OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

16862

Distr.
RESTRICTED

IO/R.75
14 June 1988

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

ENGLISH

ASSISTANCE TO THE NATIONAL SYSTEM OF SCIENTIFIC TECHNICAL INFORMATION

XP/MON/88/MC6

MONGOLIAN PEOPLE'S REPUBLIC

Terminal report*

Prepared for the Government of the Mongolian People's Republic
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of Miecyzsław Muraszkiewicz,** industrial information adviser,
Vladimir Teremetsky,*** satellite communication expert

backstopping officer: J. Pavlik,
Institutional Infrastructure Branch

United Nations Industrial Development Organization
Vienna

---

* This document has been reproduced without formal editing.

** Institute for Scientific, Technical and Economic Information,
00-041 Warsaw, ul. Jasna 14/16, Poland.

*** Institute for Automated Systems, 2a Nezhdanova Street, Moscow 103009, USSR.

Explanatory Notes

Value of the local currency "Toughriks"
1 US $ = 3 Toughriks (May 1988)

Abbreviations

STINS - Scientific and Technical Information System
CSTI - Center of Scientific and Technical Information
INTIB - Industrial and Technological Information Bank
TIPS - Technological Information Pilot System
LINK - On-Line Information Key (databank)
TIES - Technological Information Exchange System
INDIS - Industrial Information System
IDAA - Industrial Development Abstracts /Domestic/ (databank)
IDA - Industrial Development Abstracts (databank)
OFFR - Offer of Technology (databank)
NODE - Directory of the INTIB focal points (databank)
VENT - Joint Venture Opportunities (databank)
REQT - Requests for Technology (databank)
IAS - Institute for Automated Systems
EPROM - Erasable Programming Read-Only-Memory
PAD - Packet Assembler-Disassembler
CCITT - International Consultative Committee on Telegraphy and Telephony

Abstract

Muraszkiewicz, M.
Teremetsky, V.

UNIDO

Assistance to the National System of Scientific and Technical Information in the Mongolian People's Republic.
Terminal Report. XP/MON/88/M06.

This report presents the results of missions undertaken by the experts in Sept. 6-28, 1987 and in April 18-May 7, 1988, to the Center of Scientific and Technical Information (CSTI) at Ulan Bator in the Mongolian People's Republic within the project: "Assistance to the National System of the Scientific and Technical Information" in the MPR (XP/MON/88/M06). The immediate objectives were the following: (i) to advise the government on ways and means to improve the performance of the existing industrial information facilities with focus on new technologies; (ii) to establish a remote access system for some customers from Ulan Bator to the centralized information resources of the country, and to international databanks.

The microcomputer network connected to the Institute for Automated Systems, Moscow, and UNIDO has been established and made operational. Access to international databanks was provided. Some of the institutions which were identified as candidates to participate in the INTIB national network were equipped with appropriate hardware and software tools and linked on-line to the CSTI.

It is recommended to establish: (1) A national INTIB network with a focal point at the CSTI; (2) A national industrial and technological policy; (3) Domestic industrial and technological databanks in the national INTIB information centers; (4) Permanent access to international information services; (5) Local computerized information network. The future UNIDO's technical assistance is outlined in detail.

TABLE OF CONTENTS

INTRODUCTION

The objective of the project "Assistance to the National System of the Scientific and Technical Information" in the MPR is twofold: (i) to advise the Government on ways and means to improve the performance of the existing industrial information facilities with focus on new technologies; (ii) to establish a remote access system for some customers from Ulan Bator to the centralized information resources of the country, and to international databanks. The first part of the mission was basically aimed at identification of existing informational structures and facilities, subject- and document-oriented information systems, users' needs, etc., and at outlining the steps leading to the accomplishment of general purposes of the project. The second part of the mission was aimed at the establishment of a microcomputer network and its conncection to international data banks, as well as, at on-the-job training of specialists on applications. The Industrial Information Adviser (later on called adviser) and the Satellite Communication Expert (further on called expert) were attached to the Center of Scientific and Technical Information in Ulan Bator.

The methodology adopted by the adviser in performing the mission included, inter alia: (i) analysis of documents related to the aims formulated in the job description; (ii) design, dissemination and evaluation of a questionnaire; (iii) personal visits to some institutions; (iv) interviews and consultations.

The methodology adopted by the expert to perform his tasks based upon: (i) the analysis of the existing telecommunication links between the USSR and the MPR; (ii) testing the telecommunication channels between the USSR and the MPR, as well as, the channels in Ulan Bator; (iii) experiments dealing with the configuration of the network, carried out in Ulan Bator; (iv) experience acquired in establishing a satellite connection between the Central Scientific and Technical Information Institute (Pyongyang, DPR of Korea) and UNIDO (cf. report by V.Teremetsky [15])

* * *

In recent years information has increasingly been considered as a major commodity, and as a valuable national resource, and information transfer has become a major field of activity. Due to the development in computer technologies and telecommunications, sophisticated on-line information services (e.g. databanks and databases) in most fields of knowledge, including industrial and technological information, are widely available in the developed countries, but users in the Mongolian People's Republic (MPR) still have limited access to such services.

The Mongolian government and information specialists recognize that industrial and technological information is a key element in strengthening and accelerating the process of industrialization. In

a country with a relatively modern industry the shortage of such information will slow down, sooner or later, the progress of the national economy. The present level of industrial and technological information infrastructure is lower than needed, therefore substantial changes are necessary. Since Mongolia is situated far from foreign information resources, the task of modernization and extention its information services is more complex and complicated.

While designing and implementing the modernization and development of an industrial information programme one should take into account, inter alia, the following paradigms:

1. All the existing information facilities which have been developed and used so far should be employed in the best way in the process of modernization. In case of scarce financial resources, it is mandatory to co-ordinate different activities, in particular, it would be a waste of funds to make investments separately in the field of industrial and technological information and other information branches;

2. To make available adequate, accurate and timely information on industry and technology it is necessary to create a comprehensive industrial information system for the country as a whole. Needless to say, the system has to be flexible, modular and susceptible to future changes and innovations. An important element of this system is a national industrial information policy which would make it possible to generate short-, medium- and long-term development programmes.

3. A functional rather than structural approach should be adopted in order to improve the existing services and to introduce new ones. This can be done, in practice, through strengthening, promoting and developing various document- and subject-oriented systems meeting actual users' needs. Consequently, creation of an array of national databases and databanks, easily accessible and computerized, have to be stimulated and supported. Moreover, linkages with international information resources and services should be extended. The supply of copies of source documents relevant to the users' needs have to be assured, if requested. Last but not least, it is necessary to introduce new services, especially through the application of computer facilities.

UNIDO has been involved in the establishment and /or strengthening of different industrial and technological information facilities in a number of countries and in training of information personnel. Its own industrial inquiry services as well as the INdustrial and Technological Information Bank (INTIB) are intended to serve and support such facilities through the creation and maintenance of effective linkages with them. In particular, INTIB was set up with the aim of facilitating and accelerating a great flow of information between the interested countries for the proper selection of technology; it also provides inexpensive access to external sources of information.

Thanks to the acquired experience and good intellectual resources, it seems that there exists a sufficient background to extend the existing services and to introduce gradually new information techniques in the MPR. Undoubtedly, UNIDO along with other U.N. organizations can effectively contribute to fulfillment of this task.

* * *

Acknowledgments

A great deal of very helpful opinions and suggestions, and valuable contributions were received from the counterpart specialists; some of their proposals have been incorporated into the present document. The final conclusions and recommendations of the mission, however, reflect the views of the adviser and the expert only.

The adviser and expert are indebted to Mr. T.Dorjbal for valuable information on the structure and functioning of the Scientific and Technical Information National System in the MPR.

Useful information dealing with the Mongolian alphabet and its implementation on microcomputers and on telecommunication issues was given by Mr. P. Ulan Khu.

Special thanks are addressed to Ms. B. Ojunbileg who has made great efforts to render remarkable assistance to the adviser and the expert in the course of their assignments. They also appreciate technical assistance provided by Mr. Gombojav Altan.

CONCLUSIONS AND RECOMMENDATIONS

1. The structure of the Scientific and Technical Information National System (STINS) of the Mongolian Peoples' Republic is being developed as a result of increasing users' needs and their pressure for modern information services, as well as governmental decisions. At present, the total number of information centers of different categories is 54. STINS is centralized to a very large degree. The main body active on the information scene in the country is the Center of Scientific and Technical Information (CSTI) in Ulan Bator. The total number of personnel employed within STINS is some 400 staffers of whom 162 work at CSTI. A data flow along the line: terminal user - information center - CSTI and vice versa is the most typical. It seems that more horizontal connections between various information centers and direct access to the CSTI and foreign information resources for the terminal users would be desirable.

2. Technical equipment, including computers, is very modest in STINS. Practically, only CSTI has its own computers:
   - SM 4.20 and Robotron A-5120 bought some years ago;
   - 2 IBM PC XT clones (ATLEX ATS-88A) recently received from UNESCO;
   - 4 IBM PC AT and appropriate telecommunication devices, received from UNIDO within the framework of the present project.

   In addition, CSTI rents processing time on the EC-1040 mainframe.

3. Information resources are limited. Computerized databases (10 on-line databases and 8 databases on magnetic tapes from socialist countries and 1 domestic database) offer mainly bibliographic oriented information while factual industrial information is hardly available. There are a few domestic non-computerized databanks related to technological and industrial subjects.

4. An industrial and technological information system does not exist as a substantive branch. It is enveloped by the scientific and technical information system and distributed along the different parts of STINS. However, some elements of the future industrial information system can be identified (see Section II).

5. The task of establishing a national industrial and technological information policy should be a priority. The national level policy framework is required, inter alia, to prevent adhocism and to minimize the investments. It seems that the UNIDO assistance could be helpful in elaborating such a policy.

6. It is suggested that the government create a national INTIB focal point at CSTI. The focal point will be a kernel element of

the national industrial and technological information system. Next, a network of appropriately organized and equipped industrial information centers should be set up (cf. p.10).

7. Creation of domestic industrial and technological databanks in the national INTIB information centers has to be stimulated by the national authorities. The government is especially interested in developing the subject-oriented (factual) information systems on: molecular biology, genetic engineering, evaluation of technology, production, market and industrial equipment. Soon, the following databanks are supposed to be implemented: state-of-the-art in technology, on the quality of national (industrial) products, on raw materials and components for production, on national industrial enterprises, biotechnology and a referral databank on standards in the field of constructing materials.

   UNIDO assistance seems to be necessary to initialize the establishment of these databanks and to ensure logical compatibility with international systems like TIPS, LINK, TIES, INDIS, etc.

8. Permanent access to international and domestic information services based on remote terminals through data transmission networks should be implemented. In parallel, local computerized information network services, especially related to factual databases, need to be developed. It should be stressed that access to international patent information (e.g. INPADOC) is especially important for the Mongolian specialists.

9. UNIDO has equipped CSTI and 3 information centers with appropriate computer facilities including among others: 4 IBM PC AT microcomputers with 30 MB hard disks and daisy-wheel printers, telecommunication equipment (mainly modems of various speeds), etc.; It is proposed that UNIDO: (i) provide, as soon as possible, an array of software tools necessary for handling the industrial and technological information processing, and comunications software; (ii) provide the INTIB databanks, viz. IDAA, IDA, OFFR, NODE, VENT and REQT; (iii) organize training and study tours for the CSTI staffers.

10. Using the equipment provided by UNIDO a network of microcomputers placed at information centers and connected through telephone channels to CSTI and, via IAS, to UNIDO and international databases, has been established. On the basis of this network, the national INTIB network could be set up.

11. It is evident that STINS cannot be developed on the basis of microcomputers merely. Mainframes are necessary to process huge, national-range information systems, e.g. the patent information system. In the near future, CSTI will be given the EC-1040 computer from the International Center for Scientific and Technical Information in Moscow. It is suggested that the government support CSTI to extend the configuration of this computer in order to handle teleprocessing. At the same time

UNIDO could assist CSTI to develop modern information services based on the usage of mainframes and to provide CSTI with information resources which are available at the computer center of UNIDO HQ.

12. CSTI in co-operation with UNIDO should prepare a set of unified means, including software tools, information retrieval languages, standards, etc. and disseminate them within STINS. As one of the results of this action a consistency of the national system can be achieved.

13. On-the-job trainings are necessary for both upgrading the skill of the Mongolian specialists and for implementing priority information systems (cf. p.7).

14. It seems that CSTI could participate in the regional (South Central Asian countries) information network which is planned to be set up by India, Mongolia and Nepal.

15. Efforts of various U.N. organizations operating in the field of information systems building in the MPR should be harmonized. In particular, besides the present project, WHO, UNCTAD/GATT (ITC) and U.N. Dept. for Technical Co-operation for Development have been developing projects including parts dealing with the establishment of databases and databanks for medicine, trade and demographic.

16. The development of STINS will require a substantial amount of skilled cadres. Till now CSTI is the only institution which conducts professional courses, however, long-term education is needed. Therefore, it is suggested that the government consider the means to strengthen the information science education, preferably at the university level, in the country. Stress should be put on application of computers in the field of information.

17. It is recommended that CSTI, perhaps with UNIDO assistance, organize language courses (especially of English) for all the staffers who are supposed to work with international databases, databanks and other kinds of information services, and for those who will participate in study tours, training programmes, etc.

18. A practical conclusion can be drawn from the present project as far as the preparation of the equipment is concerned. After collecting all the required items by a delivering company, yet before sending the equipment to a receiver, the UNIDO expert involved in the project in question should check out all the items at the company's place.

19. It is proposed that the future UNIDO projects based on international database access should include special funds to cover data traffic expences during telecommunications experiments and demonstrations.

I. ACTIVITIES

According to the job description the adviser and the expert were expected to undertake the following tasks:

1. Prepare inventory of existing information needs, especially through relevant departments of ministries;
2. Prepare inventory of existing information facilities, including computer utilities, sources of information and their scope and the end users;
3. Identify subject-oriented and document-oriented sub-systems;
4. Outline information flow between sub-systems, sources, users and international sources including INTIB, as well specify ways and means for obtaining necessary information, such as magnetic tapes and micrography;
5. Prepare information system proposals covering all mentioned subjects;
6. Outline the sequence of steps leading to implementation of the system;
7. Install microcomputer terminal(s) in close co-operation with the national counterparts;
8. Advise on most suitable and appropriate linkage between microcomputer terminals and the national databases;
9. On-the-job training of specialists on application, maintenance and repair of microcomputers, and organizing of training programme abroad;
10. Outline technical facilities and staff for satellite connection and appropriate training programme.
11. Procure and install the relevant equipment necessary for the satellite linkage.
12 Carry out necessary experiments.
13. For the purpose of demonstration install the satellite communication line with INTIB through IAS (Institute for Automated Systems).

Below is a list of activities carried out during the mission.

1. As preparatory work the adviser and the expert identified and studied documents related to the goal of the mission. References to these documents are given in Annex 1. The most important finding was that UNIDO, UNDP and UNFSTD have been involved in strengthening the Scientific and Technical Information National System (STINS) of the Morgolian Peoples' Republic and the following projects have beer. implemented:

   (i) "Assistance in Establishing a National Scientific and Technical Information Center in Mongolia", UC/UD/MON/78/050, [11], approved on April 14, 1981. The UN input was US $ 143,800; duration: May 30 - June 30, 1981 and Aug. 31, 1981 - May 29, 1983.

   (ii) "Strengthening of the Technological Base of the State Committee for Science and Technology", ST/MON/001, MON/82/T01, [12], approved on Nov. 23, 1982. The UN input is US $ 206,000; duration Nov. 23, 1982 - being continued.

(iii) "Assistance in the Establishment of an Industrial Software Development Service at the National Scientific and Technical Center", UC/UD/MON/83/083, [13], approved on May 5, 1983. The UN input was US $ 99,250; duration: May 30, 1983 - March 29, 1984.

Moreover, two important decisions of the Mongolian Government in the field of information were identified, viz.:

(i) No. 238, item 7 of July 17, 1986 on some measures for improving design activities, requesting the establishment of a referral databank on standards in the field of constructing materials.
(ii) No. 13, item 16(a) of July 06, 1987 on improving quality of production and services, requesting the development of the factual databank storing the data on production tools and manufacturing.

2. In order to collect information relevant to the aims of the mission a questionnaire was designed by the adviser (cf. report by M.Muraszkiewicz [5]). The questionnaire was approved by the counterpart specialists, who also suggested the institutions which were about to fill in the questionnaire. Next, it was disseminated among 12 institutions. Personal visits to 6 of these institutions were payed. These vistits allowed, inter alia, to confirm the data provided in the questionnaires (for the names and addresses of these institutions see [5]). Results of the evaluation are presented in Chapter II.

3. A list of information centers which could participate in the INTIB national network was set up. Names and addresses of these centers are given in Annex 4.

4. The INTIB software along with the OFFR, REQT and VENT databases have been installed on microcomputers at CSTI and at UNDP office in Ulan Bator.

5. The adviser provided the information on the INTIB activities and carried out the demonstration on the functioning the INTIB database software and the usage of the OFFR, REQT and VENT databases. The presentation was given to Mr. M.Dash, Chairman of the State Committee for Science and Technology, Mr. T.Dorjbal, Director of CSTI, Mr. G.Mineiev, General Engineer of CSTI and some other specialists from CSTI. The demonstration was repeated for some UNDP staffers.

6. One of the major problems causing difficulties in application of western computers is the Mongolian alphabet, based on Cyrillic characters. This problem can be solved through usage of Latin/Cyrillic keyboards and adding EPROM chips to standard hardware (together with some programs) for handling, displaying and printing.

7. Ad-hoc consultations and advice dealing with hardware and software for information purposes were given. In particular,

some technical details were discussed as far as the microISIS package and dBASE III system are concerned. Additionally, the adviser gave lectures and cosultations on the PROLOG language, text processing editor CHI-WRITER and expert systems.

8. The equipment along with software and manuals ordered by UNIDO for the present project was checked out by the expert at Vienna, before sending to Ulan Bator. Again, the equipment was checked out at CSTI. It proved to be operational. For the list of items received by CSTI see Annex 6. Particularly, the expert in close co-operation with the Mongolian specialists installed and programmed the equipment of central and remote terminal stations:
   - V.27 MPS-48 Racal-Milgo 4800 bits per second (bps) synchronous modem was programmed (cf. Annex 5), self-tested and connected to 4-wired termination of the Moscow-Ulan Bator dedicated channel;
   - V.22 MPS-1222 1200 bps and V.21 MPS-3021 300 bps Racal-Milgo asynchronous modems were programmed (cf. Annex 5);
   - terminal stations each consisted of an IBM PC AT, QUME Sprint 11/55 printer and asynchronous modem were assembled, cabled and locally tested.

9. When developing the principal structure of the remote access system for STINS organizations in Ulan Bator the expert took into consideration that CSTI had already had the dedicated 600 bps asynchronous link with the Institute for Automated Systems (IAS) in Moscow, USSR which allowed for a single CSTI terminal to be connected to databanks in the USSR and COMECON countries. Given that IAS had a reliable X.25 connections to East - European information sources it was not considered feasible to attempt a direct satellite link-up with INTIB at Vienna. It proved more practical to arrange a high speed multiplexed synchronous link from CSTI through IAS in order to obtain reliable multiterminal access to international databases.

10. Choosing the method of channel multiplexing technique and type of modems, the expert considered most appropriate to use error - correcting X.25 packet switching protocol and phase modulation modems since:
   - existing CSTI-IAS asynchronous link had been noisy due to long distance of Moscow-Ulan Bator channel with frequency - shift keying modems;
   - it was in line with one of the items of CSTI-IAS agreement on scientific and technological co-operation according to which IAS was to develop 5-channel X.25 packet assembler - disassembler (PAD) for CSTI.

11. The 5-channel PAD delivered by IAS was tested and installed at CSTI. The major characteristics of PAD are given in Annex 5. With the help of IAS, CSTI, the Soviet and Mongolian Ministries of Communications the expert performed CSTI-IAS dedicated channel testing and measuring. The result of this work and

characteristics obtained (cf. Annex 5) proved to be compliant to CCITT M.1020 recommendation. The bit/error rate test (BERT) gave $1,5*10^{-5}$ ratio. All these measurements allowed to conclude that the speed of the channel could be successfully increased as high as 4800 bps.

12. Intensive discussions with CSTI authorities and specialists were made to agree on the proposed structure of remote access system (cf. Fig.1) and to identify STINS organizations in Ulan Bator to be connected to CSTI in the first place. For the list of these organizations see Annex 4.

13. Given the above, one central and four remote terminal stations were linked to PAD in CSTI simultaneously communicating with different international databanks, or each other (via IAS packet-switching center). It was accepted that remote terminal stations should be connected where possible through dedicated lines using low speed asynchronous modems because of the possibility of there being noise on degraded dial-up lines.

14. It has to be stressed that the functioning of microcomputer equipment can be hindered by the fact that the voltage of the electricity supply varies to a great extent in Ulan Bator. Therefore, stabilizers are needed.

15. Operators from CSTI were trained on accessing remote databases and on performing retrieval in the UNIDO/INTIB databanks.

16. The scenario of the press conference including demonstrations of the databases available in Moscow and UNIDO HQ was elaborated by the CSTI specialists, the adviser and the expert.

17. The adviser and the expert participated in working appointments with the Mongolian specialists and the officials from UNIDO, viz. Mr. V.Podshibyakin and Mr. J.Pavlik. The results of the present project were discussed and the foolow-up action was envisaged.

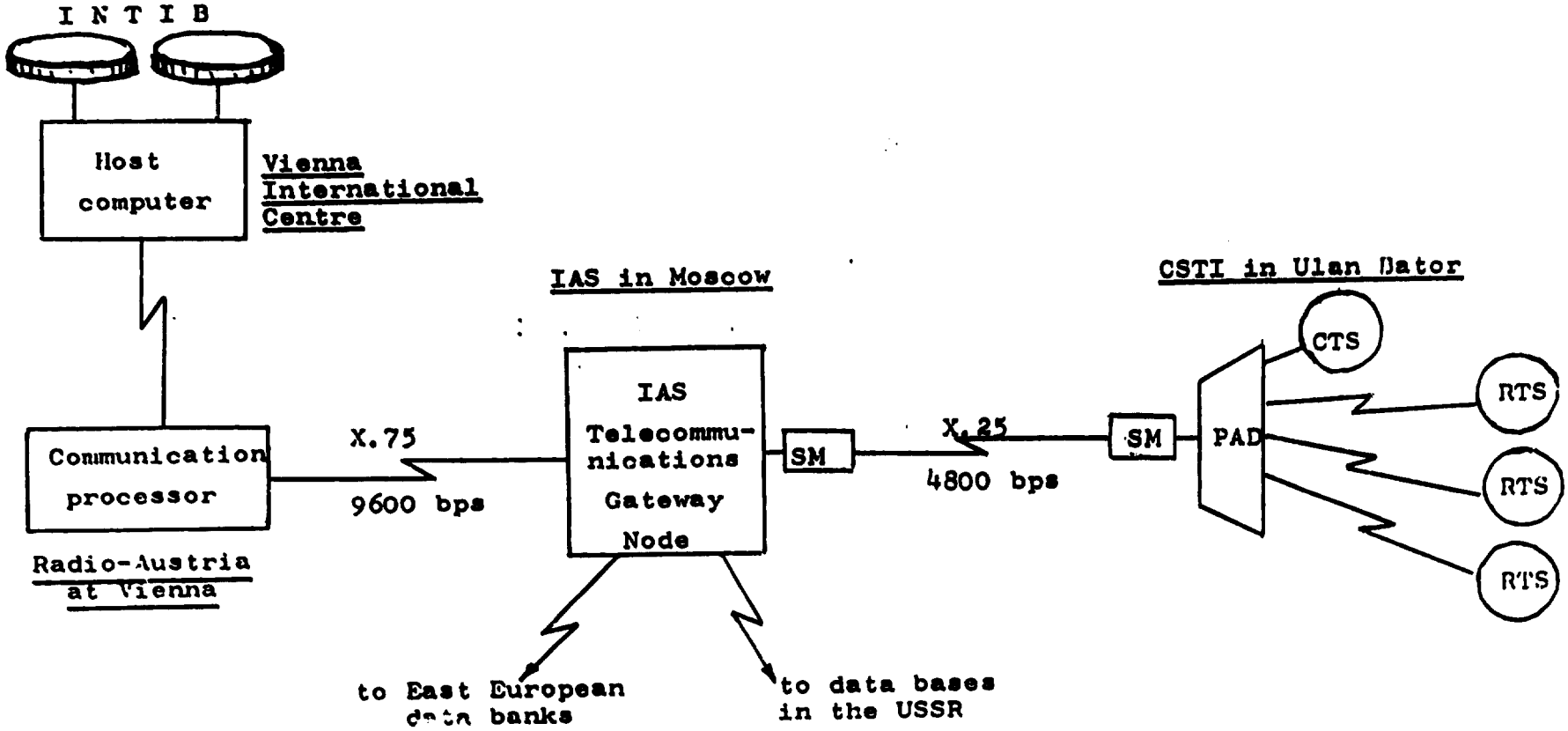


Fig. 1. The structure of remote multi-terminal access from CSTI to international data banks

Legend: SM - synchronous modem; PAD - packet assembler-disassembler; CTS - central terminal station; RTS - remote terminal station

II. OUTPUTS

1. As mentioned in Chapter I identification of documents related to the present mission was done. Special attention was payed to analysis of the reports by Mr.N.N. Kostheiev devoted to the assistance in establishing a scientific and technical information center in Mongolia [3] and in establishment of an industrial software development service [4]. Since the situation examined and described in these reports, especially in the latter, is to a large degree relevant to the current status the reader is referred to these documents for details.

2. At present, the total number of information centers of different categories is 54 in the MPR. The Scientific and Technical Information National System (STINS) is centralized to a very large extent. The main body active on the information scene in the country is the Center of Scientific and Technical Information (CSTI) in Ulan Bator. The total number of personnel employed within STINS is some 400 staffers of whom 162 work at CSTI. A data flow along the line: terminal user - information center - CSTI and vice versa is the most typical.

3. STINS is a two-level structure. On the first level one can find CSTI, Center for Informatics of the Mongolian Academy of Science and the National Library. The second level contains 20 information workshops at enterprises, 10 centers in R & D institutes, 18 regional (aimak) centers and 3 centers placed in public town libraries. CSTI coordinates professional activities carried out by all the information institutions in the country. It also provides them with relevant information. For the CSTI activities see Table 1 and Annex 3.

4. The analysis of data obtained from the questionnaires filled out by 12 institutions is given in Table 1. As a large amount of information activities in the MPR is concentrated at CSTI Table 1 contains two columns: the first one deals with CSTI and the second one with STINS. Though 12 institutions only were taken into acount against 54 which operate in the field of information in the country, it seems that data extracted from the questionnaires fairly represents and reflects the actual status of the existing information service in the MPR.

5. The industrial and technological information system has not become the case in the MPR. The industrial information is enveloped by a scientific and technical information and splitted among the protagonists of STINS.

6. 10 foreign databases through on-line access via IAS in Moscow are available from the terminal (minicomputer SM 4.20) placed

TABLE 1

	CSTI	STINS
average number of employees	162	4.6
computers	2 IBM PC XT clones,20 MB 4 IBM PC AT, disks-30 MB SM-4.20, 4 disks-2.5MB ROBOTRON-A-5120 EC-1040, 6 disks-30MB processing time rented	MINSK 32 processing time rented
photocopying, micrographying, printing machines	UBIX, PENTACTA, CANON KASKAD, EP-12R2 ROMAYOR-313	2 ROTATORs
type of information activities	selecting, storing, retrieval, performing, disseminating, editing collecting	selecting 90% YES storing 90% YES collecting 90% YES performing 80% YES retrieval 70% YES disseminating 60% YES editing 30% YES
primary documents used (average volume of different kinds within an information center)	periodicals 126,800 monographs 41,500 business catalogues 373,000 patents 2,000,000 published 3% unpublished 97% databanks (factual) 2	1,736 1,652 133 970 3,270 0
processes performed on primary documents	classification, indexing, abstracting, translating, analyzing databanks establishing 0	classification 90% YES abstracting 90% YES indexing 60% YES analyzing 60% YES translating 50% YES 2

TABLE 1 (continuation)

	CSTI		STINS	
secondary documents used (average volume within a center)	catalogue cards	547,000	3,200	
	abstract journals	30,000	2,925	
	newsletters	8,600		
	bulletins	6,600	295	
	databases	20	0	
processes performed on secondary documents	cataloguing, retrieval, disseminating, editing		cataloguing	70% YES
			retrieval	70% YES
			disseminating	60% YES
			editing	20% YES
			translating	10% YES
	databases establishment 1		2	
information language used	UDC RUBRIKATOR ISTIC key-words		UDC thesaurus key-words	100% YES 10% YES 10% YES
average number: - queries/month - users/month	160 500		130 235	
forms of: - questions - answers	verbal, written written, SDI		verbal, written written, SDI	
distribution of primary documents according to languages	Russian	70%	38%	
	Mongolian	15%	34%	
	German	5%	14%	
	English	2%	9%	
	other	8%	5%	
type of users (average distribution for a center)	develop. engineers	30%	90% YES	
	factory supervisors	25%	90% YES	
	researchers	25%	80% YES	
	managers	10%	80% YES	
	policy makers	5%	40% YES	
	sales managers	3%	40% YES	
	other	2%		

TABLE 1 (continuation)

	CSTI		STINS
needs of users	management	YES	90% YES
	products	YES	100% YES
	production	YES	100% YES
	technology transfer	YES	100% YES
	finance	YES	90% YES
	markets	YES	70% YES
	employment	YES	20% YES
	legislation	NO	20% YES
	spare-parts	YES	50% YES
	raw-materials	YES	70% YES
	quality control	YES	80% YES
	patents	YES	90% YES
	standards	NO	80% YES
	skills training	YES	30% YES
	utilisation of R & D results	YES	100% YES
applcations of computers	databases and/or databanks:		
	- creating	YES	10% YES
	- handling	YES	10% YES
	SDI	YES	20% YES
	library service	YES	
information supporting activities carried out at a center	training of:		
	- information staff	YES	10% YES
	- users	YES	40% YES
	research	YES	10% YES
main problems faced by a center	lack of:		
	-qualified personnel	YES	10% YES
	- equipment	YES	50% YES
	- space	YES	30% YES
	shortage of funds	YES	40% YES

TABLE 1 (continuation)

	CSTI		STINS
international co-operation with:	FAO	NO	20% YES
	FID	NO	
	IFLA	NO	
	INFOTTERA	YES	
	ISTIC in Moscow	YES	
	ISO	NO	
	UNESCO	YES	30% YES
	UNIDO	YES	30% YES
	WHO	YES	10% YES
	WIPO	YES	
	IAS in Moscow	YES	
expectations from UNIDO	expertise	YES	
	consulting	YES	
	technical assist.	YES	10% YES
	access to inf. res.	YES	
	equipment	YES	10% YES
	software	YES	10% YES
	traning	YES	10% YES

at CSTI. Here are the names of these databases:
BIOSIS, FAN, HORIZONT, INSPEC -A, -B, -C, INIS, MARSI, MEDIK, STANDARDS of ISO and CMEA, ZK (foreign books), ZPI (foreign periodical issues).
Moreover, 8 databases on magnetic tapes are performed by CSTI on a mainframe EC-1040 (CSTI rents processing time only). These databases are received from VINITI in Moscow. They are as follows:
AVTOMATIKA-RADIOELEKTRONIKA, BIOLOGIA, BIOTEHNOLOGIA, ELEKTROTEHNIKA, ENERGETIKA, HIMIA, INFORMATIKA, OHRANA OKRUZAIUSTCHEI SREDY.
1 domestic computerized database is created and exploited at CSTI, viz. SUTMAS-1 (some 4,000 records).

7. The subject-oriented information systems do not exist in the proper sense of the term. It would be more relevant to speak about subject-oriented information services provided by branch information centers affiliated to the corresponding R & D institutes or enterprises. These centers use their own and the CSTI resources to answer to the queries of their users. The most advanced subject-oriented services deal with: water economy, coal industry and some specific scientific issues (Mongolistics, Far East problems, etc.). The government is especially interested in developing the subject-oriented (factual) information systems on: molecular biology, genetic engineering, evaluation of technology, production, market and industrial equipment.

Soon, the following databanks are supposed to be implemented: state-of-the-art in technology, on the quality of national (industrial) products, on raw materials and components for production, on national industrial enterprises, biotechnology and a referral databank on standards in the field of constructing materials.

8. As regards the document-oriented information systems they are carried out by CSTI. These systems are dealing with the following types of documents: patents, industrial catalogues, scientific reports and theses, published documents, foreign periodicals and books.

9. Although, the number of queries addressed to CSTI was only 560 in 1986, it can be concluded from: the discussions with professionals, questionnaires, analysis of relevant documents and personal visits, that information needs of various users are not fulfilled. Therefore, new services and access to new information resources are necessary, in particular in the field of materials and technology for: agriculture, water control, energetics, light industry, food industry, biotechnology, habitat and municipal issues, metalurgy and modern techniques. CSTI is interested in having access, especially, to the following databanks: AGRO, CODATAbank, EMBL, EUROCAS, GENBank, MINICAS, POLYCAS, Protein Databank, UPCAS, TRANSIN.

10. Below is the list of institutions which have been identified as candidates to obtain the microcomputers with the appropriate telecommunication equipment:
    Center of Scientific and Technical Information
    Experimental Center for Leather
    Institute for Heating and Energetic Industry
    As the Department of Informatics of the Mongolian Academy of Science, the Ministry of Economics and the Ministry of Foreign Trade and Economic Relations (TECHNOIMPORT) possess their own microcomputers compatible with IBM PC XT, they were not given the hardware. The addresses of the above mentioned institutions are given in Annex 4.

11. The microcomputer-terminal network was established. The configuration of the network is displayed in Fig.2 (participants are specified in p. 10). All functions of the network were tested and proved to be fully compatible with expectations. The same is true for connection the network to IAS and UNIDO.

12. The press conference for the Mongolian information officers, high-level decision makers, top managers, journalists and for the UNDP staff and the UNIDO officials was organized by CSTI together with the adviser and the expert. The conference was composed of three parts, viz.:
    - general information about co-operation with UNIDO, structure and functioning of the network, type of information available within the databanks placed in Moscow and at Vienna,

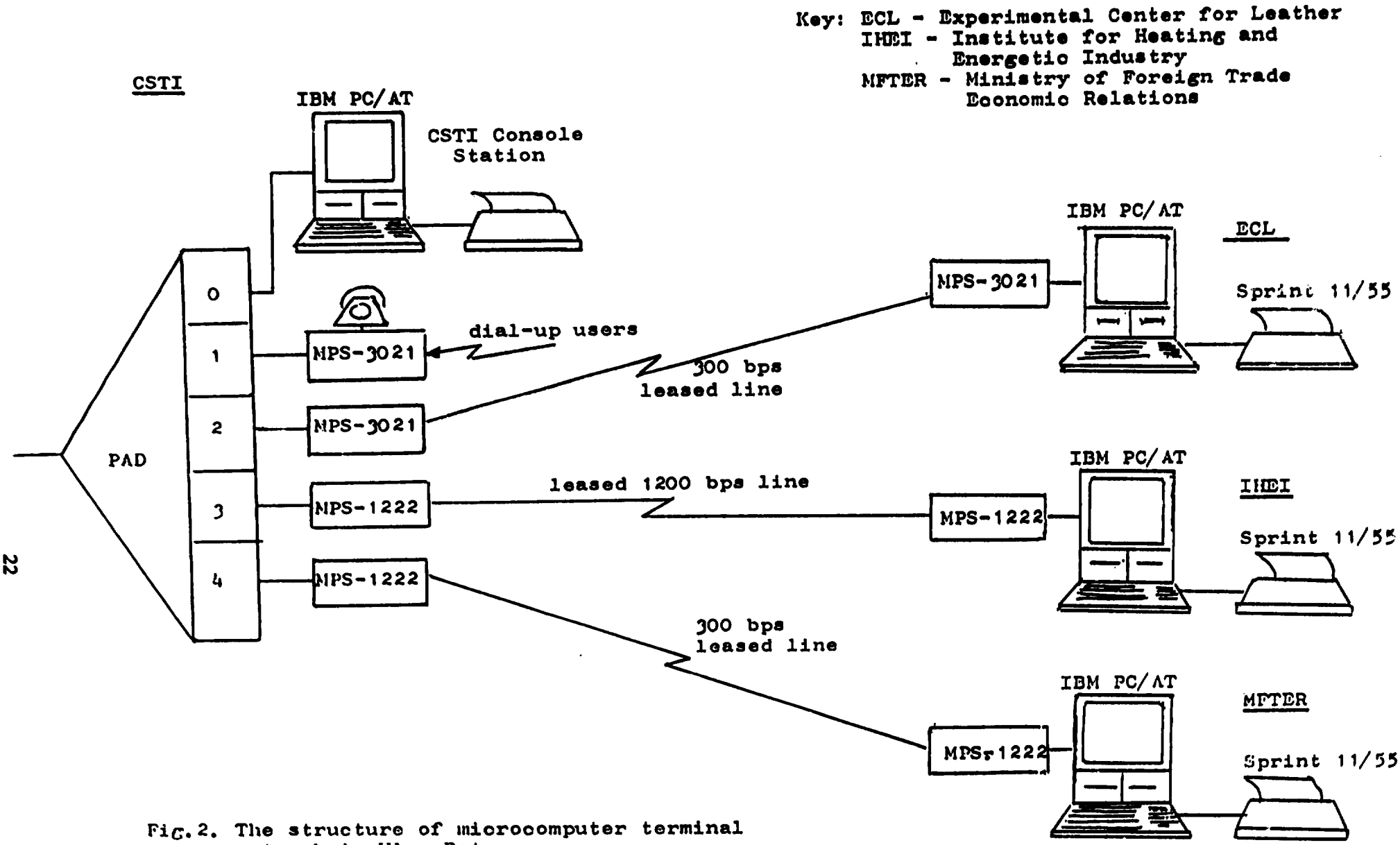


Fig. 2. The structure of microcomputer terminal network in Ulan Bator

significance of the network for the Mongolian information service and national economy was provided;
- demonstration of the retrieval in databanks in Moscow and at UNIDO from the CSTI terminal station was done (see Annex 7);
- similar demonstration was performed on the terminal installed at the Experimental Center for Leather.

All the participants of the conference obtained a pamphlet prepared by the adviser and the expert (cf. Annex 7);

III. ACTION PROGRAMME (FOLLOW-UP)

UNIDO and especially INTIB industrial and technological information resources, as well as experience acquired as a result of strengthening and development of information facilities in a number of countries could be of great value for Mongolia, and should be transferred through expertise, technical assistance and other UNIDO statutory means to the organizations concerned.

It is evident that modernization and establishment of new structures and services require such great funds and manpower that CSTI cannot afford even with the support given by UNIDO/UNDP. Therefore, the action programme in question specifies the most necessary measures which, however, could determine a solid ground for further development of the national information system in the MPR. The proposed action programme is as follows.

1. The adhocism in the design of the industrial and technological information system can be minimised by conciously formulating a viable set of information policies. The national level policy framework is required to prevent creation of non-standarized information facilities.
   It seems that UNIDO assistance is needed to initialize preparatory work for the national industrial and technological information policy building. Expertise and consultations could be the UNIDO contribution.

2. CSTI has already been equipped with microcomputers compatible with IBM PC XT/AT having input/output devices capable to handle Latin, Cyrillic and Mongolian characters.
   Establishment of the INTIB national focal point at CSTI is proposed. The following measures to be undertaken by UNIDO are suggested in this respect:
   - provide an array of software tools necessary for handling the industrial and technological information processing. The microISIS package is proposed as a basic tool for implementing small- and medium-scale databases and databanks. Of course, other information-retrieval systems (e.g. dBASE III, PARADOX), word processing packages (e.g. Word Perfect, WORDSTAR 2000), etc. are recommended, too. For a mainframe the CDS ISIS and DML package (ver. greater than 4.0) are suggested. One has to stress that CDS ISIS and microISIS are logically compatible and ackgnowleded as the U.N. official software widely used in a number of countries. Needless to say that all the software tools have to be adopted to the Cyrillic and the Mongolian alphabet. It should be noted that the Cyrillic version of the ISIS packages have been developed by International Scientific and Technical Information Center in Moscow.;
   - provide the INTIB databanks, viz. IDA, IDAA, NODE, OFFR, VENT and REQT;
   - organize on-the-job training which would allow to implement priority information systems in the fields specified in p. 4;
   - assist in setting up a model local area network (LAN)

interconnecting the microcomputers available at CSTI. At least, transmission facilities (e.g. KERMIT, Z-MODEM, X-MODEM) should be provided to ensure exchanging files between PCs at the first stage of the development of the network;
- organize study tours (especially on the usage of the UNIDO/INTIB databanks) for the CSTI staffers.

3. The focal point will be a kernel element of the national industrial and technological information system. As a next step, a network of appropriately organized and equipped industrial information centers should be set up. Some of these centers could constitute a basis for the national INTIB network building.

4. Creation of domestic industrial and technological databanks in the national INTIB information centers has to be stimulated by the national authorities. The databanks in the following fields seem to have priority: agriculture, water control, food industry, biotechnology, energetics, light industry, habitat and municipal issues, metalurgy and modern techniques. UNIDO assistance seems to be necessary to initialize the establishment of these databanks and to ensure logical compatibility with international systems like TIPS, LINK, TIES, INDIS, etc.

5. Permanent access to information services, including international databases and databanks, based on remote terminals through data transmission networks should be the case at CSTI and at the national INTIB information centers. As technical issues are basically under control in this respect, it seems that main attention should be attached to resolving financial problems.

6. It is suggested that the government consider establishment of the network for computerized exchange of information among the STINS (Scientific and Technical Information National System) members based upon the packet switching technique. CSTI, with its present and future hardware, could play the role of the co-ordinator of this network.

7. It is evident that STINS cannot be developed on the basis of microcomputers merely. Mainframes are necessary to process huge, national-range information systems, e.g. the patent information system. In the near future, CSTI will be given the EC-1040 computer (1 MB of operation memory, 15 disks of 29 MB each and 8 magnetic tape drivers) from the International Center for Scientific and Technical Information in Moscow.
It is suggested that the government support CSTI to extend the configuration of this computer in order to handle teleprocessing. A teleprocessor EC 8371 or compatible IBM 3720/25, halfduplex-to-duplex adapter, 1 concentrator (all of them connected to a Packet Switching Center - PSC) and a number of terminals are needed. Thus, the mainframe can be used as a host

computer in the network mentioned in p.6. The network of microcomputers set up within the present project could be connected to the mainframe, via PSC, too. One can envisage the establishment of the electronic mail service based on hardware available at CSTI, INTIB centers and various governmental institutions interested in such a service. It has to be emphasized that careful analysis of effectivness and cost - benefits should go before the building of the structure outlined above.

At the same time UNIDO could assist CSTI to develop modern information services based on the usage of mainframes and to provide CSTI with information resources which are available at the computer center of UNIDO HQ.

8. CSTI in co-operation with UNIDO should prepare a set of unified means, including software tools, information retrieval languages, standards, etc. and disseminate them within STINS. As one of the results of this action a consistency of the national system can be achieved.

9. It seems that CSTI could participate in the regional (South Central Asian countries) information network which is planned to be set up by India, Mongolia and Nepal.

Annex 1

DOCUMENTS USED

1. Bańkowski J., Wysocki A., Guidelines for the Establishment or Redesign of Industrial and Technological Information Service System, including Selection of Software and Hardware, UNIDO/IS.597, Jan.15, 1986.
2. Dorjbal T. et al., Technical and Economical Analysis of the Computerized Information System for the Center of Scientific and Technical Information in the MPR, Ulan Bator, CSTI, 1986 (in Russian).
3. Kostheiev N.N., Terminal report of the project "Assistance in Establishing a National Scientific and Technical Information Center in Mongolia", UC/UD/MON/78/050,UNIDO, 1983.
4. Kostheiev N.N., Terminal report of the project "Assistance in the Establishment of an Industrial Software Development Service at the National Scientific and Technical Center", UC/UD/MON/83/083, UNIDO, 1984.
5. Muraszkiewicz M., Assistance to the national System of Scientific and Technical Information; Field mission report, UNIDO, Sept. 29, 1987.
6. Nolan R.J., Informatics for Industrial Development, UNIDO/IS.415, Nov.25, 1983.
7. Sigurdson J., Role of National Planning in Science and Technology. Means for Changing the Technological Dominance of Industralized Countries, UNIDO/IS.553, Aug.12, 1985.
8. Sung Jin Choi, Guidelines for the Formulation of National Industrial and Technological Information Policies, UNIDO/IS.596, Jan.15, 1986.
9. Wysocki A., UNIDO Industrial Information Medium Term Programme, UNIDO, Jan., 1986.
10. Role of INTIB. Round Table Discussion of an Advisory Group of INTIB Users, UNIDO/ID/WG, Sept.20, 1985.
11. Assistance in Establishing a National Scientific and Technical Information Center in Mongolia, UNIDO Project Document, UC/UD/MON/78/050, 1981.
12. Strengthening of the Technological Base of the State Committee for Science and Technology, UNFSTD Project Document, ST/MON/001, MON/82/T01, 1982.
13. Assistance in the Establishment of an Industrial Software Development Service at the National Scientific and Technical Center, UNIDO Project Document, UC/UD/MON/83/083, 1983.
14. Micro-Processor Systems Applications for Feasibility Analysis and Reporting in Investment Projects, UNDP/UNIDO Project Document, MON/84/002/b/01/37, 1985.
15. Teremetsky V., Linking of DPRK Information System with UNIDO Industrial and Technological Information Bank by Means of Satellite Telecommunications, Field mission report, UNIDO, Oct. 1986.

Annex 2

PERSONS CONTACTED

Mr. M. Dash	Chairman of the State Committee for Science and Technology
Mr. T. Dorjbal	Director of the Center of the Scientific and Tecnical Information (CSTI)
Mr. G. Mineiev	General Engineer of CSTI
Mr. B. Ojunbileg	Head of the Informatics Department
Mr. P. Ulan Khu	Engineer at the Nuclear Research Laboratory at The Mongolian State University
Mr. M. Bazarragchaa	Engineer (CSTI)
Mr. G. Borisoo	Engineer in programming (CSTI)
Mr. C. Enhbat	Engineer in telecommunication (CSTI)
Mr. J. Ganbold	Engineer in electronics (CSTI)
Mr. C. Gunaasuren	Engineer in telecommunication (CSTI)
Ms. N. Maandah	Information-retrieval officer (CSTI)
Mr. Y. Litoukhin	Resident Representative, UNDP
Ms. D. Elez	Programme Adviser, UNDP
Mr. D. Kowalczyk	U.N. volunteer

SHORT NOTE ON CSTI

The Center of The Scientific and Technical Information (CSTI), the main body of information service of the MPR, was established in 1972. The CSTI is subordinated to the State Committee for Science and Technology. The CSTI is practically responsible for the national situation of the scientific and technical information services in the country. At present, CSTI employs some 160 staffers.

The main information body which Scientific and Technical Information National System (STINS) relies on is the Center of Scientific and Technical Information. More than 85% of primary information and about 70 % of reference information is stored at CSTI. About 3 million items of scientific and technical information have been collected and processed and about 1,200 collective users (enterprises, R & D institutes, etc.) are provided with information service, mainly using library information resources. Some 550 of these users cooperate with CSTI on a regular basis. The number of individual users exceeds 1800 of whom some 600 are scientific workers. For details dealing with CSTI activities see Table 1, Chapter II.

Since 1981, practical work has been done for introducing modern hardware in information processing into CSTI in order to increase retrieval effectivness and provide information completeness. The automated IRS systems on R & D work of CMEA member countries, on patent and published documents have been established and are functioning at CSTI. More than 460,000 documents were in store in the above systems at the begining of 1987. For processing, the AIDOS, ASOD, MLSPI-1, SUTMAS-1 software packages have been used. It should be noted that the latter package only has been used for handling the documents prepared in Mongolian. Finally, the CDS ISIS package has been selected as a main tool for automation of information tasks. Work on on-line access to the databases available have been started. Since 1983 research work has been carried out for establishing an automated information exchange system with foreign computer network databanks and databases. At present CSTI has direct access to 10 databases in socialist countries and exploits 9 databases distributed on magnetic tapes within socialist countries (for the databases see Chapter II.

Inadequate technical equipment at STINS does not allow effective use of the above mentioned facilities installed at CSTI. Lack of computers for information services at the enterprises and scientific research institutions makes efficient information browsing and retrieval of the information resources available at CSTI scarcely possible. Therefore, linkages through terminals and/or microcomputers between the STINS units and CSTI have to be

established. Moreover, permanent links with various international information networks including INTIB. are needed (for details see Chapter III)..

INFORMATION CENTERS OF INTIB NATIONAL NETWORK

Below is a list of institutions which are supposed to take part in the national INTIB network. The institutions marked by an asterisk participate in the microcomputer network established within the present project and connected to IAS and UNIDO.

* Center of Scientific and Technical Information
Ulan Bator 11, Kolarova 49 tel. 72920, tlx. 236

* Ministry of Foreign Trade and Economic Relations
TECHNOIMPORT
Ulan Bator, 11 tel. 24248

* Ministry of Economics
Ulan Bator tel.

* Experimental Center for Leather
Ulan Bator 52, tel. 42438

* Institute for Heating and Energetic Industry
Ulan Bator 46, tel. 42456

* Department of Informatics,
Mongolian Academy of Science
Ulan Bator 51, Zukova 56-24 tel. 53660

National State Library
Ulan Bator 11, tel. 23100

Institute for Experimental Constructions
Ulan Bator 11, tel. 20338

Institute for Stockbreeding
Ulan Bator 11, tel. 41572

Library at Darkhan
Darkhan

State Institute of Constructions
Ulan Bator 36, tel. 23975

Information Center for Railways
Ulan Bator 11, Oktabria 2 tel. 714308

Institute for Water Economy
Ulan Bator 46, tel. 21862

Department of Informatics,
Mongolian Academy of Science
Ulan Bator 51, Zukova 56-24 tel. 53660

Institute for Municipal Matters
Ulan Bator 46, tel. 24959

Equipment Parameters

The first part of the Annex gives technical parameters of the equipment installed (Tables 1- 4). The second part provides characteristics of the Moscow - Ulan Bator channel measured in accordance with CCITT recommendation M.1020.

1. Packet Assembler-Disassembler (DTE/HDLC/LAP-B)

	VALUE	DESCRIPTION
	A. Link Level	
T1	3 s	timer
N2	10	number of retransmissions
N1	1048 bit	frame length
MOD	8	frame enumeration
	B. Packet Level	
L	128 byte	packet length
W	2	window size
LCN	0...4	number of logical channels

2. MPS-48 Modem Strapping

CARD NAME	FUNCTION	SWITCH	POSITION	OPERATION
DTE interface	Data rate	RR	1	4800 bps
	DTR Control	LA	2	forced on
	Transmitter timing	N	1	internal
	Line type	P	1	4-wire
Transmitter	Sensitivity	H	1	0...-30dB
	Output level	E,F	16,1	-16 dB

3. MPS 1222 Modem Strapping

CARD NAME	FUNCTION	SWITCH	POSITION	OPERATION
Digital	Data rate	W10	B	1200 bps
	Line type	W3	B	leased line
		r,s,z,v,w	IN	operation
Analogue	Output level	B1	Off	0dB
	Sensitivity	A1	Off	-36dB

4. MPS 3021 Modem Strapping

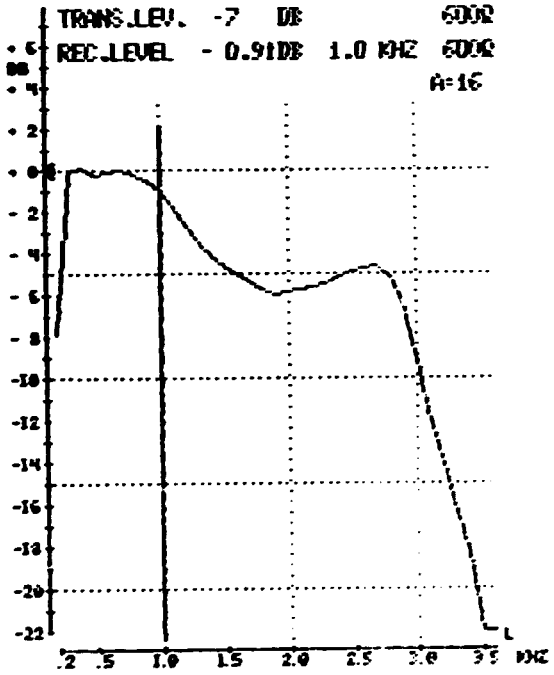
FUNCTION	SWITCH	POSITION	OPERATION
DCD Threshold	A2	Open	-38 dB
Output level	A4-A8	Open	0 dB
Line type	B1	Open	dial-up
	F,G	Out	line
	B1	Closed	leased
	F,G	In	line

SIEMENS K1190 V3

10 LEVEL

TRANS.LEV.		-7 DB
SENSITIVITY		0 DB
IMP.TRANSMITTER		600 OHM
IMP.RECEIVER		600 OHM
AVERAGE OUT OF	A=	16
DATE/TIME	0 0 0	0 19 20
LOCATION CODE		000000005

FREQUENCY KHZ	LEVEL DB
.2	- 7.80
.3	- 0.11
.4	+ 0.13
.5	- 0.18
.6	- 0.11
.7	+ 0.01
.8	- 0.13
.9	- 0.48
1.0	- 0.91
1.1	- 1.64
1.2	- 2.55
1.3	- 3.43
1.4	- 4.06
1.5	- 4.60
1.6	- 5.00
1.7	- 5.30
1.8	- 5.68
1.9	- 5.89
2.0	- 5.78
2.1	- 5.68
2.2	- 5.52
2.3	- 5.42
2.4	- 5.09
2.5	- 4.79
2.6	- 4.65
2.7	- 4.53
2.8	- 5.16
2.9	- 6.62
3.0	- 9.14
3.1	-11.94
3.2	-14.03
3.3	-16.27
3.4	-18.29
3.5	<-22.0
3.6	<-22.0



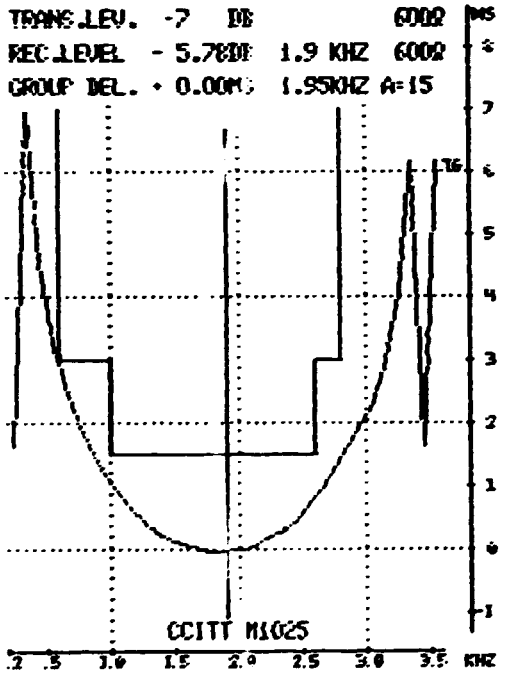
SIEMENS K1190 V3

11 GROUP DELAY DISTORTION

TRANS.LEV.		-7 DB
SENSITIVITY		0 DB
IMP.TRANSMITTER		600 OHM
IMP.RECEIVER		600 OHM
REF.FREQ. N * 0.1KHZ		19
AVERAGE OUT OF	A=	15
DATE/TIME	0 0 0	0 25 19
LOCATION CODE		000000005

FREQUENCY GROUP DEL.

KHZ	MS
.25	+ 1.64
.35	+ 6.99
.45	+ 4.55
.55	+ 3.31
.65	+ 2.58
.75	+ 2.02
.85	+ 1.58
.95	+ 1.22
1.05	+ 0.92
1.15	+ 0.69
1.25	+ 0.46
1.35	+ 0.28
1.45	+ 0.19
1.55	+ 0.08
1.65	+ 0.05
1.75	- 0.04
1.85	- 0.02
1.95	+ 0.00
2.05	+ 0.02
2.15	+ 0.11
2.25	+ 0.22
2.35	+ 0.31
2.45	+ 0.49
2.55	+ 0.72
2.65	+ 0.97
2.75	+ 1.30
2.85	+ 1.66
2.95	+ 1.97
3.05	+ 2.30
3.15	+ 3.01
3.25	+ 4.07
3.35	+ 6.17
3.45	+ 1.64
3.55	+ 6.18

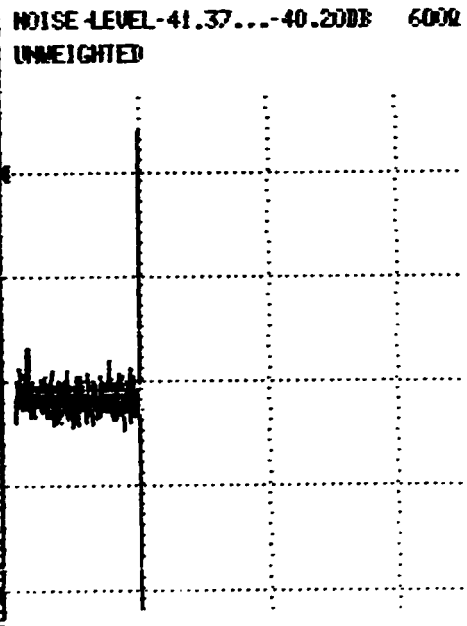


SIEMENS K1190 V3

20 NOISE LEVEL

SENSITIVITY		-30 DB
IMP.TRANSMITTER		600 OHM
IMP.RECEIVER		600 OHM
WEIGHTING		OFF
MEASURING TIME		3.5 MIN
DATE/TIME	0 0 0	0 32 52
LOCATION CODE		000000005

RESULT NO.	LEVEL DB
1	-41.75...-39.40
2	-41.82...-40.24
3	-41.47...-40.36
4	-42.15...-40.55
5	-41.91...-40.20
6	-41.54...-39.7[illegible]
7	-42.08...-39.[illegible]
8	-41.39...-39.80
9	-41.35...-40.[illegible]
10	-41.94...-40.64
11	-41.63...-39.[illegible]
12	-41.61...-40.67
13	-42.08...-40.[illegible]
14	-41.37...-40.01
15	-41.77...-40.[illegible]
16	-41.68...-40.[illegible]
17	-41.73...-39.[illegible]
18	-41.49...-40.[illegible]
19	-41.47...-40.03
20	-41.49...-39.[illegible]
21	-41.47...-38.97
22	-41.56...-39.80
23	-41.80...-40.[illegible]
24	-41.77...-40.[illegible]
25	-41.63...-39.[illegible]
26	-41.56...-39.61
27	-41.56...-39.[illegible]
28	-42.29...-40.43
29	-41.49...-39.[illegible]
30	-41.42...-40.22
31	-41.94...-39.30
32	-41.49...-39.75
33	-41.75...-40.46
34	-41.44...-40.32
35	-41.37...-40.20



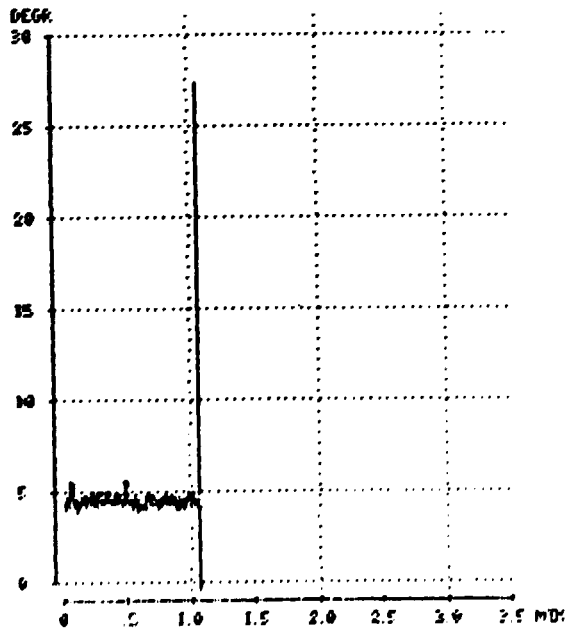
SIEMENS K1190 V3

21 PHASE JITTER

TRANS.LEV.		-7 DB
SENSITIVITY		-50 DB
IMP.TRANSMITTER		600 OHM
IMP.RECEIVER		600 OHM
RANGE		30 DEGR
MEASURING TIME		3.5 MIN
DATE/TIME	0 0 0	0 37 8
LOCATION CODE		000000005

RESULT NO.	PHASE JITTER DEGR	
1	4.58...	5.57
2	4.35...	4.79
3	4.30...	4.77
4	4.14...	4.64
5	4.35...	4.97
6	4.06...	4.70
7	4.00...	4.39
8	4.06...	4.37
9	4.08...	4.39
10	4.10...	4.72
11	4.58...	4.95
12	4.41...	4.80
13	4.41...	4.89
14	4.56...	4.83
15	4.29...	4.70
16	4.06...	4.66
17	4.24...	4.60
18	4.35...	4.85
19	4.43...	4.87
20	4.33...	4.80
21	4.33...	4.83
22	4.37...	4.87
23	4.37...	4.80
24	4.14...	4.45
25	4.14...	4.52
26	4.30...	4.72
27	4.20...	4.60
28	4.10...	4.64
29	4.49...	4.85
30	4.68...	5.04
31	4.30...	4.85
32	4.45...	4.93
33	4.33...	4.70
34	4.20...	4.68
35	4.33...	4.80

PH-JITTER 4.33... 4.80DEGR



Annex 6

LIST OF ITEMS OBTAINED BY CSTI

HARDWARE	number of items
1. IBM PC AT-3 system unit, incl. 1.512 kb, 30 mb disk and 1.2 mb diskette drive # 6134298	4
- Hercules graphic card # 2500045	4
- Quadram Liberty AT 128 K # 2500012	4
2. EIZO monochrom monitor 12 inch, green 3030 #GL 7510110	4
3. QUME Sprint 11/45 printer including profeeder 2 and IBM PC interface	4
Printer cable # 1525612	4
4. IRMAkey f. XT/AT/AT-3 # 2500014	4
-Russian keyboard option	1
-Mongolian keyboard option	1
5. SKH - SS 0630 Power conditioner 630 VA	4
6. Modem Racal Milgo MPS 48	2
7. Modem Racal Milgo MPS 1222	4
8. Modem MPS 3021	4
9. Modem cable V.24 DB-25P male/female connector	8

SOFTWARE	
1. IBM. Exploring the IBM Personal Computer AT [6361408]	4
2. IBM. Diagnostics for IBM Personal Computer AT [6138299]	4
3. IBM DOS 3.30 Startup [80X0735]	4
4. IBM DOS 3.30 Operating [80X0929]	4
5. IBM DOS 3.30 Startup/Operating [80X0939] 3.5" Diskette 1.0 MB capacity	4
6. CROSSTALK XVI, ver 3.61, serial no.519087, system IBM-PC DOS	1
7. Polywindows Desk Plus Software Ver. 1.2A, QUADRAM SOFTWARE	3
8. QuadMaster III version 3.08, QUADRAM Corp.	2
9. QuadMaster III Ver.3.04, QUADRAM Corp.	3
10. QuadMaster III N.2.02, QUADRAM Corp.	1
11. IRMAkey/3270 International Version [64-32700-300] VERSION 2.30A	4
12. IRMAkey/3270 [64-32700-200] VERSION 2.30	4
13. HERCULES GRAPHICS CARD PLUS DRIVER DISKETTE	4
14. HERCULES, Fontman and Ramfont	4

MANUALS

1. IBM. Guide to Operations. Personal Computer AT Hardware Reference. Library 4
2. DOS 3.30 Programming Family. 3.5" & 5.25" diskettes by IBM Corp.and Microsoft,Inc. [94X9573]
   2.1 Reference (Abridged) [94X9575] 4
   2.2 User's Guide [80X0933] 4
3. CROSSTALK XVI Data Communication Software System 1
4. Qume SPRINT 11 PLUS Series. PRINTER 40/55/90 User's Guide 4
5. LIBERTY-AT Operations Manual. QUADRAM Corp. 2
6. QuadMaster III User's Manual. QUADRAM Corp. 4
7. QUADBOARD-AT Operations Manual. QUADRAM Corp. 2
8. PolyWindows Operations Manual. QUADRAM Corp. 2
9. IRMAkey/3270 International User's guide Digital Communications Associates,Inc (DCA) 4
10. Hercules Graphic Card Plus User's Handbook 4

NOTE ON ON-LINE DEMONSTRATION

The access procedure to UNIDO databases is as follows:

1. Invoke the CROSSTALK (or similar) communication program.
2. Set up the appropriate parameters: 1200 (300) bps, 7E1 format, COM1 (COM2)
3. Enter the IAS INTERCOM-1 address: CON 2020400.
4. Type <CRTL>-B three times.
5. Enter User ID: CNTI.
6. Enter User Password: <CR>.
7. Enter the CHANGE ATTENTION command: CH-AT O.
8. Enter the IAS INTERCOM-2 address: GET 2110300.
9. Type <CRTL>-B three times.
10. Enter User ID: CNTI.
11. Enter User Password: <CR>.
12. Enter the GET UNIDO command.
13. Enter the Host-UNIDO teleprocessing monitor: CICS.
14. Enter the USVS command followed by the User ID and User Password: XULHTP 1620.
15. Enter the database name: IDA.
16. Make your retrieval.
17. Leave the database: EXIT.
18. Logout from the monitor: CSSF.
19. Logout from IAS INTERCOM-2: BYE.
20. Logout from IAS INTERCOM-1: BYE.

Below is a sample of the retrieval session in the UNIDO/INTIB IDA database performed from CSTI during the press conference demonstration.

```
>CON 2020400
COM
RESTART !  To enter type CTRL/B three times
***
Wednesday, 4-May-1988, 10:34:46
What is your name ? CNTI
CNTI
Type password:
     You have entered NCADE Communication System
IAS> ECHO OFF
ECHO OFF
(X.3)2:0
IAS> CH-AT 0
Attention character CTRL/O
IAS> GET 2110300
Connected to 2110300
RESTART !  To enter type CTRL/B three times
***
Wednesday, 4-May-1988, 10:36:02
What is your name ? CNTI
CNTI
Type password:
     You have entered NCADE Communication System
NCADE> ECHO OFF
ECHO OFF
(X.3)2:0
NCADE> GET UNIDO
Connected to UNIDO
IAEA LOGIN
CICS
CONNECTING
CONNECTION ESTABLISHED; PLEASE CONTINUE 8:36:47
USVS XULHTP 1620
U N E S C O  --  C D S / I S I S
A PRODUCT OF PRS/LAD
IF YOU EXPERIENCE PROBLEMS IN OPERATING THE CDS/ISIS
SYSTEM, PLEASE CALL EXT. 823.09 OR 823.10.
NOW PRESS CR/LF OR CTRL Q, DEPENDING ON TERMINAL, TO CONTINUE
N E W S  not supported on this terminal
IDA
R1203 - DATA BASE UNKNOWN - PLEASE RE-ENTER
IDA
R1208 - ENTER PASSWORD FOR ENTRY SERVICES OR HIT ENTER
RXX01 - SELECT THE DESIRED FUNCTION
=LEATHER
     -- PAGE 001 --
QUERY ELEMENT #002
------------------
P=000292   LEATHER
T=000292 - #002: LEATHER
```

```
     -- END --
D
     -- PAGE 001 --
16502                1987
Felsner, Gerhard
UNIDO
(R) SRI LANKA. ASSISTANCE TO THE LEATHER INDUSTRY. TERMINAL REPORT.
DP/SRL/83/003
Vienna, 1987. iii, 127 p. tables, diagrams.
UNIDO-DP/ID/SER.B/579
<UNIDO pub>. <Final report> on assistance to <leather industry> in
<Sri Lanka> - covers (1) activities designed to improve <leather>
and <leather goods> production generally and plant utilization,
<tanning>, <product design> and <quality control> at the Ceylon
Leather Products Corporation in particular (2) <hides and skins>
improvement, <chemicals>, <waste utilization>, <grading>, <effluent
treatment>, <shoes>, <clothing>, <gloves>, <industrial extension>.
<Recommendations>, <factory layout>, <flow chart>s, <statistics>,
<job description>. Additional references: <management>,
<livestock>. <Restricted>.
ENGL
32.40
     -- MORE --
P/+1
     -- PAGE 002 --
16328                1987
Shilkin, Geoffrey
Gilbert, Warren
UNIDO
(R) NEPAL. REVITALIZATION OF THE HETAUDA LEATHER INDUSTRIES  (HLI).
    TERMINAL  REPORT.
SI/NEP/86/862
Vienna, 1987. i, 50 p. tables.
UNIDO-DP/ID/SER.B/568
<UNIDO pub>. <Final report> on revitalization of a <leather
industry> in <Nepal> - covers (1) <export>s, <import>s, <domestic
production> of <leather>, <leather goods>, <shoes> (2) present
situation of the Hetauda Leather Industries Ltd. (HLIL), <financial
aspects>, input of <hides and skins>, foreign sales volume related
to <standards> of output (3) <prices> of buffalo, <cattle>, <sheep>
hides, availability of <chemicals>, <location of industry>,
<factory layout> and <factory organization>, condition of
<equipment>, <maintenance and repair>, <manpower> and <employment>
problems, <management> requirements (4) revitalization programme,
<costs>, <working capital> requirements. <Recommendations>.
<Restricted>.
ENGL
     -- MORE --
ISP05 - ENTER NEXT COMMAND
EXIT
RXX03 - CONTROL RETURNED TO  C.I.C.S.
CSSF
 DFH3506I 8:40:19 SIGN-OFF IS COMPLETE
Disconnected: Invitation to clear
```

```
Minutes: 3
Segments Sent: 14, Received: 75
Characters Sent: 71, Received: 3802
NCADE> BYE
BYE
-- Bye-bye --
RESTART !  To enter type CTRL/B three times
Disconnected
Minutes: 4
Segments Sent: 20, Received: 85
Characters Sent: 104, Received: 4242
IAS> BYE
BYE
-- Bye-bye --
RESTART !  To enter type CTRL/B three times
CLR DTE 132
IAS-TC/X.25 CHANNEL    0
>
```