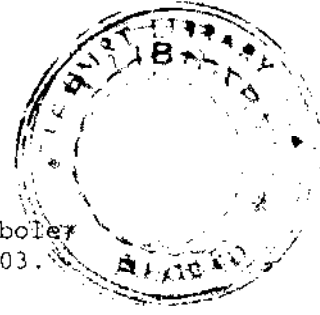


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Fri Jun 06 13:04:00 2003

GMRT FIBER OPTIC LINK SUMMARY

Report By: Pravin Raybole
6th Jun 2003.

Summary of the GMRT FIBER OPTIC LINK durring maintenance month of APRIL 2003

Following measurements were taken for optical fiber link characterisation :

- 1) Optical Fiber Link length / loss measurement using OTDR at the Antenna Base and in the Receiver Room.
- 2) Optical Link loss measurement using Optical Power Meter. This measurement includes measurement of the Optical Transmitter and Optical Received Power at Antenna base and in the Receiver Room.
- 3) RF Link Loss measurement using Spectrum Analyser.
- 4) Measurement of the monitoring point voltages and current in the Optical Fiber Transmitter , Optical Fiber Receiver at both the ends on Multimeter.

Measurement shows following results :-

OTDR MEASUREMENT :-

- 1) OTDR measurement were taken for both the fibers in the Forward Link and in the Retrun link and average loss was calculated for each fiber.
- The average loss measured by OTDR and the Optical Loss measured by Optical Power meter shows approximately same readings .
- The TRACE of each fiber was seen carefully at the various field joints along the route of the fiber on the OTDR and was compared with the older data. This has shown no deviation or extra loss near the Field Joints.

OPTICAL OUTPUT POWER :-

- 1) Optical Output Power decreased by an average 0.47dB for 27 Antennas in the Forward Link.
- 2) E02, S02 and S06 antennas optical output power decreased by more than 1dB in Forward Link.
- 3) Optical Output Power decreased by and average 0.67db for 23 Antenas in the Return Link.
- 4) C14, E03 and S06 Antennas optical output power decreased by more than 1dB in the Return Link.

LASER BIAS CURRENT :-

- 1) 12 Antennas Laser Bias Current decreased by more than 2mA in the Forward link.
- 2) 9 Antennas Laser Bias Current decreased by more than 1mA in the Forward Link.
- 3) C06, C13 Antenna Laser Bias Current increase by more than 1mA in the same link.
- 4) 4 Antennas Laser Bias Current decreased by more than 2mA in the Return Link.
- 5) 7 Antennas Laser Bias Current increased by more than 1mA in the Return Link.
- 6) C03, C04, C09 and W05 does not have monitoring facility in the Return Link.
- 7) Return link monitored current measurement shows current less by approximately 2mA to 4mA with respect to actual measurement done at the base using Multimeter. This may be due to the different reference voltages at the A to D converters in the MCM card.

RF LINK GAIN / LOSS :-

- 1) C06, C13 antenna RF power gain increased by more than 1dB in the Forward Link.
- 2) C00, C03, C05, C13, C14, E03, S02, S04, W03 RF Power Loss more than 1dB in the Forward Link.
- 3) C02, C03, C08, C09, S02, S03, S06, W01, W03 RF power gain increased by more than 1dB in the Return Link.
- 4) C01, C04, C10, C11, C13, S04 RF Power loss by more than 1dB seen in the Return Link.
- 5) Data for E05, E06 and W05, W06 could not be taken due to Optical fiber cut and no MSEB power at the shell respectively durring measurement.

Future Developments :-

- 1) The antennas which has shown more variation in the Optical Output Power , Laser Bias Current and also in the RF power for Forward Link and Return Link will be studied and they will be restored to their original values.
- 2) Monitoring facility for Optical Transmitter and Optical Receiver in the forward link (Receiver Room) will be made available on the ON-LINE. Presently Monitoring facility available for Return Link.
- 3) Facility for monitoring Return link LO frequencies higher than 300MHz using Directional Coupler.

Details of each measurement is attached here for the reference which contains :

- i) Forward Link and Return Link Optical Output Power , Laser Bias Current and RF Power summary one page each.

- ii) OTDR Link Length / Loss measurement table one page.
- iii) Return Link Monitored current measurement on the ON-LINE one page.

Raybole

Pravin Raybole.

cc : Shri. N. V. Nagarathanam (EIC)
Shri. M. R. Shankararaman
Shri. Suresh Sabhapathy. —

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OPTIC FIBER CABLE - OTDR MEASUREMENT AND LINK LOSS SUMMARY

Measured by : Pravin Raybole, Satish Lokhande
c:\pravin\data\oflink.doc
April 2003

Fenna	Forward Link				Return Link							
	OTDR measurement				OTDR measurement				Forward link		Return Link	
	Distance from CEB	Link Loss	Distance from Base	Link Loss	Distance from Base	Link Loss	Distance from CEB	Link Loss	Avg. Loss on OTDR	Measured loss on Power meter *	Avg. Loss on OTDR	Measured loss on Power meter*
	Kms.	dB	Kms.	dB	Kms.	dB	Kms.	dB	dB	dB	dB	dB
00	1.385	0.22	1.362	0.91	1.362	0.75	1.357	0.39	0.57	1.99	0.57	1.13
01	0.909	0.40	0.909	0.23	0.908	0.14	0.915	0.29	0.32	0.14	0.22	1.04
02	0.629	0.27	0.634	0.38	0.627	0.16	0.627	0.50	0.33	0.20	0.33	2.03
03	0.709	0.36	0.709	0.17	0.709	0.28	0.712	0.48	0.26	0.15	0.38	1.89
04	0.973	0.15	0.968	0.60	0.961	0.41	0.957	0.35	0.38	0.69	0.38	2.96
05	0.977	0.40	0.979	0.62	0.982	0.60	0.978	0.72	0.51	1.14	0.66	1.55
06	1.169	0.45	1.168	0.40	1.168	0.41	1.158	0.55	0.43	1.72	0.48	1.07
08	1.351	0.59	1.342	0.69	1.360	0.23	1.332	0.70	0.64	0.68	0.51	1.43
09	0.859	0.80	0.858	0.38	0.859	0.38	0.857	0.49	0.59		0.44	
10	1.332	0.30	1.332	1.10	1.332	0.46	1.337	0.44	0.70	0.41	0.45	1.43
11	1.234	0.27	1.229	0.91	1.209	0.57	1.224	0.34	0.59	0.67	0.46	
12	1.740	0.60	1.735	0.74	1.745	0.81	1.745	0.50	0.67	1.11	0.66	0.88
13	1.954	0.39	1.944	1.07	1.954	0.72			0.73	0.11		
14	1.345	0.66	1.321	0.29	1.321	0.48	1.316	0.74	0.48	0.66	0.61	0.55
02	3.716	1.32	3.711	1.38	3.711	1.37	3.716	1.31	1.35	1.86	0.34	1.67
03	6.427	2.92	6.427	2.31	6.427	3.09	6.427	2.85	2.62	3.86	2.97	2.94
04	10.61	4.34	10.60	4.10	10.61	3.89	10.61	3.95	4.22	4.56	3.92	4.78
05	15.11	5.90	15.10	6.01	15.11	5.59	15.11	5.93	6.00	7.14	5.76	6.34
06	18.31	7.49					18.31	7.70				
01	4.792	1.71	4.738	1.81	4.785	1.80	4.788	1.76	1.76	2.00	1.78	3.41
02	7.305	2.69	7.315	2.67	7.315	2.56			2.68	3.22		3.24
03	10.45	4.04	10.45	4.04	10.44	3.69	10.45	3.97	4.04	4.58	3.83	4.47
04	13.75	5.43	13.74	5.31	13.75	5.52	13.75	5.55	5.37	6.82	5.54	6.79
06	20.07	7.07	20.08	7.52	20.07	7.48	20.07	7.44	7.30	8.53	7.46	8.24
01	1.944	0.81	1.944	0.85	1.944	0.79			0.83	2.15		0.51
02	4.191	1.71	4.191	1.42	4.201	2.00	4.196	1.42	1.57	2.24	1.71	1.88
03	7.601	3.63	7.601	2.84			7.591	2.59	3.24	3.95		3.42
04	11.44	5.05	11.45	4.52	11.44	4.17	11.45	4.11	4.80	5.03	4.14	4.15
05	15.74	5.76	15.74	5.83	17.73	5.88	15.74	5.64	5.80	6.84	5.76	5.96
06	20.99	7.68					20.96	7.99				

c:- * Optical Power measured on Tektronics make "TOP 200" Power Meter @ +/- 0.25 Absolute accuracy including E2000 APC 3meter long cable and Optical Adapter Loss.

FORWARD LINK OPTICAL OUTPUT POWER
SUMMARY FROM OCTOBER 1997 TO JANUARY 2003

OPTICAL OUTPUT POWER IN dBm

ANTENNA	27/10/97	08/12/99	18/09/00	08/03/02	27/01/03
C00	-3.00	-2.25	-2.52	-2.14	-3.04
C01	-3.00	-2.64	-2.92	-2.62	-3.47
C02	-3.00	-2.55	-2.80	-2.48	-3.20
C03	-7.25	-7.53	-7.41	-7.40	-8.03
C04	-3.00	-2.41	-2.79	-2.27	-2.91
C05	-3.00	-3.42	-4.15	-3.35	-3.86
C06	-3.00	-5.15	-4.94	-4.01	-3.28
C08	-3.00	-1.81	-2.24	-1.70	-2.55
C09	-3.00	-2.88	-3.04	-2.82	-3.37
C10	-3.45	-3.09	-3.67	-3.10	-4.26
C11	-3.25	-2.86	-3.17	-2.80	-3.63
C12	-3.00	-2.51	-3.02	-2.04	-3.07
C13	-3.14	-2.88	-3.13	-2.70	-3.41
C14	-3.50	-3.69	-4.00	-3.59	-4.44
E02	-3.00	-3.23	-3.89	-3.41	-4.14
E03	-3.90	-3.29	-3.23	-3.18	-3.54
E04	-3.35	-3.61	-3.72	-3.52	-3.99
E05	-3.00	-2.98	-3.13	-3.13	-3.56
E06	-3.30	-3.33	-3.53	-3.54	-4.08
S01	-3.00	-3.17	-3.17	-3.29	-3.72
S02	-3.90	-3.20	-3.65	-4.75	-5.28
S03	-3.35	-3.64	-3.86	-4.06	-4.07
S04	-3.00	-2.97	-3.34	-3.38	-3.51
S06	-3.00	-3.20	-4.12	-3.90	-4.21
W01	-3.41	-2.97	-3.3	-2.90	-3.76
W02	-3.1	-2.64	-3.35	-2.67	-3.56
W03	-3	-3.09	-3.4	-2.94	-3.49
W04	-3	-2.7	-3.21	-2.65	-3.44
W05	-3	-2.61	-3.3	-3.0	-3.72
W06	-2.8	-2.36	-2.79	-2.20	-2.83

OPTICAL POWER VARIATION IN dB

ANTENNA	2nd Year	3rd Year	5th Year	6th Year
C00	0.75	0.48	0.86	-0.04
C01	0.36	0.08	0.38	-0.47
C02	0.45	0.20	0.52	-0.20
C03	-0.28	-0.16	-0.15	-0.78
C04	0.59	0.21	0.73	0.09
C05	-0.42	-1.15	-0.35	-0.86
C06	-2.15	-1.94	-1.01	-0.28
C08	1.19	0.76	1.30	0.45
C09	0.12	-0.04	0.18	-0.37
C10	0.36	-0.22	0.35	-0.81
C11	0.39	0.08	0.45	-0.38
C12	0.49	-0.02	0.96	-0.07
C13	0.26	0.01	0.44	-0.27
C14	-0.19	-0.50	-0.09	-0.94
E02	-0.23	-0.89	-0.41	-1.14
E03	0.61	0.67	0.72	0.36
E04	-0.26	-0.37	-0.17	-0.64
E05	0.02	-0.13	-0.13	-0.56
E06	-0.03	-0.23	-0.24	-0.78
S01	-0.17	-0.17	-0.29	-0.72
S02	0.70	0.25	-0.85	-1.38
S03	-0.29	-0.51	-0.71	-0.72
S04	0.03	-0.34	-0.38	-0.51
S06	-0.20	-1.12	-0.90	-1.21
W01	0.44	0.11	0.51	-0.35
W02	0.46	-0.25	0.43	-0.46
W03	-0.09	-0.40	0.06	-0.49
W04	0.30	-0.21	0.35	-0.44
W05	0.39	-0.30	0.00	-0.72
W06	0.44	0.01	0.60	-0.03

Comment :- 1) Optical outout power decreased by more than 1 dB in E02, S02 and S06 antennas.
2) Rest of the 27 antennas optical output power decreased by an average 0.47dB .

Measurement by : Pravin Raybole, Satish Lokhande.

FORWARD LINK LASER DIODE BIAS CURRENT
SUMMARY FROM OCTOBER - 1997 TO APRIL - 2003

LASER DIODE BIAS CURRENT IN mA

ANTENNA	27/10/97	08/12/99	18/09/00	09/04/01	01/07/02	27/04/03
C00	39.82	37.98	37.67	38.03	38.46	38.16
C01	33.82	33.57	33.21	33.57	33.91	33.57
C02	40.35	38.55	38.03	38.57	38.89	38.57
C03*						
C04	43.35	38.76	38.39	38.75	39.09	38.98
C05	38.75	36.44	36.07	36.25	36.52	36.25
C06	38.39	45.21	41.42	41.66	41.57	41.34
C08	45.17	42.53	41.78	42.14	42.30	42.30
C09	36.60	35.67	34.64	35.00	35.12	35.53
C10	37.53	34.46	33.92	34.28	34.59	34.82
C11	40.50	36.78	37.14	37.68	38.16	37.77
C12	40.30	37.28	37.32	37.85	38.25	37.94
C13	40.60	41.61	41.60	41.96	42.34	42.16
C14	45.00	41.21	41.42	41.96	42.27	42.07
E02	41.96	39.62	39.28	35.89	39.77	39.98
E03	36.25	36.05	37.71	36.96	36.16	36.10
E04	40.36	37.30	36.60	35.18	37.16	37.09
E05	37.50	35.50	34.82	33.39	35.64	35.71
E06	37.68	38.10	37.67	37.85	38.34	38.07
S01	39.24	36.94	36.25	36.60	36.77	36.07
S02	37.50	36.85	36.25	36.43	36.66	36.43
S03	42.68	40.44	39.82	39.64	40.07	39.57
S04	45.18	40.32	39.82	42.68	40.05	40.03
S06	36.07	36.07	36.07	36.43	36.73	34.46
W01	36.07	33.39	33.75	34.28	35.16	34.82
W02	43.23	40.33	40.71	41.25	41.57	NA
W03	38.41	36.28	36.60	37.14	37.64	37.16
W04	36.96	34.16	34.64	35.00	35.34	34.82
W05	43.21	39.57	38.57	38.75	38.84	38.48
W06	43.03	39.66	40.00	40.18	40.59	40.16

LASER DIODE BIAS CURRENT VARIATION IN mA

ANTENNA	2nd Year	3rd Year	4th Year	5th Year	6th Year
C00	-1.84	-2.15	-1.79	-1.36	-1.66
C01	-0.25	-0.61	-0.25	-0.09	-0.25
C02	-1.80	-2.32	-1.78	-1.46	-1.78
C03*					
C04	-4.59	-4.96	-4.60	-4.26	-4.37
C05	-2.31	-2.68	-2.50	-2.23	-2.50
C06	+6.82	+3.03	+3.27	+3.18	+2.95
C08	-2.64	-3.39	-3.03	-2.87	-2.87
C09	-0.93	-1.96	-1.60	-1.48	-1.07
C10	-3.07	-3.61	-3.25	-2.94	-2.71
C11	-3.72	-3.36	-2.82	-2.34	-2.73
C12	-3.02	-2.98	-2.45	-2.05	-2.36
C13	+1.01	+1.00	+1.36	+1.74	+1.56
C14	-3.79	-3.58	-3.04	-2.73	-2.93
E02	-2.34	-2.68	-6.07	-2.19	-1.98
E03	-0.20	+1.46	+0.70	-0.09	-0.15
E04	-3.06	-3.76	-5.18	-3.20	-3.27
E05	-2.00	-2.68	-4.11	-1.86	-1.79
E06	+0.42	-0.01	+0.17	+0.66	+0.39
S01	-2.30	-2.99	-2.64	-2.47	-3.17
S02	-0.65	-1.25	-1.07	-0.84	-1.07
S03	-2.24	-2.86	-3.04	-2.61	-3.11
S04	-4.86	-5.36	-2.50	-5.13	-5.15
S06	0.00	0.00	+0.36	+0.66	-1.61
W01	-2.68	-2.32	-1.79	-0.91	-1.25
W02	-2.90	-2.52	-1.98	-1.66	NA
W03	-2.13	-1.81	-1.27	-0.77	-1.25
W04	-2.80	-2.32	-1.96	-1.62	-2.14
W05	-3.64	-4.64	-4.46	-4.37	-4.73
W06	-3.37	-3.03	-2.85	-2.44	-2.87

* Monitoring facility not available.

- Comment : 1) C06,C13 antennas have shown increase in current by more than 1mA.
2) 12 Antennas have shown decrease in current by more than 2mA.
3) 9 antennas have shown decrease in current by more than 1mA.

Measurement by : Pravin Raybole, Satish Lokhande.

RETURN LINK OPTICAL OUTPUT POWER
SUMMARY FROM OCTOBER 1997 TO JANUARY 2003

OPTICAL OUTPUT POWER IN dBm

ANTENNA	27/10/97	18/09/00	08/03/02	27/01/03
C00	-3.00	-2.30	-2.27	-2.84
C01	-3.50	-3.37	-3.23	-3.54
C02	-3.50	-3.87	-3.72	-3.20
C03	-3.57	-3.54	-3.00	-3.34
C04	-3.00	-3.69	-3.40	-3.90
C05	-3.50	-3.90	-3.40	-3.90
C06	-3.56	-3.34	-2.94	-3.28
C08	-3.52	-3.83	-2.42	-3.57
C09	-3.50	-4.06	-3.26	-3.37
C10	-3.75	-3.58	-3.22	NA
C11	-3.29	-4.35	-3.53	-3.57
C12	-3.57	-3.12	-2.62	-4.42
C13	-3.00	NA	-2.62	-3.10
C14	-3.00	-3.20	-2.90	-5.60
E02	-3.77	-4.89	-4.37	-3.92
E03	-3.71	NA	-4.09	-4.90
E04	-3.71	-4.86	-4.34	-4.58
E05	-3.90	-4.04	-3.87	NA
E06	-4.40	-4.65	-4.44	-5.04
S01	-3.66	-4.28	-4.47	-4.44
S02	-3.77	-4.44	-5.15	-4.56
S03	-3.00	-3.44	-4.27	-3.53
S04	-3.17	-4.45	-3.83	-3.11
S06	-3.00	-4.32	NA	-4.56
W01	-3.00	-2.70	-4.00	-3.88
W02	-3.30	-3.62	-2.92	-3.94
W03	-3.00	-3.08	-3.02	-3.23
W04	-2.70	-3.12	-2.88	-3.67
W05	-3.50	-4.65	-3.09	-3.80
W06	-2.80	-3.67	-3.20	-3.20

OPTICAL POWER VARIATION IN (dB)

ANTENNA	3rd Year	5th Year	6th Year
C00	0.70	0.73	0.16
C01	0.13	0.27	-0.04
C02	-0.37	-0.22	0.30
C03	0.03	0.57	0.23
C04	-0.69	-0.40	-0.90
C05	-0.40	0.10	-0.40
C06	0.22	0.62	0.28
C08	-0.31	1.10	-0.05
C09	-0.56	0.24	0.13
C10	0.17	0.53	NA
C11	-1.06	-0.24	-0.28
C12	0.45	0.95	-0.85
C13	NA	0.38	-0.10
C14	-0.20	0.10	-2.60
E02	-1.12	-0.60	-0.15
E03	NA	-0.38	-1.19
E04	-1.15	-0.63	-0.87
E05	-0.14	0.03	NA
E06	-0.25	-0.04	-0.64
S01	-0.62	-0.81	-0.78
S02	-0.67	-1.38	-0.79
S03	-0.44	-1.27	-0.53
S04	-1.28	-0.66	0.06
S06	-1.32	NA	-1.56
W01	0.30	-1.00	-0.88
W02	-0.32	0.38	-0.64
W03	-0.08	-0.02	-0.23
W04	-0.42	-0.18	-0.97
W05	-1.15	0.41	-0.30
W06	-0.87	-0.40	-0.40

NA data not available.

Comment: 1) C04, E03, S06 antennas optical output power decreased
by more than 1dB.

Measurement by : Pravin Raybole, Satish Lokhande.

RETURN LINK LASER DIODE BIAS CURRENT
 SUMMARY FROM OCTOBER - 1997 TO APRIL - 2003

ANTENNA	LASER DIODE BIAS CURRENT IN mA				
	27/10/97	08/12/99	09/04/01	30/09/02	27/04/03
C00	39.28	37.98	38.03	40.46	40.48
C01	38.39	33.57	33.57	38.28	38.12
C02	42.32	38.55	38.57	42.41	42.85
C03*					
C04*					
C05	36.60	36.44	36.25	36.66	31.12
C06	43.57	45.21	41.66	44.60	44.48
C08	41.42	42.53	42.14	39.55	39.37
C09*					
C10	44.56	34.46	34.28	44.62	45.12
C11	46.11	36.78	37.68	48.23	47.98
C12	39.50	37.28	37.85	39.57	39.53
C13	45.00	41.61	44.94	44.75	NA
C14	40.87	41.21	41.96	40.89	40.89
E02	40.70	39.62	35.89	41.44	41.16
E03	39.50	36.05	36.96	40.55	40.64
E04	38.00	37.30	35.18	44.30	40.03
E05	38.50	35.50	33.39	39.43	34.62
E06	42.00	38.10	37.85	41.96	38.39
S01	41.00	36.94	36.60	42.28	41.94
S02	40.00	36.85	36.43	40.34	39.82
S03	41.83	40.44	39.64	43.19	43.14
S04	36.67	40.32	42.68	40.09	39.69
S06	32.14	36.07	31.88	NA	NA
W01	40.70	33.39	34.28	40.50	39.41
W02	40.00	40.33	41.25	39.96	40.10
W03	39.30	36.28	37.14	39.46	39.71
W04	38.57	34.16	35.00	41.07	41.39
W05*					
W06	43.03	39.66	40.18	37.68	NA

LASER DIODE BIAS CURRENT VARIATION IN mA

ANTENNA	LASER DIODE BIAS CURRENT VARIATION IN mA			
	2nd Year	4th Year	5th Year	6th Year
C00	-1.30	-1.25	+1.18	+1.20
C01	-4.82	-4.82	-0.11	-0.27
C02	-3.77	-3.75	+0.09	+0.53
C03				
C04				
C05	-0.16	-0.35	+0.06	-5.48
C06	+1.64	-1.91	+1.03	+0.91
C08	+1.11	+0.72	-1.87	-2.05
C09				
C10	-10.10	-10.28	+0.06	+0.56
C11	-9.33	-8.43	+2.12	+1.87
C12	-2.22	-1.65	+0.07	+0.03
C13	-3.39	-0.06	-0.25	NA
C14	+0.34	+1.09	+0.02	+0.02
E02	-1.08	-4.81	+0.74	+0.46
E03	-3.45	-2.54	+1.05	+1.14
E04	-0.70	-2.82	+6.30	+2.03
E05	-3.00	-5.11	+0.93	-3.88
E06	-3.90	-4.15	-0.04	-3.61
S01	-4.06	-4.40	+1.28	+0.94
S02	-3.15	-3.57	+0.34	-0.18
S03	-1.39	-2.19	+1.36	+1.31
S04	+3.65	+6.01	+3.42	+3.02
S06	+3.93	-0.26	NA	NA
W01	-7.31	-6.42	-0.20	-1.29
W02	+0.33	+1.25	-0.04	+0.10
W03	-3.02	-2.16	+0.16	+0.41
W04	-4.41	-3.57	+2.50	+2.82
W05				
W06	-3.37	-2.85	-5.35	NA

* Monitoring facility not available. NA data not available.
 Comment: 1) Seven antennas laser bias current increased by 1mA.
 2) Four antennas laser current decrease by more than 2mA.

Measured by : Pravin Raybole, Satish Lokhande

* RETURN LINK MONITORED CURRENT ON THE ON-LINE *

(ID) 37 39 Current (mA)

ID	37	39	Current (mA)
CEB(0)	MCM 0	Not in scan mode.	
C03(1)	170	170	0.000
C12(2)	13	62	34.314
C04(3)	170	170	0.000
C09(4)	171	171	0.000
C02(5)	10	65	38.515
C01(6)	10	59	34.314
C00(7)	8	61	37.115
W01(8)	10	61	35.714
C11(9)	11	74	44.118
C14(10)	10	63	37.115
C13(11)	11	69	40.616
C10(12)	11	70	41.317
W02(13)	7	60	37.115
W03(14)	6	58	36.415
W04(15)	10	64	37.815
W05(16)	173	173	0.000
E02(17)	10	64	37.815
E03(18)	8	60	36.415
C05(19)	7	56	34.314
C06(20)	9	67	40.616
E04(21)	7	59	36.415
E05(2)	16	62	32.213
E06(23)	5	55	35.014
C08(24)	9	60	35.714
W06(25)	11	62	35.714
S01(26)	11	66	38.515
S02(27)	MCM 0	Not in scan mode.	
S03(28)	9	66	39.916
S04(29)	MCM 0	Not in scan mode.	
S06(30)	8	58	35.014

OPTICAL FIBER FORWARD LINK RF POWER SUMMARY

Measured by : Pravin Raybole, Satish Lokhande
C:\pravin\foresq.doc
April 2003

ANTENNA	C00		C01		C02		C03		C04	
	FREQ. (Mhz)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)
17	-17.18	-20.93	-17.18	-18.59	-17.18	-20.61	-17.18	-23.19	-17.18	-21.74
19	-17.70	-21.51	-17.70	-19.20	-17.70	-21.06	-17.70	-22.97	-17.70	-19.52
97.5	-16.19	-18.29	-16.19	-16.59	-16.19	-18.25	-16.19	-18.78	-16.19	-15.33
106	-15.65	-18.12	-15.65	-16.53	-15.65	-17.05	-15.65	-17.50	-15.65	-15.17
201	-17.77	-19.41	-17.77	-17.55	-17.77	-18.53	-17.77	-20.06	-17.77	-16.78
NF	-88.55	-74.90	-88.55	-78.04	-88.55	-75.00	-88.55	-75.00	-88.55	-78.00
RF GAIN/LOSS		-1.64		0		-0.76		-2.29		+1.0

ANTENNA	C05		C06		C08		C09		C10	
	FREQ. (Mhz)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)
17	-17.18	-21.08	-17.18	-17.50	-17.18	-19.06	-17.18	-18.20	-17.18	-17.36
19	-17.70	-21.98	-17.70	-18.04	-17.70	-19.62	-17.70	-18.81	-17.70	-17.86
97.5	-16.19	-18.98	-16.19	-16.26	-16.19	-17.94	-16.19	-15.93	-16.19	-15.49
106	-15.65	-18.15	-15.65	-14.96	-15.65	-17.05	-15.65	-15.36	-15.65	-15.15
201	-17.77	-20.16	-17.77	-16.57	-17.77	-17.74	-17.77	-17.02	-17.77	-16.67
NF	-88.55	-76.40	-88.55	-71.91	-88.55	-74.05	-88.55	-76.58	-88.55	-74.47
RF GAIN/LOSS		-2.39		+1.2		0		+0.75		+1.1

ANTENNA	C11		C12		C13		C14		W06	
	FREQ. (Mhz)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)
17	-17.18	-18.20	-17.18	-19.38	-17.18	-19.80	-17.18	-18.80	-17.18	-
19	-17.70	-18.97	-17.70	-19.97	-17.70	-20.64	-17.70	-19.46	-17.70	-
97.5	-16.19	-16.52	-16.19	-14.45	-16.19	-17.92	-16.19	-17.35	-16.19	-
106	-15.65	-15.90	-15.65	-16.60	-15.65	-17.50	-15.65	-17.34	-15.65	-
201	-17.77	-18.11	-17.77	-18.74	-17.77	-19.50	-17.77	-19.37	-17.77	-
NF	-88.55	-72.00	-88.55	-74.31	-88.55	-72.05	-88.55	-75.41	-88.55	-
RF GAIN/LOSS		-0.34		-1.0		-1.73		-1.6		

Note : RF Power measured on HP make Spectrum Analyser at " PORT A OUTPUT " of the Optical Receiver at the antenna base and other port terminated to 50 Ohms.

OPTICAL FIBER FORWARD LINK RF POWER SUMMARY

FOR EAST, SOUTH AND WEST ANTENNAS

Measured by : Pravin Raybole, Satish Lokhande
C:\pravin\foresw.doc
April 2003

ANTENNA	E02		E03		E04		E05		E06	
	FREQ. (MHz)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)
17	-16.72	-18.91	-27.33	-21.06	-16.72	-16.65	-16.72		-16.72	
19	-16.35	-18.55	-26.21	-20.95	-16.35	-16.31	-16.35		-16.35	
97.5	-16.09	-17.46	-20.60	-19.82	-16.09	-15.45	-16.09		-16.09	
106	-15.86	-17.71	-22.04	-19.90	-15.86	-15.42	-15.86		-15.86	
201	-17.18	-17.88	-17.18	-20.33	-17.18	-16.19	-17.18		-17.18	
NF	-88.45	-71.98	-79.38	-72.72	-88.45	-66.99	-88.45		-88.45	
RF GAIN/LOSS		-0.70		-3.15		+1.0				

ANTENNA	S01		S02		S03		S04		S06	
	FREQ. (MHz)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)
17	-16.72	-16.58	-16.72	-21.24	-16.72	-16.25	-16.72	-19.64	-16.72	-18.42
19	-16.35	-16.35	-16.35	-20.89	-16.35	-15.83	-16.35	-19.30	-16.35	-18.20
97.5	-16.09	-15.39	-16.09	-19.31	-16.09	-14.92	-16.09	-18.38	-16.09	-17.55
106	-15.86	-15.78	-15.86	-19.75	-15.86	-15.17	-15.86	-18.39	-15.86	-17.05
201	-17.18	16.90	-17.18	-20.58	-17.18	-15.70	-17.18	-18.40	-17.18	17.53
NF	-88.45	-74.10	-88.45	-72.10	-88.45	-67.40	-88.45	-64.00	-88.45	-59.00
RF GAIN/LOSS		0		-3.4		+1.48		-1.22		0

ANTENNA	W01		W02		W03		W04		W05	
	FREQ. (MHz)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)	ORx BASE (dBm)	OTx CEB (dBm)
17	-16.79	-19.91	-16.79	-18.38	-16.79	-21.35	-16.79	-	-16.79	-
19	-17.91	-20.53	-17.91	-19.13	-17.91	-22.00	-17.91	-	-17.91	-
97.5	-16.28	-17.32	-16.28	-16.38	-16.28	-19.31	-16.28	-	-16.28	-
106	-15.22	-17.17	-15.22	-15.95	-15.22	-18.36	-15.22	-	-15.22	-
201	-17.94	18.80	-17.94	17.85	-17.94	19.99	-17.94		-17.94	
NF	-88.36	-76.04	-88.36	-73.18	-88.36	-68.27	-88.36	-	-88.36	-
RF GAIN/LOSS		-0.86		0		-2.05		-		-

Note : RF Power measured on HP make Spectrum Analyser at "PORT A" of the Optical Receiver at the antenna case and other port terminated to 50 Ohms.

OPTICAL FIBER RETURN LINK RF POWER SUMMARY

FOR CENTRAL SQUARE ANTENNAS

Measured by : Pravin Raybole, Satish Lokhande
C:\pravin\retcsq.doc
April 2003

ANTENNA	C00		C01		C02		C03		C04	
	FREQ. (Mhz)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)
105	-25.32	-	-25.76	-28.60	-27.93	-26.18	-26.83	-24.58	-24.19	-26.23
200	-26.91	-	-24.65	-29.31	-26.82	-24.71	-25.86	-24.48	-22.62	-24.49
204.5	-17.23	-	-18.70	-23.04	-24.99	-22.47	-18.35	-16.56	-19.98	-21.42
206.5	-18.41	-	-20.33	-24.51	-22.00	-19.38	-20.00	-18.10	-18.86	-20.54
NF	-78.59	-	-80.89	-74.76	-75.19	-64.63	-79.47	-65.70	-78.61	-69.26
RF GAIN/LOSS		-		-4.66		+2.11		+1.38		-1.87

ANTENNA	C05		C06		C08		C09		C10	
	FREQ. (Mhz)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)
105	-27.56	-26.93	-26.16	-25.17	-27.52	-24.44	-26.05	-26.41	-27.28	-25.31
200	-27.76	-27.58	-28.27	-28.65	-27.65	-26.39	-27.17	-25.62	-25.36	-29.79
204.5	-19.81	-18.87	-30.87	-17.68	-17.65	-16.88	-17.60	-15.03	-18.32	-21.61
206.5	-22.29	-21.65	-30.65	-19.66	-20.17	-18.91	-20.07	-16.72	-20.55	-23.07
NF	-79.00	-66.24	-77.23	-68.09	-77.25	-66.42	-75.82	-68.49	-78.02	-
RF GAIN/LOSS		0				+1.26		+1.55		-4.43

ANTENNA	C11		C12		C13		C14		W06	
	FREQ. (Mhz)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)
105	-25.95	-27.58	-26.93	-24.88	-25.31	-26.85	-24.86	-23.96	-	-
200	-26.55	-29.86	-27.76	-27.12	-25.32	-27.24	-24.51	-25.10	-	-
204.5	-18.23	-21.12	-16.39	-16.56	-18.49	-20.25	-17.95	-17.31	-	-
206.5	-19.25	-22.32	-18.10	-18.15	-18.96	-20.51	-19.85	-18.29	-	-
NF	-80.31	-66.05	-77.14	-70.33	-77.50	-68.29	-78.54	-69.13	-	-
RF GAIN/LOSS		-3.31		0		-1.92		-0.59		-

Note : RF Power measured on HP make Spectrum Analyser at " PORT C OUTPUT " of the Optical Receiver in the Receiver Room with all other port terminated to 50 Ohms.

OPTICAL FIBER RETURN LINK RF POWER SUMMARY

FOR EAST, SOUTH AND WEST ARM ANTENNAS

Measured by : Pravin Raybole, Satish Lokhande
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April 2003

ANTENNA	E02		E03		E04		E05		E06	
	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)
105	-26.60	-23.60	-27.33	-29.00	-27.10	-	-	-	-	-
200	-27.07	-25.67	-26.21	-26.62	-26.00	-	-	-	-	-
204.5	-17.24	-15.98	-20.60	-23.23	-15.89	-	-	-	-	-
206.5	-18.74	-17.09	-22.04	-24.74	-11.15	-	-	-	-	-
NF	-79.72	-67.34	-79.38	-66.63	-75.80	-	-	-	-	-
RF GAIN/LOSS		+1.4		0						

ANTENNA	S01		S02		S03		S04		S06	
	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)
105	-26.12	-22.58	-27.08	-23.93	-26.42	-22.79	-26.52	-25.59	-29.16	-26.02
200	-26.21	-25.22	-27.65	-25.92	-28.27	-25.59	-27.63	-29.14	-32.22	-26.16
204.5	-17.62	-16.83	-18.72	-17.70	-18.65	-15.93	-17.40	-18.12	-16.57	-16.76
206.5	-17.66	-16.76	-21.71	-20.23	-18.55	-15.79	-19.57	-20.27	-18.38	-18.29
NF	-78.38	-64.36	-77.88	-65.73	-79.59	-58.17	-78.87	-70.83	-79.44	-65.77
RF GAIN/LOSS		+1.0		+1.73		+2.68		-1.51		+6.06

ANTENNA	W01		W02		W03		W04		W05	
	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)	OTx BASE (dBm)	ORx CEB (dBm)
105	-24.59	-20.35	-24.86	-23.11	-26.98	-23.77	-25.97	-23.30	-26.23	-24.65
200	-25.72	-23.41	-26.72	-26.91	-25.51	-24.05	-25.59	-24.70	-28.42	-27.28
204.5	-18.74	-15.93	-16.03	-16.16	-17.33	-16.26	-18.24	-17.31	-	-17.49
206.5	-20.10	-17.25	-17.71	-17.35	-20.35	-18.19	-19.99	-19.66	-	-21.75
NF	-78.84	-68.18	-78.90	-66.40	-78.46	-64.70	-79.13	-65.14	-79.03	-71.49
RF GAIN/LOSS		+2.31		0		+1.5		+0.89		+1.08

Note : RF Power measured on HP make Spectrum Analyser at " PORT C OUTPUT " of the Optical Receiver in the Receiver Room with all other port terminated to 50 Ohms.