



All India Radio



**PRASAR BHARATI
BROADCASTING CORPORATION OF INDIA
DIRECTORATE GENERAL: ALL INDIA RADIO
(PLANNING AND DEVELOPMENT UNIT)**

File No.:30/5/2007-D(TD/FM)

**SPECIFICATION FOR SUPPLY OF FM MONO & STEREO MODULATION
MONITOR INCLUDING RF AMPLIFIER**

Specification No.:

FM Mono & Stereo Mod Monitor/ 11th Plan(NE Spl. Package) / November/2007-D(TD/FM)

[Total number of pages -10 Nos.]

CONTENTS

SECTION 1.0 :GENERAL SPECIFICATIONS (Page number 3 to 5)

SECTION 2.0 :TECHNICAL SPECIFICATIONS (Page number 6 to 7)

SECTION 3.0: INSPECTION (Page number8)

SECTION 4.0: SCHEDULE OF SUPPLY (Page number 9)

N.B. :

1. Each clause of this specification has to be complied with & supported by printed matter from the manufacturer of the equipment by the Tenderer, without which tender will be considered incomplete and shall be liable to be rejected .The Tenderer should make a detailed offer while quoting for the FM Mono & Stereo Modulation Monitor including RF Amplifier.

2. All the FM Mono & Stereo Modulation Monitor including RF Amplifier data, technical details , Schematic drawings and schedule of requirement/material must

be submitted and enclosed with the tender by the tenderer, failing which the tender shall be liable to be rejected .

3. Tenderer shall quote the rate / cost of individual spares in the tender offer while submitting the offer for spares.

4. This Specification comprises of 9 pages.

5. The Tenderer shall submit schedule of material /requirement of Supply without price as shown in Section 4.0 of AIR Specification (two bid system i.e. technical bid and commercial bid).

6. The tenderer shall submit the tender offer to AIR in the format given below.

<i>Sr No. of AIR Spec. Section wise & Clause wise</i>	<i>Details of AIR Spec.</i>	<i>Performance figures of equipment, schematic drawing Nos. and Model No.</i>	<i>Compliance Yes/NO</i>	<i>Deviations in case of non-compliance</i>	<i>Ref to tender page No.</i>	<i>Remarks</i>
Section 1.0						
Section 2.0						
Section 3.0						
Section 4.0						

7. The tenderers shall fill up their name in CAPITAL LETTERS, full address with pin code , phone number, fax number, e-mail address and with their full signatures before the submission of their tender offer to AIR.

GENERAL SPECIFICATIONS:

SECTION - 1.0

1.0 Please refer tender documents for general term and conditions of contract for supply including all the commercial aspects like ; Packing and Packing List, Insurance and Marine Risk etc., Guarantee, Payment terms, Penalty/Compensation for Delay, Damages and Liabilities, Time Period and Extension for Delay , Foreclosure of Contract due to Abandonment or Reduction in Scope of Supply , Cancellation of Contract in Full or Part, Recovery of Security Deposit, Performance Guarantee, Unsatisfactory Workmanship, Damages Incurred During transit, Tenderer Liable for Damages, Defects, Recovery of Compensation, Ensuring Payment and Amenities, Tenderer to Indemnify Government against Patent Rights, Release of Security Deposit, Safety Code, insurance from manufacturer's works/factory to respective site etc **i.e. in totality.**

2.0 INSPECTION:

Detailed inspection will be carried out by AIR representative as per details given in Section-3.0

Complete specifications & details will be checked and all parameter values will be measured. Acceptance to this has to be clearly stated in the tender document by the tenderer.

Prior intimation for carrying out Inspection is to be given by the tenderer to the indenter in advance .

3.0 FM Mono & Stereo Modulation Monitor including RF Amplifier equipment as per AIR specification shall be used for round the clock for Continuous operation without any interruption in VHF FM broadcast service at AIR stations for FM transmitter setup.

3.1 INFORMATION TO BE SUPPLIED:

3.1.1 LANGUAGE / UNITS:

All information supplied by the Tenderer & all markings, notes, designation on the drawings & associated write-ups shall be in "**English language**" only.

All dimensions on drawings and all references to weights and measures and quantities shall be in metric units.

- 3.1.2 Compliance Statement , Complete as per AIR specification, para wise/ clause wise .
- 3.1.3 Complete printed information in support of compliance statement should be furnished with the tender to assess the full merit of the offer. Similar information should be furnished in respect of Auxiliary items, Accessories and Spares etc. The tender & the associated information should be submitted in duplicate.
- 3.1.4 Descriptive information giving complete details of Equipment offered.
- 3.1.5 FM Mono & Stereo Modulation Monitor including RF Amplifier Block Diagram & full Schematic drawings.
- 3.1.6 Various technical details drawings and technical description of FM Mono & Stereo Modulation Monitor including RF Amplifier.
- 3.1.7 Detailed Schedule of Materials offered in conformity with the Schedule of requirement/material.

This list should be in the same format as in the price bid without indicating the prices.

- 3.1.8 Dimensions(overall sizes), weights & photographs/ illustrations of the interior of the FM Mono & Stereo Modulation Monitor including RF Amplifier. This should include characteristics affecting the environment, for example; heat dissipation, electromagnetic interference(EMI)/electromagnetic compatibility(EMC). This information should be in CD form also.
- 3.1.9 In support of Tenderer's claim an "up-to-date" list of their customer's alongwith complete set of actual performance figures i.e. FM Mono & Stereo Modulation Monitor including RF Amplifier. Performance measurement taken shall be furnished alongwith the tender.

4.0 INFORMATION TO BE SUPPLIED BY THE TENDERER AFTER AWARD OF SUPPLY ORDER :

One printed & duly bound set of Technical (*Installation, Commissioning, Operation & Maintenance*) manuals for FM Mono & Stereo Modulation Monitor including RF Amplifier Equipment shall be supplied to the Director Engineering (Project), P&D Unit DG AIR New Delhi within

one month of Acceptance of Tender.

All the details should be complete and exhaustive. One Soft copy of these documents is also required on CD for use with PC.

5.0 INFORMATION TO BE SUPPLIED ALONGWITH EQUIPMENT:

5.1 For each FM Mono & Stereo Modulation Monitor including RF Amplifier, one set of printed & duly bound copy of Technical manuals and books for Installation, Testing, Commissioning, Operation, Maintenance & Fault diagnosis are to be supplied to each consignee.

5.2 Six Complete sets of these documents as per 5.1, against the order for FM Mono & Stereo Modulation Monitor including RF Amplifier are required to be sent to (irrespective of number of FM Mono & Stereo Modulation Monitor including RF Amplifier ordered), the following officers / offices / places:

5.2.1	DE(Proj.), P&D Unit, DG:AIR	- 1 sets
5.2.2	Zonal Office (Project Wing)	- 1 sets (for NE Zone)
5.2.3	Zonal Office (Maintenance Wing)	- 1 sets (for NE Zone)
5.2.4	DE(Transmitter Maintenance), DG:AIR	- 1 set
5.2.5	Technical Library, P&D Unit, DG:AIR	- 1 set
5.2.6	Staff Training Institute (Technical)	- <u>1 set</u>
	Total	- <u>6 sets</u>

One Soft copy of these documents is also required on CD, for use with PC, to be delivered to DE (Proj), P & D Unit, DG AIR .

5.3 One copy of the Inspection Report - of the inspection carried out at factory - should also be sent to all officers and offices as stated in above 5.1 and 5.2 and each consignee.

6.0 DELIVERY OF EQUIPMENT

Within three months from date of placing of order.

SECTION 2.0 (TECHNICAL SPECIFICATIONS)

FM Mono & Stereo Modulation Monitoring Instrument including RF amplifier:

1.0 One Set. of FM Mono & Stereo Mod Monitor to be used in – tandem with RF amplifier are to be quoted as per technical specification given below. FM Modulation Monitor:

- (i) Should provide standard deviation reference and zero deviation for SNR.
- (ii) Should provide MPX Signal Output.

S. No.	Parameter	Technical Specification	COMMENTS OF TENDERER WITH TECHNICAL DATA / SCHEMATIC DRAWINGS Nos
2.0	R.F. INPUT:		
2.1	Frequency range	88-108 MHz [To be Tunable to any frequency in VHF FM Band 88 MHz to 108 MHz] in steps of 100 KHz.	
2.2	Maximum (High level) RF Input	10 Vrms, 50 Ohm BNC.	
2.3	Nominal Input level	3.5 V p-p, 50 Ohms on BNC.	
2.4	AGC range	60 dB.	
2.5	Sensitivity	100 mv or better.	
2.6	Accuracy	± 2%	
3.0	BASEBAND MEASUREMENTS:		
3.1	Modulation frequency	30 Hz - 100 KHz	
3.2	Frequency deviation	± 75 KHz for 100% modulation.	
3.3	Frequency deviation indication	0 to 133%	
3.4	Frequency deviation indication accuracy	± 2%	
3.5	AM noise measurement	To measure AM noise down to 70 dB from 100% AM modulation.	
3.6	<u>MPX signal output :</u>		
3.6.(i)	Frequency response (30 Hz to 100 KHz)	Better than 0.25 dB	

3.6(ii)	Harmonic Distortion	Better than 0.01%	
3.6(iii)	IMD (SMPTE)	Better than 0.01%	
3.6(iv)	SNR	Better than 90 dB	

4.0	STEREO MEASUREMENTS:		
	It should have 2 semi peak modulation meters for simultaneous monitoring of L & R channels, total modulation and measurements of channel separation, cross talk, S.C. suppression, noise and pilot etc. It should be possible to feed in MPX signal separately.		
4.1	Channel separation (L/R or R/L)	Better than 65 dB, 30 Hz to 15 KHz	
4.2	Cross talk (L+R) to (L-R) or (L-R) to (L+R)	Better than 65 dB, 30 Hz to 15 KHz with full range reading as 0 to 90 dB.	
4.3	Pilot carrier measurement	0.5%, from 7% to 13% injection	
4.4	Range indication	0-60 dB, auto in 10 dB steps	

5.0	OUTPUT:		
5.1	Level (L & R)	+ 5 dBm, 600 ohms, balanced	
5.2	Frequency response	± 0.25 dB, 30 Hz to 15 KHz	
5.3	De-emphasis	50 u sec.	
5.4	Signal to noise ratio	80 dB	
5.5	Harmonic distortion	0.01%	
5.6	Inter-modulation distortion (SMPTE)	0.01%	
6.0	POWER REQUIREMENTS		
6.1	Input power	Single Phase ,230 V(rms) ± 10%, 50 Hz ± 4%	

7.0	GENERAL REQUIREMENTS:		
7.1	All RF input and power input cords with suitable connectors are to be provided.		
7.2	Instrument should be able to be mounted in a standard 19" rack.		
7.3	All accessories needed for various measurements to be quoted.		

8.0	<u>SPARES (OPTIONAL)</u> : Essential and recommended spares components, PCBs, and modules shall be quoted separately.
-----	---

SECTION 3.0 – INSPECTION

INSPECTION DETAILS

The inspection for acceptance of FM Mono & Stereo Modulation Monitor including RF Amplifier will be carried out in accordance with Acceptance Test Procedure (ATP). Complete details and specifications of FM Mono & Stereo Modulation Monitor including RF Amplifier will be checked and all parameter values will be measured.

The complete Acceptance Test Procedure (ATP) will be prepared by the manufacturer and submitted for approval. This Procedure after modification (if required during the process of approval) shall form the basis for Performance / Inspection Tests to be carried out. ATP will also indicate full details of set up for measuring / testing equipment to be deployed during the Performance Measurement/ Inspection Test.

Operation checking of the complete FM Mono & Stereo Modulation Monitor including RF Amplifier and measurements will be carried out as per Specification .Complete list of these measuring instruments along with their set ups may be forwarded along with the Tender.

Exhaustive checking's/measurements will be carried out so as to completely check the compliance of the FM Mono & Stereo Modulation Monitor including RF Amplifier with the requirements as projected in the specifications.

It is mandatory that all these checking and measurements i. e. Operation checking of the FM Mono & Stereo Modulation Monitor including RF Amplifier and measurements are carried out well in advance and these measurements details, graphical printout notes and figures must be available, at the time of inspection.

These must also be submitted to All India Radio along with the call for inspection of the FM Mono & Stereo Modulation Monitor including RF Amplifier well in advance for analyzing etc.

Following information should also form part of above data which will also be checked for each FM Mono & Stereo Modulation Monitor including RF Amplifier during inspection by indenter's representative at manufacturer's works :-

1. Make , type , model no and country of origin of the accessories and spares.
2. Measurements of all parameters as per Section II - of Technical Specification . All the parameters will be measured.

