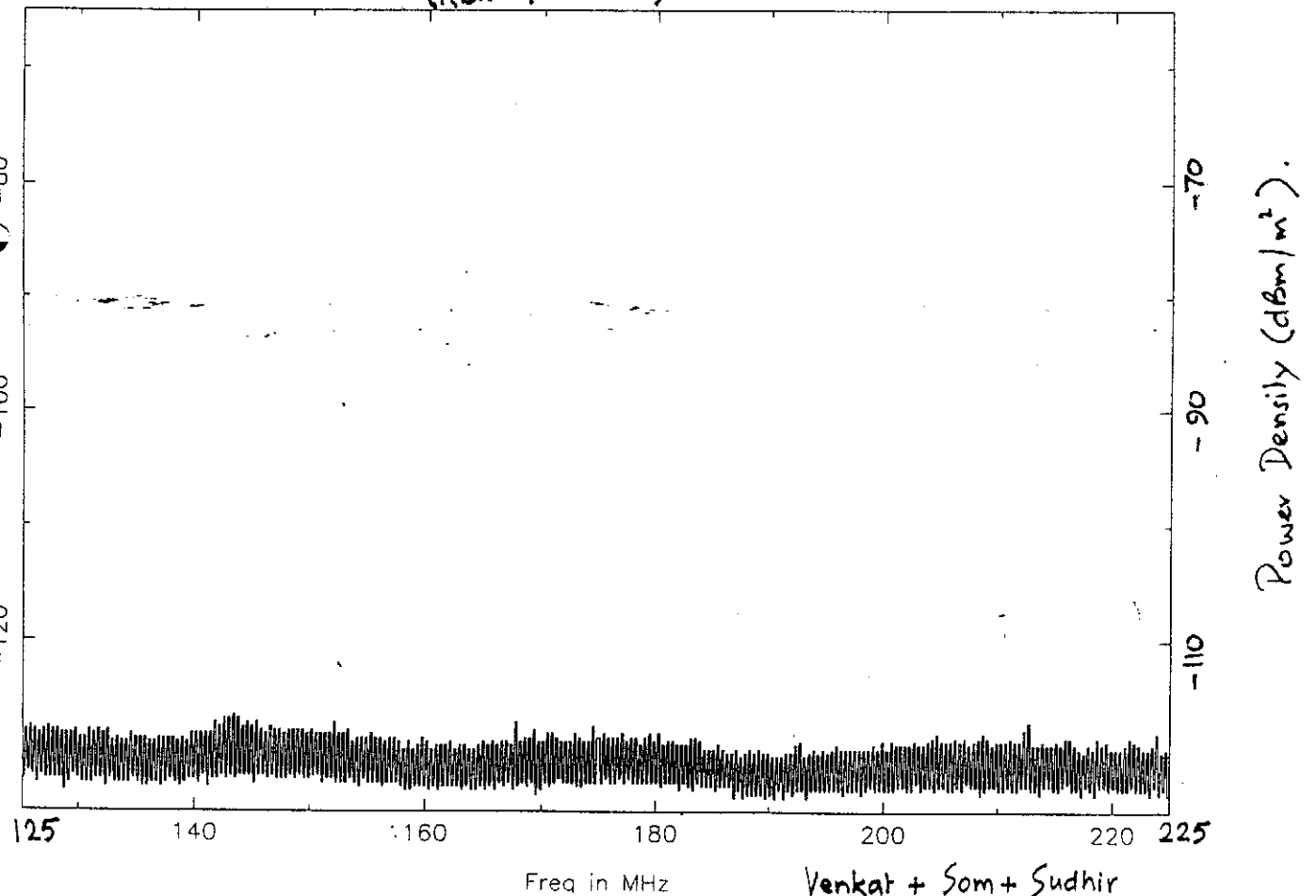
Snap shot of Spectrum Analyser Screen at 2300hrs On 26th Jun 92 at GMRT

BAND: 125- 225 MHz RBW: 30 kHz.



Snap shot of the same Band seconds after TV Transmission ceased

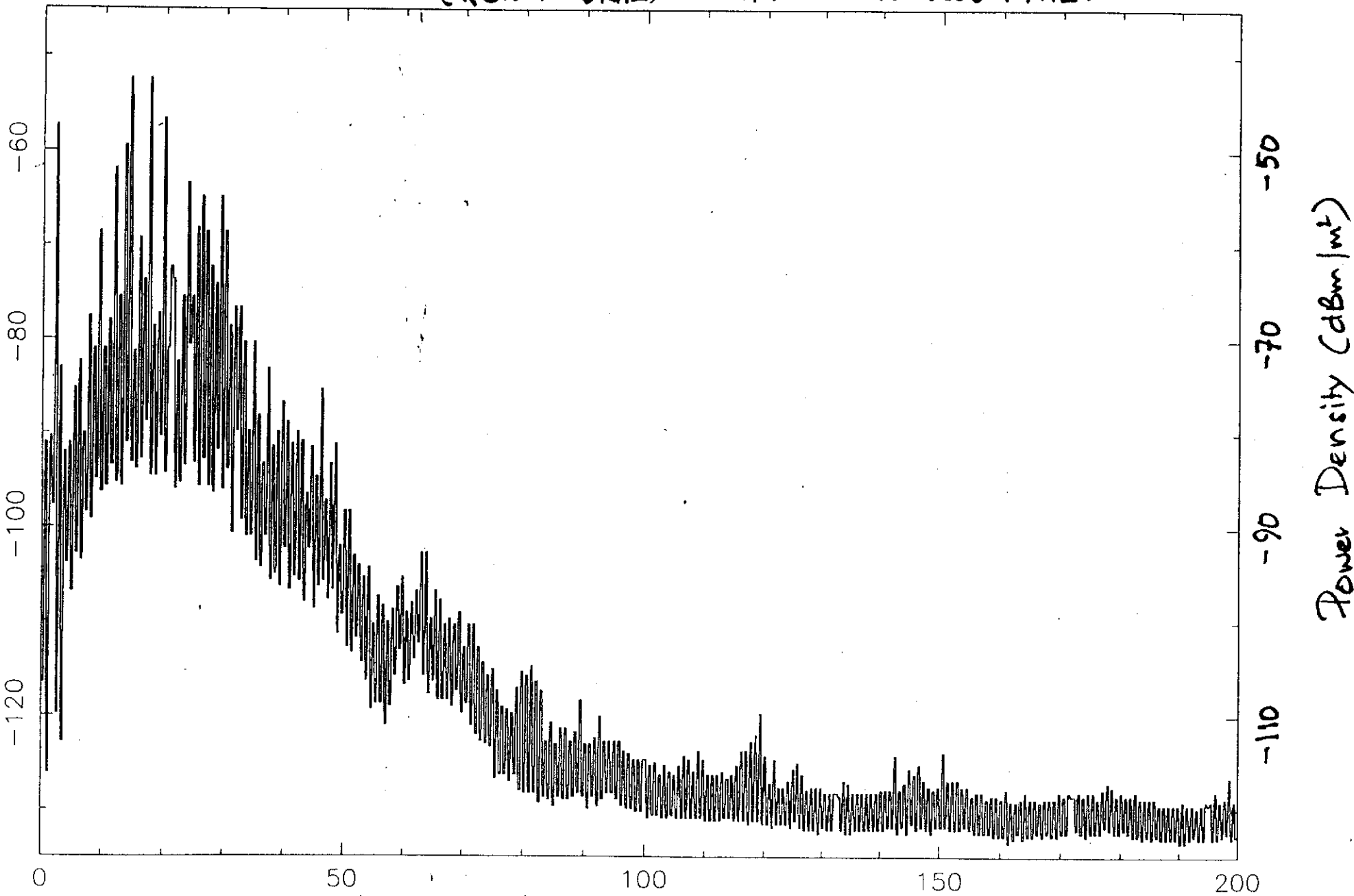
(RBW : 30kHz.)



Venkat + Som + Sudhir

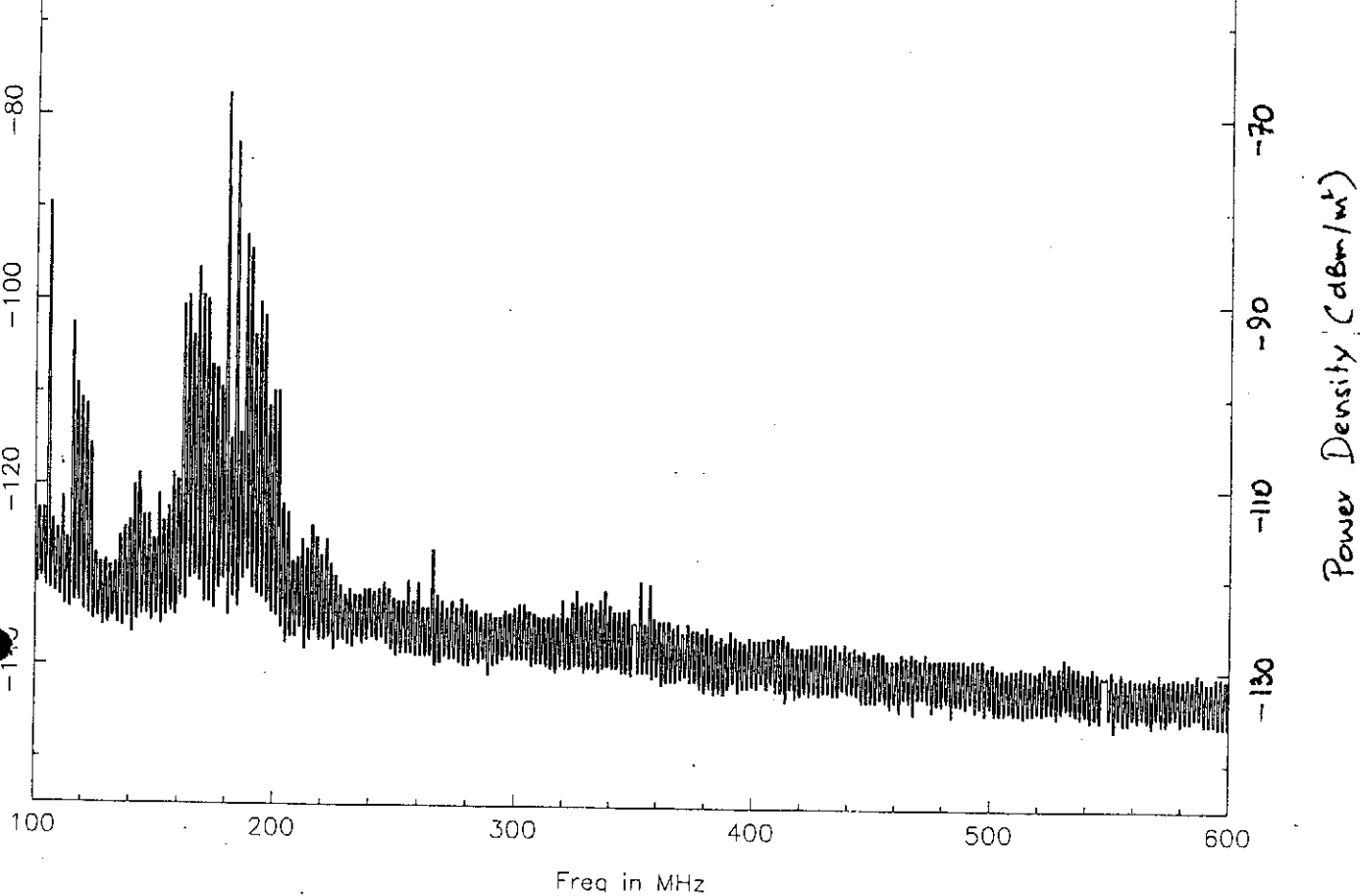
Snapshot of low Band RFI when TV Transmission is OFF.

(RBW + 30kHz) SCAN: 0 TO 200 MHz.



Freq in MHz

Venkai + Som + Sudhir



The same scan few seconds after TV transmission ceased

