GENERAL SUMMARY OF THE MET. TELECOMMUNICATIONS REQUIREMENTS OF THE IMC BOMBAY. (SUBJECT TO SOME REVISION)

The Committee carefully examined the telecommunication requirements of the proposed IMC and came to the following conclusions.

A. Point-to-point RTT links. - RTT links on a 24 hour basis would be required between Bombay and Karachi and between Bombay and Colombo. Similar RTT links but on a restricted basis would also be necessary between Bombay and Cairo, between Bombay and Bangkok and between Bombay and Nairobi for the reception of data for the four principal synoptic hours 00, 06, 12 and 18 GMT from the countries around the Indian Ocean. It was understood from the representative of the India Meteorological Department that it would not be feasible to diplex or multiplex the existing AFTN channels within the available time. Hence the provision of additional RTT links through Overseas Communication Service of the Indian Government as proposed above would be the only practical solution to the problem.

B. RTT broadcast receptions

Additional RTT equipment would be needed at the Bombay OCS and for the reception of RTT broadcasts from Canberra and Djakarta.

C. W/T Receptions

The reception of Chinese W/T broadcasts at New Delhi should be improved by the strengthening of the reception methods and machinery at New Delhi.

D. Data received at Delhi on the Delhi-Moscow and Delhi-Tokyo NHEC links.

As the Delhi-Tokyo RTT link passed through Bombay and as all the NHEC data received from Moscow are being transmitted to Tokyo through Bombay, it should be possible to make available to IMC Bombay all the data received from Moscow and Tokyo under the NHEC system, by providing the facility of a drop-copy at the IMC Bombay. The Committee would strongly recommend that this facility be provided at Bombay.
E. Facsimile Reception

The additional equipment proposed in the draft IMC plan for Facsimile receptions at the IMC end would ensure the required facsimile reception from Tokyo and Southern Hemisphere and of Weather Satellite data.

The Committee would recommend that Japan may explore the feasibility of Tokyo relaying the Washington Analysis on the NHE Channels to New Delhi.

F. Collection of ship's reports

The Committee came to the conclusion that the additional telecommunication links between IMC Bombay and the other countries proposed above should remedy to a great extent the existing deficiencies in the reception of ships' data from the Indian Ocean. The Committee also felt that any change in the existing procedure in regard to the addressing of messages by Merchant Shipping would require the prior concurrence of CMM which would be difficult to obtain in time. The Committee therefore recommends that no change may be made in regard to the addressing of messages at present.

G. Weather Bulletins in Oceanographic vessels in the Indian Ocean during the Expedition period.

It was understood from the representative of the India Met. Department that it would not be possible to utilize the AIR transmitters for the dissemination of Weather Bulletins to the Oceanographic vessels as the AIR aerials were oriented east to west. Further, the AIR transmitter could be used only if voice-transmissions were contemplated.

It was understood from the Indian representative that the transmissions from the coastal Radio station at Bombay for ships were made on medium as well as short-wave and that they could be picked up by ships plying in the Indian Ocean to the south of the equator. The Committee, therefore, came to the conclusion that the best possible arrangement under the existing circumstances would be for the Weather ships located near the equator to pick up these bulletins and retransmit them to the oceanographic vessels to the south of the equator.

Details of the additional telecommunication facilities required, together with the capital cost of the equipment and the recurring cost for the provision of the facilities, are given in the Appendix.
Requirement for Meteorological Telecommunication for IMC

(A) Point-to-Point RTT communication links:

1) Bombay - Karachi   24 hr. RTT link error-corrected and
2) " - Colombo       half-speed i.e. 30 w.p.m. is planned.
3) " - Cairo (restricted hrs. ) Limited hour use
4) " - Bangkok " "
5) " - Nairobi " "

Initial capital cost (IMC) 
Indian effort  Distant effort

<table>
<thead>
<tr>
<th>Equipment schedule</th>
<th>Indian effort</th>
<th>Distant effort</th>
</tr>
</thead>
<tbody>
<tr>
<td>attached $90,000,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>per circuit x 5)</td>
<td>450,000</td>
<td>450,000</td>
</tr>
</tbody>
</table>

Recurring cost per year 138,600

1) Karachi ... 28,800
2) Colombo ... 28,800
3) Cairo ... 27,000
4) Bangkok ... 27,000
5) Nairobi ... 27,000

138,600

(b) For RTT Reception Circuits:

1) Canberra
2) Djakarts

Initial capital cost: 40,000

Existing installation

Equipment schedule includes provision for this.
$20,000 per new circuit;
Total 3 circuits

Recurring cost per year 12,000

$6,000 per circuit for
2 circuits - $12,000 per year. (This is only an approximate estimate).

(C) For W/T Reception Circuit:

Peking W/T for 12 hrs.
a day

Capital 20,000
Recurring 12,000
RTT link New Delhi-Bombay-Tokyo: facility to have drop-copy of the circuit traffic at Bombay IMC -
Capital cost
Recurring cost per year

FAX Reception from Satellite:
(a) Aerial
(b) Equipment
(taken from draft Ramage plan, page 11)

Indian Met. Dept. Teleprinter equipment for internal links
(Ramage plan, page 11) -
Capital cost
(Bombay-Calcutta ) Capital
(Bombay-New Delhi ) costs
(Bombay- Madras )
Recurring cost per year

---o---

Equipment schedule for circuits (A) to (D)

<table>
<thead>
<tr>
<th>Capital cost</th>
<th>Recurring cost per yr.</th>
</tr>
</thead>
<tbody>
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<td>$</td>
<td>$</td>
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</tbody>
</table>

Indian Stations
items (A,B,C and D) 512,200 165,100
items (E & F) 104,000 25,000
616,200 190,100

Distant stations 450,000 138,600
Total 1,066,200 328,700
## Equipment schedule for Met. circuits for the Indian Ocean Expedition 62 - 64

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description</th>
<th>Qty</th>
<th>Indian*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>HF (4-27.5 Mcs) Radio Telegraph transmitter of about 10 kw output power and complete with crystal OBC and F1 drive units suitable for 400 V, 3 ph 50 cps. AC mains</td>
<td>10 (5)</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Dual diversity RF (4-27.5 Mcs) telegraph receivers, suitable for on - off, FSK, reception (A1 F1) must include AFC circuits; The equipment to be suitable for 230 V AC 50 cps. mains operation (Marconi HR 11, STC Rx5C type)</td>
<td>13 (8)</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Automatic error detecting/correcting multiplex equipment (TOR/ARQ) suitable for 4/2 channel operation equipped with sub-divider on one channel and leased and public traffic line connecting units. Fully Electronic transistorized equipment is required for operation from 230 V AC 50 Cps mains (Siemens or Hasler make preference)</td>
<td>10 (5)</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Receive only page printer Ollivetti type &quot;t2-st&quot; with perforating attachment type Olivetts T2-PF or Siemens type T 100 with perforating attachment</td>
<td>40 (25)</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Printing Reperforator for sending and receiving with key board Ollivetti type No. T2-PN fitted with end of line Indicator T2-ST or Siemens type 68 F.</td>
<td>26 (16)</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Page Printer with key board Ollivetti type T2-SN with perforating attachment T2-PF or Siemens type Tl00 with perforating attachment</td>
<td>16 (10)</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Automatic transmitter pulsed type Siemens No. TZ 61b TZ 519</td>
<td>20 (10)</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>6-channel FMVFT equipment for operating speed of 240 bands per channel (230 AC mains supply) Sending terminals Receiving terminals</td>
<td>2 (2)</td>
<td>2 (2)</td>
</tr>
</tbody>
</table>

*Note:* Figures in brackets indicate Indian's requirements included in the total figures under the column "QTY."