



*Reception Survey of 20kW
MW AM-DRM Transmitter at
Mall Road in Pure DRM
Mode*

***Reception Survey of
20kW MW AM-DRM
Transmitter at Mall
Road, Delhi in Pure
DRM Mode***

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O/o Chief Engineer (R&D)
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AIR & Doordarshan
14-B, I.P. Estate, Ring Road
New Delhi – 110002

Report No. RD/2015/ 911

Dated 10.01.16

Section:

Propagation Laboratories

Objective:

Reception survey of 20kW MW of AM-DRM transmitter at Mall Road, Delhi in Pure DRM Mode (Multi channel)

Team:

1. Md Javed Shams, Assistant Engineer (Team Leader)
2. Chandraballabh, Senior Technician
3. Sushil Kumar, Technician
4. Ranbir & H N Mishra, SCDs
5. Vimal Kukreti, Helper

Assisted by: G P Srivastava, AE

Supervised by: Deepak Kumar, DDG (E)

Guided by: Smt Anuradha Agarwal, ADG (E)

1. INTRODUCTION

Digital Radio Mondiale (DRM) is one of the worldwide digital radio standards accepted by the ITU. The DRM standard has configurations (modes) suitable for frequencies up to 30 MHz and additional mode (DRM+) for frequencies up to band III. In order to migrate from analog AM transmission to digital (DRM), simulcast technology will be used for suitable migration for few years. Later on, full DRM or DRM only transmission will be on air from the vast network of AIR radio transmitters spread all over India.

Based on ITU Recommendation ITU-R BS.1615-1, the minimum signal requirement for robustness mode A, which is being used for medium wave transmission lies somewhere between 40 to 45 dB μ V/ m depending upon Spectrum occupancy type and BER of 1×10^{-4} .

2. OBJECTIVES

Director General, AIR vide their letter no. 5(4)/2011-D(TD/MW)/Delhi 'C' dated 11/8/15 [Annexure-1] has directed Research Department to monitor the reception of DRM signal originating from medium-wave transmitter (20kW AM) of AIR-Mall Road in the following configuration:

1. In pure DRM mode during normal transmission period.
2. Multi channel transmission.
3. Survey to be done using professional receiver as well as commercial DRM receivers.
4. Observation of field strength at a distance of 1 km, all around the transmitter (DRM power 8.0 Kw).

3. EQUIPMENTS USED

- Field strength meter along with loop antenna and tripod make : Anritsu model ML428-B
- Field strength meter and tripod make: Anritsu mode MS2713E with Antenna (Loop) make: Schwarzbeck model FMZB 1513.

- Professional DRM receivers.
Make : Fraunhofer, Germany
Model: DT700
- Garmin make GPS, Montana 650
- Morphy Richards commercial receiver
- Dell Studio laptop computer
- Su-Kam sine wave inverter (1400 VA)
- DRM-PC radio, WIN RADIO
- Passive, 1 meter length antenna
- Tools- assorted
- Mobile set
- Propagation Van (Tata Safari)

4. METHODOLOGY

AIR medium wave transmitter is situated at Mall Road (N 28° 41' 53.0'' E 77° 12' 44.9''), in the city of Delhi. The antenna is self supported radiating mast. The transmitter is new with R.F. analog power of 20kW. It is capable of radiating Simulcast as well as pure DRM signals. In Simulcast mode, DRM power can be set @12dB, 14dB and 16dB less of full analog power.

R&D survey team has selected 8 different routes to check the field strength as well as subjective quality of pure DRM transmissions of Mall road transmitter. At the time of survey the DRM power was set at 8.0 Kw. AIR- Directorate has set parameters for Mall road transmitter which is as follows:

DRM frequency	1368 kHz
Mode	A
MSC	64 QAM
SDC	16 QAM
Channels	1. Vividh Bharati 2. FM Rainbow Gold
Bandwidth	10 KHz

Propagation Van (Tata Safari) has been equipped with all relevant equipments and one passive antenna of 1 meter length installed on rooftop of the vehicle. Eight numbers of radial route tested for subjective measurements as well as for field strength measurements (Map-1).

Remarks in Subjective Audio quality, is good for both channels of transmission in DRM mode. Similar observation is valid for both the channels.

5. DATA ANALYSIS

A. North Direction –Loni, Baghpat & Shamli Route (Table-1)

Survey started with marking of radiating tower with GPS equipment. Measurements were taken at an interval of 5 kilometres (L.O.S.) and increased it up to 30 kilometres as per terrain conditions. Side by side, audio signal of both channels was monitored for any abnormality.

Professional receiver DT700 worked very well and decoded audio of DRM signal on frequency 1368 kHz faithfully without audio drops up to 65 kilometre distance (L.O.S.), whereas first generation Morphy Richards worked only up to 40 kilometre. The DRM power was maintained at constant level of 8.0 Kw.

Geographically north side of transmitter is mainly open fields, highways and small settlements. Hence, not much problem was observed in DRM reception.

B. North East Direction-Sonia Vihar, Loni & Distt-Meerut (Table-2)

Survey team has selected Yamuna pushta, Sonia Vihar, Loni Dehat, Panchi etc. in Meerut District in North East direction. In this direction, professional receiver DT700 worked well only up to 45 kilometres and commercial DRM receiver worked only up to 35 kilometres. This route has more vehicular traffic as compared to north direction. However human settlement was similar to North direction. Large vehicles when approaches towards DRM receiver's antenna, it affects it badly. Audio drops/Breaks became more prominent.

C. East Direction-Bhajanpura, Ghaziabad, Dasna Route (Table-3)

Route from Transmitter Antenna to Bhajanpura to Wazirabad to Ghaziabad city and upto Dasna is full of high density human settlements and high traffic. MER at just 5 Km away from transmitter was showing 0 in commercial receiver. This may be due to very high level of electrical noise in surroundings.

In this route, professional receiver worked well up to a distance of 25 kilometres only. Commercial receiver never worked without regular drops and at many places it was in NT mode. It is quite clear that commercial receivers like Morphy Richards cannot work in areas having high electrical noise. Also it cannot work properly where multipath propagation is severe.

D. South East Direction-Preet Vihar, Noida & Greater Noida (Table-4).

In this route we had spots like Shastri Park Metro, Preet vihar, Sector-67 Noida & Greater Noida. Due to high human settlements and moderate to high traffic along with 4-5 stories houses, we had selected 5 Km interval for measurements. Except exception at Greater Noida west near one industrial unit, reception up to a distance of 45 Km was excellent in DT 700 professional receiver. The minimum MER was 17.5. Whereas commercial receiver worked only up to a distance of 25 Km only with bad pockets at Gharoli and Sector 67 Noida. These two places are full of small industrial units and electrical noise is high.

E. South Direction-Sadar Bazar to CP to AIIMS etc. (Table-5)

The Field strength of 8.0 Kw of DRM transmitters in this direction was just 56 dB μ V/ m at a distance of 10 Km only, where as in the North direction it was 83 dB μ V/ m. This clearly shows the very poor propagation condition towards main Delhi city area. It may be due to poor soil conductivity, very high traffic and very high density human settlements.

Professional receiver DT 700 worked only up to 7.5 Km whereas commercial receiver worked up to 5 Km only. Field strength at a distance of 25 Km was 50 dB μ V/ m, which is above minimum signal requirement for DRM reception but due to the very poor S/N (7 db) there was no audio reception.

F. South West Direction- Anand Parbat, Dwarka & Pataudi (Table-6)

Similar condition of soil conductivity is also observed in this direction but due to less traffic compared to South direction professional receiver DT 700 worked well up to distance of 45 Km with exception at one spot near Gurgaon Pataudi road. Commercial receiver worked only up to 10 Km due to very poor MER.

G. West Direction-Rohtak Road, Bahadurgarh & Beri (Table-7)

Route from Mall Road Transmitter to Rohtak road is full of middle rise buildings and very high traffic on roads. However after a distance (LOS) of 30 Km the terrain changes rapidly. Due to open areas and less traffic, this type of terrain is very optimal for ground wave transmission. DRM reception received in good quality up to a distance of approximately 60 Km. Regular drops started from 65 Km onwards. Commercial receiver Morphy Richards worked well only up to 10 Km. In commercial receiver MER fluctuates between 18 to 10 db within a distance of 10 km to 20 Km.

E. North West Direction- Sonipat Road, Gohana & Jind Road (Table-8)

The maximum coverage was reported in this direction in respect of Multi channel DRM transmission from Mall Road Transmitter. In this direction the entire area of North-West is open (Agriculture fields) with stretches of very high traffic. Field strength at a distance of 75 Km was $47 \text{ dB}\mu\text{V/m}$, which is 2 db above minimum signal requirement of DRM reception. MER in professional as well as commercial receiver reduced to zero at one particular spot (Gohana Market). An assessment of surrounding clearly shows the very high density of human settlements as well as much increase in electrical noise. The Professional receiver worked well up to LOS distance of 75 Km. Similarly commercial receiver worked well up to a distance of 15 Km only.

6. R.F. POWER AT 1 KILOMETRE (Table-9) (Map-6)

As desired for the purpose of checking R.F. power radiated and directional pattern of antenna, several field strength measurements were carried out around active radiator at 8.0 kW power (1368 KHz) at a distance of 1 Km approximately. The same is available at Table-9.

7. DRM reception (Multi Channel), in moving vehicle in different routes.

Few routes in Delhi city were selected to check the DRM multi channel reception inside moving vehicle using passive roof antenna. The antenna used,

was fabricated using copper tube of one meter length mounted on vehicle top and connected to professional receiver. During the survey minutes based recording of DRM parameters enabled in professional receiver. Graphs of MER versus time travelled, prepared and is annexed with this report as map 2 to 6.

8. CONCLUSIONS.

The conclusion of this survey is based on the field survey carried out for nearly one month. DRM technology is based on COFDM for better reception with low bit rates so that existing RF bandwidth of Medium wave spectrum can be used. COFDM has inherent property of decoding intelligence even in worst multipath environment. However with rapid changes in demographic condition of cities with rise in traffic and electrical noise, it becomes difficult to use DRM in certain pockets of large cities.

In the present case we had DRM transmission in multi channel mode, equally dividing bit rate as both the channels were of music quality. In this case bit rate of 18 Kbps was equally divided between Vividh Bharati and Rainbow programmes.

Out of eight radials selected, the propagation condition was worst in South and South-West routes. Main Delhi city's landmarks and Government area lies in this direction. Starting from Antenna location to 50-60 Km in this direction, open areas are difficult to locate. The ground is either covered with cement concrete or metalled road. Buildings are medium to high rise with high concentration of Steel in structures. Due to these problems minimum field strength of 45 db μ v/ m for reception of DRM signal is available for LOS distance of just 25 to 35 Km depending on location. But in other case of North-West direction similar field strength was available up to 75 Km.

The quality of both channels was excellent within coverage areas as shown in map#1. Within the coverage zone, reception was good in moving vehicle. Map 2 to 6 is the routes of vehicles with graph showing MER fluctuations. To cover the entire city in coverage map, transmission power is required to be increased.

9. Coverage (Map-7)

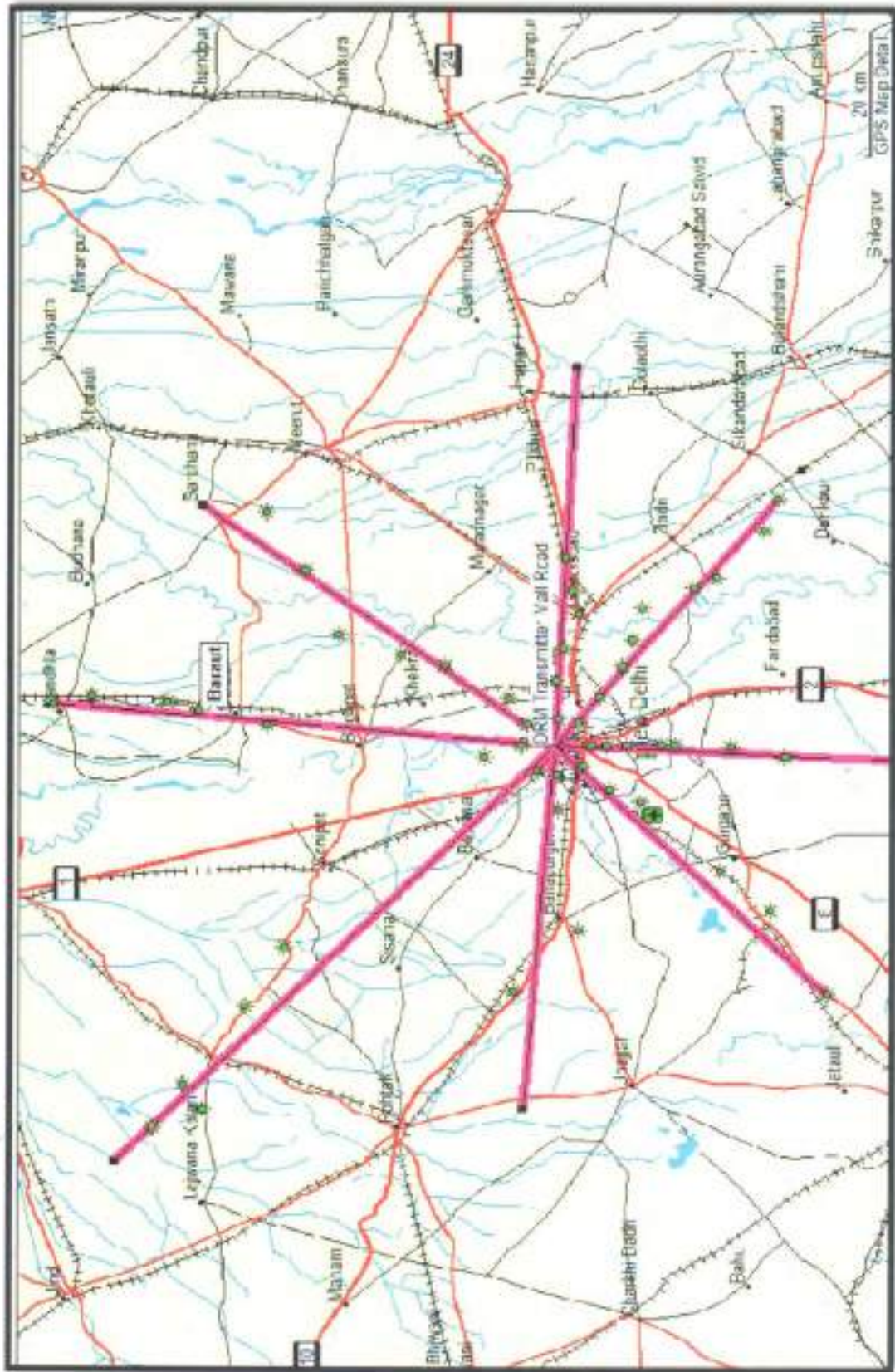
The present coverage is based on 8.0 Kw of Pure DRM power, transmitted from Mall Road 20 Kw AM DRM transmitter at Delhi.

North: Up to 65 Km (Near Kandhla)

North-East: Up to 48 Km (Atta Pura Rd, Distt: Meerut)

East:	Up to 28 Km (Near Dasna)
South-East:	Up to 45 Km (Kasna road , Greater Noida)
South:	Up to 9 km (Around Raj path)
South-West:	Up to 45 Km (Near Pataudi, Gurgaon)
West:	Up to 50 Km (West of Bahadurgarh)
North West:	Up to 75 Km (Gohana Jind Road)

MAP-1



Route Map originating from the location of transmitting antenna

RECEPTION SURVEY OF 20 KW AIR (MW), DRM TRANSMITTER
FULL DRM MODE (2 CHANNELS) (8.0 Kw)

ROUTE: North Delhi

DATE: 10/09/15

S.No.	Spot/ Location	Radial Distance (km)	Field Strength (dBuV/m)	DT 700 Receiver		Comm. Receiver		Subjective		Terrain	Remarks
				SNR (dB)	MER (dB)	MER (dB)	DT 700	Morphy			
1	Milan vihar Jagatpur Khadar	5	87	30	30.33	17	Ok	Ok	HT/HD		
2	Near Sunder Vihar Colony	10	85	25.8	25.9	18	Ok	Ok	LR/OA		
3	Baghat-Shamili Rd	40	60	30	29	18	Ok	OK	HT/OA		
4	Braut	50	50	26	26	9	Ok	NT	OA/HT		
5	Baraut-Shamili Rd	55	52	26.9	26	12	Ok	High Drops	LT/OA		
6	Near Kandhla	65	44	20	20	0	Ok	NT	LR/HT/OA		
7	Baraut-Shamili Rd	70	36	6.5	12.5	11	NT	NT	OA/HT		

LEGENDS: HR : HIGH RISE BUILDINGS, HD : HIGH POPULATION DENSITY, HT : HIGH TRAFFIC, LT : LOW TRAFFIC
LR : LOW RISE BUILDINGS, OA : OPEN AREA, V: VEGETATION AREA

TABLE NO. 1

RECEPTION SURVEY OF 20 KW AIR (MW), DRM TRANSMITTER
FULL DRM MODE (2 CHANNELS) (8.0 Kw)

ROUTE: NORTH EAST DELHI

DATE: 09/09/15

S.No.	Spot/ Location	Radial Distance (km)	Field Strength (dBuV/m)	DT 700 Receiver		Comm. Receiver MER (dB)	Subjective		Terrain	Remarks
				SNR (dB)	MER (dB)		DT 700	Morphy		
1	Yamuna Pushla, Sonia Vihar	5	85	28.5	28	20	Ok	Ok	HT/OA	
2	Loni Area, Khankhani Railway Station	10	73	17	18	13	Ok	Ok	HD/LR	
3	Loni Dehat	15	75	30	29	24	Ok	Ok	LT/OA	
4	Village Rataul	20	63	19	22	18	Ok	Few Breaks	OA	
5	Village Fanchi, District Muzaffarnagar	25	64	27.9	27.9	15	Ok	Ok	LT	
6	Sarai Pulhat Road near Meenut	35	44	10.7	14	17	Ok	Ok	HT/OA	
7	Atla Pura Road	45	52	14	23	12	Ok	NT	LT/OA	
8	District Meerut, Upper Ganga Canal	55	45	5.2	9.6	13	NT	NT	LT/OA	

LEGENDS: HR : HIGH RISE BUILDINGS, HD : HIGH POPULATION DENSITY, HT : HIGH TRAFFIC, LT : LOW TRAFFIC
LR : LOW RISE BUILDINGS, OA : OPEN AREA, V: VEGETATION AREA

TABLE NO. 2

RECEPTION SURVEY OF 20 KW AIR (MW), DRM TRANSMITTER
FULL DRM MODE (2 CHANNELS) (8.0 Kw)

ROUTE: EAST DELHI

DATE: 03/09/15

S.No.	Spot/ Location	Radial Distance (km)	Field Strength (dBuV/m)	DT 700 Receiver		Comm. Receiver MER (dB)	Subjective		Terrain	Remarks
				SNR (dB)	MER (dB)		DT 700	Morphy		
1	Yamuna Puhita Bhajanpura	4.2	84.3	30	29	0	Ok	NT	HD/HT	
2	Mandoli Jail Wazirabad Road Navyug Market	10	62	25	25.5	18	Ok	Breaks	HD/HT	
3	Ghaziabad	15	16	18	16	17	Ok	Regular Breaks	HD/HR/HT	
4	Ghaziabad Hapur Road	21	45	15.6	17.3	5	Ok	NT	HT/LR	
5	Hapur Road near Dasna	25	55	19	19.5	17	Ok	Regular Breaks	HT/OA	
6	Dasna	30	42	10.6	15.2	13	NT	NT	HT/LR/OA	

LEGENDS: HR : HIGH RISE BUILDINGS, HD : HIGH POPULATION DENSITY, HT : HIGH TRAFFIC, LT : LOW TRAFFIC
LR : LOW RISE BUILDINGS, OA : OPEN AREA

TABLE NO. 3

RECEPTION SURVEY OF 20 KW AIR (MW), DRM TRANSMITTER
FULL DRM MODE (2 CHANNELS) (8.0 Kw)

ROUTE: SOUTH EAST DELHI

DATE: 04/09/15

S.No.	Spot/ Location	Radial Distance (km)	Field Strength (dBuV/m)	DT 700 Receiver		Comm. Receiver MER (dB)	Subjective		Terrain	Remarks
				SNR (dB)	MER (dB)		DT 700	Morphy		
1	Shastri Park Metro Station	5	88.7	30.8	30.6	24	Ok	Ok	OA	
2	Preet Vihar	10	67	28	28.6	18	Ok	Ok	HR/LT	
3	Pragati Marg, Gharoli	15	60	25	25	13	Ok	High Breaks	LR/LT	
4	Sector - 67, Noida	20	51	19.7	20	5	Ok	NT	LT/LR	
5	Greater Noida, West	25	55.8	17.2	19.2	18	Ok	Ok	LT/OA	
6	Greater Noida, West	30	49	2.4	5.7	0	NT	NT	LT/OA	
7	Main Road Greater Noida	35	52	20	20.6	3	Ok	NT	HT/LR	
8	Kendriya Vihar Greater Noida	40	48.6	18.3	18	0	Ok	NT	LT/OA	
9	Village Siras, Kasna Road	45	45.9	15.7	17.5	4	Ok	NT	OA	

LEGENDS: HR : HIGH RISE BUILDINGS, HD : HIGH POPULATION DENSITY, HT : HIGH TRAFFIC, LT : LOW TRAFFIC
LR : LOW RISE BUILDINGS, OA : OPEN AREA, V: VEGETATION AREA

TABLE NO 4

RECEPTION SURVEY OF 20 KW AIR (MW), DRM TRANSMITTER
FULL DRM MODE (2 CHANNELS) (8.0 Kw)

ROUTE: SOUTH DELHI

DATE: 2-11/9/2015

S.No.	Spot/ Location	Radial Distance (km)	Field Strength (dBuV/m)	DT 700 Receiver		Comm. Receiver MER (dB)	Subjective		Terrain	Remarks
				SNR (dB)	MER (dB)		DT 700	Morphy		
1	Near Police Station Sadar Bazar	5	80	29.3	29.5	12	ok	ok	HD/HT/LR	
2	Bhagat Singh Road, CP	7.5	59	14.2	17.6	11	ok	NT	HR/HT	
3	Sunehar Bagh Road New Delhi	10	56	12.2	16.5	10	NT	NT	LR/LT	
4	Gautam Nagar back of AIIMS	15	54	9.8	14.7	0	NT	NT	HD/HT/HR	
5	MB Road near Pushap Vihar	20	48.5	4.3	8.3	0	NT	NT	HT	
6	Off Chailarpur Road	25	50.6	7	12	3	NT	NT	LT/OA	
7	Gurgaon Faridabad Road	32	48	9.2	15.4	10	NT	NT	HT/OA	Rocky Surface

LEGENDS: HR : HIGH RISE BUILDINGS, HD : HIGH POPULATION DENSITY, HT : HIGH TRAFFIC, LT : LOW TRAFFIC
LR : LOW RISE BUILDINGS, OA : OPEN AREA

TABLE NO. 5

RECEPTION SURVEY OF 20 KW AIR (MW), DRM TRANSMITTER
FULL DRM MODE (2 CHANNELS) (8.0 Kw)

ROUTE: SOUTH WEST DELHI

DATE: 07/09/15
11/9/2015

S.No.	Spot/ Location	Radial Distance (km)	Field Strength (dBuV/m)	DT 700 Receiver		Comm. Receiver	Subjective		Terrain	Remarks
				SNR (dB)	MER (dB)		MER (dB)	DT 700		
1	Anand Parbat, Rohisak Road	5	57	30	30.6	25	Ok	Ok	HT/LR	
2	Naraina Colony	10	56	21	21.2	17	Ok	Ok	LT/LR	
3	Sadar Bazar Delhi Cantt	15	50	15.7	17.9	11	Ok	NT	HR/HTV	
4	Dwarka	20	47.4	14.5	18.7	4	Ok	NT	LT/OA	
5	Near Gurgaon Railway Station	30	50	22	22.5	12	Ok	NT	LT/LR	
6	Gurgaon Pataudi Road	40	50	0-2	0	0	NT	NT	LT/HR	
7	Pataudi Road	45	48	21	21	12	Ok	NT	LT/OA	
8	Near Pataudi	55	42	18	16.7	4	Breaks Long	NT	LT/OA	

LEGENDS: HR : HIGH RISE BUILDINGS, HD : HIGH POPULATION DENSITY, HT : HIGH TRAFFIC, LT : LOW TRAFFIC
LR : LOW RISE BUILDINGS, OA : OPEN AREA, V: VEGETATION AREA

TABLE NO. 6

RECEPTION SURVEY OF 20 KW AIR (MW), DRM TRANSMITTER
FULL DRM MODE (2 CHANNELS) (8.0 Kw)

ROUTE: WEST DELHI

DATE: 14/9/2015

S.No.	Spot/ Location	Radial Distance (km)	Field Strength (dBuV/m)	DT 700 Receiver		Comm. Receiver MER (dB)	Subjective		Terrain	Remarks
				SNR (dB)	MER (dB)		DT 700	Morphy		
1	Wazir Pur Ind. Area	5	78	29.5	29.4	19	Ok	Ok	HT/HD	
2	Jaipur golden Hosp. Outer Ring Rd Rohitak Road	10	63	29.7	29.8	18	Ok	Ok	HD/LR	
3		20	50	23.9	23.2	10	Ok	NT	HT/LR	
4	Near Bahadurgath	30	51	24.4	23.5	9	Ok	NT	OA/HT	
5	Bahadurgath Rohitak Rd.	40	57	26.9	27.6	9	Ok	NT	LT/OA	
6	West of Bahadurgath	50	45	22	22	3	Ok	NT	OA/LT	
7	Ben Charikh Dadin Rd.	65	45	10	16	0	Regular Drops	NT	OA/LT	

LEGENDS: HR : HIGH RISE BUILDINGS, HD : HIGH POPULATION DENSITY, HT : HIGH TRAFFIC, LT : LOW TRAFFIC
LR : LOW RISE BUILDINGS, OA : OPEN AREA, V: VEGETATION AREA

TABLE NO. 7

RECEPTION SURVEY OF 20 KW AIR (MW), DRM TRANSMITTER
FULL DRM MODE (2 CHANNELS) (8.0 Kw)

ROUTE: North West Delhi

DATE: 17/9/2015

S.No.	Spot/ Location	Radial Distance (km)	Field Strength (dBuV/m)	DT 700 Receiver		Comm. Receiver		Subjective		Terrain	Remarks
				SNR (dB)	MER (dB)	MER (dB)	DT 700	Morphy			
1	Delhi Sonapat Rd.	10	72	29.9	30.3	22	Ok	Ok	HT/HD		
2	Delhi Sonapat Rd.	15	63	29	29	17	Ok	Ok	HD/HT		
3	Sonapa Gohana Rd	40	54	5.75	12	10	Drops	High Drops	HT/OA		
4	Sonapat Gohana Road	50	50	23	23	7	Ok	NT	OA/HT		
5	Sonapat Gohana Rd	60	48	23.7	23.7	109	Ok	NT	LT/OA		
6	Gohana Market	70	50	0	0	3	NT	NT	HD/LR/HT	SNR fluctuating	
7	Gohana Jind Rd	75	47	17	18.516	8	Ok	NT	OA/LT		
8	Shah Alam Bund marg	5	86	30	30	16-18	Ok	Ok	OA/LT		

LEGENDS: HR : HIGH RISE BUILDINGS, HD : HIGH POPULATION DENSITY, HT : HIGH TRAFFIC, LT : LOW TRAFFIC
LR : LOW RISE BUILDINGS, OA : OPEN AREA, V: VEGETATION AREA

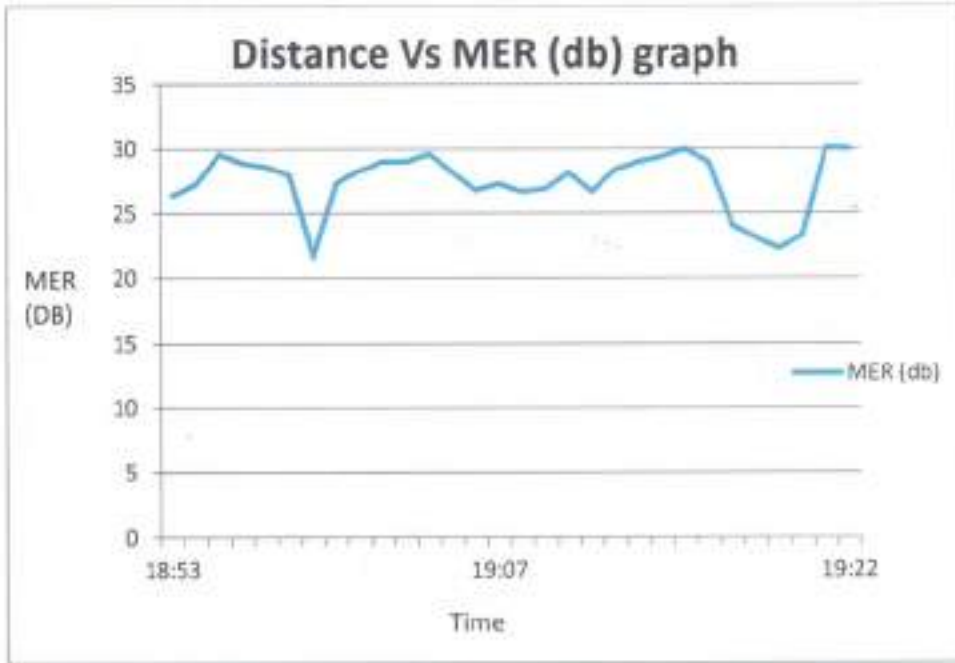
TABLE NO. 8

Field Strength at a distance of 1 Km from Antenna

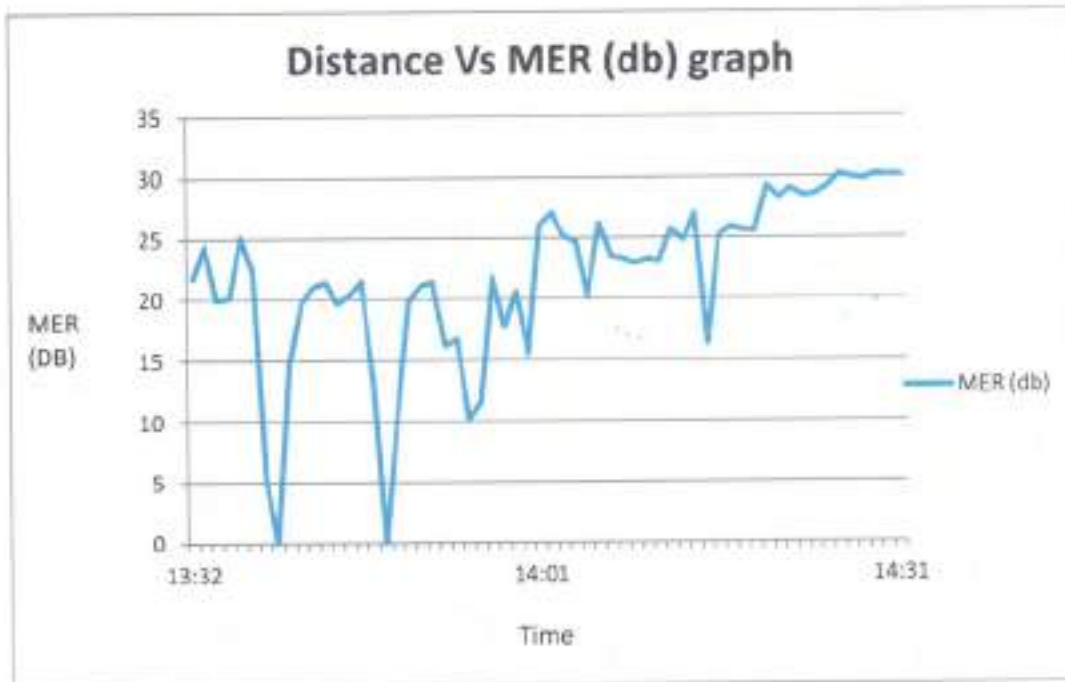
Sr No.	F/S in $\text{db}\mu\text{V/m}$	Remarks/ Location
1	92	Timar pur , North
2	102	Near PS Timarpur, North
3	101	Banda Bahadur Mg NORTH
4	96	Christian colony, SW
5	95	DU post office, South
6	105	Jahanara Rd, SW
7	105	Ring road, West
8	101	Mukherjee ngr, North West
9	105	South East

Table-9

ROUTE: ANAND VIHAR TO VIKAS MARG ON 18/09/2015

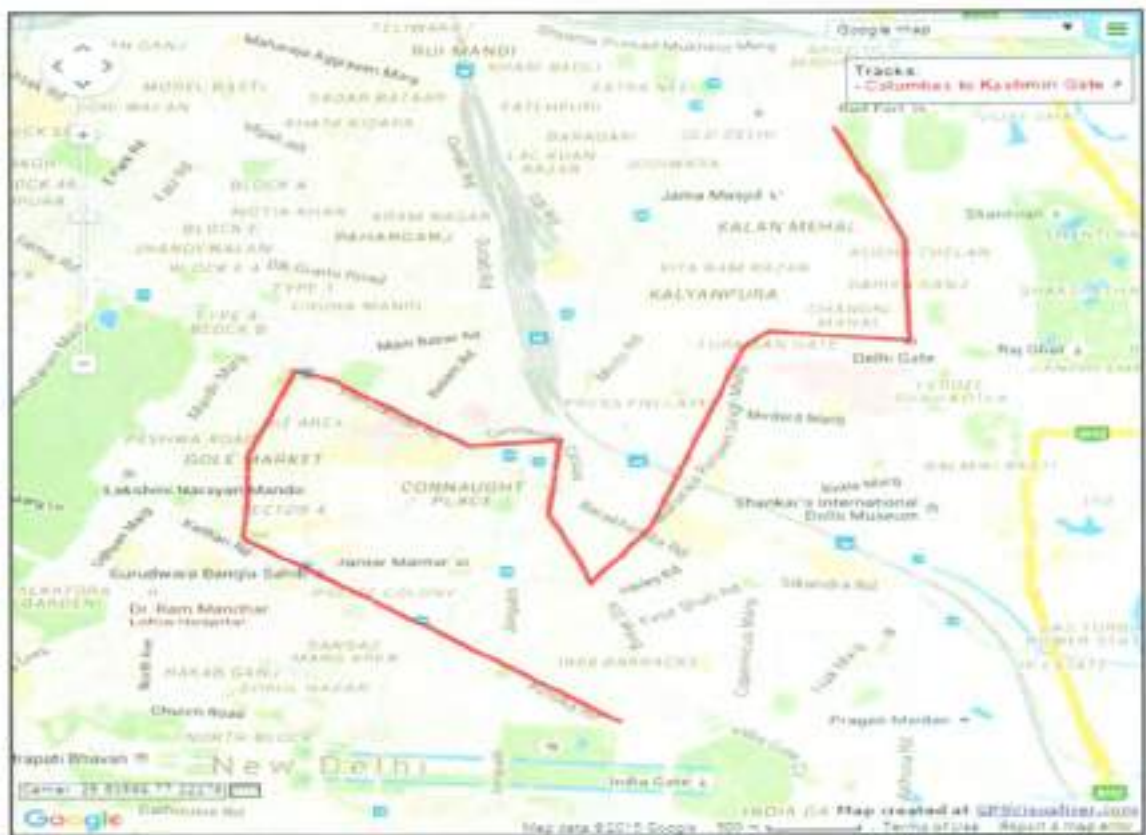
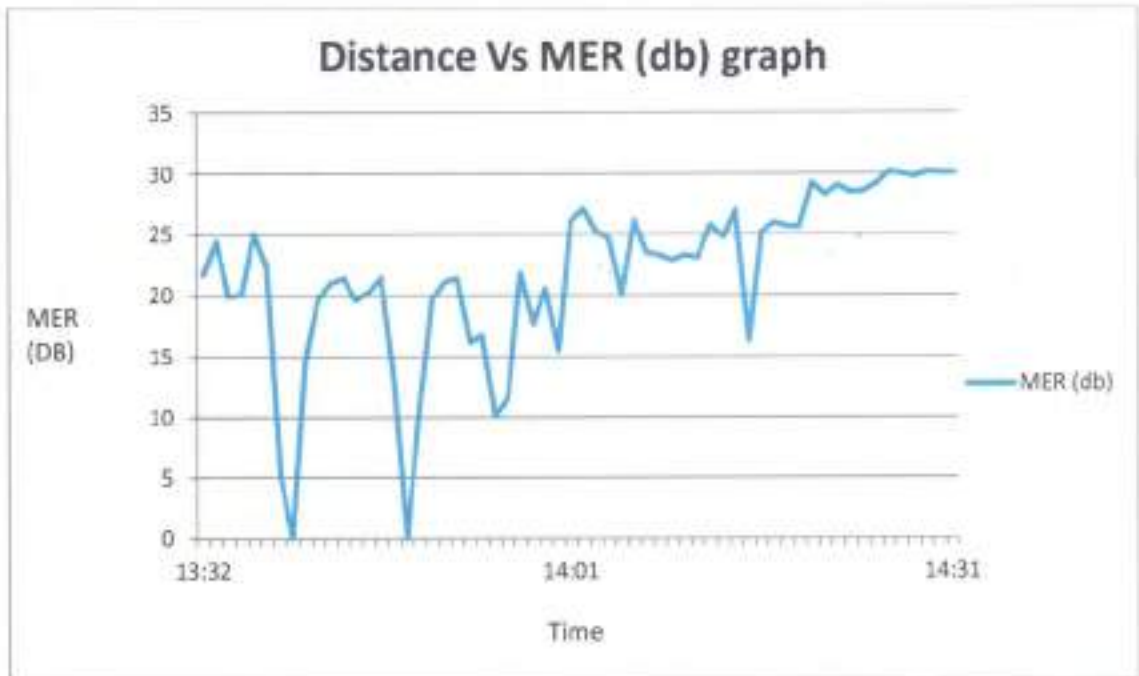


BATRA HOSPITAL TO ZAKIR HUSAIN MARG



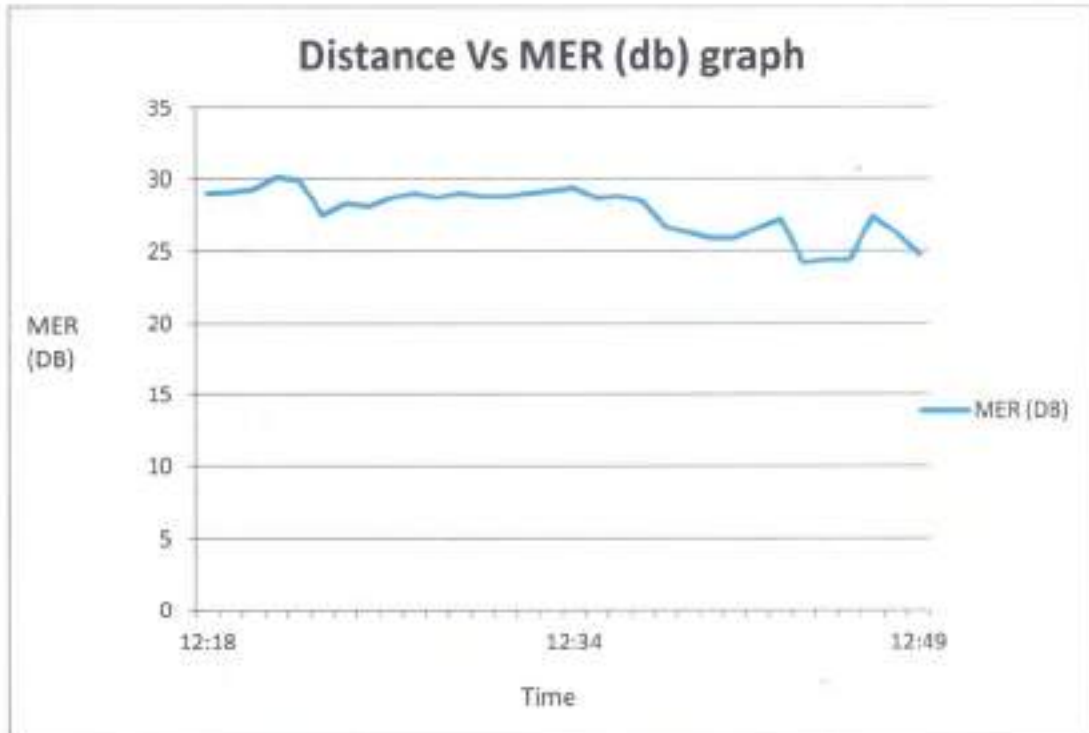
MAP-3

ST. COLUMBA'S SCHOOL TO KASHMERE GATE



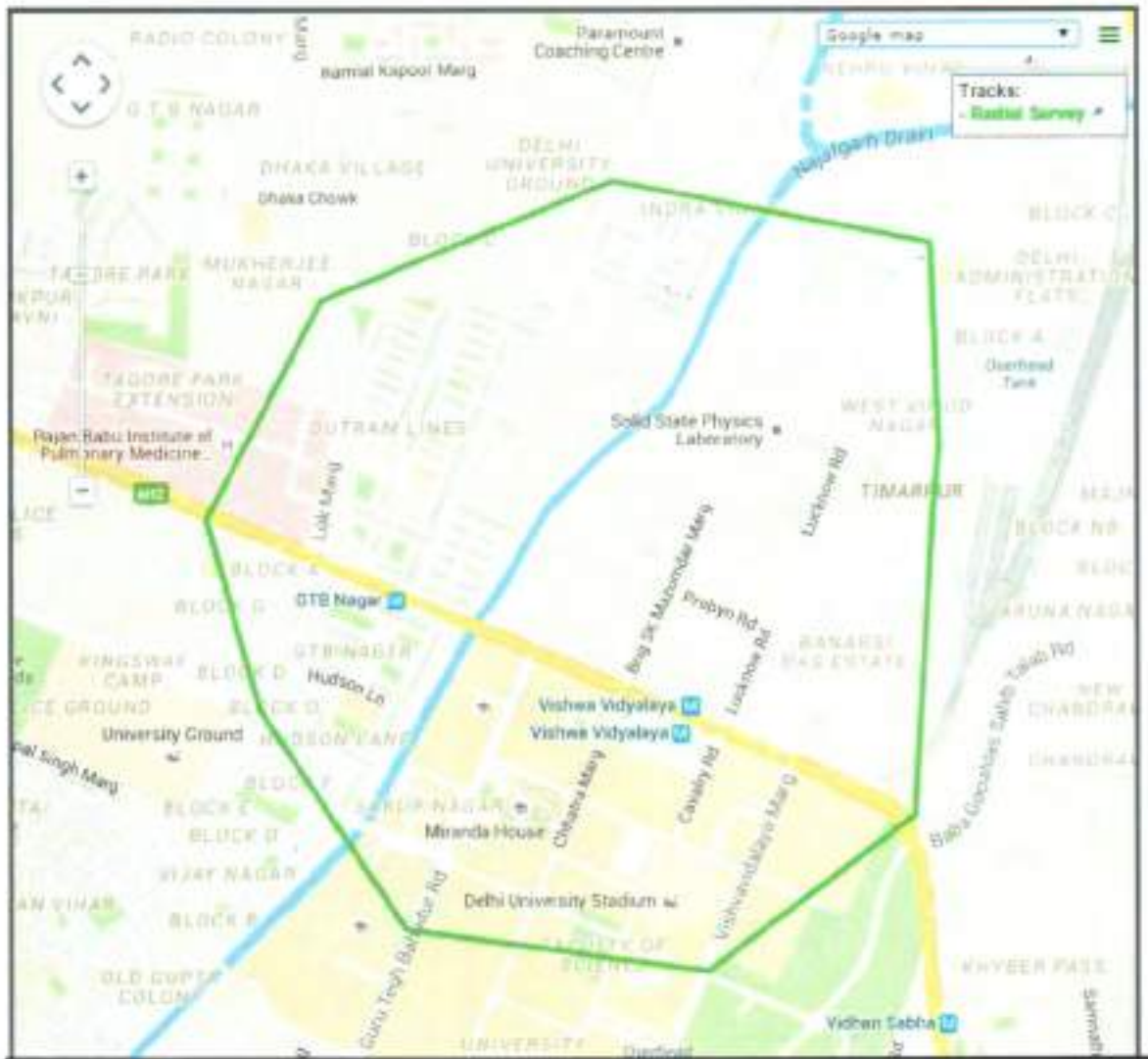
MAP-4

RASTRAPATI BHAWAN TO HAUZ KHAS



MAP-5

LOCATION OF 1 KM DISTANCE FROM ANTENNA (20 Kw AM-DRM Mall Road Xtr.)



11/08/2015 1:01 PM FAX --011 23421502 DE (T.D)

2/0001

*St. checked
DDG
Javed, AS
11/8/15
Must used please*

By Speed Post / e mail

PRASAR BHARATI
DIRECTORATE GENERAL : ALL INDIA RADIO
(PLANNING & DEVELOPMENT UNIT)

No. 5(4)/2011-D (TD/MW)/ Delhi 'C' / 109

Date : 11/08/15

Add Director General (E-R&D) All India Radio & Doordarshan
14-B, I.P Estate, Ring Road
New Delhi- 110002.

Subject : Reception survey of 20 KW MW AM-DRM transmitter at Mall Road (Delhi C)

With reference to above cited subject, 20KW MW AM -DRM transmitter at Mall Road is radiating two channels i.e Delhi C programme and Programme of FM Rainbow in pure DRM mode. It is requested to make all necessary arrangement for DRM reception survey of this newly installed DRM transmitter at a distance of exact one kilometre around the transmitter in feasible directions and in NCR region in coordination with DDG, HPT AIR Kingsway Camp Delhi 110009.

Survey has to be done with the help of both professional as well as commercial DRM receiver. Report of the survey may be submitted to this office at the earliest.

(Signature)
(S.K Saxena)

Dy. Director General (E-TD)
For director general
Tel no. 011-23421502

Copy to:

(Signature)
11/8/15

DDG HPT AIR, Kingsway Camp Delhi 110009 for extending necessary help and coordination to the team of O/o ADG (R&D).

Copy for kind information to:

1. PPS to E in C- *11/8/15*
2. PPS to ADG(R)

(Signature)
11/8/15