C.S.

POSTAL & TELEGRAPHIC.
(Broadcast)

No. 309/32.

.1932.

Electrician-in-Charge.

SUBJECT.

1932
24th November.

Previous Paper.

Possibility of installing a broadcast transmitter in Stanley for the purpose of broadcasting to the camp.

MINUTES.

1-3

Minute from Electrician-in-Charge, 24/11/32.

G.S. Schilsh.

25-11-32.

Hon C.S

The cost of installation makes the proposition impossible. Please write Mr Scott, New Zealand, to that effect.

J.O.C. 25-11-32

G.S. Draft letter to Mr Scott submitted.

Hon C.S approved J.O.C 29-11-32

26.11.32.

Subsequent Paper.

Elect. & Chge.

Please see with

thanks for your report. In

present circumstances it is

scarcely worth while obtaining the

further particulars you suggest.

30. 11. 32.

Hon Col Sec.

Seen. Thankyou.

F.H.R. 1/12/32.

P.A.
1/12/32.

Letter from the Crown Agents of 14/12/32. (5-9.)

Supt. Elect. Depn:

To see. I am aware the cost of such an installation bars anything being done in the near future. The first consideration is new receiving and sending instruments for the W/T. Stn.

M.C.H.
2.2.33 C.S.

C.S.O. No. 309/32.

Inside Minute Paper.

Sheet No. 1

Hon Col Sec

Seen. Yes. I concur.

AM
Sup E & T
3/2/38.

H.E.

Submitted. I fear this matter must wait.

MCH
C.S.
4. 2. 38

I agree

[illegible] 4/2

P.A.
MCH

(10-11.) S. of S. despatch No. 5 of 10/1/38.

Sup. Elec: Dept.

Please see despatch and note the points raised therein for future reference.

MCH
C.S.
9. 2. 38

Hon Col Sec

noted, Thank you

AM
Sup E & T
10/2/38

P. A.

Letter from Crown Agents of 24. 1. 38. 12-16.

Supr. E & T.

To see. Reds 12-16.

C. S. J.
for C.S.
25/2/38

Hon Col Sec

Reds 12-16 seen. Thank you

A.M.
Sup E & T
4/3/38

P.A.
7/3/38

Minute from Executive Engineer of 9/4/41. 17-20.

Y/E.

Reds 17-20 submitted.

C. S. J.
for C.S.
15/4/41.

No need to send this - we were merely discussing a possible eventuality.

15/IV/41

E.E.
Supr. E & T.

None 16. IV. 41.

To note.

C. S. J.
for C.S.
15/4/41

Hon Col Sec

noted.

A.M.
S. E & T
24/4/41

P.A.

(20)

No.

(It is requested that, in any reference to this minute, the above Number and the date may be quoted).

MINUTE.

9th April, 1941.

From The Executive Engineer,

Public Works Dept.,

Stanley, Falkland Islands.

To The Honourable

The Colonial Secretary

Stanley.

Red (2) 95 no

From the attached minutes you will see that E. & T. Department now find the original proposal, as adumbrated in my minute of 13th May, 1940 to be unworkable.

If His Excellency still wishes the space in the Town Hall made available for Naval Staff, I feel the alternative in para 5 of my minute of 7.IV.41 is the solution. Estimated cost of such a building would be about £500. 0. 0.

Early instructions would be appreciated as I understand work will have to be completed by 1st June next.

Austin Woodfall.

Executive Engineer.

(19.)

No.
(It is requested that, in any reference to this minute, the above Number and the date may be quoted).

MINUTE.

7th April, 1941

From The Executive Engineer
Public Works Dept.,
Stanley, Falkland Islands.

To The Honourable
Colonial Secretary,
Stanley.

In accordance with instructions received from His Excellency the Governor on Friday last dnning an inspection of the Town Hall with a view to providing further accomodation for Naval Staff, I submit herewith sketch plan for new Broadcast Station on the lines laid down in my minute of the 13th May, 1940.

Rec'd 2) Mil. 9/5/40

1) The estimated cost of the new building exclusive of land, fences and paths is £ 550-0-0 It will be prefabricated in sections and its construction will be able to proceed in winter weather, and will with the slackening of work enable me to keep the Carpenters employed. Adequate materials can be obtained from the Falkland Is Co Ltd.

2) Having discussed the proposal with Supervisor E. & T. it has been tentatively arranged that the present workshop with the loft store in the present building shall remain with his department to deal with electric light accounts, collection of outgoing telegrams, sale of stores etc. The rest of the building will meet my needs. This arrangement will entail no alteration of present organisation or staff.

3) A special cable will be necessary to connect up existing local broadcast system with new building the estimated cost of supplying and laying this is £100 The provisionally suggested site for new building is to the West of the High level reservoir at the top of Villiers St.

4) Against the proposed expenditure one must put the following advantages.

(a) Improved broadcast reception.
(b) Freedom from interference of cars, boats and machinery.
(c) The inauguration of a (say) weekly broadcast to the whole Colony - a service that would be immensely appreciated.

Para 4) (d) Revenue for rent and lighting from the rooms let to the Admiralty.

(e) In times of great pressure of traffic at the W/T Station the Government could help Naval Authorities should they so wish by temporarily taking over local routines, i.e. Pebble, Fox Bay and San Carlos.

(f) With the adoption of (c) above a "greetings Quarter Hour" at 2d per word would be a big source of revenue.

5) In course of conversation with the Supervisor E. & T. we agreed that similar results could be obtained by the erection of aerials on top of the hill with feeders to the present studio and the erection of new offices for P.W.D. staff. While I personally would prefer a building designed to suit departmental requirements it would be no more economical. The building would probably cost slightly less but the cable and feeders would be more and there would be the disadvantage of taking up still more of the rapidly decreasing space available for essential stores and expansion in the Dockyard.

Charles Woodfield
A.R.I.B.A.
Executive Engineer.

Supervisor, E. & T. Dept.,

To save time will you add any comments hereon and return so that a complete record can go forward in one.

CWS.

(17)

No.

(It is requested that, in any reference to this minute, the above Number and the date may be quoted).

MINUTE.

8th April 19 41

From Supervisor E & T

Stanley, Falkland Islands.

To Hon Executive Engineer

Stanley.

With reference to your proposed Minute to Hon Col Secretary regarding the construction of a Broadcast Station, I would like to submit the following.

Although we have discussed the question I find that the proposal to move or split this department and accommodate as planned, required some further consideration than was at first thought necessary.

1. The dept needs a work room for the various repairs to cable boxes electric fittings and telephones. Could this continue to be the present Workshop ?. The loft store to remain as at present The bottom store to be retained by this dept for attending to Public for acceptance of telegram and electrical fees ? .

2. Relaying of overseas programmes. At present this service is very easily carried out, the clerk who is broadcast announcer, can conveniently relay such programmes during office hours. The proposed division of the Dept would prevent this being done. The store and its accounts are kept by the clerk and work in connection with the store and accounts may make it necessary to close the office to the public while the clerk is in the new building.

3. I agree with the proposal for the new site for Broadcast reception. It would enable us to improve our service and we could make use of various antenna systems which are now denied to us. For transmission of Radio telephony however, using a low power, the new site may be in order but I am of the opinion that once the Broadcasting Station was working it would be found that the public would complain of interference, which may require the service to be discontinued or, the station moved away from Stanley. The power of the transmitter would have to be something better than the 10 Watt Harvey set now in use at Sapper Hill.

4. Para 4) (e) This will also depend upon the power of the transmitter.

(f) The present rate for telegrams is at 1d per word and something less than a penny would have to be offered before there would be any attraction. This can easily be adjusted however.

5. As an alternative I would suggest that this Dept in a self contained building as it is at present, be constructed in the paddock at the back of Marnon Row. Experimental Broadcasts could be made with a view to establishing a Broadsact Station when funds to cover such an expenditure became available.

RM.

S. E & T

8.4.41

(16)

ALL COMMUNICATIONS
TO BE ADDRESSED TO THE
CROWN AGENTS FOR THE COLONIES.
THE FOLLOWING REFERENCE AND THE
DATE OF THIS LETTER BEING QUOTED

W/Falkland Is. 4435.

TELEGRAMS: "CROWN, LONDON".
TELEPHONE: VICTORIA 7730.
NEW TEL. NO.
ABBEY 7730

CROWN AGENTS FOR THE COLONIES

COLONIAL SECRETARY'S OFFICE 25 FEB. 38 FALKLAND ISLANDS

4, MILLBANK,
LONDON, S.W.1.

24th January 1938.

Sir,

Red 9

I have the honour to refer to my letter dated the 17th December in reply to yours No.C/20/29 dated the 7th September, 1937, regarding quotations for a wireless transmitter for local broadcasting. In the last paragraph it was stated that a further tender was being obtained from Messrs.Radio Transmission Equipment Ltd. this tender has now been received and a copy is attached, together with a copy of Messrs.Preece,Cardew and Rider's recommendations thereon dated the 17th January.

5.1.38. & enclosure

17.1.38

You will note that the Consulting Engineers consider that the transmitter offered by Messrs.Radio Transmission Equipment is better than the one offered by Messrs. Gambrell Radio Communications, Ltd., and is, in their opinion worth the extra cost.

I have the honour to be,
Sir,
Your obedient servant,

for Crown Agents.

The Colonial Secretary,

Falkland Islands.

WLW

ap 0

COPY.

TELEPHONE. WHITEHALL 6505 (3 LINES).
TELEGRAMS, CREEPHOLE, PARL. LONDON.
TELEGRAPHIC CODES USED { A.B.C., BENTLEY'S, BROOMHALL'S, HAMILTON'S WIRE, WESTERN UNION.

8 & 10, QUEEN ANNE'S GATE,
WESTMINSTER, S.W.1.

PREECE, CARDEW & RIDER,
CONSULTING ENGINEERS.

SIR ARTHUR PREECE. J. H. RIDER.
EVAN PARRY. W. H. GRIMSDALE.
C. W. KENNAWAY. R. W. WEIGHTMAN.

CL/CF

(15)

17th January, 1938.

The Chief Engineer (Contracts)
The Crown Agents for the Colonies,
4, Millbank,
Westminster,
S. W. 1.

Sir,

W/Falkland Islands 4435/1.

The enclosed tender from Messrs. Radio Transmission Equipment Ltd. is in order and we recommend that one copy of the firm's tender covering letter dated the 5th inst. and folder be forwarded to the Falkland Islands Government.

2. This tender covers a "broadcasting" type transmitter having an aerial power of 250 Watts and wave range 225 to 550 metres at a cost of £1,450.0.0. The price is slightly higher than that quoted by Messrs. Gambrell Radio Communications Ltd., but it is a better transmitter for broadcasting purposes and in our opinion is worth the extra cost. This tender is recommended for the consideration of the Falkland Islands Government.

We are, Sir,
Your obedient Servants,

PREECE, CARDEW & RIDER.

Enclosure.

CONTRACTORS TO THE ADMIRALTY, AIR MINISTRY, WAR OFFICE, G.P.O., CROWN AGENTS & DOMINION GOVERNMENTS

(14)

RADIO TRANSMISSION EQUIPMENT LTD

DIRECTORS
S. R. MULLARD, M.B.E., M.I.E.E.
SQDN. LDR. A.V. HARVEY.
N. GUNN.

TELEPHONE
BATTERSEA 7771
TELEGRAMS
RADTRANS, PHONE, LONDON

45, NIGHTINGALE LANE
BALHAM
LONDON, S.W.12

HEAD OFFICE, 225 TOTTENHAM COURT RD., LONDON, W.1

YOUR REF.

DATE.

OUR REF.

5th January, 1938.

The Chief Engineer,
Crown Agents for the Colonies,
4, Millbank,
S.W.1.

Sir,

W/Falkland Islands 4435:

We have much pleasure in enclosing herewith our quotation and Description No.1318 in connection with our transmitter type TGM.106.

This transmitter has a waverange of 225 to 550 metres and may be crystal controlled on any preselected wavelength in that band. We would recommend that this be in the region of 490 metres.

Pentode valves have been used wherever practical and suppressor grid modulation has been employed in the final amplifier stage.

This high level suppressor grid modulation enables frequency modulation to be reduced to a minimum, and with crystal control this does not exceed 0.0001%.

Furthermore, the modulation circuits are simplified and with pentode valves no neutralisation is necessary.

Cont'd

(13)

The Chief Engineer,
Office of the Crown Agents for
the Colonies.

5th January,1938.

The equipment would be complete with aerial and earth equipment, but would be less masts.

Should however you wish us to supply masts, we would be very pleased to do so and to quote you our further price for this item.

The aerial necessary for this transmitter should be of the T type and supported between 150 or 200 ft. high masts.

We trust our offer will meet with your approval, and look forward to hearing from you in this connection in due course.

Yours faithfully,

RADIO TRANSMISSION EQUIPMENT LTD.,

DIRECTOR.

AVH/KH

W

THE CHIEF ENGINEER,

OFFICE OF THE CROWN AGENTS FOR THE COLONIES,

4, MILLBANK,

LONDON, S.W.1.

(12)

Falkland Islands 4435/1

The above reference should be quoted on all communications regarding this subject.

To :—

Telegrams: CROWN, LONDON.
Telephone: VICTORIA 7730.

Indent No.

Dated

Account (if any)

Dept.

TENDER *for the supply of :—*

For instructions as to tendering, see back.

Wireless Apparatus.

ITEM NO.	QUANTITY.	DETAILED DESCRIPTION OF ARTICLES. A detailed list of the contents must be enclosed when possible in each package.	RATE.	AMOUNT.
		ATTENTION IS DIRECTED TO THE GENERAL CONDITIONS OF CONTRACT ON THE BACK OF THIS PAGE.		
		Note: Tender, covering letter etc. to be submitted in duplicate.		
1	1	Radio broadcasting transmitter for local broadcasting in the Falkland Islands. Aerial power 200 Watts carrier. Complete with accessories (excluding studio equipment), aerial and earth materials, and spares (200% spare valves). Wave range and working wavelength proposed to be stated.		1450 0 0
		Station supply at Port Stanley 440 Volts 500 cycles S.P.		
		To be in standard (non-tropical) finish.		
		Particulars of the equipment offered to be furnished in duplicate with tender.		

NOTE.
Prompt delivery is of the utmost importance and should the Contractor at any time find that delay will arise he must at once give the notice required under Clause 26 of General Conditions of Contract.

DELIVERY PERIOD 190 DAYS.

(a) See Clause 19 overleaf.

(b) If economy can be effected by so doing, the goods should be sent by Parcel Post, sub-divided if necessary.

(c) Discounts and trade allowances of every kind to be deducted, so as to show the nett amount payable. If no discounts are allowed the tender should be marked nett. The Crown Agents claim to be placed on the footing of the most favoured wholesale shippers, and they will decline to deal a second time with any Firm that does not so treat them.

(d) Firms may quote alternatively for delivery at any other port

We hereby agree to supply, in accordance with General Conditions of Contract No. 1, dated November, 1922, on back hereof, the articles above specified, at the price set against each, which includes all charges and to deliver free on board ship or despatch by post within the period above stated from the date of order.

	Cost of packing for export ...	£	
(a)	Cost of delivery f.o.b. LONDON	£	
(b)	Alternative, cost of packing and postage to	£	
	Total	£	
(c)	Trade and Shipping allowances per cent. on £ ... =	£	
		£	
	Cash discount for prompt payment per cent. on £ ... =	£	
	... amount payable (including all charges) on receipt of Bills of Lading, or Parcels Receipt. Post Office Certificate of Posting.	£	
(d)	Alternative, total net cost f.o.b. ... ... =	£	1450 0 0

RADIO TRANSMISSION EQUIPMENT LTD.,

Signature S. R. Lindhard

MANAGING DIRECTOR.

Address 45, Nightingale Lane, Balham, S.W.12.

Dated this 5th *day of* January 1938

Date of Issue :—

(This space is for use in the Crown Agents' Office.)

November, 1922.

CROWN AGENTS FOR THE COLONIES.

GENERAL CONDITIONS OF CONTRACT.

No. 1.

Definitions. 1. In these Conditions and in any Specifications or Special Conditions annexed hereto:—

(a) The words "Crown Agents" shall mean the Crown Agents for the Colonies.

(b) The word "Engineer" shall mean and include the Consulting Engineer or Engineers for the time being of the works under this Contract or if none shall have been appointed then the Engineer-in-Chief for the time being of the Crown Agents and any deputy duly authorised by them or him.

(c) The word "Inspector" shall mean the Chief Inspecting Engineer or other Inspector appointed by the Crown Agents to inspect the work.

(d) The word "Colony" shall mean the Colony or Protectorate for which the work is intended.

(e) The word "Contractor" shall mean the person, firm or Company whose Tender for the work referred to shall be accepted by the Crown Agents.

(f) The word "Work" shall include materials of every kind, in every stage of their preparation.

Contract not to be sub-let. 2. The Contractor shall not without the written consent of the Engineer assign or sub-let any part of this Contract, nor allow any portion of the work to be done otherwise than in his own establishment, and any such consent shall not relieve the Contractor of his liability under this Contract. Should the tenderer propose to sub-let any part of the work, this must be stated at the time of tendering. In the case of stock materials not of British manufacture, the place of origin must be stated when tendering. When it is proposed to manufacture the whole or any part of the work abroad the names and addresses of the proposed manufacturers and lists of the parts proposed to be obtained from them must be stated when tendering.

Contractor to indemnify the Crown Agents. 3. The Contractor shall indemnify the Crown Agents against all claims at any time on account of patent rights or royalties, whether for manufacture or for use in the Colony.

Alterations, additions and deductions. 4. The Crown Agents or the Engineer shall have the power of requiring reasonable alterations in, additions to, or deductions from the work or any of its details, or in to or from the quantities or weights specified, and if such alterations or additions do not involve extra expense no payment shall be made in respect of them. If the Engineer considers that the alterations or deductions diminish the value of the work to be done the Contractor shall allow a reduction in the Contract sum of such amount as the Engineer shall certify to be reasonable.

Payment for extra work. 5. The Contractor shall not receive payment beyond the Contract sum for any work which he may consider should be paid for as an extra unless such work shall have been ordered in writing by the Crown Agents or the Engineer as extra work, or unless the Contractor shall have claimed in writing that it should be paid for as an extra, and the Engineer shall have certified in writing that the claim is reasonable and proper.

Extension of time for additional work. 6. In the event of additional work or alterations being ordered the Crown Agents shall extend the time for delivery to such extent (if any) as the Engineer may certify to be reasonable and proper.

Discrepancies between Drawings and Specification. 7. Should there be any discrepancy between the Contract Drawings and the Specification or any inconsistency or omission in either of them, reference must be made to the Engineer for an explanation and the Contractor will be held responsible for any errors that may occur in the work through neglect of this precaution.

Work to be delivered complete. 8. The Contractor shall deliver the whole of the work complete in all its parts and furnished with every necessary detail and fitting notwithstanding any omission or inconsistency in the Contract Drawings and Specification.

Inspector to approve methods. 9. Before proceeding to execute any work, the Contractor shall obtain the Inspector's approval of the manner in which the Contractor proposes to execute each portion of the work and shall furnish such Drawings or information as the Inspector shall require.

Contractor to take all risks. 10. The Contractor shall take all risk of accident or damage to the work from whatever cause arising and shall be responsible for the sufficiency of all means used by him for the fulfilment of the Contract and shall not be relieved from such responsibility by any approval which may have been given by the Crown Agents, the Engineer or the Inspector.

Inspection and testing. 11. The Contractor shall afford the Inspector all proper and reasonable facilities for examining, inspecting, testing and gauging the materials, machinery and workshop used, or intended to be used for the purposes of this Contract and shall also supply free of charge such apparatus, materials, tools, gauges or labour and assistance as may be required from time to time for the purpose of such examination, inspection, testing and gauging.

Work to be to satisfaction of Inspector. 12. The work is to be executed in strict conformity with the Contract Drawings and Specification. The materials and fittings of every kind used are to be free from defects and unless otherwise specified are to be of the best description of their respective kinds. The workmanship is to be of first class character and finish. If any dispute or question shall arise between the Inspector and the Contractor under the provisions of this clause the same shall be referred to the Engineer for decision.

Powers of Inspector. 13. The Inspector may adopt any means he may think fit to satisfy himself that the materials specified are actually used and he shall have power throughout the Contract either personally or by deputy to inspect in any manner he may think fit without giving previous notice, the entire work or any part thereof at every stage of progress and wherever the work or any part thereof may be in progress; to amend and alter anything he may think fit; to reject any parts of the work which he may disapprove. If any work is so rejected, the Contractor shall at once execute it afresh to the entire satisfaction of the Inspector.

Notice prior to Inspection. 14. The Contractor shall give the Inspector due notice in writing previous to any of the work being ready for inspection.

Check tests or analyses. 15. When tests or analyses are considered necessary by the Engineer or Inspector in addition to those made by the Inspector on the Contractor's or Sub-Contractor's premises, the tests or analyses will be made by persons appointed by the Crown Agents. The Contractor will pay the cost of supply and carriage of samples. The costs of tests or analyses will be paid by the Crown Agents if such tests or analyses show the material to be in accordance with the Specification; but if not, such costs shall be borne by the Contractor.

Packing. 16. The Contractor must provide and include in his Contract sum the cost of all necessary packing including cases, materials and labour. He will be held responsible for the work being so packed as to ensure as far as possible its being free from loss or injury on arrival at its destination in the Colony.

Inspector's Certificates. 17. Until the Inspector shall have given his Certificate of approval, the Contractor must not send any of the work forward for shipment and should any defects be discovered after despatch from the Contractor's works they must be immediately remedied by the Contractor at his own expense notwithstanding any previous approval by the Inspector.

Place of delivery. 18. The work is to be delivered free on board vessels lying in any dock alongside any pier or wharf or in any part of the stream as the case may be at any of the ports named in the Tender as the Crown Agents may direct; the cost of such delivery must be included in the contract sum. Should the Crown Agents require delivery to be made at a port in the United Kingdom not named in the Tender, the Contractor shall only receive the exact cost of delivery at that port. The work will remain at the Contractor's risk in all respects until delivery has been taken when the Crown Agents' risk will begin.

Dock Charges. 19. All dock and harbour dues and charges (including P.L.A. port rates, Clyde dues and Manchester Ship Canal Co.'s tolls) are payable by the Contractor. These are payable in full on:—

(a) Railway material, coal, coke, oil to be used to generate heat or to produce power, and on any stores intended for purposes other than the direct use of a Government Department or for any trading purposes.

(b) Stores shipped to Iraq.

On Other Stores, the following reduced rates are payable, viz.:—

London.—Eleven-twelfths of published consolidated rates for Dock and Harbour dues, Wharfage, etc., plus three-quarters of P.L.A. port rates.

Other Ports.—Three-quarters of charges.

The exemption certificates necessary to secure reductions will be forwarded by the Crown Agents.

Freight. 20. Freight for the conveyance of work to the Colony will be engaged by the Crown Agents. Shipping particulars must be sent as soon as possible by the Contractor to the Crown Agents' Shipping Department at 4, Millbank, S.W.1, whence instructions will be issued for delivery to a ship. Should the work not be delivered in accordance with such instructions the Contractor shall be liable to the Crown Agents for any loss or expense which they may incur by reason of the non-delivery. The Crown Agents shall, however, have the power to delay deliveries for any reasonable period to suit their shipping arrangements and the work will remain at the Contractor's risk in all respects until delivery has been taken.

Invoice and Shipping Particulars. 21. Directly the work is ready for shipment the Contractor must give notice in writing to the Crown Agents' Shipping Department and must forward to the Crown Agents, 4, Millbank, S.W.1, four copies of the invoice and three copies of shipping particulars showing the number, marks, measurement, weight (gross and net) and contents of each package. The invoices must be made out on special forms supplied by the Crown Agents from whom copies can be obtained on application. Packing particulars should be made out on Contractor's own forms. Invoices should follow the wording and order of the Tender form wherever this can be done without being misleading as to the nature of the goods or the package in which they will be found, and they must give full trade description of each article. When section letters, page numbers, item numbers or other identifications are given in the form of tender these must be quoted on the invoices. If the work is shipped by instalments, separate invoices and shipping particulars must be rendered for each instalment and must enumerate only what is included in that instalment.

Payment. 22. Subject to any deductions to which the Contractor may become liable under this Contract, payment will be made to the Contractor within a reasonable time after the Bills of Lading have been received by the Crown Agents, provided that the Inspector shall have given his Certificate that the work has been completed to his entire satisfaction. The Contractor shall, if required, weigh the whole or any portion in the presence of the Inspector or his deputy and where the work is to be paid for by weight the Contractor shall only be paid for the net weights delivered. Notwithstanding the existence of any trade custom, the weight of wrappers, battens or other materials used in packing shall not be included in the weight for payment. When payment by instalments is provided for in the Special Conditions of Contract the Contractor must forward to the Crown Agents at 4, Millbank, S.W.1, an account in duplicate for each of the instalments except the final one (which shall be forwarded in quadruplicate) and an instalment whether it be the final or an intermediate instalment will only be paid upon the Certificate of the Inspector that such instalment has been earned and that the work has been executed in accordance with the Contract and to his entire satisfaction. Subject to the grant by the Inspector of the said Certificate the final instalment will be paid within a reasonable time after the work has been completed and delivered in accordance with the Conditions of Contract and will be subject to any deductions to which the Contractor may become liable under this Contract.

Vesting in Crown Agents. 23. When payment is made by instalments the work and all materials from time to time intended and appropriated thereto shall upon payment of the first instalment become and be the property of the Crown Agents subject to the provisions of this Contract. Provided that upon the due completion of the work all such materials as shall not have been actually used for the purposes of this Contract shall be relinquished to the Contractor. Immediately upon the payment of the said first instalment the Contractor shall affix the name of the Crown Agents upon the work in such conspicuous manner and place or places as may be directed by the Inspector and shall not remove the same without the consent of the Inspector.

Insurance. 24. When payment is made by instalments the Contractors shall until delivery has been taken by the Crown Agents at their own expense keep the work or such parts thereof as shall from time to time be constructed insured in the name of the Crown Agents and to their satisfaction against all risks to which the same shall for the time being be subject in such first-class Insurance Office or Offices as may be approved by the Crown Agents in an amount at least equal to the full value of the work in respect of which payment is claimed. No money shall be paid to the Contractors hereunder except upon production and delivery to the Crown Agents of the Policies of Insurance which ought to be effected by the Contractors and the receipts for the payment of the premiums thereunder and in case the Contractors shall neglect to effect or to keep up any such insurance the Crown Agents may effect and keep up such insurance and deduct the expenses thereof from any moneys payable to the Contractors hereunder. In case the work or any part thereof shall be destroyed, damaged, or lost, the Crown Agents shall receive the moneys paid in respect of the insurance and at their option either (a) such money shall be applied in rebuilding or reinstating the work so damaged, destroyed or lost in accordance with this Contract or as near thereto as in the opinion of the Inspector the circumstances will admit or (b) this Contract shall be determined, in which case the Crown Agents shall pay to the Contractors such amount as the Inspector shall certify to be fair and reasonable in all the circumstances. For the purpose of all insurances under this Clause there shall be added to the amount representing "the full value of the work" above referred to a sum equal to 6 per cent. thereof to cover disbursements.

Contract time for delivery. 25. The Contract time for delivery shall be the period or periods named in the Tender or agreed upon with the Crown Agents reckoned from the date on which the work is ordered by the Crown Agents.

Contractor to give notice of delay. 26. Should the Contractor anticipate at any time during the execution of the Contract that he will be unable to deliver the work within the Contract time, he must at once give notice accordingly in writing to the Crown Agents explaining the cause of the delay.

Deductions for delay. 27. Failures to deliver within the Contract time will, in addition to any other liabilities incurred by the Contractor under this Contract, subject the Contractor to a deduction from the Contract sum, as and for liquidated damages, and not as a penalty, of one per cent. per week on the value of any work which may be in arrears PROVIDED that if it shall be proved to the satisfaction of the Crown Agents that any such delay has arisen from causes which were unavoidable and could not have been foreseen or overcome by the Contractor (including delay in the supply of materials to the Contractor due to causes which were unavoidable and could not have been foreseen or overcome by the Manufacturers or Vendors of such materials), then the Crown Agents may in their absolute discretion decide the extent (if any) to which the deduction should be remitted, but any deductions not so remitted shall remain in full force.

Drawings, etc. 28. Any drawings, tracings or descriptions specified must unless otherwise specified, be furnished by the Contractor with the first consignment of the work to which they refer and no payment will be made by the Crown Agents until such drawings, tracings or descriptions have been furnished to the satisfaction of the Engineer.

Insolvency of Contractor and provisions in case of default. 29. Should the Contractor become bankrupt or insolvent or should he suspend payment or compound with his creditors or from any other cause whatever become unable or fail to carry on the Contract with efficiency; or should he not progress with the work in the manner intended by the Contract or not have work ready for delivery in conformity with the terms of the Contract; or should his preparations for commencement and his subsequent rate of progress be so slow from any cause whatever that in the opinion of the Crown Agents he will be unable to complete the work by the expiration of the specified period; or should he refuse or neglect to comply with the directions given him by the Crown Agents or the Engineer or Inspector or in any other respect act contrary to the terms of the Contract; then the Crown Agents shall have power to declare the Contract at an end and the Contractor shall only be paid for such portion of the work as shall have been actually delivered at the date of such declaration, after deduction of any sum leviable under the conditions of the Contract. The Contractor shall in addition be liable to pay to the Crown Agents, or the Crown Agents shall be entitled to further deduct the value of any expense, loss or damage (including any excess difference between the Contract price of the work to be done under this Contract or of such portion thereof as may not have been delivered at the date of such declaration as aforesaid and the price which the Crown Agents may have to pay for similar work provided in lieu of such portion as may not have been so delivered) which the Crown Agents may be put to or sustain by reason of or in connection with the Contractor's breach of Contract. If at any time the Contractor shall in the opinion of the Crown Agents not be executing the work with due diligence or shall be otherwise making default in the performance of this Contract the Crown Agents may give to the Contractor written notice requiring him to remedy such default to their satisfaction and the Contractor shall forthwith comply with such notice and in case the Contractor shall not within seven days after the receipt of such notice have duly complied therewith to the satisfaction of the Crown Agents then and in any such case the Crown Agents in addition and without prejudice to any of their other rights or remedies under this Contract—

(a) May make good such default or cause the same to be made good in such manner as the Crown Agents may think fit and the expenses thereby incurred (as certified by the Inspector) shall be paid by the Contractor to the Crown Agents or may be deducted by the Crown Agents from any moneys payable or to become payable to the Contractor under this Contract, or

(b) May determine this Contract and thereupon the Crown Agents may take possession of or remove and dispose of for their own benefit the work in its then state and all materials then being the property of the Crown Agents under this Contract together with the benefit of any Sub-contracts for any part of the work without making any further payment to the Contractor than such (if any) as the Inspector shall certify ought to be paid to him having regard to his default and all the circumstances of the case, or

(c) May without determining this Contract take possession of the work in its then state and all materials intended for it and complete the work in accordance with this Contract and the costs incurred by the Crown Agents in the exercise of any of the powers contained in this sub-clause (as certified by the Inspector) shall be deducted from any moneys then payable or thereafter to be payable to the Contractor hereunder and if such moneys shall not be sufficient the deficiency shall be made good and paid by the Contractor to the Crown Agents.

Discrepancies in Conditions. 30. Should there be any discrepancy between the General Conditions and any Special Conditions or Specifications of this Contract the Special Conditions or Specifications shall be followed in preference to the General Conditions.*

No personal liability on Crown Agents. 31. Nothing in these General Conditions or in any part of the Contract shall be deemed to impose any personal liability on the Crown Agents or on any of them or on any of their officers or servants.

Members of House of Commons. 32. No Member of the House of Commons shall be admitted to any share or part of this Contract or to any benefit to arise therefrom—see House of Commons (Disqualification) Acts, 1782 and 1801.

Contract an English one. 33. This Contract shall be deemed an English Contract and shall accordingly be governed by and construed according to English Law.

Marginal notes. 34. Marginal notes hereto are for the purposes of convenience only and shall not affect the construction or interpretation of this Contract.

Fair Wages Clauses. 35. The Contractor shall pay rates of wages and shall observe hours of labour not less favourable than those commonly recognised by employers and trade societies (or in the absence of such recognised wages and hours, those prevailing in the district; where there are no such wages and hours recognised or prevailing in the district those recognised or prevailing in the nearest district in which the general industrial circumstances are similar) shall be adopted. Further the conditions of employment generally accepted in the district in the trade concerned shall be taken into account in considering how far the terms of fair wages clauses are being observed. The Contractor shall be responsible for the observance of the fair wages clauses by the Sub-contractor (if any).

36. The Contractor shall cause the preceding condition to be prominently exhibited for the information of his workpeople on the premises where work is being executed under the Contract. Printed copies of such notice will be supplied on application to the Crown Agents. In trades where it is the practice, the Contractor shall also cause to be exhibited or to be available for inspection a copy of any signed Agreement determining the rates of wages and hours of labour commonly recognised by employers and trade societies in the district.

37. The Contractor shall keep proper wages books and time sheets showing the wages paid and the time worked by the workpeople in his employ in and about the execution of the Contract and such wages books and time sheets shall be produced whenever required for the inspection of any officer authorised by the Crown Agents.

Certificates to be final. 38. Any decision, certificate or determination made or given by the Crown Agents, the Engineer or the Inspector in pursuance of this Contract shall be final, conclusive and binding for all purposes.

Arbitration. 39. Any question, dispute or difference between the Crown Agents and the Contractor arising out of this Contract shall be referred to arbitration in accordance with the provisions of the Arbitration Act, 1889, or any statutory modification thereof.

Dangerous goods. 40. Packages containing dangerous goods (see Section 446 Merchants Shipping Act, 1894) must be marked by the Contractor as provided in the Statute and specially reported to the Crown Agents' Shipping Office, attention being also drawn to them in the shipping particulars.

INSTRUCTIONS TO FIRMS TENDERING.

The original Tender Form is to be filled up complete in every respect and delivered, properly sealed, by hand or by post not later than noon on the date named on the face of the form. The blue address slip, when such is provided, is to be affixed on the face of the envelope. If no date is specified the form should be returned as soon as possible.

The duplicate form is intended to be retained by the firm.

Both forms should be returned to the Crown Agents at once if the firm is unable or unwilling to tender.

The Crown Agents do not bind themselves to accept the lowest or any tender and they reserve to themselves the right of accepting any tender wholly or in part.

Copies of any drawings referred to in the Specification can be seen at the Crown Agents' Office and can be obtained from Mr. W. J. Harrison, 7, Carteret Street, Westminster, S.W.1, on a payment of 2/6 per copy.

* The following are the matters which will more usually form the subject of special conditions:—
Payment by Instalment (cl. 22); provision of a sum to cover additional work (if any) (cl. 5); amount of liquidated damages (cl. 27)

FALKLAND ISLANDS.

No. 5.

Downing Street,

10 January, 1938.

Rec'd 5th Feb. 1938

Sir,

I have the honour to acknowledge the receipt of Mr. Craigie-Halkett's despatch No. 131 of the 7th September, 1937, in which he stated that consideration was being given to the question of installing plant for aerial broadcasting at the Wireless Telegraph Station.

2. The answers to the questions raised in the third paragraph of the despatch are that no agreement will be necessary if this proposal is proceeded with, and that the installation of a broadcasting station in the Falkland Islands would not infringe any International Agreement. The provisions of the Madrid Radio-communication Regulations would, however, have to be observed, that is to say it would be necessary for the station to use frequencies in the broadcasting bands, or at any rate frequencies which did not interfere with any other services.

3. I am advised that the existing equipment in the Colony could not readily be adapted for broadcasting as it would be necessary to provide modulating apparatus, and in view of the small power of the transmitter itself it would probably

GOVERNOR

SIR HENNIKER HEATON, K.C.M.G.,

etc., etc., etc.

probably be cheaper to obtain a completely new broadcasting transmitter. In any case, the output power of the existing transmitter is probably too low to provide an effective service.

Further, the majority of persons, whom the extended service would be designed to reach, would presumably have no electricity supply or facilities for charging accumulators. They would therefore be compelled to rely upon crystal reception, and, unless a transmitter of high power were employed, crystal reception would not be likely to provide a satisfactory service over the area which it is desired to cover.

It would seem, therefore, that if this matter is to be pursued, the technical and financial aspects will require careful consideration.

I have the honour to be,

Sir,

Your most obedient,

humble servant,

(Signed) W. ORMSBY GORE.

(9)

ALL COMMUNICATIONS
TO BE ADDRESSED TO THE
CROWN AGENTS FOR THE COLONIES.
THE FOLLOWING REFERENCE AND THE
DATE OF THIS LETTER BEING QUOTED.

W/Falkland Is. 4435

TELEGRAMS: "CROWN, LONDON".
TELEPHONE: VICTORIA 7730.

CROWN AGENTS FOR THE COLONIES

1-84/30
66/35

4, MILLBANK,
LONDON, S.W.1.
17th December, 1937.

COLONIAL SECRETARY'S OFFICE
26 JAN 38
FALKLAND ISLANDS

Rec'd 25 Jan
8/20/29.

Sir,

I have the honour to acknowledge the receipt of your letter No.8/20/29 dated the 7th September, asking for quotations to be forwarded to you from Standard Telephones and The Marconi Company for a wireless transmitter having 200-watts of aerial energy for local broadcasting.

2. We referred this matter to our Consulting Electrical Engineers, Messrs. Preece, Cardew & Rider, and, in accordance with their recommendation, tenders have been invited from The Marconi Wireless Telegraph Co. and Messrs. Gambrell Radio Communications, Ltd. In view of several complaints of unsatisfactory operation of radio equipment supplied by Messrs. Standard Telephones & Cables, Ltd., they did not recommend that this firm should be invited to tender in this instance.

3. It is assumed that the equipment, if proceeded with, will be installed in the Port Stanley Radio Station and will be operated from the station generators.

7.12.37.
9.11.37
26.11.37.

4. I enclose a copy of Messrs. Preece, Cardew & Rider's letter dated the 7th December with regard to the two tenders received, and copies of these are also enclosed.

/Messrs.

The Colonial Secretary,
Falkland Islands.

WLW.

Messrs. Gambrell's tender you will note is considerably lower (total cost £1,308. 15. -. - delivery 210 days), but the transmitter is arranged for telephony only. The Marconi Company's offer is for a high grade broadcasting transmitter, their price being £2,988. 1. 3. delivery 220 days.

5. You will note that a further tender is being obtained from Messrs. Radio Transmission Equipment, Ltd., and this will be forwarded to you in due course.

I have the honour to be,

Sir,

Your obedient Servant,

for Crown Agents.

COPY.

[redacted]LEPHONE, WHITEHALL 6505 (3 LINES).
TELEGRAMS, CREEPHOLE, PARL. LONDON.
TELEGRAPHIC CODES USED | A.B.C., BENTLEY'S, BROOMHALL'S, HAMILTON'S WIRE, WESTERN UNION.

PREECE, CARDEW & RIDER,
CONSULTING ENGINEERS.

SIR ARTHUR PREECE. J. H. RIDER.
EVAN PARRY. W. H. GRIMSDALE.
C. W. KENNAWAY. R. W. WEIGHTMAN.

8 & 10, QUEEN ANNE'S GATE,
WESTMINSTER, S.W.1.

CL/CE

7th December, 1937.

The Chief Engineer (Contracts),
The Crown Agents for the Colonies,
4, Millbank,
Westminster,
S. W. 1.

Sir,

W/Falkland Islands 4435/1.

The attached tenders from Messrs. Gambrell Radio Communications Ltd. and Marconi's Wireless Telegraph Co. Ltd. are in order and we recommend that the duplicate copies each be forwarded to the Falkland Islands Government. The duplicate copies of the Marconi Company's letter and tender have not yet been received by us.

2. Messrs. Gambrell Radio Communications Ltd. offer their type 550 transmitter having an aerial power of 300 Watts and wave range 300/550 metres at a total cost of £1,308.15.0. (delivery 210 days). This transmitter is actually a "telephone" transmitter and not a "broadcasting" transmitter though a transmitter of this type has been supplied to the Government of Iraq for broadcasting purposes. The price tendered includes two 80 ft. masts and we have been informed by the firm that if these are not required their tender price will be reduced by £126.10.0. for the masts themselves plus £2.15.0. for the corresponding packing and f.o.b. charges. A working wave length of 450 metres is suggested.

3. Messrs. Marconi's Wireless Telegraph Company offer a "broadcasting" transmitter having an aerial rating of

250 Watts and wave range of 200/545 metres at a total cost of £2,874.1.3., excluding the mast lighting (delivery 220 days). The price tendered includes £203 for a 100 ft. mast radiator with erection gear, earth materials and lead-in insulator. In a letter dated the 3rd inst. the firm say:-

> "In reply to your letter of the 1st inst. we believe there are two groups of masts, one consisting of two 200-ft. masts near the town, spaced some 300 feet apart. Assuming that these masts would be used we could furnish materials for the construction of a "T" aerial consisting of wire, strain insulators, spacers, ground anchor and triatic, together with earth material and lead-in insulators at a total price of £185. This material would replace Section 1 of our Schedule S.09042/3685.
>
> We suggest that such an aerial would prove better in performance than the mast radiator originally offered and will also be more flexible. Owing to the height which would be obtainable the working wavelength could be increased to 350 metres and thus better results could be expected."

4. If a high grade service is not expected then we consider the Gambrell transmitter would be satisfactory. If on the other hand a broadcasting service of the highest grade is required the more expensive equipment offered by Marconi's Wireless Telegraph Co. Ltd. would be desirable.

5. Since making our recommendation to you of the 15th October we have had an opportunity of visiting the Works of Messrs. Radio Transmission Equipment Ltd. and seeing the apparatus produced by this firm, with which we were fully satisfied. We have written direct to this firm for proposals, but these have not yet been received. On receipt they will be forwarded to you with our report.

We are, Sir,

Your obedient Servants,

PREECE, CARDEW & RIDER.

Enclosures.

Broadcast Transmitter for the

Falkland Islands.

In considering the erection of a Broadcast Transmitter to serve the Falkland Islands two main questions must be considered.

(1) Is it desirous of broadcasting to all outlying islands?

(2) What kind of service is desired? that is, whether communication at all times is to be established, or whether it would be sufficient for communication to be established on most days with occasional interruptions when atmospherics are bad. The power of the transmitter and also the cost mainly depend on these two questions.

Assuming that it is desired that the broadcast transmitter in favourable conditions be capable of reaching the outlying islands in addition to the East and West Falkland then it is clear that the transmitter must have a range of approximately 200 miles.

Broadcast transmitters are expensive. I have in my possession a recent quotation in connection with a Wireless Telephony transmitter having a range of 100 miles costing £1,500. A Broadcaster would be more expensive as it is designed to cover a wider frequency range, but the above figure serves to give an idea of the cost of such apparatus. As a rough estimate I should say that the cost of a Broadcast transmitter complete capable of covering a distance of 200 miles in favourable conditions would be between £2,500 and £3,000.

Annual maintenance costs may be between £100 and £150; and in addition to this further technical staff may be required, as it would be necessary for two men to be on duty continously during broadcasting hours.

An additional item of expenditure would be the provision of a suitable building and site for the accomodation of the

apparatus/

apparatus and the erection of masts and aerials.

The costs mentioned in this preliminary report are purely tentative, but should you desire me to go into the matter further I will obtain quotations from England with a view to placing a concrete scheme before you.

F.A.Brown.
Electrician-in-Charge.

No. _____

(It is requested that, in any reference to this minute, the above Number and the date may be quoted).

please file

Ref. 25/11

MINUTE.

24th November 19 32.

From Electrician-in-Charge.

To THE COLONIAL SECRETARY,

Stanley, Falkland Islands.

I have the honour to forward herewith a brief report in connection with the possibility in the near future of installing a Broadcast-transmitter in Stanley for the purpose of providing a broadcast service for the whole of the Falkland Islands.

Electrician-in-Charge.

309/32.

30th November, 32.

Sir,

With reference to your recent conversation with the Governor in regard to the inauguration of a broadcast service to the camp I am directed to inform you that on full investigation of the matter His Excellency finds with regret that the high cost of the installation required makes the proposition impossible at any rate in present circumstances.

I am,

Sir,

Your obedient servant,

Colonial Secretary.

Mr. G. Scott,
New Island,
West Falkland.

W

Duplicate

THE CHIEF ENGINEER,

Falkland Islands 4435/1
The above reference should be quoted on all communications regarding this subject.

OFFICE OF THE CROWN AGENTS FOR THE COLONIES,
4, MILLBANK,
LONDON, S.W.1.

Telegrams: CROWN, LONDON.
Telephone: VICTORIA 7730.

30 NOV 1937

To be communicated to CROWN AGENTS

RECEIVED 1 DEC 1937

FOR THE COLONIES

To :—
Marconi's Wireless Telegraph Co. Ltd.,
Marconi Offices,
Electra House,
Victoria Embankment,
W.C. 2.

Auth.
Indent No. C. S. lr. C/20/29
Dated 7.9.37.
Account (if any)
Dept.

TENDER *for the supply of:*— Wireless Apparatus

For instructions as to tendering, see back.

ITEM NO.	QUANTITY.	DETAILED DESCRIPTION OF ARTICLES. A detailed list of the contents must be enclosed when possible in each package.	RATE.	AMOUNT.		
		ATTENTION IS DIRECTED TO THE GENERAL CONDITIONS OF CONTRACT ON THE BACK OF THIS PAGE.				
		Note: Tender, covering letter etc. to be submitted in duplicate.				
1	1	Radio broadcasting transmitter for local broadcasting in the Falkland Islands, Aerial power 200 watts carrier. Complete with accessories (excluding studio equipment), aerial and earth materials, and spares (200% spare valves). Wave range and working wavelength proposed to be stated. Station supply at Port Stanley 440 volts 500 cycles S.P. To be in standard (non-tropical) finish. Particulars of the equipment offered to be furnished in duplicate with tender. comprising the supplies detailed in our Schedule S.09042.		£2988	1	3

MBN 29.

NOTE. Prompt delivery is of the utmost importance and should the Contractor at any time find that delay will arise he must at once give the notice required under Clause 26 of General Conditions of Contract.

DELIVERY PERIOD 220 DAYS.

(a) See Clause 19 overleaf.

(b) If economy can be effected by so doing, the goods should be sent by Parcel Post, sub-divided if necessary.

(c) Discounts and trade allowances of every kind to be deducted, so as to show the nett amount payable. If no discounts are allowed the tender should be marked nett. The Crown Agents claim to be placed on the footing of the most favoured wholesale shippers, and they will decline to deal a second time with any Firm that does not so treat them.

(d) Firms may quote alternatively for delivery at any other port at which they can deliver f.o.b. cheaper than in London.

	Cost of packing for export	£	included	
(a)	Cost of delivery f.o.b. LONDON	£		
(b)	Alternative, cost of packing and postage to	£		
	Total	£	2988	1 3.
(c)	Trade and Shipping allowances per cent. on £ =	£		
	Cash discount for prompt payment per cent. on £ =	£		
	Net amount payable (including all charges) on receipt of Bills of Lading, or Parcels Receipt. Post Office Certificate of Posting.	£		
(d)	Alternative, total net cost f.o.b.	£	2988	1 3.

We hereby agree to supply, in accordance with General Conditions of Contract No. 1, dated November, 1922, on back hereof, the articles above specified, at the price set against each, which includes all charges and to deliver free on board ship or despatch by post within the period above stated from the date of order.

Signature MARCONI'S WIRELESS TELEGRAPH CO.LTD Sales Manager

Address Electra House, Victoria Embankment, W.C.2.

Dated this 26th *day of* NOVEMBER, 1937.

Date of Issue :—

(This space is for use in the Crown Agents' Office.)

W. Form 50E. 50 000/6/37 W. & S. LTD.

November, 1922.

CROWN AGENTS FOR THE COLONIES.

GENERAL CONDITIONS OF CONTRACT.

No. 1.

Definitions.

1. In these Conditions and in any Specifications or Special Conditions annexed hereto :—

(*a*) The words "Crown Agents" shall mean the Crown Agents for the Colonies.

(*b*) The word "Engineer" shall mean and include the Consulting Engineer or Engineers for the time being of the works under this Contract or if none shall have been appointed then the Engineer-in-Chief for the time being of the Crown Agents and any deputy duly authorised by them or him.

(*c*) The word "Inspector" shall mean the Chief Inspecting Engineer or other Inspector appointed by the Crown Agents to inspect the work.

(*d*) The word "Colony" shall mean the Colony or Protectorate for which the work is intended.

(*e*) The word "Contractor" shall mean the person, firm or Company whose Tender for the work referred to shall be accepted by the Crown Agents.

(*f*) The word "Work" shall include materials of every kind, in every stage of their preparation.

Contract not to be sub-let.

2. The Contractor shall not without the written consent of the Engineer assign or sub-let any part of this Contract, nor allow any portion of the work to be done otherwise than in his own establishment, and any such consent shall not relieve the Contractor of his liability under this Contract. Should the tenderer propose to sub-let any part of the work, this must be stated at the time of tendering. In the case of stock materials not of British manufacture, the place of origin must be stated when tendering. When it is proposed to manufacture the whole or any part of the work abroad the names and addresses of the proposed manufacturers and lists of the parts proposed to be obtained from them must be stated when tendering.

Contractor to indemnify the Crown Agents.

3. The Contractor shall indemnify the Crown Agents against all claims at any time on account of patent rights or royalties, whether for manufacture or for use in the Colony.

Alterations, additions and deductions.

4. The Crown Agents or the Engineer shall have the power of requiring reasonable alterations in, additions to, or deductions from the work or any of its details, or in to or from the quantities or weights specified, and if such alterations or additions do not involve extra expense no payment shall be made in respect of them. If the Engineer considers that the alterations or deductions diminish the value of the work to be done the Contractor shall allow a reduction in the Contract sum of such amount as the Engineer shall certify to be reasonable.

Payment for extra work.

5. The Contractor shall not receive payment beyond the Contract sum for any work which he may consider should be paid for as an extra unless such work shall have been ordered in writing by the Crown Agents or the Engineer as extra work, or unless the Contractor shall have claimed in writing that it should be paid for as an extra, and the Engineer shall have certified in writing that the claim is reasonable and proper.

Extension of time for additional work.

6. In the event of additional work or alterations being ordered the Crown Agents shall extend the time for delivery to such extent (if any) as the Engineer may certify to be reasonable and proper.

Discrepancies between Drawings and Specification.

7. Should there be any discrepancy between the Contract Drawings and the Specification or any inconsistency or omission in either of them, reference must be made to the Engineer for an explanation and the Contractor will be held responsible for any errors that may occur in the work through neglect of this precaution.

Work to be delivered complete.

8. The Contractor shall deliver the whole of the work complete in all its parts and furnished with every necessary detail and fitting notwithstanding any omission or inconsistency in the Contract Drawings and Specification.

Inspector to approve methods.

9. Before proceeding to execute any work, the Contractor shall obtain the Inspector's approval of the manner in which the Contractor proposes to execute each portion of the work and shall furnish such Drawings or information as the Inspector shall require.

Contractor to take all risks.

10. The Contractor shall take all risk of accident or damage to the work from whatever cause arising and shall be responsible for the sufficiency of all means used by him for the fulfilment of the Contract and shall not be relieved from such responsibility by any approval which may have been given by the Crown Agents, the Engineer or the Inspector.

Inspection and testing.

11. The Contractor shall afford the Inspector all proper and reasonable facilities for examining, inspecting, testing and gauging the materials, machinery and workshop used, or intended to be used for the purposes of this Contract and shall also supply free of charge such apparatus, materials, tools, gauges or labour and assistance as may be required from time to time for the purpose of such examination, inspection, testing and gauging.

Work to be to satisfaction of Inspector.

12. The work is to be executed in strict conformity with the Contract Drawings and Specification. The materials and fittings of every kind used are to be free from defects and unless otherwise specified are to be of the best description of their respective kinds. The workmanship is to be of first class character and finish. If any dispute or question shall arise between the Inspector and the Contractor under the provisions of this clause the same shall be referred to the Engineer for decision.

Powers of Inspector.

13. The Inspector may adopt any means he may think fit to satisfy himself that the materials specified are actually used and he shall have power throughout the Contract either personally or by deputy to inspect in any manner he may think fit without giving previous notice, the entire work or any part thereof at every stage of progress and wherever the work or any part thereof may be in progress; to amend and alter anything he may think fit; to reject any parts of the work which he may disapprove. If any work is so rejected, the Contractor shall at once execute it afresh to the entire satisfaction of the Inspector.

Notice prior to Inspection.

14. The Contractor shall give the Inspector due notice in writing previous to any of the work being ready for inspection.

Check tests or analyses.

15. When tests or analyses are considered necessary by the Engineer or Inspector in addition to those made by the Inspector on the Contractor's or Sub-Contractor's premises, the tests or analyses will be made by persons appointed by the Crown Agents. The Contractor will pay the cost of supply and carriage of samples. The costs of tests or analyses will be paid by the Crown Agents if such tests or analyses show the material to be in accordance with the Specification; but if not, such costs shall be borne by the Contractor.

Packing.

16. The Contractor must provide and include in his Contract sum the cost of all necessary packing including cases, materials and labour. He will be held responsible for the work being so packed as to ensure as far as possible its being free from loss or injury on arrival at its destination in the Colony.

Inspector's Certificates.

17. Until the Inspector shall have given his Certificate of approval, the Contractor must not send any of the work forward for shipment and should any defects be discovered after despatch from the Contractor's works they must be immediately remedied by the Contractor at his own expense notwithstanding any previous approval by the Inspector.

Place of delivery.

18. The work is to be delivered free on board vessels lying in any dock alongside any pier or wharf or in any part of the stream as the case may be at any of the ports named in the Tender as the Crown Agents may direct; the cost of such delivery must be included in the contract sum. Should the Crown Agents require delivery to be made at a port in the United Kingdom not named in the Tender, the Contractor shall only receive the exact cost of delivery at that port. The work will remain at the Contractor's risk in all respects until delivery has been taken when the Crown Agents' risk will begin.

Dock Charges

19. All dock and harbour dues and charges (including P.L.A. port rates, Clyde dues and Manchester Ship Canal Co.'s tolls) are payable by the Contractor. These are payable in full on :—

(*a*) Railway material, coal, coke, oil to be used to generate heat or to produce power, and on any stores intended for purposes other than the direct use of a Government Department or for any trading purposes.

(*b*) Stores shipped to Iraq.

On Other Stores, the following reduced rates are payable, viz. :—

London—Eleven-twelfths of published consolidated rates for Dock and Harbour dues, Wharfage, etc., plus three-quarters of P.L.A. port rates.

Other Ports.—Three-quarters of charges.

The exemption certificates necessary to secure reductions will be forwarded by the Crown Agents.

Freight.

20. Freight for the conveyance of work to the Colony will be engaged by the Crown Agents. Shipping particulars must be sent as soon as possible by the Contractor to the Crown Agents' Shipping Department at 4, Millbank, S.W.1, whence instructions will be issued for delivery to a ship. Should the work not be delivered in accordance with such instructions the Contractor shall be liable to the Crown Agents for any loss or expense which they may incur by reason of the non-delivery. The Crown Agents shall, however, have the power to delay deliveries for any reasonable period to suit their shipping arrangements and the work will remain at the Contractor's risk in all respects until delivery has been taken.

Invoice and Shipping Particulars.

21. Directly the work is ready for shipment the Contractor must give notice in writing to the Crown Agents' Shipping Department and must forward to the Crown Agents, 4, Millbank, S.W.1, four copies of the invoice and three copies of shipping particulars showing the number, marks, measurement, weight (gross and net) and contents of each package. The invoices must be made out on special forms supplied by the Crown Agents from whom copies can be obtained on application. Packing particulars should be made out on Contractor's own forms. Invoices should follow the wording and order of the Tender form wherever this can be done without being misleading as to the nature of the goods or the package in which they will be found, and they must give full trade description of each article. When section letters, page numbers, item numbers or other identifications are given in the form of tender these must be quoted on the invoices. If the work is shipped by instalments, separate invoices and shipping particulars must be rendered for each instalment and must enumerate only what is included in that instalment.

Payment.

22. Subject to any deductions to which the Contractor may become liable under this Contract, payment will be made to the Contractor within a reasonable time after the Bills of Lading have been received by the Crown Agents, provided that the Inspector shall have given his Certificate that the work has been completed to his entire satisfaction. The Contractor shall, if required, weigh the whole or any portion in the presence of the Inspector or his deputy and where the work is to be paid for by weight the Contractor shall only be paid for the net weights delivered. Notwithstanding the existence of any trade custom, the weight of wrappers, battens or other materials used in packing shall not be included in the weight for payment. When payment by instalments is provided for in the Special Conditions of Contract the Contractor must forward to the Crown Agents at 4, Millbank, S.W.1, an account in duplicate for each of the instalments except the final one (which shall be forwarded in quadruplicate) and an instalment whether it be the final or an intermediate instalment will only be paid upon the Certificate of the Inspector that such instalment has been earned and that the work has been executed in accordance with the Contract and to his entire satisfaction. Subject to the grant by the Inspector of the said Certificate the final instalment will be paid within a reasonable time after the work has been completed and delivered in accordance with the Conditions of Contract and will be subject to any deductions to which the Contractor may become liable under this Contract.

Vesting in Crown Agents.

23. When payment is made by instalments the work and all materials from time to time intended and appropriated thereto shall upon payment of the first instalment become and be the property of the Crown Agents subject to the provisions of this Contract. Provided that upon the due completion of the work all such materials as shall not have been actually used for the purposes of this Contract shall be relinquished to the Contractor. Immediately upon the payment of the said first instalment the Contractor shall affix the name of the Crown Agents upon the work in such conspicuous manner and place or places as may be directed by the Inspector and shall not remove the same without the consent of the Inspector.

Insurance.

24. When payment is made by instalments the Contractors shall until delivery has been taken by the Crown Agents at their own expense keep the work or such parts thereof as shall from time to time be constructed insured in the name of the Crown Agents and to their satisfaction against all risks to which the same shall for the time being be subject in such first-class Insurance Office or Offices as may be approved by the Crown Agents in an amount at least equal to the full value of the work in respect of which payment is claimed. No money shall be paid to the Contractors hereunder except upon production and delivery to the Crown Agents of the Policies of Insurance which ought to be effected by the Contractors and the receipts for the payment of the premiums thereunder and in case the Contractors shall neglect to effect or to keep up any such insurance the Crown Agents may effect and keep up such insurance and deduct the expenses thereof from any moneys payable to the Contractors hereunder. In case the work or any part thereof shall be destroyed, damaged, or lost, the Crown Agents shall receive the moneys paid in respect of the insurance and at their option either (*a*) such money shall be applied in rebuilding or reinstating the work so damaged, destroyed or lost in accordance with this Contract or as near thereto as in the opinion of the Inspector the circumstances will admit or (*b*) this Contract shall be determined, in which case the Crown Agents shall pay to the Contractors such amount as the Inspector shall certify to be fair and reasonable in all the circumstances. For the purpose of all insurances under this Clause there shall be added to the amount representing "the full value of the work" above referred to a sum equal to 5 per cent. thereof to cover disbursements.

Contract time for delivery.

25. The Contract time for delivery shall be the period or periods named in the Tender or agreed upon with the Crown Agents reckoned from the date on which the work is ordered by the Crown Agents.

Contractor to give notice of delay.

26. Should the Contractor anticipate at any time during the execution of the Contract that he will be unable to deliver the work within the Contract time, he must at once give notice accordingly in writing to the Crown Agents explaining the cause of the delay.

Deductions for delay.

27. Failures to deliver within the Contract time will, in addition to any other liabilities incurred by the Contractor under this Contract, subject the Contractor to a deduction from the Contract sum, as and for liquidated damages, and not as a penalty, of one per cent. per week on the value of any work which may be in arrears PROVIDED that if it shall be proved to the satisfaction of the Crown Agents that any such delay has arisen from causes which were unavoidable and could not have been foreseen or overcome by the Contractor (including delay in the supply of materials to the Contractor due to causes which were unavoidable and could not have been foreseen or overcome by the Manufacturers or Vendors of such materials), then the Crown Agents may in their absolute discretion decide the extent (if any) to which the deduction should be remitted, but any deductions not so remitted shall remain in full force.

Drawings, etc.

28. Any drawings, tracings or descriptions specified must unless otherwise specified, be furnished by the Contractor with the first consignment of the work to which they refer and no payment will be made by the Crown Agents until such drawings, tracings or descriptions have been furnished to the satisfaction of the Engineer.

Insolvency of Contractor and provisions in case of default.

29. Should the Contractor become bankrupt or insolvent or should he suspend payment or compound with his creditors or from any other cause whatever become unable or fail to carry on the Contract with efficiency; or should he not progress with the work in the manner intended by the Contract or not have work ready for delivery in conformity with the terms of the Contract; or should his preparations for commencement and his subsequent rate of progress be so slow from any cause whatever that in the opinion of the Crown Agents he will be unable to complete the work by the expiration of the specified period; or should he refuse or neglect to comply with the directions given him by the Crown Agents or the Engineer or Inspector or in any other respect act contrary to the terms of the Contract; then the Crown Agents shall have power to declare the Contract at an end and the Contractor shall only be paid for such portion of the work as shall have been actually delivered at the date of such declaration, after deduction of any sum leviable under the conditions of the Contract. The Contractor shall in addition be liable to pay to the Crown Agents, or the Crown Agents shall be entitled to further deduct the value of any expense, loss or damage (including any excess difference between the Contract price of the work to be done under this Contract or of such portion thereof as may not have been delivered at the date of such declaration as aforesaid and the price which the Crown Agents may have to pay for similar work provided in lieu of such portion as may not have been so delivered) which the Crown Agents may be put to or sustain by reason of or in connection with the Contractor's breach of Contract. If at any time the Contractor shall in the opinion of the Crown Agents not be executing the work with due diligence or shall be otherwise making default in the performance of this Contract the Crown Agents may give to the Contractor written notice requiring him to remedy such default to their satisfaction and the Contractor shall forthwith comply with such notice and in case the Contractor shall not within seven days after the receipt of such notice have duly complied therewith to the satisfaction of the Crown Agents then and in any such case the Crown Agents in addition and without prejudice to any of their other rights or remedies under this Contract—

(*a*) May make good such default or cause the same to be made good in such manner as the Crown Agents may think fit and the expenses thereby incurred (as certified by the Inspector) shall be paid by the Contractor to the Crown Agents or may be deducted by the Crown Agents from any moneys payable or to become payable to the Contractor under this Contract, or

(*b*) May determine this Contract and thereupon the Crown Agents may take possession of or remove and dispose of for their own benefit the work in its then state and all materials then being the property of the Crown Agents under this Contract together with the benefit of any Sub-contracts for any part of the work without making any further payment to the Contractor than such (if any) as the Inspector shall certify ought to be paid to him having regard to his default and all the circumstances of the case, or

(*c*) May without determining this Contract take possession of the work in its then state and all materials intended for it and complete the work in accordance with this Contract and the costs incurred by the Crown Agents in the exercise of any of the powers contained in this sub-clause (as certified by the Inspector) shall be deducted from any moneys then payable or thereafter to be payable to the Contractor hereunder and if such moneys shall not be sufficient the deficiency shall be made good and paid by the Contractor to the Crown Agents.

Discrepancies in Conditions.

30. Should there be any discrepancy between the General Conditions and any Special Conditions or Specifications of this Contract the Special Conditions or Specifications shall be followed in preference to the General Conditions.*

No personal liability on Crown Agents.

31. Nothing in these General Conditions or in any part of the Contract shall be deemed to impose any personal liability on the Crown Agents or on any of them or on any of their officers or servants.

Members of House of Commons.

32. No Member of the House of Commons shall be admitted to any share or part of this Contract or to any benefit to arise therefrom—see House of Commons (Disqualification) Acts, 1782 and 1801.

Contract an English one.

33. This Contract shall be deemed an English Contract and shall accordingly be governed by and construed according to English Law.

Marginal notes.

34. Marginal notes hereto are for the purposes of convenience only and shall not affect the construction or interpretation of this Contract.

Fair Wages Clauses.

35. The Contractor shall pay rates of wages and shall observe hours of labour not less favourable than those commonly recognised by employers and trade societies (or in the absence of such recognised wages and hours, those which in practice prevail amongst good employers) in the trade in the district where the work is carried out. Where there are no such wages and hours recognised or prevailing in the district those recognised or prevailing in the nearest district in which the general industrial circumstances are similar shall be adopted. Further the conditions of employment generally accepted in the district in the trade concerned shall be taken into account in considering how far the terms of fair wages clauses are being observed. The Contractor shall be responsible for the observance of the fair wages clauses by the Sub-contractor (if any).

36. The Contractor shall cause the preceding condition to be prominently exhibited for the information of his workpeople on the premises where work is being executed under the Contract. Printed copies of such notice will be supplied on application to the Crown Agents. In trades where it is the practice, the Contractor shall also cause to be exhibited or to be available for inspection a copy of any signed Agreement determining the rates of wages and hours of labour commonly recognised by employers and trade societies in the district.

37. The Contractor shall keep proper wages books and time sheets showing the wages paid and the time worked by the workpeople in his employ in and about the execution of the Contract and such wages books and time sheets shall be produced whenever required for the inspection of any officer authorised by the Crown Agents.

Certificates to be final.

38. Any decision, certificate or determination made or given by the Crown Agents, the Engineer or the Inspector in pursuance of this Contract shall be final, conclusive and binding for all purposes.

Arbitration.

39. Any question, dispute or difference between the Crown Agents and the Contractor arising out of this Contract shall be referred to arbitration in accordance with the provisions of the Arbitration Act, 1889, or any statutory modification thereof.

Dangerous goods.

40. Packages containing dangerous goods (see Section 446 Merchants Shipping Act, 1894) must be marked by the Contractor as provided in the Statute and specially reported to the Crown Agents' Shipping Office, attention being also drawn to them in the shipping particulars.

INSTRUCTIONS TO FIRMS TENDERING.

The original Tender Form is to be filled up complete in every respect and delivered, properly sealed, by hand or by post not later than noon on the date named on the face of the form. The blue address slip, when such is provided, is to be affixed on the face of the envelope. If no date is specified the form should be returned as soon as possible.

The duplicate form is intended to be retained by the firm.

Both forms should be returned to the Crown Agents at once if the firm is unable or unwilling to tender.

The Crown Agents do not bind themselves to accept the lowest or any tender and they reserve to themselves the right of accepting any tender wholly or in part.

Copies of any drawings referred to in the Specification can be seen at the Crown Agents' Office and can be obtained from Mr. W. J. Harrison, 7, Carteret Street, Westminster, S.W.1, on a payment of 1/6 per copy.

* The following are the matters which will more usually form the subject of special conditions:—
Payment by instalment (cl. 22); provision of a sum to cover additional work (if any) (cl. 5); amount of liquidated damages (cl. 27)

DUPLICATE

26th November, 37.

The Chief Engineer,
Office of the Crown Agents for the Colonies,
4, Millbank, S.W.1.

K11/GA30/27397

Sir,

W/FALKLAND ISLANDS 4435/1

We have pleasure in enclosing herewith your Tender Form duly completed.

You will observe that we are offering a 250 watt Broadcaster in place of the 200 watt, which you specify. The Transmitter we are offering is of our standard design and we trust that it will be suitable for your purpose. As a matter of fact we have recently supplied an exactly similar Transmitter to the Argentine - Radio Rosario, which is giving its owners satisfactory service.

For your guidance we give below in analysis of our offer:

SCHEDULE REF: S.09042:

Section 1. Aerial & Earth System.	£203.	0.	0.
Section 2. Mast Lighting (optional)	£114.	0.	0.
Sections 3, 4, 5 and 6. Transmitter, Master Oscillator Power Plant and installation materials.(excluding valves)	£2230.	0.	0.
Section 7 Spares(excluding valves)	112.	0.	0.
Three sets of Valves (1 working and 2 spare) at £109. 13. 9d. per Set.	329.	1.	3.
	£2988.	1.	3.

The technical side of our offer is fully explained in the accompanying binder, but should there be any point upon which you require further information, please consider us at your entire disposal.

Encs:
Your Tender Form completed.
Binder in Duplicate No.L.2212.

We are, Sir,
Your obedient servants,

REFERENCE NO.L.2212. E.D.37329/1.

MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED

PROPOSED BROADCAST TRANSMITTING INSTALLATION FOR FALKLAND ISLANDS

C O N T E N T S

.....

AES/MF.

REFERENCE NO. 09060/3685. E.D.37329/1.

MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED.

PROPOSED 250 WATT BROADCAST TRANSMITTING INSTALLATION FOR FALKLAND ISLANDS.

TECHNICAL PERFORMANCE SPECIFICATION.

TECHNICAL SPECIFICATION FOR 250 WATT BROADCAST.

1. Transmitter Rating.

The power of the station expressed as unmodulated aerial input will be 250 watts with a permissible distortion less modulation of 95%.

2. Modulation Performance.

The modulation referred to above as "distortion-less" is intended to be maximum modulation within which the total amplitude of the whole of the parasitic components of modulation does not exceed 4% of the amplitude of the fundamental modulation frequency, which figure is in accordance with the recommendations of the C.C.I.R. (Copenhagen).

3. Noise Level.

The unweighted noise level on the carrier will be 54 dB. below the level of 100% modulation with A.C. heating of the modulated amplifier filaments, as scheduled.

If the filament heating rectifier output were increased to supply the modulated amplifier filaments with rectified A.C. the carrier noise level would be 60 dB. below the level of 100% modulation but this alternative is not included in the tender.

4. Frequency Stability.

The crystal drive offered has a stability of two parts in one million per degree centigrade. This corresponds to plus or minus 25 parts in one million with ambient temperatures between 20 degrees C. and 45 degrees C. In addition an L/C drive is contained in the same rack

with a change-over switch so that if desired the transmitter can be operated at any frequency within its full wave range.

It is assumed that the voltage and frequency of the supply is constant to within plus or minus 5% and plus or minus 1% respectively.

The above cyrstal drive is a simplified form of the more expensive type of precision drive now in general use in congested broadcast areas, such as Europe, where interference is likely to be experienced from stations on adjacent channels.

5. Frequency Response.

The frequency response will be substantially linear between 30 and 10,000 cycles per second, that is, between these limits the overall frequency response curve, plotted as decibels gain against frequency will not depart by more than plus or minus 2 decibels from its value at a mean testing frequency of 1000 cycles per second.

Signal Input Power Level.

Full modulation can be obtained by an audio frequency input at the input terminals of the transmitter of 0.15 milliwatts. This corresponds with the normal impedance of 600 ohms to about 0.3 volts at a testing frequency of 1000 cycles.

6. H.F. Harmonics.

The high frequency harmonics generated are of a very low power and special arrangements have been made in the circuits to prevent their radiation.

It is clear, however, that the harmonics will depend to a large extent upon local circumstances and disturbing circumstances not entirely under control.

It is confidently anticipated that, excluding effects of this kind, the strongest high frequency harmonic will not produce a field strength greater than 0.1 millivolts per metre at a distance of 5 kilometres from the transmitting aerial.

This corresponds to a radiated power of only about 30 milliwatts of power on the 1st harmonic frequency.

7. Power from Supply Mains.

Under conditions of full load, the power required from the A.C. low tension supply will be approximately 5 K.W. for the transmitter and drive, subject to a tolerance of plus or minus 5%.

8. Valve Life.

Subject to Marconi stipulations and conditions Reference Q.46505 the valves may be given an average life guarantee or, alternatively, a contract may be drawn up by which the Marconi Company will valve the transmitter at a stated cost per burning hour.

The average life guarantee for the valves is as follows -

(a) For radiation cooled valves with dissipation over 25 watts ..... 3000 hours.

(b) For small radiation cooled valves below 25 watts ..... 1000 hours.

9. Wave Range.

The Transmitter may be operated on any wave-length within the broadcast band of 200 to 545 metres.

AES/MF.

REFERENCE NO. 09061/3685. E.D.37329/1.

MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED.

PROPOSED 250 WATT BROADCAST TRANSMITTING INSTALLATION

FOR

FALKLAND ISLANDS.

GENERAL DESCRIPTION.

CONTENTS.

MARCONI 250 WATT BROADCAST TRANSMITTER.

SECTION 1. SUMMARY OF PRINCIPAL PERFORMANCE CHARACTERISTICS.

1. POWER RATING.	250 watt unmodulated aerial input.
2. MODULATION PERFORMANCE.	100% maximum modulation. 95% distortionless modulation on the C.C.I.R. (Copenhagen) rating.
3. WAVE RANGE.	200/545 metres (1,500/550 kc/s.)
4. CARRIER STABILITY.	Constant to plus or minus 2 parts in one million per degree Centigrade. This corresponds to a frequency constancy of ± 17 cycles for a temperature range of 10° Centigrade and a wavelength of 350 metres.
5. FREQUENCY RESPONSE.	Sensibly linear between 50 and 10,000 cycles/second. The curve does not depart from a straight line by more than 2 decibels between those limits.
6. H.F. HARMONICS.	Not greater than 0.1 millivolts/metre at a distance of kilometres.
7. POWER REQUIRED FROM MAINS.	5 K.W., including all auxiliaries.

SECTION 2. AERIAL AND EARTH EQUIPMENT.

The schedule of material is based upon the assumption that a wavelength of approximately 250 metres will be used and a suitable aerial and earth equipment for this wavelength is specified.

The choice of a working wavelength is usually limited, or in any event guided by the free channels available. It is obvious that as far as possible a wave should be selected which is not likely to suffer from interference by other stations working on adjacent channels. In some localities this is a comparatively easy matter but in others such as the European Zone it is a matter for International agreement and sanction.

If we assume that wavelengths are available throughout the accepted broadcast band of 200 to 545 metres, the selection then becomes a matter of compromise between the longest possible wavelength and the economic cost of a suitable aerial and earth system. For low power transmitters the cost of aerial and earth must be low to maintain a reasonable proportion of the total cost of the station.

In this case after careful consideration we propose a single mast radiator approximately one eighth wavelength high with a large and efficient earth circle. This type of radiator is now accepted as being particularly suitable for use with low power broadcast installations.

The cost of a mast or tower is not in direct proportion to the height, because the greater the height

the greater must be the strength of the structure in order to support its own weight. To limit the cost to a reasonable figure we suggest a mast 100 ft. high which in turn limits the working wavelength to approximately 250 metres if the radiator is to be used efficiently.

We could, of course, offer a higher mast if a longer working wavelength is considered essential but for small stations the cost usually outweighs the slight gain in field strength.

The mast offered is of the stayed and insulated type, the base resting upon compression type porcelain insulators in a specially designed housing.

No provision is made for an aerial feeder as it is felt that the small station building may be erected quite close to the mast base, the connection between the transmitter and the building being made by a single wire.

The efficiency of the mast as a radiator depends upon the provision of a satisfactory earth system. The system proposed consists of a set of perforated plates directly under the mast with 120 radial wires spaced at intervals of 3° and approximately 0.4 wavelength long. This system unfortunately necessitates a rather large site, in this particular case a circle of approximately 200 metres diameter, but nevertheless the arrangement is highly recommended on account of the increase in aerial efficiency which it makes possible.

SECTION 3. CRYSTAL MASTER OSCILLATOR.

GENERAL.

The stability and frequency constancy obtained with a broadcast transmitting installation depends primarily upon the master oscillator unit. It is obvious that the degree of stability desired will depend upon the conditions of operation, i.e. whether the station utilises an exclusive or shared frequency, and the congestion of stations on adjacent frequencies.

At the recent Bucharest Conference of the C.C.I.R. it was suggested that the frequency tolerance of new broadcast stations should not exceed ± 20 cycles, and for this reason a crystal master oscillator rack has been included.

DETAIL DESCRIPTION.

The Master Oscillator, which entirely determines the frequency and stability of the emitted carrier wave, consists of a special type of quartz crystal oscillator having a very low temperature coefficient enclosed in a lagged chamber.

The quartz is maintained in oscillation by a pentode valve, and the oscillation frequency to which the quartz is cut is made either 1/2, 1/3 or 1/4 of the required carrier frequency according to the particular frequency required.

A stage of harmonic selection or frequency multiplying follows the oscillator output and converts

the oscillations to the required carrier frequency and a single amplifier is used to raise the level to about 6 watts, the required input to drive the transmitter proper.

The master oscillator circuits described are mounted together with the rectifiers and meters for power supply etc. in an enamelled iron rack, and the output from the rack is fed to the ACS.1 stage of the transmitter through a concentric high frequency feeder line of a small type having a surge impedance of about 70 ohms, as shown on the diagram of the transmitter.

The panels of the rack are as follows:-

a. Transformer, Rectifier and Smoothing Panel.
b. Master Oscillator Panel.
c. H.F. Multiplier and Amplifier Panel.

a. <u>Transformer, Rectifier & Smoothing Panel</u>.

On this panel are mounted the necessary switches, fuses and supply transformers to control the incoming low tension A.C. supply to the rack, together with input ammeter and voltmeter, secondary switches, earthing potentiometers and the various accessories necessary for the distribution of the A.C. supply to the various circuits.

The rectifier used is a single thermionic valve type U.14 in a single phase full wave circuit.

The smoothing equipment consists of a smoothing filter comprising iron cored chokes and condensers designed to reduce the ripple on a rectifier output to

negligible proportions. A voltmeter registering the H.T. D.C. volts is mounted on the panel, together with a feed milliammeter and switch, and a low tension voltmeter for A.C. filament circuits.

b. Master Oscillator Panel.

This unit contains a thermal insulated chamber for the valve maintaining circuits, the crystal proper and an associated L/C drive, which is obtained by the movement of a switch.

The quartz crystal is of a special type ground in such a manner as to reduce to a minimum the temperature/frequency characteristic. The crystal is mounted in a holder of special type and the complete crystal unit is mounted inside the thermal insulated chamber.

Arrangements are made for mounting a second crystal in situ for emergency purposes, the changeover from one to the other being effected by the switch on the front of the panel.

The crystal is maintained in oscillation by means of a valve circuit and this circuit with its switches is contained in the lagged chamber holding the crystals. The valve, its holder, certain resistances, by-pass condensers and coupling condenser to the next stage are mounted in shielded projecting chambers in front of the lagged chamber, but not projecting before the face of the rack.

In addition to the quartz crystal which supplies of course a precision drive on the spot wave-length for

which the crystal is ground and cannot be used for other wavelengths (except for a few cycles change by special means and for harmonics or multiples of the normal frequency) a complete inductance/capacity tuning circuit is also provided.

A changeover switch enables the driving generator to be changed from one quartz to the other, or to the L/C circuit, or again provides a quartz controlled L/C drive. This last circuit does not give the true quartz frequency but a compromise between the quartz and the L.C. oscillator. The difference is not great.

With such an arrangement an emergency drive is always instantly available in case of failure of the quartz but, what is more important, the L/C drive will enable any wavelength within the band to be used, since the tuning circuit is arranged to cover the whole band.

The stability is, of course, not so high as when the quartz is used.

When a quartz crystal and an L/C circuit are associated, a certain ambiguity in the tuning point arises owing to the locking action between the quartz and the L/C circuit. The apparent stabilised frequency is different if the tuning circuit is varied from below resonance upwards from its value if the tuning circuit is varied from above resonance downwards, this effect being, of course, well known.

In order to avoid any ambiguity the tuning condenser has been arranged with a non-reversible manual control so that tuning can only be carried out in a single direction.

Screening boxes are provided where required and the complete unit forms a master oscillator of an extremely high degree of precision together with great flexibility.

c. Multiplier & Amplifier Panel.

The final carrier frequency required is obtained from the quartz or L/C frequency by means of a frequency multiplier circuit, according to the wavelength required.

The multiplier stage consists of a valve circuit with the anode output circuit tuned to the correct multiple of the frequency of the incoming driving circuit. The circuit is arranged so that valve output is rich in harmonics and the tuned circuit selects the particular harmonic required.

The valve used is the indirectly heated cathode type MPT.42 and the stage is well screened. The exact resonance is obtained by a variable air condenser and the stage contains the necessary H.F. circuit feed resistances, grid resistances and accessories.

The final frequency output from the multiplier stage is led to the H.F. amplifier mounted on the same panel. This amplifier stage uses two type MPT.42 valves in parallel, the output at the stabilised frequency being fed through a concentric H.F. transmission line or feeder to the first H.F. stage of the transmitter proper.

SECTION 4. BROADCAST TRANSMITTER.

The installation to be described has been designed to operate as an efficient low power broadcast transmitter.

The transmitter is designed to be operated directly from L.T. three phase 50 cycles supply and is arranged so that normal service operation and maintenance is reduced to a minimum and is suitable for operation by semi-skilled staff. The transmitter may be left for long periods without attention.

In the design special attention has been given to the following important points:-

1. A high quality of transmission.
2. The production of linear frequency characteristics over an extremely wide range of audio frequencies.
3. Deep and distortionless modulation.
4. Freedom from harmonics.
5. Overall reliability and economy of maintenance.

The transmitter unit is of vertical formation, the various sections and circuits being mounted in screened boxes according to the type of the particular circuit, the controls and instruments being mounted in convenient positions.

A pleasing grey cellulose finish is used throughout and suitable screens and interlocks are provided to make the whole transmitter safe to handle.

The transmitter consists of an H.F. Amplifier Modulated Amplifier and Modulator Unit mounted in a screened metal frame with a panel front; the various sections are arranged in screened boxes as follows:-

a. H.F. Amplifier.
b. Modulated Amplifier.
c. Modulator and Sub Modulator.

a. H.F. Amplifier.

This is a high frequency stage using a four electrode screened grid transmitting valve type ACS.1.

The stage functions as a voltage amplifier driven by the master oscillator, the output being coupled through suitable circuits to the grid input circuits of the modulated amplifier. The high tension feed at approximately 6000 volts is obtained from the main rectifier, the correct screen grid and anode volts being obtained through volt-dropping resistances mounted in the panel. Filament supply is from the common filament rectifier.

b. The Modulated Amplifier.

The modulated amplifier of the transmitter uses one type DET.3 transmitting valve, operating as high efficiency H.F. magnifiers and designed to introduce a total power of 250 watts into the aerial.

The stage is complete with grid input tuning circuits driven from the previously described H.F. magnifier and the valve has a stabilising resistance

and choke for minimising the danger of squiggers. The output closed oscillating circuit, coupling unit and aerial tuning circuits are also included.

The main high tension voltage available is approximately 6000 volts but as the stage is connected in series with the modulator, the normal anode voltage is only about 2500 volts actually across the valve.

c. The Modulator and Sub Modulator.

The signal input from the line is connected through an input transformer and attenuator unit to a two-stage speech amplifier using type ML.4 valves.

Then follows a stage of normal high quality resistance capacity amplification employing one type DET.2 valve. The gain of these stages is proportioned to meet the level of the line input and is such that it is possible fully to modulate the transmitter with very low inputs.

The primary of the input transformer is designed for a line of about 600 ohms surge impedance.

The modulator employs one type MT.9L valve arranged in the normal manner for series modulation, and the stage is connected in series with the modulated amplifier across the 6000 volt supply in such a manner that about 3500/4000 volts are normally applied across the modulator.

For the protection of the H.F. and modulator circuits during operation, an aerial overload relay and an over-modulation indicating and tripping device are included.

The aerial overload relay is combined with the aerial ammeter and is arranged to trip the power if any disturbance, such as valve failure, causes diminution of aerial current. It can be set to trip on small reductions of currents.

The over-modulation device includes a sensitive relay operated by the output current of a small rectifier working off the modulated anode voltage of the final stage. The relay is mechanically biassed against operation by normal anode voltages but is rendered sensitive by the nature of its current to over-modulation peaks.

In such conditions its contact closes a lamp circuit and the extent of lamp flicker is an indication of the amount of over-modulation.

The energy of the over-modulation peak is also used to heat up a thermostat which is set to trip the power supply when over-modulation of excessive amount is experienced.

Series Modulation.

In this system which has been developed by the Marconi Company and in service for several years, the modulated amplifier and modulator are connected in series across a sensibly constant high voltage supply, instead of in parallel as with the choke control system.

The modulated amplifier behaves as a resistive load of constant impedance over a very wide range of operating loads, and the modulator has an effective resistance which is controlled by its instantaneous grid bias.

The circuit in its fundamental form is therefore simply a fixed resistance in series with a variable resistance, connected across a constant voltage source.

In order to produce modulation of the H.F. currents in the modulated amplifier, the resistance of the modulator is varied in accordance with a signal applied to its grid.

In operation, since the total voltage is maintained constant, the anode voltage applied to the modulated amplifier at any instant can only be the difference between the main H.T. voltage and the voltage drop across the modulator.

Since this voltage drop depends on the anode feed current which is in turn dependent on the signal voltages applied to the modulator grid, it follows that the oscillator anode voltage varies according to the signal and the high frequency oscillation is modulated in a linear manner, the envelope of the modulated H.F. output being a faithful copy of the signal frequencies applied.

This system of modulation has been the subject of considerable research and development in the Marconi Laboratories and is capable of producing a modulated output free to a very high degree from both frequency and amplitude distortion even at very high power levels, whilst the complete absence of iron in the circuit makes for an improved faithfulness of response to transients.

The main advantage is that the modulation can be impressed on the carrier at any power level without limitations in frequency response or harmonic due to distortion. This means that stages of Class B modulated amplification can be dispensed with altogether or reduced to one stage only whatever the power required, with a consequent reduction in harmonic distortion inevitably produced by each stage of this class of amplification, however carefully designed and adjusted.

The modulation performance of the complete transmitter is discussed in more detail later in another section of this specification.

SECTION 5. RECTIFIER UNIT.

The Rectifier Unit in size and general appearance is similar to the Transmitter Unit and is designed to take its supply from 3 phase 50 cycle mains.

The complete unit consists of a metal frame of vertical formation similar to the transmitter, housing separate rectifiers with their auxiliaries and output smoothing filters, and the necessary controls brought out to the front.

Grey cellulose finish is used throughout and suitable screens and interlocks are provided to make the unit safe to handle.

The main anode rectifier mounts three valves type MR.4 air cooled which are arranged in a three phase half wave rectifying circuit.

The anode and filament transformers and power regulator are mounted in the unit in accessible positions together with an H.T. voltmeter. The smooth D.C. output from this rectifier is at approximately 6000 volts.

The ripple on the rectifier output is reduced to negligible proportions by means of a low pass smoothing filter, consisting of iron core chokes and smoothing condensers.

For the low voltage supply for filament heating, another rectifier is provided which is of the Westinghouse metal oxide type. A special output smooth-

ing circuit is incorporated in this circuit made up of a bank of electrolytic condensers and an iron choke.

The rated rectifier output is approximately 20 amps. at 20 volts.

Further small oxide rectifiers are provided for obtaining grid bias potentials for the modulator and anode potentials for the speech amplifier.

SECTION 6. MOTOR ALTERNATOR UNIT.

As the transmitter and rectifier unit is designed to operate direct from 3 phase 50 cycle mains and as the available supply is at 500 cycles a converter unit is a necessity. For this we have offered a motor alternator group, the motor being suitable for operation from the 500 cycle mains, and the 3 phase alternator having an output of 5 K.W. at 50 cycles. The voltage is given in the schedule of supplies as 400 volt but it may be more convenient to use 380/220 volts.

The machine will comply with British Standard Specifications where these apply and will be provided complete with the necessary motor starter, fixing bolts, accessories and tools.

The switchboard will consist of a single small panel mounting a main switch and fuses for the incoming supply and distribution switch for supply to the transmitter.

A voltmeter and ammeter are provided on the output of the alternator.

NOTE: The foregoing Description is submitted as a general indication of the arrangement proposed, but the Installation may differ in minor respects with the object of improving the working.

AES/EAC.

REFERENCE NO.S.09042/3685. E.D.37327/1.

MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED

PROVISIONAL SCHEDULE OF MATERIAL

FOR

BROADCAST TRANSMITTING INSTALLATION

FOR

FALKLAND ISLANDS

Transmitter Rating:	250 watts Unmodulated Aerial Feeder Input.
Modulation:	95% C.C.I.R.2.
Working Wavelength:	Assumed to be approximately 250 metres.
Wave Range:	200/545 metres.
Power Supply:	Single phase 440 volts 500 cycles assumed available.

LIST OF SECTIONS

Item	Qty.Msr.	Article and Description.

SECTION 1. AERIAL AND EARTH SYSTEM

1	1	MAST RADIATOR for a wavelength of approximately 250 metres, consisting of:- a. Lattice Steel, Equisectional Stayed Mast, 100 feet high. b. Set of Insulated Stays. c. Steelwork for foundations. d. Base compression Porcelain Insulator. e. Lightning Arrestors.
2	1 set	ERECTION GEAR for Item 1.
3	1 supply	CONSTRUCTIONAL MATERIAL for Earth System, consisting of:- a. 120 Radial Earth Wires, each No.14 S.W.G. bare copper, 100 metres long. b. Earth Plates and fittings. c. Necessary rivets and burrs.
4	1	INSULATOR, porcelain lead-in, for aerial system, complete with fittings.
5	1	INSULATOR, tubular porcelain lead-in, for earth system.

Item	Qty.Msr.	Article and Description.

SECTION 2. MAST OBSTRUCTION LIGHT EQUIPMENT (OPTIONAL)

1	1	MAST HEAD LIGHT, Air Ministry approved pattern, aviation obstruction lantern, complete with mounting adaptor for mast head.
2	3	LAMPS, 100 watt B.C., 240 volts Traction type for Item 1.
3	150 ft.	CABLE for feeding lamps, 3/.036 V.I.R. twin core, lead-covered and wire armoured.
4	1 supply	CLEATS AND CLAMPS with fittings for Item 3.
5	1	H.F. FILTER UNIT, consisting of:- a. 6 H.F. Chokes on porcelain or glass formers and complete with insulators for mounting: b. 4 Condensers, mica, H.F. bypass, with mountings. c. Mounting Plate for filter unit. d. Screening Cover, iron, with 2 leading-out insulators.
6	1	MAIN SWITCH AND FUSES, 250 volts, double pole, ironclad type.

Item	Qty.Msr.	Article and Description.

SECTION 3. CRYSTAL MASTER OSCILLATOR

1 1 MASTER OSCILLATOR UNIT, comprising metal rack with floor supports and wiring, mounting the following:-

a. Main Supply Panel mounting input switches, transformers, valve rectifier, smoothing unit, H.T. protector switch, filament potentiometer for reduction of A.C. hum, indicating meters, selector switches and detail parts.

b. Oscillator Panel, comprising L/C oscillator, duplicate crystal holders with changeover switch, trimmers, reaction switch, non-reversible condenser system for crystal controlled L/C oscillation, lagged chamber with continuous heater, condensers, resistances and all detail parts.

c. Frequency Multiplier and Amplifier Panel, comprising single valve multiplier stage with tuned anode circuit and all resistances and condensers and final amplifier, resistance capacity coupled with metal screens and all detail parts.

2 1 set WORKING VALVES, comprising:-

a. 4 Type MPT.42.

b. 1 " U.14.

3 1 supply CONCENTRIC H.F. FEEDER for connection between the Drive Unit and Transmitter.

4 1 QUARTZ CRYSTAL, ground to suit the particular working wavelength.

Item	Qty.Msr.	Article and Description.

SECTION 4. BROADCAST TRANSMITTER

1 1 BROADCAST TRANSMITTER UNIT, consisting of metal framework with screens, doors, indicating instruments, controls and mounting the following:-

a. H.F. Amplifier Unit in screened compartment, mounting one type ACS.1 screened grid valve, H.F. circuits and output coupling circuits and detail parts.

b. Modulated Amplifier Unit in screened frame and mounting one type DET.3 valve, H.F. tuning circuits, output coupling circuits and complete H.F. tuning equipment for closed oscillating and aerial tuning circuits; with all necessary indicating meters and detail parts as required.

c. Series Modulator and Sub Modulator Unit, with mountings for one type MT.9L modulator valve, one type DET.2 sub modulator valve and two-stage speech amplifier with two type ML.4 valves, complete with anode and grid resistances, coupling condensers, input transformer, attenuator unit, modulation indicator calibrated in percentage modulation and all necessary indicating meters and controls as required for the distortionless amplification of the speech frequencies and the modulation of the H.F. carrier.

2 1 RECTIFIER UNIT consisting of metal framework with protecting screens and mounting the following:-

a. Rectifier Unit for main anode power with mountings for 3 type M.R.4 valves, 3 phase main anode transformer, power regulator, filament transformer, smoothing filter circuits and all detail parts and fittings.

b. Rectifier Unit for filament heating, comprising Westinghouse metal oxide rectifier, with special output smoothing filter, voltage regulating

Item	Qty.Msr.	Article and Description.

Item 2(b) Contd.

device and all detail parts for a smooth D.C. output of 20 amps., 20 volts.

c. Rectifier Unit for grid bias, comprising input transformer, rectifier and output smoothing filter for a smooth D.C. output of 400 m/A. at 450 volts.

d. Rectifier Unit for anode supply for speech amplifier, complete with output smoothing circuits.

e. Control Switches, regulators and detail parts.

3 — 1 set — WORKING VALVES for the complete Transmitter, comprising:-

a. 1 Type ACS.1, H.F.Amplifier.

b. 1 " DET.3, Modulated Amplifier.

c. 1 " MT.9L, Modulator.

d. 1 " DET.2, Sub Modulator.

e. 2 " ML.4, Speech Amplifier.

f. 3 " MR.4, Main Rectifier.

4 — 1 set — ALARM DEVICES, comprising:-

a. Aerial Overload Relay, arranged to flash a warning lamp if the aerial current rises above a predetermined value.

b. Overmodulation Relay, arranged to flash a warning lamp if the modulation exceeds a predetermined value and to ring a bell if the over-modulation persists for a predetermined time.

5 — 1 — ALARM INDICATOR BOARD, wall mounting, consisting of one bell and two lamps.

Item	Qty.	Msr.	Article and Description.

SECTION 5. POWER PLANT AND SWITCHGEAR

1 1 MOTOR ALTERNATOR SET, consisting of:-

a. Motor, single phase, 440 volts, 500 cycles, direct coupled on the same bedplate to:

b. Alternator, 400 volts, 3 phase, with neutral, to deliver 5 K.W.

The machine to be complete with hand starter, excitation regulator, holding down bolts, tools and accessories.

2 1 CONTROL SWITCHBOARD, comprising panel mounted on framework and carrying all necessary switches and fuses for the incoming supply and indicating instruments and control switch for Item 1b and distribution switch for the control of the transmitter supplies.

Item Qty.Msr. Article and Description.

SECTION 6. INSTALLATION MATERIAL

1 1 supply CABLE for the complete transmitting installation and motor alternator, consisting of an adequate quantity of C.M.A. grade lead-covered cable of ample sections as necessary for the installation of the transmitter circuits, complete with all necessary cable lugs and thimble but not including special cable racks in trenches or chequer plate or other covering for the cable trenches.

2 1 supply BARE COPPER EARTHING BUSBARS, earth plates where necessary, holding down bolts and sundry material required for the installation of the plant.

3 1 TOOL BOX, complete with all the necessary tools for the installation of the transmitter.

4 1 set PORTABLE TESTING INSTRUMENTS.

5 1 supply SPECIAL POLISH for routine cleaning of cellulose panels.

Item	Qty.	Mar.	Article and Description.

SECTION 7. SPARES

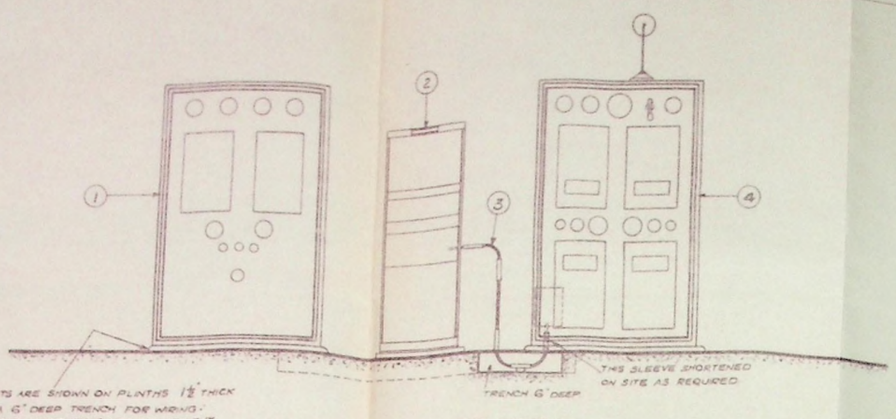
1	2 sets		SPARE VALVES for Transmitter, each comprising:-
		a.	1 Type ACS.1.
		b.	1 " DET.3.
		c.	1 " MT.9L.
		d.	1 " DET.2.
		e.	2 " ML.4.
		f.	4 " MPT.42, Precision Drive.
		g.	1 " U.14, Rectifier for Item f.
		h.	3 " MR.4, Main Rectifier.
2	12		INSULATORS, various, as used on the transmitter.
3	12		RESISTANCES, various, as used on the transmitter.
4	12		CONDENSERS, various, as used on the transmitter.
5	1 supply		FUSES AND FUSE WIRE.
6	1 set		BRUSHES AND BRUSH HOLDERS for motor alternator set.
7	1		QUARTZ CRYSTAL, ground and matched to the working crystal for mounting in situ.
8	1 set		RESISTANCES AND CONDENSERS, various, precision master oscillator.

NOTE: The foregoing Schedule is submitted as a general indication of the arrangement proposed but the actual Installation may differ in minor respects with the object of improving the working.

AES/MS.

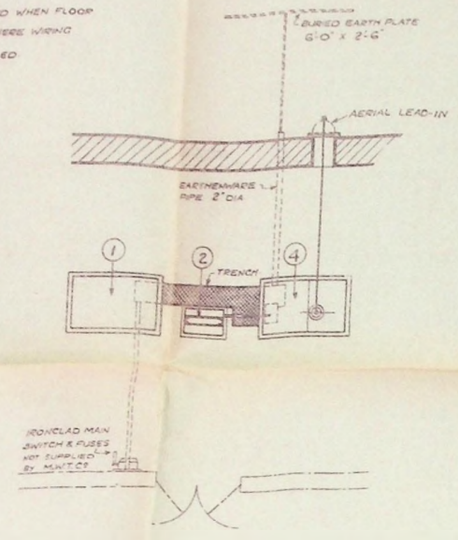
REF.	DESCRIPTION
1	RECTIFIER UNIT
2	MASTER OSCILLATOR
3	FEEDER UNIT
4	MAGNIFIER & MODULATOR UNIT

DRG. Nº	P.S. Nº	REMARKS



UNITS ARE SHOWN ON PLINTHS 1½" THICK
& A 6" DEEP TRENCH FOR WIRING.
WHERE A TRENCH IS NOT CONVENIENT
THE WHOLE TRANSMITTER SHOULD BE
MOUNTED ON A FALSE FLOOR APPROX. 6' HIGH
FOR WIRING PURPOSES
THE 1½" PLINTH CAN BE MAINTAINED WHEN FLOOR
HAS REMOVABLE FLOORBOARDS WHERE WIRING
& DRIVE FEEDER CAN BE CONCEALED

FRONT ELEVATION.
SCALE :- ½" = 1'-0"



PLAN.
SCALE :- ½" = 1'-0"

NEW NO.	DATE	ALTERATIONS OR CORRECTIONS	INITIAL

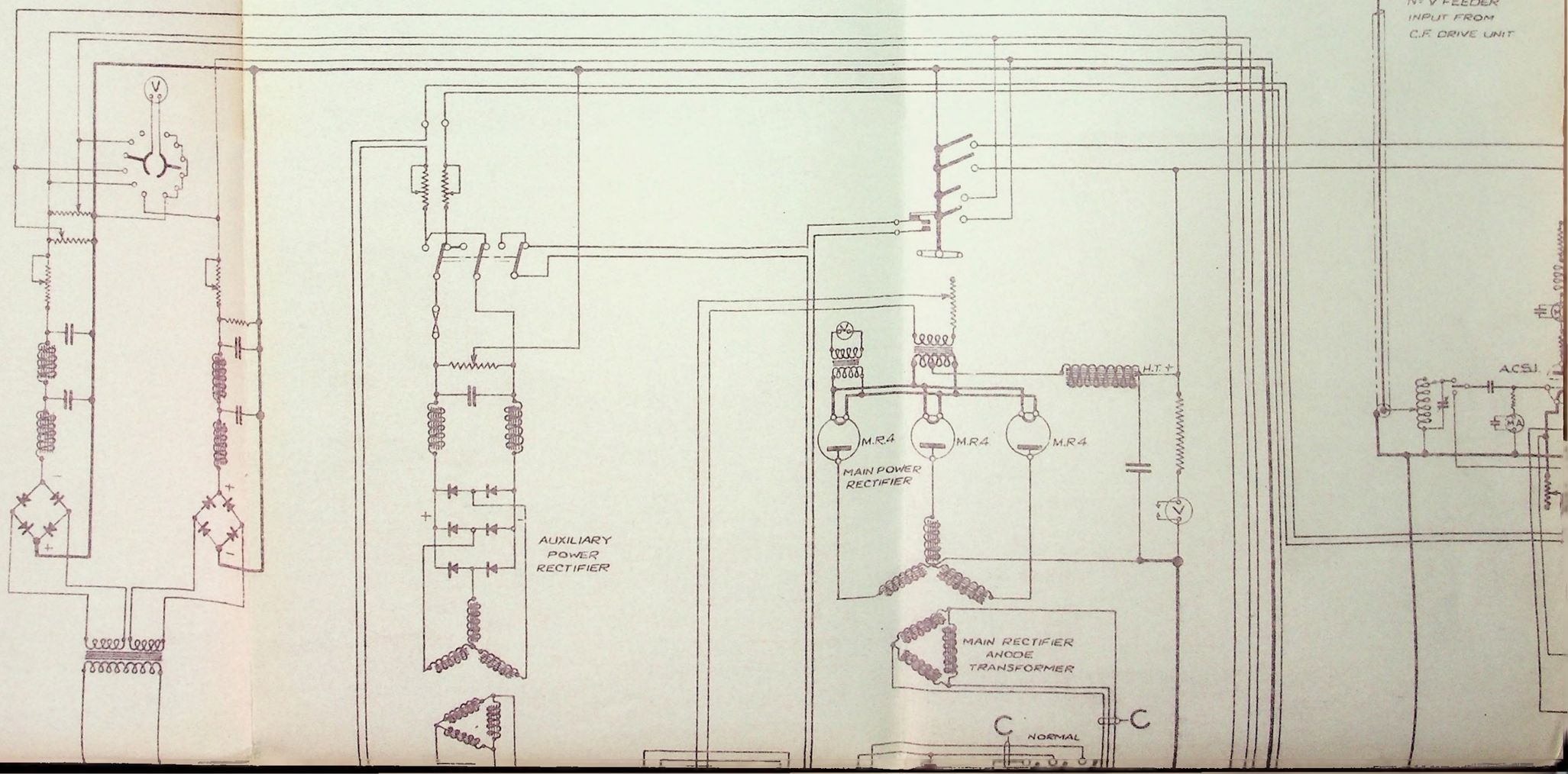
SCALE AS SHOWN.

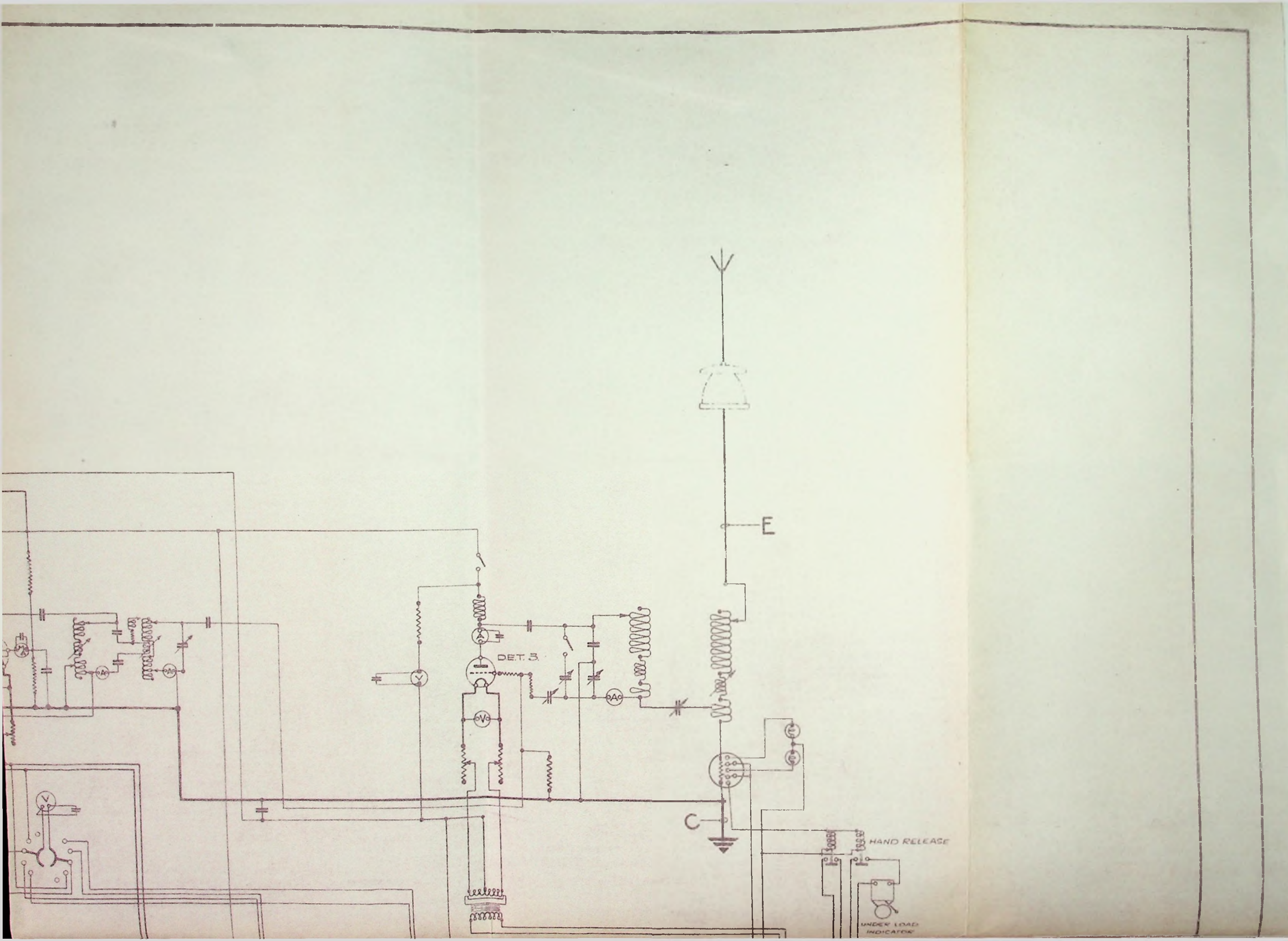
ACCOMMODATION PLAN FOR 250 W. BROADCAST TRANSMITTER TYPE B.R.4.

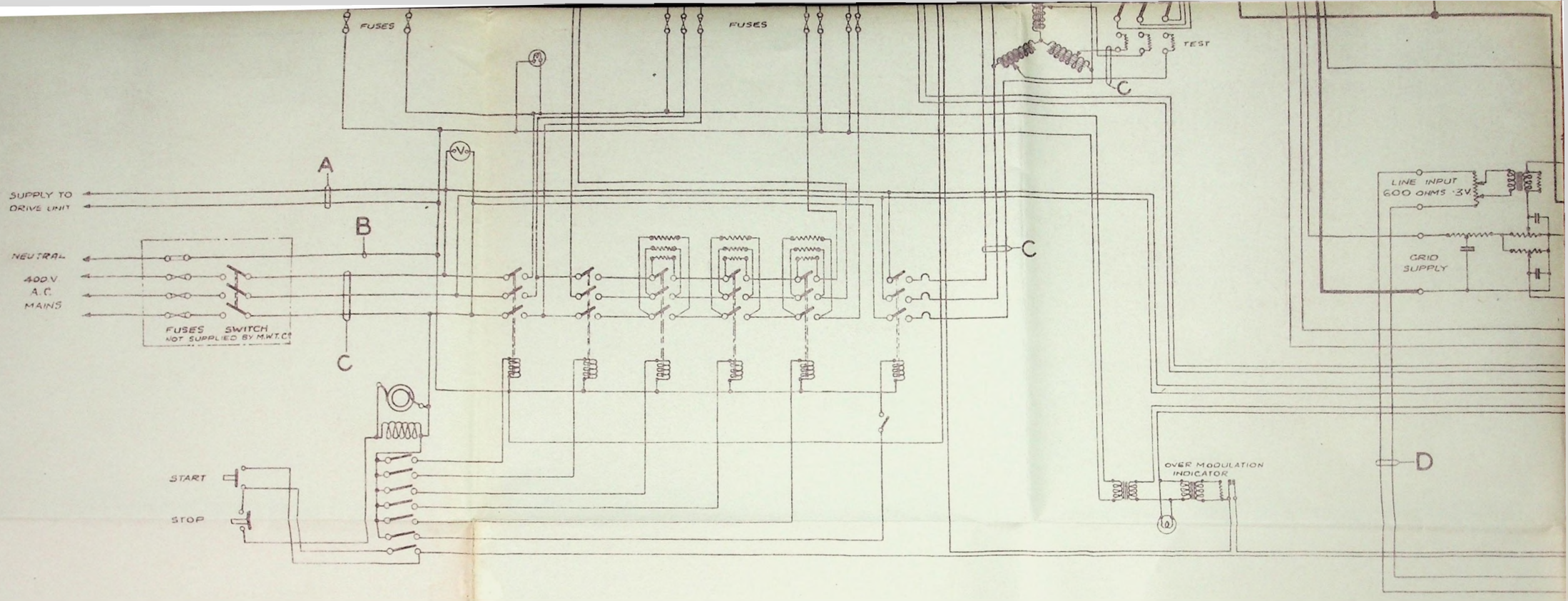
DRAWN BY
TRACED BY
CHECKED BY

MARCONI'S WIRELESS TELEGRAPH Co LTD
LONDON.

Nº L 1996


V
AUXILIARY
POWER
RECTIFIER
M.R.4
M.R.4
M.R.4
MAIN POWER
RECTIFIER
H.T.+
MAIN RECTIFIER
ANODE
TRANSFORMER
C
NORMAL
C
Nº V FEEDER
INPUT FROM
C.F. DRIVE UNIT
A.C.S.I.
MA


DET. 3.
E
C
HAND RELEASE
UNDER LOAD INDICATOR



TYPICAL DIAGRAM OF CONNECTIONS FOR 250 WATT BROADCAST TRANSMITTER

MARCONI'S WIRELESS TELEGRAPH Co. LTD
LONDON

DRG. Nº L. 1991.

NEW Nº	DATE	MODIFICATIONS	DRAWN
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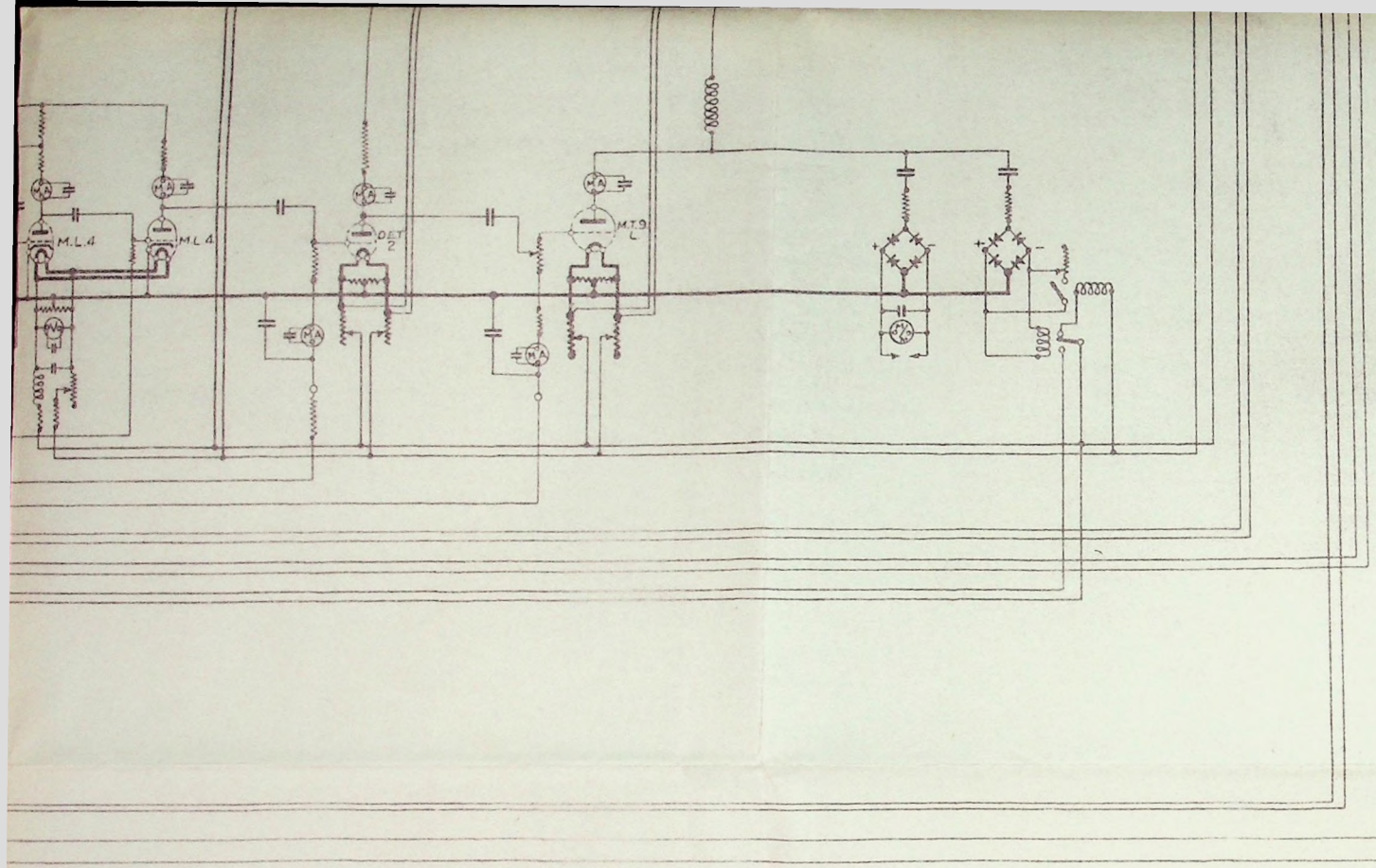
			TRACED
			[illegible] 24/10/37
			CHECKED



LINE INPUT

L. 1991.