

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

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File No:30/5/2010-D(TD/FM)

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

Specification No.: FM Mono & Stereo Mod Monitor/ June/1/2010-D(TD/FM)

[Total number of pages -11 Nos.]

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**N.B. :**

1. The Tenderer should submit schedule of material /requirement of Supply without price in the same format as given in Specification in the technical bid, failing which the tender shall be considered incomplete and is liable to be rejected.
2. Each statement of this specification has to be complied with & supported by printed technical literature , technical data sheets and technical manuals from the manufacturer of the equipment by the tenderer, to assess the merit of the offer without which tender will be considered incomplete & is liable to be rejected. The tenderer should make a detailed offer.
3. All the technical details, Schematic drawings must be submitted and enclosed with the tender by the tenderer failing which the tender is liable to be rejected.
4. The tenderer should submit the tender offer to AIR in the format given below Section wise & clauses wise in respect of all the sections of technical specifications {along with column number 5 “Ref to tender page No. by the tenderer as per the offer of the tenderer” in the format given below} in detail to assess the full merit of the offer, failing which tender shall be considered incomplete and is liable to be rejected.

Sr. No. of AIR Spec. Section wise & Clause Wise (1)	Details of Spec. Part/ Section wise & clause wise (2)	Make & Model No of the Equipment offered (3)	Compliance Yes/NO (4)	Ref to tender page No. by the tenderer as per the offer of the tenderer (5)	Remarks (6)
Section-1.0 Clause wise					
Section-2.0 Clause wise					
Section-3.0 Clause wise					
Section-4.0(I) Clause wise					
Section-4.0(II) Clause wise					

5. Tenderer should quote the rate / cost of individual items in the tender offer while submitting the offer for spares in commercial bid.
6. The complete Technical specification (section wise & clause wise) compliance statement along with schedule of requirements/materials (unpriced) must be signed & stamped on each page by the Original Equipment Manufacturer (OEM) of the equipment in the tender document including the clarifications, if any, asked by the Indenter. In case tender offer is from other than the Original Equipment Manufacturer, the tenderer must also sign & stamp each page of the complete Technical specification (section wise & clause wise) compliance statement including the clarifications, if any, asked by the Indenter, failing which the tender shall be considered incomplete and is liable to be rejected. The OEM & tenderers should fill up their name in CAPITAL LETTERS, full address with pin code, phone number, fax number, e-mail address and with their full signatures.
7. The complete tender shall be page numbered.
8. Optional items will not be considered for ranking purposes.
9. Any change in the AIR Technical Specification format or language or in parameters or of any other nature including the deletion of technical specification clause, words, lines in the technical compliance statement as mentioned in clause 6 as above by the Original Equipment Manufacturer/ tenderer will not be acceptable to Indenter and the tender is liable to be rejected.
10. Tenderers may please note that no clarifications may be asked by the Indenter regarding Indenter technical specifications, so all the tenderers may submit their tender offers accordingly.

**SECTION - 1.0 GENERAL SPECIFICATIONS:**

**1.0** FM Mono & Stereo Mod Monitor 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 station for FM transmitter/studio setup.

**1.1 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. 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.**

**1.2 INSPECTION:** As per Section 3.0

**1.3 INFORMATION TO BE SUPPLIED WITH THE TENDER :**

(The tender and the associated information should be submitted in duplicate.)

- a) A **Compliance Statement** to the complete specification of AIR, Para wise, for each clause.
- b) Complete **printed technical literature/data sheet/ detailed information** including technical manual of equipment/item as per specification from the Original Equipment Manufacturer (OEM) in support of compliance statement should be furnished for all the items of the tender, to assess the full merit of the offer, without which the tender will be considered incomplete and is liable for rejection
- c) Descriptive information giving complete details of Equipment offered.
- d) Detailed Schedule of Requirement/Materials offered for FM Mono & Stereo Mod Monitor equipment should be in conformity with specification without any change in format without price (un-priced) failing which the tender shall be considered incomplete and will be liable for rejection. **The tenderer must quote all items.**
- e) Country of origin, make, type, model number in respect of all items should be submitted along with the name & address of their vendors.
- f) Dimensions and photographs of the interior of the equipment.
- g) Information and characteristics of semiconductor devices used in the equipment.

**1.4 EXPERIENCE (Supply):**

Minimum 5 years experience of OEM in production of the products quoted.

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

One set of Technical manuals {for Installation, testing, commissioning , Operation & Maintenance, including Theory of operation and fault diagnosis printed and duly bound for FM Mono & Stereo Mod Monitor equipment along with one soft copy on CD} shall be supplied to “The Director Engg. (Projects), P & D Unit, DG:AIR, New Delhi-110001”

**1.6 INFORMATION TO PRECEDE DESPATCH OF EQUIPMENT:**

Following information should be supplied to the Director Engg. (Projects), P & D Unit, DG:AIR and each of the consignee, two months prior to dispatch of Equipment:

- a) Detailed list of equipment under dispatch.
- b) Photograph showing location of components in the various units and sub units with item numbers marked thereon.

**1.7 INFORMATION TO BE SUPPLIED ALONGWITH EQUIPMENT:**

Technical manuals {for Installation, testing, commissioning , Operation & Maintenance, including Theory of operation and fault diagnosis printed and duly bound} for FM Mono & Stereo Mod Monitor equipment along with one soft copy on CD and OEM test certificates as per Section 3.0 shall be supplied.

- 1.8 A list of required spares and tools etc. along-with item-wise price details are to be quoted separately as optional( un priced) with tender by the tenderers.

**1.9 GUARANTEE:**

Tenderer shall submit with his tender an undertaking to accept the following guarantees:

- (i) A guarantee that the equipment supplied will be in accordance with these specifications, varied only to the extent stated in his tender and agreed to in the contract.
- (ii) A guarantee to make good within 30 days at tenderer's expense, if any, component which becomes defective under normal operating conditions within 18 months from the date of acceptance of Equipment at respective site or 12 months from the date of commissioning at site whichever is earlier.
- (iii) A guarantee to supply all components for a period of ten years from the date of acceptance of Equipment at site, at rates at which these are being supplied by him to other customers and also should match prices of original manufactures of these components prevailing at that time.
- (iv) If at any stage during next 10 years, the manufacturer stops production of this model of Equipment, he shall intimate All India Radio in advance to enable the latter to stock the critical items.

**1.10 AFTER SALES SERVICE:**

The Tenderer shall specify the repair/service facility available for the equipment in India with address, Phone/Fax nos., E-mail etc. The supply of FM Mono & Stereo Mod Monitor equipment may require after sales services. Therefore full details of facilities for carrying out after sale service may be given.

1.11 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, units on drawings, all references to weights, measures & quantities shall be in MKS.

1.12 DELIVERY OF EQUIPMENT:

Eight months (08) from date of placement of the supply order.

1.13 PACKING AND PACKING LISTS:

All the equipment should be securely and properly packed to withstand transit hazards. Equipment packing shall be fit for sea freight and incorporate adequate protection against ingress of moisture. Packing slips giving details of the items contained in each package shall be placed inside the package in a water proof envelop to enable easy identification and should contain cross references to item/part numbers of installation drawings/components lists. Copies of packing slips and other details should be sent separately to respective consignee and also to The Director Engg. (Projects), P & D Unit , DG: AIR, New Delhi.

1.14 INSURANCE AND MARINE RISKS ETC:

Please refer to commercial terms.

1.15 In support of Tenderer's claim an "up-to-date" list of their customers including their

Full address, Telephone/Fax No & E-mail address is required to be submitted along with complete set of actual performance figures i.e. Performance measurement taken on FM Mono & Stereo Mod Monitor equipment are to be furnished along with the tender.

The offered equipment/items as per specification shall be field proven for satisfactory operation. A supply record of FM Mono & Stereo Mod Monitor equipment year wise may be enclosed by the tenderer.

1.16 POWER SUPPLY FOR ALL EQUIPMENT:

(i)	Operating Line voltage	AC Single Phase : 230 Volts $\pm$ 10 %
(ii)	Frequency	50 Hz $\pm$ 4%
(iii)	Power factor	Better than 0.9.

1.17 AMBIENT CONDITIONS FOR ALL INSIDE EQUIPMENT:

(i)	Operating temperature range	0 °C to 45 °C
(ii)	Relative Humidity	95% non –condensing.
(iii)	Working altitude	Up to 3000 meters AMSL

**SECTION 2.0 (TECHNICAL SPECIFICATIONS )**

**Technical Specification FM Mono and Stereo Modulation Monitor including RF amplifier:**

<p><b>2.0</b> One Set of FM Mono and Stereo Mod Monitor to be used in tandem with RF amplifier are to be quoted as per technical specification given below. FM modulation monitor;</p> <p>(i) Should provide standard deviation reference and zero deviation for SNR.</p> <p>(ii) Should provide MPX signal output.</p>
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**FM Mono and Stereo Modulation Monitor including RF amplifier:**

S. No.	Parameter	Technical Specification	COMMENTS OF TENDERER WITH TECHNICAL DATA / SCHEMATIC DRAWINGS Nos
<b>2.1</b>	<b>R.F. INPUT:</b>		
<b>2.1.1</b>	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.	
<b>2.1.2</b>	RF Input Range	1 to 5 Vrms, 50 Ohm BNC	
<b>2.1.3</b>	Sensitivity	100 $\mu$ V or better.	
<b>2.1.4</b>	Accuracy at all modulation levels	$\pm$ 2.0 %	
<b>2.2</b>	<b>BASEBAND MEASUREMENTS:</b>		
<b>2.2.1</b>	Modulation frequency	30 Hz - 100 KHz	
<b>2.2.2</b>	Frequency deviation ( Nominal )	$\pm$ 75 KHz for 100% modulation.	
<b>2.2.3</b>	Frequency deviation indication	0 to 150 %	
<b>2.2.4</b>	Frequency deviation indication accuracy	$\pm$ 2.0 %	
<b>2.2.5</b>	AM noise measurement	To measure AM noise down to 70 dB from 100% AM modulation.	
<b>2.2.6</b>	MPX signal output :		
<b>2.2.6(i)</b>	Frequency response	Better than 0.25 dB	

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<b>2.2.6(ii)</b>	Harmonic Distortion	Better than 0.01%	
<b>2.2.6(iii)</b>	IMD (SMPTE)	Better than 0.01%	
<b>2.2.6(iv)</b>	SNR	Better than 90 dB	
<b>2.3</b>	<b>STEREO MEASUREMENTS:</b>		
	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.		
<b>2.3.1</b>	Channel separation (L/R or R/L)	Better than 90 dB, 30 Hz to 15 KHz	
<b>2.3.2</b>	Cross talk (L+R) to (L-R) or (L-R) to (L+R)	Better than 90 dB, 30 Hz to 15 KHz	
<b>2.3.3</b>	Pilot carrier measurement	0.50 %, 0% to 15 % injection	
<b>2.3.4</b>	Range indication	0- 100 dB, auto in 1 dB steps	
<b>2.4</b>	<b>OUTPUT:</b>		
<b>2.4.1</b>	Level (L & R)	+ 4 dBm, 600 ohms, balanced	
<b>2.4.2</b>	Frequency response	± 0.25 dB	
<b>2.4.3</b>	De-emphasis	50 µs	
<b>2.4.4</b>	Signal to noise ratio	≥85 dB	
<b>2.4.5</b>	Harmonic distortion	≤ 0.01%	
<b>2.4.6</b>	Inter-modulation distortion (SMPTE)	≤ 0.01%	
<b>2.5</b>	<b>POWER REQUIREMENTS</b>		
		Single Phase as per Section 1.0	
<b>2.6</b>	<b>GENERAL REQUIREMENTS:</b>		
<b>2.6.1</b>	All RF input and power input cords with suitable connectors are to be provided.		
<b>2.6.2</b>	Instrument should be able to be mounted in a standard 19" rack.		
<b>2.6.3</b>	All accessories needed for various measurements to be quoted.		
<b>2.7</b>	<b>ENVIRONMENTAL</b>		
		As per Section 1.0	
<b>2.8</b>	Dimensions (Approximate) (W x H x D):	To fit in 19" rack and dimension details to be given by tenderer.	
<b>2.9</b>	Weight (Kg )	To be given by tenderer.	

**SECTION 3.0 – INSPECTION**

**INSPECTION DETAILS**

FM Mono & Stereo Mod Monitor will be accepted on the basis of OEM’s test certificate of actual performance measurements as per AIR specification before dispatch to indenter and receipt of equipment at site in good condition.

The Original Equipment Manufacturer’s (OEM) test certificates shall be duly signed & stamped on the letter head of the OEM, failing which Original Equipment Manufacturer’s (OEM) test certificates will be considered incomplete and equipment offered by the tenderer is liable to be rejected.

Following information should also form part of OEM test certificate for each FM Mono & Stereo Mod Monitor.

1. Make, type, model number and country of origin of the accessories and spares.
2. Measurements of all parameters as per Section 2.0 Technical Specification.

**SECTION 4.0; SCHEDULE OF MATERIAL/REQUIREMENT FOR SUPPLY**  
**(UNPRICED)**

(For one Set of FM Mono & Stereo Modulation Monitor including RF Amplifier)

S. No.	Description	Quantity
1.0	FM Mono & Stereo Modulation Monitor including RF Amplifier equipment complete with all accessories as per AIR specification.	1 Set complete
2.0	Any other item/accessories offered for the completeness of the system ( Items wise details of offered and included material with part numbers, if any are to be given by the tenderer)	1 lot
3.0	Technical manuals for Installation, testing, commissioning , Operation & Maintenance, including Theory of operation and fault diagnosis printed and duly bound for FM Mono & Stereo Modulation Monitor including RF Amplifier Equipment along with one soft copy on CD as per distribution given below:	1 Set
3.1	For DE (Proj.) P&D Unit, DG:AIR { Within Two Months of Supply order) ( irrespective of number of FM Mono & Stereo Modulation Monitor including RF Amplifier to be ordered )	1 Set
3.2	For <b>Consignee</b> { Within Two Months of Supply order).	2 Sets
3.3	For the following officers: 8 Nos. of Technical manuals are to be supplied) { To be supplied along with the equipment}. ( irrespective of number of FM Mono & Stereo Modulation Monitor including RF Amplifier to be ordered )	8 sets
	(i) DE (Proj.),P&D Unit, DG:AIR - 1 set	
	(ii) Zonal Offices (Project Wing) - 5 sets	
	(iii) Technical Library, P&D Unit, DG:AIR - 1 set	
	(iv) Staff Training Institute (Technical) - 1 set	

**SECTION: 4.0 (II) (OPTIONAL)**

**SCHEDULE OF MATERIAL/REQUIREMENT FOR SUPPLY (OPTIONAL INCLUDING ESSENTIAL AND RECOMMENDED SPARES)**

(UNPRICED) (For one Set of FM Mono & Stereo Mod Monitor including RF Amplifier)

<b>S No.</b>	<b>Description</b>	<b>Quantity</b>
	(OPTIONAL) :	
1.0	ESSENTIAL AND RECOMMENDED SPARES :	
1.1	Modules	LS
1.2	PCBs	1 Set
1.3	Any other item offered by the firm for the completeness of equipment	1lot
2.0	Remote Computer Interface (optional)	1 Set
3.0	Telemetry Interface etc. (optional)	1 Set

**List of Places for Supply of FM Mono Stereo modulation monitor with RF amplifier.**

Sr. No	Name of Places	Qty.
1	Cudapah	1
2	Dibrugarh	1
3	Tejpur	1
4	Thirussur	1
5	Parbhani	1
6	Ratnagiri	1
7	Bhadravati	1
8	Sangli	1
9	Jeypore	1
10	Kota	1
11	Tuticorin	1
12	Rampur	1
13	Bhuj	1
14	Ambikapur	1
15	Chhatarpur	1
16	Gwalior	1
17	Jalgaon	1
18	Tura	1
19	Bhawanipatna	1
20	Sambalpur	1
21	Ajmer	1
22	Almora	1
23	Agra	1
24	Kurseong ( Scheme -I)	1
25	Jammu	1
26	Poonch	1
27	Nawgaon	1
28	Aizwal	1
29	Kailashaahar	1
30	Kothagudem	1
31	Sasaram	1
32	Bilaspur	1
33	Raigarh	1
34	Hazaribagh	1
35	Chitradurga	1
36	Betul	1
37	Shahdol	1
38	Beed	1
39	Satara	1
40	Chandrapur	1
41	Rourkela	1
42	Bhatinda	1
43	Patiala	1
44	Nagaur	1
45	Churu	1
46	Bareilly	1

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47	Faizabad	1
48	Obra	1
49	Murshidabad	1
50	Panaji	1
51	Cuttack ( Scheme –I)	1
52	Cochin	1
53	Jalandhar	1
54	Jaisalmer	1
55	Allahabad	1
56	Dharmshala	1
57	Kasauli	1
58	Mussorie	1
59	Jaipur	1
60	Cuttack( Scheme –II)	1
61	Jamshedpur	1
62	Kurseong ( Scheme –II)	1
63	Adilabad	1
64	Keonjhar	1
65	Darjeeling	1
66	Balurghat	1
67	Dhanbad	1
68	Bhardman	1
69	Haldawani	1
70	New Tehri	1
71	Coochbihar	1