

**Reception survey for  
assessment of coverage area  
for satisfactory reception of  
HPT (TV) Transmitter  
(Analogue) *Located*  
*at*  
*Mau (Uttar Pradesh)***

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*Mau (Uttar Pradesh)*  
(Survey Period: 07/09/2016 to 14/09/2016)**

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

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# Table of Content

Sr.No	Particulars	Page
1	Introduction	1
2	Objective of survey	1
3	Measuring Instrument Used	1
4	Basic data & transmitter details	2
5	System Configuration	3
6	Measurement set up	3
7	Selection of sites for measurement	4
8	Measurement Methodology	4
9	TV Broadcast signal propagation	5
10	Collection of field strength data	5
11	Criteria for grading of received signal on the basis of subjective assessment	6
12	Broadcast service area	6
13	Interpretation of the collected data along radials	7
14	Conclusion	8
15	Acknowledgement	8
16	Table-1 (Direction: North,Radial-1)	9
17	Table-2,( Direction: North-East, Radial-2)	10
18	Table-3,( Direction: East, Radial-3)	11
19	Table-4,( Direction: South-East, Radial-4)	12
20	Table-5,( Direction: South, Radial-5)	13
21	Table-6,(Direction: South-West, Radial-6)	14
22	Table-7,(Direction: West, Radial-7)	15
23	Table-8 (Direction: North-West, Radial-8)	16
24	Table-9, Coverage contour for satisfactory reception of DVB-T2 Transmission	17
25	Annexure-I, Radial route map originating from the location of the transmitter	18
26	Annexure-II, Contour map for primary coverage	19
27	Annexure-III, Variation of Field Strength & MSL with distance along North & North-East Directions	20
28	Annexure-IV, Variation of Field Strength & MSL with distance along East & South-East Directions	21
29	Annexure-V, Variation of Field Strength & MSL with distance along South & South-West Directions	22
30	Annexure-VI, Variation of Field Strength & MSL with distance along West & North-West Directions	23



Location Map (3D View) of TV Tower Mau (Uttar Pradesh)



10kW Analogue Transmitter



Transmitter Control Unit (TCU)

## **Introduction:**

The 10kW Harris make TV transmitter is located in Kanheri (Mau) a rural area surrounding with open terrain. This TV transmitter is being installed & commissioned on dated 30/07/2014 carrying DD National on UHF Ch#21 in analogue mode. The transmitting tower is a steel structure of height 150 Meter over which a transmitting antenna is mounted radiating the broadcast signal. Being a newly installed UHF transmitter, field strength survey therefore required to be carried out for assessment of the primary coverage of satisfactory reception. Regarding this a team of survey staff of Research Department has been deputed for the said task. The survey team intensively carried out field strength survey along eight directions all around the transmitter location during the period 07/09/2016 to 14/09/2016. The geographical terrain of the district Mau formerly known as Mau Nanth Bhanjan basically rural open terrain, moderate to dense vegetation with river, their tributaries and water bodies. The field trial was carried out by utilizing survey van fitted with required survey equipment for fixed antenna receiving mode mounted on a pneumatic telescopic mast expandable up to a height of 10 meters.

## **Objective:**

1. Ascertaining the coverage area for satisfactory reception of analogue Transmission.
2. To draw coverage contour of 65dB $\mu$ V/m, the primary coverage contour.

## **Equipment Used:**

1. Spectrum Analyzer(Make: Anritsu, Model: MS 2035B & MS 2013E)
2. UHF Dipole antenna(Make: Anritsu, Model: MP651B)
3. GPS Navigator(Make: Garmin, Model: Montana 650)
4. LED TV Receiver(Make: Sony, )
5. Survey Van fitted with 10 Meters Mast & Portable Generator etc)

## Basic Data and Transmitter details

### **Transmitters Details:**

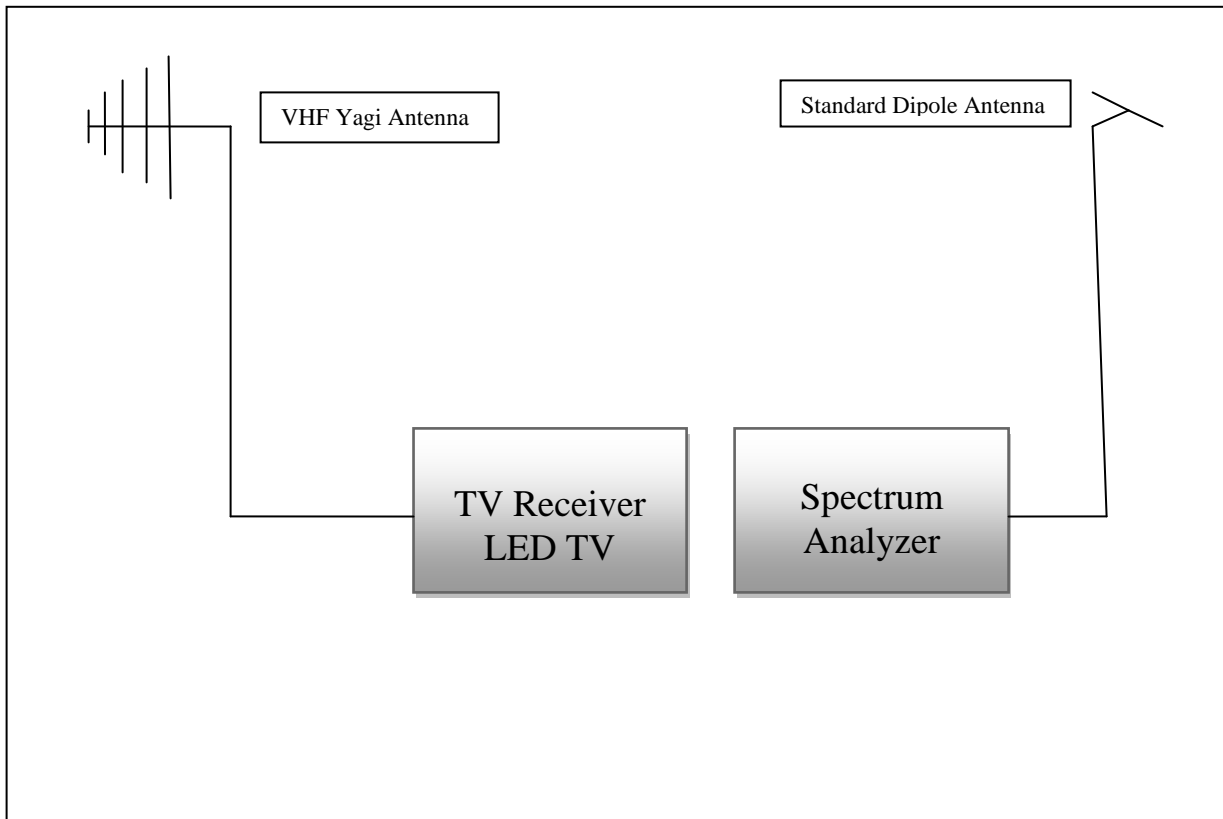
1. Name of Station : HPT(TV) Tower, Mau (UP)
2. Location of the Transmitters : LAT- N 25°53'54.0"  
(In 6 figure coordinates) LONG- E 83°35'52.1"  
MSL-69 Meter
3. Description of terrain around the Transmitters : Rural, Vegetation
4. Classification(Large city/urban/rural) : Urban
5. Rated power of the Transmitter : 10.0kW
6. Forward radiated Power : 9.41kW
7. Reflected Power : 0.0W
8. VSWR : 1.10
9. Transmission Mode : Analogue(PAL)
10. Make : Harris
11. Model No. : ULX 10000AN
12. Frequency of operation : Vision:471.25 (CH#21)  
Aural: 476.75  
Offset (.)
13. Date of Commissioning : 30-September-2014  
:

### **Transmitting Antenna Details:**

1. Make : Not available
2. Type /Model of Antenna : Not available
3. Antenna Gain : Not available
4. Height of Tower : 150 Meter
5. Effective height of antenna(Midbay) : Not available
6. Type of Polarization : Horizontal
7. Tower : Steel Structure

## System configuration:

The field trials system mainly consists of field strength measuring equipment, standard calibrated UHF Dipole antenna & Yagi receiving antenna for receiving horizontally polarized TV Broadcast signal, Portable Generator, 10 Meters pneumatic telescopic mast housed in a customized Survey Van of Research Department. A pictorial diagram is given below.



## Measurement Set Up:

The field trials were carried out by utilizing mobile survey van of Research Department having 10 meter pneumatic telescopic mast. Field strength measurement was carried out, using Anritsu make Spectrum Analyzer & UHF Dipole Antenna. The whole system was assembled in a mobile van with power generating system (portable generator set). The two main components of the reception set up are analogue TV receiving system and field strength measuring system (Spectrum Analyzer). A calibrated UHF dipole antenna is used to receive the signal whereas for subjective assessment of the received signal was performed by using Sony makes LED TV. In addition to this Garmin make GPS navigator was used for determination of the spot/location co-ordinate in six figures & radial distance from the transmitter location.



## Selection of sites for measurement:

As far as practicable an open & safe spot/ location (overhead power and telephone cables, trees and other hazards were avoided) was chosen for the measurement of received field strength. Instead of cluster measurement (measurement at four to five spot for a given location), single sample method in this survey is preferred, because of the additional time that may be taken in making cluster measurements (due to the frequent raising or lowering of the receiving antenna & insufficient space along the motor able road side), or because of the hazards in moving the measuring vehicle while the antenna is fully erected. High tension overhead wires, close to high raise buildings & elevated flyovers/underpasses were avoided while collecting field strength data along a radial route.

## Measurement Methodology:

A map of the largest available scale was used to mark the location of the transmitters. From the transmitter location eight radials are drawn passing through the transmitter location along North, East, South, West, North-East, North-West, South East & South West directions. For prediction of the coverage area, field strength measurement along a radial is carried out by employing mobile survey van having 10Mtrs telescopic mast with rotor & tilt facility. For field strength measurement the survey vehicle was mostly parked in open space, raising the telescopic mast up to the required height of 10 meters & then rotating the antenna to align it along the direction of transmission source for getting optimum value of field strength. While taking static reception measurement LAT/LONG, MSL & radial distance of each & every location was also recorded. Once all measurements have been undertaken, mast is fully retracted & then driven away for the next location. Since the purpose of the survey was to determine the primary coverage area for satisfactory reception so the measurement was carried out in static condition along motorable roads. The same procedures for field strength measurement/reception survey are adopted along all other eight radials. After data collection is over the FSM data are tabulated & interpreted on the basis of the findings. The quality of received audio/video was also analyzed by using SONY make receiver under given terrain conditions. The environment classification criteria are:

<b>Rural</b>	Areas with scarce isolated buildings, open fields.
<b>Suburban</b>	Small towns; residential areas with low building density and buildings not higher than two stories; wide roads or streets between buildings.
<b>Urban</b>	Big to medium sized cities, residential areas with high density of buildings; areas where buildings are higher than two stories and close distances between them
<b>Large Cities</b>	Densely populated cities having cluster of township with high rise building & skyscrapers

## **TV Broadcast Signal Propagation:**

TV broadcast signal propagates from the transmitter by space wave propagation mechanisms i.e. Line of sight Propagation & travel straight way in propagating medium & undergoes all optical phenomena like Reflection, Refraction, Scattering, Diffraction etc while travelling through the medium. It is also important to point out other factors typical of urban reception environment such as traffic, speed change due to traffic lights and pedestrian crossings, etc. The field strength level, at a given point, not only depends on its distance from the transmitter, the frequency of transmission and the antenna heights but also on the long-term and short-term interferences caused by reflections of the natural environment (terrain configuration, vegetation) and the man-made environment. Thus the received signal must be considered as the vector sum of the wanted signal and many reflected signals. Due to the effect of reflected signals, the Field Strength along a route shows severe fluctuation. Since, the measurements are made on public roads the reflected signals coming from other vehicles cannot be foreseen. The field strength test results therefore very rarely match the results of measurements obtained at the same place, at a different time.

## **Collection of field strength data:**

The field strength data were collected along eight radials routes drawn (Annexure-I) around the transmitting antenna. At each & every spot/location along the radial the telescopic mast was expanded upto 10 Meters from the ground level keeping the dipole antenna horizontally as the polarization of the radiated beam is horizontally polarized. The antenna position is being continuously rotated for optimized value of field strength in the direction of line of sight with respect to the transmitting antenna. The optimum field strength values are thus recorded. In addition to this the terrain detail of each & every spot/location was also recorded along with the subjective assessment of the received audio/video quality on the basis of watching on TV receiving system These collected data's are being tabulated in proper sequence to make it convenient for discussion & correlation with other parameters. The subjective assessment of received audio/video quality on TV receiver is graded as E (Excellent), VG (Very Good), G (Good), F (Fair) & P (Poor). The field strength measurement values along with subjective assessment at each & every spot/location are recorded in a tabular form giving at an instance the trend for variation in received field strength & signal reception quality with distance. In this report the received field strength & subjective assessment data collected along eight radials are tabulated accordingly in Table No.-1 to Table No.-8. In addition to this the radial distances & field strength value corresponding to satisfactory reception along all eight radials are compiled in tabular form (as in Table No: 9) to make it convenient to determine the primary coverage area of the said transmission. On the basis of Table -9, a coverage contour for analogue TV transmission has been drawn & annexed as in Annexure-II. Annexure III to Annexure VI represents variation of Field strength & MSL with distance along different radials. The code used for grading of the received signal is illustrated as follows.

## Criteria for grading of received signal on the basis of subjective assessment:

Signal	E	Excellent	No impairment in received audio/video quality.
	VG	Very Good	Near to excellent with antenna direction
	G	Good	Light grains on screen but irritable of nature
	F	Fair	Moderate grains on TV screen but tolerable
	P	Poor	Huge grains causing irritation & intolerable

## Broadcast Service Area:

The objective of broadcasting is to provide quality reception free from interferences & noise in a commercial domestic receiver, either fixed or mobile, to as much of population and area of the country as possible, In case of analogue transmission coverage area of broadcasting is decided by the minimum required received 'field strength' at the farthest end of the coverage area for satisfactory reception with commercially available domestic receivers. As per recommendation of ITU, minimum equivalent field strength value at 10Meters height for satisfactory reception of VHF/UHF transmission are as illustrated in following table.

Broadcast Band		Frequency	Minimum Field Strength			
VHF	Band-I	40-68 MHz	48 dB $\mu$ V/M			
	Band-II (Exclusively used for FM Radio Services)	88-108 MHz	Transmission Mode	Large Cities	Urban	Rural
			Mono	70 dB $\mu$ V/M	60 dB $\mu$ V/M	48 dB $\mu$ V/M
			Stereo	74 dB $\mu$ V/M	66 dB $\mu$ V/M	54 dB $\mu$ V/M
Band-III	174-230 MHz	55 dB $\mu$ V/M				
UHF	Band-IV	470-606 MHz	<b>65 dB<math>\mu</math>V/M</b>			
	Band-V	606-798 MHz	70 dB $\mu$ V/M			

## Interpretation of the collected data along radials:

In this report efforts are being made for the interpretation & analysis of the collected FSM data along a radial & then a coverage contour based on compiled Table-9 for satisfactory reception of transmission was drawn on a map.

1. **Radial-1(North)**: Along this radial field strength measurement done at location like Dandi-Ghosi-Dohrighat-Shahpur-Usari (Chillupar)-Mahunia(Hata Bazar) & Lakhayee Deeh Buzurg up to a radial distance of 60kM .Satisfactory reception of HPT(TV) Transmission was observed to be up to a radial distance of 40kM (Ghontha) on Mau –Gorakhpur road.
2. **Radial-2 (North-East)**: Along this radial field strength measurement done at location like Pahsa-Baharpur-Rattanpura-Belthara-Jamua-Salempur-Phulwaria- Pakari Babu & Bandi Bhisu up to a radial distance of 70 kM . Satisfactory reception of HPT (TV) Transmission was observed to be up to a radial distance of 45kM (Jamua, Salempur) on Bhagalpur-Salempur road.
3. **Radial-3(East)**: Along this radial field strength measurement done at location like Pindhari – Ratanpura - Rasra-Piyaria – Sukhpura – Mairitar – Bansdih & Goura (Sahatwar) up to a radial distance of 70 kM . Satisfactory reception of HPT (TV) Transmission was observed to be up to a radial distance of 50kM (Sukhpura) on Garhwar – Sukhpura Road.
4. **Radial-4(South- East)**: Along this radial field strength measurement done at location like Badura-Kasimabad-Dihawa-Yusufpur Mohammdpur-Kadipur-Narainpur-.....Buxer-Chanda (Bihar) up to a radial distance of 50 kM. Due to low height barricading on Ganga river survey van could not cross over the river & since also there was no other motorable road to reach Buxer & onward location in Bihar a projected distance of 60 kM(Chanda-Bihar) corresponding to satisfactory reception ( 65dB $\mu$ V/m) was predicted on the basis of variation of field strength along this radial.
5. **Radial-5(South)**: Along this radial field strength measurement done at location like Mardah-Rajapur-Andhaun-Gang Barar (Mednipur)-Sabbalpur-Hatimpur(Zaminia) &Illaichipur up to a radial distance of 60 kM . Satisfactory reception of HPT (TV) Transmission was observed to be up to a radial distance of 55kM (Hatimpur) on Nakhatpur-Panserwa Road.
6. **Radial-6(South-West)**: Along this radial field strength measurement done at location like Tajpur-Kamthari-Jakhanian-Doriya (Sadat)-Kaneri-Saidpur-BhandahaKala-Hathora & Bahadurpur (Chaubepur) up to a radial distance of 70 kM. Satisfactory reception of HPT (TV) Transmission was observed to be up to a radial distance of 50kM (Naraynpur Kakarahi) on Mahpur-Saidpur Road.
7. **Radial-7(West)**: Along this radial field strength measurement done at location like Harpur-ChandanChaki-Mainuddinpur-Daultabad-Chakarpanpur-Mehnagar-Bahadurpur-Jairampur & Gopalpur up to a radial distance of 64.5 kM . Satisfactory reception of HPT (TV) Transmission was observed to be up to a radial distance of 45kM (Rajdharpur, Dewaria) on Singhpur-Mehnagar road.
8. **Radial-8(North-West)**:Along this radial field strength measurement done at location like Barlai-Bhawrepur-Basaratpur-Mohammadabad-Amilo-Maltri-Bilariyaganj & Motipur up to a radial distance of 60 kM . Satisfactory reception of HPT (TV) Transmission was observed to be up to a radial distance of 45kM (Maltri) on Bilariyaganj Road.

## **Conclusion:**

On the basis of received field strength values & subjective assessment of the video quality at various spot/location along eight radials & coverage contour(Annexure-II) drawn on the basis of table prepared/compiled for satisfactory reception of analogue TV transmission following conclusions can be stipulated.

1. The coverage along North is up to 40kM. North-East, West & North-West direction is up to a radial distance of 45 kM. In East, South-West direction coverage is up to 50 kM whereas along South & South-East direction it is up to a radial distance of 55 kM & 60 kM respectively.
2. The coverage along North, North-East, West & North-West direction is the least .This shrinkage in coverage is mainly due to the existence of moderate to dense vegetation along these radials & also at the location of measurement. However along East, South-West, South & South-East direction the coverage of satisfactory reception varies from 50-60 kM.
3. Predicted coverage contour (Annexure-II) reveals that reception is satisfactory within the predicted coverage area (up to 40-60 kM) all around HPT (TV) Tower Mau with fixed roof top antenna mounted at a height of 10 Meters from the ground.
4. No interference of unwanted signal in reception of analogue transmission has been observed within its coverage area.

## **Acknowledgement:**

The propagation studies presented in this document are carried out by the Propagation Lab of Research Department of All India Radio & Doordarshan, New Delhi. The field trial and the survey report prepared is an effort of a vibrant team that deserves appreciation for their hard work & sincere devotion exhibited during the entire survey period. Firstly survey team sincerely acknowledges the contribution of Sh.V.K.Verma (DDE-Propagation lab) who totally involved in planning & execution of this field trial. Survey team also acknowledges the sincere support, contribution & cooperation of the shift duty staff of HPT (TV) Tower, Mau (UP).This team also express their gratitude to Sh. Rahul Singh (DDE), DDK Gorakhpur & In charge of DDK Mau who willingly has extended all possible help to the survey team of Research Department. The survey team is highly indebted to Mrs. Anuradha Agarwal (ADG) for her guidance, motivation, constant encouragement & supportive ideas at every step that helped in the successful completion of the survey.

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# Reception survey for satisfactory coverage of HPT (TV) Transmitter (471.25MHz), Mau (UP)

Direction: North (Radial-1)

Table-1

Route: TV Tower (Mau) - Dandi- Ghosi-Dohrighat-Shahpur-Usari (Chillupar)-Mahunia-Hata Bazar-Lakhayee Deeh Buzurg

Date: 07/09/2016

Time (Hrs)	Spot/Location	Location Co-ordinates	MSL (Mtrs)	Radial Distance (kM)	Field Strength (dB $\mu$ V/m)	Subjective Assessment	Terrain	Remarks
0845	Dandi Village Mau – Gorakhpur Road	N25°59'16.9" E83°34'40.7"	59	10	84.2	E	Rural, Vegetation, Low Traffic. Cloudy,	
0915	Kopaganj Mau – Gorakhpur Road	N26°01'45.5" E83°34'09.6"	57	15	82.6	E	Rural, Vegetation, Low Traffic. Cloudy,	
0945	Lakhipur Mau – Gorakhpur Road	N26°04'35.2" E83°33'12.8"	52	20	76.5	E	Rural, Vegetation, Low Traffic, Cloudy.	
1020	Ghosi (Ghosi-Madhuban Road)	N26°07'31.1" E83°33'12.8"	56	25.5	71.7	E	Urban, Vegetation, Low Traffic. , Cloudy.	
1115	Hardhua Mau – Gorakhpur Road	N26°09'52.6 E83°31'46.5"	56	30	71.1	E	Rural, Vegetation, Low Traffic. , Cloudy.	
1145	Shahpur Mau – Gorakhpur Road	N26°12'23.4" E83°30'58.0"	55	35	70.2	E	Rural, Vegetation, Low Traffic. , Raining.	
1215	Ghontha Mau – Gorakhpur Road	N26°15'11.8" E83°30'44.7"	53	40	65.3	E	Rural, Vegetation, Low Traffic. , Cloudy.	
1320	Usari(Chillupar) Mau – Gorakhpur Road	N26°17'44.8" E83°30'07.1"	64	45	60.7	VG	Urban, Low Traffic. , Cloudy.	
1400	Mahunia Mau – Gorakhpur Road	N26°20'26.5" E83°28'58.9"	58	50	58.4	G	Rural, Vegetation, Low Traffic. , Cloudy.	
1430	Mahurai (Hata Bazar) Mau – Gorakhpur Road	N26°22'48.9" E83°27'45.0"	56	55	56.4	G/F	Rural, Vegetation, Low Traffic. , Cloudy.	
1450	Lakhayee Deeh Buzurg Mau – Gorakhpur Road	N26°25'25.7" E83°26'52.1"	60	60	54.3	P	Rural, Vegetation, Low Traffic. , Cloudy.	

# Reception survey for satisfactory coverage of HPT (TV) Transmitter (471.25MHz), Mau (UP)

Direction: North- East (Radial-2)

Table-2

Route: TV Tower (Mau)-Pahsa- Baharpur-Rattanpura-Belthara-Jamua-Salempur-Phulwaria- Pakari Babu-Bandi Bhis

Date: 08/09/2016

Time (Hrs)	Spot/Location	Location Co-ordinates	MSL (Mtrs)	Radial Distance (kM)	Field Strength (dBµV/m)	Subjective Assessment	Terrain	Remarks
10.10	Pahsa(Kharargadi) Mau - Ballia Road	N25°58'05.6" E83°39'42.3"	51	10	83.2	E	Rural , Vegetation, Low Traffic, Cloudy	
1040	Manikpur Malap Road	N25°58'04.1" E83°43'36.8"	49	15	81.5	E	Rural , Vegetation, Low Traffic, Cloudy	
1115	Baharpur Rattanpura - Bhimpura Rd	N26°00'15.4" E83°45'39.9"	50	20	78.6	E	Rural , Vegetation, Low Traffic, Cloudy	
1145	Rampur (Udhran Bazar) Bhimpura – Belthra Road	N26°03'51.8" E83°46'05.6"	50	25	73.2	E	Rural , Vegetation, Low Traffic, Cloudy	
1230	Kath Taraon(Rattanpura) Bhimpura – Belthara Road	N26°07'00.8" E83°46'37.8"	49	30	70.7	E	Rural , Vegetation, Low Traffic, Cloudy	
1300	Belthara Belthara Road	N26°07'06.3" E83°50'59.9"	53	35	68.4	E	Urban, Vegetation, Low Traffic, Cloudy	
1330	Dewasia Bangar (Near Ghaghara Bridge)	N26°09'52.4" E83°52'21.1"	55	40	66.6	E	Rural , Vegetation, Low Traffic, Cloudy	
1400	Jamua (Salempur) Bhagalpur-Salempur Rd	N26°12'00.7" E83°54'00.9"	51	45	64.8	E	Rural , Vegetation, Low Traffic, Raining	
1420	Indouli Bhagalpur-Salempur Rd	N26°14'48.8" E83°54'58.3"	55	50	58.4	VG	Rural , Vegetation, Low Traffic, Cloudy	
1545	Salempur Salempur – Mairwa Road	N26°17'31.6" E83°56'00.7"	54	55	55.8	G	Urban, Vegetation, Low Traffic, Cloudy	
1620	Phulwaria Phulwaria- Chanuki Road	N26°17'15.5" E84°01'06.2"	56	60	55.1	G	Rural , Vegetation, Low Traffic, Cloudy	
1645	Pakari Babu Bhatpar Rani – Bhengari Rd	N26°20'01.8" E84°02'09.0"	53	65	53.6	F	Rural , Vegetation, Low Traffic, Cloudy	
1710	Bandi Bhis Bhatpar Rani – Bhengari Rd	N26°21'55.5" E84°04'15.0"	52	70	52.4	P	Rural , Vegetation, Low Traffic, Cloudy	

# Reception survey for satisfactory coverage of HPT (TV) Transmitter (471.25MHz), Mau (UP)

Direction: East (Radial-3)

Table-3

Route: TV Tower (Mau) – Pindhari – Ratanpura - Rasra-Piyaria – Sukhpura – Mairitar – Bansdih – Goura (Sahatwar)

Date: 09/09/2016

Time (Hrs)	Spot/Location	Location Co-ordinates	MSL (Mtrs)	Radial Distance (kM)	Field Strength (dB $\mu$ V/m)	Subjective Assessment	Terrain	Remarks
0945	Pindhari Bahadur Ganj-Rasra Road	N25°52'32.1" E83°41'54.5"	54	10	83.4	E	Rural, Vegetation Low Traffic Cloudy	
1045	Ratanpura Mau – Rasra Road	N25°55'11.0" E83°44'46.3"	53	15	76.3	E	Rural, Vegetation Low Traffic Cloudy	
1120	Chak Gangaram Jhor Raghopur-Pakwinar Rd	N25°53'45.9" E83°47'52.6"	49	20	78.7	E	Rural, Vegetation Low Traffic Cloudy	
1200	Barhima(Rasra) Raghopur-Pakwinar Rd	N25°56'18.8" E83°50'44.8"	50	25	79.4	E	Rural, Vegetation Low Traffic Cloudy	
1250	Melai (Rasra) Rasra – Phephna Road	N25°50'50.5" E83°53'37.2"	54	30	68.5	E	Urban , Vegetation Low Traffic Cloudy	
1315	Khalilpur Rasra – Phephna Road	N25°49'55.8" E83°56'28.0"	52	35	68.3	E	Rural, Vegetation Low Traffic Cloudy	
1340	Piyaria Rasra – Phephna Road	N25°48'35.3" E83°59'12.7"	52	40	67.7	E	Rural, Vegetation Low Traffic Cloudy	
1420	Brikalpur (Garwar) Garhwar – Sukhpura Road	N25°49'44.8" E84°02'33.9"	52	45	66.8	E	Rural, Vegetation Low Traffic Cloudy	
1445	Sukhpura Garhwar – Sukhpura Road	N25°51'23.4" E84°05'50.2"	47	50	65.4	E	Rural, Vegetation Low Traffic Cloudy	
1510	Beruarbari Garhwar – Sukhpura Road	N25°52'43.8" E84°08'51.9"	46	55	58.2	VG	Rural, Vegetation Low Traffic Cloudy	
1535	Mairitar (Bansdih) Garhwar – Sukhpura Road	N25°52'31.9" E84°11'56.1"	47	60	57.4	VG/G	Rural, Vegetation Low Traffic Cloudy	
1620	Jitoura Bansdih – Bairiya Road	N25°51'48.7" E84°14'52.7"	50	65	55.8	P	Rural, Vegetation Low Traffic Cloudy	
1645	Goura(Sahatwar) Bansdih – Bairiya Road	N25°50'27.4" E84°17'40.9"	46	70	55.2	P	Rural, Vegetation Low Traffic Cloudy	



# Reception survey for satisfactory coverage of HPT (TV) Transmitter (471.25MHz), Mau (UP)

Direction: South-East (Radial-4)

Table-4

Route: TV Tower (Mau) - Badura-Kasimabad-Dihawa-Yusufpur Mohammdpur-Kadipur-Narainpur-.....Buxer-Chanda

Date: 10/09/2016

Time (Hrs)	Spot/Location	Location Co-ordinates	MSL (Mtrs)	Radial Distance (kM)	Field Strength (dBµV/m)	Subjective Assessment	Terrain	Remarks
0910	Badura(Mohammadabad-Madhubani Vilthari Road)	N25°49'25.7" E83°39'42.6"	60	10	92.8	E	Rural Low Traffic. Cloudy, Vegetation	
0940	Kasimabad(Mohammadabad-Madhubani Vilthari Rd)	N25°46'46.4" E83°40'40.6"	56	15	91.3	E	Rural Low Traffic. Cloudy, Vegetation	
1000	Gangoli(Mohammadabad-Madhubani Vilthari Rd)	N25°44'19.2" E83°41'32.4"	54	20	86.6	E	Rural Low Traffic. Cloudy, Vegetation	
1025	Dihawa( Mohammadabad-Madhubani Vilthari Rd)	N25°41'53.1" E83°42'52.4"	54	25	81.3	E	Rural Low Traffic. Cloudy, Vegetation	
1050	Gambhirpur Khurd Mohammadabad-Madhubani Vilthari Rd	N25°39'25.7" E83°44'08.6"	47	30	77.8	E	Rural Low Traffic. Cloudy, Vegetation	
1145	Yusufpur Mohammadabad Gazipur- Ballia Road	N25°36'50.5" E83°45'10.0"	51	35	68.2	E	Urban Low Traffic. Cloudy, Vegetation	
1210	Sayidaspur Gazipur- Ballia Road	N25°35'59.5" E83°49'25.6"	59	40	74.7	E	Rural Low Traffic. Cloudy, Vegetation	
1235	Kadipur Gazipur- Ballia Road	N25°34'10.6" E83°51'47.2"	56	45	78.6	E	Rural Low Traffic. Cloudy, Vegetation	
1300	Narainpur Gazipur- Ballia Road	N25°33'58.4" E83°56'14.0"	54	50	69.8.	E	Urban Low Traffic. Cloudy, Vegetation	After this location no approach road was found to cross the Ganga River
	Buxer	----	----	55	-----	-----	-----	
	Chanda Sasaram-Patna Road	N25°34'44.4" E84°05'10.7"		60	#65.0	E	-----	Projected radial distance for primary coverage.

# Reception survey for satisfactory coverage of HPT (TV) Transmitter (471.25MHz), Mau (UP)

Direction: South (Radial-5)

Table-5

Route: TV Tower (Mau)-Mardah-Rajapur-Andhaun-Gang Barar (Mednipur)-Sabbalpur-Hatimpur (Zaminia)-Illaichipur

Date: 11/09/2016

Time (Hrs)	Spot/Location	Location Co-ordinates	MSL (Mtrs)	Radial Distance (kM)	Field Strength (dB $\mu$ V/m)	Subjective Assessment	Terrain	Remarks
0845	Mardah Mau-Gazipur Road	N25°48'54.1" E83°33'20.0"	52	10	93.2	E	Rural, Low Traffic. Cloudy, Vegetation	
0900	Govindpur Kirat (Jamira) Mau-Gazipur Road	N25°46'06.2" E83°33'11.2"	53	15	79.8	E	Rural, Low Traffic. Cloudy, Vegetation	
930	Rajapur(Birnon) Mau-Gazipur Road	N25°43'19.2" E83°32'44.7"	55	20	88.3	E	Rural, Low Traffic. Cloudy, Vegetation	
945	Dadikala Mau-Gazipur Road	N25°40'35.1" E83°33'01.4"	57	25	78.4	E	Rural, Low Traffic. Cloudy, Vegetation	
1020	Andhaun Mau-Gazipur Road	N25°37'24.9" E83°34'03.1"	55	30	74.5	E	Rural, Low Traffic. Cloudy, Vegetation	
1050	Gang Barar (Mednipur) (Nakhatpur-Panserwa Rd)	N25°34'49.4" E83°36'38.0"	61	35	82.3	E	Urban, Low Traffic. Rainy, Vegetation	
1120	Bhagirathpur (Nakhatpur-Panserwa Rd)	N25°32'13.6" E83°34'24.7"	54	40	70.4	VG	Urban, Low Traffic. Rainy, Vegetation	
1145	Sabbalpur Kalan (Nakhatpur-Panserwa Rd)	N25°29'26.0" E83°34'03.1"	56	45	67.6	E	Urban, Low Traffic. Cloudy, Vegetation	
1215	Kalanpur (Nakhatpur-Panserwa Rd)	N25°26'44.5" E83°33'59.8"	61	50	66.4	E	Rural, Low Traffic. Cloudy, Vegetation	
1240	Hatimpur(Zaminia) (Nakhatpur-Panserwa Rd)	N25°24'07.8" E83°33'21.3"	62	55	64.6	E	Rural, Low Traffic. Cloudy, Vegetation	
1315	Illaichipur Rural (Nakhatpur-Panserwa Rd)	N25°21'26.6" E83°32'24.6"	66	60	57.2	G	Rural, Low Traffic. Rainy, Vegetation	Road damaged badly & not motorable onwards

# Reception survey for satisfactory coverage of HPT (TV) Transmitter (471.25MHz), Mau (UP)

Direction: South-West (Radial-6)

Table-6

Route: TV Tower (Mau)-Tajpur-Kamthari-Jakhanian-Doriya(Sadat)-Kaneri-Saidpur-Bhandaha Kala-Bahadurpur(Chaubepur)

Date: 12/09/2016

Time (Hrs)	Spot/Location	Location Co-ordinates	MSL (Mtrs)	Radial Distance (kM)	Field Strength (dB $\mu$ V/m)	Subjective Assessment	Terrain	Remarks
0910	Tajpur Bandeivi Mandir- Kajha Rd	N25°52'24.1" E83°29'57.5"	54	10	83.5	E	Rural, Low Traffic. Cloudy, Vegetation	
935	Hundraha Taj pur- Kajha Road	N25°51'40.7" E83°27'07.7"	55	15	82.2	E	Rural, Low Traffic. Cloudy, Vegetation	
1000	Kamthari Kajha-Sarsena Road	N25°50'40.1" E83°24'20.3"	57	20	79.4	E	Rural, Low Traffic. Cloudy, Vegetation	
1045	Rehtimali Pur Dullahpur-Jakhanian Road	N25°46'58.3" E83°22'47.1"	58	25	70.3	E	Rural, Low Traffic. Cloudy, Vegetation	
1120	Kudila (Jakhanian) (Jakhanian-Sadat Road)	N25°44'12.3" E83°21'04.2"	57	30	66.7	E	Rural, Low Traffic. Cloudy, Vegetation	
1150	Hurmujpur (Jakhanian-Sadat Road)	N25°42'01.5" E83°19'26.8"	62	35	64.8	E	Rural, Low Traffic. Cloudy, Vegetation	
1220	Doriya(Sadat) Cannal Road	N25°39'53.5" E83°17'34.6"	68	40	61.6	VG	Rural, Low Traffic. Cloudy, Vegetation	
1300	Kaneri Cannal Road	N25°37'09.4" E83°15'50.2"	70	45	63.4	VG	Rural, Low Traffic. Cloudy, Vegetation	
1320	Naraynpur Kakarahi Mahpur-Saidpur Road	N25°34'32.2" E83°14'35.1"	70	50	64.7	E	Rural, Low Traffic. Cloudy, Vegetation	
1420	Saidpur NH-31	N25°32'24.9" E83°12'42.1"	62	55	57.8	G	Urban, Low Traffic. Cloudy, Vegetation	
1445	Hathora (NH-31) Saidpur-Varanasi Road)	N25°31'47.9" E83°09'25.0"	64	60	57.1	G/F	Rural, Low Traffic. Cloudy, Vegetation	
1515	Bhandaha Kala (NH-31)	N25°28'55.5" E83°08'28.1"	68	65	57.7	G	Rural, Low Traffic. Cloudy, Vegetation	
1545	Bahadurpur(Chaubepur) (NH-31)	N25°27'08.4" E83°06'06.6"	69	70	56.4	F	Rural, Low Traffic. Cloudy, Vegetation	

# Reception survey for satisfactory coverage of HPT (TV) Transmitter (471.25MHz), Mau (UP)

Direction: West (Radial-7)

Table-7

Route: TV Tower (Mau)-Harpur-Chandan Chaki-Mainuddinpur-Chakarpanpur-Mehnagar-Bahadurpur-Jairampur-Gopalpur

Date: 13/09/2016

Time (Hrs)	Spot/Location	Location Co-ordinates	MSL (Mtrs)	Radial Distance (kM)	Field Strength (dB $\mu$ V/m)	Subjective Assessment	Terrain	Remarks
0810	Harpur (Jail Road)	N25°54'45.7" E83°29'52.0"	56	10	93.5	E	Rural, Low Traffic. Cloudy, Vegetation	
0840	Basti (Sahabad Mor-Sarsena Rd)	N25°52'42.8" E83°26'53.6"	58	15	87.2	E	Rural, Low Traffic. Cloudy, Vegetation	
0940	Chandan Chaki Mau-chiruiyakot Road)	N25°54'38.5" E83°23'53.1"	59	20	72.3	E	Rural, Low Traffic. Cloudy, Vegetation	
1010	Khudkarmi(Chiraikot) Mau-chiraiyakot Road)	N25°54'05.5" E83°20'52.4"	61	25	74.4	E	Rural, Low Traffic. Cloudy, Vegetation	
1045	Mainuddinpur Chiraiyakot-Chakrapanpur Rd	N25°52'41.1" E83°17'47.2"	62	30	68.2	E	Rural, Low Traffic. Cloudy, Vegetation	
1110	Daulatabad Chiraiyakot-Chakrapanpur Rd	N25°53'10.3" E83°14'50.5"	60	35	64.9	E	Rural, Low Traffic. Cloudy, Vegetation	
1140	Chakarpanpur	N25°54'10.9" E83°11'54.5"	61	40	65.6	E	Rural, Low Traffic, Cloudy ,Vegetation	
1210	Rajdharpur(Dewaria) Singhpur-Mehnagar Road	N25°52'37.3" E83°08'55.2"	67	45	64.8	E	Rural, Low Traffic, Cloudy ,Vegetation	
1245	Mehnagar Mehnagar-Gosai Ka Bazar Rd	N25°52'31.9" E83°05'53.8"	73	50	59.8	VG	Rural, Low Traffic, Cloudy ,Vegetation	
1315	Bahadurpur Mehnagar-Gosai Ka Bazar Rd	N25°52'33.5" E83°02'47.6"	76	55	59.4	VG	Rural, Low Traffic, Cloudy ,Vegetation	
1400	Jairampur Link Road	N25°54'20.5" E82°59'54.6"	76	60	58.2	G	Rural, Low Traffic, Cloudy ,Vegetation	
1420	Gopalpur Azamgarh-Jaunpur Road	N25°54'00.5" E82°57'21.2"	74	64.5	57.3	F	Rural, Low Traffic, Cloudy ,Vegetation	

# Reception survey for satisfactory coverage of HPT (TV) Transmitter (471.25MHz), Mau (UP)

Direction: North-West (Radial-8)

Table-8

Route: TV Tower (Mau) - Barlai-Bhawrepur-Basaratpur-Mohammadabad-Amilo-Maltri-Bilariyaganj-Rukunddinpur-Motipur

Date: 14/09/2016

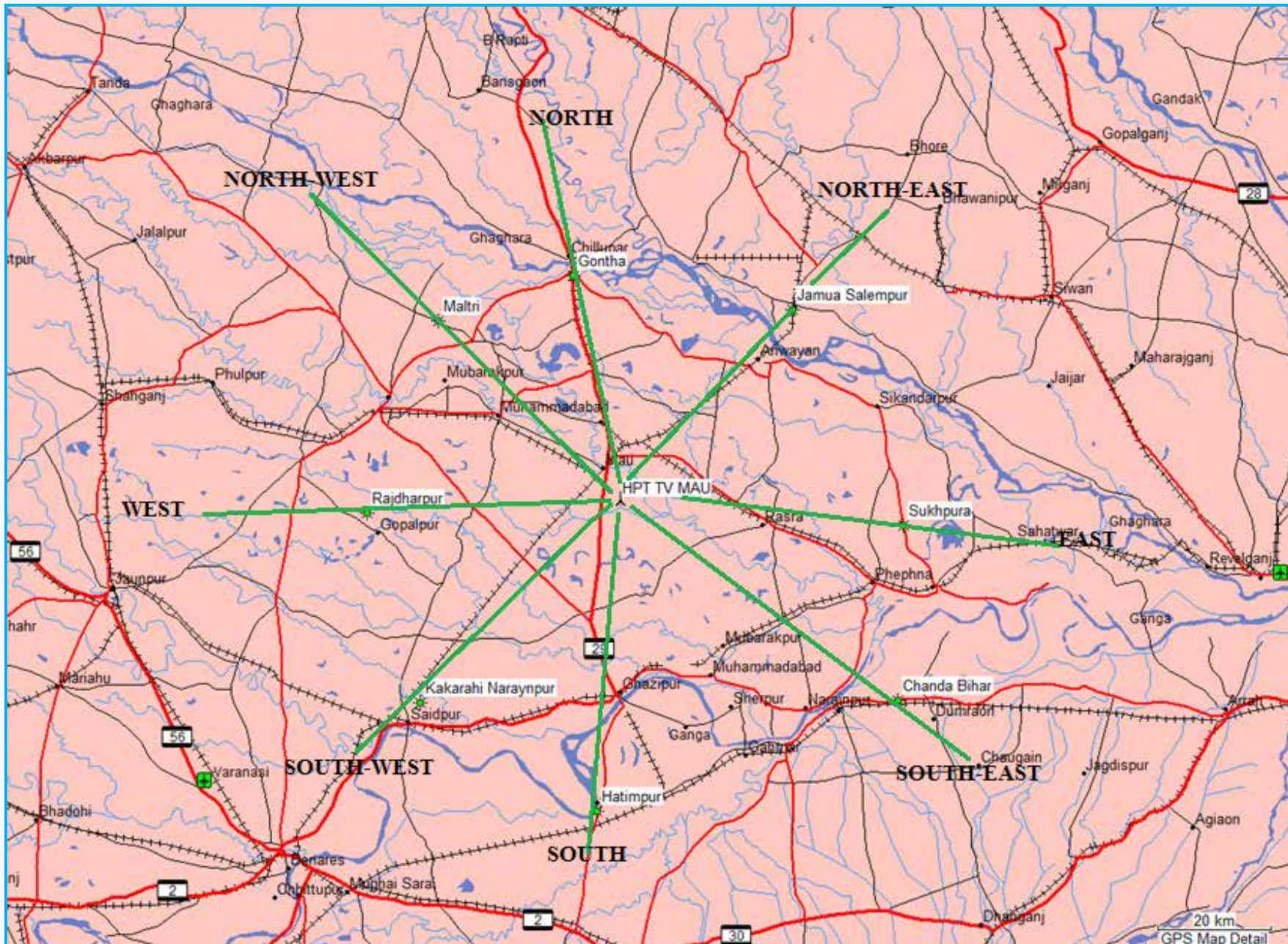
Time (Hrs)	Spot/Location	Location Co-ordinates	MSL (Mtrs)	Radial Distance (kM)	Field Strength (dB $\mu$ V/m)	Subjective Assessment	Terrain	Remarks
0745	Barlai Mau-Muhammadabad Rd	N25°58'01.8" E83°31'32.8"	56	10	94.6	E	Urban, Low Traffic, , Cloudy, Vegetation	
0810	Bhawrepur Mau-Muhammadabad Rd	N25°59'17.8" E83°29'03.8"	55	15	86.5	E	Rural, Low, Traffic Vegetation, Cloudy ,	
0825	Basaratpur Mau-Muhammadabad Rd	N26°00'21.8" E83°26'11.8"	57	20	83.4	E	Rural, Low, Traffic Vegetation, Cloudy ,	
0840	Mohammadabad(Gohana)	N26°01'37.6" E83°23'30.9"	56	25	72.8	E	Urban, Low, Traffic Vegetation, Cloudy	
0935	Kochha( Muinabad) Khairabad-Mubarakpur	N26°03'26.5" E83°21'10.9"	58	30	70.3	E	Urban, Low, Traffic Vegetation, Cloudy	
0950	Amilo (Mubarakpur) Khairabad-Mubarakpur	N26°05'00.2" E83°18'33.3"	58	35	67.4	E	Urban, Low, Traffic Vegetation, Cloudy	
1035	Nadaura Tarkari Jiyanpur-Asrafpur road)	N26°09'43.5" E83°17'22.9"	59	40	66.2	E	Rural, Low, Traffic Vegetation, Cloudy	
1100	Maltri Bilariyaganj Road	N26°10'56.0" E83°16'31.0"	58	45	64.6	E/VG	Rural, Low, Traffic Vegetation, Cloudy	
1120	Bilariyaganj Bilariyaganj-Maharajganj Rd	N26°12'09.5" E83°13'42.3"	58	50	58.7	G	Urban, Low, Traffic Vegetation, Cloudy	
1140	Rukunuddinpur Bilariyaganj-Maharajganj Rd	N26°13'29.0" E83°10'56.5"	62	55	57.1	G	Rural, Low, Traffic Vegetation, Cloudy	
1205	Motipur Bilariyaganj-Maharajganj Rd	N26°14'35.1" E83°08'05.1"	65	60	56.8	F	Rural, Low, Traffic Vegetation, Cloudy	

## Reception survey for satisfactory coverage of HPT (TV) Transmitter (471.25MHz), Mau (UP)

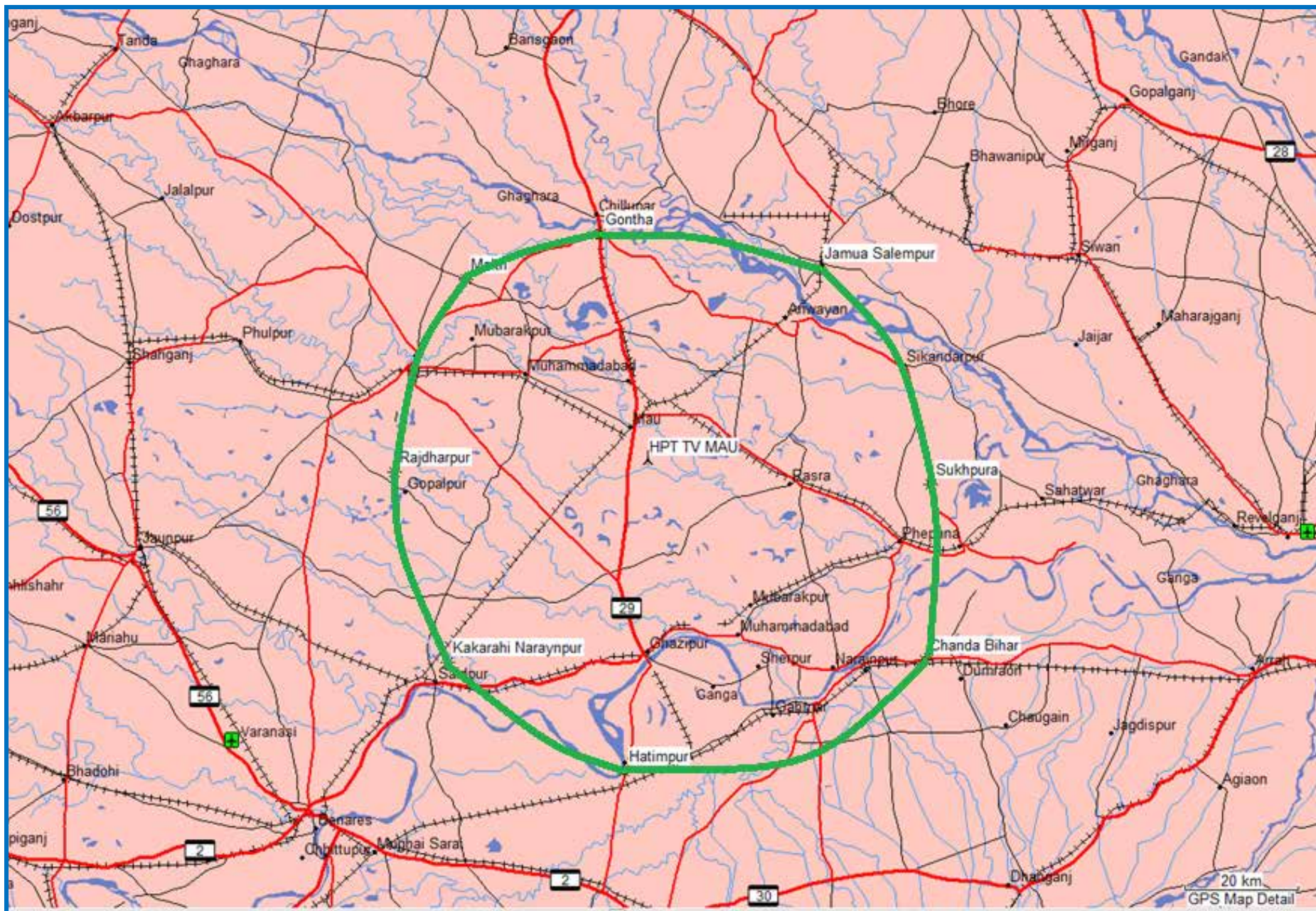
Table for satisfactory coverage of analogue TV Transmitter

Table-9

Direction	Spot/Location	Location Co-ordinates	Radial Distance (kM)	Field Strength (dB $\mu$ V/m)	MSL (Meters)	Subjective Assessment
North	Ghontha Mau – Gorakhpur Road	N26°15'11.8" E83°30'44.7"	40	65.3	53	E
North-East	Jamua (Salempur) Bhagalpur-Salempur Rd	N26°12'00.7" E83°54'00.9"	45	64.8	51	E
East	Sukhpura Garhwar – Sukhpura	N25°51'23.4" E84°05'50.2"	50	65.4	47	E
South-East	Chanda (Bihar) Sasaram-Patna Road	N25°34'44.4" E84°05'10.7"	60	#65.0	-----	E
South	Hatimpur(Zaminia) Nakhatpur-Panserwa Rd	N25°24'07.8" E83°33'21.3"	55	64.6	62	E
South-West	Naraynpur Kakarahi Mahpur-Saidpur Road	N25°34'32.2" E83°14'35.1"	50	64.7	70	E
West	Rajdharpur(Dewaria) Singhpur-Mehnagar Road	N25°52'37.3" E83°08'55.2"	45	64.8	67	E
North-West	Maltri Bilariyaganj Road	N26°10'56.0" E83°16'31.0"	45	64.6	58	E



**Radial Route Map originating from HPT (TV) Tower, Mau (Uttar Pradesh)**



Coverage Contour Map Analogue HPT (TV) Transmitter, Mau (Uttar Pradesh)



