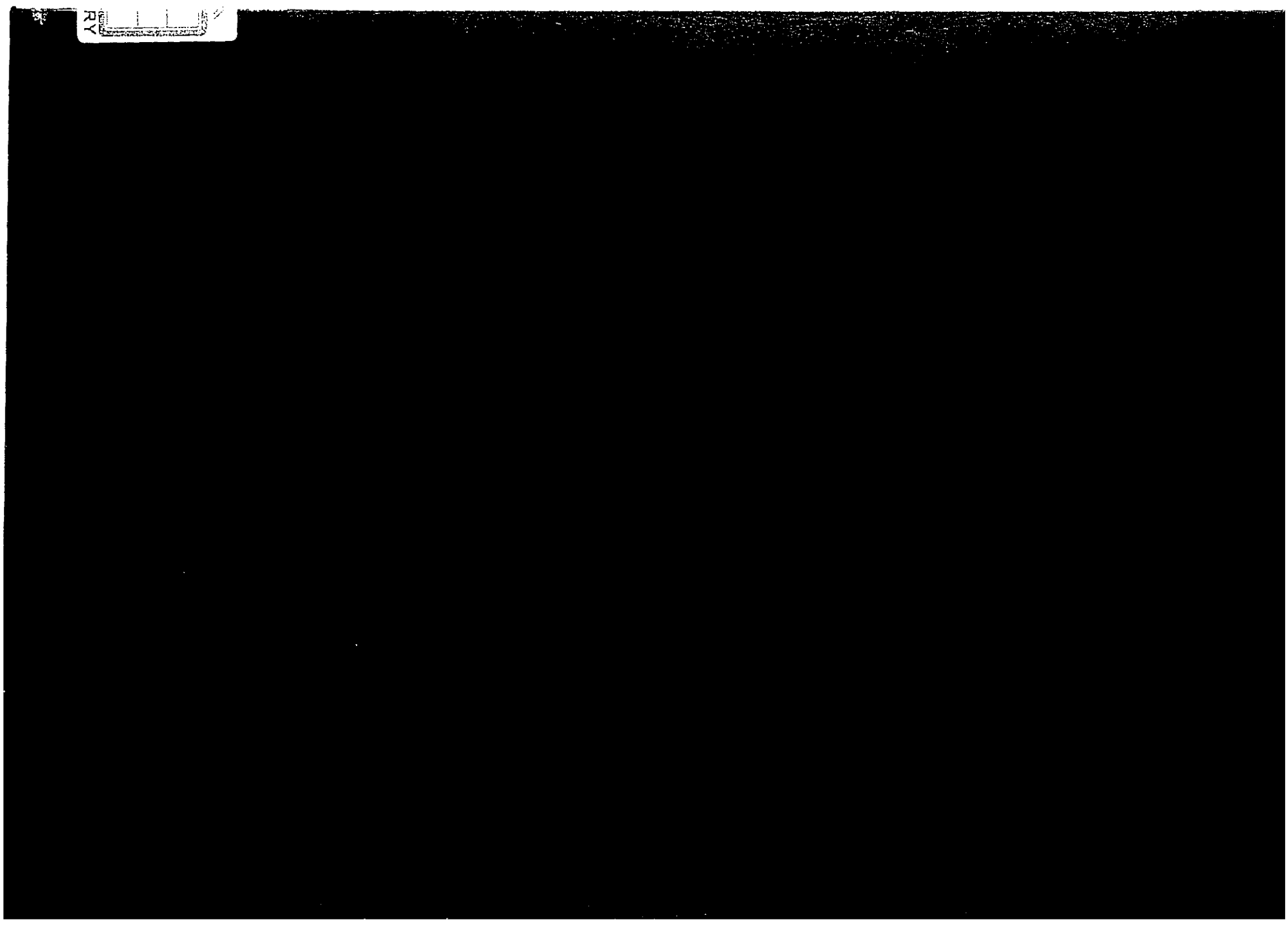

GOVERNMENT OF PAKISTAN
PORT QASIM AUTHORITY

TENDER AND CONTRACT DOCUMENTS

FOR THE PROCUREMENT OF

RADIO AIDS SYSTEM

TENDER DOCUMENT
SPECIFICATIONS FOR THE PORT
RADIO SYSTEM

DECEMBER 1975

JAPAN INTERNATIONAL COOPERATION AGENCY

TENDER NOTICE NO._____

DATED_____

TENDER NOTICE

Tenders are invited for the supply and installation of a Port Radio Aids System and its associated equipment to the Port Muhammad Bin Qasim Authority, the Islamic Republic of Pakistan.

Tender forms containing full details and specifications may be obtained from the office of Port Qasim Authority, 5th Floor, NSC Building, Moulvi Tamizuddin Khan Road, the Islamic Republic of Pakistan from _____ _____(date)__ on payment of a tender deposit of US$5,000.- in cheque.

This tender is restricted to Asian Development Bank Member Counties.

Completed tender documents must be enclosed in a sealed envelope clearly marked PORT RADIO AIDS SYSTEM FOR PORT QASIM AUTHORITY, PAKISTAN and deposited in the tender box provided at Port Qasim Authority, 5th Floor, NSC Building, Moulvi Tamizuddin Khan Road, the Islamic Republic of Pakistan, by _____(Pakistan Standard Time)_____ _____(day)_____ _____(date)__

The Purchaser reserves the right not to accept the lowest and shall not be required to state the reasons of rejection of the lowest.

TENDER INST. NO. _____

DATED _____

INSTRUCTIONS TO TENDERERS

1. INTRODUCTION

1.1. Tenders are invited for the design, manufacture, installation and testing including the Final Acceptance Test of a Port Radio Aids System, which shall be established in the Port Muhammad Bin Qasim Authority, the Islamic Republic of Pakistan.

1.2. The Port Radio Aids System shall consist of :-

(a) VHF Radio Communications System;
(b) Decca Sea-Fix System;
(c) Radar Transponder equipment

as detailed in the "Specifications for Port Radio Aids System" issued by Port Qasim Authority.

1.3. The Islamic Republic of Pakistan has received a loan from the Asian Development Bank in various currencies toward the cost of Pakistan Muhammad Bin Qasim Port Project and it is intended that proceeds of this loan would be applied to payments under the contract for which this invitation to bid is issued. Payments by the Asian Development Bank of an application presented by Port Qasim Authority in accordance with the terms and conditions of the Loan Agreement will be subject in all respects to the terms and conditions of that Agreement.

2. QUALIFICATION FOR TENDERING

This tender is restricted to Asian Development Bank Member Countries.

3. TENDER DOCUMENTS

3.1. The documents accompanying the invitation to tender, hereinafter called "Tenderer Documents", consist of Tender Notice, Instructions to Tenderers, Tender Form, Contract Form, Specimen Form of Bank

Guarantee, General Conditions of Contract, Technical Specifications, Schedules and Drawings.

3.2. The tender shall be prepared in English language and expressed in units of metric system. The tender shall quote for all items of the Works and shall be complete. Incomplete and partial tenders are liable to rejection.

3.3. Any tender which does not comply with those instructions is liable to rejection.

4. SUBMISSION OF TENDER

4.1. Closing date of tender

(1) Tenders in four (4) copies, one of which shall be regarded as the master copy, shall be enclosed in sealed envelopes, addressed and deposited in the Tender Box provided at the office of Port Qasim Authority, 5th Floor, NSC Building, Moulvi Tamizuddin Khan Road, the Islamic Republic of Pakistan before _____(time)__ Pakistan Standard Time on _____(date) . Submission of tenders by mail shall not be allowed. All tenders received after this time shall be returned unopened.

(2) The tender shall be enclosed in sealed envelopes marked on the top left hand corner "TENDER FOR PORT QASIM AUTHORITY, PAKISTAN." The envelopes must show on the outside, the name of Tenderer and his address.

(3) Should there be any discrepancies between entries in the master copy and other copies, the entries in the master copy shall be deemed to be correct.

4.2. The tender shall be accompanied with all the documents required or permitted by the Tender Documents.

4.3. Tenders may be withdrawn by Tenderer subject to the written consent by the Purchaser prior to the closing date of tender. Tender Guarantee shall be forfeited by the Purchaser in the event of withdrawal of tender by the Tenderer.

5. OPENING OF TENDER

The tenders will be opened at the office of Port Qasim Authority at _____ (time) Pakistan Standard Time on _____ (date) . All tenders invited to attend and witness the opening of tenders in Pakistan.

6. PRICES

Tenderers shall quote in their home currency. The currency in which quotations are made will be deemed to be the currency in which payments will be made and there will be no adjustments to the Contract Price on account of appreciation or depreciation of this currency.

7. VALIDITY OF TENDER

7.1. All tenders submitted shall be deemed to be valid for a period of one hundred twenty (120) days from the closing date of tenders as specified in Clause 4 and no tenderer may withdraw his tender within that period.

7.2. The Tenderer's price entered in the Schedule of Prices (refer Clause 15) shall include and cover all items necessary for the manufacture, provision, installation, testing, commissioning of the Port Radio Aids System although such items may not be specifically mentioned in the Specification or Schedule of Prices, or shown in the drawings in detail. It shall be considered that all such items are included in the Contract Price (in the case of the Successful Tenderer) and no claim for additional payment on grounds of omitted items or arising out of the tenderer not having informed himself fully (refer Clause 12) will be entertained.

7.3. All prices quoted shall be firm and not subject to escalation.

8. SIGNATURE OF TENDER

8.1. The tender shall be signed in handwriting and sealed by the Tenderer. The tender by a corporation shall be signed in handwriting by the president or by other authorized person, with the corporation seal affixed. The tender by a consortium shall be signed by the authorized officers of each corporate member of the consortium and affixed with

the corporation seals of each member of the consortium.

8.2. If erasure or other changes appear in the Completed Schedule of Prices each erasure or change must be initialled by the person signing the Tender.

9. TECHNICAL PROPOSALS

The Tenderer shall submit detailed proposals to demonstrate that each and every item of the proposed system shall meet the requirements of the Specifications. The proposal shall be in English Language and shall be complete, unambiguous and well illustrated and shall include details of the proposed design, fabrication, assembly, installation and system integration, training, test equipment, spares and documentation for the Port Radio Aids System.

10. PROJECT PROGRAMMES

The Tenderer shall submit a work programme for the design, procurement and installation for this project. Following information will be included in the work programme.

(a) Sub-devision of work categories:
(b) Identification and relationship of a activities and events:
(c) Time estimate for each activity:
(d) Scheduled dates for completion of major aspects of the project:
(e) Sub-contractor scheduled work:

11. COMPLETION DATE

11.1. The Tenderer shall state the firm date of completion of the project. A penalty will be imposed for late completion of the project at the rate of zero point one per cent (0.1%) of the Contract Price for each week of delay, up to a maximum of ten per cent (10%) of Contract Price.

11.2. In the Evaluation of the tenders due consideration will be given to early completion of the project.

12. TENDERER TO INFORM HIMSELF FULLY

The Tenderer shall be deemed to have examined the General Conditions of Contract, Specifications, Schedules, Drawings and plans and to have obtained at his own expense any additional information which he considers necessary for the completion of his tender or tenders.

13. FURTHER INFORMATION

Any questions relation to the Tender Documents prior to submission of the tender shall be addressed to:

By Registered Airmail: Port Qasim Authority
5th Floor
NSC Building
Moulvi Tamizuddim, Khan Road
The Islamic Republic of Pakistan

By Cable: PORTQATY

By Telex: QASIM KR633

The Purchaser, if necessary, will obtain clarification of submitted tenders by requesting further information from any or all Tenderers in writing.

14. SITE

14.1. The site location identified by the Purchaser in the Specifications shall be considered as an available location to the Tenderer. The use of the identified location shall in no way relieve the Tenderer from compliance with the Contract. The tenderer shall be responsible for assuring the adequacy of the site location by site survey and/or other means.

14.2. In addition to the site mentioned in the Specifications, the tenderer shall state the alternative site, if it is deemed to be desirable, based on his site survey and/or other means mentioned in Clause 14.1 above.

15. SCHEDULE OF PRICES

15.1. The Tenderers firm prices referred to in Clause 6 shall be entered into the Schedule of Prices, in strict accordance with the outline shown below Clause 15.4.

15.2. Alternative tenders proposing any alternative item or items will be considered, provided that these are additional to and not in substitution of tenders based on the original schedule of prices and specifications, and provided the Tenderer is able to give technical and/or economic justification for the alternative or alternatives proposed. The alternative proposals shall follow closely the general pattern of the original schedule of prices.

15.3. The prices shown shall be FOB port of the shipment for the equipment, associated equipment, materials, parts, components to be covered under this contract plus the cost of the installation and all other cost to be covered under this Contract. Taxes, import duties and any other charges of whatsoever nature which will be levied in Pakistan shall be exempted.

15.4. SCHEDULE OF PRICES

Item	Description	Quantity	Unit FOB Cost	Total FOB Cost
A	VHF Radio communications Systems Equipment			
B	Decca Sea-Fix System Equipment			
C	Radar Transponder Equipment			
D*	Testing Equipment			
E*	Spare Units and Consumable Spares			
F*	Installation of the Equipment			
G*	Project Management And Installation Charges			
H*	Training			
I*	Miscellaneous			
	Grand Total:-			

Notes: *; Tenderer to provide cost breakdown, if required.

16. BID BOND

The Tenderer is required to submit a Bid Bond at the time of the submission of tender not less than two percent (2%) of the total offer value in the form of a Banker's Guarantee.
Offers received without this guarantee shall not be considered.
Guarantees will be returned to the tenderers upon the expiration of the validity.

17. EVALUATION OF TENDER

17.1. In comparing tenders and in making award, the Purchaser may consider such factors as compliance with the Tender Documents, engineering technique and time of delivery offered.

17.2. The Purchaser reserves the right to reject either the lowest or any other tender which in the judgement of the Purchaser does not appear in his best interest, and not to mention any reason for the rejection of any tender.

17.3. Time of completion is an important consideration in awarding the Contract. Earliest time of completion of the project will, therefore, be taken into preferential consideration in determining the successful Tenderer, other factors heing equal or reasonable.

18. SUCCESSFUL TENDERER

18.1. The results of the Tender will be published in the Gazette. The successful Tenderer will be issued with an official Letter of Acceptance of Tender.

18.2. Succesful Tenderer will be required to enter into a contract with the Purchaser.

19. AWARD OF CONTRACT

19.1. Notification of award will be made by the Purchaser in writing to all Tenderers after deliberate evaluatidn of all tenders collected and decision of the successful Tenderer. The Purchaser shall not be under any obligation of disclose any reason for the acceptance or rejection of any tender.

19.2. The Contract will be awarded to the best qualified and responsible Tender offering the best evaluated tender in conformance with the Tender Documents subject to the provisions of Clause 17.

GENE. CON. NO._____

Dated _____

GENERAL CONDITIONS OF CONTRACT

1. DEFINITIONS

1.1 In this Contract and the annexes, the following words and expression shall have the meanings herein assigned to them unless there is something in the subject matter or context inconsistent with such construction:-

(a) "Pakistan" shall mean the Islamic Republic of Pakistan.

(b) "the Purchaser" shall mean Port Qasim Authority, Pakistan, and any officer for the time being acting in that office;

(c) "the Contractor" shall mean the tenderer whose tender has been accepted by the Purchaser, and shall include the tenderer's legal personal representatives, successors and assigns.

(d) "the Sub-Contractor" shall mean the party (other than the Contractor) named in the Contractor for any part or parts of the Works have been sub-contracted with the consent in writing of the Purchaser, and include the legal personal representative, successors, and assigns of such party or parties.

(e) "the Equipment" shall mean and include apparatus, machinery, structures, materials, articles and the associated things of all kinds to be provided under the Contract.

(f) "the Works" shall mean and include the manufacture and Installation of the Equipment, labour to be provided and work to be done and services to be rendered by the Contractor under this Contract including the Final Acceptance Test.

(g) "the Specifications" shall mean the document entitled "Specifications for the Port Radio Aids System" issued by Port Qasim Authority and annexed hereto under the Contract.

(h) "the Site" shall mean the place or places, indicated in the Specifications and Drawings, where the Equipment are to be delivered to and installed at or where work is to be done by the Contractor, for the purpose of the Contract including vehicles and vessels situated in the Port Qasim area, together with so much of the area surrounding the said place or places as the contractor shall, with the consent of the Purchaser, actually use in connection with the Works other than merely for the access to the said place or places.

(i) "the Contract Price" shall mean the sum named in Clause 21 of this Contract as the Contract Price.

(j) "the Port Radio Aids System" shall consist of the equipment as outlined in the Specifications and the Technical Proposal of the Contractor, meeting the full requirements of the Specifications.

(k) "the System" shall mean the Works duly completed and the Equipment duly installed and operating at the Site within the confines of this Contract.

(l) "the Technical Proposal" shall mean the technical document(s) entitled ..... dated ..... issued by the Contractor and annexed hereto.

(m) "the Purchaser Representative" shall mean any Engineer, Consultant, Clerk of Works or Inspector appointed from time to time by the Purchaser to carry out the dutiesset forth in Clause 12.3 of this Contract.

(n) "Day, Week, Month and Year" shall mean calendar day, calendar week, calendar month and calendar year respectively.

(o) "Writing" shall include any manuscript, typewritten or printed statement, under seal or hand.

(p) "Drawings" mean any drawings, maps, plans or sketches annexed to any tender document, referred to in Clause 2 or any modifications of such drawings approved in writing by the Purchaser.

1.2 Words importing persons shall include firms and corporations.

1.3 Words importing the singular shall include the plural and vice-versa where the context requires.

1.4 The fact that the words defined in this Clause are or are not capitalized in the Contract shall not affect their meaning.

2. TENDER AND CONTRACT DOCUMENTS

2.1 Language and Measure

All documents pertaining to the Contract including all correspondence, notices, erection, operating and maintenance instruction books, drawings or any other writings shall be written in English language. The metric system of measurement shall be used exclusively in the Contract.

2.2. The following documents shall be deemed to form an integral part of this Contract:-

(a) The Instructions to Tenderers attached to this Contract.

(b) The Specifications attached to this Contract.

(c) The Tender Form dated ..... attached to this Contract.

(d) The Technical Proposal attached to this Contract.

(e) The Specimen for Bank Guarantee dated ..... attached to this Contract.

(f) The Contract Form attached to this Contract.

(g) Such documents and correspondence as may be mutually agreed by the Purchaser and the Contractor as forming part of this Contract.

2.3. In the event of any contradiction between the above documents and the expressed terms and conditions of this Contract and contract agreement, the latter shall prevail.

3. EFFECTIVE DATE OF THE CONTRACT

3.1. The Contract shall take effect from the date of approval of the competent authorities of the Government of Pakistan and the state to which the Contractor belongs.

3.2. The Contract shall be subject to the Loan Agreement made between the Government of Pakistan and the Asian Development Bank.

4. CONTRACTOR TO INFORM HIMSELF FULLY

The Contractor by tendering shall be deemed to have satisfied himself as to all the conditions and circumstances affecting the Contract Price, as to the possibility of executing the Works as shown and described in the Contract, and as to the general circumstances at the Site of the Works.

5. CONTRACT AGREEMENT

The Contractor shall within thirty(30) days after receipt of letter of intent of the Contract enter into and execute a contract agreement with the Purchaser in the Contract Form annexed, with such modifications as may be necessary.

6. OBLIGATIONS OF THE CONTRACTOR

6.1. Subject to and in accordance with this Contract, the Contractor shall:-

(a) Manufacture, test at its factory, packing for export and supply the Equipment on FOB basis.

(b) Undertake all the Works.

(c) Undertake the unpacking and examination of all parts of the Equipment preparatory to its installation.

(d) Undertake the general assembly and installation of all parts of the Equipment on the Site.

(e) Perform the testing and commissioning of the Port Radio Aids System until the Final Acceptance under Clause 17 hereof in the presence of and to the satisfaction of the Purchaser's Project Engineer appointed under Clause 12.2. and such Purchaser's Representatives appointed under Clause 12.3.

(f) Submit to the Purchaser, withing three(3) months from the effective date of this Contract, a detailed works programme for the various operations to be carried out which shall aim at completing the Installation of the Equipment on or before the Completion Date as stated in Clause 19 hereof,

(g) Submit to the Purchaser for its approval, within six(6) months from the effective date of this Contract and prior to the commencement of the Works, detailed specifications and drawings for the installation of the System including floor plans showing disposition of the Equipment, and other associated equipment to be supplied under the Contract.

(h) Proceed with all works with diligence and expedition. The materials of every kind used shall be of suitable quality and of the kinds specified in the Specifications and the workmanship shall be of first class character.

(i) Afford the Purchaser or his duly appointed representative opportunity for the inspection of the Equipment, installation and testing.

(j) Make available all special tools and devices required for the installation of the Equipment subject to Purchaser's procuring necessary import licences thereof. The charges for insurance and freight to and from Pakistan in connection with such an import shall be to the Contractor's account. All such tools and devices shall be the property of the Contractor.

7. CONTRACTORS REPRESENTATIVES AND WORKMEN

7.1. Contractor's Project Engineer

The Contractor shall designate an Engineer to supervise the carrying out of the Works at the Site. The Contractor's Project Engineer shall be present on site during all working hours during the Installation and Testing period and orders or instructions whether written or oral which the Purchaser or his duly appointed representative may give to the Contractor's Project Engineer shall be deemed to have been given to the Contractor provided that oral instructions on significant points are subsequently confirmed in writing. The Contractor's Project Engineer shall not be changed without the concurrence of the Purchaser.

7.2. The Contractor's Project Engineer shall be in charge of the main project office and shall be primarily responsible for directing and co-ordinating the programme and all matters concerning the Works, including personnel management, contract administration, progress monitoring, the procuring of local material and labour, the procuring of the Equipment to be provided under the Contract and their installation and testing, training of the Purchaser's operational and maintenance staff.

7.3. The Contractor's Project Engineer shall have the authority to make decisions concerning the execution of all contractual activities and to accept and act upon any of the Purchaser's decisions conveyed by the Purchaser or his duly appointed representative.

7.4. The Purchaser's Project Engineer shall have direct access to the Contractor's Project Engineer who shall have under him specialised sub-system experts for the whole works.

8. PROJECT PROGRAMME AND PROGRESS REVIEWS

8.1. The contractor shall in amplification to the proposed works programme referred to in Clause 6.1.(f) prepare and submit to the Purchaser within three(3) months from the Effective Date of the Contract a detailed Project Programme covering all aspects of the work to be carried out by subcontractors. The programme shall be updated and presented to the Purchaser

by the Contractor at least once per month. The Programme shall take into account all work which shall be informed in advance in writing to be carried out by the Purchaser or other persons or organisations not responsible to the Contractor.

8.2. The Contractor shall deliver to the Purchaser four (4) copies of the aforementioned monthly progress and status Reports.

9. MANNER OF EXECUTION

9.1. The Equipment and the Works shall comply strictly with the Specifications or where not set out,to the reasonable satisfaction of the Purchaser. The Contractor shall comply with and adhere strictly to the Purchaser's instructions and directions on any matter touching or concerning the Works.

9.2. Adequacy of Design

Notwithstanding approval given by the Purchaser to any of the Contractor's proposals relating to the performance and construction of the Works and the Equipment, the Contractor shall remain solely responsible for the adequacy of the design, performance and installation within the scope of the Specifications.

9.3. Contradiction

In the event of any discrepancy or contradiction appearing in the Specifications it shall be presumed, as a general rule, that the more exacting requirement shall apply. However, the Contractor shall consult the Purchaser regarding any such discrepancy or contradiction and both parties shall endeavour to co-operate to reach agreement on it.

9.4. Conduct of Work

9.4.1. Unless specific arrangements be made to the contrary, the Contractor shall at his own expense provide all materials and tools for installation and testing, labour, transportation, haulage and services necessary to execute and complete the Works.

9.4.2. On the completion of the Works the Contractor shall clear away and remove from the Site surplus materials, rubbish and temporary works of every kind and leave the whole of the Site clean and in an orderly condition to the satisfaction of the Purchaser. He shall in particular be responsible for cleaning, washing, polishing and even repair or

replacement if the damage or loss could be attributed to the Contractor or his agents to the satisfaction of the Purchaser, all floors, walls, windows, ceilings and fitments in all parts of the building and/or structures and in all ancillary buildings and/or structures where he or his agents have carried out work.

9.4.3. In case of an emergency which threatens loss of property and/or safety of life, the Contractor will be allowed to act, without previous instructions from the Purchaser, in a diligent, reasonable and responsible manner. He shall notify the Purchaser immediately thereafter.

9.4.4. The Purchaser's Project Engineer together with such authorised representatives as mentioned in Clause 12.3 shall at all time have access to the Works, wherever, in preparation or in progress, for the purpose of inspection and testing. The Contractor shall, at his own expense, forward to the Purchaser such certificates of inspection as may be required by the Purchaser.

10. TRAINING

10.1. In-factory Training

The Contractor shall provide various in-factory training which shall be completed before the commencement of the installation in their promises for the period specified in the Specifications annexed hereto for two (2) technical personnel comprising of an engineer, and a technician to be nominated by the Purchaser. Training charges, if any, shall be quoted by the Contractor seperately.

10.2. All training shall be imparted in English language. Trainees shall have a good knowledge of both technical and conversational English. Training programme shall be proposed in the Tender.

10.3. On-the-job Training

During the period in which the installation work is in progress the Contractor's Project Engineer shall give all necessary instructions to members of the maintenance staff nominated by the Purchaser in all technicalities of the Equipment and in all matters appertaining to its efficient operation and maintenance. He shall also give assistance in the organising of maintenance methods in order to ensure that the said

staff will be fully qualified to undertake satisfactorily all operational and maintenance duties. The cost of such training is included in the Contract Price.

11. DOCUMENTATION

11.1. The Contractor shall supply to the Purchaser five (5) complete sets of System and Maintenance Manuals of the Equipment written in English language as prescribed in the Specifications Annexed hereto.

11.2. All the above manuals shall be supplied to the Purchaser before the completion of the Installation of the Equipment.

12. OBLIGATIONS OF THE PURCHASER

12.1. The Purchaser shall:-

(a) Offer adequate office accommodation, warehouse for storage of the Equipment free of charge in the Site of the Works during the execution of the Works.

(b) Be responsible for ocean transportations, unloading customs clearance, inland transportation and storage of the Equipment to be supplied under this Contract at the Site.

(c) Furnish at the Contractor's request any available information considered necessary as regards the electromagnetic environment at the Site;

(d) Provide the Site, free of charge, including the building, power supply, fresh water, lighting facilities and tower foundation as prescribed in the Specifications.

(e) Appoint a qualified engineer to be the Purchaser's Project Engineer in accordance with Clause 12.2 below.

(f) Provide the Contractor free of charge with the coordinates required for the execution of the Works.

(g) Be responsible for performing necessary Government procedures required by the Government of Pakistan, if any, including making application and obtaining approval prescribed in the Governing Laws required for the excurtion of the Works at the Site to meet the Purchaser's requirements.

12.2. Purchaser's Project Engineer

The Purchaser shall appoint an Engineer in charge of the Project under this Contract who will be the principal officer concerned with the overall supervision and liaison for this Project, who will liaise with the Contractor's main Project office to be located at a Site and who will be known as the Purchaser's Project Engineer. He shall have no authority to relieve the Contractor of any of his duties or obligations under this Contract.

12.3. Purchaser's Representatives

The Purchaser shall from time to time appoint one or more representatives to supervise the various aspects of the Works to ensure that the standards required in materials, workmanship and performance are met. Notwithstanding this, however, the Contractor shall remain liable to ensure that these standards are met and that the Works are executed in accordance with this Contract. Any such representative shall have no authority to relieve the Contractor of any of his duties or obligations under this Contractor.

13. FACTORY TESTING

13.1. The Contractor shall submit to the Purchaser for approval, within four (4) months after the effective date of the Contract, three (3) copies of written proposal for the methods and details of the factory testing of the items of the Equipment specified in the Specifications.

13.2. As and when any Equipment shall have passed the contractor's tests in conformity to the testing methods and details approved by the Purchaser, the Contractor shall furnish to the Purchaser, within two (2) weeks after the inspection and testing, five (5) copies of the duly certified test reports with test readings.
Receipt of such certified test reports by the Purchaser shall not relieve the Contractor from any of his obligations for the workmanship and quality of the Equipment under Contract.

13.3. All Equipment condemned by the Purchaser shall be removed and replaced in accordance with the Contract at the Contractor's expense and in a manner satisfactory to the Purchaser.

13.4. If the Purchaser shall waive the right of inspecting or testing as herein provided, the Contractor shall proceed with the Tests. It shall in no way relieve the Contractor of full liability for the quality, proper operation and performance of the Equipment.

13.5. No shipment of the Equipment shall be made before the factory testing is completed with the result satisfactory to the Purchaser.

13.6. The Contractor shall be obliged to conduct additional testing, if deemed necessary by the Purchaser.

14. PACKING

14.1. The Contractor shall securely protect and pack the Equipment so as to avoid any damage and loss under all conditions of ocean and inland transport of the Equipment to the Purchaser's warehouses on the Site. The costs for packing shall be included in the Tender of the Contractor. The packing materials, such as packing cases and wooden drums, shall not be returned to the Contractor.

14.2. The packing methods of each Equipment shall conform to the stipulations provided herein, but even in case not specified herein all Equipment shall be packed in strong wooden cases or in any other adequate containers.

14.3. The Purchaser shall at its option and at the Purchaser's expense be able to inspect, before shipment, the external appearance of the shipment packages and the packing condition of several units of such shipment package picked up at random by the Purchaser at the port of shipment in the state in which the Equipment are manufactured.
The Contractor shall give the Purchaser notice in writing of the date on and the place at which such shipment packages will be ready for inspection. Such inspection shall not release the Contractor from any obligations under the Contract.

14.4. The Contractor shall furnish to the Purchaser, before inspection of packing condition, two (2) copies of duly signed packing list showing the packing method, packing contents, gross weight and gross measurement.

15. DELIVERY OF EQUIPMENT

15.1. Delivery of the Equipment on F.O.B. basis shall be completed within eight (8) months from the date of the signing of the Contract.

15.2. The Purchaser shall make his own arrangements at his own expenses regarding ocean transportation, import licenses, customs and import duties and inland transportation and all matters connected with the importation of the Equipment required for the Works as well as personnel to the Site. Any delay in delivery or damage or loss to any consignment or the equipment shall be the responsibility of the Purchaser.

15.3. No Equipment shall be shipped until approval in writing has been obtained by the Contractor from the Purchaser that the Equipment may be shipped. Each application to the Purchaser shall include commercial invoices of the Equipment to be shipped and packing lists with full statement of the package consigned, and with full details of the package identification numbers, dimensions, weights, and description of the contents sufficient to enable the parts to be identified.

If by delay or failure on the part of the Purchaser to give the said approval, or from any cause for which the Purchaser shall be responsible, such approval has not been received by the Contractor within one (1) month from receipt of such application by the Purchaser, the Contractor may proceed to the delivery.

The Purchaser shall not be responsible for any loss or damages suffered by the Contractor in relation to postponement of the delivery instructed by the Purchaser.

15.4. Partial shipment shall be allowed. Transhipment shall not be permitted.

15.5. The Contractor shall airmail copies of the shipping documents comprising of bills of lading, commercial invoices, packing lists and insurance policies in ten (10) copies promptly after respective shipments.

16. INSTALLATION

16.1. Installation of the Equipment to be supplied under this Contract shall

be carried out by the Contractor after their receipt of notice in writing by the Purchaser that the Equipment are ready for commencement of the Installation.

16.2. Installation including testing at the Site and the Final Acceptance Test shall be completed within three (3) months after Contractor's receipt of such a notice as is prescribed in Clause 17.

17. FINAL ACCEPTANCE TEST

17.1. Upon completion of the Installation of the Equipment, each portion of the Equipment shall be tested by the Contractor's Project Engineer in the presence of such representatives as the Purchaser may appoint and in such manner as these representatives may direct and in accordance with the Test Procedure proposed by the Contractor and accepted by the Purchaser. The Test Procedure shall be submitted by the Contractor to the Purchaser during the reasonable period after the effective of this Contract, and, in any case, not later than three (3) months before the Equipment is due for the Final Acceptance Test.

17.2. Notice and Rejection

The Contractor shall give the Purchaser written notice of the date on which the system will be ready for the Final Acceptance Test at least ten (10) days in advance of the Final Acceptance Test.
In the event of rejection due to non-compliance with any part of the Specifications or to any defects in the Works whatsoever, the Contractor shall eliminate its causes and rectify it and upon elimination of its cause(s) and/or any necessary rectification, deliver a fresh notification whereupon the procedure set forth above shall be repeated.

18. CERTIFICATE OF ACCEPTANCE OF THE SYSTEM

Upon successful completion of the Final Acceptance Test and receipt of all items to be delivered by the Contractor including Test Equipment, Documentation, Spares, Contractor's test reports and the satisfactory completion of training courses and the proper rectification of all defects, deficiencies, inadequacies, malfunction and discrepanies to the satisfaction of the Purchaser, the Purchaser shall deliver to the Contractor within three (3) weeks a Certificate of Acceptance of the System.

19. COMPLETION DATE

19.1. The Contractor shall complete the delivery of the Equipment and the Installation of the Equipment including the Final Acceptance Test within the period stipulated in Clauses 15 and 17 respectively.

19.2. In the event of the Contractor failing to complete the delivery of the Equipment or the Installation of the Equipment within the period stipulated respectively or any extended period granted under the provisions of Clause 27 below or by the Purchaser at his discretion, the Purchaser shall have the right to debit a sum equivalent to zero point one percent (0.1%) of the Contract Price per week or part thereof as liquidated damages up to a maximum of ten percent (10%) of the Contract Price.

19.3. The payment or deduction of such liquidated damages shall not relieve the Contractor from his obligations to complete the Works or from any other of his obligations or liabilities under the Contract.

20. PERFORMANCE BOND

20.1. The Contractor shall within thirty (30) days from the effective date of this Contract deposit with the Purchaser a sum equivalent to five percent (5%) of the Contract Price as a Performance Bond in a form of Banker's Guarantee to ensure compliance with the terms and conditions of this Contract. The Purchaser may deduct from the Performance Bond a sum equivalent to any loss, damage, costs or other expenses which it may incur as a result of the non-compliance by the Contractor of any of the terms and conditions of this Contract.

20.2. The Performance Bond, subject to such deductions as may be made therefrom by the Purchaser, shall be refunded to the Contractor after the Final Acceptance of the System under Clause 18 hereof.

21. CONTRACT PRICE AND CURRENCIES

21.1. Subject to compliance with the terms and conditions of this Contract the Purchaser shall pay to the Contractor for the Supply of the Equipment and the Works under this Contract the sum of _____ (in figures)

_____ (in words) as the Contract Price. The Contract Price shall be paid by the Purchaser to the Contractor in the manner provided in Clause 22 of this Contract.

21.2. Subject to Clause 25, the Contract Price, which shall be calculated in home currency, shall be the currency tendered.

21.3. The Contract is awarded on the basis of a Fixed Price Contract only, and the Contract Price shall be at the foreign exchange rate of the Pakistan State Bank ruling at the date of the Evaluation of the Tender.

21.4. All taxes, import duties payable under the laws in force in Pakistan in respect of the Contractor's personnel, the Equipment and the Works shall be borne by the Purchaser.

22. TERMS OF PAYMENT

The Contract Price shall be paid by the Purchaser to the Contractor in the home currency contracted in the following manner:-

A. Equipment Cost:

The Purchaser shall establish in favor of the Contractor within thirty (30) days after the effective date of the Contract an irrevocable and confirmed and without recourse Letter of Credit, for the full amount of Equipment cost of the Contract, negotiable at sight against shipping documents by a first bank in form and terms satisfactory to the Contractor.

B. Charge for Training, Installation Works:

Full amount for each cost shall be paid on monthly basis by T/T remittance against the Contractor's invoice to the account of the Contractor in the designated bank.

23. FUTURE ORDERS

23.1. The Contractor guarantees that the Contractor shall make available the system expansion equipment, replacement parts and maintenance spares for a period of at least ten (10) years from the effective date of the Contract.

23.2. On receipt of orders for maintenance spares from the Purchaser, the Contractor shall supply the requested maintenance spares without undue delay on a reimbursement basis.

24. GUARANTEE

24.1. The Contractor guarantees for one (1) year from the date of Final Acceptance the satisfactory performance of the Works and that the Equipment shall give a thoroughly efficient service in accordance with the standards laid down in the Specifications, the Contractor's Technical Proposal and the Final Acceptance criteria. The Guarantee shall consequently cover any malfunciton or failure caused by faulty design workmanship or defective materials of the Equipment, except those caused by negligent use or maintenance, mis-operation of the Equipment by the Purchaser and/or third party or third parties, and the repair and replacement of any part of the Works found to be defective for causes as aforementioned. Any part of the Equipment to be replaced under this guarantee shall be delivered to the Site free of charge.

24.2. The Purchaser shall possess the right at any time during the period of this guarantee and irrespective of prior inspections or acceptances to reject any materials, equipment, facilities and services not conforming to the above guarantee (as mentioned in Clause 24.1) and may require the Contractor at his expense, to rectify or replace, at the Purchaser's option, such materials, equipment facilities and services.

24.3. If the Contractor fails to correct or replace such defective materials, equipment, facilities and services promptly after notification and authorisation by the Purchaser, the Purchaser may by contract or otherwise, rectify or replace such defective materials, equipment, facilities and services and to deduct the costs of the same from the Performance Bond. If as a result of operational conditions the Purchaser determines that it is impracticable to have the Contractor repair or replace any defective materials, equipment, facilities and services, the Purchaser may, if it so elects require the Contractor to repay such portion of the Contract Price as is equitable under the circumstances in lieu of repairing or replacing the defective materials, equipment, facilities and services unless the Contractor can satisfy the Purchaser

that the defect was not due to his negligence or to any circumstance within his control.

24.4. The guarantee shall extend to all defects as aforesaid (as per Clause 24.1) which appear during a period of one (1) year from the date of Final Acceptance by the Purchaser. This guarantee shall continue in respect of any replaced items for a period of one (1) year from the date of such replacement. In order that the Purchaser may avail themselves of the right under this Clause the Purchaser shall notify the Contractor in writing without delay of any defects that have appeared and shall give the Contractor every opportunity of inspecting and remedying such defects at the Contractor's own expense.

24.5. If the Contractor fails to proceed with due diligence after being required to fulfil his obligations under this Guarantee, the Purchaser may proceed to do the necessary work at the Contractor's risk and expense, provided it is done in a reasonable manner.

25. MODIFICATION

If it should prove necessary for the Purchaser to modify some non-standard works which deviated from the accepted method or practice such modification shall be carried out by the Contractor at a cost to be mutually agreed between the Purchaser and the Contractor provided that reasonable and proper notice shall be given to the Contractor so that the Contractor may make arrangement accordingly.

26. CONTINGENCY

In any case where the contingency is included in the Contract Price, the amount of the contingency shall be expended or used, wholly or in part, or be not used, as the Purchaser may decide and direct, provided the expending or use in whole or in part of the amount of the contingency shall be approved by the Asian Development Bank.
If no part or only part thereof is used, the amount not expended or used shall be deducted from the Contract Price.

27. PERFORMANCE UNDER SPECIAL CONDITIONS

27.1.Force Majeure

If there is a delay in the performance of any services, obligations or duties of the Contractor under this Contract due to any of the following circumstances, namely, act of God, riot and civil commotion, blockade, revolution, strike, labour disturbance, fire, war, plague or other epidemics, delay in transit or any other cause beyond the Contractor's control then in any such case the Contractor shall for the duration of any such circumstances aforesaid be relieved of his obligations to complete performance of such services, obligations or duties thereby affected but the provisions of the Contract shall remain in full force in regard to any other services, duties or obligations of the Contractor not affected by such circumstances aforesaid.

27.2.Extension of Time for Completion

In the event of delay resulting from any of the causes in this Clause and duly notified in writing to the Purchaser, within twenty (20) days after such event shall have occurred, the Purchaser shall grant to the Contractor in writing such extension of time for the completion of the Works as the Purchaser may consider reasonable.

28. CONTRACTOR'S DEFAULT

If the Contractor endangers performance of the Contract within the specified time for completion, or any extension thereof by refusing or failing to execute the work or any separable part thereof or shall refuse or neglect to comply with any reasonable instruction or order given to him in writing by the Purchaser in connection with the Works or shall contravene or fail to comply with any of the provisions of this Contract the Purchaser may by notice in writing require the Contractor to make good the failure, neglect or contravention complained of. Should the Contractor fail to comply with the notice within a reasonable time from the date of service thereof, or fail to complete the Works within the Specified time or any extension thereof, the Purchaser may by written notice to the Contractor terminate in whole or in part his right to proceed with the Works. In such an event the Purchaser may take over the Works in whole or in part and execute the same to completion by contract or otherwise and may take possession of and utilize in completing the Work such materials or appliances on the Site and work in progress as may be necessary therefor.

If the Purchaser should take over the Works as aforesaid, the Contractor shall pay any increased cost incurred by the Purchaser in completing the Works.

29. BANKRUPTCY

If the Contractor shall become bankrupt of have a receiving order made against him or shall make an arrangement with or assignment in favour of his creditors or shall agree to carry out the Contract under a committee of inspection of his creditors or (being a corporation) shall go into liquidation (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) or if the Contractor shall assign the Contract without the consent in writing of the Authority being first obtained or shall have an execution levied on his goods then the Purchaser may after giving fourteen (14) days' notice in writing to the Contractor enter upon the Site and take over the Works and proceed as specified in Clause 28.

30. PATENT RIGHT, ETC.

30.1. In the event of the Purchaser (including for this purpose every officer and department thereof) being held liable for damages arising out of any claim at any time on account of patent rights or royalties which may be held to have been infringed by virtue of the Purchaser's acceptance and use of the Equipment supplied under this Contract, the Contractor shall indemnify the Purchaser, its officers and departments against such claims and any costs, charges and expenses in respect thereof.

30.2. In the event of any claim being made or action brought against the Purchaser, its officers or departments arising out of matters referred to in this Clause, the Contractor shall be promptly notified thereof and may at his own expense conduct all negotiations for the settlement of the same, and any litigation that may arise therefrom.

31. Termination of the Contract

31.1. The Purchaser shall have the right to terminate the Contract in case of the Contractor's Default or Bankruptcy set out in Clauses 28 and 29 respectively, by notice in writing to the Contractor.

31.2. In case the Purchaser finds it impossible to continue the operations owing to the occurrence of Force Majeure or any other causes beyond his reasonable control, the Purchaser shall have the right to terminate the Contract upon notice in writing to the Contractor.

31.3. In the event of termination of the Contract, all other terms and conditions of the Contract shall remain in force and effect until such a time as the Purchaser shall certify in writing to the Contractor that all work necessary for termination of the Contract has been completed satisfactorily to the Purchaser, and thereupon it shall be deemed that the Purchaser has taken over the System.

31.4. Upon completion of all operation for termination, the Purchaser will prepare a final progress estimate which will form the basis for payment for the Works performed. The Purchaser's decision in this matter will be final, subject only to the terms of Clause 38 (Arbitration). After the final progress estimate has been prepared by the Purchaser, it shall be certified by the Contractor and thereafter there shall become due to the Contractor, the full amount of the final progress estimate including the amount of all extra work performed less payments for the System previously made.

31.5. The Purchaser shall release the Performance Bond at his disposal unless the total amount of payments previously made to the Contractor exceeds the final amount due to him. If the total amount of payments previously made to the Contractor exceeds the final amount due to him, the Contractor shall refund the excess amount withing thirty (30) days after termination and then his Performance Bond will be released. Should the Contractor fail to refund the amount received in excess withing the said period, such amount shall be secured from his Performance Bond. If the amount for his Performance Bond is less than the amount received in excess by the Contractor, the balance shall be refunded to the Purchaser by the Contractor without any reservations within thirty-seven (37) days after termination.

32. ASSIGNMENT

32.1. The Contractor shall not, without the consent of the Purchaser in writing, assign or transfer the Contract or the benefits or obligations thereof or any part thereof to any other person, provided that this shall not affect any right of the Contractor to assign, any monies due to or to become due to him under the Contract. The Contractor shall not without the consent in writing of the Purchaser make any sub-contract with any party or parties for the supply of materials or any component of the Works other than with the sub-contractors stated in the Contractor's

Tender Document and accepted by the Purchaser. Any such consent shall not relieve the Contractor from his obligations under the Contract. Once approved by the Purchaser, a sub-contractor shall not be changed without the Contractor having obtained in writing the approval of the Purchaser for such change.

32.2. The Contractor shall be responsible for the acts, defaults, neglects or omissions of any sub-contractor, his agents, or workmen as fully as if they were the acts, defaults, neglects or omissions of the Contractor, his agents, or workmen.

33. SUB-CONTRACTS

The Contractor shall cause appropriate provisions to be inserted in all sub-Contracts to bind Sub-Contractors to the Contractor by the terms of this Contract in so far as applicable to the Work of the Sub-Contractors and to give the Contractor the same power as regards termination any Sub-Contract that the Purchaser may exercise over the Contractor under any provisions of the Contract. Nothing contained in this Contract shall create any contractual relation between any Sub-Contractor and the Purchaser.

34. INSURANCE

34.1. Insurance of the Works

Without limiting any of his obligations and responsibilities under this Contract, the Contractor shall insure at his own expense in the joint names of the Purchaser and the Contractor against all loss or damage from whatever cause arising for which he is responsible under the terms of this Contract and in such manner that the Purchaser and the Contractor are covered during the period of execution of the Works and are also covered during the period of guarantee under Clause 24 for loss or damage arising from any cause whether occurring prior to or during such period of Guarantee and for any loss or damage occasioned by the Contractor in the course of any operations carried out by him for the purpose of complying with his obligations under Clause 24 hereof:-

i) The Works and the temporary Works to the full value of such works executed from time to time.

ii) The materials, equipment, tools and other things brought on to the Site by the Contractor to the full value of such materials, equipment, tools and other things.

Such insurance shall be effected with an insurer and in terms approved by the Purchaser. Provided always that without limiting his obligations and responsibilities as aforesaid nothing in this Clause contained shall render the Contractor liable to insure against the necessity for the repair or reconstruction of any work constructed with materials or Workmanship not in accordance with the requirements of the Contract.

34.2. Injury to persons - the Contractor shall be solely liable for and shall indemnify the Purchaser in respect of and shall insure against any liability, loss, claim or proceedings whatsoever, arising under any statute or common law in respect of personal injury to or the death of any person whosoever arising out of or in the course of or caused by the execution of the Works and provided always that the same is due to any negligence, omission or default of the Contractor, or agents or to any circumstances within the Contractor's control.

34.3. Injury to property - the Contractor shall be liable for and shall indemnify the Purchaser against and insure against any liability, loss, claim or proceedings in respect of injury or damage whatsoever to any property real or personal in as far as such injury or damage arises out of or in the course of the execution of the Works and provided always that the same is due to any negligence, omission or default of the Contractor, or agents or to any circumstances within the Contractor's control.

34.4. To the extent that the Contractor shall have been required under the foregoing sub-clauses to insure himself, the Contractor shall produce the relevant policy or policies and premium receipts as and when required by the Purchaser. If the Contractor should make default in so doing the Purchaser may insure against any risk with respect to which the default shall have occurred and may deduct the premium paid from any monies due or to become due to the Contractor.

35. PUBLIC RELEASE OF INFORMATION

The Contractor and his Sub-contractors shall obtain in writing the prior approval and consent of the Purchaser before the release of any

news items, article, publication, advertisement, prepared speech or any other information or material, pertaining to any part of the Works to be performed or performed under the Contract. Such approval shall be sought within a reasonable time.

36. SPECIAL RISKS

36.1. The Contractor shall be under no liability whatsoever whether by way of indemnity or otherwise for destruction or damage to the Works, Temporary Works, to the property of the Purchaser or third parties, or for injury or loss of life, which is the direct or indirect consequence of war hostilities, declared or not, invasion, act of foreign enemies, rebellion, revolution, insurrection, military or usurped power, riot, commotion, or disorder, hereinafter comprehensively referred to as the "Said Special Risks". The Purchaser shall indemnify and save harmless the Contractor against and from the Said Special Risks and against and from all claims, demands, proceedings, damages, costs, charges, and expenses whatsoever arising thereout or in connection therewith, and shall compensate the Contractor for any loss of or damage to property of the Contractor, used or intended to be used for the purposes of the Works, including property in transit to the Site,and occasioned either directly or indirectly by the Said Special Risks.

36.2. If the Works, Temporary Works or any materials on, near or in transit to the Site shall sustain destruction or damage by reason of any of the Said Special Risks, the Contractor shall be entitled to be paid by the Purchaser the cost of repairing any destruction or damage to the Works or Temporary Works and of replacing or repairing such materials as may be necessary or as may be necessary for the completion of the Works on a day-work basis, provided that the Purchaser shall first require or approve in writing the said repair or replacement.

36.3. Destruction, damage, injury or loss of life caused by the explosion or impact of any bomb, mine, shell grenade, or other projectiles, missile, munition or explosive of war shall be deemed to be a consequence of the Said Special Risks.

36.4. The Purchaser shall repay to the Contractor any increased cost of or incidental to the execution of the Works which is, howsoever, attributable to, consequent on, the result of or in any way, whatsoever, connected

with the Said Special Risks, subject, however, to the provisions in this Clause in regard to outbreak of war. The Contractor shall as soon as any such increase of cost comes to his knowledge, notify the Purchaser thereof in writing. The Purchaser shall take a decision thereon and his decision shall be binding on both parties until the completion of the Works, provided that if one party differs with the other party's decision it shall notify the other in writing accordingly within twenty-eight (28) days from the date of notification of the party's decision requesting reference of the matter to arbitration.

37. TAXATION:

The Contractor's, Manufacture's or Sub-contractor's personnel who are not citizens of Pakistan shall be exempted from all and any kinds of duties and taxies leviable in Pakistan, if any, including, but not limited to, import duty, custom duty for all equipment and materials including temporarily imported goods and income tax.

38. ARBITRATION:

Any disputes, controversies and/or difficulties arising out of or in connection with this Contract shall be settled amicably between the parties. But in case such settlement fails, they shall be finally settled by arbitration in Paris according to the Rules of Conciliation and Arbitration of the International Chamber of Commerce at Paris, France, by whose award each party is bound.

39. CORRESPONDENCE

39.1. All documents pertaining to the Contract including all correspondence, all notices, demands and other communications which shall or may be given under the Contract shall be made by registered airmail, air-freight or telegram or delivered by hands and shall be addressed to all the parties at their respective principal offices, except that they may change such offices by notice in accordance with this Clause. The communications as mentioned above shall be deemed to be received and made effective when their receipt is confirmed by the party who receives the communication whose confirmation shall not unreasonably be withheld. Unless otherwise specified under the terms of the Contract, all correspondence which shall or may be given under the

Contract shall be addressed by the Contractor to the Purchaser. The Purchaser shall reply directly to the Contractor.

39.2. The titles to the Clauses in this Contract are for convenience of reference only and shall not in any way affect the interpretation thereof.

40. GOVERNING LAW

This Contract shall be governed by and interpreted according to the laws of the Islamic Republic of Pakistan.

TENDER FORM NO._____

Dated _____

TENDER FORM

To: Port Qasim Authority,
5th Floor, NSC Building,
Moulvi Tamizuddin Khan Road,
Islamic Republic of Pakistan.

Dear Sir,

We, the undersigned, having read tha Instrucitons to Tenderers to the supply and installation of the Port Radio Aids System AND upon this basis we hereby offer to design, manufacture, and install the equipment in accordance with the said Tender Documents and the drawings and documents submitted herewith and to perform all the obligations to be performed by the Contractor under the terms of the said Tender Documents for the sum of _____ (in figures) _____ (in words) (hereinafter called the Contract Price).

If this tender is accepted we undertake and agree:-

a) To execute the Contract for the design, manufactute and installation of the Equipment in accordance with the terms of the Contract Form and the General Conditions of Contract.

b) That unless and until the formal contract is executed our tender together with your written acceptance thereof, shall constitute a binding contract between us as if the Contract had been executed.

c) To deliver to you a Performance Bond in form annexed hereto for the amount of _____ (in figures) _____ (in words) as prescribed in the General Conditions of Contact.

d) In the event that we fail to execute the said Contract and deliver the said Performance Bond the Bid Bond accompanying this tender can be encashed by or on hehalf of Port Authority and the money payable therefrom shall stand forfeited to the said authority.

Dated: day of

signed _____

A signatory authorised to sign the Contract

on behalf of

_____

Witness: _____ _____

Witness: _____ _____

_____

Sworn and signed before me

this day of

By .....

SPECIMEN FORM NO. _____

Dated _____

SPECIMEN FORM OF BANK GUARANTEE
IN LIEU OF EARNEST MONEY DEPOSIT
IN CASE _____

To: Port Qasim Authority,
5th Floor, NSC Building,
Moulvi Tamizuddin Khan Road,
Islamic Republic of Pakistan.

Bank Guarantee No.

Dated:

Dear Sir,

Whereas M/S _____ (herein called the Tenderer) have requested us through _____ Bank Ltd., to furnish Earnest Money by way of Bank Guarantee in your favour in the sum of _____ (in figures) _____ (in words) against your Tender Notice No. _____ dated _____ for supply and installation of the Port Radio Aids System. We hereby agree and undertake:-

i) to make unconditional payment of _____ (in figure) _____ (in words) to you on demand without further question or reference to the Tenderer in case of withdrawal or modification of quotation or any default or non-exucution of the contract or refusal to accept order by the Tenderer from the date of opening of Tender until expiry of the validity of their offer;

ii) to keep this guarantee is full force from date up to _____(date) _____ THE DATE UNTIL which the tenderers offer is valid;

iii) to extend the period of guarantee if such extension be necessary beyond _____(date) _____ _____ and desired by the Tenderer:

iv) any claim arising out of this guarantee must be lodged with this Bank within the period the guarantee is valid and before the date of its expiry. After this date the guarantee will be considered null and void and should be returned to us.

Yours faithfully,

Name of the Bank _____

Signature: _____

CONTRACT FORM NO._____

Dated _____

CONTRACT FORM

This CONTRACT made and entered into this _____day of _____, 19____, by and between Port Qasim Authority, the Government of Islamic Republic Pakistan (hereinafter called "Purchaser" which shall include its legal successors and assigns), having its principal office at 5th Floor, NSC Building, Moulvi Tamizuddin Khan Road, Islamic Republic of Pakistan, and _____ _____(hereinafter called "Contractor" which shall include its legal successors and assigns), having its principal office at _____.

WITNESSETH that the parties hereto agree as follows:

1. The Contractor agrees to do and complete all the Works for the Port Radio Aids System in accordance with the terms and conditions of the documents set forth below, which are included in, attached to, and form a part of this Contract.

(a) Tender Documents No. _____ dated _____ for _____,

(b) Tender of the Contractor dated _____

(c) Letter of intent of Contract dated _____ from the Purchaser to the Contractor.

(d) Any and all amendments to each of the above documents and all other additional written agreement when issued or approved in writing by the Purchaser.

It is agreed that the terms and conditions of the above documents shall prevail except to the extent they are expressly modified or altered by this Contract.

2. The Purchaser agrees to pay to the Contractor in consideration of the fulfilment of the Works, the contract price of _____ _____ (_____) in accordance with the terms and conditions specified in the General Conditions of Contract in the said Tender Documents forming a part of the Contract.

3. It is mutually agreed (herein insert particulars of any modifications or alterations of the documents set forth in item 1 above).

IN WITNESS WHEREOF, each of the parties hereto has caused this Contract to be executed in duplicate as of the date first above written by its duly authorized representative.

FOR AND ON BEHALF OF	FOR AND ON BEHALF OF
Port Qasim Authority 5th Floor, NSC Buidling Moulvi Tamizuddin Khan Road Islamic Republic of Pakistan	(Contractor's Name)
_____	_____
of	(Name and Title)
PORT QASIM AUTHORITY	

SPECIFICATIONS FOR THE PORT RADIO AIDS SYSTEM

1. OUTLINE OF THE SCHEMES

1.1 General

The basic planning, design, supply and installation shall be made for radio aids to navigation in Port Muhammad Bin Qasim to let the ships enter or leave the Port anytime during day and night and shall be made to facilitate position finding for control dredging, carrying out of surveys and positioning of buoys.

1.2 Scope of Work

The Contractor shall supply and install the equipment to be covered by this specification under the Contract and the Contractor shall also impart training for the maintenance and operation staff of the Purchaser.

1.3 Port Radio Aids System

The Port Radio Aids System shall consist of the following equipment.

1.3.1 VHF radio communications equipment

The VHF radio communications equipment shall be installed at Port Muhammad Bin Qasim area for its harbor communications services to expedite the administrative and operational activities of the port and the smooth navigation of vessels entering and leaving the Port. In other words, the VHF communications facilities installed shall be used for permission for ships to enter or to leave, request

	Unit	Quantity (Approx.)
4 Walkie - Talkie 1 watt (with battery)	Set	1
5 Consumable spare (for two years operation)	Set	1
6 Spare unit and kit	Set	1
7 Installation (except tower foundation)	Set	1
8 Training	Set	1
Decca Sea Fix equipment		
1 Master station		
a Master control unit type 9431 or equivalent	Set	1
b Transmitter type 9430 or equivalent	Set	1
c Matching Coil type 9438F or equivalent	Set	1
d 10m antenna (c/w earth mat)	Set	1
e Junction box with connecting cable	Set	1
f Equipment case	Set	1
g Power supply (Thermo-generator)	Set	1
h Battery	Set	1
2 Slave station		
a Slave control unit type 9413 or equivalent	Set	2
b Transmitter type 9430 or equivalent	Set	2
c Matching coil type 9438F or equivalent	Set	2
d 30ft antenna (c/w earth mat)	Set	2
e Junction box with connecting cable	Set	2

	Unit	Quantity (Approx.)
f Equipment case	Set	2
g Power supply device (Thermo-generator)	Set	2
h Battery	Set	2
3 Ship station		
a Receiver type80402B or equivalent	Set	3
b Antenna type 9928 or equivalent	Set	3
c Connecting cable (c/w Junction box)	Set	3
d Track plotter type 350TS or equivalent	Set	3
e Power supply device (with battery)	Set	3
f Print log (c/w Junction box and cable)	Set	3
4 Lattice chart	Sheet	25
5 Consumable spare (for two years operation)	Set	1
6 Spare unit and kit	Set	1
7 Installation and calibration	Set	1
8 Training	Set	1
Radar transponder equipment		
1 X-band radar transponder with antenna	Set	1
2 Battery	Set	1
3 Consumable spare (for two years operation)	Set	1
4 Installation	Set	1
5 Training	Set	1

		Unit	Quantity (Approx.)
Test gear and equipment			
1	Circuit tester	Set	4
2	Through line watt meter	Set	4
3	Terminating watt meter for high power	Set	4
4	Terminating watt meter for low power	Set	4
5	Wide band VTVM	Set	4
6	Frequency meter	Set	1
7	Field intensity meter	Set	1
8	Mobile radio test sit	Set	1
9	Oscilloscope	Set	1
10	Testunit type 9800 or equivalent	Set	1
11	Monitor box type 9426E or equivalent	Set	1
12	Monitor recorder type 9996 or equivalent	Set	1
13	Pattern Recorder type 9995 or equivalent	Set	1
14	Tool set	Set	2
15	Spare part cabinet	Set	1
16	Rack for test equipment	Set	1

L I S T O F E Q U I P M E N T

FOR

Port Radio Aids System

LIST OF EQUIPMENT

(Port Radio Aids System)

	Unit	Quantity (Approx.)
VHF radio communications equipment		
1 Supervisory control center station		
a Radio Apparatus 50 watt	Set	4
b Remote controller for above	Set	8
c Iron tower to install antenna (with warning light)	Set	1
d Interference removing appliance	Set	1
e Omnidirectional antenna	Set	8
f Antenna feeder cables	Set	8
g Other cable	Set	1
h Power supply equipment	Set	1
2 Port station (Ship station)		
a radio apparatus 10 watts	Set	18
b Antenna duplexer	Set	18
c Tower to install antenna (Portable type)	Set	18
d Omnidirectional antenna	Set	18
e Antenna feeder cable	Set	18
f Power unit	Set	18
3 Land mobile station		
a Radio apparatus 10 watts	Set	4
b Omnidirectional antenna (with cable)	Set	4

for pilot, quarantine, customs, etc., as well as for radio contract between various types of port facilities in the Area. The frequency used for this equipment is that reserved for RF channel for International Maritime Mobile Service of 150 MHz band prescribed under CCIR recommendation. The objectives of the communications are chiefly divided into the following seven types:

(a) Communications between the Supervisory Control Center (SCC) and a vessel entering or leaving the port.

(b) Communications between SCC and Port Karachi.

(c) Communications between SCC and land mobile station.

(d) Communications between Port station and land mobile station.

(e) Communications between Port station and ship station.

(f) Communications between land mobile stations themselves.

The VHF radio communications equipment is composed of the following stations:

Station	Number
Supervisory Control Center Station	1
Port Station (ship station)	18
Land Mobile Station (car)	4
Walkie Talkie	6

1.3.2 Decca Sea-Fix position finding equipment

Decca Sea-Fix position-finding equipment shall be established at Port Muhammad Bin Qasim area and used so that this equipment can be of tremendous advantages to the port conservancy authority. The objectives of this equipment are mainly divided into the following:

(a) echo-sounding operation

(b) dredging

(c) buoy-laying

(d) navigation aids in narrow channels.

(e) other such tasks

On the other hand, this equipment shall be also used for obtaining the position of dredgers during the port construction.

The Decca Sea-Fix position finding equipment is composed the following stations:

Station	Number
Master station	1
Slave station	2
Ship station	3
Monitor station	at request

1.3.3 Radar transponder equipment

In order to facilitate ships' navigation through the use of radar, a radar transponder shall be installed on the rear light of the leading lights.

2. VHF RADIO COMMUNICATIONS EQUIPMENT

2.1 Supervisory Control Center Station (S.C.C.)

All radio equipment shall be housed in a single rack, and capable of switching more than 5 operating channels.

The radio equipment shall be installed in the radio communications room in main building, together with various other equipment, such as switchboard, carrier units, etc. The operation of all the radio equipment shall be performed by means of eight (8) remote control units installed in separate command offices.

2.2 Port Station (Ship Station)

The radio equipment for port stations shall be of such type as is capable of safe, stabilized operation even with a power unit of small capacity.

2.3 Land Mobile Station

The radio equipment for a land mobile station shall be fitted to the dashboard of an automobile.

2.4 Walkie-Talkie

The radio equipment for the use of field staff to communicate with each other at a short distance shall be housed in a single unit.

2.5 Technical Specifications of Radio Equipment

The Radio equipment shall be designed, using up-to-date components and fully transistorized.

It may become necessary that the VHF aerial will be heightened or relay station(s) will be additionally established

if and when the effective coverage of the VHF radio communications would be smaller than that originally disigned.

The equipment shall, therefore, be designed so that easy application to that effect may be made.

The service area of VHF radio communications equipment installed in SCC will be one with the radius of approximately 70 Km.

2.5.1 Radio Equipment for SCC Station

(a) General

Type of communication	FM simplex
Frequency Range	142-169 MHz
Audio Range	300 to 3,000 Hz
Antenna Impedance	50 ohms unbalanced
Power Supply	DC 24 volts, positive grounded
Power Consumption	Transmit 180 watts/ transmitter
(Values are typical)	Receiver 12 watts/ receiver
	Standby 3 watts/ transciever
Dimensions (maximum)	Height 1,350 millimeters
	Width 520 millimeters
	Depth 225 millimeters
Number of Operating RF Channels (maximum)	8 CH for Simplex

(b) Transmitter

Type	Crystal Controlled PM
RF Power	50 watts
Audio Sensitivity	-8 dBm ± 3 dB for 2/3 maximum deviation at 1,000 Hz
Signal-to-Noise Ratio	45 dB or more for 2/3 maximum deviation at 1,000 Hz
Audio Response	+1, -3 dB of 6 dB/octave pre-emphasis from 300 to 3,000 Hz
Audio Distortion	Less than 5% at 1,000 Hz and 2/3 maximum deviation
Spurious and Harmonic Emission	-75 dB or less than carrier
Frequency Stability	Within ±2 KHz
Maximum Deviation	±5 KHz

(c) Receiver

Type	PM, Dual-Conversion Crystal Controlled Superheterodyne
Sensitivity	1 microvolt (p.d.) or less for 20 dB noise quieting
Selectivity	At least 75 dB down at ±25 KHz separation
Spurious and Image Rejection	At least 80 dB down referenced to 1 microvolt input

Audio Response	+1, -3 dB of -6 dB/octave deemphasis from 300 to 3,000 Hz
Squelch Performance	Adjustable in Noise Quieting from 10 dB to 20 dB
Audio Output	0.5 watts at 1,000 Hz
Audio Distortion	5% or less at 1,000 Hz
Frequency Stability	Within ±2 KHz

NOTE p.d. = potential difference

2.5.2 Radio equipment for Port station (Ship station)

(a) General

Type of Communication	Simplex
Frequency Range	148-169 MHz
Audio Range	300 to 3,000 Hz
Antenna Impedance	50 ohms unbalanced
Power Supply	DC 12 Volts, negative grounded
Power Consumption (Values are typical)	Transmit 40 watts Receive 7 watts Standby 2 watts
Dimensions (maximum)	Height 390 millimeters Width 250 millimeters Depth 85 millimiters
Number of Operating RF Channels	4 CH for Simplex

(b) Transmitter

Type	Crystal Controlled PM
RF Power	10 watts
Audio Sensitivity	-4 to -8 dBm ±3 dB for 2/3 maximum deviation at 1,000 Hz
Signal-to-Noise Ratio	45 dB or more for 2/3 maximum deviation at 1,000 Hz
Audio Response	+1, -3 dB of 6 dB/octave pre-empbasis from 300 to 3,000 Hz
Audio Distortion	Less than 10% at 1,000 Hz and 2/3 maximum deviation
Spurious and Harmonic Emission	-75 dB or less than carrier
Frequency Stability	Within ±2 KHz
Maximum Deviation	±5 KHz

(c) Receiver

Type	PM, Dual-Conversion Crystal Controlled Superheterodyne
Sensitivity	1 microvolt (p.d.) or less for 20 dB noise quieting
Selectivity	At least 75 dB down at ±25 KHz separation
Spurious and Image Rejection	At least 80 dB down referenced to 1 microvolt input
Audio Response	+1, -3 dB of -6 dB/octave de-emphasis from 300 to 3,000 Hz

Squelch Performance	Adjustable in Noise Quieting from 10 dB to 20 dB
Audio Output	0.5 watts at 1,000 Hz
Audio Distortion	10% or less at 1,000 Hz
Frequency Stability	Within ±2 KHz

NOTE p.d. = potential difference

2.5.3 Radio equipment for land mobile station

(a) General

Type of Communication	PM. Simplex
Frequency Range	148-169 MHz
Audio Range	300 to 3,000 Hz
Antenna Impedance	50 ohms unbalanced
Power Supply	DC 12 volts negative grounded
Power Consumption (All values are typical)	Transmit 33 watts Receive 7 watts Standby 2 watts
Dimensions (maximum)	Height 55 millimeters Width 160 millimeters Depth 235 millimeters
Number of Operating RF Channels	Maximum 8 CH for Simplex
Maximum Channel Frequency Separation	13 MHz

(b) Transmitter

Type	Crystal Control PM
RF Power	10 watts
Audio Sensitivity	-8 dBm ±3 dB for 2/3 maximum deviation at 1,000 Hz
Signal-to-Noise Ratio	45 dB or more for 2/3 maximum deviation at 1,000 Hz
Audio Distortion	Less than 10% at 1,000 Hz and 2/3 maximum deviation
Spurious and Harmonic Emission	-75 dB or less than carrier
Frequency Stability	Within ±2 KHz
Maximum Deviation	±5 KHz

(c) Receiver

Type	PM, Dual-Conversion Crystal Controlled Superheterodyne
Sensitivity	1 microvolt (p.d.) or less for 20 dB noise quieting
Selectivity	At least 75 dB down at ±25 KHz separation
Spurious and Image Rejection	At least 80 dB down referenced to 1 microvolt input
Audio Response	+1, -3 dB of -6 dB/octave de-emphasis from 300 to 3,000 Hz
Squelch Performance	Adjustable in Noise Quieting from 10 dB to 20 dB

Audio Output	0.5 watts at 1,000 Hz
Audio Distortion	10% or less at 1,000 Hz
Frequency Stability	Within ±2 KHz

2.5.4 Walkie-talkie

(a) General

Type of Communication	PM. Simplex
Frequency Range	148-169 MHz
Audio Range	300 to 3,000 Hz
Antenna Impedance	50 ohms unbalanced
Number of Operating RF Channels	Maximum 8 CH for Simplex
Maximum Channel Frequency Separation	13 MHz

(b) Transmitter

Type	Crystal Control PM
RF Power	1 watt
Audio Sensitivity	-8 dBm ±3 dB for 2/3 maximum deviation at 1,000 Hz
Signal-to-Noise Ratio	45 dB or more for 2/3 maximum deviation at 1,000 Hz
Audio Response	+1, -3 dB of 6 dB/octave pre-emphasis from 300 to 3,000 Hz
Audio Distortion	Less than 10% at 1,000 Hz and 2/3 maximum deviation

Spurious and Harmonic Emission	-75 dB or less than carrier
Frequency Stability	Within ±2 KHz
Maximum Deviation	±5 KHz

(c) Receiver

Type	PM, Dual-Conversion Crystal Controlled Superheterodyne
Sensitivity	1 microvolt (p.d.) or less for 20 dB noise quieting
Selectivity	At least 75 dB down at ±25 KHz separation
Spurious and Image Rejection	At least 80 dB down referenced to 1 microvolt input
Audio Response	+1, -3 dB of -6 dB/octave de-emphasis from 300 to 3,000 Hz
Squelch Performance	Adjustable in Noise Quieting from 10 dB to 20 dB
Audio Output	0.5 watts at 1,000 Hz
Audio Distortion	10% or less at 1,000 Hz
Frequency Stability	Within ±2 KHz

2.5.5 Power supply

(a) SCC station

The purchaser shall provide the power source of AC 115V ± 10%. 5A to the site, at which VHF equipment shall he installed. The contractor shall be responsible for the power supply

devices required for the operation of the equipment, and the devices shall have the capability of supplying back-up power source which meets the operational requirements of at least successive two days.

(b) PORT STATION (SHIP STATION)

The purchaser shall provide the power source of DC 12V ± 10%, 5A to the site, at which VHF equipment shall be installed. The contractor shall be responsible for the power supply devices required for the operation of the equipment, and the devices shall have the capability of supplying back-up power source which meets the operational requirements of at least successive two days.

(c) LAND MOBILE STATION

The purchaser shall provide the power source of D.C. 12V ± 10%, 5A to the site which the radio equipment shall be fitted in the automobile.

3. DECCA SEA-FIX POSITION FINDING EQUIPMENT

3.1 Description of the Equipment

The basis of the Sea-Fix equipment is the generation by three radio transmitting stations of a pair of stationary wave patterns, known as Pattern I and Pattern II. A receiver carried on board the observing ship and moving across these patterns gives a continuous readout of the antenna position relative to the transmitting stations. The grid positions of the three transmitting stations known, and thus the data given by the receiver may be

converted into geographical co-ordinates by reference to a chart on which the Sea-Fix patterns are shown. (see figure 1. Sea-Fix lattice)

The three radio transmitting stations consist of a 'Master', and two 'Slave', operating on a single frequency in the two megacycle waveband. Each station transmits in turn in response to a trigger signal from the Master. The complete cycle of transmissions: trigger, Master, Slave I, Slave II occupies 0.2 second. On board the observing vessel the receiver compares the phase of the incoming signal from the Master station with that from Slave I to determine its position line in Pattern I, and compares the phase of the Master signal with that from Slave II to determine its position line in Pattern II. The intersection of the two position-lines indicates the vessel's position relative to the transmitting stations.

The system is used in the hyperbolic mode. In the hyperbolic mode all three transmitting stations are situated on shore, and the radiated pattern, which may be utilised by any number of users, is as illustrated in figure 1. The multiuser facility of this mode makes it more appealing to Port Conservancy Authorities despite the falling off of fixing accuracy with range due to lane expansion and narrowing angle of cut.

The maximum working range of the system may be as mush as 50 miles, depending upon the type of equipment used, the location of working and the configuration of the transmitting stations.

Before putting a Sea-Fix Chain into action, the area of operations should be calibrated by Theodolite or Hydrodist or similar observations. This is to determine fixed errors in the computed lattices. It is also a wise precaution to

check readings at known points in the survey area from time to time during a survey to detect any pattern instability.

Sea-Fix is a miniaturised electronic position-fixing system intended for hydrographic use. The system is designed for oceanographic and offshore surveys concerning such operations as salvage, mine-sweeping, dredging and geophysical investigation.

3.2 Technical Specification of Decca Sea-Fix Position Finding Equipment

(a) General

1.	Mode of operation	Hyperbolic
2.	Pattern transmission frequency	Nominally in the band 1600-3000 KHz
3.	Trigger transmission frequency	Transmission frequency less 60 Hz
4.	Type of transmission	Interrupted continuous-wave, time multiplex
5.	Switching rate	Five times per second
6.	Radiated power	Approximately 1 watt from 10 m vertical aerial
7.	Maximum operating range (over sea)	In temperate latitude 50 km. In tropical latitudes this distance can be reduced by 50% by ambient noise levels.
8.	Receiver bandwidth	Approximately 200 Hz between 3 dB points

9.	Equipment Impedance	Input and output impedances are 50 unbalanced
10.	Maximum receiver speed	One lane per second
11.	Power Supply	From 22 V to 28 V d.c. normally provided by secondary batteries. Earthing does not affect the operation of the equipment.

(b) Licensing data

1.	Frequency range	1600-3000 KHz
2.	Radiated power	1 W to 40 W as required.
3.	Antenna	10 m omnidirectional vertical monopole
4.	Class of emission	Master station - F.9. Slave station - A.0.
5.	Range of system	Up to 150 km depending on requirement and area
6.	Period of use	Normally 24 hours per day, seven days per week
7.	Operator	To be furnished to licensing authorities by user in addition to specific answers to 1, 2, 5 and 6 above.
8.	Station positions	
9.	Coverage area	
10.	Function of system	Continuous position measurement and/or control
11.	Method of operation	C.W. pulses time-shared from Master and Slave transmitters giving time-difference position lines.

(c) Transmitter

1.	Transmitter type	9430 class C
2.	Tuning range	10 Hz
3.	Method of tuning	Variable inductance
4.	Frequency control	Crystal: stable to 1 x 10^6 per year after oven warm up.
5.	Emission bandwidth	-3 db 100 Hz -20 db 500 Hz -60 db 650 Hz
6.	Pulse rate	5 per second with rise and fall time of 2 milli-seconds
7.	Harmonic attenuation	50 db minimum
8.	Spurious attenuation	50 db minimum

(d) Receiver

1.	Receiver types	80402B
2.	Tuning range	10 Hz
3.	Method of tuning	Variable inductance
4.	Frequency control	Crystal: stable to 1 x 10^6 per year after oven warm up.
5.	R.F. Bandwidth	20 KHz
6.	Pre-selection	Tuned R.F.
7.	Post-selection	Crystal filter
8.	I.F. frequency	132, 840 Hz

9.	I.F. Bandwidth	-3 db 200-300 Hz -20 db 600 Hz -60 db 2 KHz
10.	Sensitivity	4 μ volts
11.	Aerial	Tuned 2 m whip

NOTE: PRINT LOG TO BE INSTALLED ON THE SHIP STATION.

The print log equipment shall have a printing out capability of the data on the depth of water in it. Advance Confirmation shall be made by the contractor whether the digital output of each sounder is terminated so that the output may be input into the print log.

4. RADAR TRANSPONDER EQUIPMENT

4.1 Outline

The radar transponder is sited on the rear light of leading lights and transmits R.F. coded pulses of the standard X-band marine radar frequency band only when it is triggered by the radar pulses. The R.F. coded pulses transmitted from the transponder are received by the marine radar on board and the coded pulses is displayed on the radar P.P.I. (plan position indicator) giving the precise range and bearing and identify of the transponder station to the observer.

A radar transponder is essentially a receiver and pulse transmitter. When the receiver detects a pulse interrogation (radar transmission) on its frequency, it triggers the transmitter to reply with a pulse on pulse group.

This transponder reply is returned to the interrogating radar as a signal return of much greater strength than the corresponding skin return or radar echo.

Typical applications of the transponder are ground-located identification point, reefs, drilling rig, channel, light ship, harbour entrance etc. as a Marine navigational aids.

4.2 Technical Specification of Radar Transponder Equipment

(a) General characteristics

Frequency range	8800 to 9500 MHz (tunable)
Primary power	24 to 30 VDC
Primary current (typical) ..	0.55 amp.
Recovery time	50 μsec max. for input signal levels differing by up to 65 dB
Transponder delay:	
Standard	1 μsec settable 1.0 to 4.3 μsec
Variation with signal	
Level	0.05 μsec max. from -62 dBm to 0 dBm
Pulse delay jitter	0.02 μsec max. for signals greater than -55 dBm
Dimension	8.6 x 7.4 x 10.1 (centimeter)
Volume	643 cubic centimeters
Weight	1.5 kg

(b) Receiver characteristics

Off-frequency rejection	60 dB image; 80 dBm min., 0.15 to 10,000 MHz
Sensitivity (99% reply)	-65 dBm
Signal input (maximum)	+20 dBm
Interrogation code	Single-or double-pulse
Pulse width	0.25 to 5.0 μsec (single-pulse) 0.25 to 1.0 μsec (double-pulse)
Pulse spacing	3.0 to 12.0 μsec (1 μsec steps)

(c) Transmitter characteristics

Power output (peak).....	400 watts, typical 300 watts, minimum
Duty cycle	0.002 maximum
Output pulse width	0.3 $\pm$ 0.1 μsec or 0.5 $\pm$ 0.1 μsec
Pulse rise time ..... (10% to 90%)	0.1 μsec, maximum
Pulse fall time ..... (90% to 10%)	0.2 μsec, maximum

(d) Battery

The battery capacity will be able to afford the operation for more than one year only by the battery.

The purchaser shall provide the power source of DC. 24V to the site, at which radar transponder shall be installed on the rear of leading lights. The contractor shall be responsible for the power supply devices

required for the operation of the equipment, and the devices shall have the capability of supplying back-up power source which meets the operational requirements of at least successive one year.

5. FREQUENCY EQUIPMENT

Application for all the frequency allocation for the Port Radio Aids System shall be made by the purchaser, and the contractor shall be notified by the purchaser of the allocation when the contract is awarded.

6. ENVIRONMENTAL CONDITIONS

The equipment shall operate under following environmental conditions:

a.	Temperature	-10°C to 50°C
b.	Humidity	70% to 95%
c.	Wind velocity	40m/sec.

7. SYSTEM EVOLUTION

(a) Bidders will evolve the systems as specified above.

(b) Full details of calculations with complete details of the assumed parameters and full justification of assumptions made together with a Frequency Plan for the system will be submitted for examination and approval of the purchaser.

The Contractor will be required to fully implement all reasonable directives given and effect all reasonable changes directed by the purchaser in the plans of the systems.

8. SITE SURVEY

8.1 The contractor will at his own expense conduct the check survey of the site and will also do propagation survey if he deems it necessary to check equipment and system. Parameters tendered by him to Guarantee the specified performance for which performance he will be exclusively responsible, while doing the check survey maximum utilization of depart mental talent shall be considered.

8.2 The sites including vessels and vehicles, on which the stations shall be installed and identified by the purchaser, shall be considered as available locations to the contractor. The contractor shall examine the locations designated, and shall decide the most suitable site in consultation with the purchaser.

8.3 The equipment and devices necessary for the site survey shall be provided by the contractor.

9. COORDINATES

The coordinates of the station required by the contractor shall be calculated by the purchaser and the contractor shall be notified by the purchaser thereof.

10. TOWER (for VHF radio communications equipment)

10.1 Steel towers of requisite height as determined by the Contractor are to be supplied. Quotation for guyed as well as self supported towers shall be submitted alongwith guys, fittings, foundation bolts & plates, anchor bolts, rods, base plate, obstruction light equipment, etc. as required. The tower shall withstand the wind velocity of

40 m/s. The quotation shall be separate for guyed and self supported towers for evaluation. Tower height at the respective Station shall be determined by the Contractor.

10.2 The tower foundation of VHF aerials shall be provided by the purchaser, and the general technical specifications required for the foundation works shall be submitted by the contractor to the purchaser within two (2) months after the effective date of the Contract.

10.3 The detailed technical specifications including erection procedures for the VHF aerial tower shall differ depending upon the tenderer to award the contract. Sufficient information shall be obtained from the contractor to complete the foundation. Warning lights shall be fitted on the tower.

11. ANTENNAS AND FEEDER CABLE

Omni directional antennas shall be required to be installed at the control center station as well as at the mobile, port and ship stations. Antennas feeder cable shall be supplied by the Contractor as per requirements in the system.

12. LATTICE CHART

12.1 The purchaser shall give the contractor notice of the areas, for which the charts shall be produced.

12.2 The contractor shall obtain the technical information required for producing the charts at the time of completion of the installation of the equipment.

12.3 The contractor shall be responsible for producing proper charts on the basis of the co-ordinates of the stations furnished by the purchaser.

13. INSTALLATION

13.1 The contractor shall be responsible for the satisfactory installation of the equipment according to the specifications and good engineering techniques and services.

13.2 The installation schedule is to be evolved and arranged to complete installation of the system.

13.3 The devices and tools necessary for the installation of the equipment shall be prepared by the contractor.

13.4 The contractor shall choose, till the installation of the equipment is complete the station to monitor in order to ensure that the system is ready for full operation.

13.5 The purchaser shall give the contractor notice of the place and date of the installation of the equipment.

13.6 The sites including vessels and vehicles, on which the stations shall be installed and identified by the purchaser, shall be considered as available locations to the contractor. The contractor shall examine the locations designated, and shall decide the most suitable site in consultation with the purchaser.

13.7 Installation of the Equipment to be supplied under this Contract shall be carried out by the Contractor after their receipt of notice in writing by the Purchaser that the equipment are ready for commencement of the Installation.

14. SUPPLY OF EQUIPMENT

14.1 All the equipment for the system and the tools, devices and materials for the installation and testing of the system shall be supplied by the Contractor.

The contractor shall clearly specify his intention whether he will taking the equipment, tools, devices and materials, brought into Pakistan for the installation and testing of the equipment and system, back out of Pakistan after the completion of the installation.

14.2 Free of cost and freight replacements shall be made for these pieces of equipment, that fails to satisfy the specifications till the expiry of the guarantee period.

15. ELECTRICAL PROTECTION

15.1 Equipment

The equipment shall be protected from damage due to under-voltage short circuit, open circuit and from incorrect operation of equipment controls and switches by the provision of fused, and other appropriate devices. Fuses shall be clearly labelled as to function and capacity.

15.2 Safety of Personnel

Provision shall be made by means of electrical interlocks, safety covers and similar safety devices to minimize accidental contact with conductors carrying dangerous voltages.

Safety covers shall be marked with appropriate warning as for example "DANGER HIGH VOLTAGE" in red, clearly legible letters.

15.3 Plug in Modules

All plug-in-type modules shall be removable without prior need to switch off the equipment.

15.4 Routine Adjustment

Any adjustments required during any routine maintenance procedure, shall be readily available without requiring the equipment to be first switched off.

15.5 Materials

No fungus nutrient materials or material subject to insect attack shall be used in the construction of equipment. All materials used shall be of quality suitable for protracted use in a humid tropical climate with excessive corrosion.

16. TRAINING

16.1 The maintenance and operational training for the VHF radio equipment shall be provided to the two (2) engineers nominated by the purchaser, at the site a period of three (3) weeks after completion of the installation of the equipment.

The maintenance and operational training for the Sea-Fix equipment shall be provided to the two (2) engineers, nominated by the purchaser, at the factory and at the site for a period of three (3) weeks respectively.

16.2 The maintenance and operational training for the radar transponder equipment shall be provided at the site to the two (2) engineers nominated by the purchaser for a period of two (2) days.

16.3 During the period in which the installation work is in progress the Contractor's Project Engineer shall give all necessary instructions to members of the maintenance staff nominated by the Purchaser in all technicalities of the Equipment and in all matters appertaining to its efficient operation and maintenance. He shall also give assistance in the organizing of maintenance methods in order to ensure that the said staff will be fully qualified to undertake satisfactorily all operational and maintenance duties. The cost of such training is included in the Contract Price.

16.4 All training shall be imparted in English language. Trainees shall have a good knowledge of both technical and conversational English. Training programme shall be proposed in the Tender.

17. FACTORY TESTING

17.1 The Contractor shall submit to the Purchaser for approval, within four (4) months after the effective date of the Contract, three (3) copies of written proposal for the methods and details of the factory testing.

17.2 As and when any Equipment shall have passed the Contractor's tests in conformity to the testing methods and details approved by the Purchaser, the Contractor shall furnish to the Purchaser, within two (2) weeks after the inspection and testing, five (5) copies of the duly certified test reports with test readings.

Receipt of such certified test reports by the Purchaser shall not relieve the Contractor from any of his obligations for the Contractor from any of his obligations for the workmanship and quality of the Equipment under the Contract.

17.3 All equipment condemned by the Purchaser shall be removed and replaced in accordance with the Contract at the Contractor's expense and in a manner satisfactory to the Purchaser.

17.4 If the Purchaser shall waive the right of inspecting or testing as herein provided, the Contractor shall proceed with the tests. It shall in no way relieve the Contractor of full liability for the quality, proper operation and performance of the Equipment.

17.5 No shipment of the Equipment shall be made before the factory testing is completed with the result satisfactory to the Purchaser.

17.6 The Contractor shall be obliged to conduct additional testing, if deemed necessary by the Purchaser.

18. ACCEPTANCE TEST

18.1 Upon completion of the Installation of the Equipment, each portion of the Equipment shall be tested by the Contractor's Project Engineer in the presence of such representatives as the Purchaser may appoint and in such manner as these representatives may direct and in accordance with the Test Procedure Proposed by the Contractor and accepted by the Purchaser. The Test Procedure shall be submitted by the Contractor to the Purchaser during the reasonable period after the effective date of this Contract, and, in any case, not later than three (3) months before the Equipment is due for the Final Acceptance Test.

19. MARKING AND FINISH REQUIREMENT

19.1 Equipment

All Radio equipment shall be clearly and permanently marked. All controls, meters, switches and indicator lamps shall be clearly labelled as to function.

19.2 Test Points

All test points shall be clearly labelled as to function.

19.3 Surfaces

All steel surface except stainless steel, shall be protected against corrosion. All external surfaces will be finished with suitable paint.

20. TEST GEARS AND MEASURING EQUIPMENT

20.1 All Test gears, measuring equipment and tools necessary for maintenance shall be supplied. The following are the general requirements for measuring equipments:-

a) Measuring equipment shall be provided with all necessary accessories for measuring, such as attennaters, auxiliary amplifiers, filters as well as plugs and cords.

b) Power source for measuring equipment other than of mobile mounted type shall be AC 230V, single phase 50Hz. Equipment shall be capable of satisfactory operation within voltage variation of 10% and frequency variations of $\pm$2%

c) Measuring equipment shall have sufficient measuring range compatible with the system subject to measuring.

d) Measuring equipment other than units specified to be stationary in type shall be easy to transport.

e) Measuring accuracy of equipment shall be sufficiently high to bear comparison with the standards of objects to be measured, and shall be such as can be calibrated as required.

f) In case single equipment cannot measure the required range it will be permissible to use two or more equipment.

20.2 The following types of principal measuring equipment, tools and facilities for maintenance shall be provided.

a)	Circuit Tester	4 Nos.
b)	Through line watt meter	4 "
c)	Terminating watt meter (for high power)	4 "
d)	Terminating watt meter	4 "
e)	Wide band VTVM	4 "
f)	Frequency meter	1
g)	Field intensity meter	1
h)	Mobile radio Test set	4 Nos.
i)	Oscilloscope	1
j)	Test unit (9800) or equivalent	1
k)	Monitor box (9426E) or equivalent	1
l)	Monitor recorder (9996) or equivalent	1
m)	Pattern recorder (9995) or equivalent	1

In addition to the above list, the manufacturer/supplier shall suggest other test gears, measuring equipment and special tests that may be required for proper and efficient maintenance of the equipment and shall quote accordingly in their bids.

20.3 The integrated maintenance for the various equipment to be installed in Port Qasim should be considered, and the logistic support as to the maintenance equipment, materials, parts and/or component shall be made in accordance with this line.

21. TOOLS

In addition to items mentioned in Article 21, the Contractor shall supply all tools necessary for proper day to day maintenance of the radio equipment. The tools and the costs of all tools shall be listed in the maintenance manual and unit instruction manual for the maintenance of the radio and other equipment. Two complete sets of special tools shall also be supplied.

22. SPARE PARTS

The Contractor shall supply spare parts to maintain the radio equipment, test gears and associated equipment. The list of spares shall be based upon a recommended list supplied by the Contractor and approved by the Purchaser.

The Contractor shall recommend spares necessary to maintain the system for a period of two (2) years. He shall indicate which spares are required for station level maintenance, following the same philosophy of maintenance as expressed in the specifications.

The spares to be supplied under this specifications shall be included in the Tender.

After the two (2) years period or within the two (2) years if required, the Contractor shall supply on a reimbursement basis the requested spares without undue delay on receipt of orders for spares from the Purchaser.

23. DOCUMENTATION

23.1 System manuals shall be supplied. These manuals shall show and describe, in terms of functional block diagrams, the relation of each major unit of the entire system.

23.2 Maintenance Manuals

The system maintenance manuals shall be delivered prior to the completion of the Installation and before any equipment is operated in the field. The maintenance manuals shall cover all routine periodic inspection, testing, slignment, adjustments, faults locations and any other maintenance procedures. Test equipment and tools required for equipment and system maintenance shall be called out. Periodic maintenance schedules and recommended form for recording maintenance data shall be included.

24. GUARANTEE

24.1 The Contractor guarantees for one (1) year from the date of Final Acceptance the satisfactory performance of the Works and that the Equipment shall give a thoroughly efficient service in accordance with the standards laid down in the Specifications, the Contractor's Technical Proposal and the Final Acceptance criteria. The Guarantee shall consequently cover any malfunction or failure caused by

faulty design workmanship or defective materials of the Equipment, except those caused by negligent use or maintenance, mis-operation of the Equipment by the Purchaser and/or third party or third parties, and the repair and replacement of any part of the Works found to be defective for causes as aforementioned. Any part of the Equipment to be replaced under this guarantee shall be delivered to the Site free of charge.

24.2 The Purchaser shall possess the right at any time during the period of this guarantee and irrespective of prior inspections or acceptances to reject any materials, equipment, facilities and services not conforming to the above guarantee and may require the Contractor at his expense, to rectify or replace, at the Purchaser's option, such materials, equipment facilities and services.

24.3 If the Contractor fails to correct or replace such defective materials, equipment, facilities and services promptly after notification and authrization by the Purchaser, the Purchaser may, by contract or otherwise, rectify or replace such defective mateirals, equipment, facilities and services and to deduct the costs of the same from the Performance Bond. If as a result of operational conditions the Purchaser determines that it is impracticable to have the Contractor repair or Purchaser may, if it so elects require the Contractor to repay such portion of the Contract Price as is equitable under the circumstances in lieu of repairing or replacing the defective materials, equipment, facilities and services unless the Contractor can satisfy the Purchaser that the defect was not due to his negligence or to any circumstance within his control.

24.4 The guarantee shall extend to all defects as aforesaid which appear during a period of one (1) year from the date of Final Acceptance by the Purchaser. This guarantee shall continue in respect of any replaced items for a period of one (1) year from the date of such replacement. In order that the Purchaser may avail themselves of the right under this Clause the Purchaser shall notify the Contractor in writing without delay of any defects that have appeared and shall give the Contractor every opportunity of inspecting and remedying such defects at the Contractor's own expense.

24.5 If the Contractor fails to proceed with due diligence after being required to fulfil his obligations under this Guarantee, the Purchaser may proceed to do the necessary work at the Contractor's risk and expense, provided it is done in a reasonable manner.

25. MAINTENANCE, OPERATION & SUPERVISORY SERVICES

(a) The equipment, shall be exclusively maintained, operate and supervised by the Purchaser after the final acceptance, during the Guarantee period, however, if the Contractor considers it necessary, he may retain a few of his supervising engineers at his own cost of avoid difficulties in replacements free of cost and freight of each items, parts and whole of assemblies that fail to function according to the specifications and the specified tests during the Guarantee period.

(b) Maintenance Manuals, (Detailed drawings of all units showing all components, their values and layout) details of installations, wiring daigram: test results, Manuals

describing the equipment, Testing Equipment and Gear shall be supplied on the basis of five sets.

(c) Bidders will propose equipment, test equipment and gear, set up and organization of maintenance workshops for the entire port radio system spread all over the coastal areas.