

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]

File No. Specification-FM Combiner/BIND-9/4/2023-D(TD-FM)

Dated 06.12.2024

Subject: Specifications for Supply of FM Combiner under BIND Scheme 2021-26 at (1+7) places-**regarding Industry feedback & budgetary quotes.**

Dear Sir,

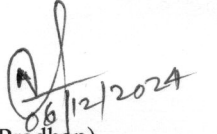
DG: Akashvani is planning for procurement of above referred equipment/items, on open tender basis. Draft technical specifications are enclosed for reference.

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 23.12.2024** To get an estimated cost, the Prospective bidders from India are also requested to give their budgetary quote for the above referred subject **up to 23.12.2024**.

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

ravindragoyal@prasarbharati.gov.in
viveksingh@prasarbharati.gov.in
devesh@prasarbharati.gov.in
yogendraair@prasarbharati.gov.in

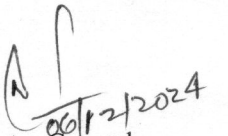
Encl: As above.


(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

PRASAR BHARATI
(India's Public Service Broadcaster)
DIRECTORATE GENERAL: ALL INDIA RADIO
(PLANNING & DEVELOPMENT UNIT)

Specification for Supply of FM Combiner with copper rigid lines & accessories etc.

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A. ESSENTIAL REQUIREMENT FOR THE TENDER:

1. (i) The tenderer should submit Schedule of Requirements/Materials for supply without *price in the same format as given in Section-5.0* of AIR Specification in the technical bid, failing which, the tender shall be considered incomplete and is liable to be rejected.
(ii) It is also mandatory to mention ***Make & Model of the offered Equipment*** in the Schedule of Requirements/Materials of supply, failing which, the tender shall be considered incomplete and is liable to be rejected.
2. Each statement of the technical specification has to be complied with & supported by printed technical literature, technical data sheets, schematic drawings and technical manuals from the manufacturer of the equipment by the tenderer to assess the full merit of the offer, failing which, the tender shall be considered incomplete and is liable to be rejected.
3. The tenderer should submit the tender offer to AIR in the format given below, section wise & clause wise, in respect of all the sections of technical specifications. The OEM/tenderer must provide the page number reference, in column (4) of the table given below, of the technical bid clearly indicating the volume number also, if any, for each supporting document to verify the parametric values shown in the compliance statement, to assess the full merit of the offer, failing which the tender shall be considered incomplete and is liable to be rejected.

Specification No Supply of FM Combiner /BIND 2021-26/9/4/2024-D(TD/FM)

S. No. of AIR Specifications (Section wise & Clause wise) (1)	Details of AIR Specifications (Part/ Section wise & Clause wise) (2)	Compliance (Yes/No) (3)	The page no. of the tender offer, where the information/ supporting document is available. (4)	Remarks (5)
A. Essential requirements for tenderers				
B. Essential eligibility criteria for tenderer				
Section-1.0 Clause wise				
Section-2.0 Clause wise				
Section-3.0 Clause wise				
Section-4.0 Clause wise				

4. The complete technical specifications (Section wise & Clause wise) compliance statement along with Schedule of Requirements/Materials (un-priced) must be signed & stamped on each page by the respective Original Equipment Manufacturer (OEM) in the tender document including the clarifications, if any, asked by AIR, failing which the tender shall be considered incomplete and is liable to be rejected.
In case tender offer is from other than the Original Equipment Manufacturer, the tenderer must also sign & stamp each page of the complete Technical specifications compliance statement (Section wise & Clause wise) including the clarifications, if any, asked by AIR, failing which the tender shall be considered incomplete and is liable to be rejected. The OEM & tenderer should mention their names in CAPITAL LETTERS & designation of the signatories, full address with pin code, phone number, fax number, e-mail addresses etc.
5. All the volumes of the entire tender offer must be page numbered.
6. The authorization and guarantee must be given by respective Original Equipment Manufacturer (OEM) on their letter head pad duly signed & stamped on each page. In case tender offer is from other than the Original Equipment Manufacturer, the tenderer must also give guarantee on their letter head pad duly signed & stamped on each page, failing which the tender shall be considered incomplete and is liable to be rejected without any notice/back reference. Guarantee shall be as per the format given in clause 13 of Section-2.0
7. In case tender offer is from other than the Original Equipment Manufacturer, the tenderer should also furnish a certificate from the OEM that the tenderer can quote items of the OEM directly, failing which the tender shall be considered incomplete and is liable to be rejected without any notice/back reference.
8. Public Procurement (Preference to Make in India) Order No. P-45021/2/2017-B.E-II dated 15.06.2017 of Government of India, Ministry of Commerce and Industry, Department of Industrial Policy and Promotion shall be applicable.
9. Any change/modifications in the AIR technical specifications format, language, technical parameters or of any other nature including the deletion of clause, words, lines in the technical compliance statement by the OEM/ tenderer will not be acceptable to AIR and the tender is liable to be rejected.

B. ESSENTIAL ELIGIBILITY CRITERIA FOR TENDERER:

- (a) The tenderer should either be the OEM of FM Combiner or their authorized representative/dealer.
- (b) (i) The OEM of the FM Combiner must have an experience of manufacturing and supplying FM Combiners for at least last 10 years. Documentary evidence to support this must be provided.
- (ii) The OEM should have supplied FM Combiners to reputed/public broadcasters. The OEM must provide the details of past supply record (**in the format given below**) for at least 07 Nos. of such offered FM Combiners of power ratings $\geq 45\text{kW}$, supplied during last five years ending last day of the month previous to the one in which the tender is invited.

Order No. with date, reference	FM Combiner Type, Model with Output Power rating	Qty.	Name of the broadcaster with full postal address including e-mail address to whom FM Combiner was supplied, for getting feedback on FM Combiner performance	Remarks
(1)	(2)	(3)	(4)	(5)

(iii) All India Radio reserves the right to get performance feedback of the FM Combiners from any of the above broadcasters named by the tenderer/OEM.

(iv) Copies of orders for supply and Completion certificates/delivery challans/invoice of at least 4 Nos., out of the 7 Nos. of FM Combiners submitted by the tenderer in above format, are also to be enclosed by the tenderer.

- (c) In case the tenderer is the authorized representative/dealer, the tenderer must be an authorized representative/dealer of any OEM of FM/TV Combiners **OR** must be in the business of sales and supply of FM/TV Combiners for last three years or more. Documentary evidence to support this must be provided.
- (d) The OEM of the offered FM Combiners must have his local office/authorized representative/dealer in India for after sales support. **A certificate as per Annexure-II** duly signed by the OEM as well as local office/authorized representative/dealer must be submitted with the offer. Copy of Agreement/MoU executed between OEMs and their authorized representative/dealer duly signed by both must also be submitted with the offer.

SECTION-1.0

TECHNICAL REQUIREMENTS at following sites.

Project Sl.	FM Combiner with Accessories	RF coaxial copper rigid lines & accessories	RF coaxial air dielectric Cable & accessories	Unit
1	Bhavnagar	Yes, Required	Not Required	Combiner-1No
2	Nandyal	Yes, Required	Not Required	Combiner-1No
3	Leh	Yes, Required	Not Required	Combiner-1No
4	Darbhanga	Yes, Required	Not Required	Combiner-1No
5	Vellore	Yes, Required	Not Required	Combiner-1No
6	Kumbakonam	Yes, Required	Not Required	Combiner-1 No
7	Dwarka	Yes, Required	Not Required	Combiner-1No

Note:- Combiners/Diplexers may be utilized any where in India. Places/ Quantity may changed.

SECTION-2.0

GENERAL SPECIFICATIONS

Note : Please refer tender documents for general terms and conditions of supply of FM combiners 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.**

All equipment and items of supply as per AIR specification shall be used for round the clock operation.

1.0 SCOPE:

Supply of FM Combiners, RF coaxial copper rigid lines, and accessories as per AIR specification.

The broad scope of above Supply are:

1.1 FM Combiner with accessories as per AIR specification.

1.2 RF coaxial copper rigid lines as per specification.

1.3 RF patch panel with metering etc.

2.0 For completion of the supply all items, fittings and accessories which are necessary for the setup, which may not have been specifically mentioned or which the tenderer may not explicitly mention in the tender but the same are necessary for the operation of the equipment shall be deemed to be included in the tender and shall be provided by the successful tenderer without any additional payment by AIR. The full technical details and technical literature/pamphlets shall be submitted by the tenderer.

3.0 INSPECTION:

- a. Detailed inspection of complete FM Combiner system will be carried out at Manufacturer's works by **two engineers** of All India Radio as per details given in Annexure-I.
- b. Call for Pre-dispatch Inspection (PDI) of all FM Combiners at OEM's Works is to be given by the tenderer to All India Radio at least **6 weeks** in advance. Inspection period shall be N+1 days for FM Combiner system etc. Testing/measurements reports as per approved ATP must be submitted to All India Radio along with the call for inspection of FM Combiners for analyzing etc.
- c. For AIR inspecting engineers, expenses towards to and fro air journey, boarding, lodging etc. will be borne by All India Radio.
- d. The complete Acceptance Test Procedure/Protocol (ATP) will be prepared by the OEM of the FM Combiner and other equipment/items as per Section-5.0 and submitted to DDG (E-FM), P&D Unit, DG: AIR for approval within one month of issue of Acceptance of Tender. ATP will also indicate full details of setup for measuring/testing equipments to be deployed during the performance measurements/inspection at factory. The **approved ATP** shall form the basis for performance measurements/inspection to be carried out. AIR has the right to include other technical parameters in ATP submitted by OEM within the ambit of specification of the product offered.
- e. All other associated equipment, items and accessories i.e. RF coaxial copper rigid line, RF Connectors/ Adoptors, , tray etc. will be accepted on the basis of OEM's test certificates (as per AIR specifications) duly stamped and signed by respective OEM on the letterhead of the OEM, failing which, test certificates will be considered incomplete and equipment offered by the firm is liable to be rejected.

4.0 DELIVERY PERIOD:

Supply, at site will have to be completed within 7 months from the date of Acceptance of Tender.

However, the Payment for the tender shall be linked to various milestones of and testing work as detailed below:

S. No.	Milestone	Payment
1	On receipt of Complete Equipment as per Schedule of Requirements/Materials for supply in good condition at site	80% of Equipment/Items Cost
2	After successful completion of site acceptance test at site	

5.0 LANGUAGE/UNITS:

All information supplied by the tenderer and all markings, notes, designation on the drawings and associated write-ups including Instruction Manuals shall be in **"English language" only**. All dimensions and units on drawings and all references to weights, measures and quantities shall be in **SI units**.

6.0 INFORMATION TO BE SUPPLIED WITH THE TENDER:

- (i) The complete technical specifications (Section wise & Clause wise) compliance statement alongwith Schedule of Requirements/Materials (un-priced) duly signed & stamped on each page by the respective Original Equipment Manufacturer (OEM) and countersigned by the tenderer as per the format given above in clause A (3), to assess the full merit of the offer, without which the tender offer will be considered incomplete and is liable for rejection.
- (ii) Complete printed technical literature/data sheet/schematic drawings/detailed information including technical manual of FM Combiner and associated equipments/items as per Section-5.0 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 offer will be considered incomplete and is liable for rejection.
- (iii) Detailed Schedule of Requirements/Materials offered for supply of the FM Combiner, associated equipments & accessories should be in conformity with Section-5.0 without any change in the format without price, failing which, the tender will be considered incomplete and is liable for rejection. The tenderer must quote all items.
- (iv) Descriptive information and complete details of each equipment offered shall be given by the tenderer.
- (v) Country of Origin, Make, Type & Model of all the offered items should be mentioned including the name & address of their vendors.
- (vi) A copy of the Technical Manual must be enclosed with technical bid for assessing the complete FM Combiner system. The Technical Manual must include at least the details given below:
 - (a) General description of the offered FM Combiner, block diagram/schematic drawings etc.
 - (b) A suggestive drawing/ floor equipment layout plan with dimensions in metres for installation of the FM Combiner system with all allied equipment.
 - (c) Diagrams showing the isometric view of FM Combiner and allied equipment with dimensions in metres.
 - (d) Installation Manual & drawings with dimensions in respect of offered equipment.
 - (e) The procedure of frequency tuning of FM Combiner should be described in detail with practical examples.
 - (f) Photograph of the FM Combiner showing Front, Rear, Side & Top view of the FM Combiner.
 - (g) **All Do's and Don'ts which are essential for safe Installation, Operation & Maintenance of the FM Combiner.**

7.0 INFORMATION TO PRECEDE DESPATCH OF EQUIPMENT:

Following information should be supplied to The DDG (E-FM), P & D Unit, DG: AIR and the consignee prior to dispatch of equipment:

- (a) Detailed list of equipments under dispatch.
- (b) Photograph showing location of various units/subunits with item numbers marked thereon.

8.0 INFORMATION TO BE SUPPLIED BY THE TENDERER WITHIN ONE MONTH AFTER ISSUE OF ACCEPTANCE OF TENDER:

One set of Technical Manuals (Installation, Testing, Commissioning, Operation & Maintenance, including theory of operation and fault diagnosis) **COLOUR** printed and duly bound for FM Combiner along with associated equipment, items & accessories along with soft copy on CD must be supplied to “DDG (E-FM), P & D Unit, DG: AIR, New Delhi-110001”.

9.0 INSURANCE AND MARINE RISKS ETC.

Please refer to commercial terms.

10.0 GUARANTEE: Tenderer shall submit with his tender an undertaking to accept the following guarantees: *{This Guarantee clause is applicable to all the equipments/items mentioned in Schedule of Requirements/Materials (un-priced)}*.

- (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 (from the date of first intimation to OEM/tenderer) at tenderer’s expense any component which becomes defective under operating conditions for 30 months from the date of commissioning by the tenderer at ultimate installation site. If the tenderer failed to rectify the fault within the stipulated period of 30 days, the guarantee period would be extended corresponding to the outage period.
- (iii) A guarantee to supply all components for a period of ten years from the date of supply, at rates at which these are being supplied by the firm 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 FM Combiner, the firm shall intimate All India Radio in advance to enable the latter to stock the critical items.

11.0 ESSENTIAL REQUIREMENT FOR LOCAL OFFICE/AUTHORIZED REPRESENTATIVE/ DEALER:

- (a) The OEM should have complete setup for maintenance/repair of the FM Combiners in India, either of its own or through local office/authorized representative/dealer.
- (b) The local office/authorized representative/dealer will be the nodal point for resolving issues related to after sales support. It is the responsibility of local office/authorized representative/dealer to arrange the repair/replacement of faulty items. Any module of FM Combiners or other equipment requiring repairs will be repaired at site. If it is not feasible to repair the module at site, the same will be collected from the site by local office/authorized representative/dealer that will arrange repairs locally. The cost of transportation, repairs etc. shall be borne by the tenderer during the guarantee period.

- (c) After sales support for the repairs/maintenance of FM Combiners after the completion of guarantee period, shall also be provided by the respective OEM of the FM Combiners and other associated equipments through their local offices/representatives/dealers in India.
- (d) The details of technical facilities available with local offices/representatives/dealers for after sales support office, such as test bench, necessary test & measuring equipment and photographs thereof, must be provided in the technical bid.
- (e) At the discretion of AIR, AIR representative(s) may visit the works of local office/ authorized representative/dealer of OEM in India to ensure/verify that adequate technical infrastructure is available for after sales service for timely resolving the issues related to attending/replacing the equipments. Tenders from the tenderers who failed to meet these criteria shall be considered incomplete and is liable to be rejected.

12.0 HANDING OVER OF DETAILED MANUALS:

Two sets of Technical Manuals for FM Combiner, associated equipments and all other items & accessories, **colour printed** & duly bound copies along with inspection report, OEM test certificate of associated equipments and soft copies on pen drive are to be supplied to consignee.

The above Technical Manual and soft copies are required to be sent (irrespective of number of FM Combiner ordered) to the officers/offices.

(i) DDG (E-FM), P&D Unit, DG: AIR			1 Set
(ii) Zonal Office (Project Wing)			1 Set
(iii) DDG (E-TM) DG: AIR			1 Set
(iv) Technical Library, P&D Unit, DG: AIR			1 Set
(v) NABM (Technical), New Delhi			1 Set
Total			5 Sets

13.0 ENVIRONMENTAL CONDITIONS FOR FM COMBINER AND ALL ASSOCIATED EQUIPMENTS:

(i)	Operating room temperature range	0 °C to 45 °C
(ii)	Relative Humidity	95% non –condensing
(iii)	Working altitude	Normal up to 3000* meters AMSL Extended up to 4500 meter AMSL

* Degradation(if any) in performance from 3000 meter to 4500 meter must be indicated by tenderer

14.0 POWER SUPPLY FOR IN DOOR EQUIPMENT:

(i)	Operating voltage	AC Single Phase : 230 Volts \pm 10 %
(ii)	Frequency	50 Hz \pm 4%

SECTION-3.0

TECHNICAL SPECIFICATIONS

3.1 SPECIFICATION OF FM COMBINER:

Exact frequency of the transmitter for feeding to Narrow Band Input (NB) will be intimated at the time of placement of order. However during installation stage if the change of frequency/place occurred. Returning of combiner will be done by OEM/Local Representative of tenderer at the time of site acceptance test.

Introduction:

1. FM Combiners are required by AIR for combining the power of VHF FM Transmitters operating on different frequencies for feeding into a single Antenna.
2. The FM Combiners shall be complete with MS frame, reject loads, by-pass patch panel,(Quick release type) metering panel, interlock circuit, LED mimic diagram and all connection with RF coaxial copper rigid lines etc. mounted on a **MS channel** frame, 6-port by-pass patch panel will be of size 3-1/8".
3. By-passing the Combiner: In case of malfunctioning of the FM combiner or other requirement such as maintenance/retuning of the FM Combiner, the provision should exist for by-passing the FM Combiner i.e. provision for connecting the WB input port directly to WB output. This feature is must. **Full details including Engineering Drawings are to be given with the tender.**
4. The FM Combiner shall be of compact, rugged design & with minimum floor area requirements. It should have natural ventilation cooling. FM Combiner modules should be mounted on sturdy, unitized frames. All the components of Combiner are to be supplied in one assembled unit alongwith Patch-Panel. The testing of Combiner parameters will be done upto patch-panel
5. The FM Combiner shall be of balanced Band Pass Constant Impedance design. Filter cavities should be constructed of high grade Aluminum & inner probes inside cavities should be constructed of high grade silver coated copper/silver coated aluminum. The tunable probes should be attached to the cavity top with temperature compensated invar rods.
6. The individual filter should be tunable in the frequency range and tuning control should be lockable. It should be possible to easily retune the FM Combiner at site to a new frequency within the VHF FM Band i.e. 88 MHz to 108 MHz.
The cavity plunger position vis-à-vis frequency graph is to be provided. Probe will be given graduation marking.
Full details including illustration, schematic diagrams are to be given with Tender.

TECHNICAL SPECIFICATION:

S. No.	Technical Parameters	Technical Specifications
(i)	Frequency Range	88 MHz –108 MHz
(ii)	Minimum Channel Separation	800 kHz
(iii)	Minimum Number of poles(Cavities)	3 Nos in each filter.
(iv)	Number of inputs/outputs at each combiner	
	(a). Narrow Band input for transmitter	1No
	(b). Wide Band input	1 No
	(c). Combined Wide Band Output	1 No.
(v)	Impedance (All input & output Ports)	50 Ω \pm 0.5 Ω
(vi)	Power Ratings	
	FM Combiner	
	(a). Narrow Band Input Power	\geq 15 kW rms
	(b). Wide Band Input Power	\geq 45 kW rms
	(b). Combined Wide Band Output Power	\geq 55 kW rms
(vii)	Technical specification of FM Combiner at patch panel inputs and outputs.	
a.	Narrow Band Input:	
	(a) Insertion Loss, Centre frequency \pm 150 kHz	\leq 0.3 dB
	(b) Frequency Response, Centre frequency \pm 150 kHz	Within \pm 0.1 dB
	(c) Group Delay variation over channel Bandwidth, Centre frequency \pm 100 kHz	within \pm 25 n sec.
	(d) Return Loss for Centre frequency \pm 150 kHz	Better than 26 dB
b.	Isolation Between:	
	(i) Narrow Band to Wide Band, Centre frequency \pm 150 kHz	Better than 32 dB
	(ii) Wide Band to Narrow Band	Better than 50 dB
c.	Wide Band Input:	
	(a) Insertion Loss	\leq 0.07 dB
	(b) Return loss	Better than 26 dB
(viii)	Ventilation	Natural air ventilation
(ix)	Ambient Temperature	0°- 45°C
(x)	Humidity	95 %
(xi)	Connector size	FM Combiner
	(a) Narrow Band input	3-1/8" EIA Unflanged male
	(b) Wide Band input	3-1/8" EIA Unflanged male
	(c) Combined Wide Band Output	3-1/8" EIA Unflanged male

8. MECHANICAL DATA:

S. No.	Description			Remarks
(i)	Approximate Dimensions (<i>in vertical stacking</i> *)	Height (H)	≤ 1600 mm	Actual size to be given by tenderer
		Width (W)	≤ 1700 mm	
		Depth (D)	≤ 2300 mm	
(ii)	Weight			To be given by the tenderer

9. All necessary terminating loads should be included in the tender and their ratings should be indicated.

10. An interlock & mimic LED display system should be included. This should take care of patching arrangement of transmitters. Details should be given in the tender.

11. Digital Metering arrangements for Forward & Reflected power measurement simultaneous at each input port and output port of the Combiner shall be provided. Directional couplers (total 3 Nos.) used for power metering systems shall have directivity 30 dB or better. Full details should be supplied along with the tender.

12. Earthing work: Two independent earth systems will be provided by the AIR.

3.2 RF COAXIAL COPPER RIGID LINES & ACCESSORIES FOR COMPLETENESS OF SYSTEM

Following are technical Specifications of RF coaxial copper rigid lines & associated accessories:

All RF coaxial copper rigid lines with associated accessories are to be offered as per details given in SECTION-5.0. RF coaxial copper rigid lines and associated accessories should be of standard make. All the technical specifications/parameters are to be supported with printed technical literature/data sheet etc. from the OEM.

The tenderer is also required to submit certificates from recognized laboratory testifying the composition of materials used for RF coaxial copper rigid lines and associated accessories.

Figures showing rigid lines accessories are also enclosed for reference.

Technical Specification of RF Coaxial Copper Rigid lines & accessories for each site:

S. No.	Technical Parameters	Technical Specification
(i)	Size	3-1/8"
(ii)	Attenuation @100 MHz at 20°C	≤ 0.35 dB/100M
(iii)	Average power handling capacity at ambient temperature 40°C @ 108 MHz	≥ 45 kW
(iv)	Frequency Range	88 MHz-108 MHz
(v)	Impedance	50 Ω
(vi)	VSWR	< 1.05:1.0
(vii)	Material for Outer & Inner Conductor of Rigid lines	High conductivity copper conforming to 95% IACS/99% purity
(viii)	Material for Outer Conductor for Elbows & Adapters	Copper/ Aluminium alloy
(ix)	Material for Inner Conductor for Elbows, Adapters and all the entire support inner bullets	Silver-plated Copper/ Silver-plated brass/ Silver-plated Aluminium alloy
(x)	Material for all the support insulators	High quality Virgin Teflon(PTFE)

SECTION-4.0

INSPECTION DETAILS

The inspection for acceptance of the Complete FM Combiner system will be carried out at the Manufacturer's Works by **two Engineers** of All India Radio (AIR) in accordance with Acceptance Test Procedure/Protocol (ATP). All facilities like complete set of measuring instruments, power supply, manual assistance etc. will be provided by the manufacturer. Complete details and specifications of the FM Combiner system will be checked and all parameter values will be measured.

Testing/measurements including operational & functional checking of all the FM Combiner shall be carried out at three different frequencies in addition to operating frequency of the transmitter in the VHF Band i.e. 88 MHz to 108 MHz as per approved ATP. PDI testing may take approximate Two days for first combiner with accessories and ONE day each for remaining combiners.

Tenderer shall arrange for the photographs of Complete FM Combiner system which will be attached with the ATP/Inspection report.

Exhaustive checking and measurements will be carried out so as to completely check the compliance of the FM Combiners as per AIR specifications.

It is mandatory that all these testing/measurements of FM Combiner System as per parameters in Section-3.0 at three frequencies in addition to operating frequency of the transmitter in the VHF band i.e. 88 MHz to 108 MHz, are carried out well in advance. These must be submitted to All India Radio along with the call for inspection of FM Combiners well in advance for analyzing etc. These measurement details, graphical printout, notes and figures must be available at the factory at the time of inspection.

All other associated equipments, items and accessories i.e. RF coaxial copper rigid lines, etc. will be accepted on the basis of OEM test certificates (as per AIR specifications) duly stamped and signed by respective OEM on the letterhead of the OEM, failing which, test certificates will be considered incomplete and equipment offered by the firm is liable to be rejected. OEM test certificates are also to be submitted by the tenderer to All India Radio before giving call for inspection for analyzing etc. These OEM test certificates must also be available at the time of inspection.

SECTION-5.0**SCHEDULE OF SUPPLY OF FM COMBINERS AND ACCESSORIES**

S. No.	DESCRIPTION	Make	Model	Qty.
1.	Supply of FM Combiner complete as per AIR Specification along with: (i) All the necessary hardware tools/items/components required for frequency change/tuning in complete VHF band i.e. 88 MHz to 108 MHz. (ii) Terminating loads (1 kW, 50 Ω) – 3 Nos with cables & connectors. (iii) All interlocks with mimic LED displays , patch panel with interconnections etc. (iv) Metering arrangements for forward & reflected power measurements at each input port and output port of the FM Combiner. Directional couplers (total 3 Nos.) used for power metering systems shall have to be provided. (v) Technical Manuals (Installation, Testing, Commissioning, Operation, Maintenance & Service, including theory of operation and fault diagnosis) COLOUR printed and duly bound for FM Combiner along with associated equipment, items & accessories along with soft copy on pen drive shall be supplied as per specification.			1 Set Complete
2.	Supply of any accessories offered for the completeness of the system (Items wise details of offered and included material are to be given by the tenderer)			1 Lot
3.	Supply of additional hardware material as per AIR Specification as given below:			
3.1.	3-1/8" RF coaxial copper rigid line with inner bullets & insulators			18 M
3.2.	3-1/8" Un-flanged Elbows with inner bullets & insulators			6 Nos.
3.3.	3-1/8" clamp type Couplings with inner bullets & insulators			8 Nos
3.4.	3-1/8" Field Flange with inner bullets & insulators			5 Nos
3.5.	3-1/8" Un-flanged to N Adopter (for measurements purpose)			3Nos.
3.6.	3-1/8" to 1-5/8" (Un-flange) Adopter with inner bullets & insulators			3 Nos.
3.7.	1-5/8" to N Adopter (for measurements purpose)			2 Nos.
4.	Any other accessories offered for the completeness of the system with details.			
5.	Inspection charges at manufacturer's works of FM Combiner etc as per AIR specification.			1 Lot

ANNEXURE-II

PERFORMA FOR INFORMATION ABOUT OFFICE/AUTHORIZED REPRESENTATIVE/DEALER IN INDIA FOR AFTER SALES SUPPORT

1.	Address of local office/authorized representative/dealer	
	Telephone (Landline) No.	
	Mobile No.	
	E-mail Address	
2.	Address for communication (if different)	
3.	Legal Status (local office/authorized representative/dealer)	
4.	Name, address, contact number (Mobile number) & e-mail address of local office/authorized representative/dealer	
5.	Brief details of Technical facilities available for after sales support: The details of technical facilities available with local office/authorized representative/dealer for after sales support such as test bench, necessary test & measuring equipment and photographs thereof, must be provided in the technical bid.	
6.	Main line of business, specialization and number of years of operation	
7.	Total number of permanent technical employees including their designation and qualification	
8.	Details of Agreement/MoU for after sales support with OEM (Copy must be provided with the offer)	Date of Agreement: Executed at : Executed by :
(Authorized Signatory of local office/authorized representative/dealer)		(Authorized Signatory of FM Combiner OEM)
Name :		Name :
Signature :		Signature :
Place and Date:		Place and Date: