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(BROADCASTING CORPORATION OF INDIA)  
DIRECTORATE GENERAL; ALL INDIA RADIO  
(PLANNING & DEVELOPMENT UNIT)**

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F. No. 27/12/Spec/CEs Comm. - I /2005-D (TD/FM) &F. No: 27/12/1(24)/Lucknow/2007-D(TD/FM)

Specification for Supply, erection, testing and commissioning (SETC) {of Combiner, RF coaxial Rigid Lines & Accessories } { Site Lucknow }

{Specification no: SETC Combiner /24(Revision-I) /Lucknow/ September /2008- D (TD/FM)}

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And

**Schematic Drawing No. : TM-15821**

**N.B. :**

- 1. The Tenderer shall submit schedule of material /requirement of SETC *without price* as in Section 4.0 & Section 5.0 of AIR Specification (two bid system i.e. technical bid and commercial bid).**
- 2. Each statement of this specification has to be complied with & supported by printed literature/data sheets from the manufacturer of the equipment by the tenderer, 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 and schedule of requirement/material 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 the tender offer to AIR in the format given below .**

<b>Sr. No. of AIR Spec. Section wise &amp; Clause wise</b>	<b>Details of AIR Spec.</b>	<b>Make &amp; Model No of the Equipment offered</b>	<b>Performance figures of equipment and schematic drawing Nos.</b>	<b>Compliance Yes/NO</b>	<b>Ref to tender page No.</b>	<b>Remarks</b>
Section 1.0						
Section 2.0						
Section 3.0						
Section 4.0						
Section 5.0						

**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 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 statement. 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 liable for rejection.**

## **SECTION 1.0 TECHNICAL REQUIREMENTS**

(Site-Lucknow)

<b>S.No</b>	<b>Project</b>	<b>Combiner</b>	<b>RF Coaxial rigid lines &amp; accessories required</b>	<b>Reference to SECTION of AIR Specification</b>
1.	Lucknow	1No.	Yes	5.0

## SECTION 2.0 GENERAL SPECIFICATION

**Note : Please refer tender documents for general terms and conditions of contract for SETC works 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 Work, Cancellation of Contract in Full or Part, Recovery of Security Deposit, Performance Guarantee, Indian Electricity Rules ,Unsatisfactory Workmanship, Damages Incurred During Erection , Tenderer Liable for Damages, Defects, Recovery of Compensation, Ensuring Payment and Amenities, Labour Laws to be Complied by Tenderer, Minimum Wages Act Compliance, Tenderer to Indemnify Government against Patent Rights, Return of Surplus Material, Employment of Technical Staff and Employees, Release of Security Deposit, Safety Code, insurance from manufacturer's works/factory to site etc **i.e. in totality .**

### **GENERAL SPECIFICATIONS :**

All equipment and items of SETC as per AIR specification shall be used for 24X7 operation.

Each statement of this specification has to be complied with & supported by printed matter from the manufacturer of the equipment by the Tenderer .

#### 1.0 SCOPE:

Supply, erection, testing and commissioning (SETC) of { Combiner, RF Coaxial Rigid Lines & accessories as per AIR specification. }

The broad scope of above supply, erection, testing and commissioning (SETC) are as follows:

- 1.1 Combiner as per specification.
  - 1.2 RF Coaxial Rigid Lines as per specification.
  - 1.3 All components including elbows, rigid lines, meters, directional couplers etc used for Combiner & Patch panel shall be of standard make & must be specified while quoting.
- 2.0 For completion of the SETC 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 all 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 the Indentor . The full technical details and technical literature/ pamphlets shall be submitted by the Tenderer.

3.0 **INSPECTION:** Inspection will be by the representative of All India Radio at manufacturer's works. Before giving the call for inspection to the Indentor, the Original Equipment Manufacturer (OEM) & Tenderer (in case tenderer happens to be different from OEM) should satisfy themselves that the offered equipment etc. are as per the AIR Specification and approved drawings. OEM & Tenderer shall submit one set of complete performance figures as per ATP to the Indentor before giving call for inspection to the Indentor.

Prior intimation for carrying out inspection and pre-despatch performance test as per ATP at manufacturer's works is to be given by the OEM to the Indentor at least 6 weeks in advance.

The total inspection period for Combiner shall be 2 working days (for Combiner and RF Coaxial Rigid Lines & accessories etc. ). Expenses for inspection charges on account of providing of infrastructure are to be quoted separately. For AIR Inspecting Engineers expenses toward to and fro air journey, boarding, lodging etc will be borne by All India Radio.

Acceptance Test Procedure will be submitted by the Tenderer within one month of placement of order for approval by AIR in respect of all the equipment /items. This will include all tests so as to assess the performance of the equipment vis-à-vis all specifications.

The Combiner shall be tested at manufacturer's works as per ambient condition specified in specification.

4.0 The successful Tenderer shall supply within one month from the date of placement of the order, 2 sets of complete design & drawing documents in respect of the setup for the approval of AIR. Tenderer should submit detailed design, all drawings with full details as per the specification.

5.0 **DESIGN & DRAWING DOCUMENTS :**

( **Total 3 sets** )

{ SITE - Lucknow }

After approval of all the design document and drawings of complete set up by AIR as at 4.0 above, the successful Tenderer shall send **one set** of all above complete drawings & documents to Superintending Engineer/ Station Engineer/, Installation officer All India Radio, Lucknow; ( TOTAL - 1 SET)

**one set** of the above documents to the Chief Engineer of the Zone (NZ) and ( TOTAL - 1 SET)

**one set** of the above documents to Director Engg.(Proj.), P&D Unit, DG, AIR, New Delhi-110001 ( TOTAL - 1 SET)

**i.e. in brief, total 3 sets** of such drawings and design document are required against SETC. A soft copy of these documents on CD shall be provided to DE(Proj.), P&D Unit, DG: AIR,

New Delhi by the Tenderer.

- 6.0 All the necessary measuring equipment and tools etc. required for completion of Erection of the project will be arranged by the Tenderer during SETC and no additional amount shall be paid on this account.
- 7.0 Erection, testing and commissioning (ETC) of above “set-up” as per specification shall be done by a Qualified Engineer of OEM of Combiner at site.
- 8.0 The Tenderer should either be original equipment manufacturer or supply the equipment only from the original equipment manufacturer. Original manufacturers should have ISO certification for the manufacturing work and the documentary proof for all above are to be enclosed by the Tenderer with the Tender paper/documents.
- 9.0 DELIVERY PERIOD FOR SUPPLY, ERECTION, TESTING & COMMISSIONING:  
6 months from the date of placement of order.
- 10.0 All information submitted by the Tenderer & all markings, notes, designation on the design, drawing documents & associated write-ups shall be in "English language" only. All dimensions and units on drawings and all references to weights and measures and quantities shall be in MKS.
- 11.0 Complete printed technical information in support of compliance statement should be furnished with the tender to assess the full merit of the offer. The tender & the associated information should be submitted in duplicate.
- 12.0 Descriptive information giving complete details of each equipment offered . shall be given by the Tenderer.
- 13.0 Make, model and type of individual units along with printed technical details shall be given by the Tenderer.
- 14.0 The Tenderer shall make his own arrangements for providing accommodation for his workmen at site.
- 15.0 The Tenderer should conform to all local State laws/Central laws and regulations amended up to date concerning labour and their employment as applicable. The insurance etc of the labourers shall be the responsibility of the Tenderer including any kind of pre /post action and consequences relating to above insurance etc.
- 16.0 The Tenderer shall indemnify the purchaser, his employees and purchaser employees from any liability that may arise out of infringements of patents and copy rights associated with the design, fabrication, erection of any equipment etc.
- 17.0 The Tenderer is required to submit details of his previous experience in similar Supply of

such Equipments i.e. the capacity of their organizational set up.

18.0 Tenderer shall submit detailed Supply, erection, testing and commissioning schedule of equipment/requirement offered as per specification. This list should be in the same format as in the price bid minus the price.

19.0 HANDING OVER OF DETAILED MANUALS & DRAWINGS:

19.1 At the time of handing over, the Tenderer shall hand over technical manuals (for erection, testing, commissioning, Operation, maintenance & theory of operation manuals, fault diagnostic with a copy of the Inspection Report carried out at factory and performance measurement carried out at the time of commissioning on site) to the following:- **(Total :3 Sets)**

19.1.1 DE (Projects), P&D Unit, DG: AIR, New Delhi with One soft copy on CD of all these manuals, drawings, instructions, performance measurements, amendments, etc. **one set (TOTAL- 1 set)**

19.1.2 **Chief Engineer (North Zone): - one set (TOTAL- 1 set)**

19.1.3 **Site consignee - The Superintending Engineer/Station Engineer:(TOTAL- 1 set)**  
The Superintending Engineer, AIR, Lucknow

19.1.4 At the time of handing over, the Tenderer shall also hand over technical manuals of Combiner, RF coaxial Rigid Lines & accessories for erection, testing, commissioning, operation, maintenance & theory of operation and fault diagnostic to the following.

19.1.4.1 DE(Transmitter Maintenance), DG:AIR	- 1 sets
19.1.4.2 Technical Library, P&D Unit, DG:AIR	- 1 sets
19.1.4.3 Staff Training Institute (Technical)	- 1 sets
Total	- <u>3sets</u>

20.0 In support of Tenderer's claim an "up-to-date" list of their customers alongwith complete set of detailed actual performance figures for projects similar to AIR Specification (duly certified by the customers) must be furnished alongwith the tender. Names, Address, E-mail, telephone nos. and Fax numbers of customers must be given.

21.0 In case of 'kits' complete details of all components that form part of kit should be spelt out/clearly given i.e. the details of the component/item offered in the kit including their part no. and quantities.

22.0 INFORMATION TO PRECEDE DESPATCH OF EQUIPMENT:

Following information should be supplied to Indentor and each of the consignees, prior to dispatch of equipment:

- 22.1 Detailed list of equipment under dispatch .
- 22.2 Photographs, detailed engineering drawings showing location/details of components in the various units and sub units with Item/part number marked thereon.
- 23.0 After completion of work the Tenderer shall remove dust, dirt, debris and leave the building/premises in a clean condition .
- 24.0 **SUPPLY, ERECTION, TESTING AND COMMISSIONING** :
- The SETC {of Combiner, RF Coaxial Rigid Lines & accessories}, shall be undertaken by the Tenderer in accordance with ATP and in conformity with the AIR Specification.
- 24.1 **SUPPLY**: Supply of Combiner, RF coaxial Rigid Lines & accessories etc. shall be as per SECTION 5.0 of AIR Specification.
- 24.2 **ERECTION**: Combiner, RF coaxial Rigid Lines & accessories ( as per SECTION 5.0) at site will be done as per layout plan approved by AIR.
- 24.3 **TESTING**:
- Combiner, RF Coaxial Rigid Lines & accessories and associated equipment are to be tested after the erection, after making all the initial checks including physical inspection and continuity checks of wiring/cablings etc. as per drawings. Only after satisfying that erection is fit for testing (without the application of RF power), the testing will be taken up with RF power in a sequential manner in respect of all the equipment. The testing will be undertaken by the Tenderer as per standard practice and in conformity with procedure laid down in ATP.
- 24.4 **COMMISSIONING AT SITE**: After erection and testing of Combiner, RF Rigid Lines & Accessories, performance figures/measurement for all parameters are to be taken by the Tenderer in the presence of AIR's representative as per approved ATP.
- 25.0 In case of any tender where unit rate of any item/items appears unrealistic, such tender will be considered an unbalanced and in case the Tenderer is unable to provide satisfactory explanation , such a tender is liable to be disqualified and rejected.
- 26.0 On acceptance of the tender, the name of the accredited representative(s) of the Tenderer who would be responsible for taking instructions from DG:AIR ,New Delhi-110001 or his authorized representative shall be communicated in writing to Indentor.
- 27.0 **Experience (Supply)**: Minimum 10 years experience of OEM in production of the products quoted.



## SECTION 3.0 TECHNICAL SPECIFICATIONS

### 3.1 SPECIFICATION OF COMBINER :

Exact frequency of transmitter for feeding to Narrow Band Input (NB) will be intimated at the time of placement of order.

#### 1.0 Introduction :

1. Combiner is required by AIR for combining the power of VHF FM Transmitters operating on different frequencies for feeding into a single Antenna.
2. ***The Combiners shall be complete with reject loads, by-pass patch panel, metering panel, interlock circuit, LED mimic diagram and all connection with rigid lines etc mounted on a MS channel frame as per schematic diagram Drawing No. TM-15821***

***Bypassing the Combiner:*** In case of malfunctioning of the combiner or other requirement such as maintenance/ retuning of the combiner; the provision should exist for bypassing the combiner i.e. provision for connecting the WB input port directly to WB output port. This feature is must. Full details including Engineering Drawings are to be given with the tender.

3. The Combiner shall be of compact & rugged design & with minimum floor area requirements. It should have natural ventilation cooling. Combiner modules should be mounted on sturdy, unitized frames.
4. The Combiner shall be of balanced Band Pass Constant Impedance design. Filter cavities should be constructed of high grade Aluminium & inner probes inside cavities should be constructed of high grade copper. The tunable probes should be attached to the cavity top with temperature compensated invar rods.
5. The individual filter should be tunable in the frequency range and tuning control should be lockable. It should be possible to easily retune the Combiner at site to a new frequency within the frequency band of 88-108 MHz.  
The cavity plunger position vis-à-vis frequency graph to be provided. Probe will be given graduation marking.  
Full details including illustration schematic diagrams are to be given with Tender.

**6.0 ELECTRICAL DATA:**

i)	Frequency Range		88 –108 Mhz
ii)	Minimum Channel Separation		800 KHz
iii)	Minimum Number of poles(Cavities)		3 Nos.
iv)	Number of Inputs/Outputs		
	a)Input	Narrow Band Input	1No.
	b)Input	Wide Band Input	1No.
	c)Output	Combined Output	1No.
v)	Impedance	All Input & Output Ports	50 Ω ( ohms)
vi)	Insertion Loss ( between any input port to the combiner output)	Narrow Band Input	≤ 0.3 dB
		Wide Band Input	≤ 0.1 dB
vii)	Return Loss	Narrow Band Input	Better than 26 dB for $f_c \pm 150$ KHz
		Wide Band Input	Better than 26 dB at a separation of 800KHz for the entire FM band II 88-108 MHz
viii)	Constant Impedance Bandwidth		± 150 KHz
ix)	Isolation between inputs at channel spacing 800 kHz.	Narrow Band input to W.B input	Better than 32 dB
		Wide Band input to N.B input	Better than 50 dB
x)	Group delay		25 n sec. for (+/-) 100 KHz
xi)	frequency response		Within ± 0.1 dB
xii)	Power Rating	Narrow Band Input	≥ 15 KW
		Wide Band Input	≥ 30 KW
		Combined Output	≥ 45 KW
xiii)	Ventilation		Natural air ventilation
xiv)	Ambient Temperature		0°- 50° C
xv)	Humidity		95 %
xvi)	Connectors Size	Narrow Band Input	3-1/8” EIA unflanged male
		Wide Band Input,	3 1/8” EIA unflanged male
		Combined Output	3 1/8” EIA unflanged male

**7.0 MECHANICAL DATA:**

i)	Dimensions	(H)	≤ 2000 mm
		(W)	≤ 1600 mm
		(D)	≤ 2000 mm
ii)	Weight		≤ 700 Kg.

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

9. 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.

10. Metering Arrangements for Forward & Reflected power measurement at each Input port and Output port of the Combiner shall be provided. Full details should be forwarded along with the Tender.

11. Combined output of AIR & IGNOU FM Transmitters (at the output of existing Diplexer) are available on 3-1/8" unflanged rigid coaxial lines. The output of the proposed Combiner through its patch panel will be connected through 3-1/8" rigid coaxial lines to 3 1/8" RF Coaxial feeder cable having 3 1/8" EIA flange connector.

12. Recommended spares should be quoted separately. This list should be based upon actual failure pattern observed in previous supplies.

13. Combiner should be guaranteed for a period of 2 years from the date of supply at site in good condition or 18 months from date of completion of SETC; whichever is later.

14. Inspection/Acceptance tests as per approved ATP will be carried out at OEM's works. It will be the responsibility of the Supplier to arrange equipment and instruments for inspection. This will include a set of full measurements and checking change of frequency & retuning. One copy of Manual including Tuning process should be forwarded within two months of Supply Order. Charges for inspection, if any, may be quoted separately.

15. Final performance measurements of the combiner and accessories as per specification is required to be taken at site after successful completion of erection & commissioning alongwith graphical printouts of the measurements like VSWR/return-loss & isolation for entire frequency range of 88 MHz to 108 MHz.

16. Earthing work: Two independent earth systems will be provided by the tenderer/OEM as per IS. The value of earth resistance of each system will be less than 1 ohm.

17. 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 his own expense any component which becomes defective under normal operating conditions within 18 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 him 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 , he shall intimate All India Radio in advance to enable the later to stock the critical items.

### 3.2 RF COAXIAL RIGID LINES & ACCESSORIES:

#### RF COAXIAL RIGID LINES & ACCESSORIES FOR COMPLETENESS OF SYSTEM

##### 1.0 Technical Specification of RF Coaxial Rigid lines (50 Ohm):

S. No.	TECHNICAL PARAMETER	TECHNICAL SPECIFICATION
1.1	Size	3-1/8"
1.2	VSWR	≤1.1:1.0
1.3	Attenuation (100 MHz) at 20°C	≤ 0.35 dB/100M
1.4	Average power handling capacity at ambient temperature 40°C (100 MHz)	≥ 45 kW
1.5	Frequency Range	88-108 MHz
1.6	Material	High conductivity copper

##### 2.0 Additional Hardware: (Impedance: 50 ohm)

- |      |   |           |
|------|---|-----------|
| 2.1  | 4-1/2" to N Test Reducer  | - 1 no.   |
| 2.2  | 3-1/8" to 4 1/2" reducer adopter  | - 2 nos.  |
| 2.3  | 3-1/8" RF coaxial Rigid Line with inners, bullets & insulators  | - 18 M    |
| 2.4  | 3-1/8" Elbows with inner and bullets & insulators   | - 7 nos.  |
| 2.5  | 3-1/8" Couplings with inners, bullets& insulators   | - 10 nos. |
| 2.6  | 3-1/8" Field Flange with inners, bullets& insulators  | - 2 nos.  |
| 2.7  | 3-1/8" to N Test Reducer  | - 1 no.   |
| 2.8  | 1-5/8" to N Test Reducer  | -1 no.    |
| 2.9  | Hanger for 3-1/8" RF coaxial Rigid Line   | -10 nos.  |
| 2.10 | Any accessories offered for the completeness of the system ( Items wise details of offered and included material , items & part are to be given by the Tenderer ) | - 1 Lot   |

**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 his own expense any component which becomes defective under normal operating conditions within 18 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 him 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 , he shall intimate All India Radio in advance to enable the later to stock the critical items.

#### **4.0 INSPECTION AT MANUFACTURER'S WORKS:**

##### **INSPECTION DETAILS AT MANUFACTURE WORKS**

The inspection for acceptance of the Combiner and RF Coaxial rigid lines etc. will be carried out at the Works of the Manufacturer of the main Equipment i.e Combiner in accordance with approved Acceptance Test Procedure (ATP).

All facilities like complete set of measuring instruments, power supply, manual assistance, etc. will be provided by the supplier without any additional charges. Inspection will be as per Specification. Engineers of All India Radio will carry out detailed inspection at manufacturer's works.

Prior intimation for carrying out inspection and pre-despatch performance test as per ATP at works is to be given by the OEM to the indenter at least 6 weeks in advance.

Inspection period for Combiner, RF Coaxial Rigid Lines & accessories shall be 2 working days total at the manufacturer's works.

Complete Acceptance Test Procedure (ATP) will be prepared by the manufacturer and submitted to Indentor 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 at factory.

Operation checking of the Combiner and RF Coaxial rigid lines etc and measurements will be carried out at any three frequencies in the VHF band, 88 to 108 MHz. Complete set of instruments will be made available in advance.

It is mandatory that checking at three frequencies in the VHF band, 88 to 108 MHz, are carried out well in advance and these measurements details, graphical printout notes and figures must be available, at the factory at the time of inspection. These must also be submitted to All India Radio alongwith the call for inspection by OEM & Tenderer well in advance for analyzing etc.

**INSPECTION:**

Tenderer shall quote charges for Inspection of Combiner, RF Coaxial Rigid Lines & accessories etc. at manufacturer's works of Combiner by two AIR Engineers for 2 working days in respect of all equipment/items of Section 5.0 of AIR Specification.

<b>S. No.</b>	<b>DESCRIPTION</b>	<b>QTY</b>	<b>UNIT</b>
	Charges for inspection at manufacturer's works by two AIR Engineers for 2 working days in respect of Combiner & RF Coaxial Rigid Lines & accessories.		
1	Lucknow	1 job	each

**TOTAL AMOUNT: (In figures and words)**

Signature of Tenderer & OEM with date and seal  
Full Name in CAPITAL LETTERS

**SECTION 5.0 SCHEDULE OF SUPPLY, ERECTION, TESTING & COMMISSIONING  
FOR LUCKNOW**

**SECTION 5.1 SCHEDULE OF SUPPLY FOR LUCKNOW**

<b>S. No.</b>	<b>DESCRIPTION</b>	<b>Quantity</b>	<b>UNIT</b>
1	Supply of Combiner complete as per Section 3.1 of AIR Specification along with complete hardware material.	1set/System	set/ system
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	Lot
3	Supply of additional hardware material as per Section 3.2 of AIR Specification as given below		
3.1	4- 1/2" to N Test Reducer	1no.	each
3.2	3 -1/8" to 4 1/2" reducer adopter	2nos.	each
3.3	3-1/8"RF coaxial Rigid Line with inners, bullets & insulators	18 M	M
3.4	3-1/8" Elbows with inner and bullets & insulators	7 nos.	each
3.5	3-1/8" Couplings with inners, bullets & insulators	10 nos.	each
3.6	3-1/8" Field Flange with inners, bullets & insulators	2 nos.	each
3.7	3-1/8" to N Test Reducer	1 no.	Each
3.8	1-5/8" to N Test Reducer	1 no.	Each
3.9	Hanger for 3-1/8" RF coaxial Rigid Line	10 nos.	each

**TOTAL AMOUNT: (In figures and words)**

Signature of Tenderer & OEM with date and seal  
Full Name in CAPITAL LETTERS

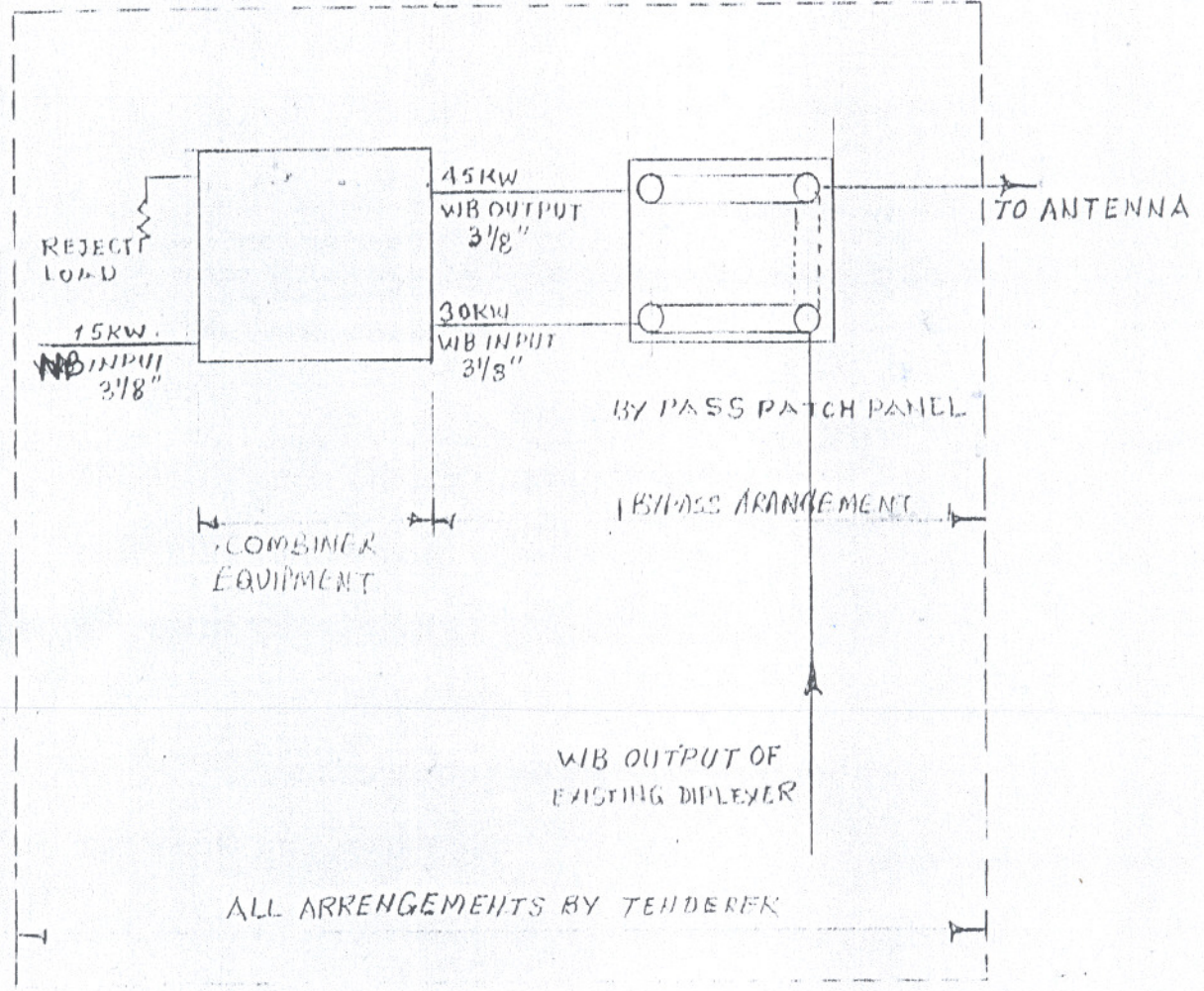
**SECTION 5.2 SCHEDULE OF ERECTION, TESTING & COMMISSIONING FOR  
LUCKNOW**

<b>S. No.</b>	<b>DESCRIPTION</b>	<b>Quantity</b>	<b>UNIT</b>
1	Erection,Testing& commissioning (ETC) of Combiner and other accessories (S. No.1,2&3 of Section 5.1) etc as per AIR Specifications	1 job	job

**TOTAL AMOUNT: (In figures and words)**

Signature of Tenderer & OEM with date and seal  
Full Name in CAPITAL LETTERS

SCHEMATIC DIAGRAM OF COMBINER AT A.I.R. LUCKNOW



NOTES:-

1. THE REJECT LOAD, INTERLOCK CIRCUIT, LED MIMIC DIAGRAM WITH ALL RIGID LINE CONNECTION. BY PASS PATCH PANEL ETC. TO BE PROVIDED BY THE <sup>DEM</sup>TENDERER.
2. METERING ARRANGEMENT FOR FORWARD & REFLECTED POWER TO BE PROVIDED BY OEM/TENDERER ON INPUT & OUTPUT SIDES.
3. ALL NECESSARY HARDWARE FOR BY PASSING ARRANGEMENT TO BE INTEGRAL PART OF THE <sup>DEM</sup>Combiner.

*[Handwritten signature]*

ENGINEER  
P & D UNIT  
A.I.R. LUCKNOW

AE(E)	DD(E)	ALL INDIA RADIO P & D UNIT NEW DELHI-INDIA
DRAWN BY	DATE	DRG. No. TM-15221