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# Reception survey of Foreign and AIR Stations in the city Area of Jammu (J&K)

**Reception survey of Foreign  
And AIR Stations in the city  
Area of Jammu (J&K)**

# **Field Strength Measurement/Reception Survey Team**

## **PROPAGATION LAB**

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**Team Members : Chandra Ballabh, Sr Technician  
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**Assisted By : G P Srivastava, AE**

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**Guided By : Mrs. Anuradha Agarwal, ADG (E)**

## **Introduction**

Radio Kashmir Srinagar and Radio Kashmir Jammu have submitted a written complaint to DG-AIR New Delhi regarding a huge network of various foreign F.M. channels near the border areas and are operating in the pockets where the signal strength of our F.M. channels is very poor with marginal or no signal at all. It has also been pointed out that any power failure or a break down in the power transmission results in the availability of foreign services on the same frequencies.

Accordingly DG-AIR vide their letter no. 7/1/2012/D(M&C) dated 23<sup>rd</sup> December 2015 has directed this Office to undertake a reception survey of all AIR stations (MW & FM) including foreign radio stations in the city areas of Jammu, Srinagar and Leh.

The survey was conducted in the last week of March and finished in the first week of April.

## **Objectives**

1. To carry out field strength and subjective assessment of all available AIR F.M. and Medium Wave channels in the city area of Jammu.
2. To carry out field strength and subjective assessment of all available foreign F.M. and Medium Wave channels in the city area of Jammu.
3. Determination of interference due to co-channel or adjacent channel transmissions.

## **Measuring Instruments Used**

1. Anritsu make standard VHF dipole antenna.
2. Schwarz Beck make active loop antenna

3. Rohde & Schwarz make ESPC measuring receiver
4. Garmin make Montana 650 GPS system
5. 10 metre height electromechanical mast fitted inside the technical van
6. Sony Superhetrodyne receiver
7. Philips receiver (cheap)
8. Honda portable generator

### **Basic Data and Transmitter Details of Radio Kashmir, Jammu**

#### 1. FM 1

- Frequency- 100.3 MHz
- Rated Power- 6.0 kW
- Output Power- 5.0 kW
- Program Content- Local programs

#### 2. FM 2

- Frequency- 104.5 MHz
- Rated Power- 3.0 kW
- Output Power- 1.1-1.5 kW
- Program Content- Vividh Bharti/Local

#### 3. Medium Wave

- Frequency- 990 kHz
- Rated Power- 300 kW

- Output Power- 150 kW
- Program Content- Local program

## **Measurement Methodology**

In order to check the correct reception and field strength measurements, the entire city area of Jammu was demarcated into 23 spots based on population density. This included all types of terrain and population density. At each spot, VHF measurements were carried out using standard dipole antenna installed on a 10 meter electromechanical mast so as to meet the requirements of ITU regulations. For medium wave, a standard magnetic loop was used for field strength measurements.

Before the start of the actual measurements, the entire F.M. band and Medium Wave Band was scanned in the morning, afternoon and evening for obtaining frequencies of operations of foreign transmissions.

## **Data Collection & Mapping**

Data collected from all 23 locations inside city areas of Jammu, has been tabulated and results are annexed with this report. All locations are marked on Google map for reference and numbered as per data table. For subjective assessment, standard phrases of Excellent (E), Very Good (VG), Good (G), Fair (F) and Poor (P) are used for easy understanding. Terrain in the city area of Jammu is hilly except at few locations where it is plain.

As per ITU recommendations, minimum signal strength of  $63\text{dB}\mu\text{v/m}$  is required for medium wave reception whereas  $60\text{dB}\mu\text{v/m}$  is required in VHF band (FM) at a height of 10 meters from ground in urban areas. Similarly RF protection ratio of 20 db is required if carrier spacing is 400 to 500 KHz.

## Conclusion

To check the availability of foreign Radio Stations, the first spot selected was within 1 kilometer of the International border (Suchetgarh, R S Pura). Here the Team scanned all medium wave band and full FM bands for this purpose. The Team identified many Pakistan origin signals from weak to strong at this point. Later on, the survey team made measurements in city areas.

### 1. FM band:

The Team identified three Pakistan FM channels available in Jammu city on 104 MHz ( Sama ), 94.6 MHz ( Dhamal ) and 94.6 FM. AIR operates on 100.3 MHz and 104.5 MHz from Radio Kashmir, Jammu city office. The field strength of Pak 104FM is 50-80 dB $\mu$ v/m in the Jammu city whereas AIR FM's field strength (104.5MHz) is 44-94 dB $\mu$ v/m. As such listener easily tunes this FM channel. Again Protection ratio is also very low compared to ITU regulations. One of the main reasons for this problem is due to the low power of radiation from AIR FM transmitter on 104.5 MHz At the time of the survey it was around 1.0 KW instead of 3.0 KW.

Similarly output power of AIR FM on 100.3 MHz is 5.0 KW against the rated power of 6.0 KW. The F/S at a LOS distance of 26 Km was only 60 dB $\mu$ V/m, which is low for satisfactory reception.

To counter these problems, the following proposals are suggested:-

- Increase power of both AIR FM transmitters to rated power.
- FM Antenna system at AIR Jammu may be checked for its parameters and radiation characteristics.

- An additional FM transmitter below 100 MHz could be installed with good quality content to counter the Pakistan based channels.

## 2. Medium Wave band:

The reception quality of AIR MW transmitter on 990 KHz is satisfactory in entire city as well as in outskirts of Jammu. However modulation level was not up to the mark. The transmitter is a new one and is located in Bantalab area of Jammu. Good quality Pakistani medium wave transmission was received at various locations inside the city on frequencies 630 KHz (68 db $\mu$ v/m), 972 KHz (55db $\mu$ v/m Night timings) and 1035 KHz (52db $\mu$ v/m Night timings). Out of these frequencies, the 630 KHz (Lahore) is only prominent medium wave transmission available with a field strength more than 60 db $\mu$ v/m during day timings. Many distant International transmissions are available in Jammu city during the night due to sky wave component of MW which includes many transmissions from Pakistan. In order to fully utilize the newly installed MW transmitter, the recommendation is as follows:

- Output power must be raised from present 150 KW to 300 KW (Rated Power)
- Modulation level should be maintained between 90 to 100 percent.





## Availability of Foreign & AIR Radio Station in Jammu City Region

Map ref. Number	LOCATION	LOS(km)		COORDINATES (LAT/LON)	FM SIGNALS (dB $\mu$ V/m in Vertical Polarization)														MEDIUM WAVE	
		MW X'TR	FM X'TR		AIR (104.5 MHz)		AIR (100.3 MHz)		BIG (92.7 MHz)		SHARDA (90.4 MHz)		SAMA Pakistan 104 MHz		Dhamal Pakistan 94.0 MHz		FM Pakistan 94.6 MHz		AIR 990 kHz	
					F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO
1	Suchet Garh Border, RS	27.8	26.6	32.56722 74.67612	44	G	60	E	57	VG	-	-	33	VG	-	-	-	-	92	VG
2	Roop Nagar Top	3.2	4.1	32.77819 74.85522	70	G	91.4	E	-	-	-	-	70	E	61	VG	48	G	120	VG
3	Sidhra	9.0	4.6	32.76163 74.91401	63	G	99	E	78	E	48	F	-	-	-	-	-	-	102	VG
4	Pir Khoh	7.6	1.1	32.73442 74.87608	65	VG	80	E	-	-	-	-	-	-	-	-	-	-	100	VG
5	Mahamaya Temple	8.9	2.4	32.73072 74.89140	90	E	98	E	-	-	-	-	-	-	54	G	43	G	104	VG
6	Trikuta Nagar	11.2	5.3	32.69504 74.87462	63	G	78	E	-	-	-	-	-	-	48	G			102	VG

Subjective Assessment - E: Excellent, VG: Very Good, G: Good, F: Fair, P: Poor

## Availability of Foreign & AIR Radio Station in Jammu City Region

Map ref. Number	LOCATION	LOS(kM)		COORDINATES (LAT/LON)	FM SIGNALS (dB $\mu$ V/m in Vertical Polarization)														MEDIUM WAVE	
		MW X'TR	FM X'TR		AIR (104.5 MHz)		AIR (100.3 MHz)		BIG (92.7 MHz)		SHARDA (90.4 MHz)		SAMA Pakistan 104 MHz		Dhamal Pakistan 94.0 MHz		FM Pakistan 94.6 MHz		AIR 990 kHz	
					F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO
7	Gandhi Nagar	9.7	4.0	32.70715 74.86728	72	VG	86	E	-	-	-	-	50	G	48	G	-	-	107	VG
8	Residency Road	7.5	1.58	32.72945 74.86637	76	VG	93	E	87	E	64	VG	-	-	63	VG	68	VG	111	VG
9	Akhnoor City	14.9	21.2	32.89837 74.73605	54	G	62	G	-	-	-	-	45	F	42	F	-	-	101	VG
10	Hazoori Bagh Talab Tillo	5.2	5.1	32.73442 74.87608	66	VG	80	E	-	-	-	-	30	P	39	G	-	-	118	VG
11	Jewel Chowk	7.5	2.47	32.72406 74.85673	68	E	97	E	-	-	-	-	51	G	-	-	-	-	110	VG
12	Kunjwani Chowk	14.0	8.5	32.66712 74.87534	72	VG	86	E	-	-	-	-	46	G	44	F	-	-	105	VG

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					F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO
13	Rani Talab Digiana	11.8	6.5	32.68488 74.86246	52	G	93	E	-	-	5 5	F	80	VG	--	--	-	-	105	VG
14	Bhor Camp Airport	12.9	9.3	32.66907 74.82428	58	G	78	VG	-	-	4 0	P	42	P	--	--	--		104	VG
15	Domel NH1-A	17.2	18.7	32.89095 74.95675 586	40	F	50	G	-	-	-	-	49	G	-	-	-	-	85	G
16	Nagrota Town	8.7	7.2	32.79730 74.91380	66	G	84	VG	77	VG	-	-	52	F	--	---	-	-	101	VG
17	Mubarak Mandi Jammu	7.1	0.6	32.73886 74.87347	84	E	100	E	-	-	-	-	42	F	-	-	-	-	108	VG
18	Lower Roop Nagar	2.3	4.7	32.76451 74.82561	69	VG	90	E	-	-	-	-	60	G	--	--	-	-	122	VG

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					F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO	F/S	AUDIO
19	Near Railway Station	10.0	4.0	32.70768 74.87728	81	VG	100	E	-	-	--	--	48	F	--	--	-	-	103.5	VG
20	Near Jogi Gate Tawi River	7.8	2.28	32.72377 74.86267	71	VG	86	VG	-	-	P	F	46	F	--	--	--		108.7	VG
21	4 <sup>th</sup> Bridge Tawi	8.6	4.6	32.70976 74.84008	85	VG	104	E	-	-	-	-	59	G	56	F	-	-	105	VG
22	Subhash nagar	4.6	2.59	32.74810 74.84278	74	VG	93	E	--	--	-	-	51	F	50	P	46	P	114	VG
23	Jain Bazar	7.19	0.829	32.73587 74.87101	94	E	108	E	-	-	-	-	48	F	-	-	-	-	108	VG

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