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Communications in the United Nations system

Note by the Secretary-General

The Secretary-General has the honour to transmit to the members of the General Assembly the report of the Joint Inspection Unit entitled "Communications in the United Nations system" (JIU/REP/82/6).

* A/37/150.

COMMUNICATIONS IN THE UNITED NATIONS SYSTEM

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Joint Inspection Unit

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I. INTRODUCTION

1. Following a request from one of its participating organizations, the Joint Inspection Unit included in its work programme for 1981 a study on communications in the United Nations system. A similar study was issued by the JIU in 1972 (JIU/REP/72/7 - September 1972); this study is intended to be an up-date of the previous JIU report: its scope and recommendations are however somewhat broader.
2. Many developments have taken place in the field of communications over the past ten years: the increasing convergence in the technology governing satellites, computers, micro processors and telecommunications has given birth to new styles of communications and new services - computer conferencing, "intelligent" or "memory" telephones, electronic mail - which are increasingly used by public and private organizations world-wide. Progress has been quicker than expected. For instance, the 1972 JIU report did not see any great future for facsimile transmission, a technique which already existed in 1972. Today, even in the UN system, facsimile is being used on a day-to-day basis and in some cases is considered a cost-effective alternative to telex.
3. On the other hand, the "traditional" communications services have not been replaced: mail, pouch, telex and telephone still constitute the backbone of UN system communications and are likely to maintain this position in the foreseeable future. This report addresses the following questions: how can these services be utilized more effectively? What new technologies or systems can best complement the traditional media to enhance their effectiveness?
4. In undertaking their study, the Inspectors faced two options. One was to focus on the existing situation and problems of the traditional communications media of the UN system (mail, pouch, telex, telephone) and on the organizational, administrative and budgetary decisions which might be needed in order to maintain adequate service, with reasonable controls, while keeping expenditures at an acceptable level. Such a study would have ignored the thrust of modern developments and its recommendations would have been directed primarily to the streamlining of existing services.
5. The other option open to the Inspectors was to attempt an assessment of the communications needs and requirements of the organizations of the UN system for the second half of this decade and into the 1990s. To produce such a thorough forward-looking study would have been a formidable task for Inspectors who although they were assisted by consultants do not have the pretention of being communications specialists. Apart from the fact that the subject is a highly technical one, the rapid developments in the technologies make long-term prognostication very difficult even for specialists.
6. The Inspectors chose an intermediate solution: to identify the nature of the problem, to stress the need for its urgent consideration and to point in the direction of possible solutions rather than providing specific or detailed recipes. Given the rapid pace of innovation, UN organizations need to be well informed in order to make the best decisions, arrived at with a proper balance between technical know-how and forward-looking management efforts to improve the delivery of programmes and projects.
7. In undertaking this study the Inspectors attempted to gather comparative data on communications usage in the organizations of the UN system and to present the data in summary form in their final report. Basic data on communications for the last ten years was requested from JIU participating organizations. It soon became apparent, however, that such information was difficult to obtain and that what was available varied in quality and comprehensiveness. As a result the attempts (in the following chapter) to analyze trends within organizations and to make inter-agency comparisons are exercises of uncertain value. The paucity, unreliability and incompatibility of the statistical information

available in many organizations, the lack of analysis of communications usage and the absence of long-term planning of communications needs were findings in themselves, the gravity of which needs to be underscored. In the view of the Inspectors these findings point to the need for agency and inter-agency attention and action.

8. The Inspectors therefore stress that this report could not and does not examine in depth the effectiveness of each of the communications media in each of the organizations of the common system. Its objectives are rather: to make a general review of available data on communications expenditures and trends in utilization, recognizing that shortcomings exist in the information presented (Chapter II); to discuss recent developments in the field of communications which may be relevant to the needs of United Nations system organizations in the foreseeable future (Chapter III); and to suggest a frame and a programme of work for a more effective and integrated development of communications in the future (Chapter IV). Accordingly, the main recommendations of this report are of an inter-agency nature and will require attention and action in the context of the Administrative Committee on Co-ordination (ACC). However, some specific comments and suggestions for improvement concerning the UN will be found at the beginning of Chapter V.

9. In the course of their enquiry the Inspectors have noted a general feeling in governing and budgetary review bodies, that expenditures on communications are too high and that efforts should be made to reduce them. In some cases, in the absence of adequate controls, this may be true, but at the same time the Inspectors would wish to stress that the nature of the activities and the pressures under which UN organizations operate often demand rapid communications if results are to be maximised. The most economical communications devices (mail, pouch) do not always serve this purpose. Excessive budgetary restraint may be counter-productive in operational terms. Rather, action needs to be taken to utilize modern communications possibilities in as cost-effective a manner as possible.

10. The level of expenditures, however, is only part of the problem. One must also ask: communications for what? What is the justification for communications systems owned, made available or operated by UN system organizations? The responses normally given to these questions is day-to-day operations, peace-keeping and disaster relief. As essential as these functions may be, the Inspectors would venture that UN organizations should adopt a broader "communications philosophy" in which the systems and media operated should be seen as instruments of development geared to the needs and requirements of developing countries.

11. The issue is one of strategy and policy rather than a technical or budgetary one. How are UN organizations preparing themselves for their communications requirements of the 10 to 20 years to come? Are the two-year programme budgets and the five-year medium term plans adequate frameworks for the long-term planning of UN system communications development? What managerial, operational, behavioural changes are to be expected as the result of increased use of computer-controlled or assisted communications methods? What are the risks associated with the increased dependence on non-organizational suppliers of communications services? The present report does not offer the solution to such problems; it attempts rather to bring these to the attention of top management and governing bodies. Fundamental political issues are involved in communications development. Planning and decision-making in such matters cannot be left solely in the hands of technical communications specialists, as often has been the case until now. On the other hand, as organizational requirements - which are driven by political decisions - change, managers may be tempted to improvise solutions which may prove to be ineffective on technical grounds. In order to avoid such mistakes, the communications specialists should share in the planning and decision-making in their field.

II. THE PRESENT SITUATION

1. Overall UN system expenditures on communications

12. Expenditures related to communications in the organizations of the United Nations system can be estimated to add up to a yearly figure close to US\$ 100 million (see paragraph 15). This at first sight appears to be a sizeable amount, which alone would justify scrutiny of how funds are being spent. As will be seen, however, this global figure in itself does not mean very much unless one possesses a methodology and instruments capable of determining whether such expenditures are too high or too low in terms of the results being achieved and what an "appropriate" level of expenditure might be. To arrive at a satisfying methodology, reliable statistics gathered and kept in such a way as to permit comparison are a must. The Inspectors, at the outset, encountered difficulties in obtaining and analyzing hard and compatible data on which one could draw valid conclusions. They would therefore stress that if the governing bodies of the organizations individually and the common system as a whole wish to monitor expenditures in an effective manner and if meaningful comparisons are to be made, steps are needed to up-grade the methods of gathering communications statistics and improve the scope for analysis. (This should be done in the framework of the inter-agency machinery which is recommended in Chapter IV).

13. Before presenting the data they have collected for this study, the Inspectors wish to emphasize, as the 1972 JIU report did, that "these data should be used with great caution. They indicate only 'orders of magnitude' and may not be comparable between agencies because of lack of uniform categories of accounts" (JIU/REP/72/7, paragraph 21). The quantitative information presented in this Chapter in fact suffers from deficiencies similar to those identified in 1972: data for United Nations entities are scattered amongst a number of accounts, not all of which appear in the tables; it is difficult to determine whether communications expenditures relate to regular budget or extra-budgetary activities, to Headquarters, other "established offices" or field operations; there appears to be some "double counting" between data shown under the UNDP heading and UN and agency expenditures, because of reimbursements made from UNDP to other organizations (for Agency support costs) or payments made to the UN for the use of its network. ITU and UPU data reflect a special situation because much of their traffic is carried free of charge by national PTTs, etc. Nevertheless, the Inspectors considered that the information gathered was worth presenting, not least because it showed gaps and ambiguities in what was available but could serve to underline the seriousness of the problem.

14. JIU asked its participating organizations to provide basic data on communications usage and expenditures for the years 1972 to 1980 (and projections to 1982). Most organizations experienced difficulties in providing the data in the required common format and detail. However, 13 organizations provided sufficiently detailed information and time-series for at least a rough analysis of the present situation to be made and principal trends in usage identified. One organization provided data on communications expenditure for only one year (WMO) and another (UNICEF) was apparently not in a position to provide any information. Although data provided by the United Nations is fairly complete for New York, Geneva, Vienna and Nairobi it was not possible to obtain data for two regional commissions (ECA and ECWA) and for the smaller established offices.

15. Table I contains the basic data on communications expenditures and usage for the year 1980. Although all columns are not fully completed, and bearing in mind the reservations on the quality of the data mentioned above, a few interesting conclusions may be drawn from it:

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TABLE I: COMMUNICATIONS EXPENDITURES, AND UTILIZATION - ORGANIZATIONS OF THE UNITED NATIONS SYSTEM - 1980

Organization	I Conversion rate to US \$	II 1980 estimate and expenditure (US \$ million)	III Mail out pieces	IV Mail out expenditures (\$ thousand)	V Funch out expenditures (\$ thousand)	VI Messages out (thousand)	VII Messages out expenditure (\$ thousand)	VIII Telephone expenditures (\$ thousand)	IX Facsimile expenditures (\$ thousand)	X Other postal costs (\$ thousand)	XI Total communications expenditures (excluding staff costs) (\$ thousand)	XII Total communications expenditures (including staff costs) (\$ thousand)	XIII Communication point-to-point (excluding staff costs) (thousands of messages)	
UNEP (HQ + Field)	1.0	50.2		2693.4	3480.1		1069.9	3894.8	48.8	684.2	1258.1		3.0	TOTAL UN
UNICEF		87.4		216.0	1097.8		2277.1	1521.8			3164.7		5.9	UNEP
ILO	1.6	179.6		756.9	244.9		181.0	514.4			2387.5		1.3	UNICEF
WHO	1.0	429.8		280.0	1200.0		164.7	958.0			3352.4		0.7	ILO
UNESCO	4.1	274.9		1042.3	43.0		55.8	744.6			3101.7		1.1	WHO
IAEA	1.6	155.3		1774.3	344.8		48.5	577.8			2539.8		1.6	UNESCO
ITC	1.6	80.7		176.7	11.0		24.7	308.0			409.0		0.7	IAEA
UNEP	1.0	22.1		405.0	7.1		14.9	185.0			609.0		1.5	ITC
UNEP	0.4	11.3		156.0	216.9		21.4	103.3			629.9		3.4	UNEP
UNEP	1.6	11.8		78.2	14.2		68.9	38.3			185.5		1.1	UNEP
UNEP	1.6	36.5		150.0	10.9		50.8	121.2			402.0		1.1	UNEP
TOTAL		1993.3									32945.4		1.6	

Notes:
 1/ Rates used in this table represent the average of the agency's monthly rates during 1980.
 2/ Unless otherwise indicated, data are from doc. E/390/91, Table 11. It is assumed that 1980 expenditures correspond to 50% of expenditures for the 1980-81 biennium.
 3/ Though estimates of distribution of budget appropriations by main office locations are estimated, which refers to regular budget expenditures, a breakdown of proposed programme budget (A/34/6) p.3, extra-budgetary expenditures by office location is difficult.
 4/ Administrative and programme costs (see note 23).
 5/ Data on communications usage and expenditures refer to HQ only; accordingly, in order to ensure comparability, data for HQ expenditures have been entered in column II.
 6/ ILO and WHO columns III to IX refer to HQ data and UN expenditures only.
 7/ UN-RTI excluding reimbursable expenditures incurred on behalf of other agencies of the UN system.
 8/ 200 data on communication usage and expenditure refer to HQ only. Column II however shows total expenditures as total HQ expenditures was not provided.

Notes (cont.):
 9/ Messages telex and cables and HF teleprinter network traffic.
 10/ UN-RTI provided data in words' value (4.9 million in 1980) rather than in number of messages; it is assumed that the average message comprises 60 words.
 11/ Note that UN-RTI column XI includes reimbursable traffic provided for other agencies (where data is available) and UN-RTI (UN-RTI) and other agency reimbursable traffic which presumably is also counted in the agencies' data appearing in the lower half of columns VI and VII. These UN-RTI messages are counted in column XI as communications of at least one UN-RTI message.
 12/ Figure indicates total traffic separate breakdown of incoming/outgoing traffic not available.
 13/ Actual HQ average traffic is 18.0, however approximately 60% is sent free-of-charge because of special UN privileges with priv. Expenditure in column VII therefore relates only to messages traffic actually paid by UN.
 14/ INCO provided data in 'words'; it is assumed the average message comprises 60 words.
 15/ Some organizations included rental and maintenance costs in the figures provided (UN-RTI, UN-Vietnam); others provided only expenditures related to long-distance calls (WHO).
 16/ 40 to 60% of UN telephone expenditures are free-of-charge (see note 13).
 17/ Includes \$154,910 for rental and maintenance of UNESCO II computer, \$717,200 for rental of leased line to N.I.T., \$224,400 maintenance costs transferred to other States, \$710,600 for IP transmitters, \$721,740 for printers and maintenance of fax machines.
 18/ For rental of telex machines and of leased line to Geneva (to UNESCO II).
 19/ Estimates ILO HQ communications expenditures appearing in column IV, V, VII and VIII add up to \$119,000; overall expenditures (HQ + Field) are estimated at \$67.4 million provided by ILO for previous years; to be 50% higher. Reported at \$67.4 million (1979-1980 figures provided by UNESCO) data in column IV, V, VII and VIII add up to \$21,542,211.
 20/ HQ expenditures only.
 21/ \$219,000 for local telephone calls and \$240,000 for telephone subscription.
 22/ HQ communications expenditures add up to \$497,600; the total figure given here includes \$79,756 for telephone and \$56,840 for mail and freight in telephone circuits regular programme only.
 23/ A total amount of about \$80 million was budgeted for UNEP programme expenditures for 1980-81. The amount of about \$10 million was allocated to support the operations of the UN system and constitutes a substantial part of their extra-budgetary funds. How much of UNEP's communications expenditures is related to the servicing of those \$10 million communications expenditures is not known. The amount of about \$10 million was allocated to the UNEP budget for administrative and programme support activities (\$166.5 m. for the 1980-81 biennium, estimated at \$87.4 million for 1980 in column II) even if the percentage given here - almost 66% - is correct, certainly for 1980. But we used the former figure, the percentage of about 50% for 1980, since it is more realistic. The mail is carried free-of-charge by UN-RTI - except for a small percentage only those amounts are shown in the table.

(a) expenditure for communications, for the 17 organizations or entities for which at least some communications data were available, adds up to US\$32.5 million for 1980. This corresponds to 1.63 per cent of the regular and extra-budgetary expenditures for the same organizations. Staff costs related to communications may be estimated at an additional 35 per cent on the basis of the data provided by some organizations: these in fact range from 17 per cent (UN Vienna) to 42 per cent (IAEA and ITU) and over 50 per cent (FAO and UPU) ^{1/}. If staff costs are added, overall expenditures related to communications can be estimated at close to US\$ 44 million or approximately 2.2 per cent of the regular and extra-budgetary expenditures of these 17 entities (outside transnational organizations spend about 6 to 8 per cent of their total budgets on communications). Total UN system expenditures, as shown in document E/1980/81, Table I, are estimated at US\$ 7173.8 million for the 1980-81 biennium. Assuming that expenditures are equally divided for each year, we can estimate by extrapolation that communications expenditures excluding staff costs amount to US\$ 58.4 million and including staff costs to US\$ 78.9 million. In 1982 the annual global figure for recurrent costs related to communications is in all likelihood close to US\$ 100 million;

(b) Communications expenditures, excluding staff costs as a percentage of total budget expenditures (see column XIII of Table I) range from 0.7 per cent (FAO and IAEA) to 5.9 per cent (UNDP). As is explained in footnote 25 to the table, the figure for UNDP is almost certainly too high. The percentage figure for the United Nations as a whole is also high (2 per cent), but this may simply reflect (a) the heavy communications traffic related to the special political responsibilities of the UN (peace-keeping activities in particular) and (b) UN public information activities which exceed in scope those of other organizations of the system. Figures for IAEA (0.7) and ICAO (2.8) since they relate only to communications expenditures as a percentage of regular budget expenditures cannot be compared with those of the other organizations.

16. Table II shows the degree to which the different forms of communications are being used in the several organizations. The most striking differences are in the use of the less sophisticated services - pouch and mail. While these account for only 25 per cent of communications expenditures for UNDP, and 48 per cent for UN NY, the corresponding figures for the European-based organizations are generally much higher (74 per cent in ITU, 58 in WHO, 55 in UN Geneva, over 50 per cent in ILO, WHO, IMCO, etc.). This fact perhaps indicates that controls in the use of the more expensive services (telex and telephone) are more severe or better enforced than in the New York-based organizations. This is almost certainly the case in WHO, which, in percentage terms, has the lowest telephone expenditures among the organizations of the UN family due to its policy of actively discouraging long-distance telephone usage. On the other hand, it could be argued that the European-based organizations have an advantage over the New York-based ones because most of the latter's message and telephone traffic is transatlantic or transcontinental, and therefore more expensive, while the former, at least in part, communicate with their counter-parts within Europe. Amongst the European organizations FAO is the lowest user of mail and the highest of pouch. ITU's message and telephone traffic are low, given the mandate of the organization, but as noted in footnotes 13 and 16 of Table I, a sizeable proportion of ITU's traffic moves free of charge.

^{1/} A large portion of ITU and UPU communications are carried free of charge by the national telecommunications authorities; staff costs for these organizations therefore appear artificially high.

TABLE 11: COMMUNICATIONS EXPENDITURES

Percentage by service and total cost

	Mail	Pouch	Messages (Telex + cables + tele- printer)	Telephone (inc. fax)	Other recur- rent exp. ^{1/}	Total expendi- tures (\$ 000s)
	%	%	%	%	%	
UN-NY	10.8	37.5	15.6	36.1	-	5 069.3
UNOG	35.2	19.5	9.7	27.7	7.8	4 195.6
UN-Vienna	18.9	23.9	9.3	29.4	18.2	1 957.5
UN-Nairobi	21.2	20.0	32.3	26.4		702.2
Other est. offices						
- ESCAP	28.1	14.7	35.7	21.5	-	194.1
- ECLA	22.1	23.5	20.8	33.4		432.3
TOTAL UN	21.4	27.5	14.1	31.4	0.5	1 255.1
UNDP	4.1	21.2	44.5	30.1	-	5 162.7
UNICEF						
ILO (HQ only)	41.2	13.3	17.3	28.0		1 835.0
FAO	8.3	41.8	31.7	18.1	-	3 352.0
UNESCO	38.3	2.4	32.0	27.3	-	2 724.2
WHO (HQ only)	45.2	13.6	21.3	11.2	8.5	2 519.8
IAEA	33.4	1.8	40.0	30.7	-	603.0
ITU ^{2/}	73.8	0.6	11.2	14.4	-	1 286.1
ICAO (HQ only)	31.3	43.6	4.3	20.7	-	497.6
IMCO	52.8	5.1	5.8	36.2		275.8
UPU	42.1 ^{3/}	-	37.1	20.6	-	185.5
WMO	56.2	2.7	12.7	28.4		402.0

^{1/} See column X of Table I.

^{2/} Note that a considerable proportion of ITU's telephone and message traffic is carried free of charge.

^{3/} Note that UPU mail is carried free of charge - except for airmail surcharge.

2. Trends in communications expenditure and usage

17. In the following pages we attempt to summarize briefly the growth and development of communications services and expenditures in the organizations of the UN system over the past decade. The Inspectors had prepared a series of eight graphs giving visual representation of the evolution of expenditures and volume for each of the communications services in the larger organizations. These graphs were circulated to the JIU participating organizations with the draft report. They are not reproduced here because of space constraints and in view of the fact that because of the unreliability of the data on which they are based, they may be somewhat misleading. The graphs may, however, be obtained on request from JIU.

18. Perhaps the most striking feature in the data gathered is the exponential growth in communications expenditures - especially for message and telephone traffic at UN Headquarters and in UNDP. If the data had been converted to 1970 US dollars, accounting for inflation the growth would of course have been more linear. "Messages" (i.e. cables, telex and UN teleprinter traffic) constitutes the fastest growing service: it has grown seven-fold in expenditure from about half a million dollars in the early 1970s to almost US\$ 4 million in 1980; in terms of volume the increase has been slightly less dramatic:

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from 10 to 50 million words transmitted each year. The pattern of increase for telephone expenditures seems similar; however, as no volume statistics are available it is difficult to attribute the increases to a particular cause. Since 1973, UN New York pouch expenditures have grown almost four-fold, reaching a total of nearly US\$ 3 million per year in 1980, (with a comparable increase in volume). In contrast, mail expenditures and volume have been practically level during the past decade. Facsimile, only available for one year, has already reached 25 per cent of the mail total. In UNDP growth patterns have been altogether very similar to those of UN Headquarters, with mail showing little or no real growth, but pouch doubling in five years, telephone service tripling and message traffic almost quadrupling reaching totals of almost half of UN NY expenditure in 1980.

19. The relationships between the different communications services of Vienna-based organizations show striking differences when compared to those based in New York. Pouch and mail account for the highest expenditures, with telephone and message traffic the lowest. However, whereas all media were growing at approximately the same rate between 1975 and 1978, there has been a noticeable fall in message traffic expenditure in the past couple of years. UN-Vienna's message volume has increased by more than 40 per cent between 1978 and 1980; however, during the corresponding period costs decreased considerably. Although facsimile has only been available for one year, it has already reached about 15 per cent of the mail total. IAEA provided information in time series only for mail expenditures. The data shows that expenditures for this service are growing at a slower pace than for the other UN-Vienna organizational entities.

20. In the case of the Geneva-based UN system organizations - UNOG, ILO, WHO and ITU - again it is striking to note the contrast with the UN-New York and UNDP expenditures: telephone and message expenditures show significantly slower growth rates. Another feature is the fact that UNOG communications expenditures seem to have reached a peak in 1977 - at least as far as mail, messages and telephone are concerned.

21. It is not possible to analyze pouch service completely because no statistics have been made available by WHO. There is practically no pouch use in ITU and ILO's own pouch services are relatively minor, although ILO is in fact a rather heavy user of the UN pouch. As in UNOG the expenditures on messages in other Geneva-based specialized agencies have levelled off, whereas telephone expenditures have continued to increase, although at a slower rate.

22. The ILO experienced a decline in mail and message expenditure during the years 1976-79; this is explained by intentional increase in UN pouch use which is cheaper than the normal PTT airmail service. The ITU mail expenditure levelled off during the last three years, and those of WHO have been increasing at a moderate growth rate for the past four years after having experienced a decrease. However, all three agencies seem to have experienced a rather severe decline in overall communications usage between 1976 and 1977. It is difficult to discern any overall pattern in the statistics, and explanations for fluctuations in expenditures from year to year probably will have to be sought in the policies and procedures of each organization.

23. In the case of FAO, mail is the smallest and declining expenditure, with pouch the greatest, undoubtedly reflecting the unreliability of the local postal service. Message traffic expenditures have been relatively high but seem to be levelling off (with a slight increase in the volume transmitted), while telephone expenditures have been increasing for the past three years. In 1980, facsimile became available but as yet shows only slight expenditure. Statistics for FAO prior to 1978 have not been made available thus making comparisons with the other agencies more difficult.

24. UNESCO has experienced rapid growth in expenditures for all media for which records are kept (pouch expenditure statistics are not available). The most striking difference in the pattern of use in UNESCO is that the totals for message and telephone traffic have tripled in seven years, whereas mail, starting from a much higher level, only doubled. Thus, even though mail still holds first place, it is probable that the telecommunications media will displace it in the near future. Contrary to what was noted for UN-Vienna and UNOG, while message volume is practically level, expenditures show an exponential growth. It is difficult to explain this; perhaps it is due to greater usage by UNESCO of the commercial telex network rather than the UN teleprinter network.

3. Conclusions

25. The data gathered by the Inspectors indicates that expenditures for communications services have been growing during the past decade at rates between 5 and 15 per cent a year. Taking inflation into account this hardly seems to be an excessive level of growth. The data also appears to suggest that at least some organizations are getting more communications services for the same amount of money. Also, growth of expenditure for communications services has taken place despite policies and procedures discouraging the use of what are seen by many administrations and budgetary review bodies to be expensive forms of communication, namely telephone and message traffic. In fact, experience seems to indicate that use of advanced telecommunications equipment, such as facsimile or computer to computer data transmission, results in faster transmission and delivery of information, which in turn encourages the use of such equipment. The Inspectors are led to conclude that the effectiveness of the telecommunications media is much greater than that of media requiring physical transport so that only severe constraints on use of the former could stop their rapid growth. The Inspectors however do not recommend such action: rather it is a challenge to the UN and the specialized agencies to re-consider their policies and procedures in the light of evident benefits to be gained from encouraging the best use of all available services taking into account the overall cost-effectiveness of each organization's programme of activities.

26. Growth rates of communications expenditures have not exceeded the rhythm of the overall UN system organizations' budget growth - which until recently has been in the order of 10 to 20 per cent per year. The situation may change if a lengthy period of budgetary stringency sets in. The fact remains, however, that the rising level of communications expenditure and the trend caused by the technological "explosion" in the communications and data transmission fields will probably give rise to a continuing and increasing concern with communications costs both from the secretariats and the governing bodies of the organizations of the common system. In past years, the level of communications expenditure in most organizations has not excited serious attention. The growth of such expenditures, however, and the rapidly developing technology which is making available quicker, improved or new systems, now underline the need for some indication of a level of service which could be considered as "appropriate" for international organizations.

27. The Inspectors have no ready solution to this problem. They appreciate the fact that the officials responsible for communications, the users and the budgetary review bodies look at communications expenditures from different angles. An expenditure level totalling 2 per cent of the budget may seem "appropriate" to one group but may well be considered "excessive" by another. They would recommend, however, that in order to reconcile the sometimes contradictory exigencies of rational effective service and budgetary restraint, more senior level attention be devoted to monitoring communications trends and expenditures, and to the formulation of a communications policy within each organization and on an inter-agency basis. Clear policy and operational guidelines for the user, special training and orientation in the use of the new techniques, improved

statistics and controls, surveys of the cost-effectiveness of the services offered, etc., would undoubtedly help Executive Heads to better determine the percentage of operational budgets needed to meet the communications requirements of their organization and to have these financial levels accepted by their governing bodies.

28. The Inspectors, believe that for this building up of knowledge and awareness on communications matters to be most profitable the organizations should share their perspectives and expertise. In essence, the problem goes beyond the precincts of the individual organization and, as is mentioned later in this report, more should be done to canvass ideas and seek solutions in an inter-agency framework (see Chapter IV).

29. Finally, the Inspectors would caution against the risks of a conservative budget policy in telecommunications matters: short-term restraint may turn out to be counter-productive in the medium or long-term. An excessive level of controls in the use of the more expensive services - telex and telephone - may limit the timeliness and capacity of action of UN organizations, not only in day-to-day operations but also in such sensitive and highly political areas as peace-keeping. The issue of communications is not simply one of expenditures; it is a much broader one which cannot be separated from the fundamental *raison d'être* of the organizations of the UN system. Communications, in essence the transmission of information, is also an instrument of development. The utilization and eventual upgrading of the systems and media operated by the UN system and the expenditures related thereto, should be viewed from this perspective and ultimately with the needs and requirements of developing countries in mind.

30. Similarly, a deliberate policy to curb investments or to postpone the upgrading of antiquated equipment, may, in the present context of worldwide modernization of communications systems, progressively reduce the UN system's capacity to respond effectively, in operational terms, to the challenges that face it in the coming decades. A final consideration should not be overlooked. As telecommunication equipment and operational costs tend to decline in real terms, and labour costs continue to escalate, the long-term cost-effectiveness of the introduction of new labour-saving techniques or equipment (optical character readers, facsimile, word processors, advanced telephone exchanges, etc.) would have the positive effect of reducing staff costs which account for such a substantial portion of overall communication costs. The suggestions made in the following chapter - on new developments in telecommunications - should be read with this consideration in mind.

III. NEW DEVELOPMENTS IN COMMUNICATIONS AND
POSSIBLE APPLICATIONS IN THE UN SYSTEM

1. Background

31. The purpose of this Chapter is to discuss briefly some technological developments in the field of communications which may be relevant to the needs of United Nations system organizations in the future. The Inspectors are aware that the present convergence between electronics, computers and telecommunications may well bring about radical changes in the modes of operation of many organizations during the current decade. It is difficult to predict the impact of such changes and the extent to which innovation will be introduced in the organizations of the UN system. Accordingly, the Inspectors have limited their analysis to services or media which have already proven their capability and therefore have the potential of being immediately applicable, while stressing the need for the United Nations system to continually assess telecommunications requirements and monitor new technologies as they are developed (see Chapter IV).

32. Although the potential users of improved telecommunications in the organizations may be aware of what is currently being prepared and progressively made available by the telecommunications industry, decisions on communications issues are taken by managers who sometimes lack specific training and awareness in this field. Budgetary reviews tend to look at immediate costs and not at long-term (i.e. over more than one budgetary period) implications. Because of the lack of attention to medium or long-term cost-effectiveness of present-day choices in the communications field, it is the impression of the Inspectors that organizations are individually introducing a variety of types of, for example, word-processors, mini-computers, etc., which may lack compatibility. There is also the risk that ultimately organizations may spend more than if a more integrated approach were followed.

33. Another argument would support proper study before taking far-reaching decisions: were the JIU to recommend that in the field of telecommunications the UN system should move from the 1950s (where, with some significant exceptions, many of the services presently provided now stand) to the age of telematics and introduce time, money or energy-saving innovations by substituting, e.g. pouch with electronic mail, paper with visual display units, secretaries with electronic filing systems, missions with extensive teleconferencing, such recommendations would have to face not only bureaucratic and other resistance to change, but also serious political implications involved in the decision to introduce the new technology. The Inspectors recognize the existence of these problems and accordingly they recommend that an approach based on thoughtful analysis - as outlined in Chapter IV - be followed in upgrading UN system telecommunications capabilities.

34. Telephone, telex and mail are the three most common publicly available, inter-personal forms of communication. Travel is another important means of communications but it is costly. Although the immediate costs of some of the communications media (telephone, telex) may be high the decision on which service to utilize requires careful consideration. Attempts to discourage telephone usage, for example, may be at cross purposes with efforts to increase staff productivity and cost-effectiveness. Table III below presents a comparative table of communications costs included by WHO in its telephone directory. The table makes no allowance for the staff costs related to the preparation of letters, telex or telegram messages, nor for the fact that the amount of information that can be communicated by telephone in nine minutes is more than ten times that of the telex or telegram examples presented. Also, it is often possible to receive an immediate reply by telephone, whereas the other means usually require two-way traffic, thus doubling the cost.

TABLE III: Comparative table of communications costs included by a Geneva-based specialized agency (WII) in its telephone directory.

Country	Letter ^{1/} Sw. Fr.	Telex ^{2/} Sw. Fr.	Telegram ^{2/} Sw. Fr.	Telephone ^{3/} Sw. Fr.
Europe				
Germany	0.80	0.90	19.50**	13.50
France	0.80	0.90	19.50**	13.50
U.K.	0.80	1.00	19.50**	16.20
USSR	0.90	1.80	19.50**	28.80
Asia				
Burma	1.20	8.90	45.00	108.00
China	1.20	8.90	81.00**	108.00
India	1.20	8.90	39.00	90.00
Iran	1.20	6.50	39.00	63.00
Japan	1.20	6.50	45.00	63.00
Pakistan	1.20	8.90	39.00	90.00
Africa				
Ethiopia	1.20	8.90	69.00**	90.00
Gambia	1.20	36.00**	39.00	90.00
Ghana	1.20	36.00**	39.00	108.00
Kenya	1.20	8.90	39.00	90.00
North America				
USA	1.20	4.20	33.00	48.60
Canada	1.20	4.20	33.00	48.60
Mexico	1.20	8.90	33.00	90.00
South America				
Argentina	1.20	8.90	51.00	90.00
Brazil	1.20	8.90	51.00	90.00
Dominican Republic	1.20	36.00**	51.00	90.00
Guatemala	1.20	8.90	93.00**	90.00
Venezuela	1.20	8.90	51.00	90.00
Oceania				
Australia	1.20	8.90	39.00	90.00
New Zealand	1.20	8.90	51.00	90.00
Western Samoa	1.20	36.00*	93.00**	108.00

^{1/} Based on airmail letter of 10g. For Europe, based on letter up to 20g. (Automatically sent by airmail where connection exists).

^{2/} Based on an average of 40 words per message including address, and LT despatch whenever possible. For full rate these costs are doubled.

^{3/} Based on an average conversation of nine minutes.

* Transmission charges made per minute (minimum three minutes).

** FR only. LT no longer admitted.

35. It might be preferable to discourage the physical movement of thousands of people and millions of pieces of paper where electronic information transmission could perhaps do the job more quickly and cheaply. There are times and occasions when travel is essential, of course, but cost considerations have led many public and private organizations to now introduce policies discouraging travel and encouraging electronic communications. The Inspectors are convinced that in the UN system a 10 to 20 per cent substitution could be easily attainable. Staff travel and telecommunications complement each other, but rational decisions as to which mode to use can only be taken if the cost-effectiveness of each is carefully analyzed.

36. The most potent of the new communication media are those which integrate computers and telecommunications. Such new systems are usually developed for business organizations, and are offered to others after they have already proved their worth. The United Nations should not wait too long to take advantage of new developments. In the following paragraphs the most promising of these new systems are analyzed with respect to the needs and resources of the United Nations system.

2. New public and private communications services

37. At present, most users of United Nations communications services use only mail, pouch, cable and telex, and telephone. Their options seem to be even more restricted in practice by policies and procedures which attempt to reduce the apparent expense to the organizations, but which may actually result in reduced staff effectiveness.

(a) Public services offered by telecommunications authorities

38. Most post and telecommunications authorities in developed countries now offer a number of new public services which at least potentially could be of great utility to UN system operations. Among these are services in the category of "electronic mail". These may be grouped into three categories: facsimile, text (message) communication, and data communication.

(i) Facsimile - this form has the great advantage that no typewriting is necessary if the message already exists on paper. Facsimile terminals act like remote copiers and reproduce print, typewritten or handwritten text, drawings, photographs, etc. with adequate, though inferior to local copier, quality. At the present time, for example, European PTTs are offering three types of public facsimile service:

- Bureaufax: a facsimile transmission service from post office to post office which is available in 20, mostly European, countries between designated post offices in the same country at a fixed charge of approximately \$1. plus approximately \$1.6 per page. Transmission costs between countries vary from about \$5 to \$11 per page. Messages are hand-delivered by the PTT at the receiving end.

- Telefax: a desktop service using the public telephone system. An A4 standard page can be transmitted in three minutes between compatible facsimile transceivers connected to normal telephone sets virtually anywhere in the world. Transmission costs are a function of national or international telephone rates. Transceivers can be rented from the PTT at a reasonable price (about \$50 per month) or bought from various manufacturers.

- Intelpost: an advanced, all-digital facsimile service capable of transmitting a page of text in 12 seconds via satellite at a cost of about \$5. At the present time, the service is only available between Switzerland and Canada, the USA and the United Kingdom and between the UK and Canada; it will no doubt be greatly expanded in future years.

(ii) Text communication - several new text-based services are being made available by PTTs. These will not replace telex, which provides the most internationally available service; rather these new text services will extend the variety and utility of what can be done throughout Europe:

- Teletex: a "supertelex" service which provides all the capabilities of communicating word processors (full character sets, tabulation, editing capabilities, etc.) and eventually graphics at speeds from four to perhaps thirty times that possible on international telex service.

- Videotex: an interactive information service using television sets to display text and simple graphics transmitted over the public telephone system.

(iii) Data communication - at the present time, most publicly available data communication services are restricted in speed and versatility by the capabilities of the switched telephone service.

39. This proliferation of publicly available communication services provides new opportunities and challenges to United Nations organizations. Services offered by PTTs should be kept under constant review. Greater use of public services will however require careful study in order to determine the cost-benefits of possible options (e.g. in the case of increased use of facsimile, should organizations utilize the PTT facilities - Bureaufax - or buy/rent their own transceivers). In any case, present communications policies and procedures will need to be modified and streamlined if full advantage is to be obtained from these new services.

(b) Private services to enhance public capabilities

40. Many new products and services which enhance the utility of the public telephone system are coming on the market. Notable among these devices are "memory" telephones which can remember the number last dialled and keep trying until a connection is made and/or which have repertories of up to 100 frequently called numbers which can be dialled with one or two strokes instead of more than a dozen. There are "cordless" telephones, call diverters, which automatically redirect incoming calls and conference bridges which enable several telephones to be interconnected at the same time, etc. Automatic answering systems are becoming much more versatile and easier to use. Some have evolved into a type of electronic mail called "voice mail". This provides most of the capabilities of text-oriented systems (store-and-forward, file searching, multiple-destination routing, etc.) without requiring users to type in their messages. In the most advanced systems, voices are digitized and stored in a central computer under numerical codes. Users can retrieve messages directed to them from any telephone by keying in their identification codes with portable Touch-Tone generators. These devices which are becoming commonplace in many public and private organizations are almost unknown in the UN system.

41. Perhaps the greatest cost-benefit possible from new telephone technology is to be obtained from private branch exchange (PBX) systems designed to optimize each organization's communications. Many of the new generation of PBX systems are micro processor-controlled and designed to work with all-digital, integrated communication systems coming into service during this decade. PBX systems may be quite small - controlling and monitoring ten or so telephones - on up to those handling thousands of lines. The cost is about \$1000 per line, which investment usually is amortized in from three to seven years. Although the initial costs of these systems may be high, their advantages are numerous. These include computerized billing and traffic statistics, direct inward and outward dialling both for local and long distance calls, automatic answering, automatic recall, shortening of frequently used numbers, possibility of conversations between three or more persons, data base interrogation, data collection, savings on labour costs etc. Perhaps the main advantage, besides the reduction in labour costs, is the ability to pass digital data for computer interrogation and processing. UN organizations which have not already done so may wish to consider their introduction especially when large-scale upgrading of internal telephone facilities are envisaged.

3. Facsimile

42. The United Nations and several of the specialized agencies started to use facsimile in 1978 or 1979. Most commonly, it serves as an alternative to telex, and the procedures and forms used reflect this. Most of the Geneva-

New York leased telephone line time (16 hours per day) is devoted to two-way facsimile transmission (see Table IV). The theoretical capacity of the system is almost 1000 pages per day both ways. If we allow for loading and unloading of pages, retransmission of illegible pages, equipment maintenance, etc., the actual capacity should be at least half this, or 500 pages per day both ways.

43. Actual traffic statistics from Geneva to New York show an average of about 160 pages per day both ways (using a 21-day month since there is limited use of facsimile during weekends). To this must be added occasional facsimile messages originating in UNHCR, Geneva, for retransmission through the tie-line, and occasional facsimile messages to UNIDO, Vienna, and FAO, Rome, all of which have compatible equipment - however, all of these together average less than one page per day as far as can be determined. The inward facsimile traffic to Geneva is somewhat greater, so that an overall average of 80 pages per day each way or a total of 160 pages both ways can be taken as a reasonable approximation.

44. Still, as may be seen from an analysis of Table IV, 160 pages per day is only 30 per cent of readily attainable throughput. A better balance between teleprinter and facsimile traffic should be possible, taking some of the pressure off teleprinter operation while at the same time saving the organizations using this facility, time and money by reducing the need for the re-keying of messages.

45. An attempt to compare the costs of facsimile on the UN leased line to commercial telex and UN teleprinter is made in Annex I. This shows that the only case in which facsimile is more expensive to the user - it is assumed that the user is a specialized agency which reimburses the UN for the cost of using the United Nations Message Switching System (UNMESS) and leased line facilities - than commercial telex or UN teleprinter is that of telegraphic messages. Where a full page is to be transmitted, the user could save up to \$16.50 per page (over UN teleprinter) or \$26.50 per page (over commercial telex). If the message already exists in typed form, the savings by using facsimile and thus avoiding re-typing are probably doubled, and then facsimile is less expensive than any other method in all cases.

TABLE IV: DAILY TRAFFIC OF UN LEASED AVD* LINE BETWEEN NEW YORK AND GENEVA

Service	Scheduled time hrs.	Theoretical maximum throughput	Practical attainable throughput (1/2 max.)	Actual throughput and % of practical (averaged over 1980)
Telephone	3	60 3-minute calls each way	30 3-minute calls each way	7
Teleprinter (four 75-baud units simultaneously)	Unscheduled (96 teleprinter-hours possible)	350,000 words (assuming 8 character words)	175,000 words	70,000 words (40%)
Facsimile ** (2 units simultaneously)	16	1,000 A-4 pages both ways	500 A-4 pages both ways	160 A-4 pages both ways (30%)
Data transmission (assuming 4,800 bits/sec. each way)	5	10 million characters each way	5 million characters each way	(no regular statistics available but appears to be shifting from experimental to full use)

* AVD stands for "alternate Voice-Data" and is something of a misnomer since 4 teleprinter channels and voice or facsimile or data may be transmitted simultaneously each way on the dedicated 4-wire circuit. The rental of this 4-wire line costs the UN SF 12,000 per month at the Geneva end and \$5,700 per month at the New York end, and to this must be added SF 930 per month for terminal equipment and a comparable charge for terminal equipment in New York; thus, the total cost for line and terminal equipment is about \$12,000 per month, or \$150,000 per year.

** Some agencies require a cover page containing only address information; if the cover page were used to type the first complete page of the message facsimile throughput would be increased up to 50 per cent.

46. A confirmation of the cost-effectiveness of facsimile is given by the fact that message traffic between New York and Geneva is now being increasingly sent by facsimile. Only traffic which needs to be relayed by the UN teleprinter system to other destinations is sent via teleprinter. Also, since the beginning of 1980 FAO has introduced a dial-up facsimile service between Rome and its liaison office at the United Nations in New York. This has been so successful that it has replaced telex traffic entirely between these two points.
47. One possible explanation of the current under-utilization of facsimile service may be the policies and procedures which govern its use in the UN and some of the specialized agencies. UNOG, for example, requires that messages for transmission by facsimile be submitted in five copies. The reasons for this are difficult to understand, unless it is a deliberate attempt to discourage the user. In contrast, New York requires only one copy. Also current cover-page forms require transmission of the entire page as the signature of the authorizing official appears on the bottom line of the page. A different design would allow transmission of partial pages for short messages, thus increasing cost-effectiveness.
48. At the present time, a number of different facsimile systems are in use within the UN system. Most are high-speed 'Group 3' machines which are capable of transmitting an A4 page over telephone lines in less than one minute; Group 3 machines which are more expensive are justified for high volumes - at least several hundred pages transmitted per month - and for long-distance international transmission where the use of the slower (two to three minutes per page) Group 2 machines would be uneconomical.
49. While the Inspectors recommend greater use of facsimile in UN system organizations, they recognize that this technology is being surpassed by the newer techniques based on communicating computers and word processors which may be more advantageous in the long run. Where the flow of information justifies it, this latter option may be the one to take. The choice of the particular equipment to be introduced should depend on the anticipated requirements and long-term cost-effectiveness of the systems offered. Desktop facsimile machines are however relatively reasonable to buy or lease and may in the immediate future serve useful purposes whenever a good quality telephone line is available. The Group 4 (digital high speed) facsimile with its capacity for multiplexing with data channels will also add to the options available. In any case, it is necessary to ensure full compatibility between equipment installed. Forms and guidelines for facsimile use should be revised in order to maximize transmission possibilities. Steps should also be taken to make all staff cognizant of the advantages of facsimile transmission over other communications services. Organizations should offer orientation and training for this purpose.
50. Additional uses of facsimile transmission need to be encouraged. During its 1980 CCITT meeting in Montreal, the ITU successfully experimented with long-distance servicing of an important meeting through the use of facsimile: conference documents requiring translation were transmitted to Geneva via facsimile. The resulting translations were sent back to Montreal via facsimile and reproduced there by offset for immediate distribution. Therefore, no re-keying was necessary and the quality of the product was more than adequate. Similar experiments have also been conducted by the UN and UNESCO. The Inspectors strongly believe that this technique of remote reproduction could be applied more generally. There are at least two areas in which expenses might be reduced considerably:

(i) Servicing of conferences or meetings away from Headquarters, as in the example mentioned above. If local reproduction facilities are available, all documents generated by the meeting could be translated at Headquarters, thus eliminating the need for a large number of translators, typists etc. to be present during the entire duration of the conference (and not always utilized

at full capacity). Important savings would result in travel and per diem costs; staff productivity would also be enhanced by avoidance of jet-lag, health hazards, etc.

(ii) Facsimile and local reproduction as an alternative to sending large numbers of the same document through the pouch. Printed documents (press releases, General Assembly documents, etc.) account for over 75 per cent of pouch traffic. Where documents are urgently needed at the receiving end, these could be sent by facsimile and reproduced locally. The Inspectors suggest that some experiments on these lines should be carried out in duty stations (e.g. regional commissions or regional offices of specialized agencies) where there is sufficient document traffic from Headquarters. They recognize that this may require the upgrading of reproduction facilities in duty stations away from Headquarters as well as increases in staff and space; however decentralization of reproduction would no doubt also have the positive effect of easing the burden of UN Headquarters reproduction services and its cost-effectiveness would have to be studied in this light.

51. The Inspectors would also recommend that experiments be conducted with the following additional uses of facsimile:

(i) Mixed facsimile and letter system: for destinations for which a direct facsimile link is not currently available, urgent letters could make use of existing facsimile links and then be re-routed using a window-envelope at the receiving end (e.g. an urgent letter from WHO Headquarters to PAHO in Washington would be sent by facsimile over the UN leased line and re-routed by airmail or pouch from New York to Washington; a letter from Tunis to New York might be first mailed to Rome or Geneva and then re-routed by facsimile to New York). Special forms, envelopes and procedures would naturally have to be developed. An experiment between Geneva and various destinations in Brazil is presently being conducted by ITU; if it proves successful other organizations should consider introducing this technique.

(ii) Facsimile as an alternative to messenger service: FAO, which has become an enthusiastic user of facsimile between Rome and New York, is also considering using this technology locally. One of their buildings is located five kilometers from the main premises, and it is proposed to use facsimile for urgent documents and cables instead of the present courier service. It appears also that UNHCR is using facsimile to send urgent messages (outgoing telexes) from its Headquarters building to the UNOG cable room. If desktop receivers were made available to larger numbers of organizational units this system would have the potential of replacing the existing special messenger service which normally carries urgent messages to and from the cable room.

52. Of course the prospects for facsimile are not uniformly favourable. UNIDO in Vienna has experienced frequent difficulties in using dial-up facsimile to communicate with offices at UN New York and Geneva, due to the allotted hours of transmission to New York and busy terminal of UN Geneva. Unreadable pages have to be re-transmitted because of line interruptions. However, UN Geneva and UNIDO Vienna (because of their proximity) have arranged that a request from Vienna through the telex line would result in Geneva ceasing its transmission to allow Vienna's urgent transmissions to come through. The only answer to such problems is a willingness to experiment and perhaps also to make use of the new facsimile services made available by PTTs at favourable rates.

4. Communicating computers and word processors

53. Although facsimile will certainly maintain its place in UN system communications in the foreseeable future - especially for the transmission of diagrams and non roman character texts - the present convergence between computers and communications will undoubtedly radically modify the communications scene in the coming

years. Word processing machines which have the potential of becoming the terminals of computer-controlled communications services are being increasingly introduced in UN system organizations. The rate at which visual display units (VDU) are being introduced can give some indication of future developments: until 1977 VDU screens were the exception and those that existed were practically used exclusively for EDP work; there are now some 350 terminals in UN New York and over 500 in the Geneva-based organizations. Probably the majority of these are designed specifically for word-processing; many are also linked to the ICC computer network, thus forming the embryo of a computer-controlled communications system 2/.

54. It can therefore be anticipated that during the 1980s all large UN Agencies will be preparing an increasing proportion of their documents and correspondence on computers or word processors of one sort or another. As most of the equipment now being introduced provides telecommunications capabilities, this will in all likelihood lead to radical changes - including behavioural changes - in the communications philosophy and practices of UN organizations. The minimum speed for computer-computer communication is 300 baud (six times as fast as commercial telex) and it can be multiplexed on leased lines at least thirty times faster than this. This type of communication allows the production at the destination of a perfect camera-ready copy for all material using roman characters. This is a better and cheaper solution than facsimile for typed material and should represent a major United Nations thrust in the 1980s. One further advantage is that such messages are automatically available for "store and forward" purposes including retransmission to third destinations. Finally a draft could, for instance, be made in Geneva, transmitted to New York, modified there, returned to Geneva and produced for distribution without ever being re-typed. If required it could be automatically circulated to concerned Agencies for comment, and be available everywhere within a few hours. The fast transmission rates and the utilization of terminal equipment which is already paid for (for other than telecommunications purposes) as well as the high quality of the output make this by far the cheapest and most effective method of communication for documents which need to be studied in several locations.

55. Experiments in this direction are already being conducted by some organizations. UN Headquarters and UNOG are using this system for the daily transmission of press releases, as well as for the transmission of financial statements, personnel data, etc. UNICEF and UNDP have also started to use the data transmission facilities between Geneva and New York on a regular basis. By the end of 1983 the Language Services of both New York and Geneva Conference Divisions will be able to exchange word-processing produced documents for translation and/or reproduction at the other hand, without any further manipulation beyond the initial entry of text.

56. There is no optimum method which can be prescribed for all types of message and all correspondents, and continued experimentation with new techniques should be encouraged. The technical expertise of ICC should be utilized whenever possible. The Inspectors would advocate a flexible approach in the introduction

2/ The International Computing Centre (ICC) in Geneva has been very active over the last few years in developing, promoting and providing its clients with modern data and text processing, storage and communication facilities offering services such as CALL/TELEX, CALL/TEXT, CALL/MAIL, etc. In the last year, a working group specifically set by the ICC Management Committee has reviewed the state of the art in telecommunications and in the new computer-assisted technologies such as text-processing, electronic mail, videotext, local area networks as well as the impact and prospectives for the UN family this decade. The findings and recommendations of the group have been submitted to the last session of its Management Committee.

of sophisticated computer-controlled communications services. These should be installed whenever warranted by the volume and intensity of traffic between duty stations (e.g. between the various Headquarters and between them and their regional offices) and provided that long-term cost-effectiveness has been carefully evaluated. On the other hand, telex and facsimile are likely to be the only practical telecommunication modes for smaller offices, such as UNDP Resident Representatives or UN Information Centres.

5. Telecommunications as an alternative to travel

57. As the costs of air travel at best remain stable and other travel-related costs continue to escalate (hotels, restaurants, terminal expenses, etc.) many public and private organizations have been considering alternatives to travel with the aim of improving cost-effectiveness and staff productivity. Moreover, developments in electronics and telecommunications have now reached the point where increasing amounts of information in the form of voice, text, data or video may be transmitted from one point to another at costs which are no longer prohibitive and which in fact seem to be dropping, at least in real terms. The advantages of telecommunications over travel - both in terms of costs and overall effectiveness - have led many private firms in developed countries to set up their own systems, ranging in sophistication from simple multiple telephone conferencing with sometimes a parallel facsimile link so that documents can be passed, modified and passed back, to more elaborate systems with, e.g. an audio and a freeze-frame television link, but requiring the use of a satellite channel and the setting up of special conferencing rooms and equipment.

58. UN system experience in this field has been extremely limited but it is felt that there may be significant potential here. The Inspectors are aware that the substitution of the communication function for other functions may require a fundamental restructuring in the pattern of work of UN system organizations and may generate some psychological resistance. This may especially be the case with travel, which is seen by many as a privilege that carries status and therefore some international civil servants may be reluctant to relinquish it. On the other hand, many managers may feel that they already travel too much and in uncomfortable conditions and may welcome the opportunity to reduce their travel. It should also be noted that from an organization's point of view the substitution of telecommunications for travel has some other important though less apparent advantages: it allows staff members to remain at their duty stations and this creates more time for other duties, it eliminates the effects of jet-lag and the need for a day of recuperation after trans-atlantic or similar lengthy trips, it eliminates travel-related health or security hazards, etc.

59. With the above considerations in mind we will briefly illustrate two alternatives to travel which are already being utilized outside the UN system and may be of interest to United Nations organizations.

(a) Voice teleconferencing

60. Teleconferencing denotes the holding of a meeting by the aid of telecommunications. Participants do not have to travel at great expense to meet, but may remain at their own locations. Using the public telephone system, or leased lines, or a combination of these, three or more locations are linked together so that all participants may interact. More than one participant may be present at each location if a loudspeaking or "hands-off" telephone or specially equipped "teleconferencing rooms" are available. Many telephone conferences use voice alone, but this is not an inherent limitation of the telephone network. Special terminal equipment can be made available at each location to provide any (or all) of the following facilities:

- teleprinters for the exchange of text messages;

- telewriters or electronic blackboards for the exchange of handwritten messages and line drawings;
- telefacsimile for the exchange of existing documents, drawings and photographs;
- slow-scan television for sending TV snapshots of participants or three-dimensional objects.

61. The precise economics of teleconferencing would have to be worked out in detail on the basis of concrete situations. The Inspectors are, however, convinced that this technique if applied in a situation where there was no language barrier could result in savings for UN organizations: a six-hour tele-conference (spread over a period of, for example, four days) between participants in three duty stations, according to a rough estimate, would cost between 25 to 30 per cent less than a mission by two representatives to a third duty station. Savings of this kind, if they were to be confirmed, would fully justify investments to make this technique more acceptable (e.g. for "hands-off" telephones or for the setting up of "teleconferencing rooms" allowing small groups of people to participate in the teleconference at each duty station).

62. The Inspectors consider that there is potential in this formula and would recommend that experimental teleconferencing be tried by the UN and other organizations in lieu of routine consultations or short missions. Once sufficient positive evidence on the cost-effectiveness of this is gathered, it is recommended that organizations adopt policies governing its use and discourage recourse to travel when it is possible to obtain the same results through teleconferencing. Naturally, this system could not be used in all circumstances: negotiating difficult issues or attending very technical meetings or behind-the-scene discussions may require face-to-face consultations. Also, if several languages had to be used, this would no doubt complicate and lengthen the procedures.

(b) Computer conferencing

63. This is a radically different approach, whereby all interactions take place through a computer. In most cases, participants do not interact with each other on-line. Rather, they use typewriter-like terminals which are connected to a centrally located conference computer by telephone lines. They interact with the computer in a question-and-answer fashion, depending on whether they want to make a statement, react to previous interventions, review the conference proceedings, retrieve background information, etc. The computer serves as rapporteur of the conference, and the entire proceedings are available at any time. Computer conferencing is particularly attractive in situations where participants are on opposite sides of the earth, because each participant may interact at his own time, pace and convenience. Also, the conference may continue over days and weeks, or even longer, yet individual participants need interact only a few minutes at a time. Computer conferencing also encourages a different psychology of interaction by providing more time for reflection. There is also less chance for a few strong personalities to dominate the conference.

64. Up to now experience with computer conferencing within the UN system has been limited. It has been used for some time in the work of UNESCO's Intergovernmental Oceanographic Commission; the ongoing dialogue between the International Computing Centre (ICC) and its participants may also be considered as a form of computer conferencing. The Inspectors recognize that computer conferencing - under present conditions - may not yet be more advantageous than a traditional-type meeting. Although the costs charged by companies offering such facilities are not prohibitive, the risk of computer and line failures are such that costly back-up arrangements would probably be necessary. However, it has merit for further exploration and the Inspectors would venture that this technique might be particularly suited for some inter-agency meetings on technical matters, such as those taking place in the CCAQ context.

65. Experience will show the actual potential of this medium. Moreover, it can be anticipated that if computer and telecommunications costs continue to fall and if organizations continue to install mini-computers and computer terminals at the present rate, the time will soon come when there will be sufficient numbers of terminals linked to inter-connected computers in various UN organizations which will make recourse to an outside computer company unnecessary. Computer conferencing will then become a day-to-day occurrence. The Inspectors therefore recommend that developments in computer conferencing be carefully monitored by organizations, if possible on an inter-agency basis, and that experiments with this technique be carried out. Only in this way can sufficient experience be obtained to determine actual advantages and disadvantages in the UN context. UN organizations should also attempt to negotiate preferential rates with the private companies providing equipment/services or to obtain experimental demonstrations free of charge.

6. Radio communications 3/

66. A basic level of United Nations-owned and United Nations-operated radio communications has existed since the origins of the Organization. In effect, on the basis of a number of agreements with the United States Government, the Swiss authorities and the member States of the ITU, the United Nations was able to take over (at least in part) the frequencies previously allocated to the League of Nations. The rather intricate history of these agreements is not discussed in any detail here. In 1947 the ITU agreed that the United Nations should benefit by the same rights and be bound by the same obligations as the members of the ITU for operating telecommunications services. Thus, the legal basis for UN radio communications is clearly established (the authority of the specialized agencies to have independent access to such communications is however not recognized by the member States of the ITU). The Inspectors understand that a number of frequencies have been allocated to the United Nations but that these are not fully utilized at the present time.

67. The UN radio communications network at present comprises:

- UN-owned ground stations for satellite radio-teleprinter and voice circuits (for communications between Geneva, Jerusalem and Naquora). These circuits are operated through the experimental "Symphonie" Franco-German satellite (whose design life-time will probably be over some time during 1982).

- UN-owned high-frequency radio-teleprinter circuits for telex-type messages for transmission from Geneva eastward (to Rawalpindi, Dacca, Bangkok) and southward (to Nicosia, Addis Ababa, Nairobi and Lusaka).

68. In addition to this network which is heavily used by the UN both for peacekeeping and day-to-day operations (and by the specialized agencies for traffic related to technical co-operation projects), some use of point to point single-side-band (SSB) radio communications has also been made:

- UN and UNDP are increasingly using SSB radio within countries (e.g. for communication to outlying projects) and between neighbouring countries for emergencies or as a back-up for normal communications. In both cases, governmental permission is required.

3/ This report is not concerned with the issue of short-wave radio broadcasts for public information purposes. Document A/AC.198/20 (Intensification and expansion of United Nations short-wave broadcasts) and document A/AC.98/36 give some details on the present situation, and on future plans to up-grade the use of SW radio for international public information purposes.

- FAO is in the process of establishing radio links between Headquarters and the Locust Control Organizations in six African countries (Algeria, Mali, Mauritania, Morocco, Senegal and Tunisia) in order to maintain closer operational control over the desert locust activities. WHO has set-up similar links in several African countries in the framework of its Onchocerciasis disease programme.

- UNICEF is using SSB radio for communications between the representative's office in the capital city and outposted projects or duty stations in some African countries.

- Portable short wave radio sets are available to UNDRO for use during emergencies or disaster relief activities (but have not been successfully utilized).

69. The Inspectors did not attempt to assess the cost-effectiveness of the UN radio-teleprinter network vs. commercial or PTT-owned communications ^{4/}. In fact, it should be recognized that the UN radio communications network was established to provide a direct link, under UN control only, with the UN peacekeeping missions in the Middle East and Pakistan. All other aspects of UN communications are subordinate to this fact and the transmission of facsimile, data, voice, etc., for other purposes are therefore possible only if they do not interfere with the main function of the system.

70. The Inspectors agree that the critical factor is the unhindered availability of communications for the United Nations at all times. Political crises or natural disasters usually result in commercial communications facilities either being disrupted or made unavailable to the United Nations. If the critical contingency responsibilities of the United Nations are to be met the prime consideration must be the availability of a basic level of reliable communications at all times. The Inspectors would argue, however, that this level and the consequent balance between UN and commercial facilities should be kept under review and adjusted periodically. The Inspectors considered whether or not they should recommend that a deliberate move should be made to up-grade the United Nations radio-communications capability. It would be possible to envision that all UN system duty stations in the field would be equipped with radio-communications equipment. Advances in telecommunications technology would, at least in theory, permit such developments: small sophisticated short-wave transmitters which, it is claimed, are as easy to operate as a telephone, are now available on the market at a unit cost of approximately \$100,000 (to which should be added the cost of antennae, training of operators, etc.). These devices claim to possess an all-purpose electronic capability for the transmission and reception of cross-country or inter-continental communications and would allow a variety of functions: radio-telephone, radio circuits for audio-transmission, facsimile, word processing, teletype, etc.

71. A "UN system radio-communications network" as appealing as it might be would have to be justified by solid technical and operational arguments, even if political and financial obstacles were to be overcome. The Inspectors understand however that radio-communications tend to be less reliable than other communications media because of interference by objective factors such as over-crowded frequencies, sun-spot activities or atmospheric conditions, and that recent technology does not as yet appear to have found satisfactory solutions to such problems. The present UN radio-teleprinter network is, of course, also affected by these factors but overcomes them by using very "heavy" equipment and by changing frequencies (both of which require specialized personnel).

^{4/} A recent study prepared for the ICC Telecommunications Task Force entitled "Comparison of Costs UNMESS-TELEX" (CIC XXVIII/6 Suppl. 1) purports to show that in most cases for organizations not funded by the UN Regular budget, commercial telex is cheaper than the UN network. This may however be more a result of UNMESS pricing mechanisms than of the inherent costs of the network, which the study did not attempt to evaluate.

72. The Inspectors also noted that more and more options were becoming available in telecommunications. A heavy commitment to radio-communications would limit the UN to just one option, whereas it may be prudent to adopt a more flexible approach. Accordingly, the Inspectors would recommend that as a matter of urgency a thorough investigation of the communications needs and requirements of field duty stations be undertaken before any attempt is made to modernize the UN radio network.

73. Should there nevertheless be a consensus to move in this direction, the building-up of a comprehensive United Nations system radio-communications network raises a number of issues which would have to be solved: e.g. problem of the legal authorizations necessary for the UN and specialized agencies to set up their own system; need to set aside appropriate frequencies, etc. The Inspectors consider that it is possible that such difficulties could be overcome, provided that both in terms of costs and operational effectiveness the advantages of the "UN system radio-communications network" can be demonstrated. Should this be the case, it would therefore appear that as a first step some technical studies and one or two long-distance communications experiments should be undertaken with the new multi-purpose communications systems currently being marketed. It might be possible to induce the companies marketing such equipment to organize demonstrations at little or no cost to the United Nations. The Inspectors would however strongly recommend that any action taken in this area - either by the United Nations as the "lead agency" or by the inter-agency body, the institution of which is recommended in the following chapter - should be closely co-ordinated with the Department of Press and Information of the UN and with the agency and inter-agency bodies which govern its activities and which are presently pursuing similar plans.

7. Satellite communications channels

74. Considering the volume of communication of UN system organizations it can be safely anticipated that increased use will be made of dedicated satellite channels. Instead of looking into the possibility of acquiring its own communications satellite system, UN organizations - preferably with a single voice, through the mechanisms suggested in the following Chapter - should endeavour to negotiate with Intelsat (or similar consortia) the acquisition of channels at preferential rates, so that the majority of UN and agency offices could be connected to a satellite communications network.

75. The issue is not so much who should launch the satellites, but whether the UN organizations should acquire their own earth stations or whether they should rely on government or commercially operated earth stations. The Inspectors would favour prudent steps towards UN-owned and operated earth stations. As international regulations require that such stations be licensed by the government of the host country, a move in this direction would require detailed negotiations with a number of governments. Such negotiations would no doubt be facilitated by collective decisions of Member States in the appropriate UN system fora recommending that such avenues be pursued. The costs of small parabolic-antenna earth stations is now much less prohibitive and the expense would probably be justified by the increased security these stations would provide for UN system communications.

76. Operating in the ultra-high frequency range, such a system will require only small parabolic antennas (and transceivers) to be installed at any duty station, field project or conference site for full telephone, telex, computer-to-computer, high-speed facsimile or even television communication with all points in the system. Once such a system is available communication costs based on time and distance (the present charging standard for commercial systems) will cease to exist.

77. The advent of a UN system network of earth stations for satellite communications would not necessarily make obsolete any existing high-frequency radio equipment. Only separate parabolic antennas, frequency converters and other similar equipment would be necessary. It is difficult to predict the cost of such a move, particularly as new equipment appears on the market with increasing regularity. In fact, it may be worth while to keep the existing radio network as a back-up in case of emergencies.

8. Changes in the working environment

78. Whatever the scenario for the future of communications, the role of the computer will continue to grow in UN organizations, providing larger, and more accessible data bases, handling automatic switching, time and priority sorting for transmissions, and eventually automatic filing of written communication. Judging from the experience of outside organizations, this is but a small part of the revolution in the working environment which is likely to take place in the coming years. Changes will affect primarily secretarial staff - with the introduction of word processing and similar equipment, with labour intensive messenger service being progressively replaced by internal electronic mail or facsimile (at least for more urgent messages). However, changes in due course, will also take place in the work of managers: with the gradual introduction of such innovations as "speech typing" (typewriter machines capable of recognizing the human voice) and store and forward capability in the telephone system (which can store messages and from which information can be retrieved orally at all times by simple touch-tone dialling, in much the same way as in a computer) the working habits and atmosphere are bound to be drastically modified. Similar changes will also no doubt take place in UN system meetings and conferences (introduction of terminals and screens in committee rooms, storage of documents in mini-computer memories rather than in paper form). Some experts are even predicting that the physical presence of participants in meetings or staff members in their offices will soon no longer be necessary: it will be possible to carry out many functions from one's home using electronic mail or mini-computer facilities connected to the telephone, thus reducing the need for office accommodation, expensive centralized facilities, time-consuming commuting to and from the office, etc. These are vistas for the not very distant future and recruitment practices in the various organizations should take fully into account the need for these new skills.

79. The Inspectors cannot, of course, predict to what extent and at what pace such changes are likely to take place. They would stress, however, that steps should be taken to (a) make top level management cognizant of changes taking place in outside organizations and likely to be applicable to UN operations; (b) ensure that sufficient long-term planning and, if possible, inter-agency co-ordination, takes place, and (c) set up orientation and training programmes for all staff affected by the introduction of new equipment or services to ensure that psychological and bureaucratic resistance to change is reduced to a minimum.

IV. UNITED NATIONS SYSTEM CO-OPERATION

80. A certain degree of co-operation on communications matters between the organizations of the United Nations system already exists - as is apparent from the preceding sections of this report. It is important, however, that more be done. The Inspectors have gained the impression that until now the organizations of the UN system have, not unnaturally, concentrated their efforts on achieving efficiency and confidentiality in their own communications services, whilst somewhat overlooking the fact that a rationalized common communications system may have considerable advantages both in terms of effective services and in keeping costs to a minimum.

81. It has become clear to the Inspectors that there are a number of problem areas which could profit from inter-agency approaches or solutions. These include:

(a) The pouch: despite some limited progress and inter-agency co-operation (which has certainly served the useful purpose of identifying the problems), separate pouch services belonging to different organizations still exist (UN, FAO, WHO, etc.). Integration is recognized as a long-term need, but little seems to have been done to fulfill this need. This results in costly, cumbersome and time-consuming procedures and often in abnormal pouch routings (e.g. the UN pouch from Tunis to Cairo is presently transshipped through New York, whereas a direct link or routing through Rome or Geneva might be more convenient if the co-operation of the other United Nations agencies working in the region could be obtained; the pouch from Dacca to Colombo also transits through New York). The Inspectors consider that it is urgent to find a solution more in line with logic and that this might conceivably entail the creation of a true United Nations system pouch network, operated on an inter-agency basis rather than under the stewardship of a single organization, with clear and accepted operational and billing procedures (preferably computerized).

(b) The telephone: the issue of AVD lines (or tie lines) also seems to require inter-agency consideration. At present, a somewhat excessive level of control in such matters seems to be in the hands of the United Nations - which leases the New York-Geneva line and establishes the rates for the services that this line provides to other agencies of the United Nations system (for entities funded by the United Nations regular budget, costs are absorbed by General Operating Expenses). The United Nations appears to have discouraged FAO in setting up its own AVD line for telephone, facsimile and data communications between Rome and New York. UNESCO and UNIDO are also considering the possibility of leasing AVD lines, while the United Nations is considering the introduction of a second AVD line between New York and Geneva. The Inspectors would, here again, suggest that such issues should be analyzed and resolved in an inter-agency context.

(c) The increased use of facsimile also has inter-agency implications: compatibility of the equipment used, introduction of digital facsimile, harmonization of procedures, introduction of store-and-forward or "facsimile + letter" (see paragraphs 42 to 52) experiments, etc.

(d) The monitoring of the performance and possible upgrading of the UNMESS I and II message switching centres and of the UN radio-teleprinter network will also require inter-agency attention, especially since, as mentioned earlier (paragraph 69), a recent study seems to show that commercial telex is often more advantageous than the United Nations network for non-UN regular budget entities.

(e) Other areas such as the upgrading of UN system radio communications, data communications, the introduction on a regular basis of teleconferencing

or computer conferencing, communicating word processors, long-distance conference servicing or document printing, the introduction of sophisticated computer-assisted communications vehicles such as videotex, etc., will all require varying degrees of inter-agency consultation.

82. This listing, which is by no means complete, points to the need for the establishment of an inter-agency mechanism to review and take action on communications issues on a system-wide basis. The Inspectors carefully considered various possible alternatives. They realize that, to some extent, inter-agency consultations have already taken place in the past (e.g. in the framework of the ICC Task Force on Telecommunications, or at the initiative of the United Nations on an ad hoc basis - consultations on the use of the pouch or telephone services, etc.). However, in view of the wide diversity and complex nature of the problem, past efforts seem to have lacked authority and sufficient recognition from the parties involved. The Inspectors feel that support of top management is essential if United Nations system communications are to develop in a rational and cost-effective fashion. For this reason, they recommend - and they consider this recommendation to be the most important in the present report - that the Secretary-General should take the initiative, within ACC, to set up an ad hoc inter-agency committee on communications on which top level managers would supervise the programme of research and action to be followed-up and acted upon by lower-level meetings of officials concerned with each type of communications service. Some of these meetings should be held under teleconferencing or computer conferencing modes. This committee should benefit from advice from ICC on computer controlled communications and from the Inter-organization Board for Information Systems on word processing and related matters.

83. The mandate of this committee might be as follows: its long-term objective would be the review and adoption of a UN system plan for communications, as well as the continuous monitoring of it; its immediate objective should be to facilitate discussions between communications experts of the organizations of the common system in order to prepare the terrain for the preparation of this plan. This high-level committee would probably need to meet only once a year and would serve primarily as the guiding and reviewing body of the activities of special expert groups. Some of the tasks which could be undertaken under the overall direction of this committee could include the following:

(a) Arrange for expert studies prepared, when appropriate, by outside consultants directed to the up-grading of United Nations system communications facilities assessing overall needs and evaluating the usefulness and effectiveness of various types of communications equipment and systems in the light of current problems and anticipated long-term needs of the complex worldwide UN network.

(b) Co-ordinate administrative communications requirements, with the plans currently under discussion in the UN Committee on Information and in the Joint United Nations Information Committee for the expansion of communications for public information purposes.

(c) Review and establish general communications policies and standards; share communications techniques and practices; advise individual organizations at their request on internal communications issues; review new equipment specifications before acquisition by organizations in order to ensure compatibility where required, etc.

(d) Review the functioning of existing or potential system-wide communications networks (radio-teleprinter, leased lines, facsimile, pouch, other new services) in order to maximize cost-effectiveness for all parties concerned and reduce possibilities of friction; develop appropriate billing and control procedures and produce workload statistics.

(e) Monitor new developments in the field of telecommunications and conduct experiments to test new services (e.g. teleconferencing, computer conferencing, etc.).

(f) Monitor and compare costs and exchange information on realistic budgeting of communications expenditures, taking into account current and anticipated volume and rate levels and sufficient appropriations to modernize communications equipment where required.

(g) Provide the framework for the exchange of information on methods for the technical training for staff operating sophisticated communications equipment.

84. The Inspectors suggest the following time-table for the setting-up of this inter-agency co-ordinating machinery:

- The ACC should constitute an ad hoc committee on communications, define its mandate and terms of reference before the end of 1982;

- the committee should establish its working groups and submit its first report, which would include a work programme and time-table, to ACC in 1983; simultaneously the committee should gather data for points (a) to (g) above;

- ACC would review this report and submit its comments to governing bodies by the end of 1983;

- the committee would submit to ACC progress reports on the preparation and implementation of the proposed UN system plan on communications every year thereafter;

- Legislative bodies should periodically review progress made.

V. CONCLUSIONS AND RECOMMENDATIONS

1. Conclusions

85. As explained in the Introduction, the present study should not be considered as a comprehensive report on the status and prospects of communications in the UN system. The Inspectors recognize that much of the data gathered on communications usage and expenditures suffered from severe qualitative limitations. The information appearing in Chapter II only shows rough ideas of magnitude and it would be hazardous to make generalizations on the basis of the data presented.

86. The Inspectors would stress however that the primary objective of their study was not to present hard and fast data on communications, but rather to draw the attention of top-level managers and inter-governmental bodies to the existence of a sizeable communications problem in the United Nations system. In essence, this problem has three components:

- History: The progressive building-up of the organizations of the UN system has led each one to respond to particular demands in its field of competence and to develop its own style, practices and procedures, including those related to communications, within a loose common framework. Some organizations have moved faster than others, but all seem to in some degree entrenched in their particular bureaucratic patterns which scarcely foster a psychological climate favourable to change.

- Technology: Because of pressing programme and operational demands, organizations have hardly devoted enough attention to the development of new systems or services in the field of communications. As a result the technological gap with outside organizations is widening and the capacity of the UN system to respond rapidly and effectively in terms of communications to the challenges of a rapidly changing world is probably being impaired.

- Attitudes: In times of scarce resources, communications tend to attract attention from budgetary review bodies, whose natural propensity is to cut and streamline. As a result communications has become an issue of expenditures and one confined to biennial budgetary periods. No long-term - 10 to 15 year - planning of communications needs and requirements has ever been made. The Inspectors argue that there is need to introduce a broader perspective in this regard.

87. The question, therefore, is how to ensure the balanced development of a communications philosophy and of adequate communications systems within the UN system, bearing in mind, that communication should not be seen as an end in itself, but as a means to make UN organizations more effective, more responsive and better adapted to the formidable tasks before them.

88. The Inspectors believe that the recommendations of this report can be implemented over a period of time and prove to be cost-effective. They express the hope that the recommendations will be examined with all these considerations in mind.

2. Specific issues concerning the United Nations

89. As explained in the Introduction, it was not possible to cover in this report all aspects of communications in all the organizations of the common system. Nevertheless, in the course of the preparation of this study, the Inspectors reviewed a number of issues concerning the UN which in their view required attention. As a result of their analysis, they recommend the following actions:

(a) Telephone

- Engage a consultant to conduct an in-depth study to evaluate various options, including the installation of a private telephone system, to determine the most efficient means to modernize the UN Headquarters telephone system.
- Conduct an in-depth study on the replacement of the present antiquated manually-operated telephone exchange in UNOG with a micro-processor controlled system which would form the basis of an integrated communications system (see also paragraphs 40 and 41).

(b) Cables, telex and teleprinter network

- Conduct a study on the advisability of up-grading the present computer-controlled message switching capacity of UNMESS I and II and of the need for the establishment of additional message switching stations.
- Devise a computerized system to gather data from all UNMESS stations so that the most economical and efficient routing of telex and cable traffic can be determined.
- Introduce optical character readers (OCR) and mini-computer to eliminate time-consuming manual "punching" or typing of outgoing cables and telex.
- Replace present outmoded code machines for which parts are no longer available with modern, more sophisticated code systems and equipment.

(c) Pouch

- Take urgent measures to up-grade present working conditions in UN NY pouch room.
- Modernize the pouch accounting system by installing computerized billing procedures to allocate shipping costs to originating offices more accurately.
- Without prejudice to the setting up of an inter-agency pouch network, reduce the volume of expensive, time-consuming transshipment of pouch items through New York by: making better use of existing pouch networks; increasing the number of direct pouch links between overseas UN offices and expanding satellite pouch systems centred on UN regional offices.

(d) Mail and messenger service

- Upgrade equipment used by mail and messenger units to reduce sorting and delivery time.
- Study the possibility of replacing the present UNOG labour-intensive, office to office messenger system with either an automated system (with pre-programmed carts, dumb-waiters, pneumatic tube, etc.) or a system in which internal mail is distributed only to designated central points in each unit.

3. Recommendations

- (a) Services offered by public telecommunications authorities (PTTs) Most post and telecommunications authorities in developed countries are starting to offer a host of services - facsimile, electronic mail - of potential interest to UN organizations.

RECOMMENDATION 1

Communications Services offered by PTTs should be kept under constant review. Greater use of public services will, however, require careful study in order to determine the cost-benefits of possible options. In any case, present communications policies and procedures will need to be modified and streamlined if full advantage is to be obtained from these new services (paragraphs 38-39).

(b) Greater use of facsimile Several UN system organizations have started to use facsimile as an alternative to telex; in most cases this has proven to be cost-effective although present procedures do not always encourage usage.

RECOMMENDATION 2

(i) Greater use should be made of facsimile in UN system organizations. The choice of the particular equipment to be introduced should be made on the basis of anticipated requirements and cost-effectiveness of the systems offered. In any case, it is necessary to ensure full compatibility between equipment installed. Forms and guidelines for facsimile use should be revised in order to maximize transmission possibilities. Steps should also be taken to make all staff cognizant of the advantages of facsimile transmission over other communications services (paragraphs 42-49).

(ii) Additional uses of facsimile need to be encouraged, e.g. long-distance servicing of conferences or meetings through facsimile as an alternative to the travel of translators and typists; remote reproduction as an alternative to sending large quantities of the same document through the pouch. Experiments should also be conducted with mixed facsimile and letter transmission to reach destinations for which a direct facsimile link is not available and as an alternative to messenger service for in-house transmission of urgent messages between different buildings of the same organization (paragraphs 50-51).

(c) Communicating computers and word processors The increasing use of word processing and computer equipment which possess the potential of becoming the elements of a computer-controlled communications system open new avenues to the transmission of information in the UN system. A flexible approach in this area is however essential as there is no optimum method which can be prescribed for all communications needs.

RECOMMENDATION 3

Continued experimentation with the new computer-controlled communications techniques should be encouraged. Wherever possible organizations should utilize the valuable experience and expertise built up by the International Computing Centre (ICC) (paragraphs 53-56).

(d) Telecommunications as an alternative to travel As travel related costs continue to escalate while costs of electronics and telecommunications are dropping many public and private organizations have started to consider alternatives to travel with the aim of increasing cost-effectiveness and staff productivity. In particular, two alternatives to travel appear to have significant potential: voice-teleconferencing and computer conferencing.

RECOMMENDATION 4

Voice-teleconferencing between three or more participants should be tried out on an experimental basis in lieu of routine consultations or short missions. Once sufficient positive evidence on its cost-effectiveness is gathered, organizations should adopt policies governing its use and discourage recourse to travel when it is possible to obtain the same results through teleconferencing (paragraphs 60-62).

RECOMMENDATION 5

Developments in computer conferencing should be carefully monitored by organizations, and if possible on an inter-agency basis, and some experiments with this technique be carried out in order to determine the actual advantages and disadvantages of this technique in the UN context. Inter-agency meetings might be particularly suitable for an experiment. UN organizations should also attempt to negotiate preferential rates with the private companies providing equipment/services or to obtain experimental demonstrations free of charge (paragraphs 63-65).

(e) Increased use of radio communications The existing United Nations owned and operated radio communications network has its justification in the critical need for a basic level of communications at all times. The question is rather whether the present balance between UN and commercial facilities should be modified and if so in what sense. The development of a UN system comprehensive radio-communications network would have to be justified by solid technical and operational arguments even if political and financial obstacles were to be overcome.

RECOMMENDATION 6

Before any attempt is made to modernize the present UN radio network thorough studies should be undertaken on the communications needs and requirements of field duty stations and on the costs, operational effectiveness and overall advantages of a communications system based on radio communications. Should such studies yield promising results, one or two long-distance experiments with the new multi-purpose radio communications systems might be conducted (paragraphs 66-73).

RECOMMENDATION 7

Any action in the field of radio communications should be closely coordinated with the Department of Press and Information of the UN and with the inter-governmental bodies which govern its activities (paragraph 73).

(f) Increased use of satellite communications channels Considering the present volume and trends of communications in the organizations of the common system it is safe to anticipate that increased use will be made of leased satellite channels.

RECOMMENDATION 8

Instead of looking into the possibility of acquiring their own communications satellite system, UN organizations - preferably with a single voice - should endeavour to negotiate with Intelsat (or similar consortia) and with the governments of host countries the acquisition of communications channels at preferential rates and their operation so that the majority of UN and agency offices could be connected to a satellite communications network comprising a number of UN owned and operated earth stations (paragraphs 74-77).

(g) Changes in the working environment The increasing role of computers, word-processors, computer-assisted telecommunications services in day-to-day activities is bound to have drastic effects on the working atmosphere and habits of UN organizations.

RECOMMENDATION 9

Steps should be taken to make top level management cognizant of changes taking place in outside organizations and likely to be applicable to UN operations; to ensure that sufficient orientation and training programmes are set-up

for all staff (and eventually government delegates) affected by the introduction of new equipment or services so that psychological (and bureaucratic) resistance to change is reduced to a minimum (paragraphs 78-79).

(h) United Nations system co-operation Although some co-operation on communications matters already exists between the organizations of the UN system, the present study concludes that it is urgent that more should be done. It has become clear to the Inspectors that there were a number of problem areas - in the operation and routings of the pouch, in the establishment of leased telephone lines, in the operation of the UN teleprinter network and UNMESS switching centres, in the introduction of compatible facsimile equipment, etc. - requiring inter-agency approaches or solutions. Moreover, it would appear that the organizations of the UN system have somewhat overlooked the fact that a rationalized common communications system might have considerable advantages both in terms of effective services and in keeping costs at an acceptable level. This has led the Inspectors to make the following recommendation, which they consider to be, by far, the most important in their report.

RECOMMENDATION 10

The Secretary-General should take the initiative within ACC, to set up an ad hoc inter-agency committee on communications on which top level administrators would guide the programme of research and action to be followed-up and acted upon by lower-level meetings of officials concerned with each type of communications services.

(i) The mandate of this committee might be as follows: its long-term objective would be the review and adoption of a UN system plan for communications, as well as the continuous monitoring of it; its immediate objective should be to facilitate discussions between communications experts of the organizations of the common system in order to prepare the terrain for the preparation of this plan (paragraphs 80-83. Some of the specific tasks to be carried out under the guidance of this committee are listed in paragraph 83, sub-paragraphs (a) to (g)).

(ii) The following time-table for the setting-up of this inter-agency co-ordinating machinery is suggested:

- the ACC should constitute an ad hoc committee on communications, define its mandate and terms of reference before the end of 1982;

- the sub-committee should establish its working groups and submit its first report, which would include a work programme and time-table to ACC in 1983;

- ACC would review this report and submit its comments to governing bodies by the end of 1983;

- the committee would submit to ACC progress reports on the preparation and implementation of the proposed UN system plan on communications every year thereafter;

- Legislative bodies should periodically review progress made (paragraph 83).