

COMMONWEALTH  
TELECOMMUNICATIONS BOARD

Sixteenth General Report

and

STATEMENT OF ACCOUNTS

1st April 1966 to 31st March 1967

28 PALL MALL, LONDON S.W.1.

COMMONWEALTH TELECOMMUNICATIONS BOARD

28, Pall Mall,  
London, S.W.1.

- To the Right Honourable HAROLD WILSON, OBE, MP,  
Prime Minister of the United Kingdom of Great Britain and Northern Ireland.
- To the Right Honourable LESTER B. PEARSON, OBE,  
Prime Minister of Canada.
- To the Right Honourable H. E. HOLT, CH,  
Prime Minister of the Commonwealth of Australia.
- To the Right Honourable K. J. HOLYOAKE, CH,  
Prime Minister of New Zealand.
- To Mrs. INDIRA GANDHI,  
Prime Minister of India.
- To Field Marshal MOHAMMED AYUB KHAN, N Pk, HJ,  
President of Pakistan.
- To the Honourable D. S. SENANAYAKE,  
Prime Minister of Ceylon.
- To Lieutenant-General J. A. ANKRAH, OOV, MC,  
Chairman of the National Liberation Council, Ghana.
- To the Honourable Y. T. M. TUNKU ABDUL RAHMAN PUTRA AL-HAJ, KOM, CH,  
Prime Minister of Malaysia.
- To His Excellency Major-General Y. GOWON,  
Head of Federal Military Government and Supreme Commander of the Armed Forces, Nigeria.
- To His Beatitude Archbishop MAKARIOS,  
President of the Republic of Cyprus.
- To Brigadier A. T. JUXON-SMITH,  
Chairman of the National Reformation Council, Sierra Leone.
- To Mwalimu Dr. JULIUS K. NYERERE,  
President of the United Republic of Tanzania.
- To the Honourable H. L. SHEARER,  
Prime Minister of Jamaica.
- To His Excellency Dr. A. MILTON OBOTE, MP,  
President of Uganda.
- To His Excellency the Honourable JOMO KENYATTA,  
President of Kenya.
- To Dr. the Honourable H. KAMUZU BANDA, MP,  
President of the Republic of Malawi.
- To His Excellency Dr. KENNETH D. KAUNDA,  
President of the Republic of Zambia.
- To the Honourable LEE KUAN YEW,  
Prime Minister of the Republic of Singapore.
- To the Honourable Sir DAWDA JAWARA,  
Prime Minister of The Gambia.
- To the Honourable FORBES BURNHAM, MP,  
Prime Minister of Guyana.
- To His Excellency Sir SERETSE KHAMA, KBE,  
Prime Minister of Botswana.
- To the Right Honourable GEORGE THOMSON,  
Secretary of State for Commonwealth Affairs.

The Members of the Commonwealth Telecommunications Board have the honour to submit their report to 31st March 1967 and Statement of Accounts for the year ended 31st March 1967.

(signed)

DAWSON DONALDSON, *Chairman*  
C. J. GILL, *United Kingdom*  
J. R. BAXTER, *Canada*  
G. T. HUGHES, *Australia*  
T. N. MORRISON, *New Zealand*  
G. D. GOKARN, *India*  
(Vacant) *Pakistan (Observer)*

C. A. R. ANKETELL, *Ceylon*  
M. S. ADEWALE, *Nigeria*  
V. MARKIDES, *Cyprus*  
S. MATTURI, *Sierra Leone*  
C. S. McMORRIS, *Jamaica*  
CHIA CHEONG FOOK, *Singapore*  
A. H. SHEFFIELD, *Other Commonwealth Territories*

C. A. G. COLERIDGE, *Secretary General*  
19th October 1967

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## CONSTITUTION OF THE BOARD

### Partner Governments

By the Commonwealth Telegraphs Agreement of 11th May 1948, the Governments of the United Kingdom, Canada, Australia, New Zealand, South Africa, India and Southern Rhodesia (the Partner Governments) agreed to establish the Commonwealth Telecommunications Board 'for the purpose of promoting the efficiency and development of the external telecommunications services of the British Commonwealth and Empire'. This Agreement was modified by a supplemental Agreement, the Commonwealth Telegraphs Agreement, 1963, of 25th July 1963, which made certain amendments to the original Agreement and replaced the Third Schedule to the 1948 Commonwealth Telegraphs Agreement by a new Form of Agreement between Partner Governments, the Board and National Bodies.

Since 1948 the following Commonwealth countries have adhered to the Commonwealth Telegraphs Agreement and have been admitted as Partner Governments:

Ceylon	..	..	..	..	..	1st June 1951
Cyprus	..	..	..	..	..	1st April 1961
Nigeria	..	..	..	..	..	12th March 1962
Ghana	..	..	..	..	..	3rd April 1962
Malaya (now Malaysia)	..	..	..	..	..	1st September 1962
Tanganyika (now Tanzania)	..	..	..	..	..	30th January 1964
Jamaica	..	..	..	..	..	2nd July 1964
Kenya	..	..	..	..	..	7th August 1964
Sierra Leone	..	..	..	..	..	16th September 1964
Uganda	..	..	..	..	..	18th June 1965
Singapore	..	..	..	..	..	26th February 1966
The Gambia	..	..	..	..	..	31st August 1966
Guyana	..	..	..	..	..	13th October 1966
Botswana	..	..	..	..	..	8th February 1967

In 1954 the Federal Government of Rhodesia and Nyasaland assumed control over the external telecommunications of Southern Rhodesia, and other Partner Governments agreed that the Federation should take the place of Southern Rhodesia. On 31st December 1963, however, the Federation was dissolved and ceased to be a Partner Government. Since then the former members of the Federation have been admitted as Partner Governments, as follows:

Southern Rhodesia	..	..	..	..	..	6th October 1964
Zambia	..	..	..	..	..	9th March 1965
Malawi	..	..	..	..	..	29th June 1965

The Commonwealth Telegraphs Agreement, 1948, provided by Clause 10(1) that 'If any Partner Government ceases to be a member of the British Commonwealth and Empire that Government shall forthwith cease to be a Partner Government for the purposes of this Agreement . . .'. South Africa ceased to be a member of the Commonwealth on 31st May 1961 and in accordance with Clause 10(1) ceased to be a Partner Government on that date.

### National Bodies

In accordance with the Commonwealth Telegraphs Agreement the following Partner Governments nationalised the cable and radio systems in their respective territories and either established public corporations, or nominated government departments to own and operate them as below:

<i>Partner Government</i>	<i>National Body</i>
Britain	Post Office.
Canada	Canadian Overseas Telecommunication Corporation.
Australia	Overseas Telecommunications Commission (Australia).
New Zealand	Post Office.
India	Overseas Communications Service, Government of India.
Ceylon	Posts and Telecommunications Department.
Ghana	Department of Posts and Telecommunications.
Malaysia	Telecommunications Department.
Nigeria	Nigerian External Telecommunications Limited.
Cyprus	Cyprus Telecommunications Authority.
Sierra Leone	Sierra Leone External Telecommunications Company Limited.

*Partner Government*

*National Body*

Tanzania	..	..	..	} East African External Telecommunications Company Limited.
Kenya	..	..	..	
Uganda	..	..	..	
Malawi	..	..	..	Department of Posts and Telecommunications.
Zambia	..	..	..	General Post Office.
Singapore	..	..	..	Telecommunications Department.
Southern Rhodesia	..	..	..	Ministry of Posts.

In accordance with new conditions for the admission of Partner Governments agreed upon in 1961 the following countries did not nationalise their external telecommunications; they appointed as their National Body the Company shown below:

Jamaica	..	..	..	Cable and Wireless (West Indies) Limited.
The Gambia	..	..	..	Cable and Wireless Limited.
Guyana	..	..	..	Cable and Wireless (West Indies) Limited.

Botswana has not yet advised the name of her National Body.

**The Commonwealth Telecommunications Board (CTB) and its functions**

The Board was incorporated in the United Kingdom by the Commonwealth Telegraphs Act, 1949. It is composed of representatives of the Partner Governments with an independent Chairman.

The principal functions of the Board are:

To make recommendations to the Partner Governments and to National Bodies on the following matters relating to their external telecommunications systems:

The formulation and execution of the joint telecommunication policy of the Partner Governments, including the fixing of rates (terminal, transit and parcoures proportions).

Co-ordination of the development of the cable and wireless systems of the Commonwealth.

Extensions and alterations to the telecommunication systems of National Bodies which do or might form part of the Commonwealth network.

Co-ordination with the appropriate authorities on telecommunication matters affecting the defence of the Commonwealth or any part thereof.

Co-ordination of research in telecommunication matters conducted by National Bodies.

Any other telecommunication matter which may be referred to the Board by any of the Partner Governments or by any National Body.

At the request of the Partner Governments or National Bodies to conduct negotiations with foreign telecommunication interests on their behalf.

To promote and conduct research in telecommunication matters.

COMPOSITION OF THE BOARD

The constitution provides that the Board shall consist of members to be appointed as follows:

- (a) As to one (who shall be Chairman of the Board) jointly by the Partner Governments;
- (b) As to one, by each of the Partner Governments separately;
- (c) As to one, by Her Majesty's Government in the United Kingdom to represent British Commonwealth and Empire territories not directly represented by other Members.

The term of appointment is for such period, not exceeding five years, as may be fixed at the time of appointment. A retiring member is eligible for reappointment.

The following was the composition of the Board as at 31st March 1967:

- Chairman**  
DAWSON DONALDSON
- Britain**  
Colonel D. McMILLAN, CB, OBE
- Canada**  
J. R. BAXTER
- Australia**  
A. H. KAYE, MVO  
(Chairman, Traffic Study Group)
- New Zealand**  
T. N. MORRISON  
(Chairman, Finance and Rates Study Group)
- India**  
M. V. PAI  
(Chairman, Technical Study Group)
- Ceylon**  
C. A. R. ANKETELL
- Nigeria**  
M. S. ADEWALE  
(Vice-Chairman)
- Cyprus**  
J. C. CHRISTOPHIDES
- Sierra Leone**  
S. MATTURI
- Jamaica**  
V. A. PANTON
- Singapore**  
CHIA CHEONG FOOK
- Other Commonwealth Territories**  
A. H. SHEFFIELD, CBE
- Secretary-General**  
W. STUBBS, CBE, MC
- Assistant Secretary**  
C. A. G. COLERIDGE, OBE

MEMBERSHIP NOTES

**Vice-Chairman:** Under the annual rotation of this office Mr. M. S. Adewale, Member for Nigeria, succeeded Mr. H. E. Seneviratne on 1st April 1966.

**Ceylon:** Mr. H. E. Seneviratne was succeeded by Mr. C. A. R. Anketell with effect from 1st April 1966.

**Sierra Leone:** Mr. F. E. Karemo was succeeded by Mr. S. Matturi with effect from 18th November 1966.

**Jamaica:** Mr. G. A. Gauntlett was succeeded by Mr. V. A. Panton with effect from 4th November 1966.

**Singapore:** Mr. G. F. A. Hibberd served as Member for Singapore from 13th June 1966, until 15th January 1967, when he was replaced by Mr. Chia Cheong Fook.

**Other Commonwealth Territories:** During the year Mr. A. H. Sheffield, CBE, has been asked by the Governments concerned to represent the interests of The Gambia, Guyana and Botswana in addition to those he already represents: Ghana, Zambia, Malawi and the British Overseas Territories.

The Board continued, as in previous years, to remit questions requiring detailed examination to its Study Groups, for their consideration and advice. The composition of these Study Groups at 31st March 1967, was as follows:

### **Finance and Rates Study Group**

#### *Chairman*

T. N. MORRISON, Member for New Zealand

#### *Members*

J. R. BAXTER .. ..	Member for Canada
A. H. KAYE, MVO .. ..	Member for Australia
M. V. PAI .. ..	Member for India
C. A. R. ANKETELL .. ..	Member for Ceylon
M. S. ADEWALE .. ..	Member for Nigeria
CHIA CHEONG FOOK .. ..	Member for Singapore
A. H. SHEFFIELD, CBE .. ..	Member for Other Commonwealth Territories
E. F. H. GOULD .. ..	Deputy Director (External Relations), British Post Office
K. S. NASH .. ..	Deputy Financial Adviser, External Telecommunications Executive, British Post Office
R. W. HARRISON .. ..	Assistant Chief Accountant, Cable and Wireless Limited

#### *Secretary*

W. W. DIMON

### **Technical Study Group**

#### *Chairman*

M. V. PAI, Member for India

#### *Members*

Colonel D. McMILLAN, CB, OBE	Member for Britain
A. H. KAYE, MVO .. ..	Member for Australia
C. A. R. ANKETELL .. ..	Member for Ceylon
C. W. SOWTON, OBE .. ..	Staff Engineer, External Telecommunications Executive, British Post Office
A. S. PUDNER, MBE .. ..	Engineer-in-Chief, Cable and Wireless Limited
H. STANESBY .. ..	Deputy Director of Engineering, British Post Office

#### *Acting Secretary*

F. C. BLACKMAN

### **Traffic Study Group**

#### *Chairman*

A. H. KAYE, MVO, Member for Australia

#### *Members*

T. N. MORRISON .. ..	Member for New Zealand
M. V. PAI .. ..	Member for India
C. A. R. ANKETELL .. ..	Member for Ceylon
M. S. ADEWALE .. ..	Member for Nigeria
A. H. SHEFFIELD, CBE .. ..	Member for Other Commonwealth Territories
H. LEIGH .. ..	Deputy Director, External Telecommunications Executive, British Post Office
J. T. BALDRY .. ..	Deputy Director, External Telecommunications Executive, British Post Office
P. A. McCUNN .. ..	Traffic Manager, Cable and Wireless Limited

#### *Secretary*

F. C. BLACKMAN

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STATEMENT OF ACCOUNTS

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ANNEX

LIST OF CABLES AND RADIO CIRCUITS IN THE COMMON-USER  
 SYSTEM (WITH WORLD MAP SHOWING COMMONWEALTH  
 TELECOMMUNICATIONS)

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# COMMONWEALTH TELECOMMUNICATIONS BOARD

## Sixteenth General Report

1st April 1966 to 31st March 1967

### I. GENERAL SURVEY

#### **New Partner Governments**

1. Three more Commonwealth Governments—The Gambia, Guyana and Botswana—joined the Partnership during the year by acceding to the Commonwealth Telegraphs Agreements of 1948 and 1963. This brought the total number of Partners at 31st March 1967 to 22, viz. Australia, Botswana, Britain, Canada, Ceylon, Cyprus, Ghana, Guyana, India, Jamaica, Kenya, Malawi, Malaysia, New Zealand, Nigeria, Rhodesia, Sierra Leone, Singapore, Tanzania, The Gambia, Uganda and Zambia.

#### **Commonwealth Telecommunications Conference 1966 (CTC 1966)**

2. Reference was made in paragraph 20 of the Fifteenth General Report to the CTC 1966 and to the recommendations contained in its Report to Governments. These recommendations have been progressively implemented.

3. The recommendations dealt with the following matters:

- (1) The future organisation of Commonwealth co-operation in telecommunications;
- (2) Modifications to the joint financial arrangements (First Wayleave Scheme);
- (3) The implications of Commonwealth use of, and participation in, satellite communications;
- (4) Future external circuit requirements of Commonwealth countries and consequential network development;
- (5) Technical assistance (telecommunications training schemes).

Some details relevant to these recommendations are given in the paragraphs below.

#### **Future Organisation of Commonwealth Co-operation in Telecommunications**

4. The Commonwealth Telecommunications Board was set up in 1949 for the purpose of promoting the efficiency and development of the external telecommunications services of the Commonwealth and has functioned continuously over the ensuing years. The Commonwealth Telecommunications Conference 1965, after considering the current situation, concluded that the Commonwealth Telecommunications Board had fulfilled and continued to fulfil a very useful function in the fostering of Commonwealth co-operation in telecommunications and in the dissemination of advice and information, but that, in view of the increase in the size and complexity of Commonwealth telecommunications and of the rapid developments in communications technology, there was a need to review the existing arrangements for collaboration.

5. This question was subsequently studied by an Organisation Review Committee, set up by the 1965 Conference, which reported back to the CTC 1966. The latter Conference decided to recommend to Governments that a new Commonwealth Telecommunications Organisation should be set up and that it should absorb the functions of the Commonwealth Telecommunications Board. The structure of the new Organisation would include:

- (1) Commonwealth Conferences on Telecommunications, which would normally take place at three-yearly intervals and would be governmental meetings at official level for the consideration of Commonwealth external telecommunications policies;
- (2) A Commonwealth Telecommunications Council, which would be a continuing body comprised of representatives from each of the participating Governments. It would assemble from time to time as required to transact its business, which would embrace the wide range of functions concerned with close collaboration between Commonwealth countries in matters concerning their external telecommunications and the development of the Commonwealth system;
- (3) A Commonwealth Telecommunications Bureau, which would be located in London and permanently staffed. It would service the Organisation and function under the control and direction of the Council.



6. With the concurrence of Commonwealth Governments action has been put in hand to establish the new Organisation outlined above. Some time, however, will be required for the complete setting up of the new machinery and the taking over of the functions of the Commonwealth Telecommunications Board. The Board itself has also been involved in a number of important tasks related to the process of winding up its affairs. The objective is to complete the handover as early as possible, but, because of practical considerations, it is unlikely that the Board will be dissolved until early 1969. During the period of co-existence of the Board and the new Organisation special arrangements to ensure full liaison will be observed.

#### **Modifications to the First Wayleave Scheme**

7. The Commonwealth Telecommunications Board is responsible for prescribing and administering the financial arrangements between the Partner Governments (the First Wayleave Scheme). This Scheme was introduced in 1950, and although the basic features remain, several modifications have been introduced over the years. The 1966 Conference, after reviewing the operation of the Scheme, decided to recommend several significant changes. Note was taken of these by the Board, which accordingly prepared, for the concurrence of Partner Governments, a revision of the definitions and procedure applicable to the Scheme for introduction from 1st April 1966.

#### **The Implications of Commonwealth Use of, and Participation in, Satellite Communications**

8. In considering this matter the CTC 1966 reiterated the conclusion of previous Conferences, that cable and satellite systems were complementary and that, in order to obtain full operational flexibility, it was important to develop an integrated system of cables and satellites. This, together with HF radio links, could provide a Commonwealth network which would offer an efficient service to the public.

9. The Conference recognised that effective forward planning for such a network called for full information on basic factors involving both financial and operational considerations. Further careful study was necessary and it was proposed that this should be put in hand by the new Organisation.

#### **Future External Circuit Requirements of Commonwealth Countries and Consequential Network Development**

10. The Conference agreed that the development of an adequate network required the continuing availability of up-to-date information on anticipated future traffic volumes and circuit needs over the various sectors, and decided that the statistical information submitted by the Board to the Conference should be up-dated as required and in due course maintained by the Council. This would provide the basis for the preparation and progressive revision of an integrated Commonwealth plan embracing all media of telecommunications, a task that the Council should undertake.

#### **Technical Assistance: Telecommunications Training Schemes**

11. The Conference discussed a proposal by Malaysia which drew attention to the problem of training telecommunications personnel in the developing countries and suggested that some special provision to help meet expenses of trainees might be made. In view of the general interest in training schemes the Conference recommended that Commonwealth Governments should give consideration to the Malaysian proposal so that Representatives on the Council might take it further. The Conference also recommended that in the meantime the Board should collect from Partners details of appropriate training schemes which were open to trainees from other Partner countries.

12. Acting on this recommendation the Board has taken steps to ascertain from Governments details both of training schemes available and also of any training needs that they might have. As information has come to hand, it has been consolidated and distributed to Governments.

#### **Satellite Communications**

13. The commercial exploitation of satellite communications has continued to develop at great speed, alongside the provision of increasing facilities for the US Space Project Apollo. In addition to successful operation of 'Early Bird' (now known as INTELSAT I) regular broadband circuits have been made available via an INTELSAT II satellite launched over the Pacific in January 1967. A further INTELSAT II satellite was launched over the Atlantic in March 1967, but at present this only carries Apollo traffic. Plans are proceeding for the next series of satellites (INTELSAT III), to be stationed over the Atlantic, Pacific and Indian Oceans. These will provide a world-wide system with multiple access. To work to these satellites several new earth stations have been completed and many more are planned.

14. The Commonwealth has played a growing part in these developments; and in addition to participation in the Intelsat Consortium—11 Commonwealth countries are members—and the Interim Communications Satellite Committee (ICSC) (3 Commonwealth members), a number of Commonwealth earth stations are either operational, under construction or firmly planned. The following countries are concerned: Australia—Carnarvon (operational) and Moree (due to be operational by the end of 1967); Britain—Goonhilly (operational, but second aerial under construction); Canada—Mill Village (operational); India—Arvi (planned); Ascension Island (operational); Bahrain (planned); and Hong Kong (planned).

**Progress of the Commonwealth Comprehensive Cable Plan**

15. The SEACOM system of Commonwealth submarine telephone cables was completed during the year. The Hong Kong/Guam section was brought into service in the middle of 1966, the Madang (New Guinea)/Cairns (Australia) section was completed in September 1966, and the Guam/Madang section in January 1967. The whole system was opened by Her Majesty the Queen on 30th March 1967. There now exists an all-Commonwealth high-grade telephone system extending from Malaysia via the Pacific to Britain—a total distance of some 23,000 miles.

16. As had been anticipated, the opening of SEACOM has stimulated a big increase in traffic in the Pacific area; and this has led to an early filling of all circuits in COMPAC. Arrangements have therefore been made to instal Time Assignment Speech Interpolation (TASI) equipments at Sydney and Vancouver which will provide an extra 37 through circuits. Further relief will follow with the introduction of satellite services.

**Indian Ocean Commonwealth Cable**

17. As mentioned in paragraphs 14–16 of the Fifteenth General Report, a Conference which met in Colombo in January 1966, recommended urgent consideration by Governments of a proposed Indian Ocean Commonwealth Cable (IOCOM) linking Malaysia with Ceylon and India. At the conclusion of the CTC 1966, a further meeting of the participants in the Colombo Conference was held in London, but it was not possible to reach a conclusion at that time.

18. In June 1966, Britain informed the Board, and the Governments represented at Colombo, that on the information available she was unable to support the IOCOM proposal. Britain suggested, however, that before a final decision was taken a proper network plan should be drawn up of all telecommunications requirements within the Indian Ocean area.

19. Such a plan will form part of the world-wide Commonwealth plan which the new Council is charged by the CTC 1966, to undertake.

**West African Cable**

20. Arising out of recommendations of the Commonwealth Telecommunications Conference 1965, a West African Telephone Cable Committee was set up, to consider the feasibility of a telephone cable connecting West African Commonwealth countries with Britain and the rest of the Commonwealth. (See paragraphs 18 and 19 of the Fifteenth General Report.)

21. A Meeting of interested Commonwealth countries was planned for January 1966, in Lagos, but, owing to unforeseen circumstances, the meeting had to be postponed. However, in the meantime this matter was considered at a Meeting of the International Telecommunication Union Regional Plan Committee for Africa in Addis Ababa, which concluded that the project for a West African submarine cable should be abandoned.

**Other Broadband Systems**

22. The Eastern Caribbean tropospheric scatter system referred to in paragraph 29 of the Fifteenth General Report was opened in August 1966, and the Bermuda/Tortola cable, which provides the international outlet for the system, was brought into service in September 1966. Local radio links with other Caribbean Islands were also established during 1966/67 and an extension southwards by tropospheric scatter between Trinidad and Guyana is planned.

23. A further development of Commonwealth broadband capacity into this area will be provided when a 480/640 circuit cable between Canada and Bermuda, due for completion in 1969, is brought into service.

24. Elsewhere in the world tropospheric scatter systems were being installed to provide high grade links from Commonwealth (operated) points. Of these the Bahrain/Qatar (Doha) link was opened for traffic at the end of 1966 and links between Jamaica and the Cayman Islands and between Hong Kong and Taiwan were nearing completion by the end of March 1967. Installation of the Cyprus/Crete tropospheric scatter system, which will provide a service with Greece, was in progress; and plans were proceeding for a Bahrain/Dubai (Trucial States) link.

25. In November 1966, a contract was awarded for construction of a new type of transistorised submarine telephone cable between Britain and Portugal to be completed early in 1969. This will provide 480 circuits spaced at 4 kHz or 640 circuits spaced at 3 kHz. It will connect with a new cable to be laid between Portugal and South Africa.

**Telex Services**

26. The rapid growth of telex services has continued. Traffic has increased by some 20 per cent over 1965/66 and many new services have been opened. These are shown in Section V. In addition, telex was introduced for the first time in the following countries: Sierra Leone, Muscat (Cable and Wireless Limited), and Dubai, Trucial States (Cable and Wireless Limited). Even in those countries where telex has been long established (e.g. Britain, Canada) there have been big increases in the number of subscribers.

27. The increase in traffic has necessitated the opening of additional telex circuits, particularly between London and certain other Commonwealth centres; whilst both Britain and Canada have made major extensions to their international telex switchboards. Nevertheless, traffic growth exceeded anticipated demands, and this, coupled with manufacturing delays in the supply of equipment, gave rise to difficulties, particularly on radio routes. This matter has been considered by the Board, and, following a study by its Traffic Study Group, recommendations for both short-term action and long-term planning were made to National Bodies.

#### **Data Transmission Services**

28. With the increased use of computers the demand is growing, both over inland networks and external telecommunications, for high speed data transmission services. From Britain an international service is now available to Austria, Denmark, France, the USA and West Germany; and plans are proceeding for further extensions, in particular to Australia and Canada.

#### **Traffic**

29. As will be seen from the statistics in Section III, the volume of public telephone and telex traffic continued to rise significantly during the year. The total telephone traffic increased by 17 per cent to 125 million paid minutes, and the telex traffic rose by 20 per cent to 70 million paid minutes.

## **II. STUDY GROUPS**

30. As in previous years, the Board remitted many questions which required detailed examination to its Study Groups. The composition of these Study Groups is given on page 6 of this Report. Some notes on their work during the past year are given in the following paragraphs.

#### **Finance and Rates Study Group**

31. The Finance and Rates Study Group held 21 meetings during 1966/67. It was actively engaged throughout the year in dealing with a variety of financial and rate matters remitted to it by the Board.

32. Principal among these was the preparation of revised definitions and procedure of the First Wayleave Scheme, which involved lengthy and meticulous work. This task was necessitated by the changes, described in paragraph 7 above, in the financial arrangements, agreed at the Commonwealth Telecommunications Conference 1966. An important consideration was the need to assist new Partner Governments in this complicated field by the issue of clear and definite 'rules'. As an adjunct to this basic document, the Study Group initiated standard forms for traffic accounting between the National Bodies, and these are now in use.

33. Apart from its normal consideration of National Bodies' wayleave estimates and accounts and other matters relating to the First Wayleave Scheme, the Study Group carried out an examination of telex and telephone collection charges and made recommendations to the Board aimed at a greater degree of uniformity in the fixing of such charges.

#### **Technical Study Group**

34. The Technical Study Group has maintained its interest in the technical aspects of the development of National Bodies' systems and any other technical matters referred to it by the Board. Items of particular interest were the development of tropospheric scatter systems in the Eastern Caribbean, Cyprus and Hong Kong, lincompex equipment, telegraph message relay systems and power supplies for remote radio relay stations.

35. The Study Group held 5 meetings during the year, and these were supplemented by visits to the London Message Relay Unit; the Mechanised Letter and Parcel Sorting Office; Leaffield Radio Station; Dollis Hill Research Station; Cable Ship *Mercury*; and the Post Office Tower.

#### **Traffic Study Group**

36. The Traffic Study Group continued its consideration of the traffic operational aspects of the Commonwealth telecommunications services and held 14 meetings during the year.

37. The principal subjects that came under consideration, other than routine matters, were:

- (1) The format aspects of telegraph mechanisation that had arisen from the Fourth Technical and Traffic Meeting.
- (2) Shortage of circuits on international telex. This study arose from a British National Body report on the telex service.
- (3) Review of the CTB procedure for the provision of new services.

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- (4) Revised (up-dated) Traffic and Circuit Estimates (1970 and 1975)—at the request of the CTC 1966.
  - (5) Review of CTB monthly, quarterly and annual returns and publications of statistics.

### III. TECHNICAL AND TRAFFIC

#### Telegraph Mechanisation

38. Further progress has been made in the mechanisation of public telegraph message services, and Australia, Britain and Canada have large, fully-automatic systems planned or in process of installation. India has completed the installation of a semi-automatic message relay distribution system in Bombay. Cable and Wireless Limited have produced a fully-automatic telegraph message selective switching system for a maximum of 16 out-stations, which is already in operational service in the Caribbean.

39. The Traffic Study Group's telegraph message format proposals, which dealt mainly with service messages, were submitted by India to the CCITT Study Group I Joint Working Party on Message Retransmission at the meetings held in Melbourne in September/October 1966. The proposals were, in general, accepted and now form part of the CCITT Study Group I recommendations.

40. As a follow up to these CCITT Study Group meetings Canada has formulated format proposals for the automation of control functions in the telegraph message retransmission network, which she proposes to submit to the CCITT. Through the Board she has invited the comments of other National Bodies on these proposals and a number of National Bodies have already submitted their views.

#### Commonwealth Traffic and Circuit Estimates

41. During the year the Board carried out the task of producing up-to-date traffic and circuit estimates of the Commonwealth. These were submitted as a paper to the First Meeting of the new Council.

#### Traffic Statistics

42. The Board prepares annual statistics of Telegraph, Telephone, Telex and Phototelegraph traffic carried on the Commonwealth telecommunications system. These detailed statistics are published in a separate printed document and those for 1966/67 will be published as soon as they become available.

43. The statistics cover only those services available for public traffic. Leased telegraph and telephone circuits carry considerable traffic (and produce substantial revenue), but it is not possible to obtain statistics of the traffic carried on them. Despite the high level of growth of telex traffic and the continuing growth of leased circuits, the public telegraph service has virtually maintained its previous upward trend. The slight decrease of 0.2 per cent this year should be considered in conjunction with the exceptional rise of 6.7 per cent last year.

44. Quarterly Traffic Reports giving details of the operational working of the various services are received from the National Bodies and are considered by the Board.

45. The following Tables A, B and C give a summary of the 1966/67 traffic statistics (estimated figures are used where actual figures are not yet available), together with a similar summary for 1965/66 for comparison.

## Telegraph

46. Distribution of telegraph traffic among the National Bodies is given in Table A. Total telegraph traffic originated by National Bodies, and received from foreign countries and Commonwealth countries not Partners to the Commonwealth Telegraphs Agreements, for the year ended 31st March 1967, is estimated to have been 905,840,000 paid words, a decrease of 0·2 per cent on the previous year.

**TABLE A**

### Telegraph Paid Words

Total telegraph traffic originated by National Bodies and received from foreign countries and Commonwealth countries not Partners to the Commonwealth Telegraphs Agreements

(estimated traffic 1966/67 compared with actual traffic 1965/66)

National Bodies	Paid Words (thousands)		% Increase (+) Decrease (-)
	1965/66	1966/67	
Britain .. .. .	613,290*	620,000	+ 1·1
Canada .. .. .	35,236	36,990	+ 5·0
Australia .. .. .	61,527*	66,050	+ 7·4
New Zealand .. .. .	18,634	18,840†	+ 1·1
India .. .. .	91,392	71,000	- 22·3
Ceylon .. .. .	9,472	9,350	- 1·3
Ghana .. .. .	5,877	4,240	- 27·8
Malaysia .. .. .	23,328‡	8,960	— (a)
Nigeria .. .. .	9,726	8,410	- 13·5
Cyprus .. .. .	4,631	4,550	- 1·8
Sierra Leone .. .. .	2,623	2,080	- 20·7
East Africa .. .. .	13,632	14,490	+ 6·3
Jamaica .. .. .	8,784	11,000	+ 25·2
Malawi .. .. .	897§	1,160	— (a)
Zambia .. .. .	2,844	4,130	+ 45·2
Singapore .. .. .	5,567	23,030	— (a)
The Gambia .. .. .	— ¶	170 ¶	— (a)
Guyana .. .. .	— ¶	1,390 ¶	— (a)
<b>Total .. .. .</b>	<b>907,460</b>	<b>905,840</b>	<b>- 0·2</b>

(a) %'s not appropriate

\* Britain's figure excludes 186,000 appropriate to Britain, but included under Australia.

† New Zealand's 1966/67 total excludes some traffic streams not included in the 1965/66 total, i.e. New Zealand-Western Samoa/Cook Islands/Niue 2,910,000 appropriate to 1966/67.

‡ Malaysia's figure includes Singapore traffic for the period April-December 1965; this traffic was appropriate to Malaysia.

§ Malawi's traffic is for nine months only.

|| Singapore's traffic is for three months only (January-March 1966)—see also ‡.

¶ The Gambia and Guyana traffic for 1965/66 included under Britain. Traffic for 1966/67 is for the periods 1st September and 13th October 1966-31st March 1967 only; traffic for periods 1st April-31st August and 14th October 1966 is included under Britain.

## Telephone

47. Distribution of telephone traffic among the National Bodies is given in Table B. Total telephone traffic originated by National Bodies and traffic received by National Bodies over direct circuits from foreign countries and Commonwealth countries not Partners to the Commonwealth Telegraphs Agreements (terminal and transit) for the year ended 31st March 1967, is estimated to have been 125,640,000 paid minutes, an increase of 17·3 per cent over the previous year.

**TABLE B**

### Telephone Traffic Paid Minutes

Total telephone traffic originated by National Bodies and traffic received by National Bodies over direct circuits from foreign countries and Commonwealth countries not Partners to the Commonwealth Telegraphs Agreements (terminal and transit)

(estimated traffic 1966/67 compared with actual traffic 1965/66)

National Bodies	Paid Minutes (thousands)		% Increase (+) Decrease (-)
	1965/66	1966/67	
Britain .. .. .	98,851	114,845	+16·2
Canada .. .. .	2,653	3,450	+30·0
Australia .. .. .	1,905	2,465	+29·4
New Zealand .. .. .	1,061	1,330	+25·4
India .. .. .	247	287	+16·2
Ceylon .. .. .	31	38	+22·6
Ghana .. .. .	91	96	+ 5·5
Malaysia .. .. .	321*	229	— (a)
Nigeria .. .. .	117	133	+13·7
Cyprus .. .. .	259	332	+28·2
Sierra Leone .. .. .	13	15	+15·4
East Africa .. .. .	126	159	+26·2
Jamaica .. .. .	1,311	1,720	+31·2
Malawi .. .. .	3†	8	— (a)
Zambia .. .. .	23	31	+34·8
Singapore .. .. .	84‡	467	— (a)
The Gambia .. .. .	—§	3§	— (a)
Guyana .. .. .	—§	32§	— (a)
<b>Total .. .. .</b>	<b>107,096</b>	<b>125,640</b>	<b>+17·3</b>

(a) %'s not appropriate

\* Malaysia's figure includes Singapore traffic for period April–December 1965; this traffic was appropriate to Malaysia.

† Malawi's traffic is for nine months only.

‡ Singapore's traffic is for three months only (January–March 1966)—see also \*.

§ The Gambia and Guyana traffic for 1965/66 included under Britain. Traffic for 1966/67 is for the periods 1st September and 13th October 1966–31st March 1967 only; traffic for periods 1st April–31st August and 14th October 1966 is included under Britain.

## Telex

48. Distribution of telex traffic among the National Bodies is given in Table C. Total telex traffic originated by National Bodies, and traffic received by National Bodies over direct circuits from foreign countries and Commonwealth countries not Partners to the Commonwealth Telegraphs Agreements (terminal and transit), for the year ended 31st March 1967, is estimated to have been 70,157,000 paid minutes, an increase of 19·6 per cent on the previous year.

**TABLE C**  
**Telex Traffic Paid Minutes**

Total telex traffic originated by National Bodies and traffic received by National Bodies over direct circuits from foreign countries and Commonwealth countries not Partners to the Commonwealth Telegraphs Agreements (terminal and transit)

(estimated traffic 1966/67 compared with actual traffic 1965/66)

National Bodies	Paid Minutes (thousands)		% Increase (+) Decrease (-)
	1965/66	1966/67	
Britain .. .. .	55,011	65,800	+ 19·6
Canada .. .. .	950	1,200	+ 26·3
Australia .. .. .	1,232	1,360	+ 10·7
New Zealand .. .. .	280	337	+ 20·4
India .. .. .	350	419	+ 19·7
Ceylon .. .. .	87	130	+ 49·4
Ghana .. .. .	79	86	+ 8·9
Malaysia .. .. .	309*	90	— (a)
Nigeria .. .. .	135	165	+ 22·2
Cyprus .. .. .	— §	— §	— (a)
Sierra Leone .. .. .	— §	45	— (a)
East Africa .. .. .	87	128	+ 47·1
Jamaica .. .. .	32	50	+ 56·3
Malawi .. .. .	— †	2	— (a)
Zambia .. .. .	14	29	+ 107·1
Singapore .. .. .	69‡	316	— (a)
The Gambia .. .. .	— §	— §	— (a)
Guyana .. .. .	— §	— §	— (a)
<b>Total .. .. .</b>	<b>58,635</b>	<b>70,157</b>	<b>+ 19·6%</b>

(a) %'s not appropriate

\* Malaysia's figure includes Singapore traffic for period April–December 1965; this traffic was appropriate to Malaysia.

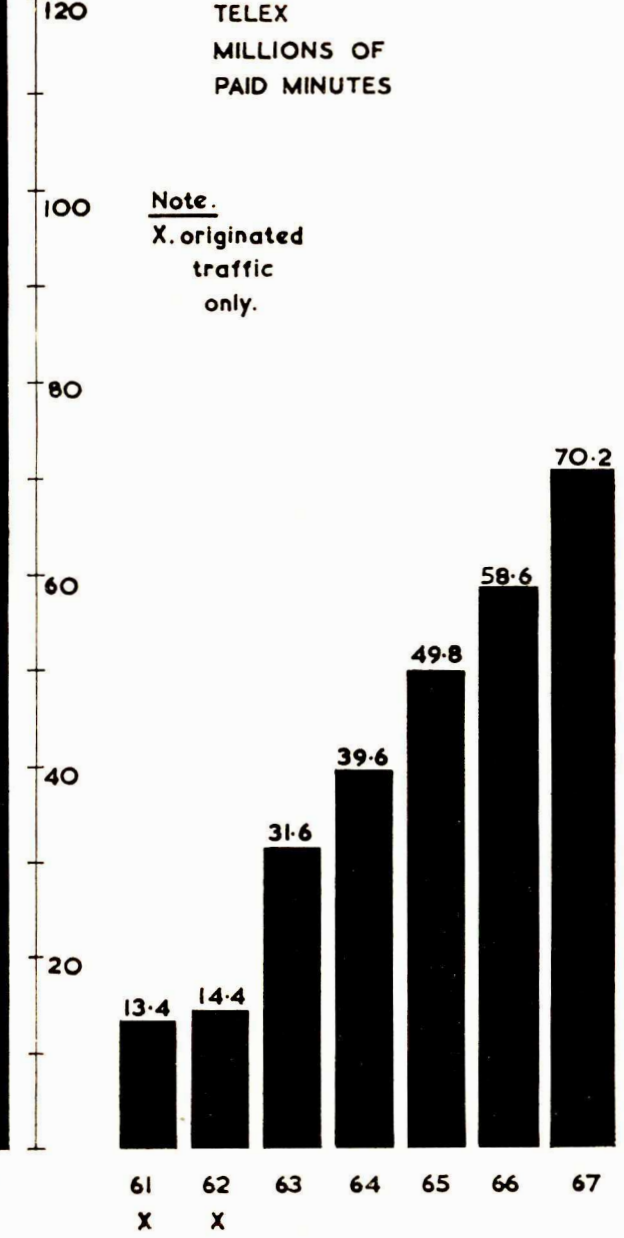
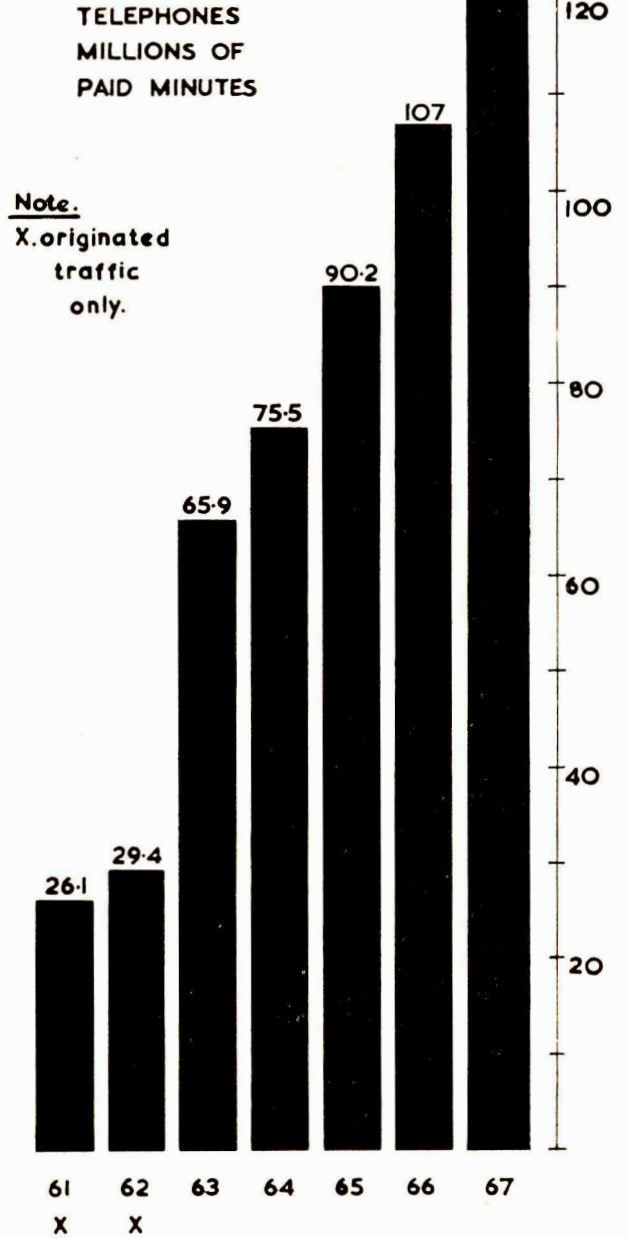
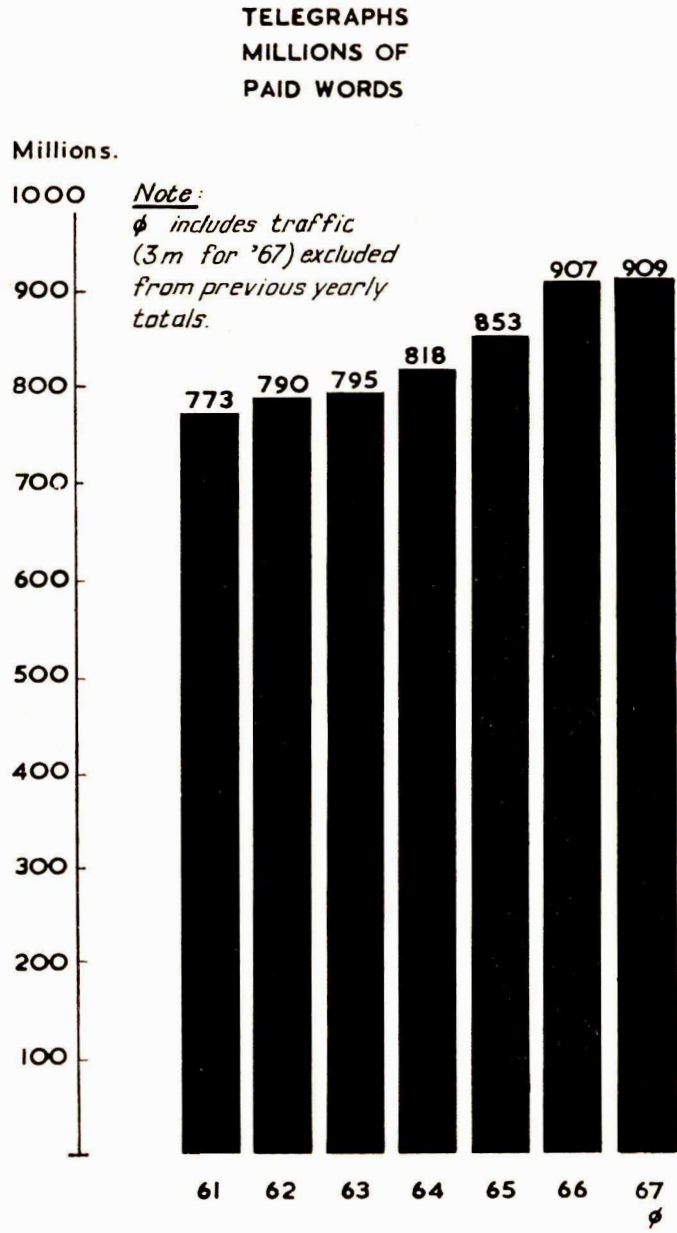
† Malawi's actual traffic was 200 paid minutes (nine months only).

‡ Singapore's traffic is for three months only (January–March 1966)—see also \*.

§ No service.

# YEARLY TRAFFIC TRENDS ENDING 31st. MARCH 1961/1967.

TRAFFIC ORIGINATED BY NATIONAL BODIES AND TRAFFIC RECEIVED OVER DIRECT FOREIGN CIRCUITS.



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#### IV. RATES

50. The following Tables show in terms of sterling the telegraph, telephone and telex collection rates of the Partner Governments, in relations between them and in relations with certain representative foreign countries, as at 31st March 1967. Tables 1 and 2 set out telegraph rates per ordinary word: Tables 3 and 4, and Tables 5 and 6, set out respectively telephone and telex rates per unit call of three minutes. The main changes in rates which have taken place during the year are described below.

51. With effect from 6th June 1966, India devalued her currency by 36·5 per cent. In order to minimise the financial effect on other Commonwealth Partners, India made certain increases in her local currency overseas telecommunications collection rates with effect from 17th June 1966. At the same time she took the opportunity to rationalise the large number of differing overseas rates by the introduction of new rate patterns. Details are given in Section V (Indian National Body's contribution).

52. With effect from 1st October 1966, overseas telegraph rates from Malawi were increased by some 40 per cent. With few exceptions, the intra-Commonwealth telegraph rate per ordinary word now generally approximates to 1s. 10d. sterling.

53. Also effective from 1st October 1966, telegraph collection rates from Canada were increased by 2 cents (Can.) per ordinary word to most Commonwealth and foreign destinations. Small increases in foreign press telegraph rates were also made.

54. Further progress was made towards the abolition of concessional rates for Government telegrams and such rates are now exceptional.

TABLE 1

Inter-National Body Telegraph Rates per Ordinary Word in Terms of Sterling as at 31st March 1967

From	To																				
	Australia	Botswana	Britain	Canada	Ceylon	Cyprus	East Africa <sup>1</sup>	Ghana	Guyana	India	Jamaica	Malawi	Malaysia	New Zealand	Nigeria	Rhodesia	Sierra Leone	Singapore	The Gambia	Zambia	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Australia .. .. .	—	1 4·3	1 4·3	1 7·2	1 4·3	1 4·3	1 4·3	1 4·3	1 4·3	1 4·3	1 4·3	1 4·3	1 4·3	1 4·3	4·8	1 4·3	1 4·3	1 4·3	1 4·3	1 4·3	1 4·3
Botswana .. .. .	1 5·2	—	1 5·2	1 5·2	1 5·2	1 5·2	1 5·2	1 5·2	1 5·2	1 5·2	1 5·2	4·7	1 5·2	1 5·2	1 5·2	4·7	1 5·2	1 5·2	1 5·2	1 5·2	4·7
Britain .. .. .	1 10	1 10	—	1 5	1 10	1 6	1 10	1 10	1 5	1 10	1 5	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10
Canada .. .. .	1 11·2	1 11·2	1 3·2	—	1 11·2	1 11·2	1 11·2	1 11·2	1 4·8	1 11·2	1 4·8	1 11·2	1 11·2	1 11·2	1 11·2	1 11·2	1 11·2	1 11·2	1 11·2	1 11·2	1 11·2
Ceylon .. .. .	1 10·5	1 10·5	1 10·5	1 10·5	—	1 10·5	1 10·5	1 10·5	1 10·5	1 10·5	1 10·5	1 10·5	1 10·5	1 10·5	1 10·5	1 10·5	1 10·5	1 10·5	1 10·5	1 10·5	1 10·5
Cyprus .. .. .	1 10·3	1 10·3 <sup>2</sup>	1 7·2	1 10·3	1 10·3	—	1 10·3	1 10·3	1 10·3	1 10·3	1 10·3	1 10·3	1 10·3	1 10·3	1 10·3	1 10·3	1 10·3	1 10·3	1 10·3	1 10·3	1 10·3
East Africa <sup>1</sup> .. .. .	1 10·2	1 10·2	1 10·2	1 10·2	1 10·2	1 10·2	—	1 10·2	1 10·2	1 10·2	1 10·2	7·2	1 10·2	1 10·2	1 10·2	1 10·2 <sup>4</sup>	7·2	1 10·2 <sup>5</sup>	1 10·2	1 10·2	7·2
Ghana .. .. .	1 10	1 10	1 10	1 10	1 10	1 10	1 10	—	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 4	1 10	1 8	1 10	1 10	1 10
Guyana .. .. .	1 10	1 10	1 5	1 8	1 10	1 10	1 10	1 10	—	1 10	1 6	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10
India .. .. .	11·4	11·4	11·4	11·4	11·4	11·4	11·4	11·4	11·4	—	11·4	11·4	11·4	11·4	11·4	11·4	11·4	11·4	11·4	11·4	11·4
Jamaica .. .. .	1 10	1 10	1 5	1 8	1 10	1 10	1 10	1 10	1 3	1 10	—	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10
Malawi .. .. .	1 10	4·5	1 10	1 10	1 10	1 10	7	1 10	1 10	1 10	1 10	—	1 10	1 10	1 10	3·5	1 10	1 10	1 10	1 10	3·5
Malaysia .. .. .	1 10·4	1 10·4	1 10·4	1 10·4	1 10·4	1 10·4	1 10·4	1 10·4	1 10·4	1 10·4	1 10·4	1 10·4	—	1 10·4	1 10·4	1 10·4	1 10·4	1 10·4	Local system 1 4	1 10·4	1 10·4
New Zealand .. .. .	6	1 4	1 4	1 4	1 4	1 4	1 4	1 4 <sup>6</sup>	1 4	1 4	1 4	1 4	1 4	—	1 4	1 4	1 4	1 4	1 4	1 4	1 4
Nigeria .. .. .	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 4	1 10	1 10	1 10	1 10	1 10	1 10	—	1 10	1 10	1 10	1 10	1 10	1 10
Rhodesia <sup>9</sup> .. .. .	1 10	3·5	1 10	1 10	1 10	1 10	1 10	1 10 <sup>7</sup>	1 10	1 10	1 10	3·5	1 10	1 10	1 10	—	1 10	1 10	1 10	1 10	3·5
Sierra Leone .. .. .	1 9·6	1 9·6	1 9·6	1 9·6	1 9·6	1 9·6	1 9·6	1 8·4	1 9·6	1 9·6	1 9·6	1 9·6	1 9·6	1 9·6	1 9·6	1 9·6	—	1 9·6	8	1 9·6	1 9·6
Singapore .. .. .	1 10·4	1 10·4	1 10·4	1 10·4	1 10·4	1 10·4	1 10·4	1 10·4	1 10·4	1 10·4	1 10·4	1 10·4	Local service 1 10	1 10·4	1 10·4	1 10·4	1 10·4	—	1 10·4	1 10·4	1 10·4
The Gambia .. .. .	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10	1 10	3	1 10	—	1 10	1 10
Zambia .. .. .	1 4	4·5	1 4	1 4	1 4	1 4	7	1 4	1 4	1 4	1 4	3·5	1 4	1 4	1 4	3·5	1 4	1 4	1 4	1 4	—

<sup>1</sup> Tanzania, Uganda and Kenya.

<sup>2</sup> Via Salisbury 8·2d.

<sup>3</sup> Freetown 1s. 6d., Other Offices 1s. 8d.

<sup>4</sup> From Accra to Lagos 1s. 2d.

<sup>5</sup> From Accra to Freetown 1s. 6d.

<sup>6</sup> To Accra 1s. 2d.

<sup>7</sup> To Accra 1s. 7·2d.

<sup>8</sup> To Bathurst 1s. 7·2d., Other Offices 1s. 9·6d.

<sup>9</sup> Rates from Rhodesia include the additional surcharge of 6d. per ordinary word which is levied on all international telegrams forwarded from Rhodesia. This surcharge is not applicable on telegrams to Botswana, Malawi and Zambia which are classified as inter-territorial services.

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TABLE 2

## Examples of Commonwealth-Foreign Telegraph Rates per Ordinary Word in Terms of Sterling as at 31st March 1967

	Bahrain		France		Germany		Japan		South Africa		USA		Argentina		Brazil	
	To	From	To	From	To	From	To	From	To	From	To	From	To	From	To	From
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Australia ... ..	2 4·8	5 9·3	2 0	4 5·5	2 0	4 7·1	2 9·6	3 0	1 4·3	1 7·2	1 7·2	2 0	3 2·4	5 3·6	3 2·4	7 8·3
Botswana ... ..	3 7·8	4 3·3	1 7·8	3 5·7	1 7·8	3 6·9	3 7·8	5 0	3·6	3·6	1 9·8	2 0	4 1·8	6 3	4 1·8	8 1·2
Britain ... ..	2 3	2 3	7	6·7	8	8·2	3 5	3 10	1 10	1 7·2	1 5	1 7·7	2 11	3 0·8	2 8	4 0
Canada ... ..	3 4	3 5·4	1 6·4	2 2	1 8	2 6·6	2 4	2 2	1 10·4	1 7·2	Domestic service (see Note)		2 10·4	2 11·5	2 11·2	3 1·7
Ceylon ... ..	1 9·6	1 11·4	1 11·6	3 0·7	2 0·4	3 0·7	3 6·3	2 10	1 10·5	1 7·2	2 2·1	2 0	5 7·5	6 1·6	4 11·4	8 2
Cyprus ... ..	3 10·3	3 10·8	1 8·4	2 8·2	1 9·6	3 0·7	5 6	4 10	2 2·4	1 7·2	2 1·9	1 10·7	5 1·2	5 0·9	4 6	7 2
East Africa ... ..	5 2·4	5 2·1	3 3·6	5 2·5	3 6	5 7·3	7 2·4	5 8	1 1·2	1 2·4	2 2·4	2 0	6 6	6 6·5	5 9·6	8 7·7
Ghana (Accra) ... ..	5 9	5 9·3	4 1	6 4·0	4 3	6 7·6	7 5	6 6	2 2	1 7·2	2 2	2 0	5 8	5 11·5	5 1	7 8
Guyana (Georgetown) ... ..	6 8	6 5·4	4 6	6 10·3	4 7	7 1·7	7 5	6 8·7	2 2	1 7·2	1 8	2 0	2 4	2 5·8	2 4	3 7·1
India ... ..	11·4	1 8·7	1 2·8	3 1·3	1 2·8	3 0·7	1 2·8	2 7	1 2·8	1 7·2	1 6·2	2 0	1 6·2	6 0·6	1 6·2	8 2·8
Jamaica ... ..	6 0	5 9·3	3 9	5 9·7	3 11	6 1·5	6 8	5 10	2 2	1 7·2	1 8	1 7·7	2 4	2 5·8	2 4	5 0
Malawi ... ..	4 0	4 2·4	2 0	3 3·8	2 0	3 6·9	4 0	4 8	4·5	4·8	2 2	2 0	4 6	6 1·8	4 6	7 11·3
Malaysia ... ..	3 3·2	3 2·7	3 3·2	5 0·9	3 3·2	5 1·2	3 0·4	2 4	2 2·6	1 7·2	2 2·6	2 0	6 10·6	7 1·7	6 3·6	9 4·5
New Zealand ... ..	3 0	5 9·3	2 0	4 5·5	2 0	4 7·1	3 6	3 5	2 2	1 7·2	1 10	2 0	3 6	5 3·6	3 6	7 8·3
Nigeria ... ..	5 9	5 9·3	3 1	4 9·1	3 3	6 7·6	7 5	6 6	2 2	1 7·2	2 2	2 0	5 8	5 11·5	5 1	7 8
Rhodesia (Note) ... ..	4 0	4 2·4	2 0	3 3·8	2 0	3 6·9	4 0	4 8	3·5	3·6	2 2	2 0	4 6	6 1·8	4 6	7 11·3
Sierra Leone (Freetown) ... ..	5 1·2	5 1·2	2 6	3 11	2 8·4	5 7·3	6 8·4	6 1·9	2 2·4	1 7·2	2 2·4	2 0	5 0	5 3	4 4·8	6 7·2
Singapore ... ..	3 3·2	3 2·7	3 3·2	5 0·9	3 3·2	5 1·2	3 0·4	2 4	2 2·6	1 7·2	2 2·6	2 0	6 10·6	7 1·7	6 3·6	9 4·5
The Gambia (Bathurst) ... ..	5 1	5 1·2	2 6	3 11	2 8	5 7·3	6 8	6 1·9	2 2	1 7·2	2 2	2 0	5 0	5 3	4 4	6 7·2
Zambia ... ..	3 6	4 2·4	1 6	3 3·8	1 6	3 6·9	3 6	4 8	4·5	1 2·4	1 8	2 0	4 0	6 1·8	4 0	7 11·3

Note: Rates from Rhodesia include the additional surcharge of 6d. per ordinary word which is levied on all international telegrams forwarded from Rhodesia. This surcharge is not applicable on telegrams to South Africa, which is classified as an inter-territorial service.

TABLE 3

## Inter-National Body Telephone Rates per Unit Call of 3 Minutes in Terms of Sterling as at 31st March 1967

From	To																				
	Australia	Bots- wana	Britain	Canada	Ceylon	Cyprus	East Africa	Ghana	Guyana	India	Jamaica	Malawi	Malaysia	New Zealand	Nigeria	Rhodesia	Sierra Leone	Singa- pore	The Gambia	Zambia	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Australia .. .. .	—	No service	3 0 0	4 6 5 <sup>1</sup>	3 0 0	3 15 0	3 15 0	3 15 0	3 15 0	3 0 0	3 15 0	3 15 0	3 0 0 <sup>2</sup>	1 10 0	3 15 0	3 0 0	3 15 0	3 0 0	3 15 0	3 0 0	3 0 0
Botswana .. .. .	No service	—	3 0 0	4 5 6	No service	3 15 0	2 2 0	No service	No service	No service	No service	Local service	No service	No service	No service	Local service	No service	No service	No service	No service	Local service
Britain .. .. .	3 0 0 <sup>3</sup>	3 0 0	—	3 0 0	3 0 0	2 5 0	3 0 0	3 0 0	3 0 0	3 0 0	3 0 0	3 0 0	3 15 0	3 0 0	3 0 0	3 0 0	3 0 0	3 15 0	3 0 0	3 0 0	3 0 0
Canada .. .. .	4 0 0	4 0 0	3 0 0	—	5 0 0	5 0 0	5 0 0	5 0 0	<sup>4</sup>	5 0 0	<sup>4</sup>	4 0 0	4 0 0	4 0 0	5 0 0	4 0 0	5 0 0	4 0 0	5 0 0	4 0 0	4 0 0
Ceylon .. .. .	3 0 0	No service	3 0 0	3 15 0	—	3 15 0	3 15 0	3 15 0	3 15 0	Local service	3 15 0	3 15 0	3 0 0	3 0 0	3 15 0	3 15 0	No service	3 0 0	No service	3 15 0	
Cyprus .. .. .	3 15 0	3 15 0	2 5 0	3 15 0	3 15 0	—	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0
East Africa .. .. .	3 15 0	2 2 0	3 0 0	3 15 0	3 15 0	3 15 0	—	2 5 0	3 15 0	3 0 0	3 15 0	1 10 0	3 0 0	3 15 0	2 5 0	1 10 0	3 15 0	3 0 0	No service	1 10 0	
Ghana .. .. .	3 15 0	No service	3 0 0	3 15 0	3 15 0	3 15 0	2 5 0	—	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	1 2 6	3 15 0	1 10 0	3 15 0	1 17 6	3 15 0	
Guyana .. .. .	3 15 0	No service	3 0 0	<sup>5</sup>	3 15 0	3 15 0	3 15 0	3 15 0	—	3 15 0	1 2 6	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	
India .. .. .	2 11 5	No service	2 11 5	3 0 0	Local service	3 0 0	2 11 5	3 0 0	3 0 0	—	3 0 0	3 0 0	2 11 5	3 0 0	3 0 0	3 0 0	3 0 0	2 11 5	No service	3 0 0	
Jamaica .. .. .	3 15 0	No service	3 0 0	<sup>4</sup>	3 15 0	3 15 0	3 15 0	3 15 0	1 2 6	3 15 0	—	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	
Malawi .. .. .	3 15 0	Local service	3 0 0	4 5 6	3 15 0	3 15 0	1 10 0	3 15 0	3 15 0	3 15 0	3 15 0	—	3 15 0	3 15 0	3 15 0	Local service	3 15 0	3 15 0	3 15 0	Local service	
Malaysia .. .. .	3 0 0	No service	3 17 0	4 11 0	3 0 0	3 17 0	3 0 0	3 17 0	3 17 0	3 0 0	3 17 0	3 17 0	—	3 0 0	3 17 0	3 17 0	No service	No service	3 17 0	3 17 0	
New Zealand .. .. .	1 10 0	No service	3 0 0	3 6 0	3 0 0	3 15 0	3 15 0	3 15 0	3 15 0	3 7 6	3 15 0	3 7 6	3 7 6	—	3 15 0	3 7 6	3 15 0	3 7 6	3 15 0	3 7 6	
Nigeria .. .. .	3 15 0	No service	3 0 0	3 15 0	3 15 0	3 15 0	2 5 0	1 2 6	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	—	3 15 0	1 17 6	3 15 0	1 17 6	3 15 0	
Rhodesia .. .. .	3 0 0	Local service	3 0 0	4 5 6	3 15 0	3 15 0	1 10 0	3 15 0	3 15 0	3 15 0	3 15 0	Local service	3 15 0	3 7 6	3 15 0	—	3 15 0	3 15 0	3 15 0	Local service	
Sierra Leone .. .. .	3 15 0	No service	3 0 0	3 15 0	No service	3 15 0	3 15 0	1 10 0	3 15 0	3 15 0	3 15 0	3 15 0	No service	3 15 0	1 17 6	3 15 0	—	No service	1 2 6	3 15 0	
Singapore .. .. .	3 0 0	No service	3 17 0	4 11 0	3 0 0	3 17 0	3 0 0	3 17 0	3 17 0	3 0 0	3 17 0	3 17 0	Local service	3 0 0	3 17 0	3 17 0	No service	—	3 17 0	3 17 0	
The Gambia .. .. .	3 15 0	No service	3 0 0	3 15 0	No service	3 15 0	No service	1 17 6	3 15 0	No service	3 15 0	3 15 0	3 15 0	3 15 0	1 17 6	3 15 0	1 2 6	3 15 0	—	3 15 0	
Zambia .. .. .	3 0 0	Local service	3 0 0	4 5 6	3 15 0	3 15 0	1 10 0	3 15 0	3 15 0	3 15 0	3 15 0	Local service	3 15 0	3 7 6	3 15 0	Local service	3 15 0	3 15 0	3 15 0	—	

<sup>1</sup> £3 4s. 10d. Reduced Sunday Rate.<sup>2</sup> Sarawak £3 15s. 0d.<sup>3</sup> £3 0s. 0d. Reduced Sunday Rate.<sup>4</sup> £3 or £4 according to Canadian Zone.<sup>5</sup> £2.25 or £3.00 according to Canadian Zone.

TABLE 4

Examples of Commonwealth-Foreign Telephone Rates per Unit Call of 3 Minutes in Terms of Sterling as at 31st March 1967

	Bahrain		France		Germany		Japan		South Africa		U.S.A.		Argentina		Brazil	
	To	From	To	From	To	From	To	From	To	From	To	From	To	From	To	From <sup>1</sup>
Australia .. .. .	£ s. d. 3 15 0	£ s. d. 3 15 0	£ s. d. 4 6 5	£ s. d. 4 9 7	£ s. d. 4 6 5	£ s. d. 4 11 5	£ s. d. 3 19 3	£ s. d. 3 18 0	£ s. d. 3 0 0	£ s. d. 3 0 0	£ s. d. 4 6 5	£ s. d. 4 6 0	£ s. d. 5 8 0	£ s. d. 5 5 0	£ s. d. 5 8 0	£ s. d. 8 10 6
Botswana .. .. .	No service		3 4 3	3 5 3	3 6 8	3 3 9	No service		Various		4 5 6	4 6 0	No service		No service	
Britain .. .. .	3 0 0	3 0 0	7 0	7 1½	10 0	10 10	3 15 0	4 5 6	3 0 0	3 0 0	4 0 0	4 6 0	3 0 0	4 4 0	3 0 0	5 13 9
Canada .. .. .	5 0 0	3 15 0	4 0 0	4 6 8	4 0 0	4 6 7	4 0 0	4 5 6	4 0 0	4 5 6	Various		4 0 0	4 5 8	4 0 0	4 15 6
Ceylon .. .. .	No service		3 6 0	3 5 3	3 12 0	3 10 10	3 0 0	3 0 6	3 15 0	3 15 0	4 10 0	5 7 0	No service		No service	
Cyprus .. .. .	3 15 0	3 15 0	2 11 0	2 10 0	2 17 0	2 11 11	3 15 0	5 6 10	3 15 0	3 15 0	3 15 0	5 7 0	3 15 0	5 5 0	3 15 0	8 10 6
East Africa .. .. .	2 5 0	2 5 0	3 6 0	3 5 3	3 12 0	3 10 10	3 15 0	5 6 10	1 17 6	3 0 0	3 15 0	5 7 0	3 15 0	5 5 0	3 15 0	8 10 6
Ghana .. .. .	3 15 0	3 15 0	3 6 0	3 5 3	3 12 0	3 10 10	3 15 0	5 6 10	3 15 0	3 15 0	3 15 0	5 7 0	3 15 0	5 5 0	3 15 0	8 10 6
Guyana .. .. .	3 15 0	3 15 0	3 6 0	4 9 7	3 12 0	4 11 5	3 15 0	5 6 10	No service		2 5 0 to 3 0 0	3 4 6 to 4 6 0	3 15 0	5 7 2	3 15 0	5 19 6
India .. .. .	1 17 2	2 5 0	2 11 5	3 5 3	2 11 5	3 3 4	2 11 5	3 0 3	3 0 0	3 15 0	3 0 0	5 7 0	3 0 0	5 5 0	3 0 0	8 10 6
Jamaica .. .. .	3 15 0	3 15 0	3 6 0	4 9 7	3 12 0	5 8 2	5 7 6	5 6 10	3 15 0	5 7 3	2 3 0	2 3 0	5 7 6	5 7 2	5 7 6	5 19 6
Malawi .. .. .	3 15 0	3 15 0	3 6 0	3 5 3	3 12 0	3 7 0	3 15 0	5 6 10	Various		4 5 6	4 6 0	3 0 0	4 4 0	3 0 0	8 10 6
Malaysia .. .. .	No service		4 4 0	4 9 7	4 9 3	4 11 5	3 0 0	2 19 8	No service		4 11 0	4 6 0	5 13 9	5 7 2	5 13 9	5 19 6
New Zealand .. .. .	3 12 0	3 15 0	3 6 0	4 9 7	3 12 0	4 11 5	4 4 0	4 3 8	3 15 0	3 7 6	3 6 0	4 6 0	4 10 0	5 7 2	4 10 0	5 19 6
Nigeria .. .. .	3 15 0	3 15 0	3 6 0	3 5 3	3 12 0	3 10 10	3 15 0	5 6 10	3 15 0	3 15 0	3 15 0	5 7 0	3 15 0	5 5 0	3 15 0	8 10 6
Rhodesia .. .. .	3 15 0	3 15 0	3 6 0	3 5 3	3 12 0	3 7 0	3 15 0	5 6 10	Various		4 5 6	4 6 0	3 0 0	4 4 0	3 0 0	8 10 6
Sierra Leone .. .. .	No service		3 6 0	3 5 3	3 12 0	3 7 0	No service		3 15 0	3 15 0	3 15 0	5 7 0	No service		No service	
Singapore .. .. .	No service		4 4 0	4 9 7	4 9 3	4 11 5	3 0 0	2 19 8	No service		4 11 0	4 6 0	5 13 9	5 7 2	5 13 9	5 19 6
The Gambia .. .. .	No service		3 6 0	3 5 3	3 12 0	3 7 0	No service		3 15 0	3 15 0	3 15 0	5 7 0	No service		No service	
Zambia .. .. .	3 15 0	3 15 0	3 6 0	3 5 3	3 12 0	3 7 0	3 15 0	5 6 10	Various		4 5 6	4 6 0	3 0 0	4 4 0	3 0 0	8 10 6

<sup>1</sup> An additional charge of 13s. 9d. applies on calls beyond Rio de Janeiro.

TABLE 5

## Inter-National Body Telex Rates per Unit Call of 3 Minutes in Terms of Sterling as at 31st March 1967

From	To														
	Australia	Britain	Canada	Ceylon	East Africa	Ghana	India	Jamaica	Malawi	Malaysia	New Zealand	Nigeria	Sierra Leone	Singapore	Zambia
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Australia .. .. .	—	3 15 0	3 4 10	3 4 10	4 6 5	No service	4 6 5	4 6 5	4 6 5	3 4 10	1 17 6	No service	No service	3 4 10	4 6 5
Britain .. .. .	3 0 0	—	3 0 0	3 0 0	3 0 0	3 0 0	3 0 0	3 0 0	3 0 0	3 15 0	3 0 0	3 0 0	3 0 0	3 15 0	3 0 0
Canada .. .. .	3 0 0	3 0 0	—	4 0 0	4 0 0	4 0 0	4 0 0	3 0 0	3 0 0	4 0 0	3 0 0	4 0 0	4 0 0	4 0 0	3 0 0
Ceylon .. .. .	3 0 0	3 0 0	3 15 0	—	3 15 0	3 15 0	Local service	No service	No service	No service	3 15 0	3 15 0	No service	3 15 0	No service
East Africa .. .. .	3 15 0	3 0 0	3 15 0	3 15 0	—	3 15 0	3 0 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	3 15 0	1 10 0
Ghana .. .. .	No service	3 0 0	3 15 0	3 15 0	3 15 0	—	3 15 0	4 5 9	No service	3 15 0	No service	2 5 0	4 5 9	3 15 0	No service
India .. .. .	2 5 9	2 5 9	2 14 3	Local service	2 5 9	2 14 3	—	2 14 3	No service	2 5 9	2 14 3	2 14 3	No service	2 5 9	No service
Jamaica .. .. .	4 6 0	3 0 0	3 4 6	No service	4 6 0	4 6 0	4 6 0	—	4 6 0	5 7 0	4 6 0	No service	4 6 0	5 7 0	4 6 0
Malawi .. .. .	4 5 6	3 0 0	3 4 6	No service	1 10 0	No service	No service	4 5 6	—	5 7 6	4 5 6	4 5 6	No service	5 7 6	Local service
Malaysia .. .. .	3 4 6	3 15 0	4 6 0	No service	5 7 0	5 7 0	5 7 0	5 7 0	5 7 0	—	4 6 0	5 7 0	No service	Local service	No service
New Zealand .. .. .	1 17 6	3 4 6	3 4 6	4 6 0	4 6 0	No service	4 6 0	4 6 0	4 6 0	4 6 0	—	No service	4 6 0	4 6 0	4 6 0
Nigeria .. .. .	No service	3 0 0	4 6 0	3 15 0	3 15 0	2 5 0	No service	No service	4 6 0	5 7 0	No service	—	4 6 0	5 7 0	4 6 0
Sierra Leone .. .. .	No service	3 0 0	4 6 0	No service	4 6 0	4 6 0	No service	4 6 0	No service	No service	4 6 0	4 6 0	—	No service	No service
Singapore .. .. .	3 4 5	3 15 0	4 6 0	3 4 5	5 7 0	5 7 0	5 7 0	5 7 0	5 7 0	Local service	4 6 0	5 7 0	No service	—	5 7 0
Zambia .. .. .	4 5 6	3 0 0	3 4 6	No service	1 10 0	No service	No service	4 5 6	Local service	5 7 6	4 5 6	4 5 6	No service	5 7 6	—

Note: Botswana, Cyprus, Guyana and The Gambia had no telex service at 31st March, 1967.

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**TABLE 6**  
**Examples of Commonwealth-Foreign Telex Rates per Unit Call of 3 Minutes in Terms of Sterling as at 31st March 1967**

	Bahrain		France		Germany		Japan		South Africa		USA		Argentina		Brazil	
	To	From	To	From	To	From	To	From	To	From	To	From	To	From	To	From
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Australia .. .. .	4 6 5	4 5 6	4 6 5	4 7 1	4 6 5	4 6 7	3 4 10	3 4 1	3 4 10	3 4 6	3 4 10	3 4 6	4 6 5	3 17 0	4 6 5	4 13 11
Britain .. .. .	3 0 0	3 4 6	4 0	Paris 1 7 Other 2 8	6 0	5 11	3 0 0	3 4 1	3 0 0	3 0 0	3 0 0	3 4 6	3 0 0	2 17 10	3 0 0	4 13 11
Canada .. .. .	4 0 0	4 5 6	3 0 0	3 5 4	3 0 0	3 4 11	3 0 0	3 4 1	3 0 0	3 4 6	Local service		3 0 0	2 17 10	3 0 0	3 16 8
Ceylon .. .. .	No service		3 7 6	3 5 4	3 7 6	3 4 11	3 7 6	3 4 1	No service		4 10 0	4 6 0	No service		No service	
East Africa .. .. .	4 6 0	4 5 6	3 4 6	3 5 4	3 4 6	3 4 11	No service		3 15 0	3 15 0	4 6 0	4 6 0	4 5 6	3 17 0	4 5 6	4 13 11
Ghana .. .. .	4 6 0	4 5 6	—	3 5 4	—	3 4 11	—	3 4 1	No service		—	4 6 0	—	—	—	4 13 11
India .. .. .	1 14 3	4 5 6	2 5 8	3 5 4	2 5 8	3 4 11	2 5 8	3 4 1	No service		2 14 3	4 6 0	2 14 3	3 17 0	2 14 3	4 13 11
Jamaica .. .. .	4 6 0	4 5 6	3 4 6	3 5 4	3 4 6	3 4 11	3 4 6	3 4 1	4 6 0	4 5 6	2 13 7	2 13 7	3 4 6	2 17 10	3 4 6	3 16 8
Malaysia .. .. .	5 7 10	5 8 0	4 6 5	4 7 1	4 6 5	4 12 9	3 4 5	3 4 1	4 6 5	4 5 6	4 6 5	3 4 6	5 7 10	4 16 4	5 7 10	4 13 11
New Zealand .. .. .	No service		4 6 0	4 7 1	4 6 0	4 6 7	3 4 6	3 4 1	4 6 0	4 5 6	3 4 6	4 6 0	4 6 0	3 17 0	4 6 0	4 13 11
Nigeria .. .. .	No service		3 4 6	3 5 4	3 4 6	3 4 11	4 6 0	3 4 1	4 6 0	4 5 6	4 6 0	4 6 0	4 6 0	3 17 0	4 6 0	4 13 11
Sierra Leone .. .. .	4 6 0	4 5 6	3 4 6	3 5 4	3 4 6	3 4 11	4 6 0	3 4 1	No service		4 6 0	4 6 0	4 6 0	3 17 0	4 6 0	4 13 11
Singapore .. .. .	5 7 10	5 8 0	4 6 5	4 7 1	4 6 5	4 12 9	3 4 5	3 4 1	4 6 5	4 5 6	4 6 5	3 4 6	5 7 10	4 16 4	5 7 10	4 13 11
Zambia .. .. .	4 5 6	4 5 6	3 4 6	3 5 4	3 4 6	3 4 11	4 5 6	3 4 1	No service		3 4 6	3 4 6	4 5 6	3 17 0	4 5 6	4 13 11

*Note:* Botswana, Cyprus, Guyana and The Gambia had no telex service at 31st March 1967.

## V. ACTIVITIES OF NATIONAL BODIES

(1st April 1966 to 31st March 1967)

### BRITISH NATIONAL BODY

55. *Cables.* There are approximately 105,000 nautical miles of telegraph cable in the Cable and Wireless Limited system. The Company partly owns the telephone cables CANTAT (2,011 nautical miles), COMPAC (8,234 nautical miles) and SEACOM (7,049 nautical miles). The Company is also part owner of 1,625 nautical miles of telephone cable between Bermuda/USA and Jamaica/USA, and is sole owner of the Bermuda/Tortola cable (902 nautical miles).

56. Telephone cables wholly or partly owned by the British Post Office include the two cables in the TAT 1 system (total length 4,536 nautical miles), the TAT 3 cable (3,518 nautical miles) and about 2,840 nautical miles of telephone cable in the English Channel and North Sea.

57. *SEACOM.* The Hong Kong-Guam section of SEACOM was successfully brought into service on the planned date (1st August). To complete the SEACOM project the Guam-Madang (New Guinea) and Madang-Cairns (Queensland) sections were laid by CS 'Mercury' and HMTS 'Monarch', with assistance from CS 'Retriever', thus completing the ocean laying operations. During the year terminal installations at Guam, Madang and Cairns and the overland mixed microwave and coaxial link from Cairns to Sydney were also completed. The whole SEACOM system was brought into service at the end of March 1967, when the opening ceremony was performed by Her Majesty The Queen.

58. *Eastern Caribbean System and Tortola-Bermuda Cable.* The multi-channel tropospheric scatter system between Barbados-St. Lucia-Antigua-Tortola was opened in August, and connected with the existing tropospheric system between Barbados and Trinidad. Terminal equipment installation for the Bermuda-Tortola cable was completed during the year and the link officially opened in September to provide the northern outlet for the Eastern Caribbean system. Further extensions are planned between Trinidad and Guyana, and between Antigua and Guadeloupe in conjunction with the French Administration; equipment for the latter is on order. With the completion of this system plans have been agreed with the other parties concerned for the introduction of semi-automatic telephone working to provide direct operator-dialling facilities within the Caribbean area and into the worldwide network.

59. *Canada-Bermuda Cable (CANBER).* To provide additional capacity between Bermuda and North America, the provision of a 480/640-circuit coaxial cable system between Bermuda and Nova Scotia (in the vicinity of the Canadian Satellite Earth Station at Mill Village) has been agreed with the COTC, scheduled to come into operation during 1969. CCGS 'John Cabot' has completed the survey of the sea-bed route, using with complete success a deep-sea camera developed by Cable and Wireless Limited. This was of particular value in examining the sea-bed characteristics over the Nova Scotia continental shelf.

60. *Satellite Earth Stations.* The Ascension earth station for the NASA Apollo project was completed and made ready for service, as scheduled, in September 1966. Minor teething troubles were cleared, and the station tracked and communicated via the errant INTELSAT II F.1 and subsequently with INTELSAT II F.3.

61. Preliminary planning proceeded for the provision of earth stations at Hong Kong and Bahrain. Progress was made with site surveys.

62. *Telephone Cable and Repeater Manufacture.* During the year 769 nautical miles of lightweight coaxial cable were manufactured to complete the requirements for SEACOM, together with 91 Type U (160 circuit) repeaters and five equalisers.

63. Cables to the Netherlands and Norway are being manufactured for the Post Office. Both cables, each with a capacity of 480 circuits and equipped with transistorised repeaters operating at frequencies up to 5 MHz, will be laid towards the end of 1967 and will be ready for service early in the following year. Supervisory facilities include the monitoring of gain and noise of each repeater.

64. The BPO in collaboration with the Companhia Portuguesa Radio Marconi has placed a contract for a submarine telephone cable of the same design and circuit capacity as the projected cables to Norway and the Netherlands, to be provided between Britain and Portugal. The cable, expected to be in service early in 1969, will terminate at a point south of Lisbon, where a link-up will be possible with a cable being provided by the South Atlantic Cable Company (Pty) Ltd. between Portugal and South Africa.

65. *Cable Ships.* Ten cable ships are available for construction, maintenance and repair. During the year the six Cable and Wireless ships carried out 72 restorations to telegraph cables and three repairs to telephone cables.

66. *Cable Stations.* There are cable stations at Porthcurno (common-user telegraph cables), Oban (TAT 1 and CANTAT telephone cables), Widemouth (TAT 3 telephone cable) and a number of other cable landing points along the coast of Britain. Cable and Wireless Limited operate 65 cable stations overseas.



67. *Radio Stations.* In Britain there are point-to-point radio transmitting stations at Bodmin, Criggion, Dorchester, Leafield, Ongar and Rugby, and receiving stations at Baldock, Bearley, Brentwood and Somerton for overseas services. Cable and Wireless Limited operate 40 radio stations overseas.

### Traffic

68. *Telegraph.* The estimated total international telegraph traffic handled by Britain and the overseas branches of Cable and Wireless Limited during the year was 620 million words, an increase of just over 1 per cent on the previous year.

69. *Telephone.* Traffic from Britain to Commonwealth and other countries during 1966/67 is estimated to have been 17 per cent higher (55·7 million minutes) than in the previous year.

70. Telephone traffic originating at Cable and Wireless Limited's stations during the year was 3,587,000 minutes, 26 per cent greater than in the previous year, a heavy rate of growth largely due to the introduction of further wideband facilities.

71. *Phototelegraph.* Phototelegraph traffic originating in Britain and at overseas branches of Cable and Wireless Limited during the year was 12,590 items, 19 per cent lower than in the previous year. This reduction has no particular significance since phototelegraph traffic is very much subject to fluctuations depending upon the incidence of topical news events.

72. *Telex.* At 31st March 1967, there were 19,501 telex subscribers in Britain, an increase of 13·4 per cent since 31st March 1966. The originated international traffic handled in London during 1966/67 was 33,050,000 paid minutes, an increase of 16·9 per cent over the previous year. 92·3 per cent of all international calls were dialled by the subscribers.

73. Telex traffic originating at Cable and Wireless Limited's branches during the year was 1,164,000 minutes, 32 per cent greater than in the previous year, thus continuing and increasing the heavy growth rate of this service.

### Services

74. *Telegraph.* A 5-unit protected radiotelegraph circuit was opened between London and Dar es Salaam in October 1966.

75. A cable/radiotelegraph service was opened between London and Kuala Lumpur in September 1966, an extension of one of the Britain/Singapore circuits.

76. Public telegraph services between Barbados and Tortola, Montreal, New York (WUI), San Juan (Puerto Rico) and Britain were transferred to circuits in the Eastern Caribbean system during August 1966.

77. Following the opening of the Hong Kong/Guam section of SEACOM the Hong Kong/Manila public telegraph circuits were transferred from the Hong Kong/Manila telegraph cables to circuits in the Hong Kong/Guam and Guam/Manila telephone cables. Direct Hong Kong/USA (WUI, RCA and ITT) public telegraph cable circuits were established via Hong Kong/Guam and the Trans-Pacific Telephone Cable between Guam and Hawaii.

78. Two public telegraph circuits (one Roman and one Arabic) opened between Dubai and Ras al Khaimah on 1st September 1966.

79. A direct London/Tripoli public service telegraph circuit was opened on 30th January 1967, utilising a channel in the Britain/Malta radio link feeding into one of the Malta/Tripoli cables.

80. *Telephone: Extra-European Services.* The following direct radiotelephone services were opened during 1966/67:

Aden/Somalia (Mogadiscio)  
Britain/Tanzania.

81. The opening of the Eastern Caribbean system enabled the provision of the following high-grade telephone circuits in the Caribbean area:

Antigua/Miami	..	..	..	..	2
Antigua/Tortola	..	..	..	..	2
Barbados/Jamaica	..	..	..	..	1
Barbados/Miami	..	..	..	..	8
Barbados/Montreal	..	..	..	..	5
Barbados/Puerto Rico	..	..	..	..	3
Jamaica/Trinidad	..	..	..	..	1
Trinidad/Miami	..	..	..	..	7
Trinidad/Montreal	..	..	..	..	3
Tortola/St. Thomas	..	..	..	..	3

82. A direct Grand Cayman/Jamaica HF radiotelephone circuit was opened on a temporary basis pending the inauguration of a thin-route tropospheric scatter system between the Cayman Islands and Jamaica scheduled for operation during 1967.

83. With the completion of SEACOM the following Hong Kong telephone circuits were established via all-cable routes:

Hong Kong/Britain	..	..	..	2
Hong Kong/Manila	..	..	..	6
Hong Kong/Sydney	..	..	..	15
Hong Kong/Tokyo	..	..	..	5
Hong Kong/USA	..	..	..	15
Saigon/USA via Hong Kong	..	..	..	2

84. The Australia/Guam section of SEACOM was opened on 30th March 1967. The effect on the various Commonwealth routes is indicated in sub-paragraphs (4) to (6) below.

85. Coincident with the changes in circuit quantities on these routes the London/Montreal route was rearranged to allow for future growth and increased overflow traffic to the Pacific (sub-paragraph (3) refers).

- (1) The number of speech circuits on the London/Montreal route which are carried by cable has been increased from 34 to 44. The number of speech circuits on the London/Montreal route which are carried by satellite has increased from six to seven.
- (2) The semi-auto component of the London/Montreal route has increased from 40 to 46 circuits. The route now consists of 46 both-way semi-auto and five outgoing manual circuits.
- (3) The London/Sydney route has been rearranged from 10 direct circuits, 10 overflow circuits Montreal/Sydney and five overflow circuits Montreal/Hawaii/Sydney, to five direct circuits and overflow on to 29 Canada/Sydney circuits.
- (4) The Auckland/London route has been increased from four full time and two scheduled patched (part time) circuits to four full time and three scheduled patched circuits.
- (5) The Hong Kong/London route is to be rearranged from two direct circuits to one direct circuit and automatic overflow via 15 Hong Kong/Sydney circuits (as indicated above) and one Canada/Hong Kong circuit.
- (6) The London/Singapore route is to be rearranged from two direct circuits to one direct circuit and manual overflow via two Singapore/Sydney circuits.

86. The number of speech circuits on the London/White Plains (New York) route which are carried by cable has been increased from 107 to 132. The number of satellite circuits on the route remains at 18.

87. The semi-auto component of the London/White Plains route has been increased from 110 to 120 circuits and split into an incoming, outgoing and both-way component. The route now consists of 30 outgoing, 30 incoming and 60 both-way semi-auto circuits, 20 outgoing and 10 incoming manual circuits.

88. Additional circuits were opened on the following existing routes:

- Auckland/Suva
- Bahrain/Beirut
- Bahrain/Dammam
- Bermuda/USA (2)
- Doha/Dubai
- Hong Kong/Indonesia (Bandung)
- Hong Kong/Kuala Lumpur
- Hong Kong/Macao (3)
- Hong Kong/Taipei
- London/Nicosia (3rd channel)
- London/Tel Aviv (3rd channel)
- London/Bahrain (3rd channel)
- Tripoli/Rome

89. The channel hours were extended on services between Britain and the following countries:

Aden, Bahrain, Ceylon, Cyprus, India (Madras and Poona), Israel, Kenya, Kuwait, Lebanon, Libya, Nigeria, Pakistan (Dacca), Rhodesia, Sierra Leone, South Africa and Zambia.

90. Channel hours were reduced on services between Britain and the following countries:

Argentina (ITT and Transradio), Iraq and Pakistan (Karachi).

91. The following channels were ceased during 1966/67:

London/Ankara, as there are now two cable/microwave circuits.

Two Barbados/London channels, as cable routing is available via Montreal with the opening of Cable and Wireless Limited's Eastern Caribbean project.

London/Rio de Janiero (ITT) and (Radiobras), as there is a low level of traffic and a good service via Montreal.

One London/Khartoum channel because of lack of traffic.

One London/Teheran channel because of lack of traffic.

92. Extensions of schedule hours took place on many existing routes and many new interconnected services were introduced via intermediate switching points.

93. *Telephone: European Services.* The number of public telephone circuits between Britain and the Continent of Europe increased from 1,476 at 31st March 1966 to 1,606 at 31st March 1967.

94. ISD was introduced between Britain and Luxembourg in May 1966, and semi-automatic working between Britain and East Berlin in June 1966. Direct both-way manual service was opened between London and Bulgaria in November 1966, between London and Valencia in August 1966, and between London and Bilbao in February 1967. Direct incoming manual service was opened between Bologna and London in September 1966.

95. *Phototelegraph.* Britain opened a new two-way service with Jordan during 1966/67.

96. The phototelegraph service between Britain and Bahrain, formerly a two-way service, now operates on the incoming link only.

97. *Telex.* The following new telex services were opened during the year (service is direct unless otherwise indicated):

Bahrain/Dubai  
Bahrain/Muscat  
Barbados/Antigua  
Barbados/Dominica  
Barbados/Grenada  
Barbados/Montserrat  
Barbados/St. Kitts  
Barbados/St. Lucia  
Barbados/St. Vincent  
Barbados/Bermuda  
Barbados/Canada  
Barbados/Puerto Rico  
Barbados/USA (WUI and ITT)  
Britain/Sierra Leone  
Britain/Trucial States (via Bahrain)  
Britain/Ryukyu Islands (via New York)  
Britain Nicaragua (via New York)  
Britain Muscat (via Bahrain)  
Britain El Salvador (via New York)  
Hong Kong USA (WUI, ITT and RCA)  
Peru/Ecuador  
Philippines/Malaysia  
Philippines/Singapore  
Philippines/Australia

98. New direct routes were opened for the following existing services:

Britain/Trinidad  
Britain/Philippines  
Britain/Bulgaria  
Britain/Zambia

99. No new subscriber dialling services were opened during the year, but semi-automatic facilities were introduced on the routes from Britain to:

Bombay, Lusaka, Manila, Sydney and Tel Aviv.

100. At 31st March 1967, there were 1,591 international telex circuits terminating in London, 1,243 to Europe and 348 beyond.

101. In addition to new direct services, capacity on many existing routes expanded during the year, and many new interconnected services were introduced.

102. *Datel Service.* The international Datel 600 service was introduced on 1st November 1965, and is now available to Austria, Denmark, France and West Germany. Negotiations for further extensions of the service are proceeding.

103. There are now 19 customers using international Datel 600 service between Britain and the USA. Engineering problems associated with the extension of the service to Australia and Canada are still under consideration, the main difficulty being to overcome the restriction imposed by the type of echo suppressor at present employed. However, until the new type echo suppressors are available it may be possible to operate the service in the half duplex mode (i.e. without backward channel) and negotiations on this basis are proceeding.

104. *Press Services.* Signal reception and transmission services continued to expand.

105. *Leased Circuits.* At 31st March 1967, there were 166 commercial leased telegraph circuits between Britain and the Continent of Europe and 245 circuits between Britain and extra-European countries, an increase since 31st March 1966 of 12.7 per cent and 15.6 per cent respectively.

106. The number of leased telephone circuits between Britain and the Continent of Europe increased from 38 at 31st March 1966 to 47 at 31st March 1967.

107. As at 31st March 1967, Cable and Wireless Limited provided one or both terminals of 143 telegraph circuits, 15 alternate voice/data circuits, 7 telephone circuits and 1 facsimile circuit.

108. *Capacity.* Circuit capacity for the public telegraph service was adequate. Schedule extensions and additional channels to meet continued increased demand were provided for telex and telephone services.

109. In general, radio propagation conditions were better during 1966/67 than 1965/66, and consequently the traffic carrying capacity of many radio circuits improved.

110. COMPAC capacity is being utilised to the maximum by the increased use of overflow working via Canada and Sydney. Some relief is expected during the coming year when COMPAC TASI is opened. Trans-Atlantic cable capacity is fully utilised although spare capacity is available via the INTELSAT I satellite.

111. *Major Changes in Telegraph Traffic Handling.* The London/Afghanistan (Kabul) circuit was converted from morse to 5-unit working in May 1966.

112. The London/Falkland Islands (Port Stanley) circuit was converted from morse to 5-unit protected working in January 1967.

113. The 5-unit London/Kuwait circuit was converted to ARQ working in June 1966 and the London/Nicosia circuit was converted to ARQ working in December 1966.

114. The majority of circuits in Britain are now using page reception.

115. A half-speed protected public service telegraph channel between Chile and Peru (rented from Transradio Chilena at the Chile end) was opened to replace the telegraph cable route between Santiago and Lima on 17th October 1966.

116. Automatic error correction working was brought into use between Muscat and Bahrain, Barbados and Georgetown (Guyana), and Hong Kong and Saigon (Vietnam).

117. The Bahrain/Kuwait morse circuit was converted to unprotected 5-unit working.

118. Automatic channel numbering was introduced on a number of services.

**Rates**

119. Britain introduced a differential tariff for personal and ordinary telephone calls to the United States mainland on 1st February 1967. For ordinary calls the rate was reduced by one-sixth to 16s. 8d. per minute full rate and 12s. 6d. per minute reduced rate; personal calls carry a surcharge of £1 10s. 0d. per call full rate and £1 2s. 6d. per call reduced rate. The corresponding dollar accounting rates are \$2.5, \$1.9, \$4.5 and \$3.3 respectively. The sterling accounting rates with the US are now converted at \$3=£1, as against the former coefficient of \$4=£1 which applied since 1949.

**Modernisation and Expansion of the System**

*(a) British Post Office*

120. The number of 2-channel error-correcting multiplex terminals in use in London at 31st March 1967 were:

- 56 at Electra House, serving 18 routes, and
- 96 at Fleet Building, serving 27 routes.

121. *Storage for ARQ Systems.* A contract has been placed for a new design of character storage equipment for use with ARQ radio systems providing telex services. These storage equipments use stored-programme principles and enable a common core assembly having a total capacity of 24,000 characters to be shared between 15 radio channels. The use of time-shared stored-programme techniques and integrated circuit technology enables the equipment to be competitive with other known forms of storage. Five equipments catering for a total of 75 radio circuits are being prepared.

122. *Cable Multiplex*. Cable multiplex equipment with a total capacity of 240 channels has been installed and has been satisfactorily tested between London and Sydney, New York and Tokyo. The equipment, conforming to draft CCITT recommendations, caters both for telex and telegraph circuits, and some of the channels are already in use between London and Sydney and London and New York.

123. *Electronic Telegraph Relays*. A programme is in hand to replace all electro-magnetic telegraph relays in international radio and long distance cable circuits by solid state devices or mercury wetted relays. The replacing items include proprietary designs as well as specially designed units where satisfactory commercial items are not available. This work, now largely completed, has resulted in a substantial improvement in reliability as well as a significant reduction in maintenance.

124. *International Telegraph and Telex Provision*. The London telex switchboard has been extended and the number of operating positions increased from 72 to 106 (46 cable and 60 radio). A contract has been placed for a further extension to 154 positions, planned for completion during 1969.

125. Installation of the new inter-continental switching equipment has begun, which will extend to a number of additional countries automatic inter-continental telex service for British subscribers, including automatic recording of charging information, and will provide further automatic switching facilities for transit traffic. The equipment will be brought into use in stages, the first towards the end of 1967, and the last stage, which provides for the new type C signalling, in mid-1968.

126. Installation of equipment at the new London Telegraph Centre at St. Botolph's House has started. For international services 60 2-channel error correcting multiplex terminals and 40 24-circuit VFT terminals will be available in 1968, with a further 40 24-circuit terminals in 1969. The first stage of the international telex exchange is scheduled to open in Autumn 1969.

127. *Extensions at Faraday International Exchange*. The contract to extend the link equipment to a 2x4 system is now well advanced. A contract has been placed to provide equipment for Inter-continental Subscriber Dialling to North America, and a further contract will provide equipment to enable Remote Manual Boards to have direct access to the Faraday International Switching Centre.

128. *Automatic Transmission Measuring Equipment*. In May 1966 the British Post Office began the field trial of an Automatic Transmission Measuring Equipment (ATME) as part of a CCITT investigation of the equipment's suitability for the routine testing of international automatic and semi-automatic circuits. ATME sets are required at each end of a route and measurements may be made in each direction of transmission with results, in the form of punched paper tape or teleprinter page print out, available at each end of the route.

129. Ultimately 16 Administrations will be equipped to participate in the investigation. For her part Britain intends to conduct the field trial on 10 European routes, including one British national route, using 10 circuits on each route, but at present testing is limited to the four routes which are fully equipped.

130. *New International Telephone Centres*. Building work is well advanced on the new centre in Wood Street (Central London) and should be completed by November 1967, when the installation of transmission and switching equipment will begin. The initial installation of transmission equipment will be completed at the beginning of 1969, and the first stage of the switching equipment is scheduled to be available for service by late 1969 accommodating approximately 1,000 overseas circuits and 1,500 inland circuits.

131. A site had been purchased and feasibility plans produced for a further London centre to be located in Upper Thames Street. Some 200,000 sq. ft. are likely to be available for apparatus purposes.

132. *Extensions and Modifications to Radio Stations in Britain*. The installation of twelve 30 kW transmitters for point-to-point services and six 85 kW transmitters for press broadcast services, with their associated aerials and rack equipment, has been completed at the new Leafield transmitting station and the station is now in full operation.

133. Modernisation of the Ongar transmitting station is in progress and over the next two to three years 23 new ISB transmitters and associated centralised control equipment will be installed to replace existing telegraph-type transmitters.

134. Installation of new receivers and control equipment in the new building at Bearley receiving station is well advanced and will be completed next year. The Brentwood receiving station is to be closed in September 1968.

135. *Overseas Telegraph Mechanisation*. The new message relay equipment in Cardinal House has been installed and will be brought into use in October 1967, after which the torn tape unit will be closed down.

136. An extension of message relay facilities in London is now being planned with a view to the mechanisation of all overseas routes by 1969/70.

137. *Goonhilly Earth Station*. Goonhilly has been operating to the Early Bird satellite (now generally referred to as INTELSAT I) with marked success since the system opened to public traffic on 28th June 1965.

138. The first satellite of the INTELSAT II series (provided primarily for support communications for the Apollo Project) was launched on 26th October 1966. A faulty apogee motor caused the satellite to take a highly elliptical orbit instead of the planned synchronous equatorial orbit, but during the

week 20th–26th November 1966, it became visible for short periods to both Goonhilly and the West Australian earth station at Carnarvon. A series of telephony and television tests was carried out during periods of mutual visibility and an historic transmission took place on 25th November directly linking Australia and England by live television.

139. Progress has been made during the year in preparing Goonhilly for the INTELSAT III satellite programme to establish a global system, commencing in 1968, and initially comprising three geo-stationary satellites over the Atlantic, Pacific and Indian Oceans respectively. A contract has been placed for the construction of a second large aerial installation which will be ready during the first half of 1968 with a view to operation to INTELSAT III (Atlantic Ocean).

140. Plans have been prepared for the modification of the existing aerial installation after its release from the Atlantic service to enable operation to INTELSAT III (Indian Ocean), and by the end of 1968 Goonhilly should be able to work simultaneously to both the Atlantic Ocean and Indian Ocean INTELSAT IIIs.

*(b) Cable and Wireless Limited*

141. *Hong Kong.* The installation of terminal equipment of the Hong Kong–Taiwan tropospheric scatter link neared completion and service contact with Taiwan was achieved. The system is scheduled to be ready for service in June 1967.

142. A new broadcasting station being constructed for the Government at Smugglers Ridge, providing four 10 kW transmitters, two each for the English and Chinese services, is expected to be operational by the end of 1967, replacing the Hung Hom station which will be demolished.

143. A further HF station being built at Cape d’Aguilar to accommodate the HF transmitters presently at Hung Hom used for the aeronautical services is due for completion at the end of 1967.

144. An automatic telegraph switching centre, designed by Cable and Wireless Limited, was brought into service for Pan American World Airlines (PANAM).

145. Equipment was ordered to expand the Hong Kong telex exchange to 500 lines.

146. The new automatic international telephone exchange was completed and commissioned on 1st August 1966. An extension of the centre is being undertaken to meet further rapidly growing requirements.

147. *Eastern Caribbean.* An automatic polling/selective-calling telegraph system produced by Cable and Wireless Limited was brought into service for British Overseas Airways Corporation (BOAC) in Barbados and Antigua and was being expanded to include Port of Spain.

148. The existing PANAM polling/selective telegraph switching system was transferred to Cable and Wireless Limited’s routes and is in process of being equipped.

149. The central telegraph offices at Georgetown (Guyana), Montserrat and St. Lucia have been moved into new buildings.

150. 200-line manual telex switchboards (equipped initially for 60 lines) have been installed at Barbados and Georgetown (Guyana). 12-line cordless switchboards have been installed at Antigua, Dominica, Grenada, Montserrat, St. Kitts, St. Lucia and St. Vincent and an 18-line cordless switchboard at St. Croix (US Virgin Islands).

151. *Arabian Gulf.* The Bahrain–Doha tropospheric scatter link began to take traffic at the end of 1966 using existing transmission equipment.

152. Plans proceeded for the provision of a tropospheric scatter system between Bahrain and Dubai.

153. A signals centre was installed and equipped for BOAC in Bahrain.

154. A 12-line cordless telex switchboard was installed at Muscat and an 18-line one at Dubai.

155. *Cayman Islands–Jamaica.* Work proceeded on a thin-line tropospheric scatter system between Grand Cayman and Jamaica via a relay station on Cayman Brac. The system will provide seven telephone channels, meeting the requirements both for inter-island and external telephone calls. It is expected to go into service in mid-1967.

156. *Falkland Islands.* Arising out of requirements for the ESRO satellite tracking station Cable and Wireless Limited installed new transmitters, receivers, landlines and associated equipment, including ARQ, for the Falkland Islands Government, and will maintain the system for them. This upgrading of their external communications will provide a 12-hours-per-day circuit to London.

157. *Bermuda.* During the year Cable and Wireless Limited continued to provide special coverage of NASCOM circuits in Bermuda for all major NASA operations. Tests have been carried out periodically between Bermuda and the Apollo ship Vanguard. The shore station for NASA has gone into service and has been regularly used for tests with the Apollo ships.

158. To meet a request by NASA to diversify the routing of its numerous circuits between Bermuda and the USA, a 16-voice channel through-group was commissioned between Bermuda and St. Thomas (US Virgin Islands) via Tortola, for onward connection to the States.

159. Work commenced on the installation of a 200-line manual telex switchboard, equipped for 60 lines initially.

160. *Peru*. Approximately 300 telex subscriber sets have been issued in Lima and the capacity of certain exchanges increased. Plans were made to increase the capacity of the automatic exchange from 250 to 500 subscribers.

161. *British Honduras*. Work on the new Ladyville Radio Station, Belize, progressed satisfactorily.

#### **Inland Telephone Systems Operated by Cable and Wireless Limited**

162. *Antigua*. An agreement has been negotiated and a contract signed for Cable and Wireless Limited to instal a telephone system on behalf of the Antigua Government. Work is due to start about the middle of 1967.

163. *Ascension*. Cable and Wireless Limited has installed an Island telephone system to meet the requirements of all organisations there. Telephone cables were laid for the BBC and for the Apollo Earth Station, and an exchange has been built at Two Boats. At the end of February there were 55 connections at Two Boats and 94 at Georgetown.

164. *Bahrain*. New exchanges were opened at Salamina, Budaiya and Isatown. The total number of exchange connections increased during the year by 771 to 4,902.

165. *British Honduras*. Subscribers connected to the telephone system in Belize City at 31st March 1967 totalled 955, an increase of 142 on the previous year.

166. *Cayman Islands*. The installation of the telephone system at Grand Cayman was completed with the opening of the Georgetown and West Bay exchanges with 383 connections. Cayman Brac exchange opened with 43 subscribers and is due to be connected with the remainder of the system by mid-1967.

167. *Doha (Qatar)*. The number of subscribers connected to the telephone system at 31st March 1967 totalled 4,179, an increase of 679 during the year.

168. A 50-line exchange on Halul Island was commissioned, providing connection into the mainland system in Qatar.

169. *Dominica and St. Vincent*. Negotiations were completed and agreements signed for the establishment of telephone systems in both islands, to be supplied, installed and operated by Cable and Wireless Limited. Planning was virtually completed, and installation in both cases was expected to start in 1967.

170. *Grenada*. The number of subscribers connected to the telephone system at 31st March 1967 totalled 1,417, an increase of 119 on the previous year.

171. *Montserrat*. The telephone system in Montserrat was made ready for service. Exchanges at Woodlands, Bethal and Plymouth were completed and the system was scheduled to open in April 1967.

172. *Muscat*. The number of subscribers connected to the telephone system at 31st March 1967 totalled 272.

173. *Seychelles*. The number of subscribers connected to the telephone system at 31st March 1967 totalled 240.

174. *St. Lucia*. The St. Lucia telephone system opened on 1st January 1967, and by the end of March 810 subscribers were connected via the Castries and Anse-la-Raye exchanges. The installations at Dennery, Vieux Fort and Soufrière were scheduled to be ready for service by mid-1967.

175. *Tortola (British Virgin Islands)*. Installation of the island telephone system proceeded satisfactorily. The main exchange at Roadtown and the satellite exchanges were scheduled to open during the latter half of 1967.

#### **Research and Development**

##### *(a) British Post Office*

176. *Radio Receiver Development*. Delivery of the type HF transistorised self-tuning receiver has been completed. Traffic trials have indicated that their performance is as good as earlier valve type receivers and that they can be controlled satisfactorily from a central point in the station. Evaluation of the economics of controlling the receivers from the operating centre is in hand.

177. *Radio Telephone Systems*. Delivery has been taken of a number of 'Lincompex' equipments but tests have indicated that the receive side of the equipment is temperature conscious. This is being rectified and equipments are shortly being sent overseas for field trials. A contract has been placed for 24 additional fully engineered equipments (MK II) and delivery is expected early in 1968.

178. *HF Aerials*. Tests on the HF log-periodic aerials showed them to operate satisfactorily at 30 kW but showed voltage breakdown at the ends of the dipoles under some adverse weather conditions (e.g. low pressure and high humidity) when operated at 85 kW (F1). The mechanical and electrical arrangements at these points have been redesigned and further extensive trials are in hand.

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179. *Satellite Communications.* The development of earth station equipment has continued, particularly with a view to the requirements of the INTELSAT III programme. Effective progress has been made in the fields of cryogenic systems, wide-band low-noise parametric amplifiers, threshold extension demodulators and wide-band high-efficiency aerial feed systems. Long-term studies have continued embracing many aspects of communication-satellite usage, including methods of modulation for telephony systems, sound and television broadcasting and possible aeronautical applications, particularly where these aspects affect the efficiency of use of the radio frequency spectrum.

180. *Satellite Earth Station Aerials and Aerial Feeders.* The present primary feed of the Goonhilly No. 1 aerial is linearly polarized and the bandwidth is limited to about 50 MHz because of the difficulty of matching the coaxial receive aperture to free space. The feed is being modified by fitting a smaller diameter dielectric loaded transmit waveguide; this will ease the matching problem and should enable the 500 MHz transmit and receive bandwidth requirement to be achieved.

181. It is proposed to decrease the feeder loss and system noise temperature of the Goonhilly No. 1 aerial by using a larger size of rectangular waveguide between the primary feed and the low-noise amplifier. Development of the necessary over-size rectangular waveguide tapers and bends was commenced.

182. The development of a d.c. beam-swing control system for the Goonhilly No. 1 aerial was completed. This system will replace the present 400 Hz synchro system; fewer components will be required with the result that the reliability will be greatly improved.

183. Work on the off-set cassegrain type of aerial system continued. High efficiency will be obtained by the use of a shaped sub-reflector.

184. *Low-Noise Amplifiers.* Low-noise amplifier work has been concentrated on the design and construction of wide-band parametric amplifiers operating in the 4 GHz band, with low noise temperatures achieved by cooling the amplifiers with either liquid nitrogen or liquid helium. The work is being extended to cover the use of closed-cycle refrigerators to replace the baths of liquid coolant. Present bandwidths exceed 250 MHz, with noise temperature of about 17°K.

185. Equipment for the measurement of noise temperature to an accuracy of  $\pm 1^\circ\text{K}$  has been developed.

186. *Satellite System Studies and Associated Experimental Work.* An investigation of the intermodulation effects produced by the transmission of 8 FDM/FM carriers through a wideband satellite travelling-wave tube operating near to saturation has been concluded.

187. Work on an alternative multiple-access scheme for communication satellites using P.C.M. has continued. The system uses time-division multiplex techniques and a baseband experiment has been successfully concluded, in which high-speed 'bursts' of digital signals have been effectively placed sequentially within a master time-frame, as would occur in practice at the satellite. Compensation for Doppler shift and variable path delay have also been demonstrated. Work is continuing to determine the minimum number of digits required to preface each burst.

188. To avoid lightly loaded FDM carriers in a common satellite transponder causing excessive intermodulation, and also to keep such carriers within the internationally agreed levels of received power flux density at the earth's surface, the addition of energy-dispersal signals to the baseband signal at the transmitter is being investigated.

189. *Echo-Suppressors.* The development of an echo-suppressor, suitable for circuits having long propagation times, e.g. circuits via synchronous orbit satellites, has reached the prototype approval stage. This echo-suppressor, designated Echo Suppressor No. 7A, will be compatible with the echo-suppressor developed by Bell Laboratories.

190. *Submarine Cable Systems.* A submarine cable system, which will be used for the Britain-Portugal cable, has been developed. It will have a system bandwidth of 5 Mc/s, i.e. a capacity of 480 4 kHz spaced channels or 640 3 kHz spaced channels. The system will be equipped with transistor repeaters and will be designed to ocean cable standards.

191. The development of a 12 MHz submarine cable system using transistor repeaters to provide a capacity of up to 1,140 4 kc/s spaced circuits is in hand and will be completed by next year. Its initial application is likely to be in new submarine cables to be provided across the North Sea.

192. *Transmission Equipment.* A complete range of frequency translating equipments for use on international circuits is under development. In general they perform the same functions as translating equipments used on inland circuits but give increased facilities and better performance. They include 62 type 3 kHz channel translating equipment with built-in carrier generation and 62 type 4 kHz high grade channel translating equipment with programme infusion facilities.

193. A through-group filter is being developed which will be suitable for both 3 kHz and 4 kHz spaced channel working and may, if required, be fitted with a delay equalizer. Such through-group filters will be required to provide international group links suitable for the transmission of wideband data.

194. *International Switching and Signalling.* To cater for growth in international telephone traffic an additional switching centre is required in London by early 1970. It has been decided to use the basic 5005 Cross Bar 4-wire switching system for this purpose. Development of the system to cater for some 2,500 international circuits employing CCITT Signalling Systems Nos. 4 and 5, and giving full



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international transit switching facilities as well as terminal facilities to and from the British national network, is progressing. Semi-automatic and automatic operation will be catered for and IMC facilities and International Accounting and Traffic Analysis Equipment will be provided.

(b) *Cable and Wireless Limited*

195. *Message Switching Systems.* A fully automatic half-duplex polling and selective-switching system for a maximum of 16 outstations was developed and produced in four months to meet a target date set by BOAC for such a system in the Caribbean area. It was brought into operation during the first week of February 1967 and has performed successfully since. The design was based on electro-mechanical techniques, using the 'stunbox' switching facilities of the American Teletype Model 28 equipment. A solid-state version of the system is now being developed; using micro-miniature integrated circuits, this version will be capable of working with any make and type of teleprinter equipment.

196. *Deep Sea Camera.* During the year the design of Cable and Wireless Limited's deep sea camera was finalised, and after successful trials it was used on two surveys, namely Barcelona-Pisa and Canada-Bermuda. Valuable information about sea-bottom conditions was obtained on high quality pictures down to a depth of 2½ miles, the maximum so far attempted. The camera is, however, designed to operate at a depth of over four miles.

197. *D.c. Cable Testing.* Investigations were carried out into the automation of d.c. cable testing, and a timing unit was developed to eliminate the manual operation of the testing keys.

198. *High-Speed Telegraph Relay.* A combination of solid-state and electro-mechanical techniques resulted in the development of a very efficient high-speed telegraph relay for keying and monitoring purposes.

### Special Events

199. Special facilities were provided for important events of the year, which included:

- African Unity Conference, Addis Ababa.
- Australian Rugby Union Tour of the British Isles.
- Barbados Independence celebrations.
- Botswana Independence celebrations.
- British Lions Rugby Union Tour of Australia and New Zealand.
- Caribbean Games, San Juan.
- Commonwealth Games, Kingston, Jamaica.
- Commonwealth Prime Ministers' Meeting, Marlborough House, London.
- Guyana's Independence celebrations.
- MCC Cricket Tour of Pakistan.
- Organisation of American States Conference, Buenos Aires.
- President Ayub Khan's State visit to Britain.
- President Johnson's visit to Manila and Thailand.
- Sir Francis Chichester's World voyage.
- Visit of Her Majesty The Queen Mother to Australia.
- Visit of Mr. Kosygin to Britain.
- West Indies Cricket Tour.
- Wimbledon Lawn Tennis Championships.
- World Soccer Cup Championships held in Britain.

### Changes in Cable and Wireless Limited's Operation in Certain Countries

200. The operations of Cable and Wireless Limited in Jesselton, Sabah, were transferred to the Malaysian Government with effect from 1st January 1967.

201. The following branches in Chile were closed during the year:

- Antofagasta
- Arica
- Concepcion
- Coquimbo
- Iquique
- La Serena
- Talcahuano.

202. The branches in Los Andes and Valparaiso are due to close in June 1967. Future activities in Chile are to be concentrated on the Santiago office, and agencies are being established in former branch towns to attract traffic to Cable and Wireless Limited's routes through Santiago, via the outlets to Lima, Peru, and the Transandine system to Buenos Aires, Argentina.

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## CANADIAN NATIONAL BODY

203. *Cables.* Cables owned by the Corporation comprise:

- (1) two submarine telegraph cables between Bamfield and Port Alberni, Vancouver Island. Traffic transferred to the COMPAC cable in December 1963—these cables not now in use;
- (2) a share in the first trans-Atlantic telephone coaxial submarine cable system (TAT 1);
- (3) Hampden to Corner Brook, Newfoundland, overland 80-circuit telephone cable (CANTAT Section A3);
- (4) Hampden, Newfoundland, to mid-point of Hampden/Oban telephone coaxial submarine cable (CANTAT Section A2);
- (5) 140-circuit submarine coaxial telephone cable between Corner Brook, Newfoundland, and Grosses Roches, Quebec;
- (6) 'Indefeasible right of user' of 16 half circuits in the USA/Bermuda telephone cable system owned by AT & T Company and Cable and Wireless Limited;
- (7) Hampden to Corner Brook, Newfoundland, overland 60-circuit telephone cable and mid-point Hampden, Newfoundland/Frederiksdal, Greenland, 24-circuit telephone cable (ICECAN);
- (8) 'Indefeasible right of user' of nine half circuits in the USA/Jamaica telephone cable system owned by AT & T Company and Cable and Wireless Limited;
- (9) Segment A of the COMPAC Cable System includes the following sections:  
Vancouver (BC)/Port Alberni (BC), Port Alberni (BC)/Keawaula (Hawaii), Keawaula (Hawaii)/Suva (Fiji) (part of);
- (10) SEACOM, jointly owned with Australia, Britain, Malaysia, New Zealand and Singapore.

204. *Cable Stations*

- (1) Port Alberni and Vancouver, British Columbia.
- (2) Corner Brook, Newfoundland, and Grosses Roches, Quebec, became operational when CANTAT was brought into service on 19th December 1961.
- (3) Halifax is being retained on a standby basis with a greatly reduced staff, consequent upon the abandonment of the Halifax/Bermuda, Halifax/Porthcurno (via Azores) cables and recovery of part of the Halifax/St. John's Newfoundland telegraph cable.
- (4) Keawaula, Hawaii.

205. *Radio Stations.* Drummondville (transmitting) and Yamachiche (receiving), both near Montreal, and Cloverdale (transmitting) and Ladner (receiving) in the Vancouver area.

### Traffic

206. *Telegraph.* The statistics submitted, compared with those for 1966, show a wordage decrease of 7.06 per cent in Commonwealth to Commonwealth relations and increases of 11.97 per cent in Commonwealth to foreign and 14.43 per cent in foreign to Commonwealth relations. In foreign to foreign relations there was a decrease of 6.21 per cent.

207. *Telephone.* The overall total of 3,038,996 minutes originated traffic represents a 31.48 per cent increase over the previous year. Increases in the main streams were: Atlantic 30.22 per cent, Pacific 30.48 per cent, West Indies 86.49 per cent, Bermuda 17.17 per cent and Jamaica 52.70 per cent. Traffic received over direct circuits amounting to 409,529 minutes showed an increase of 28.58 per cent.

208. *Telex.* 677,476 minutes were used for Canadian origin telex calls, representing an increase of 25.51 per cent over the previous year. Traffic received over direct circuits amounting to 523,110 minutes showed an increase of 35.70 per cent. A steady growth continued, particularly in relations with Britain and the Federal Republic of West Germany, where the one minute minimum charge applies.

209. *Programme Transmissions booked in Canada.* 30,604 minutes of programme transmissions were booked for the period ending 31st March 1967, an increase of 23.95 per cent.

210. *Phototelegrams.* Phototelegrams forwarded totalled nine, a decrease of 36 as compared with last year.

### Services

211. *Telegraph.* No significant changes occurred in the provision of public telegraph circuits during this period.

212. *Telephone.* Semi-automatic service, with overflow via Sydney, was inaugurated with Hong Kong at the time of the opening of the SEACOM cable.

213. Additional satellite circuits were brought into service as required during the year and at 31st March 1967, 16 circuits were in daily use.

214. New services were established as follows:

Brunei	..	..	..	Via Hong Kong
Chatham Island	..	..	..	Via Auckland
Greenland	..	..	..	Via Copenhagen
Korea, South	..	..	..	Via Tokyo
Nevis	..	..	..	Via Barbados
Ryukyu Islands	..	..	..	Via Tokyo
Taiwan	..	..	..	Via Tokyo
Thailand	..	..	..	Via Hong Kong
Tortola	..	..	..	Via Barbados
Trucial States:				
Abu Dhabi	..	..	}	Via London
Dubai	..	..		
Jebel Dhana	..	..		
Ras al Khaimah	..	..		
Tarif	..	..		

215. *Telex*. Canadian telex subscribers—domestic and TWX—now total approximately 15,000.

216. Telex service was established with the following countries: Antigua, Botswana, Dominica, El Salvador, French Antilles, Grenada, Montserrat, Muscat, Nicaragua, St. Kitts, St. Lucia, St. Vincent, Sierra Leone and Trucial States (Dubai).

217. Telex service is now available to 133 countries.

218. *Leased Circuits*. Active interest continues to be shown in the leasing of circuits. A total of 91 leased telegraph circuits and 28 leased telephone circuits were being provided at 31st March 1967. In addition 38 transit telephone circuits and 140 transit telegraph circuits are provided for leasing and public message traffic purposes.

### Capacity of Services

219. *Telegraph*. Capacity was available to meet all requirements.

220. *Telephone*. On-demand working prevailed for public services except during peak traffic periods for the Europe-North American working hours. The additional circuit capacity required for extension of circuits to SEACOM and for increasing Pacific area traffic continued to tax severely available facilities. The installation of TASI equipment at Montreal and the use of additional satellite circuits will assist in alleviating this situation.

221. Capacity for public service between Canada and Pacific points was adequate for existing traffic levels. The requirement for circuit capacity for extension of SEACOM circuits will severely tax the available facilities in the Pacific until the TASI system between Sydney and Vancouver is brought into service.

222. *Telex*. Additional circuits opened on heavy traffic routes according to need, coupled with a major expansion of the Montreal international exchange during March 1967, eliminated delays previously encountered during peak traffic hours.

### Rates

223. *Telegraph*. The following changes to telegraph rates were made:

Argentina	..	..	Press rate reduced from \$0.13 to \$0.07.
Bolivia	..	..	Press rates reduced from \$0.13 and \$0.15 to \$0.06.
Italy	..	..	Ordinary rate increased from \$0.25 to \$0.26.
Jordan	..	..	Ordinary rate increased from \$0.27 to \$0.31; Press rate increased from \$0.065 to \$0.075.
Peru	..	..	Ordinary rate to Tacna increased from \$0.41 to \$0.48; Press rates reduced from \$0.13, \$0.145 and \$0.166 to \$0.07.
Tortola (B.V.I.)	..	..	Ordinary rate reduced from \$0.31 to \$0.21; Press rate reduced from \$0.075 to \$0.02.

The following rates were introduced:

Urgent	..	..	..	\$0.42
Urgent Press	..	..	..	\$0.105
GLT	..	..	..	\$0.105
Uruguay	..	..	Press rates reduced from \$0.13 and \$0.155 to \$0.06.	
USSR	..	..	Press rate reduced from \$0.09 to \$0.06.	

224. Preferential Government rates were abolished with Angola, Bahamas, British Honduras, Brunei, Cayman Islands, Cyprus, Gibraltar, Irish Republic, Israel, Jordan, Macao, Nigeria, Portugal, Portuguese Guinea, Principé, San Thomé, Solomon Islands, Syrian Arab Republic, Turks Island and United Arab Republic.

225. With effect from 1st October 1966, due to increased Canadian landline requirements, outgoing rates were increased by \$0.02 per ordinary word to all Commonwealth and foreign destinations, and \$0.01 per ordinary word to destinations where Bermuda pattern rates apply. At the same time press rates were increased by two-thirds of one cent where rates were formerly one-third of ordinary, and also where rates ended in fractions of thirds. Where former press rates ended in one-half cent, the rate was rounded up to the next cent. Bermuda pattern press rates were increased by one-half cent. Commonwealth press rates remained unchanged.

226. *Telephone.* Station-to-station service with lower rates was introduced with Austria, Belgium, Denmark, Faroe Islands, Finland, France, Germany, Greece, Greenland, Italy, Liechtenstein, Luxembourg, Monaco, Netherlands, Norway, Sweden, Switzerland and Vatican City.

227. The St. Pierre-Miquelon unit rate was reduced by \$1.50 from all Canadian Zones.

228. *Telex.* The Jamaica unit rate was reduced from \$9.00 to \$7.50.

**Special Events**

229. Special facilities were provided for programme and facsimile transmissions during the World Football Cup matches.

**Modernisation and Expansion of the System**

230. Installation of the automatic switching equipment for telegraph operations is proceeding and it is expected that this equipment will be put into service during 1967.

231. Expansion of the telex and telephone switching facilities at Montreal was completed in March 1967. A further expansion to meet anticipated requirements in 1969 is proceeding.

**AUSTRALIAN NATIONAL BODY**

232. *Telephone Cable Stations.* For the Commonwealth telephone coaxial submarine cable systems COMPAC and SEACOM at Sydney, N.S.W., Cairns (Queensland), Madang (New Guinea), and Guam (US Territory). The telegraph cable stations at Cottesloe (Western Australia), and Cocos Island were closed on 31st July 1966.

233. *Radio Stations.* At Doonside (transmitting) and Bringelly (receiving) in New South Wales, Fiskville (transmitting) and Rockbank (receiving) in Victoria, Applecross (transmitting), Gngangara (transmitting) and Bassendean (receiving) in Western Australia. The Gngangara Station commenced operation on 1st March 1967 for limited (NASA) purposes only. It will take over all Applecross transmissions during the current year.

234. *Satellite Earth Stations.* At Carnarvon, Western Australia, commenced October 1966, providing for the Apollo project, voice, data and telegraph links between the NASA tracking station in that area and the control centre in the USA.

235. Under construction, at Moree, New South Wales, and scheduled to become operational in December 1967.

**Traffic**

236. *Telegraph.* Total telegraph traffic handled by Australia (excluding that from or via other National Bodies) increased from 61.53 million gross words in 1965/66 to 66.05 million gross words in 1966/67 (+7.35 per cent). The variations relative to the individual traffic streams concerned were:

	<i>Increase in Gross Words 000's</i>	<i>Per cent</i>
From Australian origins and adjacent Commonwealth Islands to Commonwealth destinations .. .. .	771	(2.7)
From Australian origins and adjacent Commonwealth Islands to foreign destinations .. .. .	2,489	(12.8)
From foreign origins to Australia and other Commonwealth countries .. .. .	1,056	(8.8)
From foreign origins to foreign destinations .. .. .	208	(13.6)

237. The traffic outward from Australia was substantially influenced by a fall of 1·53 million words in the volume of Press traffic handled (24·4 per cent). Excluding this press traffic the increase in commercial traffic was 11·5 per cent.

238. Little importance can be attached to the marked fluctuation in press traffic because the basic flow of news media is now carried over full-time leased telegraph circuits, with that handled on the public network tending to be directly influenced by the special press coverage given to the exceptional sporting and other news events which have taken place during any particular year. However, the continued increase in commercial traffic represents a steady growth in the outward flow of traffic from Australia.

239. *Telephone*. Overall traffic handled (excluding that from or via other National Bodies) increased by 560,000 paid minutes (+29·4 per cent) from 1·905 million paid minutes in 1965/66 to 2·465 million paid minutes in 1966/67.

240. Variations under individual traffic streams were:

	<i>Paid Minutes 000's</i>	<i>Per cent</i>
From Australia .. .. .	488	(33·9)
To Australia on direct foreign circuits ..	95	(22·9)
Transit traffic .. .. .	-23	(-45·6)

241. The decrease in transit traffic reflects in the main the transfer of USA traffic to South-East Asia from routes via Australia to the direct TPC/SEACOM cable route following the commissioning of the Guam/Hong Kong section of SEACOM in August 1966.

242. The increases in outward Australian traffic and inward traffic over direct foreign circuits continue the substantial growth in telephone usage arising from the availability of plentiful and reliable broadband coaxial cable circuits.

243. *Phototelegraph*. There was a decrease of 56 from 1,712 to 1,656 in the number of phototelegrams transmitted during the year. As with press traffic, phototelegrams normally are associated with sporting and special events and happenings so that fluctuations have no significant long term trend.

244. *Telex*. Overall traffic growth (excluding calls from and via other National Bodies) was from 1,232,000 paid minutes in 1965/66 to 1,361,000 paid minutes in 1966/67 (an increase of 129,000 paid minutes or 10·5 per cent). In detail the variations were:

	<i>Paid Minutes 000's</i>	<i>Per cent</i>
From Australia .. .. .	158	(20·7)
To Australia over direct foreign circuits ..	-23	(-5·7)
Transit traffic .. .. .	-6	(-9·0)

245. The decrease in telex transit traffic is also associated with the opening of the Guam/Hong Kong link of the SEACOM cable, whilst the decrease in traffic received over direct foreign circuits reflects the second year effect of the opening of a considerable number of leased circuit services with Japan during the middle of 1965/66.

246. *Leased Services*. During the year 22 additional circuits were leased to customers and there are now 46 regular users of the Commission's leased circuit services compared with 40 at 31st March 1966. Several clients rent multiple circuits to the same or different destinations.

## Services

247. Although the Indian Ocean telegraph cable chain was closed on 27th February 1966, the section between Australia and Cocos Islands remained open to provide service to the Islands up to 1st August 1966. Since that date service has been by radio provided by the Department of Civil Aviation as agent for OTC (A).

248. *Telephone*. Telephone services were extended during the year to:

Turks Island via Montreal/Jamaica  
Tortola via Montreal/Barbados  
Paraguay via Oakland/New York  
Cambodia via Hong Kong  
Liberia via London.

249. *Phototelegraph*. The Australia/Canada service was extended to Peru from 15th June 1966, and the Japan/Australia service was transferred from a switched service via Singapore to direct operation from 24th August 1966.

250. An 'on demand' service with Seoul via Hong Kong commenced on 10th September 1966.

251. *Telex*. Services were opened with Kenya, Uganda, Tanzania, USSR, Dubai, Muscat (Persian Gulf) and Zambia via London; Ryukyu Islands via RCA/San Francisco, Nicaragua and El Salvador via ITTCOM/New York; and Antigua, Dominica Island, Grenada, St. Kitts, St. Lucia and St. Vincent via Montreal.

**Modernisation and Expansion of the System**

252. *SEACOM*. The SEACOM Cable Stations at Guam, Madang and Cairns, constructed and operated by OTC(A), were completed during the year. The Guam/Hong Kong link came into service on 17th July 1966, and the Guam/Madang/Cairns/Sydney sections (Cairns/Sydney being overland via microwave and coaxial cable) followed on 30th March 1967.

253. A formal opening ceremony by Her Majesty The Queen, bringing in the entire Commonwealth Telephone Cable system from London to Kuala Lumpur, marked the completion of this major project.

254. *Satellite Earth Stations*. Australia's entry into satellite communication was achieved with the completion of the OTC(A) satellite earth station at Carnarvon, Western Australia, and the successful launching, by the International Telecommunications Satellite Consortium (INTELSAT), of the Pacific INTELSAT II satellite. A commercial service, providing leased voice/data and telegraph circuits to the USA National Aeronautics and Space Administration (NASA) between Australia and the USA, commenced operation on a full-time basis on 4th February 1967. On 25th November 1966, the station was used for a live television demonstration relay between Carnarvon and London.

255. A contract has been let for the construction of a satellite earth station near the town of Moree, New South Wales. The station is scheduled to be available for operation in December 1967, via the INTELSAT II satellite already in orbit over the Pacific Ocean, and will provide connection into the Australian domestic network, not available from the Carnarvon satellite earth station.

256. *HF Radio*. The Gngangara High Frequency Radio Transmitting Station, Western Australia, was placed in operation on 1st March 1967, with the opening of service on new leased voice/data and telegraph circuits for the National Aeronautics and Space Administration (NASA). Other services via Western Australia, currently carried by the Applecross Transmitting Station, will be transferred to Gngangara during the coming year.

257. *Telex Developments*. Conversion of the Australian national telex network to automatic operation has enabled the introduction of subscriber-to-subscriber working in the direction incoming to Australia in some cases. Plans are in hand to provide call charging equipment at the overseas gateway exchange in Sydney in order to permit subscriber-to-subscriber operation in the direction outgoing from Australia.

258. *COMPAC*. Installation of equipment permitting two additional out-of-band circuits to be derived between Sydney and Auckland was completed on 10th February 1967. A contract was placed for the Sydney terminal of the proposed Time Assignment Speech Interpolation (TASI) system to be established between Sydney and Vancouver and installation is in progress with a view to the system being placed in service during the latter half of 1967.

259. *Telegraph Mechanisation*. A contract was let for the supply of an automatic message relay centre at the Overseas Telecommunications Terminal, Paddington, in Sydney, involving digital computer control with keyboard-operated cathode ray display units at the message preparation positions at OTC(A) telegraph operating offices in Sydney and Melbourne. The system is scheduled to begin operational trials at the end of 1967.

**Research and Development**

260. The collaboration which the Overseas Telecommunications Commission (Australia) maintains with other authorities and research organisations was continued; the financial contribution to the work of the Radio Research Board, which is primarily concerned with the encouragement of research in radio propagation in all its aspects within the Universities of Australia, was continued.

261. The Australian National Body continued to play an active part in Meetings of the Interim Communications Satellite Committee and its advisory sub-committees on Technical and Financial matters.

**NEW ZEALAND NATIONAL BODY**

262. *International Telegraph Offices*: Auckland; Wellington.

263. *Radio Stations*: Himatangi (transmitting), Makara (receiving).

**Traffic**

264. *Telegraph*. Outward telegraph words from New Zealand and received words from foreign origins on direct circuits during the year ended 31st March 1967, compared with the previous year, were as follows:

	1966	1967	Percentage Increase
Outward traffic	17,612,753	19,423,676	10.3
Traffic received from foreign origins on direct circuits	1,014,808	2,323,675	129

265. A large proportion of the apparent increases (1,678,867 words and 1,226,441 words respectively) represent traffic on the direct circuits with Western Samoa, Cook Islands and Niue which were included in the First Wayleave Scheme from 1st April 1966.

266. *Telephone.* The number of outward paid minutes increased by 240,981 during 1966/67—from 981,117 during 1965/66 to 1,222,098—representing a 24·6 per cent increase. The average call duration increased slightly from 6·2 minutes in 1965/66 to 6·4 in 1966/67.

267. The following table shows the continued growth in traffic to individual countries:

<i>Year ended 31st March:</i>	<i>Outward paid minutes</i>		<i>Percentage Increase</i>
	1966	1967	
Australia .. .. .	660,359	817,247	24
Britain .. .. .	182,104	218,017	20
Canada .. .. .	18,671	27,184	46
Fiji .. .. .	43,632	54,258	24
USA .. .. .	70,235	95,415	36

268. There were 2,497 paid minutes from New Zealand to ships at sea, during the year ended 31st March 1967, compared with 2,474 minutes in the previous year.

269. *Phototelegraph.* 475 outward phototelegrams were handled during 1966/67 compared with 578 in 1965/66. The higher figure in 1965/66 was due to the 1965 tour of New Zealand by the South African Rugby Union Football Team.

270. *Telex.* During the year ended 31st March 1967, there were 256,590 outward minutes of telex traffic, compared with 213,241 minutes in 1965/66—an increase of 20·3 per cent.

### Services

271. *Telephone.* One additional Auckland–Vancouver manual telephone circuit was introduced on 4th April 1966. On 13th April two additional Auckland–London time-patched manual telephone circuits were brought into service, one of these being relinquished on 13th February 1967.

272. On 12th December 1966, two additional Auckland–Oakland manual cable circuits were established.

273. The international telephone service was extended to the following places during 1966/67:

via *Sydney*: Macao.

via *London*: Albania, Angola, Ascension Island, Azores, Burundi, Cameroons, Cape Verde Islands, Central African Republic, Chad, Congo (Brazzaville), Congo (Kinshasa), Dahomey, Ethiopia, Gabon, Gambia, Guinea, Iraq, Ivory Coast, Kuwait, Libya, Madeira, Malagasy Republic, Mali Republic, Mozambique, Muscat-Oman, Niger, Portuguese Guinea, Príncipe, Qatar (Doha), Reunion, Rwanda, St. Helena, St. Thomé, Senegal, Sierra Leone, Sudan, Togo, Trucial States, Upper Volta.

via *Oakland*: Aruba, Bonaire, British Virgin Islands (Tortola), Curaçao, Dominican Republic, French Guiana, Guadeloupe, Martinique, Paraguay, St. Martin, Surinam.

via *Montreal*: Miquelon, St. Pierre, Turks Island.

274. Agreement was reached with 23 further countries to establish the 'collect' telephone service.

275. *Phototelegraph.* The phototelegraph service was extended to South Korea during the year.

276. *Telex.* During the year the international telex service was extended to:

via *London*: Aden, Algeria, Ghana, Nigeria, Poland, Sierra Leone, Vatican City.

via *San Francisco*: RCA—Bahamas, Ryukyu Islands, Surinam. ITT—El Salvador, Nicaragua.

277. The introduction of the Australian automatic telex network in June 1966, enabled connections with Australian subscribers to be obtained direct by New Zealand operators. This resulted in a marked improvement in the setting-up time of telex calls to Australia.

278. *Leased Circuits.* A75 baud teleprinter circuit from Canberra to Wellington leased by the United States Embassy for the visit to New Zealand of President Johnson in October was retained on a permanent basis.

279. *Reception Services.* A one-way reception service of radio signals from Noumea (New Caledonia) commenced on 3rd July 1966, on behalf of the French Embassy, Wellington. The signals are received for about one hour daily from Monday to Saturday inclusive.

280. The radio reception of the London Press Service on behalf of the British High Commission, Wellington, was discontinued as from 31st March 1967.

**Capacity of Services**

281. *Telegraph*. Requirements are adequately covered.

282. *Telephone*. Demand telephone service to Australia could not be provided at peak times and it became necessary, towards the end of 1966/67, to introduce more circuits. (Five additional circuits were established on 1st April 1967.)

283. Capacity to other destinations is adequate at present but further circuits will be necessary to cater for continuing growth.

284. *Telex*. Present capacity is adequate for immediate needs.

**Major Changes in Traffic Handling**

285. On 18th July 1966, the New Zealand terminal of the TOR circuit to Canada was transferred from Wellington to Auckland, and traffic for this circuit is now routed on Auckland.

286. The CCITT Recommendation F31 format for message signalling was adopted for all outward traffic as from 3rd October 1966.

**Rates**

287. Following a routing change from via Oakland to via Vancouver/Montreal, the rate for telephone calls to the British Virgin Islands was reduced from £4 10s. 0d. for a three-minute call to £3 15s. 0d.

**Modernisation and Expansion of the System**

288. A new international gateway telephone exchange for New Zealand is to be established at Auckland to replace the present exchange, which was installed in 1961 on a temporary basis to cater for the introduction of the COMPAC cable. The new exchange will accommodate 60 international circuits and 80 national circuits together with a manual switchboard of 24 positions. The switchboard will provide for direct operator dialling on outward routes, and also for manual assistance on inward calls as necessary. Most incoming calls will be switched automatically to the called numbers in New Zealand, and the equipment will also provide for the automatic switching of other international through calls which may require to transit New Zealand in the future. The new exchange is planned to cut over in May 1968.

289. It is proposed to provide equipment for automatic ticketing of international telex calls to facilitate the introduction of fully automatic telex operation during 1967.

290. The number of subscribers to the national telex system totalled 647 as at 31st March 1967, compared with 441 at the same time last year.

291. With the opening of the SEACOM cable on 30th March 1967, high quality communication links are now available between New Zealand and countries in South East Asia. It is expected that traffic with these countries will increase substantially.

**Special Events**

292. During the visit to New Zealand of Her Majesty The Queen Mother from 16th April to 4th May 1966, a moderate amount of public Press traffic was lodged—6,888 press words and 17 phototelegrams.

293. The British Isles Rugby Union Team toured New Zealand from June to September 1966, and an additional telegraph circuit between Auckland and London was introduced on a temporary basis to assist with the clearance of traffic on match days. 2,644 press telegrams were lodged during the tour, representing 505,253 words. In addition there were 37 phototelegrams, and 12 programme transmissions comprising 420 minutes.

294. 7,964 press words were lodged during a short visit by the British Isles Rugby League Team in August 1966.

295. President Johnson of the United States visited Wellington on 19th and 20th October 1966, and the following additional circuits were provided on a temporary basis:

			<i>Leased</i>	<i>Public</i>
Telegraph	..	..	3	6
Telephone	..	..	3	4

(One leased telegraph circuit was later retained on a permanent basis.)

296. Public telegraph traffic arising from President Johnson's visit was lighter than anticipated and was cleared without difficulty. 122 telegrams were sent comprising 28,518 words, plus 71 phototelegrams. There were, in addition, 32 programme transmissions representing a total paid time of 636 minutes, as well as four private-to-private phototelegraph transmissions totalling 170 minutes.

297. Special telex facilities were provided for news media representatives covering the visit, and the facilities were well patronised, a total of 131 calls being made comprising 1,221 minutes.



## INDIAN NATIONAL BODY

298. *Cable Stations.* Submarine telegraph cable links operate with Aden and Singapore from Bombay and Madras respectively, with inter-connecting landline links.

299. *Radio Stations.* Point-to-point radio transmitting and receiving stations are operated at four gateway centres:

- (1) New Delhi: Kalkaji (transmitting) and Chattarpur (receiving);
- (2) Bombay: Dighi (transmitting) and Dhond (receiving);
- (3) Calcutta: Haliashahar (transmitting) and Hatikanda (receiving);
- (4) Madras: Korattur (transmitting) and Padianallur (receiving).

### Traffic

300. *Telegraph.* The originated international traffic handled by the Indian National Body registered an increase of 2·96 per cent in the number of messages and a decrease of 28·66 per cent in the number of words as compared with 1965/66. The comparison of wordage with 1965/66 is misleading because of the very abnormal wordage registered in 1965/66 due to international events involving India. About 50·48 million originated words (about 1·6 million originated messages) were handled during the year.

301. *Telephone.* The originated telephone traffic (including programme transmissions) registered an increase of 18·91 per cent in number of calls and 18·14 per cent in total number of paid minutes as compared with the previous year. About 245,000 paid minutes were handled during the year. Some significant improvement in the quality of service offered has been noticeable on the main India-Britain services following the technical improvements in aerials and the various operational steps taken jointly with the British National Body. A quarter-speed radioteleprinter circuit has been in use between London and Poona international telephone exchanges for handling ancillary information on the telephone traffic. The utility of this arrangement has been confirmed, and plans are under way to extend this arrangement between London and other Indian international exchanges at Calcutta and New Delhi by organising a tape relay at Poona to link with Calcutta and New Delhi.

302. *Telex.* Originated international telex traffic registered an increase of 26·74 per cent in number of calls and 19 per cent in number of paid minutes as compared with the previous year. About 322,000 paid minutes of originated traffic were handled during the year. Two of the telex circuits on the London-Bombay route were converted to semi-automatic from 8th July 1966, marking the beginning of direct access to the automatic domestic telex network. Most of the international telex traffic is cleared over 5 circuits between Bombay and London, 4 circuits between New Delhi and London and 3 circuits between Calcutta and London. The total number of international telex circuits operated from India is 17.

303. *Phototelegraph.* The originated phototelegraph traffic registered a decrease of 35·10 per cent in messages and 32·99 per cent in total area over the previous year. During the year 429 messages with a total area of 172,050 sq. cms. were handled.

### Services

304. *Telegraph.* A direct radiotelegraph circuit between Bombay and Lagos was opened on 14th November 1966. The second Bombay/London ARQ public telegraph channel, Bombay/New York (RCA, via Tangier—auto-relay), Bombay/Hamburg, Bombay/Berne and Bombay/Cairo public telegraph channels have been placed on a semi-automatic message relay basis during the period.

305. *Telephone.* No additional telephone service was opened during the period.

306. *Telex.* Telex service with Britain has been extended to Dubai, Nigeria and Muscat and is now available with 56 countries via London.

307. *Phototelegraph.* Phototelegraph service was made available from Madras Centre from 30th April 1966.

308. *Leased Services.* The number of leased teleprinter channels has increased during the year with the following additions and terminations:

Additions:	(1) New Delhi-London	..	..	..	..	..	Half speed
	(2) New Delhi-Melbourne (via Bombay-Singapore)	..	..	..	..	..	Full speed
	(3) Bombay-Nairobi (via Singapore)	..	..	..	..	..	Quarter speed
	(4) Bombay-London	..	..	..	..	..	Quarter speed
	(5) Calcutta-Hong Kong	..	..	..	..	..	Quarter speed
	(6) Bombay-Tokyo	..	..	..	..	..	Quarter speed
Terminations:	(1) Bombay-Zurich	..	..	..	..	..	Quarter speed
	(2) Bombay-Aden (via Singapore)	..	..	..	..	..	Quarter speed
	(3) Bombay-London	..	..	..	..	..	Quarter speed.

**Modernisation and Expansion**

309. Installation of equipment for the semi-automatic message relay distribution system (SAMDIS) was completed at Bombay. Work at other centres is in progress. Most of the major circuits in Bombay have been connected to the new unit. Calcutta, New Delhi and Madras are expected to be ready by mid-1967. Traffic operating procedures are gradually changing over to F31 pattern.

310. *Telex circuits with London.* Two additional telex circuits—one each from Bombay and Calcutta—were opened with London. One additional telex circuit was opened on the Bombay–Osaka route, bringing the total number of telex circuits working from India to 17, of which 12 work with London. Arrangements are in progress to open a direct service with Sydney and to augment further the number of circuits with London.

311. *Service Facilities.* The Bombay/London route was converted to multi-channel FDMX (frequency division multiplex) working using TA5 type of equipment (six channel tone keying) to provide capacity for growing requirements of telex circuits. Chief additions made to equipment are:

- (1) Three 2 × 2 Electronic TOR equipments installed at Bombay;
- (2) One 250 KVA automatic voltage regulator installed at Halihsahar Transmitting Station, Calcutta;
- (3) Multi-channel FDMX equipment, type TA5, put into service on the Bombay–London W/T circuit;
- (4) 200 ft. high three-tier rhombics installed at Poona for radiotelephone service with Sydney.

312. *Future Plans—Satellite Communications.* Plans are progressing for the establishment of an earth station at Arvi near Poona, and the station is expected to be operational in 1968/69.

313. *Development and Construction.*

- (1) Electronic multiplex equipment not having automatic phasing and marked cycle facilities was fitted with locally developed and fabricated units for incorporation of these facilities at the New Delhi branch. Similar units are being fitted to multiplex equipment at Calcutta.
- (2) A number of four-channel electronic multiplex equipment not initially capable of operation as 2 × 2 units were modified for such operation at Overseas Communications Service branches.
- (3) A telegraph receiver Marconi type HR91 was converted for telephone operation. The modified receiver could be used as either a telegraph or telephone receiver, as required.
- (4) A number of TAG (telex repetition) units for operation with electronic multiplex equipment on telex circuits have been constructed.
- (5) Work is in progress in respect of:
  - (i) Five-unit test signal generator;
  - (ii) Transistorised tester for 5-wire simultaneous TDs (transmitter distributors) and FRXDs (fully automatic reperforator transmitter distributors);
  - (iii) Start/stop regenerators;
  - (iv) Synchronous and start/stop telegraph distortion measuring test;
  - (v) Construction of synchronised regenerators (transistorised).

**Rates**

314. *Revision of Collection Charges during the year 1966/67.* The entire structure of telegraph, telephone, telex and phototelegraph collection charges was revised in June 1966, following the devaluation of Indian currency by 36.5 per cent. The main features of the new rate pattern are as follows:

(100 paise = 1 rupee: Rs.21 = £1 sterling)

(1) *Telegraph:*

Intra-Commonwealth penny press .. .. .	8 paise per word (increased from 6 paise)
<b>Public message telegrams:</b>	
(Numerous individual country rates now grouped into slabs)	
Slab 1—Intra-Commonwealth, non-Commonwealth proximate countries (Middle East, Arabia, South-East Asia) .. .. .	100 paise per ordinary word
Slab 2—Europe, Africa and East Asia, Oceania ..	130 paise per ordinary word
Slab 3—South, Central and North American countries .. .. .	160 paise per ordinary word
<b>Ordinary press rates (other than penny press):</b>	
Slab 1—(As above) .. .. .	25 paise per ordinary word
Slab 2—(As above) .. .. .	30 paise per ordinary word
Slab 3—(As above) .. .. .	40 paise per ordinary word

(2) Telephone:

Slab 1—Proximate countries .. .. .	Rs.39 up to 3 minutes (increased from Rs.33), and Rs.13 per additional minute or part thereof. Rs.4 report fee (increased from Rs.3.50)
Slab 2—Inter-continental direct services .. .. .	Rs.54 up to 3 minutes (increased from Rs.45) Rs.5.50 report fee (increased from Rs.4.50)
Slab 3—Inter-continental switched services .. .. .	Rs.63 per unit call (increased from Rs.54) Rs.6.50 report fee (increased from Rs.5.50)

(3) Telex:

Slab 1—Proximate countries .. .. .	Rs.36 per unit call (increased from Rs.30)
Slab 2—Inter-continental direct services (including European destinations) .. .. .	Rs.48 per unit call (increased from Rs.42)
Slab 3—Inter-continental switched services .. .. .	Rs.57 per unit call (increased from Rs.51) Rs.5 report fee (increased from Rs.4)

(4) Phototelegraph:

(Numerous individual country rates now grouped into slabs)	Up to 150 sq. cms.	Additional 100 sq. cms. or part
Slab 1—Intra-Commonwealth direct circuit services:		
‘Ordinary’ .. .. .	Rs.80	Rs.25
‘Press’ .. .. .	Rs.50	Rs.17
Slab 2—Intra-Commonwealth switched services:		
‘Ordinary’ .. .. .	Rs.115	Rs.35
‘Press’ .. .. .	Rs.75	Rs.25
Slab 3—Non-Commonwealth services:		
‘Ordinary’ .. .. .	Rs.120	Rs.60
‘Press’ (where available).. .. .	Rs.60	Rs.30

(5) Leased Telegraph channels:

	Rs.	Rs.
Full time full speed .. .. .	375,000 (increased from 285,000)	
Full time half speed .. .. .	250,000 (increased from 190,000)	
Full time quarter speed .. .. .	150,000 (increased from 114,000)	
Full time full speed—Bombay—Colombo .. .. .	250,000 (increased from 200,000)	
Full time half speed—Bombay—Colombo .. .. .	166,000	
Full time quarter speed—Bombay—Colombo .. .. .	100,000	

Rebates on 2nd, and on 3rd and subsequent channels, taken by the same lessee, continue to be 5 per cent and 10 per cent respectively of basic rental.

Surcharges for multi-user channels also remain unchanged at 10 per cent per approved co-sharer, subject to a maximum of 37½ per cent.

### International Participation

315. India participated in the following international conferences during the year:

- (1) Plan Asia and Oceania Meeting of the CCITT at Melbourne—September 1966.
- (2) CCITT Study Group Meetings at Melbourne—September/October 1966:
  - (i) Joint Working Party on Message Retransmission—Study Groups I and X;
  - (ii) Joint Working Group on World-Wide Telex and Gentex Plan;
  - (iii) Study Group I;
  - (iv) Joint Meeting of Study Groups I and X and Meeting of Study Group X.

CEYLON NATIONAL BODY

316. *Cable Station.* Colombo, with facilities for terminal and relay services.

317. *Radio Stations.* Kadirana transmitting and Pothode receiving stations, with facilities for telegraph and telephone terminal and relay services. Phased-out transfer of transmitting station to new site at Kotugoda has commenced, and already telephone services are operated from the new station. All services operated from the present transmitting station at Kadirana will be transferred to the new station at Kotugoda this year, when Kadirana will be converted to a second receiving station.

**Traffic**

318. *Telegraphs.* The number of words transmitted during the year ended 31st March 1967, totalled 8,587,178, showing an increase of 0.63 per cent over the previous year.

319. *Telephone.* The number of paid minutes of originated telephone calls during the year ended 31st March 1967, was 31,711 paid minutes, representing an increase of 28.97 per cent over the previous year.

320. *Phototelegraph.* The number of phototelegrams forwarded during the year ended 31st March 1967, was 15, compared with three in the year ended 31st March 1966.

321. *Telex.* For the year ended 31st March 1967, there were 126,293 paid minutes of outgoing telex traffic, which represented an increase of 49.84 per cent over the previous year.

**Services**

322. *Telegraph.* One London-Hong Kong telegraph/telex circuit is being relayed via Colombo.

323. *Telephone.* New telephone services via Hong Kong to Manila, via London and New York to Hawaii and Puerto Rico, and via London and Canada to Barbados, Trinidad, Guyana, Leeward Islands, Windward Islands, Tortola (British Virgin Islands) and Turks Island were opened.

324. *Telex.* 19 new subscribers were connected to the system, bringing the total number to 44. There is a waiting list of 15 applicants, and it is expected to provide them with service before the end of the year. During the year service was made available to Manila, New Zealand (alternative route), Singapore and Pakistan via Hong Kong; and to Algeria, South Africa and Argentina via London.

325. *Leased Circuits.* With the cessation of a circuit to Sydney, the number of leased circuits has been reduced from four to three.

**Capacity of Services**

326. Adequate capacity was available to meet all requirements, except in the case of telex service. Plans have been finalised to bring in two additional telex channels to London, when the situation will improve.

**Modernisation and Expansion of the System**

327. The Development Programme initiated five years ago will be completed with the transfer to the new transmitting station at Kotugoda. A fresh programme will be drawn up once a decision on satellite communications is made.

328. *Overseas Telegraph Office—Cable Station.* International telex service continues to expand, and the installation of a semi-automatic telex exchange is under tender action. Work on the new building continues satisfactorily and is scheduled for completion by the end of 1968.

329. *Radio Transmitting Station.* Installation of diesel alternators at the new site at Kotugoda has commenced. When completed, they will ensure a reliable power supply and will facilitate complete transfer of services to the new site.

330. *Radio Receiving Station.* Once the transfer of the transmitting station to the new site at Kotugoda is completed this year, work will commence on converting the present transmitting station at Kadirana to a receiving station for telegraph circuits. The present receiving station at Pothode will then be restricted to radiotelephone services.

**Other Information**

331. One senior officer returned after pursuing postgraduate studies in Management at the University of Manchester. During the year another technical officer completed a course of training in Advanced Submarine Cable Engineering at the Cable and Wireless Engineering College and has resumed work.

332. A delegate from the Ceylon National Body attended the CCITT Asia Plan Committee Meeting held in Melbourne during September 1966.

## GHANA NATIONAL BODY

333. *Cable Station.* Accra.

334. *Radio Stations.* Bubuashie (transmitting) and Adentan (receiving).

### Traffic

335. *Telegraph.* Total traffic forwarded during the year was 4,240,177 words, a decrease of 28 per cent from the previous year's total. This decrease could be attributed to the abnormally high traffic recorded for February 1966, following the change of government in Ghana.

336. *Telephone.* A total of 85,295 paid minutes was obtained from the originated telephone traffic handled during the year, an increase of 8 per cent over traffic for the previous year.

337. *Phototelegraph.* The number of phototelegrams forwarded totalled 57, covering 24,932 sq. cms., a fall of 43 per cent and an increase of 1 per cent compared with the respective figures for the previous year.

338. *Telex.* Forwarded traffic yielded 86,014 paid minutes, an increase of 8 per cent compared with the preceding year's figure.

### Services

339. *Telegraph.* A second telegraph circuit to London was connected to the London tape relay centre on a permanent basis.

340. *Telephone.* Direct radiotelephone services were established with Lome, Dakar, Abidjan and Ouagadougou on a schedule basis.

341. *Telex.* The number of telex subscribers remained at 50. Extension of the existing telex exchange at Accra from 50 to 200 subscribers was in sight, and additional circuits to London were planned (see paragraph 344 below).

342. *Leased Circuits.* There were no new circuits leased during the year.

### Modernisation and Expansion of the System

343. A project was under study to introduce a protected ARQ circuit to link Accra with Freetown. The submarine cable previously carrying the telegraph circuit between the two terminals went faulty in June and remained so till the end of the year, due to long stretches of this cable requiring replacement, with consequent high maintenance expenditure.

344. Additional TOR equipment already on the high seas was expected to provide two more telex channels to London.

345. The access roads to the two radio stations at Bubuashie and Adentan, previously laterite and subgrade, were surfaced and brought up to standard.

## MALAYSIAN NATIONAL BODY

346. *Cable Stations.* Penang, Jesselton.

347. *Radio Stations.* Jesselton, Kuala Lumpur.

### Traffic

348. *Telegraph.* The total number of originated words from Malaysia during the period was 8,367,000 compared with 5,830,410 in 1965.

349. *Telephone.* The total amount of originated traffic in paid minutes from Malaysia during the period was 213,364 compared with 59,116 in 1965.

350. *Telex.* The total amount of originated traffic in paid minutes from Malaysia during the period was 70,827 compared with 62,494 in 1965.

### Services

351. The following new direct telephone, telegraph and telex circuits were provided during the year:

<i>Telephone</i>			
Kuala Lumpur-London	..	..	1
Kuala Lumpur-Oakland (ATT)	..	..	2
Kuala Lumpur-Manila (RCA)	..	..	1
Kuala Lumpur-Tokyo	..	..	1
Kuala Lumpur-Sydney	..	..	1
Kuala Lumpur-Jakarta	..	..	1
Kuala Lumpur-Medan	..	..	1
Kuala Lumpur-Bangkok	..	..	1

}	Scheduled Radio Service
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*Telegraph*

Kuala Lumpur-Manila .. ..	1
Kuala Lumpur-Tokyo .. ..	1
Kuala Lumpur-New York (ITT) .. ..	1
Kuala Lumpur-San Francisco (RCA) .. ..	1
Kuala Lumpur-New York (WUI) .. ..	1
Kuala Lumpur-London .. ..	1
Kuala Lumpur-Jakarta .. ..	1 Scheduled Radio Service

*Telex*

Kuala Lumpur-Hong Kong .. ..	1
Kuala Lumpur-Jesselton .. ..	1
Kuala Lumpur-San Francisco (RCA) .. ..	1
Kuala Lumpur-San Francisco (ITT) .. ..	1
Kuala Lumpur-San Francisco (WUI) .. ..	1
Kuala Lumpur-Manila .. ..	1
Kuala Lumpur-Tokyo .. ..	2
Kuala Lumpur-Sydney .. ..	4

**Modernisation and Expansion of the System**

352. *Radio Station.* Construction of a new transmitting and receiving station for direct normal and standby services from Kuala Lumpur was started. The transmitting station was expected to be in operation by the second half of 1967 and the receiving station by the first half of 1968.

353. *International Telephone Exchange.* Construction of a new ten-position cordless type international switchboard, working in conjunction with a four-wire automatic inter-continental Telephone Switching centre was commenced and the exchange and auto-switching centre was scheduled to be commissioned on 1st July 1967, in Kuala Lumpur.

354. *International Telegraph Office.* A semi-automatic message relay switching centre was being constructed at Kuala Lumpur and was scheduled to be commissioned in August 1967.

**NIGERIAN NATIONAL BODY**

355. *Cable Station.* Lagos.

356. *Radio Stations.* Lagos: Ikorodu (transmitting), Ikoyi (receiving).

**Traffic**

357. *Telegraph.* A total of 8,412,474 words comprising both foreign and Commonwealth traffic was transmitted from Nigeria during 1966/67. This showed a decrease of 10.4 per cent compared with the figures for the 1965/66 period.

358. *Telephone.* The total number of paid minutes transmitted during 1966/67 period was 127,533. This represented an encouraging increase of 14.7 per cent over that of the previous year, when the total was 111,153.

359. *Telex.* Calls originated from Nigeria increased from 14,577 to 18,653, amounting to 120,048 and 138,279 paid minutes respectively. This represented a percentage increase of 15.29 per cent.

360. *Phototelegraph.* A decrease of 0.56 per cent compared with last year's figure was recorded. Seventy-five pictures were transmitted last year and 71 this year.

**Services**

361. *Telegraph.* Since the last report direct radiotelegraph circuits have been opened with Monrovia and Bombay. This brings the total number of international direct circuits to 13.

362. *Telephone.* Direct radiotelephone links have now been established with Brazzaville, Dakar and Monrovia.

363. A new microwave link has been established by the Post and Telecommunications Department between Lagos, Port Harcourt, Ibadan, Benin, Onitsha and Enugu.

364. *Telex.* There is now a total of seven channels to London, with plans to open two more in the near future. In addition circuits have now been opened with Abidjan and Douala and through Abidjan to Congo (Brazzaville).

365. The number of telex subscribers has risen to 96.

366. *Phototelegraph*. A phototelegraph link has been established with Japan via London.

367. *Leased Circuits*. Twenty-five leased circuits were operating during the period as follows:

17 terminating in London  
4 in Liverpool  
1 in Paris  
1 in Geneva  
1 in Manchester  
1 in Accra.

368. *Press reception*. Press reception services were provided for the following agencies:

London Press Service  
Agence France Presse  
Associated Press  
Jiji Press  
Reuters.

### **Modernisation and Expansion of the System**

369. Installation work has been completed at Ikorodu transmitting station which is now fully operational.

370. *Lagos CTO*. Reorganisation of the Lagos Telegraph Control Room has been completed. The present capacity of 96 baud ARQ equipment is 16 Electronic and 6 Electro-mechanical Diplexes.

371. *Instrument Room*. The installation of a semi-automatic message handling centre has been temporarily suspended pending the erection of a new building.

372. The present Instrument Room is presently being modernised to ease traffic handling.

373. *Telex Room*. Plans for a semi-automatic telex gateway exchange are still under consideration.

374. *Ikoyi Radio Station*. Major reorganisation of the station has been completed and the transmitters mentioned in the Fourteenth General Report re-installed at Ikorodu.

375. Plans are on hand to instal the necessary radiotelephone terminal equipment and switchboard.

376. *Posts and Telecommunications Department*. Under Step II of the Department of Posts and Telecommunications Development Programme, new cable schemes are being constructed at Enugu, Lagos multi-exchange area, and Port Harcourt. Also, new automatic crossbar exchanges are being installed at Lagos (Mainland) 7,000 lines, Lagos (Ikeja) 4,000 lines, Enugu 6,500 lines and Port Harcourt 8,000 lines.

### **CYPRUS NATIONAL BODY**

377. *Cable Station*. Larnaca.

378. *Radio Stations*. Nicosia (Saranta Spilia, Kolokosh).

### **Traffic**

379. *Telegraph*. The statistics for 1966/67 show a total wordage decrease of 4·92 per cent in Commonwealth–Commonwealth traffic, from 1,908,916 to 1,814,891 gross words, and an increase of 1·07 per cent in Commonwealth–foreign traffic, from 2,174,991 to 2,198,343 gross words. The number of forwarded telegrams increased by 8·15 per cent from 133,396 to 144,276.

380. *Telephone*. The total of 332,103 minutes represents an increase of 28·29 per cent over the previous year's figure of 258,862 minutes.

381. *Phototelegrams*. There was a 37·96 per cent decrease of outgoing phototelegrams from 137 in the year ended 31st March 1966, to 85 in the year ended 31st March 1967.

382. *Leased Circuits*. The Cyprus National Body is in a position to satisfy the anticipated demand for leased circuits by the Department of Civil Aviation and the public.

### **Services**

383. *Telegraph*. Telegraph service with Israel was maintained throughout the year via London–Nicosia HF wireless telegraphy, due to the total interruption of the Larnaca–Haifa submarine cable since 8th February 1965. Owing to the forthcoming opening of a direct telegraph circuit with Israel on VHF, repairs to the cable have not been effected.

384. Abandonment of the Larnaca-Haifa cable on the introduction of direct telegraph service between Israel and Cyprus will be negotiated. Favourable consideration will be given by Israel to route a percentage of Commonwealth traffic via Israel-Cyprus VHF.

385. The envisaged direct telegraph service with Lebanon has not yet been introduced. A test has been carried out with Lebanon and the final Lebanese decision is awaited.

386. *Telephone.* The Cyprus-London radiotelephone service has been extended to Congo (Kinshasa), Puerto Rico, Tortola (British Virgin Islands), Turks Island and Virgin Islands (US).

387. Telephone service with Israel was transferred from HF to VHF during the year. Test transit calls Israel-Greece via Nicosia were effected during the year with a view to introducing transit service between Israel and Greece via Nicosia VHF link.

388. *Telex.* The switched telex service between Britain and Greece via Cyprus established in March 1966, on two 50-baud channels, is operated satisfactorily.

#### Capacity of Services

389. Adequate circuit capacity was available to meet all requirements.

390. Extension of the existing telephone channels with London proposed by Cyprus is considered necessary.

#### Rates

391. *Telegraph.* The abolition of preferential government rates from 1st January 1967, for Commonwealth countries and 1st April 1967, for foreign countries has been implemented.

392. There have been no changes to the collection or accounting rates with Greece and Lebanon during the year. Rates to Lebanon will be reduced from 0.9775 g.fcs. to 0.60 g.fcs., shared equally, on the introduction of direct telegraph service.

393. *Telephone.* The Cyprus National Body has agreed to the discontinuance of accounting for report charges for telephone calls to Commonwealth and foreign countries recommended by the Board.

#### Modernisation and Expansion of the System

394. Satisfactory progress has been maintained in the implementation of the development plan for external telecommunications.

395. Installation of the tropospheric scatter equipment for the Cyprus-Greece link is in progress and it is estimated that the service will be put into operation on 1st February 1968.

396. Telex system equipment has also been placed on order. The telex exchange which will have an initial capacity of 300 (275 telex, 25 Gentex) lines and ultimate capacity of 900 (875 telex, 25 Gentex) lines, will provide service for

(1) Gentex lines;

(2) Telex lines;

(3) Incoming and outgoing international telex and Gentex service over HF and VHF links with error correction.

397. It is now estimated that telex service, which will be operated continuously, will be introduced in the first quarter of 1968.

398. The cost of equipment required for the improvement of existing links estimated at £187,000 is also included in the five-year 1967/72 Development Plan.

#### SIERRA LEONE NATIONAL BODY

399. *Cable Station.* Freetown.

400. *Radio Station.* Freetown (Wilberforce).

#### Traffic

401. *Telegraph.* The number of paid words transmitted during the year was 2,028,000, a decrease of 24 per cent compared with last year.

402. *Telephone.* There were 14,600 paid minutes originating in Freetown during the year, an increase of 13 per cent over the previous year. Calls totalling 766 minutes were received over direct circuits from foreign countries, an increase of 76 per cent over last year.

403. *Telex.* There were 44,400 paid minutes originating in Freetown during the year.



## Services

404. *Telegraph.* The cable to Accra was interrupted twice during the year, and was not repaired after the second interruption. An unprotected five-unit radio circuit was operated to cover the interruption. The Freetown/Ascension Island cable was interrupted during the year and not repaired.

405. *Telephone.* During the year a radiotelephone circuit to Monrovia was opened, operating for one hour daily.

406. *Telex.* A telex service was opened to London during the year, using two protected radio channels. It is available to the public for 13 hours daily.

## Modernisation and Expansion of the System

407. The main development during the year was the opening of the Freetown international telex service on 1st April 1966, with 16 subscribers; by 31st March 1967, 27 subscribers had been connected.

408. It is planned to increase the number of protected channels to London to three and later to four. Development plans take into account a further increase in the number of channels to London, and the installation of protected telegraph and telex circuits to Bathurst and Accra, and to other places in West Africa.

409. At the radio station work continues on development for all foreseen needs for the next five years. A complete reorganisation of transmitting and receiving aerials has been planned and the work is expected to commence in mid-1967.

## EAST AFRICAN NATIONAL BODY

### Tanzania (excluding Zanzibar)

410. *Cable Station.* Dar es Salaam.

411. *Radio Station.* Dar es Salaam.

### Kenya

412. *Cable Station.* Mombasa.

413. *Radio Station.* Nairobi.

## Traffic

414. *Telegraph.* A total of 12,457,000 words comprising Commonwealth and foreign traffic originating in East Africa was forwarded for the period under review.

415. *Telephone.* The total number of originated paid minutes handled during the year ended 31st March 1967, was 159,439 minutes, an increase of approximately 26 per cent over the previous year.

416. *Telex.* Traffic figures indicated an upward trend. The number of outgoing paid minutes during the period April 1966–March 1967, was 128,453, a rise of 48.4 per cent over last year.

417. *Phototelegraph.* There were 205 outgoing phototelegrams, compared with 346 during the previous year, a decrease of 141 phototelegrams.

## Services

418. *Telegraph.* During the period under review direct protected radiotelegraph channels were established from Nairobi to Addis Ababa and from Dar es Salaam to London.

419. An unprotected telegraph channel Nairobi/Port Louis (Mauritius) was also established as a standby in the event of interruption of the Mauritius/Seychelles cable and will be available for 24-hour working.

420. *Telephone.* New direct radiotelephone services were introduced from Nairobi to Cairo and Tananarive and from Dar es Salaam to London and Ndola.

421. Switching facilities were also made available via Nairobi for calls between Malawi and Aden; and services were opened to various countries from East Africa via London.

422. *Telex.* Four additional channels were opened from Nairobi to London, bringing the total number of telex channels to London to seven. Direct channels were also established from Nairobi to Addis Ababa, Limbe and Lusaka.

423. Additional services from East Africa to a number of countries were inaugurated via London; and transit facilities via Nairobi have been provided to Malawi for switching her telex calls to and from London and beyond.

424. *Leased Circuits.* The following additional leased circuits were activated during the period April 1966–March 1967:

- Dar es Salaam/Zanzibar
- Dar es Salaam/Lusaka
- Mombasa/Tananarive
- Nairobi/Bombay
- Nairobi/Lusaka (two circuits)
- Nairobi/Zurich.

425. *Press Reception.* A reception service of the Reuters Economic Beam was provided in Nairobi and Kampala.

**Rates**

426. *Preferential Government Rates.* The above tariffs have been withdrawn in all relations with the exception of Zanzibar and Pemba, where they are at present under negotiation.

**Modernisation and Expansion of the System**

**Nairobi**

427. A message relay system with auto-channel numbering, embracing a number of international telegraph circuits carrying transit traffic, is now operational at the CTO.

428. The telex radio control positions, which were previously located in the Instrument Room, have now been moved and are self-contained in a separate room.

**Kampala**

429. A new telegraph office was opened at Kampala early last year for the acceptance and delivery of overseas telegrams.

430. The direct radiotelephone channel Kampala/London, which was due to be operational towards the end of 1966, has been delayed and will now go into service early in July 1967.

**Dar es Salaam and Mombasa**

431. A general reorganisation of the Central Telegraph Offices at Dar es Salaam and Mombasa is being planned and VHF Ship/Shore radiotelephone services based on the Hague Plan are due to be operational in the next month or two, at both these places.

**JAMAICAN NATIONAL BODY**

432. *Cable Station.* Kingston, providing both terminal and transit submarine telegraph cable facilities and a main coaxial cable outlet via Miami.

433. *Radio Stations.* Fairview and Port More, providing direct HF radio circuits with six separate international points.

**Traffic**

434. *Telegraph.* Forwarded telegraph traffic amounted to 11,027,000 words during the year, representing a 30 per cent increase over the previous year.

435. *Telephone.* International telephone traffic from Jamaica amounted to 905,120 paid minutes, an increase of 50 per cent over the previous year.

436. *Phototelegraph.* 332 items were transmitted from Jamaica.

437. *Telex.* Traffic originating in Jamaica amounted to 30,950 minutes, which was more than double the previous year's total.

438. *Leased Services.* Four commercial leased telegraph circuits are in operation.

**Services**

439. *Telegraph.* The Jamaica/Panama and Jamaica/Miami public telegraph circuits were transferred from HF radio to channels in the Jamaica/Miami and Miami/Panama coaxial cables.

440. The hours of the Jamaica/London circuit were extended to continuous working to facilitate the handling of Britain/West Indies through-prefixed traffic when the London/Barbados circuit is closed. The hours of the Montreal/Jamaica circuit were extended to continuous working to facilitate clearance of Jamaica/Canada traffic.

441. *Telephone*. Direct telephone circuits were made available between Jamaica and Trinidad/Barbados and the Eastern Caribbean system via Miami–St. Thomas (US Virgin Islands)–Tortola (British Virgin Islands).

442. Two additional telephone circuits were opened on the Jamaica/Montreal route.

443. A direct Jamaica/Grand Cayman HF radiotelephone circuit was opened on a temporary basis pending the inauguration of a thin-route tropospheric scatter system between Jamaica and the Cayman Islands scheduled for operation during 1967.

444. *Telex*. A telex channel with Miami was provided, which enables the provision of service on a switched basis to Panama and the Bahamas.

445. Two additional telex channels were opened to Montreal on the 7th March 1967, making a total of three.

446. Two telex circuits were made available between Barbados and Jamaica via Miami–Montreal–Bermuda and the Eastern Caribbean system, replacing the previous HF radio route.

#### **Modernisation and Expansion of the System**

447. Work proceeded on a thin-line tropospheric scatter system between Grand Cayman and Jamaica via a relay station on Cayman Brac. The system will provide seven telephone channels, meeting the requirements both for inter-island and external telephone service. It is expected to go into service in mid-1967.\*

448. The second stage of the telegraph switching network for BOAC was brought into service.

#### **Special Events**

449. *Commonwealth Games*. During the Commonwealth Games, held in August 1966, special direct telegraph circuits for press copy were provided with Barbados, London, Montreal and Sydney, as well as leased circuits with New York. Telegraph traffic and pictures handled in connection with the Games totalled 475,000 words and 282 items respectively.

### **MALAWI NATIONAL BODY**

450. *Radio Stations*. Blantyre: Hynde Dam (transmitting); Kanjedza (receiving).

#### **Traffic**

451. *Telegraph*. A total of 1,065,790 paid words were forwarded over common-user circuits during 1966/67. In addition an estimated 96,000 paid words were received on direct common-user circuits from foreign sources for destinations within Malawi.

452. *Telephone*. Outgoing international traffic on the common-user system amounted to 7,512 paid minutes.

453. *Telex*. 1,924 paid minutes were forwarded over common-user circuits during 1966/67.

#### **Services**

454. *Telex*. A direct Blantyre/Nairobi telex link was established.

#### **Modernisation and Expansion of the System**

455. *Radio*. A new 7½ KW MST transmitter has been installed for use on the Limbe/Nairobi HF circuit to provide telephone, telegraph and telex services. An associated receiver is used for reception of radiotelephone.

456. *Telephone*. Direct telephone service with Beira in Mozambique is planned for 1967, with conversion of the Morse telegraph circuit to teleprinter working.

457. *Telex*. Telex service with Nairobi was opened during the year. All overseas traffic is now routed this way. The proposed automatic telex exchange was late in arriving and will be ready for service in late 1967.

458. *ARQ*. Equipment was brought into service during 1966/67 on the Nairobi telegraph and telex links.

459. One leased circuit is likely to be provided during 1967/68 as a result of the protection given to the route.

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\* Duly opened on 15th June 1967.

## ZAMBIAN NATIONAL BODY

460. *Radio Station.* Ndola.

### Traffic

461. *Telegraph.* Paid words originating in Zambia totalled 4,132,842 of which 3,131,053 were to Commonwealth destinations and 1,001,789 to foreign destinations. Press traffic accounted for 26 per cent of the total originated traffic. In Commonwealth relationships, the increase was 1,246,008 paid words (66 per cent). The total increase was of the order of 61 per cent.

462. *Telephone.* The number of paid minutes totalled 31,397, of which 75 per cent were to Commonwealth destinations. The total increase in traffic was 20·46 per cent.

463. *Telex.* There were 4,352 calls, totalling 29,539 minutes: 65 per cent of this traffic was to Commonwealth destinations. Calls totalling 472 minutes were routed via Rhodesia–South Africa and calls totalling 23,568 minutes were routed via Rhodesia–London. The rest were routed via the new direct Lusaka–London and Lusaka–Nairobi links, which were opened on 23rd January 1967. The total increase in traffic was 47·4 per cent.

### Services

464. *Telegraph.* Automatic error correction was provided on the Ndola–Nairobi public telegraph system in June 1966; and the Zambian operating terminals of both the London and Nairobi public telegraph circuits were transferred from Ndola to Lusaka in November 1966. The hours of service to Nairobi were extended.

465. *Telephone.* A direct radiotelephone service was opened between Ndola and Dar es Salaam in November 1966.

466. *Telex.* Direct telex services from Lusaka to London and Nairobi were introduced on 23rd January 1967, following the installation of telex switchboards at Lusaka.

467. *Leased Circuits.* Leased sub-speed teleprinter circuits were provided during the year as follows:

Lusaka–Nairobi	..	..	2
Lusaka–Dar es Salaam	..	..	1 (via Nairobi)
Lusaka–London	..	..	2
Ndola–London	..	..	1

468. *Press Reception.* Three services are received, Reuters, the London Press Service (British Information Services) and Agence France Presse. The latter was introduced in September 1966.

### Modernisation and Expansion

469. The building of the international radio receiving and transmitting stations at Lusaka has been delayed and completion is not expected until mid-1968. The radio equipment is now to hand awaiting the completion of the buildings.

470. Telex switchboards were installed at Lusaka in January 1967, permitting direct semi-automatic working to London and Nairobi.

### Other Information

471. A meeting of Telecommunications officials was held at Ndola between the 11th and 15th July 1966, primarily to discuss telecommunications links between the East African countries, Malawi and Zambia as well as Satellite Communications. Britain, Canada, the Commonwealth Telecommunications Board, East Africa, Malawi and Zambia were represented.

## THE GAMBIAN NATIONAL BODY

472. *Radio Station.* Bathurst, providing direct HF radio circuits with four separate international points.

### Traffic

473. *Telegraph.* Forwarded telegraph traffic amounted to 170,000 words during the period September 1966–March 1967.

474. *Telephone.* International telephone traffic originating in The Gambia amounted to 3,000 paid minutes in the period September 1966–March 1967.

## SINGAPORE NATIONAL BODY

475. *Cable Station.* Singapore (SEACOM Cable Terminal).

476. *Radio Stations.* Singapore–Jurong (transmitting), Trafalgar and Yio Chu Kang Road (receiving).

### Traffic

477. *Telegraph.* The total number of originated words handled from Singapore during the period was 18,089,834. Total telegraph traffic forwarded to other National Bodies and forwarded and received from foreign countries during the period was 23,032,384 words.

478. *Telephone.* The total number of originated paid minutes for the period was 356,783. Total telephone traffic originated by the National Body and traffic received by the National Body over direct circuits from foreign countries and Commonwealth countries not partners to the Commonwealth Telegraphs Agreements (terminal and transit) for the period was 467,413 minutes.

479. *Telex.* The number of originated paid minutes of international telex calls totalled 213,608. Total telex traffic originated by the National Body and traffic received by the National Body over direct circuits from foreign countries and Commonwealth countries not Partners to the Commonwealth Telegraphs Agreements (terminal and transit) for the period was 315,837 minutes.

480. *Programme transmissions.* A total of 225 voicecasts were put through to Sydney, New York, London, Melbourne, Berne, Berlin, Delhi, Cologne, Bangkok, Tokyo, Washington, Kuching and Montreal during the year.

### Services

481. *Telegraph.* On 22nd August 1966, telegraph service between Singapore and the USA (RCA) was established, via direct SEACOM circuit.

482. The telegraph service between Singapore and Djakarta, Indonesia, on a direct radio circuit was reopened on 9th September 1966, following the cessation of confrontation. The Singapore–Tanjong Uban telegraph service was resumed on 1st March 1967.

483. *Press Services: Reuters.* Reuters radioteprinter circuits from Sydney and Hong Kong were diverted via SEACOM with effect from 1st October 1966. Radio standby equipment is available for this service in case of SEACOM failure.

484. *Agence France Presse.* Agence France Presse's morse-cast from Bangkok was reverted to radioteprinter with effect from 11th July, 1966.

485. *German Press Agency.* The German Press Agency (DPA) radioteprinter relay service was discontinued with effect from 30th June 1966.

486. *Telephone.* The radiotelephone service between Singapore and Djakarta via Bandoeng was reopened on 9th September 1966, following the cessation of confrontation. This service was extended to the principal cities in Java via Bandoeng on 24th January 1967. The Singapore–Tanjong Uban direct VHF telephone service was reopened on 1st March 1967.

487. The following extensions of the telephone service took place during the year:

<i>Service</i>	<i>Route</i>	<i>Effective date</i>
Singapore–Bulgaria .. .. .	via London	1.6.66
Singapore–Alaska .. .. .	} via Oakland	29.8.66
Singapore–Puerto Rico .. .. .		
Singapore–Virgin Islands (US) .. .. .		
Singapore–Turks Island .. .. .	via London	1.9.66
Singapore–American Samoa (Pago Pago) .. .. .	via Sydney	14.11.66
Singapore–Cambodia .. .. .	via Hong Kong	29.11.66
Singapore–Malta .. .. .	via London	1.2.67

488. The following radiotelephone services were diverted to cable circuits via SEACOM on 1st August 1966:

Oakland–Singapore .. .. .	M1 and M2
London–Singapore .. .. .	M1 and M2
Manila–Singapore .. .. .	M1
Singapore–Sydney .. .. .	M1 and M2 on 31st March 1967.

489. The following additional cable telephone circuits via SEACOM were provided during the year:

Singapore–Tokyo .. .. .	M1 on 22nd October 1966
Hong Kong–Singapore .. .. .	M1 and M2 on 4th November 1966 and 29th November 1966 respectively.

490. The Singapore-Bandoeng radiotelephone service schedule was extended by three hours daily to meet the increased volume of traffic.

491. The Singapore-Colombo radiotelephone service schedule was extended by half-an-hour daily due to increase in volume of traffic.

492. The Singapore-Bangkok radiotelephone service morning schedule was extended by half-an-hour daily on both circuits to meet the increased volume of traffic.

493. The Overseas Telephone Service between Singapore and the Virgin Islands (US) ceased to operate via Oakland and the service was routed via Sydney with effect from 1st January 1967.

494. *Telex*. The following new telex services were provided during the year:

- (1) The Singapore-Manila (Eastern) direct telex circuit via SEACOM, established on 15th August 1966;
- (2) The Singapore-USA (RCA) direct telex circuit via SEACOM, established on 18th August 1966;
- (3) Four direct circuits via SEACOM, provided on 20th September 1966, to establish a direct telex link between Singapore and Tokyo.

495. *Extension of Telex Services*. The following extensions of the telex service took place during the year:

- (1) Singapore-Colombo via Hong Kong on 15th June 1966;
- (2) Singapore-Bulgaria via London on 16th February 1967.

496. *Singapore-Jesselton Telex Circuit*. With effect from 16th March 1967, the Singapore-Jesselton telex circuit is operating for terminal-to-terminal traffic only.

497. *Disconnection of Singapore-Osaka Telex Circuit*. The fourth Singapore-Osaka radiotelex circuit was disconnected on 20th September 1966, thereby reducing the radiotelex channels to Osaka to three with the inauguration of four direct cable telex circuits to Tokyo.

498. *Phototelegraph Service*. The following new phototelegraph services were established during the year:

- (1) Singapore-Madras auto relay via London on 30th April 1966 (radio via Melbourne);
- (2) Singapore-Tokyo direct via M1 (cable) on 5th November 1966.

499. *Leased Circuits*. The following new services were provided during the year:

Service	Speed	Effective date	Link
Mitsubishi Shoji Kaisha Ltd. (via SEACOM)	$\frac{1}{2}$	7.4.66	HKG-SIN TGP9
World Meteorological Organisation (cable/radio relay with effect from 4th April 1967).	Full	10.6.66	Melbourne-Delhi (radio relay via SYD/SIN/BMB).
Reuters Ltd. (via SEACOM)	Full	1.10.66	HKG-SIN TGP10
Reuters Ltd. (via SEACOM)	Full	1.10.66	MTL-SIN TGPI
Air India (radio relay via SIN)	$\frac{1}{4}$	6.1.67	Bombay-Nairobi
Toyomenka Ltd. (via SEACOM)	$\frac{1}{4}$	15.2.67	HKG-SIN TGP11

500. The following leased circuits were disconnected during the year:

Service	Speed	Effective date	Link
Mitsui & Co.	$\frac{1}{2}$	21.12.66	HKG-SIN TGP4
Air India	$\frac{1}{4}$	17.1.67	BMB-AN

**Special Events**

501. *US President's Visit and Asian Games at Bangkok*. Many additional newscasts were given to Press Agencies during the period October to December 1966, in respect of these events.

502. *SEACOM Cable Opening Ceremony*. On 30th March 1967, a special ceremony was held to mark the completion of the SEACOM Cable Project. For this ceremony a conference circuit of 8 kHz bandwidth was set up connecting Kuala Lumpur, Singapore, Hong Kong, Sydney, Wellington, Montreal and London. The representatives of these centres were able to carry on a simultaneous conversation over this circuit. Immediately after the ceremony the broadcasting companies of Sydney, Hong Kong, Singapore and Kuala Lumpur used the same circuit for a joint programme transmission.

503. *Singapore Grand Prix*. A special voicecasts circuit was established between Singapore and Hong Kong during the Singapore Grand Prix period.

2/13

### Modernisation and Expansion of the System

504. *International Telephone Switching Exchange.* Installation of a new international telephone switching exchange at Mercury House, 35 Robinson Road, Singapore, is in progress and the exchange is expected to be ready for use by August 1967.

### GUYANA NATIONAL BODY

505. *Cable Station.* Georgetown, providing a submarine telegraph cable outlet.

506. *Radio Station.* Georgetown, providing direct HF radio circuits with three separate international points.

### Traffic

507. *Telegraph.* Forwarded telegraph traffic amounted to 1,391,000 words during the period 13th October 1966–31st March 1967.

508. *Telephone.* International telephone traffic originating in Guyana amounted to 22,246 paid minutes in the period 13th October 1966–31st March 1967.

509. *Leased Services.* Two commercial leased telegraph circuits are provided.

### Services

510. *Telegraph.* During the year the Georgetown/Barbados public telegraph service was extended to 24-hour working, and automatic channel numbering commenced; arrangements were made for the Central Telegraph Office to be kept open 24 hours per day.

511. *Telephone.* At the end of the period under review consideration was being given to the provision of an additional telephone circuit with Barbados together with extended schedules with Surinam.

### Modernisation and Expansion of the System

512. *Tropospheric Scatter Link with Trinidad.* A tropospheric scatter system capable of working up to 64 circuits is to be constructed between Georgetown and Port of Spain, Trinidad. It is expected to be operational in 1968, and will connect with the existing East Caribbean wideband outlet for international services.

513. International telex service was due to open in May 1967. A 200-line manual telex switchboard, equipped initially for 60 lines, has been installed in Georgetown.

## VI. THE BOARD'S ACCOUNTS

514. The Statement of Accounts for the year ended 31st March 1967, duly certified by the Board's Auditors, Messrs. Thomson McLintock & Co., is attached to this Report.

515. The total expenditure for 1966/67 was £97,389, compared with £105,650 for 1965/66, and came within 1 per cent of the Budget.

516. The decrease in expenditure in 1966/67 was mainly due to the inclusion in 1965/66 of certain non-recurring items. There was also less spent on overseas travel.

517. Contributions from National Bodies received in 1966/67 included £1,100 from Nigeria and £850 from Ghana in respect of 1965/66 and an advance against 1967/68 expenses from Zambia. Amounts totalling £1,034 due from two National Bodies were outstanding at 31st March 1967. It was found unnecessary to call for the final instalment (£7,950) of Britain's contribution, because this would have unduly inflated the cash balance.

## VII. ACKNOWLEDGMENTS

518. The Board is again greatly indebted to the Administrations and National Bodies of the Partner Governments for their co-operation in all aspects of the Board's work. The assistance of officers of the British Post Office and Cable and Wireless Limited who serve on the Study Groups has been invaluable.

## SECRETARY GENERAL

519. Mr. W. Stubbs, CBE, MC, Secretary General of the Board since 1st April 1961, died on 3rd July 1967. The Board recorded its deep appreciation of the outstanding service which Mr. Stubbs had rendered to the Board and of the contribution he had made to Commonwealth telecommunications. In addition to his duties as Secretary General of the Board he acted as Secretary to the Commonwealth Telecommunications Conferences of 1962, 1965 and 1966.

520. The Board has appointed Mr. C. A. G. Coleridge, OBE, Assistant Secretary to the Board since 1st March 1964, to undertake the duties of Secretary General.



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STATEMENT  
OF ACCOUNTS

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Commonwealth Telecommunications Board

STATEMENT OF ACCOUNTS FOR THE YEAR ENDED 31ST MARCH 1967

RECEIPTS				PAYMENTS			
	£	s.	d.	1965/66		1966/67	
				£		£	s. d.
Balance of Funds at 1st April 1966:				5,813	Chairman's remuneration and overseas allowance .. .. .	5,375	0 0
Current account .. .. .	1,338	2	11	28,390	Members' remuneration and subsistence allowances .. .. .	29,855	18 5
Cash in hand .. .. .	81	11	10	35,248	Salaries, Wages and National Insurance .. .. .	35,223	14 4
				3,598	Superannuation .. .. .	3,254	14 3
			1,419 14 9	13,843	Accommodation expenses .. .. .	15,413	9 8
Contributions from Partner Governments:				446	Office furniture and equipment .. .. .	206	6 8
In respect of 1965/66:	£	s.	d.	3,181	Printing, Postage, Stationery and Publications .. .. .	3,570	18 5
Ghana .. .. .	850	0	0	286	Motor transport and travelling expenses in the United Kingdom .. .. .	365	14 5
Nigeria .. .. .	1,100	0	0	1,791	Telephones, Telegrams, Telex and Cables .. .. .	1,580	8 0
			1,950 0 0	76	Official hospitality .. .. .	115	15 4
In respect of 1966/67:				3,512	Travel abroad .. .. .	1,505	1 8
Britain .. .. .	50,000	0	0	4,610	Technical and Traffic Meeting, 1964 .. .. .	—	
Canada .. .. .	4,000	0	0	1,841	Financial Review Conference, 1964 .. .. .	—	
Australia .. .. .	8,350	0	0	838	Commonwealth Telecommunications Conference, 1966 .. .. .	224	4 11
New Zealand .. .. .	1,500	0	0	1,501	Chairman's expenses on furlough to New Zealand .. .. .	—	
India .. .. .	5,750	0	0	105	Audit fee 1965/66 .. .. .	131	5 0
Ceylon .. .. .	1,600	0	0	571	Miscellaneous expenses .. .. .	566	10 7
Cyprus .. .. .	1,350	0	0				
Malaysia .. .. .	8,250	0	0				
Ghana .. .. .	3,100	0	0	£105 650			
Nigeria .. .. .	3,200	0	0				
East Africa .. .. .	7,750	0	0				
Jamaica .. .. .	1,950	0	0				
Sierra Leone .. .. .	900	0	0				
Zambia .. .. .	350	0	0				
Malawi .. .. .	50	0	0				
Singapore .. .. .	4,566	0	0				
			102,666 0 0				
In respect of 1967/68:					Balance of Funds at 31st March 1967:	£	s. d.
Zambia .. .. .	117	12	3		Deposit account .. .. .	7,500	0 0
					Current account .. .. .	1,237	8 4
Interest on deposit account .. .. .			104,733 12 3		Cash in hand .. .. .	74	2 2
			47 5 2				
			£106,200 12 2				8,811 10 6
							£106,200 12 2

LONDON. 14th August 1967.

AUDITORS' REPORT

We have examined the books and accounts of the Commonwealth Telecommunications Board for the year ended 31st March 1967 and we certify the foregoing account to be in accordance therewith and with the information furnished to us.

(signed) Thomson McLintock & Co.  
Chartered Accountants.

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# LISTS OF CABLES AND RADIO CIRCUITS IN THE COMMON-USER SYSTEM AS AT 31st MARCH 1967

These Cables and Radio Circuits provide services between Commonwealth countries and with practically all countries of the World; they are given in the following lists:

- I. SUBMARINE TELEGRAPH CABLES (Cable and Wireless Limited)
  - IIA. SUBMARINE TELEPHONE CABLES (European)
  - IIB. SUBMARINE TELEPHONE CABLES (Extra-European)
  - III. CARRIER AND RADIO SYSTEMS (other than HF)
  - IV. HF RADIO STATIONS AND RADIO CIRCUITS
-

1. SUBMARINE TELEGRAPH CABLES (Cable and Wireless Ltd.)

1. Telegraph cables still in use. The first column gives the cable sections; in most cases these form links in long-distance cable chains but they may also be used for local circuits.

Cable Section	Length of Cable Section in Nautical Miles	Cable Station Operator	Cable Section	Length of Cable Section in Nautical Miles	Cable Station Operator
ACCRA—	249	P & T (GA)	HONG KONG—	718	CW
LAGOS		NET	MANILA III		EXT
ADEN—	1,861	CW (ME)	KINGSTON—	200	CW (WI)
BOMBAY III		OCS (I)	SANTIAGO I		CW (WI)
ADEN—	1,846	CW (ME)	KINGSTON—	210	CW (WI)
BOMBAY IV		OCS (I)	SANTIAGO II		CW (WI)
ADEN—	2,266	CW (ME)	KINGSTON—	457	CW (WI)
COLOMBO		P & T (C)	TURKS ISLAND		CW (WI)
ADEN—	1,589	CW (ME)	LAGOS—	70	NET
SEYCHELLES		CW	COTONOU		CCSA
ASCENSION—	3,149	CW	LIMA—	475	WC
BUENOS AIRES		WTC	MOLLENDO		WC
ASCENSION—	2,103	CW	MADEIRA—	1,170	CW
RIO DE JANEIRO		WTC	SAO VICENTE I		CW
ASCENSION—	796	CW	MADEIRA—	1,137	CW
ST. HELENA		CW	SAO VICENTE III		CW
ASCENSION—	1,132	CW	MADRAS—	1,389	OCS (I)
SIERRA LEONE		CW	PENANG III		MAT
BARBADOS—	432	CW (WI)	MALDONADO—	66	WTC
GEORGETOWN		CW (WI)	MONTEVIDEO I		WTC
BENGHAZI—	446	CW	MALDONADO—	73	WTC
MALTA I		CW	MONTEVIDEO II		WTC
BENGHAZI—	523	CW	MALDONADO—	75	WTC
MALTA II		CW	MONTEVIDEO IV		WTC
CARCAVELOS—	338	CW	MALTA—	245*	CW
GIBRALTAR I		CW	PALERMO		Italcable
CARCAVELOS—	344	CW	MALTA—	207	CW
GIBRALTAR II		CW	TRIPOLI		CW
CARCAVELOS—	341	CW	MALTA—	208	CW
GIBRALTAR IV		CW	TRIPOLI II		CW
CARCAVELOS—	623	CW	MALTA—	398	CW
MADERA I		CW	ZANTE		OTE
CARCAVELOS—	1,038	CW	MAURITIUS—	422	CW
FAYAL		CW	RODRIGUEZ		CW
CIENFUEGOS—	145	CW (WI)	NATAL—	178	WTC
BATABANO I		CW (WI)	RECIFE		WTC
CIENFUEGOS—	136	CW (WI)	PATRAS—	59	OTE
BATABANO II		CW (WI)	ZANTE II		OTE
COLOMBO—	1,410	P & T (C)	PENANG—	396	MAT
PENANG I		MAT	SINGAPORE III		STD
COLOMBO—	1,436	P & T (C)	PENANG—	391	MAT
PENANG II		MAT	SINGAPORE V		STD
COLONIA—	23	WTC	PIRAEUS—	31	OTE
PUNTA LARA I		WTC	KALAMAKI II		OTE
COLONIA—	23	WTC	PORHCURNO—	501	ETC
PUNTA LARA II		WTC	ARRIGUNAGA I		TE
CORINTH—	73	OTE	PORHCURNO—	484	ETC
PATRAS II		OTE	ARRIGUNAGA II		TE
FAYAL—	1,465	CW	PORHCURNO—	826	ETC
SAO VICENTE		CW	CARCAVELOS I		CW
FLORIANOPOLIS—	395	WTC	PORHCURNO—	1,326	ETC
RIO GRANDE I		WTC	FAYAL I		CW
FLORIANOPOLIS—	437	WTC	PORHCURNO—	1,358	ETC
RIO GRANDE II		WTC	FAYAL II		CW
FORTALEZA—	804	WTC	PORHCURNO—	1,219	ETC
BELEM		WTC	GIBRALTAR III		CW
FORTALEZA—	323	WTC	PORHCURNO—	1,198	ETC
NATAL		WTC	GIBRALTAR IV		CW
FORTALEZA—	399	WTC	PORHCURNO—	1,375	ETC
SAO LUIZ		WTC	MADERA		CW
FREETOWN—	1,059	CW	PORHCURNO—	574	ETC
ACCRA		P & T (GA)	VIGO		ETC
FREETOWN—	70	CW	PORT SUDAN—	712	ETC
CONAKRY		CCSA	ADEN IV		CW (ME)
GIBRALTAR—	1,078	CW	PORT SUDAN—	742	ETC
MALTA III		CW	ADEN V		CW (ME)
GIBRALTAR—	1,094	CW	PUNTA YEGUAS—	90	WTC
MALTA IV		CW	COLONIA I		WTC
GIBRALTAR—	1,137	CW	PUNTA YEGUAS—	87	WTC
MALTA V		CW	COLONIA II		WTC
HONG KONG—	671	CW	RECIFE—	587	WTC
MANILA I		EXT	FORTALEZA		WTC
HONG KONG—	780	CW	RECIFE—	176	WTC
MANILA II		EXT	MACEIO		WTC

\* Length of cable in common-user system.

Cable Section	Length of Cable Section in Nautical Miles	Cable Station Operator	Cable Section	Length of Cable Section in Nautical Miles	Cable Station Operator
RECIFE— RIO DE JANEIRO	1,376	WTC	SANTIAGO— CIENFUEGOS I	410	CW (WI) CW (WI)
RECIFE— SAO LUIZ	976	WTC	SANTIAGO— CIENFUEGOS II	360	CW (WI) CW (WI)
RECIFE— SALVADOR I	465	WTC	SANTOS— FLORIANOPOLIS I	263	WTC WTC
RECIFE— SALVADOR II	468	WTC	SANTOS— FLORIANOPOLIS II	270	WTC WTC
RIO DE JANEIRO— RIO GRANDE	888	WTC	SAO LUIZ— BARBADOS	1,510	WTC WTC
RIO DE JANEIRO— SANTOS I	230	WTC	SAO LUIZ— BELEM	408	WTC WTC
RIO DE JANEIRO— SANTOS II	208	WTC	SEYCHELLES— COLOMBO	1,769	CW P & T (C)
RIO DE JANEIRO— SANTOS III	205	WTC	SEYCHELLES— MAURITIUS	1,062	CW CW
RIO GRANDE— MALDONADO I	251	WTC	VIGO— CARCAVELOS	268	ETC CW
RIO GRANDE— MALDONADO II	261	WTC	VITORIA— RIO DE JANEIRO I	366	WTC WTC
ST. HELENA— CAPE TOWN	1,950	CW P & T (SA)	VITORIA— RIO DE JANEIRO II	291	WTC WTC
SAO VICENTE— ASCENSION I	1,809	CW CW	ZANZIBAR— DAR-ES-SALAAM	60	CW EAETC
SAO VICENTE— ASCENSION II	1,854	CW CW	ZANZIBAR— MOMBASA I	149	CW EAETC
SAO VICENTE— RECIFE II	1,913	CW WTC	ZANZIBAR— MOMBASA II	160	CW EAETC
SALVADOR— VITORIA I	651	WTC WTC	ZANZIBAR— SEYCHELLES	1,132	CW CW
SALVADOR— VITORIA II	492	WTC WTC	HARBOUR AND BAY CABLES	77	

2. Telegraph cables not in use, but not yet withdrawn from service; not included in Section I.1.

Cable Section	Length of Cable Section in Nautical Miles	Cable Station Operator	Cable Section	Length of Cable Section in Nautical Miles	Cable Station Operator
ADEN— MOMBASA	1,857	CW (ME) EAETC	KINGSTON— PONCE	675	CW (WI) CW (WI)
ALEXANDRIA— IRAKLION KRITIS	416	MRT (E) OTE	KINGSTON— SAN JUAN	753	CW (WI) CW (WI)
ALEXANDRIA— LARNACA	326	MRT (E) CYTA	LARNACA— HAIFA	152	CYTA P & T (IS)
ALEXANDRIA— PORT SAID I	154	MRT (E) MRT (E)	LA SERENA— VALPARAISO	216	WC WC
ALEXANDRIA— PORT SAID II	157	MRT (E) MRT (E)	MADEIRA— SAO VICENTE II	1,178	CW CW
ALEXANDRIA— PORT SAID III	161	MRT (E) MRT (E)	MALTA— ALEXANDRIA I	922	CW MRT (E)
ANTOFAGASTA— LA SERENA	416	WC WC	MALTA— ALEXANDRIA II	929	CW MRT (E)
ARICA— ANTOFAGASTA	347	WC WC	MALTA— ALEXANDRIA IV	891	CW MRT (E)
BARBADOS— PORT OF SPAIN	207	CW (WI) CW (WI)	MALTA— ALEXANDRIA V	908	CW MRT (E)
BARBADOS— TURKS ISLAND	985	CW (WI) CW (WI)	MALTA— POZZALLO I	55	CW Italian Admin.
BERMUDA— TURKS ISLAND	827	CW (WI) CW (WI)	MALTA— POZZALLO II	58	CW Italian Admin.
CARCAVELOS— MADEIRA II	620	CW CW	MARSEILLES— BARCELONA	221	ETC (F) TE
COCOS— COTTESLOE I	1,719	OTC (A) OTC (A)	MOLLENDO— ARICA	146	WC WC
COCOS— COTTESLOE II	1,751	OTC (A) OTC (A)	MUSCAT— KARACHI	534	CW CW
COCOS— DJAKARTA	783	OTC (A) CW	PIRAEUS— SYRA II	82	OTE OTE
DURBAN— MAURITIUS	1,800	P & T (SA) CW	PORHURNO— CARCAVELOS II	935	ETC CW
FAYAL— HALIFAX	1,900	CW COTC	PORT SUDAN— ADEN I	758	ETC CW (ME)
GRENADA— PORT OF SPAIN	129	CW (WI) CW (WI)	PORT SUDAN— ADEN II	749	ETC CW (ME)
JESSELTON— MANILA	829	MAT EXT	PORT SUDAN— DJEDDAH	195†	ETC Saudi Arabian Admin.

† Cable jointly owned by Saudi Arabian and Sudan Governments but maintained by the Eastern Telegraph Co. Ltd. : not in common-user system.

Cable Section	Length of Cable Section in Nautical Miles	Cable Station Operator	Cable Section	Length of Cable Section in Nautical Miles	Cable Station Operator
RODRIGUEZ— COCOS	2,156	CW OTC (A)	SINGAPORE— DJAKARTA II	561	STD Indonesian Admin.
ST. CROIX— PONCE	140	CW (WI) CW (WI)	SINGAPORE— HONG KONG	1,529	STD CW
ST. CROIX— ST. THOMAS	49	CW (WI) CW (WI)	SINGAPORE— JESSELTON	821	STD CW
ST. LUCIA— GRENADA	168	CW (WI) CW (WI)	SUEZ— PORT SUDAN II	757	MRT (E) ETC
ST. LUCIA— ST. CROIX	345	CW (WI) CW (WI)	SUEZ— PORT SUDAN III	755	MRT (E) ETC
ST. THOMAS— ST. KITTS	174	CW (WI) CW (WI)	SUEZ— PORT SUDAN IV	814	MRT (E) ETC
SAO VICENTE— BATHURST	697	CW CW	SUEZ— PORT SUDAN V	800	MRT (E) ETC
SAO VICENTE— RECIFE I	1,798	CW WTC	SYRA— IRAKLION KRITIS	136	OTE OTE
ST. VINCENTE (WI)— BARBADOS	112	CW (WI) CW (WI)	VALPARAISO— CONCEPCION	267	WC WC
ST. VINCENTE (WI)— ST. LUCIA	91	CW (WI) CW (WI)	VIGO— GIBRALTAR	667	ETC CW
SAN JUAN— ST. THOMAS	79	CW (WI) CW (WI)	ZANZIBAR— DURBAN	1,856	CW P & T (SA)
SINGAPORE— DJAKARTA I	558	STD Indonesian Admin.			

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IIA. SUBMARINE TELEPHONE CABLES (European)

Cable Section	Length of Cable in the common-user system in Nautical Miles	Total Length of Cable in Nautical Miles	Cable Station Operator	Nominal Capacity (telephone channels)
ANGLO-BELGIAN CABLES:				
ST. MARGARETS— LA PANNE VI	24	47	BPO Belgian Admin.	420
DUMPTON GAP— MIDDLEKIRK No. 2 (CANTERBURY—OSTEND)	27	54	BPO Belgian Admin.	120
ANGLO-DANISH CABLE:				
WINTERTON— ESBJERG No. 1	145	291	BPO Danish Admin.	120
ANGLO-DUTCH CABLES:				
ALDEBURGH— DOMBURG IV	41	83	BPO Netherlands Admin.	60
ALDEBURGH— DOMBURG V	41	83	BPO Netherlands Admin.	60
ALDEBURGH— DOMBURG VI	41	81	BPO Netherlands Admin.	180
COVEHITHE— KATWIJK I	51	103	BPO Netherlands Admin.	120
ANGLO-FRENCH CABLES:*				
DOVER— SANGATTE III	10	23	BPO French Admin.	60
DOVER— AUDRESSELLES	13	26	BPO French Admin.	60
ST. MARGARETS— SANGATTE IV	10	21	BPO French Admin.	144
ST. MARGARETS— SANGATTE V	10	20	BPO French Admin.	60
ST. MARGARETS— SANGATTE VI	10	21	BPO French Admin.	60
ANGLO-GERMAN CABLES:				
LOWESTOFT— BORKUM	98	197	BPO German Admin.	5
WINTERTON— LEER No. 1	126	251	BPO German Admin.	120
WINTERTON— LEER No. 2	125	250	BPO German Admin.	120
ANGLO-SWEDISH CABLE:				
MARSKE— SANDVIK	255	509	BPO Swedish Admin.	60
ANGLO-FAROES CABLE:				
GAIRLOCK— THORSHAVN No. 1†	142	285	BPO Danish Admin. and Gt. Northern Telegraph Co.	26

\* Also Tolsford Hill-Lille microwave system; capacity 1,200 circuits.

† SCOTICE—see Section IIB, Note (d) regarding ICECAN.

## IIB. SUBMARINE TELEPHONE CABLES (Extra-European)

Cable Section	Length of Cable in the common-user system in Nautical Miles	Total Length of Cable in Nautical Miles	Cable Station Operator	Nominal Capacity (telephone channels)
TRANSATLANTIC CABLE (TAT 1): OBAN (SCOTLAND)— SYDNEY MINES (CANADA)	1,191	2,268	BPO (a) COTC	48
TRANSATLANTIC CABLE (TAT 3): WIDEMOUTH (ENGLAND)— TUCKERTON (USA)	1,759	3,516	BPO (b) ATT	128
CANTAT CABLE: OBAN (SCOTLAND)— HAMPDEN (CANADA)	2,011	2,011	CW (c) COTC	80
ICECAN CABLE: GROSSES ROCHES (CANADA)— FREDERICKSDAL (GREENLAND)	913	913	COTC (d)	24
BERMUDA—USA CABLE: BERMUDA— MANAHAWKIN (USA)	375	750	CW (WI) (e) ATT	80
BERMUDA—TORTOLA CABLE: BERMUDA— TORTOLA (BR. VIRGIN IS.)	902	902	CW (f) CW (WI)	80
JAMAICA—USA CABLE: KINGSTON (JAMAICA)— FLORIDA (USA)	219	875	CW (WI) (e) ATT	128
COMPAC CABLE SYSTEM: SYDNEY (AUSTRALIA)— AUCKLAND (NEW ZEALAND)	1,273	1,273	OTC (A) (g) NZPO	80
AUCKLAND— SUVA (FIJI)	1,260	1,260	NZPO (g) CW	80
SUVA— HAWAII	3,073	3,073	CW (g) COTC	80
HAWAII— PORT ALBERNI (CANADA)	2,545	2,545	COTC (g)	80
PORT ALBERNI— VANCOUVER (CANADA)	83	83	COTC (g)	80
SEACOM CABLE SYSTEM: SINGAPORE— JESSELTON (SABAH, MALAYSIA)	867	867	STD (h)	80
JESSELTON— HONG KONG	1,103	1,103	CW (h) CW	80
HONG KONG— GUAM	2,062	2,062	CW (h) OTC (A)	80
GUAM— MADANG (NEW GUINEA)	1,391	1,391	OTC (A) (h) OTC (A)	160
MADANG— CAIRNS (AUSTRALIA)	1,614	1,614	OTC (A) (h) OTC (A)	160

(a) Transatlantic cable (TAT 1) is jointly owned by British Post Office, Canadian Overseas Telecommunication Corporation and American Telephone and Telegraph Co. This system consists of two separate cables each of 2,268·042 nautical miles length.

(b) Transatlantic cable (TAT 3) is jointly owned by British Post Office and American Telephone and Telegraph Co.

(c) CANTAT cable is jointly owned by Canadian Overseas Telecommunication Corporation and Cable and Wireless Limited. (The Vancouver–Nova Scotia microwave system, owned by Canadian Overseas Telecommunication Corporation, provides the Commonwealth link between Atlantic and Pacific cable systems—see also Note (g)).

(d) ICECAN cable shown is jointly owned by Canadian Overseas Telecommunication Corporation, the Danish Administration and the Great Northern Telegraph Co. (The Greenland/Iceland portion of ICECAN and the Iceland/Faroes portion of SCOTICE is foreign owned—see Section IIA for Anglo/Faroes portion of SCOTICE).

(e) The Bermuda/USA and Jamaica/USA cables are jointly owned by Cable and Wireless (West Indies) Limited, and American Telephone and Telegraph Co.

(f) The Bermuda–Tortola cable is owned by Cable and Wireless Limited.

(g) The complete COMPAC cable system is jointly owned by Canadian Overseas Telecommunication Corporation, Overseas Telecommunications Commission (Australia), New Zealand Post Office and Cable and Wireless Limited—see also Note (c) for link with CANTAT.

(h) The complete SEACOM system is jointly owned by Canadian Overseas Telecommunication Corporation, Overseas Telecommunications Commission (Australia), New Zealand Post Office, Malaysian Telecommunications Department, Singapore Telecommunications Department and Cable and Wireless Limited. (The Cairns–Sydney microwave system owned by the Overseas Telecommunications Commission (Australia), provides the link between the COMPAC and SEACOM cable systems—see also Note (g)).

(i) Additional circuit capacity provided by Time Assignment Speech Interpolation switching system (TASI): Britain/United States 74 additional TASI circuits; Australia/Canada 37 additional TASI circuits.



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III. CARRIER AND RADIO SYSTEMS (other than HF)

**Atlantic Area\***

Terminals	Type of System	System Operator	Nominal Capacity (telephone channels)
Tortola— Antigua	TROPOSCATTER	CW (WI)	80
Antigua— St. Kitts	VHF	CW (WI)	6
St. Kitts— Montserrat	VHF	CW (WI)	6
Antigua— St. Lucia	TROPOSCATTER	CW (WI)	64
St. Lucia— Dominica	VHF	CW (WI)	6
St. Lucia— Barbados	TROPOSCATTER	CW (WI)	80
Barbados— St. Vincent	VHF	CW (WI)	6
Barbados— Trinidad	TROPOSCATTER	CW (WI)	64
Trinidad— Grenada	VHF	CW (WI)	12
Trinidad— Guyana	TROPOSCATTER	CW (WI)	64
Caymans— Jamaica	TROPOSCATTER	CW (WI)	8
St. Thomas— Tortola	MICROWAVE	ITT (Virgin Is.) CW (WI)	300

\* Canada; for microwave system which provides the link between the Atlantic/Pacific cable systems see Section II.B, Note (c).

**Pacific and Far East Area†**

Terminals	Type of System	System Operator	Nominal Capacity (telephone channels)
Kuala Lumpur— Singapore	MICROWAVE	MAT STD	600
Hong Kong— Taiwan	TROPOSCATTER	CW CGRA	32

† Australia; for microwave system which provides the linking between the SEACOM and COMPAC cable systems see Section II.B, Note (h).

**Mediterranean and Middle East Area**

Terminals	Type of System	System Operator	Nominal Capacity (telephone channels)
Cyprus— Turkey	VHF	CYTA P & T (TY)	5
Cyprus— Lebanon	VHF	CYTA P & T (LE)	5
Cyprus— Israel	VHF	CYTA P & T (IS)	5
Bahrain— Qatar	TROPOSCATTER	CW	60

**African Area**

Terminals	Type of System	System Operator	Nominal Capacity (telephone channels)
Sierra Leone— Conakry	VHF	SLET	5
Rhodesia— Zambia	O/W LINE	MPR GPO (Z)	102
Rhodesia— Malawi	VHF	MPR P & T (MA)	11
Nairobi (Kenya)— Mombasa (Kenya)	VHF	EAETC	96
Malawi— Zambia	O/W LINE	P & T (MA) GPO (Z)	12
Malawi— Nairobi (Kenya)	VHF	P & T (MA) EAETC	12
Malawi— Mozambique	VHF	P & T (MA)	12
Lagos (Nigeria)— Cotonou	MICROWAVE	‡	960‡
Lagos (Nigeria)— Accra (Ghana)			
Lagos (Nigeria)— Abidjan (I. Coast)			
Nakuru (Kenya)— Jinja (Uganda)	VHF	EAETC	48
Mombasa (Kenya)— Tanga (Tanzania)	VHF	EAETC	96
Nairobi (Kenya)— Moshi (Tanzania)	VHF	EAETC	36

‡ (Lagos / Cotonou / Lome / Accra / Abidjan system)  
NET: P & T (DY): P & T (TO): P & T (GA): P & T (IC):

**Abbreviations Used in Sections I-IV**

ITT	International Telephone and Telegraph Co. (USA)
AT & T	American Telephone and Telegraph Co. (USA)
BPO	British Post Office
CCSA	Compagnie des Cables Sud Americains
CGRA	Chinese Government Radio Administration
COTC	Canadian Overseas Telecommunication Corporation
CW	Cable and Wireless Limited
CYTA	Cyprus Telecommunications Authority
EAETC	East African External Telecommunications Company Limited
GPO (Z)	General Post Office, Zambia
MAT	Telecommunications Department, Malaysia
MPR	Ministry of Posts Rhodesia
MRT (E)	Marconi Radio Telegraph Company (UAR), Cairo
NET	Nigerian External Telecommunications Ltd.
NZPO	New Zealand Post Office
OCS (I)	Overseas Communications Service (India)
OTC (A)	Overseas Telecommunications Commission (Australia)
OTE	Greek Telecommunications Authority
P & T (C)	Posts and Telecommunications Department, Ceylon
P & T (DY)	Posts and Telecommunications Department, Dahomey
P & T (GA)	Department of Posts and Telecommunications, Ghana
P & T (IC)	Posts and Telecommunications Department, Ivory Coast
P & T (IS)	Posts and Telecommunications Department, Israel
P & T (LE)	Posts Telegraph and Telephone Department, Lebanon
P & T (MA)	Department of Posts and Telegraphs, Malawi
P & T (SA)	Department of Posts and Telegraphs, South Africa
P & T (TO)	Posts and Telecommunications Department, Togoland
P & T (TY)	Posts Telephone and Telegraph Department, Turkey
SLET	Sierra Leone Telecommunications Department
STD	Telecommunications Department, Singapore
TE	Transradio Espanola
T & T (PK)	Telegraph and Telephone Department, Pakistan
T & T (PT)	Genal Dos Correios Telegraphal et Telefonel, Portugal

**Associated and Subsidiary Companies of Cable and Wireless Limited:**

Bel. Co	Societe Anonyme Belge de Cables Telegraphiques
CW (ME)	Cable and Wireless (Mid-East) Limited
CW (WI)	Cable and Wireless (West Indies) Limited
ETC	Eastern Telegraph Company Ltd.
ETC (F)	Eastern Telegraph Company (France) Ltd.
EXT	Eastern Extension Australasia and China Telegraph Company Ltd.
WC	West Coast of America Telegraph Company Ltd.
WTC	Western Telegraph Company Ltd.

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#### IV. HF RADIO STATIONS AND CIRCUITS

The following lists show the radio stations and regularly operated radio circuits either direct or via automatic relay.

##### Aden

*Radio Station:* Aden (Hiswa and Ras Boradli). *Operator:* Cable and Wireless (Mid-East) Limited.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Bahrain	X		X	
Britain (London)	X	X*	X	X
East Africa (Nairobi)	X		X	X
Ethiopia (Addis Ababa)	X		X	X
Hadramaut (Meifaah)	X			
Hadramaut (Mukalla)	X			
Hadramaut (Seiyun)	X			
India (Poona)			X	
Kamaran Island	X			
Malta	X			
Somalia (Hargeisa)	X		X	
Somalia (Mogadiscio)			X	
Somaliland, French (Djibouti)	X		X	
Yemen (Sanaa)	X			
Yemen (Taiz)	X			
Zanzibar	X			

##### Antigua

*Radio Station:* Antigua Island. *Operator:* Cable and Wireless (West Indies) Limited.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Barbuda	X			

##### Ascension Island

*Radio Station:* Ascension Island. *Operator:* Cable and Wireless Limited.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Britain (London)			X	
St. Helena Island			X	
USA (New York)			X	

##### Australia

*Radio Stations:* Melbourne (Rockbank, Fiskville), Perth (Applecross, Bassendean, Gnangara), Sydney (Bringelly, Doonside).

*Operator:* Overseas Telecommunications Commission (Australia).

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
<b>Melbourne Circuits:</b>				
Britain (London)	X	X		
Britain (London)	via Barbados†			
Britain (London)	via Perth†			
India (Calcutta)	X			
Japan (Tokyo)		X		
Nauru	X		X	
Singapore		X		
USA (San Francisco)		X		
<b>Perth Circuits:</b>				
Britain (London)			X	
South Africa (Pretoria)	X		X	X
<b>Sydney Circuits:</b>				
Britain (London)				X
Britain (London)	via Barbados†			
Britain (London)				via Singapore† and Nairobi†

X Direct circuit.

\* One-way service only.  
|| Standby for COMPAC cable failure.

† Automatic relay.

**Australia (contd.)**

Circuits (contd.)

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Sydney Circuits (contd.)				
Canada (Montreal)	via Vancouver†			
Canada (Vancouver)			X	X
Ceylon (Colombo)			X	X
China (Shanghai)	X			
Fiji Islands (Suva)	X		X	
Hong Kong	X		X	X
India (Calcutta and Poona)			X	
Indonesia (Djakarta)	X		X	
Japan (Tokyo)			X	
Japan (Osaka)	X			X
Malaysia (Kuala Lumpur)			via Singapore†	
New Caledonia (Noumea)	X		X	
New Hebrides (Port Vila)	X		X	
New Zealand (Wellington)	X		X	X
Philippine Islands (Manila)	X		X	X
Portuguese Timor (Dili)	X			
Singapore	X		X	X
Soekarnopura (West Irian)	X			
Solomon Islands (Honiara)	X		X	
USA (San Francisco)	X			X

**Bahrain**

*Radio Station:* Bahrain (Hamala and Sitra Road). *Operator:* Cable and Wireless Limited.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Aden	X		X	
Britain (London)	X	X	X	X
East Africa (Nairobi)			X	
India (Poona)			X	
Iraq (Baghdad)			X	
Jordan (Amman)			X	
Kuwait	X		X	
Lebanon (Beirut)	X		X	
Muscat and Oman (Muscat)	X		X	
Pakistan (Karachi)			X	
Trucial States (Dubai)	X		X	X
Trucial States (Abu Dhabi)	X		X	
UAR (Cairo)			X	

**Barbados**

*Radio Station:* Boarded Hall, Carrington, Mt. Misery. *Operator:* Cable and Wireless (West Indies) Limited.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Bermuda	X			
Britain (London)	X			
Britain (London)	X	X		X
Curacao	X		X	
Dominican Republic (Santo Domingo)	X		X	
Guiana, British (Georgetown)			X	
Jamaica (Kingston)	X	X		X
Martinique I. (Fort de France)	X		X	
Peru (Lima)	X	X		X
Surinam (Paramaribo)	X			

**Bermuda**

*Radio Station:* St. Georges, Flatts. *Operator:* Cable and Wireless (West Indies) Limited.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Bahamas (Nassau)	X			
Barbados	X			
USA (New York)		X		X

X Direct circuit.

† Automatic relay.

|| Standby for COMPAC cable failure.

**Bolivia***Radio Station:* La Paz. *Operator:* West Coast of America Telegraph Co. Ltd.

## Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Peru (Lima)	X			X
USA (New York)	via Lima†			via Lima†

**Britain***Radio Stations:* Receiving: Baldock, Bearley, Brentwood, Somerton.

Transmitting: Bodmin, Criggion, Dorchester, Leafield, Ongar, Rugby.

*Operator:* Post Office.

## Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Aden	X	X*	X	X
Afghanistan (Kabul)	X	X	X	
Argentina (Buenos Aires)	X	X	X (2 routes)	X
Ascension Island	X		X	
Australia (Melbourne)	X	X		
Australia (Melbourne)	via Barbados†			
Australia (Melbourne)	via Perth†			
Australia (Sydney)	X			X
Australia (Sydney)	via Barbados†			
Australia (Sydney)				via Singapore† and Nairobi†
Australia (Perth)			X	
Austria (Vienna)	X			
Bahrain		X	X	X
Barbados	X	X	X	X
Bermuda (Hamilton)		X		
Brazil (Rio de Janeiro)	X	X		X
Bulgaria (Sofia)	X			
Burma (Rangoon)	X			
Ceylon (Colombo)	X	X	X	X
Chile (Santiago)	X			X
China (Taipeh, Formosa)	X	X		
China (Shanghai)	X	X		
Congo (Kinshasa)	X	X		
Cyprus (Nicosia)	X	X	X	
Czechoslovakia (Prague)	X			
East Africa (Nairobi)	X	X	X	X
Ethiopia (Addis Ababa)	X	X	X	
Ethiopia (Asmara)	X			
Falkland Islands (Port Stanley)	X			
Ghana (Accra)	X	X	X	X
Greece (Athens)	X			X
Hong Kong	via Colombo† and Sydney		via Colombo† and Sydney	via Colombo† and Sydney
Hong Kong	via Nairobi† or Aden†			via Nairobi† and Aden†
Hungary (Budapest)	X			
India (Bombay)	X	X		X
India (Calcutta)	X	X	X	X
India (New Delhi)	X	X	X	X
India (Madras)	X	X	X	
India (Poona)			X	
Iran (Teheran)	X	X	X	X
Iraq (Baghdad)	X		X	
Israel (Tel Aviv)	X	X	X	X
Italy (Rome)	X			
Italy (Vatican City)	X			
Japan (Osaka)	X			X
Japan (Tokyo)	and via Aden†			and via Aden†
Jordan (Amman)	X	X	X	
Kuwait	X		X	
Lebanon (Beirut)	X	X	X	X
Liberia (Monrovia)			X	
Libya (Tripoli)			X	
Malta	X	X	X	X
New Zealand (Wellington)	via Montreal and Vancouver†	via Melbourne†		via Montreal and Vancouver†
New Zealand (Auckland)	via Montreal and Vancouver†		via Montreal and Vancouver†	

X Direct circuit.

\* One-way service only to London.

† Automatic relay.

|| Standby for COMPAC cable failure.

**Britain (contd.)**

Circuits (contd.)

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Nigeria (Lagos)	X	X	X	X
Pakistan (Karachi)	X	X	X	X
Pakistan (Rawalpindi)		X		
Pakistan (Dacca)	X	via Karachi†	X	
Peru (Lima)		X		X via Barbados†
Poland (Warsaw)	X			
Portugal (Lisbon)	X	X		
Rhodesia (Salisbury)	X	X	X	
Roumania (Bucharest)	X			
Sierra Leone (Freetown)	X		X	
Singapore	via Aden† or via Nairobi†		via Nairobi†	via Aden† or via Nairobi†
Singapore		X		
Singapore	X	X	X	X
South Africa (Johannesburg)	via Sydney†	via Melbourne†		via Sydney†
South Africa (Pretoria)	X	X	X	X
Spain (Las Palmas, Canary Islands)	X			
Spain (Madrid)	X			
Sudan (Khartoum)	X		X	X
Switzerland (Berne)	X			
Syria (Damascus)	X			
Tanzania (Dar-es-Salaam)	X		X	
Thailand (Bangkok)	X			
The Gambia			X	
Turkey (Istanbul)	X			X
UAR (Cairo)	X	X	X	
USA (New York)			X	
USSR (Moscow)	X			
Yugoslavia (Belgrade)	X			
Zanzibar	X			
Zambia (Ndola)	X		X	

**British Honduras**

*Radio Station:* Belize. *Operator:* Cable and Wireless Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Jamaica (Kingston)	X		X	
USA (Miami)	X		X	
Mexico	X			

**Canada**

*Radio Stations:* Montreal (Yamachiche, Drummondville), Vancouver (Cloverdale, Ladner).

*Operator:* Canadian Overseas Telecommunication Corporation.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
<b>Montreal Circuits:</b>				
Argentina (Buenos Aires)	X	X	X	X
Brazil (Rio de Janeiro)	X	X	X	X
Germany (Frankfurt)	X			
Peru (Lima)	X			X
St. Pierre and Miquelon Is.	X		X	
<b>Vancouver Circuits:</b>				
Australia (Sydney)			X	X
New Zealand (Wellington)	X			
Japan (Tokyo)				X

**Cayman Islands**

*Radio Station:* Grand Cayman. *Operator:* Cable and Wireless (W.I.) Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Jamaica (Kingston)§	X		X	

X Direct circuit.

† Automatic relay.

|| Standby for COMPAC cable failure.

§ Temporary circuits pending provision of tropospheric scatter system.

## Ceylon

*Radio Stations:* Colombo (Poththode, Kadirana).

*Operator:* Posts and Telecommunications Department, Ceylon.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Australia (Sydney)			X	X
Britain (London)	X	X	X	X
Burma (Rangoon)	X			
China (Shanghai)	X			
Hong Kong			X	
Japan (Osaka)	X		X	
Japan (Tokyo)		X	X	
Pakistan (Karachi)	X		X	
Philippines (Manila)			X	
Singapore			X	

## Cyprus

*Radio Stations:* Nicosia (Saranta Spilia, Kolokosh). *Operator:* Cyprus Telecommunications Authority.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Britain (London)	X	X	X	
Greece (Athens)	X	X	X	
Israel (Tel Aviv)		X	X	
Jordan (Amman)			X	
Lebanon (Beirut)			X	
Syria (Damascus)			X	
Turkey (Ankara)			X	
UAR (Cairo)			X	

## East Africa (Kenya/Uganda/Tanzania)

**Kenya** *Radio Stations:* Nairobi (Kabete, Ngong), Mombasa. *Operator:* East African External Telecommunications.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Aden	X		X	X
Algeria (Algiers)			X	
Bahrain			X	
Britain (London)	X	X	X	X
Burundi (Bujumbura)	X		X	
Congo (Kinshasa)	X			
Ethiopia (Addis Ababa)	X		X	X
Ghana (Accra)			X	
India (Poona)			X	
Malagasy (Tananarive)			X	
Malawi (Limbe)	X		X	X
Mauritius			X	
Nigeria (Lagos)	X		X	
Pakistan (Karachi)			X	
Rwanda (Kigali)	X		X	
Seychelles			X	
Singapore			X	
Somalia (Mogadiscio)			X	
South Africa (Johannesburg)	X	X	X	
Sudan (Khartoum)	X		X	
UAR (Cairo)			X	
Zambia (Ndola)	X		X	X
Zanzibar	X			

**Tanzania** *Radio Station:* Dar-es-Salaam (Ubongo, Mbweni). *Operator:* East African External Telecommunications Co. Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Britain	X		X	
Zambia			X	
Zanzibar	X		X	

(Note: Zanzibar included as separate entry.)

X Direct circuit.



**Fiji Islands**

*Radio Stations:* Suva (Vatuwaga, Samabula). *Operator:* Cable and Wireless Limited.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Australia (Sydney)	X		X	

**Ghana**

*Radio Stations:* Accra (Bubuashie, Adentan). *Operator:* Telecommunications Department.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Britain (London)	X	X	X	X
East Africa (Nairobi)			X	
Ethiopia (Addis Ababa)	X		X	
Guinea (Conakry)			X	
Nigeria (Lagos)	X	X	X	
Sierra Leone (Freetown)	X		X	
The Gambia (Bathurst)			X	
Togo (Lome)			X	

**Gibraltar**

*Radio Station:* Gibraltar. *Operator:* Cable and Wireless Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Tangier	X		X	X

**Grenada**

*Radio Station:* Grenada. *Operator:* Cable and Wireless (West Indies) Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Carriacou	X		X	

**Guyana**

*Radio Station:* Georgetown (Thomas Lands). *Operator:* Cable and Wireless (West Indies) Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Barbados			X	
Surinam (Paramaribo)			X	
Trinidad (Port of Spain)			X	

**Hong Kong**

*Radio Stations:* Cap d'Aguilar, Victoria Peak, Mount Butler. *Operator:* Cable and Wireless Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Australia (Sydney)	X	X	X	X
Britain (London)	via Colombo† and Sydney		via Sydney†	via Colombo† and Sydney
Britain (London)	via Nairobi† or Aden		via Nairobi† and Aden	
Cambodia (Phnompenh)	X		X	
Ceylon (Colombo)			X	X
China (Canton)	X		X	
China (Shanghai)	X		X	
China (Taipeh, Taiwan)	X	X	X	X
India (Poona)			X	
Indonesia (Djakarta)	X		X	
Japan (Osaka)	X			X
Japan (Tokyo)	X	X	X	X
Korea (Seoul)	X	X	X	X
Laos (Vientiane)	X		X	
Macao	X			
Okinawa Island	X		X	
Pakistan (Karachi)			X	X
Philippine Is. (Cebu)	X			
Philippine Is. (Manila)	X		X	X
Singapore	X			X
Thailand (Bangkok)	X	X	X	X
Vietnam South (Saigon)	X		X	
Vietnam North (Hanoi)	X			

X Direct circuit.

† Automatic relay.

|| Standby for SEACOM cable failure.

**India**

*Radio Stations:* Delhi (Kalkaji, Chattarpur), Bombay (Dighi, Dhond), Calcutta (Halishahar, Hatikanda), Madras (Korattur, Padianallur).

*Operator:* Overseas Communications Service (India).

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
<b>Bombay Circuits:</b>				
Britain (London)	X	X		X
France (Paris)	X	X		
Federal Republic of Germany (Hamburg and Frankfurt)	X	X		X
Indonesia (Djakarta)	X			
Iran (Teheran)	X			
Iraq (Baghdad)	X			
Italy (Rome)	X	X		
Japan (Osaka)	X			X
Japan (Tokyo)		X		
Nigeria (Lagos)	X			
Singapore	X			
Switzerland (Berne)	X			
UAR (Cairo)	X			
USA (New York) (RCA)	via Tangier†			
USSR (Moscow)		X		
Vietnam North (Hanoi)	X			
<b>New Delhi Circuits:</b>				
Afghanistan (Kabul)	X		X	
Britain (London)	X	X	X	X
China (Peking)	X			
China (Shanghai)	X	X	X	
France (Paris)		X		
Federal Republic of Germany (Hamburg and Frankfurt)		X		
Italy (Rome)		X		
Japan (Tokyo)		X		
Poland (Warsaw)	X	X		
Roumania (Bucharest)	X			
USSR (Moscow)	X	X	X	
Yugoslavia (Belgrade)	X			
<b>Calcutta Circuits:</b>				
Australia (Melbourne)	X			
Australia (Sydney)			X	
Britain (London)	X	X	X	X
Burma (Rangoon)			X	
France (Paris)		X		
Federal Republic of Germany (Hamburg and Frankfurt)		X	X	
Italy (Rome)		X		
Japan (Tokyo)		X	X	
Philippines (Manila)	X			X
Thailand (Bangkok)	X		X	
USA (New York) (Mackay)	via Manila†			
USSR (Moscow)		X		
Vietnam South (Saigon)	X		X	
<b>Madras Circuits:</b>				
Britain (London)	X	X	X	
Federal Republic of Germany (Hamburg)		X		
France (Paris)		X		
Italy (Rome)		X		
Singapore			X	
USSR (Moscow)		X		
<b>Poona Circuits:</b>				
Aden			X	
Australia (Sydney)			X	
Bahrain			X	
Britain (London)			X	
Burma (Rangoon)			X	
East Africa (Nairobi)			X	
Ethiopia (Addis Ababa)			X	
France (Paris)			X	
Hong Kong			X	
Indonesia (Bandung)			X	

X Direct circuit.

† Automatic relay.

**India (contd.)**

Circuits (contd.)

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Poona Circuits (contd.)				
Iran (Teheran)			X	
Iraq (Baghdad)			X	
Italy (Rome)			X	
Japan (Tokyo)			X	
Poland (Warsaw)			X	
Saudi Arabia (Djeddah)			X	
Switzerland (Berne)			X	
UAR (Cairo)			X	

**Jamaica (Kingston)**

*Radio Stations:* Fairview, Port More. *Operator:* Cable and Wireless (West Indies) Limited.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Barbados	X	X		
Bermuda (Hamilton)		X		
Cayman Island (Grand Cayman)	X		X	
Cuba (Havana)			X	
Honduras, British (Belize)	X		X	
Panama (Panama)	X			
Turks Island	X		X	

**Kenya**—see East Africa entry.

**Libya**

*Radio Station:* Tripoli. *Operator:* Cable and Wireless Limited.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Britain (London)			X	
Italy (Rome)			via Malta†	
Malta			X	

**Malawi**

*Radio Stations:* Hynde Dam, Kanjedza. *Operator:* Department of Posts and Telecommunications.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
East Africa (Nairobi)	X		X	X
Mozambique (Beira)	X			

**Malaysia**

*Radio Station:* Sabah (Tanjong Aru Jesselton). *Operator:* Telecommunications Department, Malaysia.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Bangkok—Kuala Lumpur	via Singapore†		via Singapore†	
Djakarta—Kuala Lumpur			via Singapore†	
Medan—Kuala Lumpur			via Singapore†	
Singapore  —Jesselton	X			
Sydney—Kuala Lumpur			via Singapore†	

**Malta**

*Radio Stations:* Malta (St. Georges and Tawied Rini). *Operator:* Cable and Wireless Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Aden	X			
Britain (London)	X	X	X	X
Libya (Tripoli)			X	

X Direct circuit.

† Automatic relay.

|| Standby for COMPAC/SEACOM cable failure.

### Mauritius

*Radio Station:* Port Louis (Cassis). *Operator:* Cable and Wireless Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
East Africa (Nairobi)			X	
Malagasy (Tananarive)	X		X	
Reunion	X		X	
Rodriguez			X	

### Muscat and Oman

*Radio Station:* Muscat. *Operator:* Cable and Wireless Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Bahrain	X		X	X

### New Zealand

*Radio Stations:* Makara, Himatangi. *Operator:* Post Office.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Australia (Sydney)	X		X	X
Australia (Sydney)				X
Britain (London)	via Vancouver and Montreal †		via Vancouver †	via Vancouver †
Canada (Vancouver)	X		X	X
Canada (Vancouver)	X			
Cook Is. (Rarotonga)	X		X	
New Caledonia (Noumea)	X			
Niue Is.	X			
Tonga Island (Nukualofa)	X			
USA (San Francisco/Oakland)			X	
USA (San Francisco)		X		
Western Samoa (Apia)	X			

### Nigeria

*Radio Stations:* Lagos (Ikoyi, Ikorodu). *Operator:* Nigerian External Telecommunications Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Britain (London)	X	X	X	X
East Africa (Nairobi)	X		X	
Gambia (Bathurst)			X	
Ghana (Accra)	X	X	X	
Sierra Leone (Freetown)			X	

### Peru

*Radio Stations:* Lima (Monterrico, Chacarilla). *Operator:* West Coast of America Telegraph Co. Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Argentina (Buenos Aires)	X	X		X
Barbados	X	X		X
Bolivia (La Paz)	X			X
Britain (London)				via Barbados †
Canada (Montreal)	X	X		X
Chile (Santiago)	X			X
Equador (Quito)	X			X
USA (New York)	X	X		X

### Rhodesia

*Radio Stations:* Salisbury (Cleveland, Hatcliffe). *Operator:* Ministry of Posts.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Britain (London)	X	X	X	
East Africa (Nairobi)	X		X	

X Direct circuit.

† Automatic relay.

|| Standby for COMPAC/SEACOM cable failure.

### Rodriguez

*Radio Station:* Rodriguez. *Operator:* Cable and Wireless Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Mauritius (Port Louis)			X	

### Seychelles

*Radio Station:* Seychelles. *Operator:* Cable and Wireless Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
East Africa (Nairobi)			X	

### Sierra Leone

*Radio Station:* Freetown (Wilberforce). *Operator:* Sierra Leone External Telecommunications.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Britain (London)	X		X	
Ghana (Accra)	X		X	
Guinea (Conakry)			X	
Liberia (Monrovia)	X			
Nigeria (Lagos)			X	
Senegal (Dakar)			X	
The Gambia (Bathurst)	X		X	

### Singapore

*Radio Stations:* Jurong (CRTS)/Jurong (transmitting); Trafalgar/Yio Chu Kang (receiving).

*Operator:* Telecommunications Department, Singapore.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Aden	X			
Australia (Melbourne)		X		
Australia (Sydney)	X		X	X
Britain (London)¶	via Aden† or via Nairobi†		via Nairobi† or X	via Nairobi†
Britain (London)	X	X	X	X
Britain (London)	via Sydney†	via Melbourne†		via Sydney†
Brunei	X			
Burma (Rangoon)			X	
Ceylon (Colombo)			X	
Christmas Is.	X			
East Africa (Nairobi)			X	
Hong Kong¶	X	X	X	X
India (Bombay)	X			
India (Madras)		X	X	
Japan (Osaka)	X			X
Japan (Tokyo)¶		X	X	X
Malaysia (Jesselton)¶	X		X	X
Philippines (Manila)	X	X	X	
	via Hong Kong†			
Sarawak (Kuching)	X		X	X
Pakistan (Karachi)			X	
Thailand (Bangkok)	X		X	
USA (Oakland)	X		X	X
Viet-Nam South (Saigon)	X		X	

### St. Helena Island

*Radio Station:* St. Helena. *Operator:* Cable and Wireless Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Ascension Island			X	

X Direct circuit.

† Automatic relay.

¶ Standby for COMPAC/SEACOM cable failure.

**St. Lucia***Radio Station:* St. Lucia. *Operator:* Cable and Wireless (West Indies) Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Dominica	X		X	

**Tanzania**—see East Africa entry.**The Gambia***Radio Station:* Bathurst. *Operator:* Cable and Wireless Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Britain (London)			X	
Ghana (Accra)			X	
Nigeria (Lagos)			X	
Sierra Leone (Freetown)	X		X	

**Trinidad and Tobago***Radio Stations:* Port of Spain (Caroni, Blanchisseuse Road). *Operator:* Cable and Wireless (West Indies) Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Guyana (Georgetown)			X	
Surinam (Paramaribo)			X	
Venezuela (Caracas)			X	

**Trucial States***Radio Station:* Dubai. *Operator:* Cable and Wireless Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Bahrain	X		X	X
Trucial States (Sharjah)	X			

**Turks Island***Radio Station:* Turks Island. *Operator:* Cable and Wireless (West Indies) Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
East Harbour			X	
Jamaica (Kingston)	X		X	
Salt Cay			X	

**Uganda**—see East Africa entry.**Zambia***Radio Station:* Ndola. *Operator:* General Post Office.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Britain (London)	X		X	X
East Africa (Nairobi)	X		X	X
Tanzania (Dar-es-Salaam)			X	

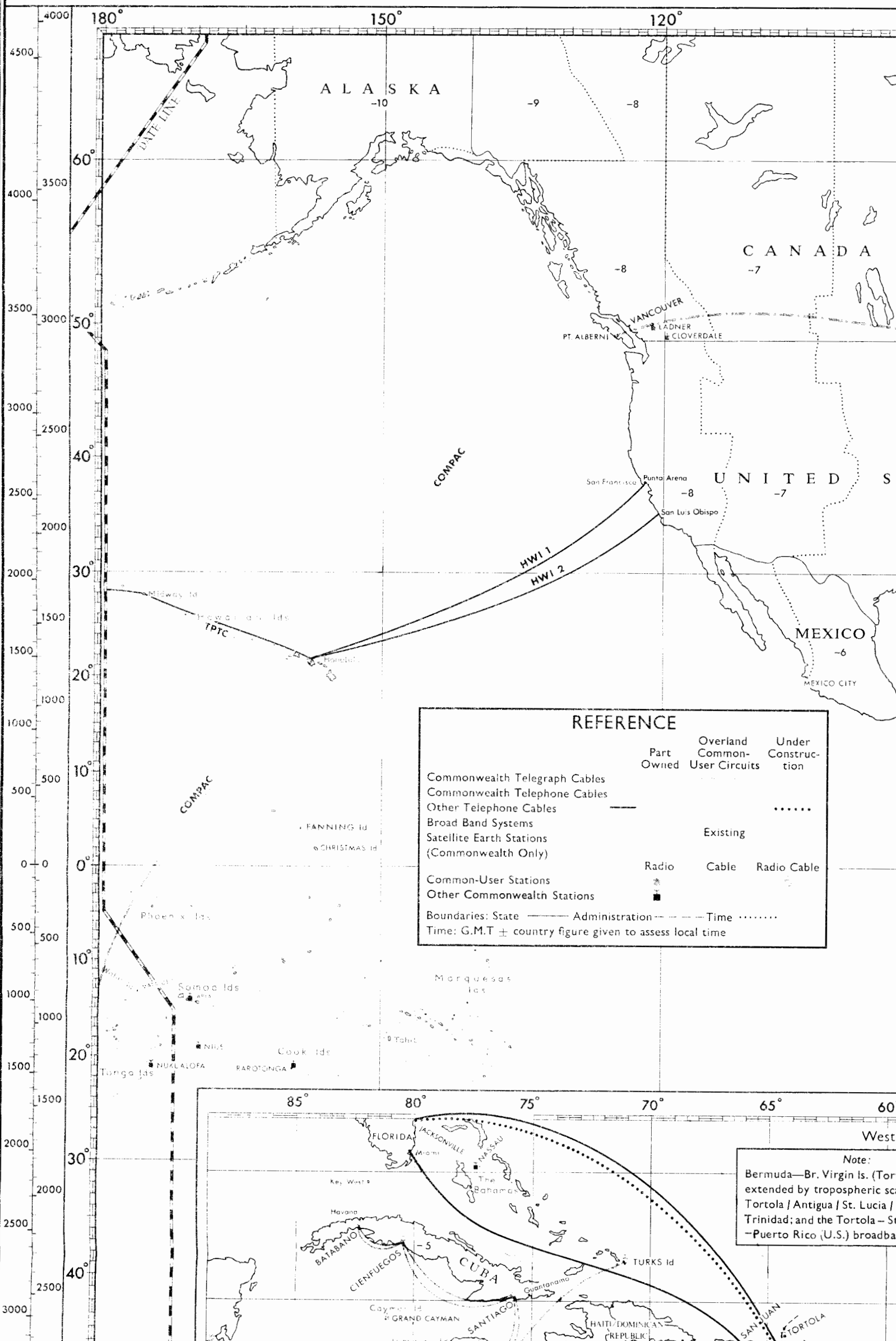
**Zanzibar***Radio Stations:* Zanzibar (Marhubi, Creek Road). *Operator:* Cable and Wireless Ltd.

Circuits:

<i>Distant Country</i>	<i>Telegraph</i>	<i>Phototelegraph</i>	<i>Telephone</i>	<i>Telex</i>
Aden	X			
Britain (London)	X			
Pemba Island	X		X	
Somali (Mogadiscio)	X			
Tanzania (Dar-es-Salaam)	X		X	

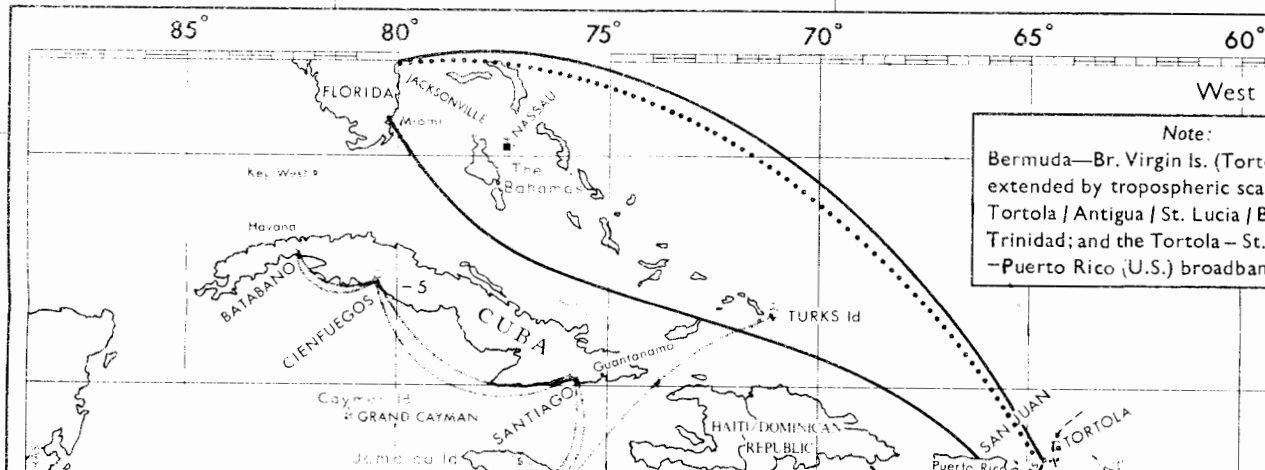
*(Note:* Tanzania details—other than Zanzibar—shown under East Africa entry.)

X Direct circuit.



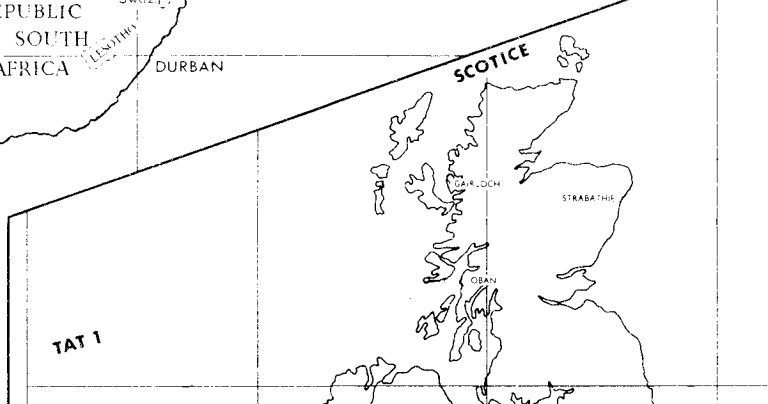
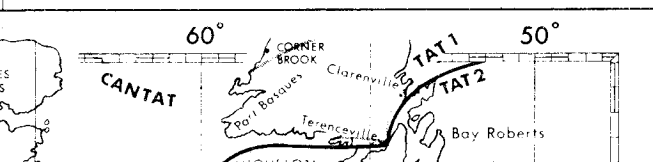
### REFERENCE

	Overland	Under
	Part	Construction
	Owned	Circuits
Commonwealth Telegraph Cables	—	.....
Commonwealth Telephone Cables	—	.....
Other Telephone Cables	—	.....
Broad Band Systems	—	.....
Satellite Earth Stations (Commonwealth Only)	Existing	.....
Common-User Stations	Radio	Cable
Other Commonwealth Stations	Radio	Cable
Boundaries: State	Administration	Time
Time: G.M.T ± country figure given to assess local time		



**Note:**  
 Bermuda—Br. Virgin Is. (Tortola extended by tropospheric scatter)  
 Tortola / Antigua / St. Lucia / Barbados / Trinidad; and the Tortola—St. John's—Puerto Rico (U.S.) broadband

0° 0° 30° 60°





90° 120° 150° 180°

