प्रसार भारती/Prasar Bharati
(भारत का लोक सेवा प्रसारक)
(India's Public Service Broadcaster)
आकाशवाणी महानिदेशालय /Directorate General: All India Radio
योजना एवं विकास एकक, आकाशवाणी भवन, संसद मार्ग, नई दिल्ली-110001
P & D Unit, Akashvani Bhawan, Sansad Marg, New Delhi-110001
[एफ. एम. डिजाईन अनुभाग /FM Design Section]
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File No. Specs-Spectrum-Analyzer-9/4/2025-D(TD/FM) Dated 02.06.2025

Subject: Specifications for Supply of Portable RF Analyzer with Spectrum Analyzer, Field Strength Meter, Cable and Antenna Analyzer for the 5kW/10kW/20kW FM transmitter set up under BIND Schemes 2021-22 to 2025-26-**regarding Industry feedback & budgetary quotes.**

Dear Sir,

DG:Akashvani is planning for procurement of above referred equipment/items, on open tender basis. Draft technical specifications are enclosed for reference.

In this regard, the Prospective bidders from India are requested to give their industry feedback (if any) on the above referred draft Specifications **up to 16.06.2025**. The Prospective bidders from India are also requested to give their budgetary quote for the above referred subject **up to 16.06.2025.**

Industry feedback (if any) and budgetary quote may be sent to this Directorate at the following e-mail addresses.

ravindragoyal@prasarbharati.gov.in
jskatara@prasarbharati.gov.in
viveksingh@prasarbharati.gov.in
onpradhan@prasarbharati.gov.in

Encl: As above.

02/6/2025
(O.N. Pradhan)
Dy. Director (Engg.)

For Director General

To: (through email)

1. Prasar Bharati web-site
2. The Prospective Bidders
3. DDG (E-Purchase), P&D Unit, DG: AIR, New Delhi

For Director General 02/6/2025

Spec. No: Spectrum Analyzer/FM/2/May /2025/-D (TD/FM)

Prasar Bharati
(*India's Public Service Broadcaster*)
Directorate General: All India Radio
Planning & Development Unit
Akashvani Bhawan, Sansad Marg, New Delhi-110001
[FM Design Section]
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Specification for Portable RF Analyzer-Spectrum Analyzer with Field Strength measurement and Cable & Antenna Analyzer

[Total number of pages – 9]

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1. Each statement of this specification has to be complied with &supported by printed technical literature/data sheets from the manufacturer of the equipment by the tenderer along with Technical manual of the Portable RF Analyzer-Spectrum Analyzer with Field Strength measurement and Cable & Antenna Analyzer to assess to merit of the offer, without which tender will be considered incomplete & is liable to be rejected. The Tenderer should make a detailed offer while quoting for Portable RF Analyzer-Spectrum Analyzer with Field Strength measurement and Cable & Antenna Analyzer.

2. The Tenderer shall submit schedule of material /requirement without *price* *as in Section III (A) & Section III (B)* of AIR Specification (two bid system i.e. technical bid and commercial bid).

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 shall submit clause by clause technical compliance in the tender offer to AIR in the format given below, failing which the tender shall be considered in complete and shall be liable to be rejected.

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Sr. No. of AIR Spec. Section wise& Clause wise	Details of AIR Spec.	Make & Model No of the Equipment offered	Performance figures of equipment.	Compliance Yes/NO	Ref to tender page No.	Remarks
Section I						
Section II						
Section III(A)						
Section III(B)						

5. Tenderer shall quote the rate / cost of individual items in the tender offer while submitting the offer for spares in commercial bid.

6. The complete technical compliance Section I to III must be signed & stamped by the Original Equipment Manufacturer (OEM) of the equipment in the tender document. In case tender offer is from other than the Original Equipment Manufacturer, the tenderer must also sign & stamp each page of the compliance technical statement section I to III. The OEM & 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, failing which the tender shall be considered in complete and shall be liable for rejection.

7. Optional items shall not be counted for ranking purpose.

SECTION-I
GENERAL SPECIFICATION

SCOPE**:** This specification lays down the general, technical and performance parameters requirement of the equipment to be used for the measurement of RF signal with Field Strength measurement and Cable & Antenna measurement of VHF FM transmitters.

The equipment should be simple in operation, fully solid state, and portable type hand held battery operated with all standard accessories and fully tropicalized in order to ensure guaranteed performance under environmental conditions. **The equipment shall conform to international broadcasting measuring standards.**

1.1 **Please refer tender documents for general terms 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**: Portable RF Analyzer-Spectrum Analyzer with Field Strength measurement and Cable & Antenna Analyzer will be accepted on the basis of OEM's test certificate of actual performance measurements as per standard International manufactures practice before dispatch to AIR and receipt of equipment at site in good condition.

1.3 DETAILS REQUIRED ALONG WITH TENDER

(i) The complete technical compliance Section I to III must be signed & stamped by the Original Equipment Manufacturer (OEM) of the equipment in the tender document. In case tender offer is from other than the Original Equipment Manufacturer, the tenderer must also sign & stamp each page of the compliance technical statement section I to III. The OEM & 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, failing which the tender shall be considered in complete and shall be liable for rejection.

(ii) Complete **printed technical literature/data sheets/detailed information** including technical manuals in support of compliance statement should be furnished for all the items of the tender from the manufacturer of the equipment to assess the full merit of the offer without which tender will be considered in complete and is liable to be rejected.

(iii) Complete technical information, details, parameters as mentioned in **Section -II (technical specifications)** as above are to be submitted with tender *by the tenderers.*

(iv) Complete set of T*echnical* drawings, giving full details and dimensions of equipment with complete list of items to be submitted with tender.

(v) A write up giving full working details and salient *technical* features of the equipment are to be submitted with tender by the tenderer. A copy of tech. manuals including specifications of equipment and installation / operation instructions are to be forwarded with tender.

(vi) In support of Tenderer's claim above, an "up-to-date" list of their customers is required to be submitted ***Names, Postal address, E-mail address and Fax numbers of customers must be indicated along with complete set of actual performance figures are to be furnished with the tender.***

(vii) Country of origin , make, model are to given in tender by the tenderer.

1.4 **EXPERIENCE (Supply):**

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

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

(i) For each complete Portable RF Analyzer-Spectrum Analyzer with Field Strength measurement and Cable & Antenna Analyzer **two** printed and duly bound copies of manuals and books for Operation, Maintenance, and Fault diagnosis are to be supplied to consignee.

(ii) Three Complete set, of these documents i.e. **printed & duly bound** set of *Operation & Maintenance* manuals for each Portable RF Analyzer-Spectrum Analyzer with Field Strength measurement and Cable & Antenna Analyzer against the order are required to be sent to the following officers / offices / places:

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(a) Zonal Offices (Project Wing) - 5 set *(one each for 5 Zones)*
(b) Technical Library, P&D Unit, DG: AIR - 1 set
(c) NABM (Technical) - 1 set
Total - 7 sets

One Soft copy of these documents is also required in pen drive for use with PC to be delivered to DDG(TD), P & D Unit, DG Akashvani.

1.6 **ISO CERTIFICATION**: The tenderer should either be original equipment manufacturer or supply the equipment only from the original equipment manufacturer. Original equipment manufacturer should have ISO Certification or equivalent for the manufacturing work and the documentary proof for the same are to be enclosed with the tender.

1.7 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.

1.8 **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 tender's offer and agreed to in the contract.

(ii) A guarantee to make good within 30 days at tenderer expense any component which becomes defective under normal operating conditions during 36 months from the date of acceptance of the equipment at respective site.

(iii) A guarantee to supply all components for a period of 10 years from the date of acceptance of equipment at site, at rates at which these are being supplied by tenderer to other customers & also should match prices of original manufactures of these components prevailing at the time.

(iv) If at any stage, during next 10 years, the manufacturer stops production of this model of equipment , tenderer shall intimate All India Radio in advance to enable the Intender to stock the critical items.

1.9 **SERVICE FACILITY:**

The Tenderer shall specify the repair/service facility available for the equipment in India with address, Phone/Fax nos., E-mail etc.

1.10 **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, and quantities shall be in MKS.

1.11 **DELIVERY OF EQUIPMENT:**

Within **Three months (03)** from date of order. The equipment to be supplied at D-6 Godown of O/o ADG (NZ), AIR & DD, New Delhi.

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SECTION - II
TECHNICAL SPECIFICATION

2.1 DESIGN & GENERAL CONFIGURATION OF SPECTRUM ANALYZER

Portable RF Analyzer-Spectrum Analyzer with Field Strength measurement and Cable & Antenna Analyzer/ equipment should have following features:

Specification of Portable RF Analyzer - Spectrum Analyzer with Field Strength Measurement & Cable & Antenna Analyzer		
	Technical Specifications	
Sr. No.		
A	**Spectrum Analyzer**	
1.1	Frequency Range:	Spectrum Analyzer : 9 KHz to 4 GHz
1.2	Analysis Bandwidth	20 MHz or more
1.3	Built-in Frequency Counter Function	0.001 Hz or better
1.4	Sweep/Data Points	10,000pts or better for Spectrum Analyzer
1.5	Accuracy (-10 to + 55deg.C)	≤ ± 1.3ppm or better (including Aging)
1.6	Amplitude Accuracy	Typically ± 0.5 dB or better for 9 KHz to 4GHz
1.7	Tuning resolution:	1 Hz or better
1.8	RBW&VBW (3dB)	RBW: 1Hz to 5MHz or better in steps. 1 Hz to 10 MHz in zero span. VBW: 0.1 Hz to 5MHz, 1 Hz to10 MHz in zero span
1.9	Sweep Time (Zero span)	100ns to 3000 sec or better.
2.0	Sweep rate (non-zero span)	30 GHz/s or better
2.1	Dynamic range :	>104 dB at 1 GHz or better
2.2	Measurement range:	-160 to +30dBm or better.
2.3	Preamplifier	Built-in required.
2.4	SSB phase noise at 1GHz offset of 10 KHz:	-90 dBc/Hz or better
2.5	Third Order Intercept	Spectrum Analyzer : @ 4.0 GHz, +10 dBm(typ.) or better
2.6	Detector:	Peak, Negative, Sample and True RMS
2.7	Input Attenuator	0 dB to 50 dB in 5 dB steps or better
2.8	Displayed Average Noise Level:	-160dBm ≥ 10 MHz to full frequency range with preamplifier ON or better
2.9	Damage Level (without external attenuator)	5W or better , ± 50V dc
3.0	No. of Traces and Detection	6 or more with selection of independent detection type for each trace

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3. 1	Marker Function (Spectrum Analyzer), no of traces	Up to 10 or more Markers Normal, Delta, Fixed, Noise, Frequency Counter, Peak Search, Marker to Center, Marker to Ref Level, Marker table.
3.2	RF Trace Record and Playback	Should be available
3.3	Measurements	**a.** RF channel power, Occupied Bandwidth, Adjacent Channel Power Ratio, Frequency Counter Marker **b.** AM/FM demodulation Analysis - RF Spectrum, Audio Spectrum (AM Rate, RMS Depth, (Pk-Pk)/2 Depth, SINAD,. THD, Distortion, FM Rate, RMS Deviation & (Pk-Pk)/2 Deviation) & channel occupancy. c. Audio Recording in ".wav format or equivalent" should be provided. **d.** Adequate storage for Audio Recording upto 24 Hrs. or more should be provided. **e.** Audio Spectrum trace should provide info about mono audio, stereo pilot, left- right stereo channels and RDS sub carrier. **f.** Demodulated audio display should be available.
3.4	Spectrogram	Spectrogram should be provided for monitoring captured and recorded intermittent and drifting transmission signals or over-the-air received signals.
B	**Field Strength Measurement**	
1.1	Frequency Range:	9 KHz – 1 GHz
1.2	EMF voltage measurement	Should be possible to measure the EMF Voltage from -5 dBµV to +120 dBuV or better
1.3	Field Strength Measurement	Should be possible to measure the field strength from -5 dBµV to +120 dBuV/m or better

1.4a	Received Signal/Field Strength Measurement & Coverage Mapping	Field Strength Coverage Mapping should be available. It should be possible to acquire a selected target geographical area from Google Map on to Instrument screen for performing RSSI -Received Signal/Field Strength coverage Mapping stamped with GPS coordinates. It should be possible to save the mapping results to the internal memory of the instrument. Software should be provided for transfer of RSSI Coverage Mapping data to external PC or Laptop using USB or LAN for post -processing and later comparison and analysis.
1.4b		Field Strength Measurement results should be available in dBµV/m, dBmV/m², dBw/m² units

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1.5	Antenna system for Field Strength Measurement	Frequency Range: 80 MHz to 120 MHz or better. Type : Half wave, Tuned, Dipole Antenna Isotropic gain :up to 2 dB or better Impedance : 50 ohms Connector type : N -Female Calibration of Antenna: Individually Calibrated both at 3m and 10 meter height. Calibration test data and Certificate of Calibration to be provided. Tripod -Construction : Non-metallic (non-reflective), rugged Tripod with Collapsible telescopic' legs, light weight having easy height Adjustment up to 2meters, Standard 1/4-20 mounting threads with rugged Azimuth and Elevation Head should be supplied. Pole should be supplied for Vertical height Extension for making measurements at height from ground upto 3meters or more. RF cable - Low loss, length in 10 meter or more suitable for making field strength measurement at 3 m & 10 m height from the ground should be supplied. Carrying Bag: Suitable Carrying bag should be supplied for carrying Antenna System in the field.
1.6	GPS/GNSS Receive -	The instrument should have built-in GNSS (GPS) receiver to provide the Longitude, Latitude in six figure co-ordinate and Altitude-in meters. It should be possible to stamp GPS information on measured traces and then save it in internal memory. Suitable GPS antenna with min 5m cable should be offered.
C	**Cable and Antenna Analysis**	
1.1	Frequency Range	5 KHz to 4 GHz
1.2	Frequency Resolution 1 Hz	1 Hz
1.3	Aging Rate	≤ ± 1 ppm
1.4	Measurements	Return Loss, VSWR, Cable Loss, DTF Return Loss, DTF VSWR, Smith Chart (S11), I-Port Phase, TDR (Ohm/Linear), 1- Port Insertion Loss, 2-Port Insertion Loss, Gain/ Loss measurement & Isolation. It should be possible to test/ tune filters, Amplifiers, Duplexers, Diplexers, Repeaters, Combiners and other such RF devices used in Radio Transmission.
1.5	DC Bias Voltage	1 V - 30 V, Current - 1 amp (max.)
1.6	Sweep Speed	≤ 750 [µsec/data point
1.7	Measurement range	Cable Loss: 0 dB to 30 dB Return Loss: 0 dB to 40 dB VSWR: 1.01 to 1:10 Smith Chart : 1 ohm to 50/75 ohm 1- port Phase (S11) Distance-to-Fault VSWR/Return Loss: 600 meter or more

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		TDR Measurement: It should be possible to measure the change in impedance vs. distance or length of the transmission line.
D	**General**	
1.1	Accessories required for above measurements including Phase Stable Test port cables , 1 meter (2 nos.), Soft Carry Case, USB/LAN Cable for PC interface, Calibration Kit for Cable Antenna Analyzer , etc. should be supplied. Technical Manuals should be supplied. Licensed Software supplied, if any, should be perpetual with life time validity and free upgrades.	
1.2	RF Input & Out Ports	Type N(f) 50 Ohm
1.3	Power Supply	230 V ± 10%; 50 Hz ± 5%, Rechargeable Battery- Li-On, Operating Hours > 3Hrs
1.4	Display	Inbuilt 8 inch color display with touch screen or better.
1.5	Internal Memory	5GB or more
1.6	Connectivity and Data Transfer Interfaces	Remote Control feature, USB C- Type, Ethernet Port
1.7	Warranty for the instrument and Antenna System	3 years standard
1.8	Temperature & humidity:	-10 °C to 55 °C, Humidity 95 %
1.9	Calibration Certificate for the instrument and Antenna System	Should be provided along with supply
2.0	Operation & Preventive Maintenance Training Should be supplied by the OEM	

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SECTION - III (A)

SCHEDULE OF REQUIREMENTS / MATERIALS (UNPRICED)

[FOR ONE SET OF Portable RF Analyzer-Spectrum Analyzer with Field Strength measurement and Cable & Antenna Analyzer for **VHF FM Transmitter]**

S NO.	Description	Qty
3.0	Spectrum Analyzer with Field Strength measurement and Cable & Antenna Analyzer for VHF FM Transmitter Complete as per AIR Spec. No: BIND plan/Spectrum Analyzer/FM/2/May/2025/-D (TD/FM)	1 Set Complete
3.1	Any other accessories offered for the completeness of the system (Items wise details of offered and included material , including part number are to be given by the tenderer)	1 lot

SECTION-III (B)

OPTIONAL ITEMS:

[FOR ONE SET OF Portable RF Analyzer-Spectrum Analyzer with Field Strength measurement and Cable & Antenna Analyzer for VHF FM Transmitter]

S NO.	Description	Qty
3.2	**(Optional) Spares:** *(Items wise details of offered material including part number are to be given by the tenderer)*	1 Set

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