

**PRASAR BHARATI
DIRECTORATE GENERAL: ALL INDIA RADIO
PLANNING & DEVELOPMENT UNIT**

SPECIFICATION DOCUMENT FOR BROADCAST AUDIO PROCESSOR

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SUMMARY OF CONTENTS:

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2. Section II : Schedule of requirements (P.No.6)

N.B:1. The tenderer should go through all the clauses of this specification document carefully and should confirm clause-by-clause compliance clearly. Tenders received without clause by clause compliance are liable to be rejected.

2. The tenderer should indicate the items offered as per schedule of requirements, without cost details in technical bid to assess the completeness of offer against AIR's requirement.

(R.K.SAINI)
DY. DIRECTOR ENGG. (TD)

SECTION - I

TECHNICAL SPECIFICATION FOR BROADCAST AUDIO PROCESSOR

1. GENERAL:

The audio processor shall be a part of the audio input chain to AM-DRM Transmitters. The equipment should be capable of processing sound in digital domain for producing very clear and punchy sound providing balance between optimum loudness & high quality with substantial improvement in speech/spoken words and music quality for high modulation and simultaneously offering protection to transmitter also. The equipment should be fully solid state, self-contained, compact, and easy to set up, simple to use, efficient for working round-the-clock, 365 days a year and based on field-proven design.

2. DESIGN & GENERAL CONFIGURATION:

The equipment should have:

- (a) A minimum five band compressor / limiter function for optimum loudness & high quality
- (b) Built in digital processing having A/D & D/A conversion with minimum of 24 bit resolution.
- (c) Provision for final clipper/peak limiter for protection against peak over modulation
- (d) Provision for transmitter equalization
- (e) Front panel controls/metering
- (g) By pass mode.
- (h) Should be capable to accept analogue mono/stereo, as well as digital audio signals & should deliver analogue mono/stereo as well as digital audio signals.

3. TECHNICAL PARAMETER:

3.1	Total System	
a)	Frequency response (Bypass Mode, Analog Processing Chain)	± 0.2 dB, 50Hz -9.5KHz
b)	Frequency response (Bypass Mode, Digital Processing Chain)	± 0.2 dB, 5Hz-15kHz
c)	Distortion (de-emphasized 100% modulation)	i) 0.05% or less 30Hz-9.5KHz ii) 0.02% or less SMPTE IM Distortion.
d)	Low-Pass Filter (processing for analog modulation)	4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0 or 9.5 (NRSC) KHz

e)	Low-Pass Filter (processing for digital modulation)	15KHz
f)	High-Pass Filter (processing for analog modulation)	50, 60, 70, 80, 90 or 100Hz user settable.
g)	High Pass Filter (processing for digital modulation)	1 Hz
3.2	Analog Audio Input	
a)	Configuration	Stereo
b)	Impedance	>10k Ω load impedance, electronically balanced.
c)	Nominal Input Level	-4.0 to +13.0 dBu (VU) adjustable
d)	Maximum Input Level	+27dBu
e)	Connectors	Two XLR-type, female, EMI-suppressed
f)	A/D Conversion	24 bit
3.3	Analog Audio Output	
a)	Configuration	Two stereo pairs, capable to driving two transmitters.
b)	Source Impedance	50 Ω
c)	Load Impedance	600 Ω
d)	Output Level (100% peak modulation)	Adjustable from -6dBu to +24 dBu peak, into 600 Ω
e)	Signal-to-Noise	90dB or better, unweighted
f)	L/R Crosstalk	-70dB or less, 30Hz – 9.5 kHz.
g)	Distortion	0.01% or less, 30Hz – 9.5 kHz bandwidth
h)	Connectors	Four XLR-type, male, EMI suppressed,
i)	D/A Conversion	24 bit
3.4	Digital Audio Input	
a)	Configuration	Stereo as per AES3 standard, 24 bit resolution, selection of stereo, mono from left, mono from right or mono from sum.
b)	Sampling Rate	32, 44.1, 48, 88.2 or 96 kHz. Automatically selected
c)	Connector	XLR type, female, EMI-suppressed
d)	Input Impedance	110 Ω
e)	Input Reference Level	Variable from -30dBFS to -10dBFS
3.5	Digital Audio Output	
a)	Configuration	Stereo as per AES3 standard
b)	Sample Rate	Internal free running at 32, 44.1, 48, 88.2 or 96 kHz

c)	Connector	Two XLR-type, male, EMI-suppressed
d)	Impedance	110 Ω impedance
e)	Output Level (100% peak modulation)	-20.0 to 0.0dBFS
3.6	Remote Computer Interface	
a)	Configuration	TCP/IP protocol via direct cable connect, modem, or Ethernet interface.
b)	Serial Port	115 kbps RS-232 port DB-9 male. EMI suppressed.
c)	Ethernet Port	10 or 100 Mbit/s on RJ45 female connector.

4. ENVIRONMENTAL:

a)	Operating Temperature	0° to 45°C
b)	Humidity (RH)	0 -95%, non-condensing
c)	Mounting	19" rack mounting

5. POWER SUPPLY:

a)	Voltage	230VAC \pm 5%,
b)	Frequency	50Hz
c)	Safety Standards	ETL listed to UL standards, CE marked.

6. DELIVERY OF EQUIPMENT:

The delivery of the entire equipment at AIR's transmitter site, shall be completed within **12 (Twelve)** months from the date of placement of order in case of INR Quote/ date of opening of LC in case of FOB quote.

7. TECHNICAL MANUALS:

Technical Manuals covering operating instruction, detailed circuit descriptions, schematic/circuit drawings for operation & maintenance/ service, in printed as well as electronic format, shall be supplied along with each equipment.

8. GUARANTEE:

The equipment shall be guaranteed for a minimum period of one year from the date of putting the equipment into service.

9. SPARES:

Essential and recommended spares (Discreet and Modules) shall be quoted separately. If not recommended the same may be specified.

10. ACCESSORIES:

The equipment shall be supplied along with all the standard accessories such as mating XLR connectors for input, output, remote interface and power supply chord etc.

11. OPTIONS:

Optional items, if any may be quoted separately.

SECTION - II

SCHEDULE OF REQUIREMENTS / PRICES

AIR requires the following equipment as per specifications detailed under Sections I. The tenderer shall quote price of each item separately with necessary break-up details keeping in view the following:

- i. Make & Model of each item, to be indicated.
- ii. Indenter reserves the right to choose & decide the quantity of Equipments at the time of finalization of Tender.
- iii. All items mentioned in the Schedule under Sl. No. 1 to 2, will be taken in to consideration for ranking purpose where as all items mentioned in the Schedule under Sl. No. 3 to 4, will not be taken in to consideration for ranking purpose. However the tenderer must quote for all the items under the schedule of requirements.
- v. Present requirement is for the following stations:
 - 1) 20kW MW transmitter Guwahati'B', Delhi (VB), Barmer, Bikaner, Chennai (VB), Tawang
 - 2) 50kW MW transmitter Mumbai 'C'
 - 3) 100kW MW transmitter Vijaywada, Patna, Panaji, Ranchi, Mumbai'A', Mumbai'B', Pune, Tiruchirapalli, Varanasi, Kolkata B, Passighat
 - 4) 200kW MW transmitter Delhi'A', Ahemdabad, Bangalore, Dharwad, Jabalpur, Ajmer, Chennai 'A', Siliguri, Kolkata A, Itanagar
 - 5) 300kW MW transmitter Jammu, Dibrugarh, Suratgarh, Rajkot, Jalandhar, Lucknow

S. No.	Requirements for each site	Quantity
1	Broadcast Audio Processor for AM-DRM transmitter complete with all standard accessories.	1 set
2	Technical Manuals	1 set
3	Spares (Discreet and Modules) recommended by the O.E.M	1 set
4	Optional items, if any	1 set