



NO. RD/2012/903

AIR & DD

Study of co-channel capture effect

in FM Band at

Vadodara, Surat & Ahmedabad

PRASAR BHARATI RESEARCH DEPARTMENT ALL INDIA RADIO & DOORADRSHAN 14-B, LP. ESTATE, RING ROAD NEW DELHI-110002. PRASAR BHARATI (Broadcasting Corporation of India) RESEARCH DEPARTMENT ALL INDIA RADIO & DOORADRSHAN 14-B, LP. ESTATE, RING ROAD NEW DELHI-110002.

RESEARCH REPORT NO. 903

GROUP	Propagation, Spectrum & Monitoring (PSM)
SUBJECT	Study of co-channel capture effect in FM Band at Vadodara, Surat & Ahmedabad
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INTRODUCTION

In compliance of DG: AIR letter no. 8/1/2012-EIII dated 14/8/12, a research team, consisting of Md Javed Shams (AE), Shri G.P. Srivastava (AE) and Shri Sushil Kumar(Tech.), was deputed on a tour to Vadodara(Gujarat) from 10th September 2012 to 20th September 2012 to carry out field strength measurement and subjective listening to assess the capture effect between co-channel FM transmitters situated in Vadodara, Ahmedabad and Surat.

OBJECTIVES OF SURVEY

Main objective of the survey was as follows

- Field strength measurement of FM Transmitters operating on frequencies viz. 91.1 MHz, 92.7 MHz and 98.3 MHz en route Vadodara to Surat.
- F/S measurement on frequencies viz. 91.1 MHz, 93.5 MHz and 98.3 MHz en route Vadodara to Ahmedabad (Ahmd).
- Subjective listening of all four operating frequencies simultaneously along the routes from Vadodara to Ahmedabad and Vadodara to Surat.
- Assess the capture effect (corresponding L.O.S distance) between co-channel FM transmitters on two routes i.e., Vadodara to Ahmedabad and Vadodara to Surat.

INSTRUMENTS USED

Following equipment/instruments were utilized for collection of field strength data and subjective listening -

- 1. Field Strength Meter (Anritsu Make, Model No. ML 524B)
- 2. Standard VHF dipole Antenna(25-250MHz) (Anritsu make, Model No. MP534)
- 3. AM/FM Receiver (Sony Make, Model No. ICF)
- 4. Portable AM/FM receiver (Phillips Make, Model No. DL167)
- 5. GPS Receiver (GRAMIN make, Model No. M5)

MEASUREMENT PROCEDURE

In order to know the L.O.S distance from two different FM transmitters for the purpose of capture effect following method was adopted during survey -

 First of all, a proper route was selected between co-channel transmitters of Vadodara and Surat/Ahmedabad. The routes between Vadodara to Surat and Vadodara to Ahmedabad were marked along the National Highway/State Highway on a map. On Vadodara-Surat and Vadodara-Ahmedabad route, F/S measurements were carried out starting from transmitting antenna site increasing the L.O.S distance at an interval of 5 km

- Field Strength measurements were taken for a period of about 5 minutes on each of three frequencies using standard VHF dipole antenna. The stable readings were taken during this period to achieve best received signal at that particular location. Further F/S meter was calibrated for each frequency and the meter was switched off after every measurement at each spot to avoid any memory related effect on meter readings.
- Simultaneously, subjective listening of that particular operating frequency was also carried out along the directions from Vadodara to Ahmedabad, Vadodara to Surat and back.
- After observing full capture condition by co-channel transmitter on route from Vadodara to Surat/ Ahmedabad, the survey was again carried out on the reverse routes towards Vadodara starting from individual transmitter sites at Surat/ Ahmedabad

COLLECTION OF DATA

- The field strength meter alongwith the standard VHF dipole antenna, GPS receiver and FM receivers were used for collection of data. The F/S meter was calibrated for each of three frequencies and the meter was switched off after every measurement in each spot to avoid any memory related effect on meter readings.
- Before undertaking the survey, location of transmitting antenna at Surat. Vadodara and Ahmedabad were ascertained and stored in GPS receiver so as to measure the L.O.S distance at each spot. The RF Power output of these transmitters were also recorded.
- The field strength measurements were carried out at antenna height of 1.5 meter compared to 10 meter standard I.T.U model. The L.O.S distance from both transmitting antennas were also recorded at every spot.
- The Field strength measurement and subjective assessment were carried out on two routes i.e.. Vadodara to Surat and Vadodara to Ahmedabad in forward and reverse directions as shown in Annexure I.
- The measured field strength in dBµv/m and subjective reception quality of signal from all these transmitters were recorded at the interval of 5 km L.O.S distance and summarized in table no. 1 to 12.
- Table 1,3 and 5 are for 91.1 MHz, 92.7 MHz & 98.3 MHz frequencies respectively for measurements from <u>Vadodara to Surat</u>. Similarly Table 2,4 and 6 are for measurements from <u>Surat to Vadodara</u>.

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 Table 7,9 and 11 are for 91.1 MHz, 93.5 MHz & 98.3 MHz frequencies respectively for measurements from <u>Vadodara to Ahmedabad</u>. Similarly Table 8,10 and 12 are for measurements from <u>Ahmedabad to Vadodara</u>.

PRESENTATION OF DATA

- In order to simplify the contents of all 12 tables, efforts have been made to differentiate the observations using colored presentation. Green zone shows the normal reception (excellent to very good) of particular FM frequency in which neither orientation of receiver is required nor additional antenna is needed i.e., reception is normal with inbuilt antenna of the receiver.
- In yellow zone, reception quality of concerned FM station is still very good to nearly good with little or more orientation of receivers i.e., with orientation effect (O/E).
- In orange zone, an interesting phenomenon was observed. In this zone concerned station is still available with good to fair assessment with orientation effect, however capture by co-channel FM transmitter frequency is also observed. Receiver was responding to FM transmitter of one city in one orientation and at the same time responding to co-channel FM transmitter of another city in different orientation.
- In red zone, previously observed signal completely disappeared and FM channel was completely captured by co- channel FM transmitter of nearby city. The L.O.S distance at this spot can be taken into consideration for full capture effect. Similar type of measurements were carried out in reverse direction also.

OBSERVATION

a. Route-Vadodara to Surat & back

This route was selected to observe capture effect on three transmitter frequencies i.e., 91.1 MHz, 92.7 MHz & 98.3 MHz of FM band. FM transmissions were being radiated by private FM broadcasters on all these three frequencies. The L.O.S distance between Vadodara and Surat was recorded approximately 126Km. The sum of L.O.S distances at particular measurement spot (from both transmitter locations) are not equal to 126 km as measurement spots are not exactly on the radial path connecting both transmitters. The Table 1, 3 and 5 are for 91.1 MHz, 92.7 MHz & 98.3 MHz frequencies respectively for measurements from Vadodara to Surat. Similarly Table 2, 4 and 6 are for same frequencies for measurements from Surat to Vadodara. The observations on all above mentioned transmitter frequencies are as under:

 91.1 MHz: As per table 1 and 2 reception quality was normal (excellent to very good) up to LO.S distance of 35 km from Vadodara and 40 km from Surat. From LO.S distance of 35 km to 55 km, mixed observation was recorded as shown in yellow zone. Finally full capture was observed at a LO.S distance of

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80 km from Vadodara. Similarly in return path the full capture effect was observed at 75 km from Surat. At this point the L.O.S distance from the cochannel transmitters at Surat/Vadodara were 48 km & 51 km respectively. This L.O.S distance may be called full capture effect distance for this particular frequency at existing transmitting RF power on the route.

- 92.7 MHz: As per table 3 and 4, reception quality is normal at the distances of 35-40 km. The capture effect was observed at L.O.S distance of 80 km from Vadodara(48 km from Surat) and 75 km from Surat (51 km from Vadodara) on return route.
- 98.3 MHz: As per table 5 and 6, reception quality is normal up to 35-40 km L.O.S distance from concerned transmitters. The full capture effect was observed at L.O.S distance of 80 km from Vadodara (48 km from Surat) and 75 km from Surat (51 km from Vadodara) on return route.

The variation in the distance of capture effect is due to variation in time and location.

b. Route-Vadodara to Ahmedabad and back

This route was selected to observe capture effect on three transmitter frequencies i.e. 91.1 MHz, 93.5 MHz & 98.3 MHz of FM band. At all these three frequencies, FM transmissions were being radiated by private FM broadcasters. The distance between Vadodara and Ahmedabad was recorded approximately 110 Km. Table **7**, **9** and **11** are for 91.1 MHz, 93.5 MHz & 98.3 MHz frequencies respectively for onward measurements from Vadodara to Ahmedabad. Similarly Table **8,10** and **12** are for 91.1 MHz, 93.5 MHz & 98.3 MHz frequencies respectively for measurements from Ahmedabad to Vadodara. The observations on all above mentioned transmitter frequencies were as under.

- 91.1 MHz: As per table 7 and 8, reception quality is normal up to the distance of 35 km. The capture effect was observed at L.O.S distance of 65 km from Vadodara (42 km from Ahmedabad) and 65 km from Ahmed (47 km from Vadodara) on return route.
- 93.5 MHz: As per table 9 and 10, reception quality is normal at the distance of 35-40 km. The capture effect was observed at L.O.S distance of 65 km from Vadodara (42 km from Ahmedabad) and 65 km from Ahmed (47 km from Vadodara) on return route.
- 98.3 MHz: As per table 11 and 12, reception quality is normal up to 35-40 km L.O.S distance from concerned transmitters. The full capture effect was observed at L.O.S distance of 60 km from Vadodara (52 km from Ahmedabad) and 60 km from Ahmedabad (52 km from Vadodara) on return route.

The variation in the distance of capture effect is due to variation in time and location.

CONCLUSION

Field strength measurement/subjective listening of FM Transmitters operating on frequencies 91.1 MHz, 92.7 MHz, 93.5 MHz and 98.3 MHz on route Vadodara to Surat and Vadodara to Ahmedabad were successfully carried out using two different types of portable FM receivers viz. Sony and Philips. After analyzing the measured/recorded data it is concluded that -

- Before full capture effect, a partial capture effect was observed, between all pairs of cochannel transmitters. In this zone FM receiver may pick up any co-channel signal depending upon orientation of receiving antenna, L.O.S distance and field strength at this particular spot.
- Full capture effect was observed at LO.S distance of 51 km from Vadodara and on return route 48 km from Surat.
- Similarly, full capture effect was observed at 52 km from Vadodara and on return route 42 km from Ahmedabad
- NOTE: All these observations were made under given RF power of transmitters and height of transmitting antennas during the measurement. Results may vary under different operating conditions of transmitter and terrain conditions.

Co-Channel Frequency: 91.1 MHz, Rated Power(Vadodara): 5 KW ,

Rated Power(Surat) : 10 KW

Actual Power: 5KW Actual Power: 7.5KW

Normal quality FM Receiver Urban Highway Highw	Location(km)(km)(bls)/m(1.5)meter)High quality fMNormal qualityTerrain1 Jamuva, Vadodara5VHHReceiverCUnban2 Varnama NH-81008081AmileMeceiverUnban2 Varnama NH-81006560FFH3 Por NH-8150595660FH4 NH-8205149FFHH5 NH-8205149FFFF6 Toll NH-83041748FFFFF6 Toll NH-83041748760FFFF6 Toll NH-830417484037KG O/FFFFF7 NH-83003175656KGKG O/FFFFF7 NH-8503137KG O/FKG O/FFFFFFF8 NH-850315656KGKG O/FFFFFFF8 NH-85031565056FFFFFFFF8 NH-8505151515156FFFFFFFFFFFFFFFFFFF			Radial Dist	Radial Distance(LOS)	Field St	field Strength	Subjective	Subjective assessment		
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Jammuva, Vadodare 5 80 81 Baltimuva Urbain Urbain Varnama NH-8 10 69 65 65 7 1 Varnama NH-8 10 69 65 60 7 1 Por NH-8 15 60 65 60 7 1 NH-8 20 55 60 65 7 1 1 NH-8 30 60 65 60 1 1 1 1 NH-8 30 47 48 7 48 1	Jamouro, Vadodars58081ScienceInhanUrbanVarinama NH-810106965 \land \land \lor \bullet <			From Vdra	From Surat	>	H	Receiver	FM Receiver		
Variname NH-8 10 60 65 60 41 46 Por NH-8 15 62 60 9 9 9 Por NH-8 15 55 56 9 56 9 9 NH-8 25 59 56 56 9 9 9 9 NH-8 33 25 1 43 48 9	Varinama NH-8 10 69 65 60 65 60 67 100<					80	81	Eaching.		Urban	
Por NH-8 15 60 Antilation Highway NH-8 20 55 56 76 10 NH-8 20 55 56 76 10 10 NH-8 30 47 48 10 10 10 10 NH-8 35 45 45 45 10 10 10 10 NH-8 35 45 45 45 10 <td< td=""><td>Por. NH-8 15 60 56 Fermionic Highway Fighway NH-8 20 59 56 56 9 9 9 9 NH-8 20 51 59 56 9 9 9 9 NH-8 35 51 49 51 49 9</td><td></td><td></td><td>10</td><td></td><td>69</td><td>65</td><td></td><td></td><td></td><td>O/E-Orientation effect</td></td<>	Por. NH-8 15 60 56 Fermionic Highway Fighway NH-8 20 59 56 56 9 9 9 9 NH-8 20 51 59 56 9 9 9 9 NH-8 35 51 49 51 49 9			10		69	65				O/E-Orientation effect
NH-8 20 59 56 1 1 NH-8 25 51 49 6 6 6 NH-8 30 51 49 6 6 6 6 Toll NH-8 33 45 45 45 6 6 6 6 NH-8 35 45 45 45 6	NH-8 20 59 56 51 49 1 1 NH-8 25 51 49 1 49 1 1 NH-8 35 51 43 43 1 1 1 1 Ioll NH-8 33 45 45 45 1		Por NH-8	15		62	60			Highway	C/E-Capture effect
NH-8 25 5 51 49 6 6 6 6 foll NH-8 35 45 45 45 45 6	NH-8 25 51 49 6 6 7 Toll NH-8 30 47 48 45 46 40 41 37 VG O/E VG O/E 45	4	NH-8	20		59	56				VG-Very Good
Toll NH-8 30 47 48 41 37 VG O/E VG O/E 41	Toll NH-8 30 47 48 40 41 40 41		8-HN-8	25		51	49				
NH-8 35 45 45 45 45 45 45 45 45 45 46 47 4	NH-8 35 45 45 45 45 45 45 45 45 45 45 40 37 VG O/E VG O/E 10 10 NH-8 45 40 36 37 VG O/E VG O/E 10 10 10 NH-8 50 45 37 36 Good O/E Fair O/E 10 10 NH-8 55 31 36 Good O/E Fair O/E 10 10 10 NH-8 55 31 Go/E C/E Fair O/E C/E 10 10 10 10 NH-8 70 58 31 Good, O/E C/E 10 10 10 10 NH-8 70 58 31 Good, O/E C/E Fair O/E C/E 10	-	5 Toll NH-8	30		47	48				
NH-8 40 41 37 VG_0/E VG_0/E %	NH-8 40 41 37 VG VG VG ° <th<< td=""><td>-</td><td>NH-8</td><td>35</td><td></td><td>45</td><td>45</td><td></td><td></td><td>-</td><td></td></th<<>	-	NH-8	35		45	45			-	
NH-8 45 40 36 ************************************	NH-8 45 40 36 40 40 <	~	8 NH-8	40		41	37	VG O/E			
NH-8 50 31 36 Good O/E Far O/E " NH-8 55 31 33 * </td <td>NH-8 50 31 36 Good O/E Fair O/E " NH-8 55 31 33 31 "</td> <td></td> <td>8-HN 0</td> <td>45</td> <td></td> <td>40</td> <td>36</td> <td></td> <td></td> <td></td> <td></td>	NH-8 50 31 36 Good O/E Fair O/E " NH-8 55 31 33 31 "		8-HN 0	45		40	36				
NH-8 S5 31 ************************************	NH-8 S1 31 ************************************	I	8-HN 0	50		37	36	Good O/E	Fair O/E	Ŧ	
NH-8 Narmada 60 61 34 31 60/E C/E Fair O/E C/E " NH-8 65 35 31 6004,0/E C/E 6004,0/E C/E 6004,0/E C/E " " NH-8 70 58 31 2004,0/E C/E 6004,0/E C/E 6004,0/E C/E 6004,0/E C/E Fair O/E C/E " " NH-8 75 52 33 35 6004,0/E C/E Fair O/E C/E Fair O/E C/E Fair O/E C/E " " NH-8 73 33 35 6004,0/E C/E Fair O/E C/E Fair O/E C/E " " " NH-8,Rose Gard 85 44 33 Good O/E C/E Fair O/E C/E Fair O/E C/E Fair O/E C/E East O/E C/E East O/E C/E East O/E C/E East O/E C/E Fair O/E C/E Fair O/E C/E Fair O/E C/E East O/E C/E East O/E C/E East O/E C/E East O/E C/E Fair	NH-8 Narmada 60 61 34 33 60/E C/E Fair O/E C/E * * NH-8 65 13 35 31 6004,0/E C/E 6004,0/E C/E % * * NH-8 70 58 31 208 fair 0/E C/E % * * NH-8 7/5 52 33 35 6004,0/E C/E fair 0/E C/E fair 0/E C/E fair 0/E C/E * <	1	8-HN 1	55		35	31				
NH-8 65 35 31 Good,O/E C/E Good, O/E C/E NH-8 70 58 31 28 Fair O/E Fair O/E Fair O/E Fair O/E Fair O/E N NH-8 75 52 33 35 Good,O/E C/E Fair O/E Fair O/E N NH-8 80 48 34 30 Good,O/E C/E Fair O/E C/E N NH-8,Rose Gard 85 44 45 30 Good,O/E C/E Fair O/E C/E N NH-8,Rose Gard 85 44 45 47 VG VG V N	NH-8 65 35 31 Good, O/E C/E Good, O/E C/E <	1	2 NH-8 Narmada	60		34	31	GO/E C/E	Fair O/E C/E		
NH-8 70 58 31 28 Fair O/E C/E Fair O/E C/E NH-8 75 52 33 35 600d,O/E C/E Fair O/E C/E NH-8 80 48 34 30 600d,O/E C/E Fair O/E C/E Fair O/E C/E NH-8,Rose Gard 85 44 45 47 MG MG MG Keellent to Ver wood Freention without and orientation etc 600d O/E C/E NG MG MG MG	NH-8 70 58 31 28 Fair O/E C/E Fair O/E C/E Fair O/E C/E NH-8 73 52 33 35 Good,O/E C/E Fair O/E C/E	1	8-HN S	65		35	31	Good,O/E C/E	Good ,0/E C/E	i	
NH-8 75 52 33 35 Good,O/E C/E Fair O/E C/E NH-8 Sanjali 80 48 34 30 Good Good Good Good Mair	NH-8 75 52 33 35 Good, O/E C/E Fair O/E C/E NH-8 Sanjali 80 48 34 30 Good, O/E C/E Fair O/E C/E NH-8, Rose Gard 85 44 45 47 WG VG VG MH-8, Rose Gard 85 44 45 47 VG VG VG VG Very good reception without any orientation etc. Very good reception with orientation etc. VG VG VG VG	1	1 NH-8	70	_	31	28	Fair O/E C/E	Fair O/E C/E		
NH-8 Sanjali 80 48 34 30 Good Good Good NH-8,Rose Gard 85 44 45 47 VG VG	NH-8 Sanjali 80 43 34 30 Good Good Good NH-8,Rose Gard 85 44 45 47 VG VG NH-8,Rose Gard 85 44 45 47 VG VG NH-8,Rose Gard 85 47 VG VG VG Vellow Zone Very good reception without any orientation etc. Very good reception with orientation etc. Very good reception with orientation etc.	1	8-HN S	75		33	35	Good,O/E C/E	Fair O/E C/E		Prominent TxSURAT
NH-8, Rose Gard 85 44 45 47 NG NG NG For an and the state of the state	NH-8, Rose Gard 85 44 45 47 VG VG Contraction Excellent to Very good reception without any orientation etc. Very good reception with orientation etc. Very good reception with orientation etc.	16	5 NH-8 Sanjali	80	48	34	30	6	Good		Full Capture TxSURAT
Excellent to Very soud recention without any orientation etc.		F	NH-8, Rose Gard	85		45	47	VG	VG		Full Capture TxSURAT
		-	NIT-6, KOSE Gard	Excellent to	Verv good a	v notion	vithout an	v orientation etc.	AD		consider in a

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Good to Very Good reception after capturing.

Co-Channel Frequency: 91.1 MHz, Rated Power(Surat): 10 KW ,

Rated Power(Vadodara) : 5 KW

Actual Power: 7.5KW Actual Power: 5KW

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	Radial Dist	Radial Distance(LOS)	Field Strength	rength	Subjective	Subjective assessment		
S.No. Location	(Ki	(Km)	dBµV/m(1.5Meter)	SMeter)	High quality FM Normal quality	Normal quality	Terrain	Remarks
	From Surat	From Vdra	N	н	Receiver	FM Receiver		
1 Market, Surat	5		72	68	Capations:		Urban	
2 Outskirts, Surat	10		73	64			E	O/E-Orientation effect
3 Outskirts, Surat	15		60	63				C/E-Capture effect
4 Tapi Toll	20		67	62			High way	VG-Very Good
5 Kanyasi, Surat	25		60	54	WE .		*	
6 NH-8	30		54	48			×	
7 NH-8	35		48	45				
8 NH-8	40		50	49	a la	NG		
9 NH-8	45(44)		41	41	Good,O/E	Good,O/E	2	Measurement at 44 km.
10 NH-8	50(48)		39	38	Good,O/E	Fair	-	Measurement at 48 km.
11 Ankleshwar	55		26	27	Poor	Poor	City.	
12 Golden Bridge	60	68	35	33	Poor, Weak C/E	Weak, O/E C/E	City outskirts.	
13 NH-8	65		36	35	Good,O/E	Good ,O/E	NH-8	
14 NH-8	70	57	35	30	Fair O/E C/E	Fair O/E C/E	2	
15 NH-8	75	51	35	37	Good	Fair		Full Capture TxVadodara
Yellow Zone	Excellent to Very good r	Excellent to Very good reception without Very good reception with orientation etc.	reception . th orientat	without a tion etc.	Excellent to Very good reception without any orientation etc. Very good reception with orientation etc.	ů		Vdra-Vadodara
Orange Zone Bad Zone	Good to Fai	Good to Fair reception with orientation and w Good to Very Good reception after capturing.	with orien	tation and	d weak to fair cap	Good to Fair reception with orientation and weak to fair capture by co-channel transmitter. Good to Very Good resortion after capturine	el transmitter.	

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Co-Channel Frequency: 92.7 MHz,

Rated Power(Vadodara): 5 KW , Rated Power(Surat) : 10 KW

Actual Power: 8.5KW Actual Power: 5KW

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		Radial Dis	Radial Distance(LOS)	Field St	Field Strength	Subjective	Subjective assessment		
S.No. Lot	Location	×	(Km)	dBµV/m(1.5 meter)	5 meter)	High quality FM	Normal quality	Terrain	Remarks
		From Vdra	From Surat	N	н	Receiver	FM Receiver		
1 Jamvuva	Jamvuva, Vadodara	5		80	79	Tate lines		Urban	
2 Varnama NH-8	NH-8	10		65	64			2	0/E-Orientation effect
3 Por NH-8		15		60	60			Highway	C/E-Capture effect
4 NH-8		20		56	55			1	VG-Very Good
5 NH-8		25		51	51				
6 Toll NH-8	8	30		51	49				
2 NH-8		35		43	43		VG O/E		
8 NH-8		40		42	39	VG O/E	VG 0/E	a	
9 NH-8		45		40	36	-	-	z	
10 NH-8		50		37	35	Good 0/E	Fair O/E	+	
11 NH-8		55		36	31			*	
12 NH-8 Narmada	rmada	60(61)	61	34	31	31 G O/E C/E	Fair O/E C/E		Measurement at 61 km.
13 NH-8		65		31	33	Good,O/E C/E	Good ,O/E C/E		
14 NH-8		20	58	31	28	Fair O/E C/E	Fair O/E C/E		
15 NH-8		75	52	34	35	Good,O/E C/E	Fair O/E C/E		Prominent TxSURAT
16 NH-8 Sanjali	ijali	80		31	32	Good	fair		Full Capture TxSURAT
17 NH-8, Rose Gard	se Gard	85	44	39	41	Good	Good		Full Capture TxSURAT
18 Canal crossing NH	NH Buissing NH	90		45	47	Very Good	Good		
Grown Zr		Excellent to	Excellent to Very good n	eception v	vithout an	reception without any orientation etc.			
Yellow Zone	one	Very good r	Very good reception with orientation etc.	h orientat	ion etc.				
Orange Zone	one	Good to Fai	ir reception v	vith orient	lation and	weak to fair capt	Good to Fair reception with orientation and weak to fair capture by co-channel transmitter.	I transmitter.	

NO:RD/2012/902;Study of co-channel capture effect in FM Band at Vadadara,Surat Ahmedabad

Table: 4

CO-CHANNEL CAPTURE EFFECT IN FM BAND

Co-Channel Frequency: 92.7 MHz, Rated Power(Surat): 10 KW ,

Rated Power(Vadodara) : 5 KW

Actual Power: 8.5KW Actual Power: 5KW

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	Radial Distance(LOS)	ance(LOS)	Field St	Field Strength	Subjective	Subjective assessment		
S.No. Location	(Km)	(H	d8µV/m(1.5Met	SMeter)	High quality FM Normal quality	Normal quality	Terrain	Remarks
	From Surat	From Vdra	~	н	Receiver	FM Receiver		
1 Market, Surat	ŝ		17	70	Cale will		Urban	
2 Outskirts, Surat	1 10		75	67			-	O/E-Orientation effect
3 Outskirts, Surat	t 15		64	63	0==10			C/E-Capture effect
4 Tapi Toll	20		66	62			High way	VG-Very Good
5 Kanyasi,Surat	25		59	57			=	
6 NH-8	30		54	49			*	
7 NH-8	35		48	46				
8 NH-8	40		50	52	2	4c	×	
9 NH-8	44		45	42	42 Good, O/E	Good,D/E	E	
10 NH-8	48		42	40	40 Good, O/E	Fair	1	
11 Ankleshwar	55		27	27	27 Poor	Poor	City.	
12 Golden Bridge	60		35	35	35 Paar.	Weak.	City outskirts.	
13 NH-8	65		36	36	36 Good,O/E	Good.	NH-8	
14 NH-8	70	57	32	32	32 Fair O/E C/E	Fair O/E C/E	=	
15 NH-8	22	51	36	38	Good	Tair		Full Capture TxVadodara

NO:RD/2012/903:Study of co-channel capture effect in FM Band at Vadodara,Surat Ahmedabad

Good to Fair reception with orientation and weak to fair capture by co-channel transmitter.

Good to Very Good reception after capturing.

Orange Zone

Co-Channel Frequency: 98.3 MHz, Rated Power(Vadodara): 5 KW , Rated Power(Surat) : 10 KW

Actual Power: 8.8KW Actual Power:4.5KW

-		Radial Dist	Radial Distance(LOS)	Field S	Field Strength	Subjective	Subjective assessment		
S.No.	Location	(KI	(Km)	dBµV/m(1.5Meter)	5Meter)	High quality FM	High quality FM Normal quality FM	Terrain	Remarks
		From Vdra	From Surat	V	Ξ	Receiver	Receiver		
11	Jamvuva, Vdra	5		81	81	Contrart		Urban	
2 1	Varnama NH-8	10		64	65				0/E-Orientation effect
e.	Por NH-8	15		67	64			Highway	C/E-Capture effect
4	4 NH-8	20		60	58				VG-Very Good
5	5 NH-8	25		55	54			7	
9	Toll NH-8	30		51	51				
1	NH-8	35		50	50		VG O/E		
60	NH-8	40		46	47	47 Very Good, 0/E	VG 0/E		
6	NH-8	45		40	37				
10 5	10 NH-8	50		39	39	Good O/E	Fair O/E		
11 1	NH-8	55		36	34			+	
12 N	NH-8 Narmada	60	61	34	33	Good, O/E C/E	Fair O/E C/E		
13 8	NH-8	65		30	32	Good, D/E C/E	Good ,O/E C/E		
14 1	NH-8	70	58	30	30	30 Fair, O/E, C/E	Fair O/E C/E		
15 A	NH-8	75	52	36	37	Good, D/E C/E	Fair O/E C/E		Prominent TxSURAT
16 1	16 NH-8 Sanjali	80	48	30	33	Good	fair		Full Capture TxSURAT
17 10	NH-8, Rose Gard	85	44	45	47	NG	PVG DV		Full Capture TxSURAT
		Excellent to	Very good r	eception v	vithout ar	Excellent to Very good reception without any orientation etc.			
-	Yellow Zone	Very good n	Very good reception with or	h orientat	rientation etc.				
9	Orange Zone	Good to Fair	Good to Fair reception with		ation and	I weak to fair capt	orientation and weak to fair capture by co-channel transmitter.	ransmitter.	
	A REAL PROPERTY AND A REAL								

Co-Channel Frequency: 98.3 MHz, Rated Power(Surat): 10 KW

Actual Power:4.5KW Actual Power: 8.8KW

Rated Power(Vadodara) : 5 KW

ROUTE: SURAT to VADODARA.

S.No 15 NH-8 14 NH-8 13 NH-8 12 Golden Bridge 11 Ankleshwar 10 NH-8 8-HN 6 8 NH-8 ð ψi 4 Tapi Toll 3 Outskirts, Surat 2 Outskirts,Sural 1 Market, Surat NH-8 NH-8 Kanyasi,Surat Location From Surat Radial Distance(LOS) 5 60 5 2 48 숡 8 3 30 23 20 5 5 20 (Km) S From Vdra a, 57 dBµV/m(1.5meter) Field Strength < 5 28 30 34 26 36 È 50 43 56 ŝ 8 5 74 36 π 38 53 49 53 2 63 26 Weak, O/E, C/E 34 Fair,O/E 33 Good, O/E 27 Poor 41 Good,O/E ų 69 39 Good, O/E 20 Receiver High quality FM Normal quality Subjective assessment Weak, 0/E, C/E Fair. Poor FM Receiver Good,O/E Fair,O/E Fair,O/E NH-8 City. Urban City outskirts High way Terrain Full Capture Tx-Vadodara O/E-Orientation effect C/E-Capture effect VG-Very Good Remarks

Excellent to Very good reception without any orientation etc.

fellow Zone Very good reception with orientation etc.

Orange Zone Good to Fair reception with orientation and weak to fair capture by co-channel transmitter.

Good to Very Good reception after capturing

NO:07/2017/903 study of co-chonnel conture effect in FM Rand of Vadoriara, Surat Ahmedahod

Co-Channel Frequency: 91.1 MHz, Rated Power(Vadodara): 5 KW

Actual Power:5.0KW

ROUTE: Vadodara to Ahmedabad Rated Power(Ahmedabad): 10 KW

Actual Power:6.0KW

S.No. 14 Meh-NH-8 13 Nadiad-Mehmeda 12 Nadiad 11 NH-8 10 NH-8 9 NH-8 8 NH-8 6 NH-8 ú Þ 7 NH-8 3 NH-8 2 City, Vadodara 1 City, Vadodara NH-8 NH-8 Location Excellent to Very good reception without any orientation etc. From Vdra. From Ahmd Radial Distance(LOS) 70 5 3 60 5 \$5 8 33 3 25 20 t H (Km) 42 52 56 d8µV/m(1.5 meter) [High quality FM |Normal quality Field Strength < 48 2 3 23 3 3 3 ŧ 3 2 56 5 76 I 42 54 37 Poor, 0/E, C/E 32 Fair, 0/E 31 Good, O/E ÷ 51 39 26 Weak, O/E, C/E 38 Good, O/E S 56 5 5 Receiver Subjective assessment Poor,O/E Weak, O/E, C/E FM Receiver Fair,0/E Good;0/E Fair,0/E 1000 City. NH-8 SHI-NH8 State Highway Urban City outskirts High way outskirts Terrain Vdra- Vadodara Full capture by Ahmedabad. Full capture by Ahmedabad. O/E-Orientation effect C/E-Capture effect VG-Very Good Remarks

Orange Zone Yellow Zone Good to Fair reception with orientation and weak to fair capture by co-channel transmitter. Very good reception with orientation etc.

Ahmd- Ahmedabad

Good to Very Good reception after capturing

NC-RD/2012/903-Sturke of co-channel canture effect in FM Band at Vadodara, Surat Ahmedabad

Co-Channel Frequency: 91.1 MHz, Rated Power(Vadodara): 5 KW , Rated Power(Ahmedabad): 10 KW

Actual Power:6.0KW

Actual Power:5.0KW

ROUTE: Ahmedabad to Vadodara.

14 /	13 N	12 S	11 1	10 1	9		77	67	5	4	3	27	1 1		N NO
mand circle	1H-8	H-NH8	H-8	IH-8	H-8	4H-8	IH-8	4H-8	4H-8	NH-8	Jutskirts, NH-8	larod,Ahmd.	Ahmd City Area	and an are	location
70	59	60	55(56)	50	45	40	35	30	25	20	15	10	5	From Ahmd	Radial Distance(LOS
40	43	52	56	61	67									From Vdra	ance(LOS)
49	40	36	34	33	42	42	56	60	63	66	68	71	85	<	Held Strength
47	41	35	36	23	39	39	60	66	64	65	67	73	76	Ξ	ength 5 meter)
Very Good.	Very Good.	Fair,O/E	Fair,O/E.	Fair,O/E,C/E	Fair,O/E,C/E	Good,O/E			Will I I				Secolenii	Receiver	Subjectiv High quality FM
Very Good.	Very Good	Fair,O/E	Fair,O/E	Fair,O/E,C/E	Fair,O/E,C/E	Good-Fair,O/E								FM Receiver	Subjective assessment
City Outskirts.	NH-8	1			State high way.	Nadiad rd.		-	2	High way	outskirts	*	Urban	-	Terrain
Full capture by Vadodara.	Full capture by Vadodara.	Vadodara,							VG-Very Good	C/E-Capture effect	O/E-Orientation effect				Remarks
	Anand circle 70 40 49 47 Very Good. Very Good. City Outskirts.	NH-8 65 47 40 41 Very Good. Very Good NH-8 Anand circle 70 40 49 47 Very Good. Very Good. City Outskirts.	SH-NH8 60 52 36 35 Fair,O/E " NH-8 65 47 40 41 Very Good. Very Good. NH-8 Anand circle 70 40 49 47 Very Good. City Outskirts.	NH-8 55(56) 56 34 36 Fair,O/E. Fair,O/E " SH-NH8 60 52 36 35 Fair,O/E Fair,O/E " " NH-8 60 52 36 35 Fair,O/E Fair,O/E " " NH-8 65 47 40 41 Very Good. Very Good. NH-8 NH-8	NH-8 50 61 33 23 Fair,O/E,C/E Fair,O/E,C/E " NH-8 55(56) 56 34 36 Fair,O/E. Fair,O/E " " SH-NH8 60 52 36 35 Fair,O/E Fair,O/E " " NH-8 60 52 36 35 Fair,O/E Fair,O/E " " NH-8 60 52 36 35 Fair,O/E Fair,O/E " " <	NH-8 45 67 42 39 Fair,O/E,C/E Fair,O/E,C/E State high way. NH-8 50 61 33 23 Fair,O/E,C/E Fair,O/E,C/E " " NH-8 55(56) 56 34 36 Fair,O/E,C/E Fair,O/E,C/E " " . NH-8 55(56) 56 34 36 Fair,O/E,C/E Fair,O/E,C/E " . . SH-NH8 60 52 36 35 Fair,O/E Fair,O/E " . . NH-8 60 52 36 35 Fair,O/E Fair,O/E " . . NH-8 60 52 36 35 Fair,O/E Fair,O/E " . . . Anand circle 70 40 49 47 Very Good. Very Good. City Outskirts. .	NH-8 40 42 39 Good,O/E Good-Fair,O/E Nadiad rd NH-8 45 67 42 39 Fair,O/E,C/E Fair,O/E,C/E State high way. NH-8 50 61 33 23 Fair,O/E,C/E Fair,O/E,C/E State high way. NH-8 55(56) 56 34 36 Fair,O/E,C/E Fair,O/E,C/E " NH-8 55(56) 56 34 36 Fair,O/E,C/E Fair,O/E,C/E " " SH-NH8 60 52 36 35 Fair,O/E Fair,O/E " " NH-8 60 52 36 35 Fair,O/E Fair,O/E " " NH-8 60 52 36 35 Fair,O/E Fair,O/E " " M NH-8 65 47 40 41 Very Good NH-8 MH-8 MH-8 MH-8 MH-8 MH-8 MH-8 MH-8 M M <td>NH-8 35 56 60 — " " NH-8 40 42 39 Good.O/E Good.Fair,O/E Nadiad rd NH-8 40 42 39 Good.O/E Good.Fair,O/E,C/E Nadiad rd NH-8 45 67 42 39 Fair,O/E,C/E Fair,O/E,C/E State high way. NH-8 50 61 33 23 Fair,O/E,C/E Fair,O/E,C/E " " NH-8 55(56) 56 34 36 Fair,O/E, C/E " " " NH-8 55(56) 56 34 36 Fair,O/E, C/E Fair,O/E, C/E " " " SH-NH8 60 52 36 35 Fair,O/E " " " NH-8 60 52 36 35 Fair,O/E " " Anand circle 70 40 49 47 Yeny Good. Yeny Good. City Out</td> <td>NH-8 30 60 66 Feedbox " " NH-8 35 35 56 60 Feedbox " !<!--</td--><td>NH-8 25 63 64 N Vic " " NH-8 30 60 66 66 9 9 " !</td><td>NH-8 ZO 66 65 Mer High way High way NH-8 25 63 64 VG " " " NH-8 30 56 60 66 VG " " " " NH-8 30 56 60 66 VG " " " " " " " N " " " " " " N " N " N " " " N " N " N " N " N " N<</td><td>Outskirts, NH-8 15 68 67 <math>error outskirts High way NH-8 20 66 65 <math>error High way " High way NH-8 25 63 64 82 <math>Vror " High way NH-8 30 56 60 66 <math>Vror " " " NH-8 35 56 60 66 <math>Vror "<!--</math--></math></math></math></math></math></td><td>Narod,Ahmd. 10 71 73 $=$ $=$</td><td>Ahmd City Area 5 85 76 Excellion Excellion Urban Narod,Ahmd. 10 71 73 P P P P Outskirts, NH-8 15 68 67 P P P P NH-8 20 68 65 P P P P NH-8 20 63 64 P P P P NH-8 30 60 66 P P P P NH-8 35 56 60 P P P P NH-8 35 67 42 39 Good,O/E Good-Fair,O/E Nadiad rd. NH-8 45 67 42 39 Fair,O/E,C/E Nadiad rd. P NH-8 55 67 42 39 Fair,O/E,C/E Fair,O/E,C/E P P NH-8 50 61 33 23 Fair,O/E,C/E</td><td>From Ahm Ahmd City AreaFrom Ahm From VdraFrom VdraVHReceiver ReceiverFM Receiver FM ReceiverFM Receiver FM ReceiverAhmd City Area10717354545454Narod,Ahmd.1071735354545454Outskirts, NH-8205665655454545454NH-825566066567674747474NH-830566056607676767676NH-8404239Good,O/EGood-Fair,O/E,C/EState high way.7676NH-8405674239Fair,O/E,C/EFair,O/E,C/EState high way.76NH-855(56)563436Fair,O/E,C/EFair,O/E,C/EState high way.76NH-855(56)563435Fair,O/E,C/EFair,O/E,C/E%%76NH-855(56)563435Fair,O/E,C/EFair,O/E,C/E%%%%NH-855(56)563435Fair,O/E,C/E%%%%%NH-856523635Fair,O/E,C/E%%%%%NH-855(56563435Fair,O/E,C/E%%%%%NH-8555634<</td></td>	NH-8 35 56 60 — " " NH-8 40 42 39 Good.O/E Good.Fair,O/E Nadiad rd NH-8 40 42 39 Good.O/E Good.Fair,O/E,C/E Nadiad rd NH-8 45 67 42 39 Fair,O/E,C/E Fair,O/E,C/E State high way. NH-8 50 61 33 23 Fair,O/E,C/E Fair,O/E,C/E " " NH-8 55(56) 56 34 36 Fair,O/E, C/E " " " NH-8 55(56) 56 34 36 Fair,O/E, C/E Fair,O/E, C/E " " " SH-NH8 60 52 36 35 Fair,O/E " " " NH-8 60 52 36 35 Fair,O/E " " Anand circle 70 40 49 47 Yeny Good. Yeny Good. City Out	NH-8 30 60 66 Feedbox " " NH-8 35 35 56 60 Feedbox " ! </td <td>NH-8 25 63 64 N Vic " " NH-8 30 60 66 66 9 9 " !</td> <td>NH-8 ZO 66 65 Mer High way High way NH-8 25 63 64 VG " " " NH-8 30 56 60 66 VG " " " " NH-8 30 56 60 66 VG " " " " " " " N " " " " " " N " N " N " " " N " N " N " N " N " N<</td> <td>Outskirts, NH-8 15 68 67 <math>error outskirts High way NH-8 20 66 65 <math>error High way " High way NH-8 25 63 64 82 <math>Vror " High way NH-8 30 56 60 66 <math>Vror " " " NH-8 35 56 60 66 <math>Vror "<!--</math--></math></math></math></math></math></td> <td>Narod,Ahmd. 10 71 73 $=$ $=$</td> <td>Ahmd City Area 5 85 76 Excellion Excellion Urban Narod,Ahmd. 10 71 73 P P P P Outskirts, NH-8 15 68 67 P P P P NH-8 20 68 65 P P P P NH-8 20 63 64 P P P P NH-8 30 60 66 P P P P NH-8 35 56 60 P P P P NH-8 35 67 42 39 Good,O/E Good-Fair,O/E Nadiad rd. NH-8 45 67 42 39 Fair,O/E,C/E Nadiad rd. P NH-8 55 67 42 39 Fair,O/E,C/E Fair,O/E,C/E P P NH-8 50 61 33 23 Fair,O/E,C/E</td> <td>From Ahm Ahmd City AreaFrom Ahm From VdraFrom VdraVHReceiver ReceiverFM Receiver FM ReceiverFM Receiver FM ReceiverAhmd City Area10717354545454Narod,Ahmd.1071735354545454Outskirts, NH-8205665655454545454NH-825566066567674747474NH-830566056607676767676NH-8404239Good,O/EGood-Fair,O/E,C/EState high way.7676NH-8405674239Fair,O/E,C/EFair,O/E,C/EState high way.76NH-855(56)563436Fair,O/E,C/EFair,O/E,C/EState high way.76NH-855(56)563435Fair,O/E,C/EFair,O/E,C/E%%76NH-855(56)563435Fair,O/E,C/EFair,O/E,C/E%%%%NH-855(56)563435Fair,O/E,C/E%%%%%NH-856523635Fair,O/E,C/E%%%%%NH-855(56563435Fair,O/E,C/E%%%%%NH-8555634<</td>	NH-8 25 63 64 N Vic " " NH-8 30 60 66 66 9 9 " !	NH-8 ZO 66 65 Mer High way High way NH-8 25 63 64 VG " " " NH-8 30 56 60 66 VG " " " " NH-8 30 56 60 66 VG " " " " " " " N " " " " " " N " N " N " " " N " N " N " N " N " N<	Outskirts, NH-8 15 68 67 $error outskirts High way NH-8 20 66 65 error High way " High way NH-8 25 63 64 82 Vror " High way NH-8 30 56 60 66 Vror " " " NH-8 35 56 60 66 Vror "$	Narod,Ahmd. 10 71 73 $=$	Ahmd City Area 5 85 76 Excellion Excellion Urban Narod,Ahmd. 10 71 73 P P P P Outskirts, NH-8 15 68 67 P P P P NH-8 20 68 65 P P P P NH-8 20 63 64 P P P P NH-8 30 60 66 P P P P NH-8 35 56 60 P P P P NH-8 35 67 42 39 Good,O/E Good-Fair,O/E Nadiad rd. NH-8 45 67 42 39 Fair,O/E,C/E Nadiad rd. P NH-8 55 67 42 39 Fair,O/E,C/E Fair,O/E,C/E P P NH-8 50 61 33 23 Fair,O/E,C/E	From Ahm Ahmd City AreaFrom Ahm From VdraFrom VdraVHReceiver ReceiverFM Receiver FM ReceiverFM Receiver FM ReceiverAhmd City Area10717354545454Narod,Ahmd.1071735354545454Outskirts, NH-8205665655454545454NH-825566066567674747474NH-830566056607676767676NH-8404239Good,O/EGood-Fair,O/E,C/EState high way.7676NH-8405674239Fair,O/E,C/EFair,O/E,C/EState high way.76NH-855(56)563436Fair,O/E,C/EFair,O/E,C/EState high way.76NH-855(56)563435Fair,O/E,C/EFair,O/E,C/E%%76NH-855(56)563435Fair,O/E,C/EFair,O/E,C/E%%%%NH-855(56)563435Fair,O/E,C/E%%%%%NH-856523635Fair,O/E,C/E%%%%%NH-855(56563435Fair,O/E,C/E%%%%%NH-8555634<

NO 00/2012/901-Studie of co-channel canture effect in FM Rand at Vadodara Surat Ahmedabad

Orange Zone

Good to Very Good reception after capturing.

Good to Fair reception with orientation and weak to fair capture by co-channel transmitter.

Co-Channel Frequency: 93.5 MHz, Rated Power(Vadodara): 5 KW ,

ROUTE: Vadodara to Ahmedabad.

Actual Power: 5.0KW

Actual Power:6.0-5.0KW

Table: 9

Rated Power(Ahmedabad): 10 KW

		15	14	13	12	11	10	9	00	7	6	s.	4	w	N	-	S.NO.	
Vellow Zone Orange Zone	Same Jame	15 NH-8	Meh-NH-8	Nadiad-Mehmeda	Nadiad	NH-8	8-HN	NH-8	NH-8	NH-8	NH-8	NH-8	NH-8	NH-8	CityVadodara	City,Vadodara	Location	
Very good r Good to Fai	Excellent to	75	70	3	60	55	50	45	40	35	OE	25	20	15	10	5	From Vdra. Fr	Radial Distance(LOS)
Very good reception with orientation etc. Good to Fair reception with orientation and v	Very anod	51	42	42	52	56	62										m) From Ahmd	tance(LOS)
h orienta vith orien	acontion	62	46	40	33	36	35	36	32	40	45	55	54	54	65	75	T hu/Arfso	Held Strength
tion etc. tation an	without a	61	56	45	31	32	34	37	28	39	47	51	53	54	55	68	H H	rength
d weak to fair c	Excellent to Very and recention without any orientation atc	Very Good	Good	Good.	Weak,O/E,C/E	Fair,O/E	Fair,O/E	Good,O/E	Cood								V H Receiver	Subjectiv
Very good reception with orientation etc. Good to Fair reception with orientation and weak to fair capture by co-channel transmitter.	580	Very Good:	Good.	Good.	Weak,O/E,C/E	Poor,O/E	Noisy	Noisy	Good								FM Receiver	
nel transmitter.		1	SHI-NH8	NH-8	City.	*		City outskirts.		*			High way	outskirts	Ξ	Urban	lerrain	•
Ahmd- Ahmedabad	Vera-Vadodara	Full Capture TxVadodara	Full capture by Ahmedabad.	Full capture by Ahmedabad.	Audio mixed.								VG-Very Good	C/E-Capture effect	O/E-Orientation effect		Remarks	1

NO-PD/2012/903-Studie of co-channel canture effect in FM Rand at Vadodara Surat Ahmedabad

Co-Channel Frequency: 93.5 MHz, Rated Power(Vadodara): 5 KW , Rated Power(Ahmedabad): 10 KW

ROUTE: Ahmedabad to Vadodara.

Actual Power:6.0-5.0KW Actual Power:4.50KW

Table: 10

30 61 67 Good, O/E Good-Fair, O/E 35 58 60 41 60 60 40 41 44 Good, O/E Good-Fair, O/E Good-Fair, O/E 40 67 38 42 Fair, O/E, C/E (W) Fair, O/E, C/E Fair, O/E, C/E 45 67 38 42 Fair, O/E, C/E (W) Fair, O/E, C/E Fair, O/E, C/E 50 61 30 29 Fair, O/E, C/E Fair, O/E, C/E Fair, O/E, C/E 55 67 32 37 Fair, O/E, C/E Fair, O/E, C/E 55 56 42 37 Fair, O/E, C/E Fair, O/E, C/E 60 52 31 33 Fair, O/E, C/E Fair, O/E, C/E 65 47 47 41 Good, C/E(W) Good, 70 40 43 Very Good Very Good. Very Good.	Good-Fair, Fair,O/E,C Fair,O/E,C Fair,O/E Fair,O/E,C Good
67 Good,O/E Good-Fair, 44 Good,O/E,C/E(W) Fair,O/E,C,C 42 Fair,O/E,C/E Fair,O/E,C 29 Fair,O/E,C/E Fair,O/E,C 37 Fair,O/E Fair,O/E,C 33 Fair,O/E,C/E Fair,O/E,C 41 Good, C/E,W) Good, 43 Very Good Very Good 43 Very Good Very Good	67••60•••44Good,O/EGood-Fair,O/E•42Fair,O/E,C/E(W)Fair,O/E,C/EState high way.29Fair,O/E,C/EFair,O/E,C/E•37Fair,O/EFair,O/E,C/E•33Fair,O/E,C/EFair,O/E,C/E•41Good, C/E(W)Good.NH-843Very Good.Very Good.City Outskirts.any orientation etc.••
Good-Fair, Fair,O/E,C Fair,O/E,C Fair,O/E,C Good	Good-Fair,O/E = Fair,O/E,C/E State high way. Fair,O/E,C/E = Fair,O/E,C/E = Fair,O/E,C/E = Fair,O/E,C/E = Very Good. NH-8 City Outskirts.
Good-Fair, Fair,O/E,C Fair,O/E,C Fair,O/E,C Good Very Good	Good-Fair,O/E = Fair,O/E,C/E State high way. Fair,O/E,C/E = Fair,O/E,C/E = Fair,O/E,C/E = Fair,O/E,C/E = Very Good. NH-8 City Outskirts.
	high way.

NO-PD/2012/902-Study of co-channel centure effect in FM Rand at Vadodara Surat Ahmedabad

Good to Very Good reception after capturing.

Co-Channel Frequency: 98.3 MHz,		Rated Power(Vadodara): 5 KW , Rated Power(Ahmedabad): 10 KW	adodara): 5 k Ahmedabad)	CW., 10 KW		Actual Power: 4.5 KW Actual Power:	N	Table: 11
ROUTE, Vadodara to Ahmedabad	Ahmedabad.							
		Radial Distance(LOS)	Field Strength	ingth	Subjecti	Subjective assessment		
S.WO. LOCATION	Emm Udr	(NR)	d8µV/m[1.5 meter]	meter)	High quality FM	Normal quality FM	lerrain	Remarks
1 City.Vadodara		0.1	75	74		and the second se	Urban	
			1.0					O/E Opionstation officer
T Citil and Consider		14	10	200				and the second se
3 NH 8		15	52	56			outskirts	C/E-Capture effect
4 NH-8	2	20	56	57			High way	VG-Very Good
5 NH-8	2	25	58	53			T	
6 NH-8		30	49	48				
7 NH-8	3	35	41	43				
8 HN 8	4	40	36	30				
8-HN 6	45	0	37	36	Good,O/E	Good,O/E	City outskirts.	
10 NH-8	50	0 62	39	36	38 Good,O/E,C/E	Weak,O/E,C/E	1	Partial capture by Ahmedabad.
11 NH-8	5	55 56	39	36	Fair,C/E,O/E	Fair,O/E,C/E	State Highway.	Combined signal of Ahmd & Vadodara
12 Nadiad	69	5	29	28	Good, Q/E	Good,D/E	City,	Vadodara signal NT.Ahmedabad good
13 Nadiad-Mehmeda	neda 65	5 42	55	56	Very Good	Very Good	NH-8	Full capture by Ahmedabad.
14 Meh-NH-8	70	0 42	51	55	Excellent	Excollent	SH-NH8	Full capture by Ahmedabad.
15 NH-8	75	5 37	59	60	Excellent	Excellent		Full Capture TxVadodara
Vellow Zone	Excellent Very good	Excellent to Very good reception without any orientation etc Very good reception with orientation etc.	ception with orientation	iout any etc.	orientation etc.			Vdra- Vadodara Ahmd- Ahmedabad

NC 10/2013/902 Study of couchannel rapture effect in FM Band of Vadordara, Surat Ahmedahad

Co-Channel Frequency: 98.3 MHz, Rated Power(Vadodara): 5 KW , Rated Power(Ahmedabad): 10 KW

Actual Power:4.50KW Actual Power:----

ROUTE: Ahmedabad to Vadodara

S.No. 14 Anand circle 13 NH-8 12 SH-NH8 11 NH-8 10 NH-8 ø 00 d) U1 4 NH-8 3 Outskirts, NH-8 2 Narod, Ahmd 1 Ahmd City Area NH-8 NH-8 NH-8 NH-8 NH-8 fellow Zone Location Excellent to Very good reception without any orientation etc. Very good reception with orientation etc. From Ahmd Radial Distance(LOS) 55(56) 65 25 40 20 50 30 Ka 3 23 2 5 10 From Vdra 47 8 56 61 5 dBµV/m(1.5 meter) High quality FM Field Strength < 47 8 46 5 56 8 80 8 5 3 4 5 53 Z Т 42 \$3 43 Good, O/E 57 58 50 58 32 Good, O/E, C/E 31 Fair, O/E 44 Good, O/E, C/E(W) 47 Good, O/E 56 79 77 Receiver CREININ Subjective assessment Fair,O/E,C/E Normal quality Good-Fair, O/E Good,O/E Fair,O/E,C/E FM Receiver 600d,0/1 SID ON NH-8 = State high way. - 2 City Outskirts -Urban High way outskirts Terrain Ahmd- Ahmedabad Vdra- Vadodara O/E-Orientation effect capture by Vadodara capture by Vadodara C/E-Capture effect Vadodara signal VG-Very Good Vadodara. Remarks

NO-RD/2012/903:Sturiv of no-channel canture effect in FM Band at Vadodara Surat Ahmerlabad

Orange Zone

Good to Very Good reception after capturing

Good to Fair reception with orientation and weak to fair capture by co-channel transmitter

Annexure-1



RADIAL ROUTES:

VADODARA TO AHMEDABAD

VADODARA TO SURAT