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

RESTRICTED

17000

DP/ID/SER.A/1030
23 June 1988
ENGLISH

ASSISTANCE TO MAINTENANCE AND REPAIR CENTRE FOR TESTING AND MEASURING INSTRUMENTS

DP/VIE/85/009

VIET NAM

Technical Report: Importance, necessity and establishment of the Repair and Maintenance Centre for Electronic Testing and Measuring Instruments*

Prepared for the Government of Viet Nam by the
United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of Dr. Gyula Stokum, expert in instrumentation policies

Backstopping officer: C. Gurkok, Engineering Industries Branch

United Nations Industrial Development Organization

Vienna

*This document has been reproduced without formal editing.

2/

V.88-25912

Keywords-Abbreviations

Instrument	In the context of this report instrument means such equipment which is or can be used for measuring purposes itself (e.g. oscilloscopes,gaschromatographs, etc.) or in conjunction with these in measuring procedures (e.g. signal generator, thermostat, reference standard voltage)
SCST	State Committee for Science and Technology
GDSMQC	General Department for Standardization, Metrology and Quality Control
COSTMAS	Company for Scientific and Technical Materials Supply
HCMC	Ho Chi Minh City
Centre III	GDSMQC Centre III
VINATEST	Non-Governmental Association of Testing Laboratories in the South of Viet Nam
ISC	Instrumentation Service Centre
MRC	Maintenance and Repair Centre
R&M	Repair & Maintenance activity
CTA	Chief Technical Adviser

SUMMARY

In the period of 1979 - 1985 two UNDP/UNIDO projects were implemented at Centre III. As a result of these, the Centre III has largely enhanced its activities which cannot be secured, unless an effective, well equipped MRC gets operations. To avoid further deterioration of instruments in the South Region, at least as a first step an MRC is to be established.

COSTMAS is not as far now that it could take over the responsibility for some years to establish MRC also in the South. Therefore, the Government has decided to delegate the concerned activities to Centre III in the South, and asked for UNDP assistance to be implemented there (DP/VIE/85/009).

There is the same situation in other laboratories in the region. The Centre III's own very modestly equipped workshop cannot attend the needs. In view of the growing demand, considering the already achieved outputs and good utilization of available resources here, the decision of the Government was firm to establish the MRC at Centre III.

To establish only the MRC is not the way to solve the existing problems. After establishing an MRC for instruments of clients' institutions, newer and newer requirements will arise in the cases of other instruments, newer purchases particularly, the priorities may change, etc. To get the problem under control it necessary the implementation of complex instrumentation policy. The implements of such policy are the systemic approach of the instrumentation infrastructure and to establish an ISC where the co-operation of all elements of instrumentation infrastructure is secured for the sake of the whole region. The Centre III is a suitable institution for such ISC for the South Region. After implementing the MRC the basis of a complex ISC is suggested to be established.

CONTENT

INTRODUCTION

The instruments are needed to investigate the input materials of production, to determine the quality of final products in framework of commercial quality control, to check standardization, to keep the standards as well as for scientific research, technical development and several fields of technical life.

In the past 30 years more and more modern and effective instruments and equipment have appeared in the technical life. These instruments have become increasingly expensive and they have represented higher and higher value in the national assets and shown bigger and bigger amount in the investment plans and at the expenses of operation and maintenance, as well.
At the same time the fact has become essential whether these instruments are at the country's disposal or not to carry out tasks for research, development, quality control, higher education, public health,etc. so the importance of R&M has increased, in a great extent.
To establish step by step R and M for the smooth operation of Centre III, all of the UN (UNIDO, UNESCO, etc.) and sponsor (SIDA, etc.) projects and VINATEST (about 220 testing laboratories) in the South is a pressing demand.

Objectives of the mission

The Consultant was expected to prepare:

1. a/ A comprehensive background report

b/ Formulate and draft a project document on the establishment of a MRC, based on the findings of the background study mentioned above.

c/ First drafts of the background report and a project document will be submitted to UNDP/Hanoi and the Government for clearance before the Consultant leaves the field. Final versions of these documents will be submitted to UNIDO Headquarters not later than 15 days after the completion of field work by the Consultant.

Work program

See ANNEX II.

RECOMMENDATION

1./It is recommended to establish a MRC at Centre III, suitable for R&M of the instruments of Centre III's client institutions (see ANNEX III).
In this MRC the Consultancy for the instruments and Training for R and M is necessary to be implemented, too, with the basis (suitable workshop, facilities, trainable experts and basic conditions of contracting) of the After Sale Service representations of selected instruments.

2./The MRC is to be developed in a second phase based on the experiences and operation of MRC to be able to provide R&M services for other important instruments of the research institutes, quality control and testing laboratories, education, public health, etc., in the South Region.
In this phase the basis of the complex ISC has to be established where the elements of the instrumentation infrastructure (Consultancy with registry of instruments, registry of free capacity for measuring instruments, advices on measurement technique and systems, After Sale Services, Renting, Training etc.) may co-operate in one institution.

3./ It is recommended to make all preparatory work necessary to establish the basis of a complex Instrumentation Service Center (ISC) at Centre III. of SOSMQC in HCM city during the implementation of MRC:

- to study the elements of instrumentation infrastructure in the South Region.

- to work out draft layout of ISC (Consultancy with registry of instruments, R&M with after sale service, Expertise in measurement techniques).

- to evaluate the instrument register of the South Region made by Vietnam counterpart.

- to elaborate the draft project document of establishing of the basis of ISC for the South Region with the specification of the equipment necessary for repairing of the instruments in the South Region(taking into consideration a project value of USD 1,500,000).

- to prepare a proposal for legal, financial, administrative measures of the Government necessary for the operation of ISC

- to identify the future purchase conception to avoid purchase without R&M background.

4./ The ISC to be established in the second phase constitutes an essential part of the institution building of the South Region. This ISC makes possible to implement the instrumentation policy of the South Region which policy shall result in forming operational service background of instruments, purchasing instruments of suitable types for the region with the necessary background,etc.

5./ It is very recommended to purchase up-to-date laboratory testing instruments in order to establish appropriate capacities for effective R&M for MRC. (Detailed list and specification in ANNEX IV.)

6./When purchasing new equipment Service Manuals should be demanded along with them, for these include all the information indispensable to carry out a succesful repair.

7./The existing and lately purchased instruments should be assigned inventory code-numbers according to their functions, categories and accuracy rates.

8. It is also recommended to use an Instrument Registration Card (see Annex VIII), including the type number serial number, manufacturer (supplier), inventory code number, date of installation, standard and optional accessories of the instrument in question and the name of department in which the instrument has been installed.

9. The broken-down instruments are to be scrutinized with the decision what measures should be taken in order to carry out the repairs as soon as possible. In case the faulty equipment is very old and no more worth repairing, it should be sorted out. In certain cases it is advisable to disassemble these instruments and save the usable parts.

10. It is also very necessary to establish a modern mechanical workshop with hard work and fine mechanical facilities. (for detailed list of machine and hand tools refer to Annex IV). In repair and maintenance laboratories should also be very well equipped with appropriate tools, fittings attachments and other accessories (see Annex IV).

11. Establishing a spare parts store is of great importance for supporting the basic activity of MRC and improving its effectiveness. The store should continuously be completed in order to avoid even the momentary lack of any spares (See Annex IV). Chemicals, flammable and other materials that endager the environment and human life should be separately stored.

12. In case of purchasing either new equipment or spare parts the choice of manufacturers (suppliers) should be optimalized, concerning both the enterprises and countries of origin. In so doing the administrative work and the chance of

coming by the spares required will be improved.

13./To carry out high level R&M three levels of staff are envisaged:

- Technicians
- Senior technicians
- Engineers

(For detailed job description refer to ANNEX IX.)
The engineers and senior technicians are to be systematically trained both in the country and abroad at such institutes where R&M is carried out for high precision instruments. All of them shall acquire the necessary microprocessor application technique.

14./It is very recommended for Centre III to establish after-sale service contracts (step by step) with the most important manufacturers or with their representatives.This contract compels the counterpart to meet the spare part demand of MRC, immediately.The framework of such contract makes it also possible to establish a consignment store with the required stock of spares at CENTRE III.

15./By opinion of the consultant,up-to date computer system is to be employed for registration of the material and equipment inventory and other organizational purposes.

16./The present documentation store and library should also be developed in a large scale.New data books,theoretical editions,periodicals,etc should be purchased.

17./For in the laboratories both 220V and 110V line voltages are required,this must be taken into consideration when planning the work benches.The mains receptacles should be of different type to avoid even the possibility of misuse which may cause heavy demages.The three-phase(four wire)receptacles will supply 110V voltage.

18./The power line system should be checked for disturbances(pulses,surges,frequency distortions.etc.)with severe respect to the sophisticated equipment, installed.If necessary,phase conditioners are to be employed.

19./Special care should be taken on the proper illumination of the laboratories and workshop.

20./When ordering new equipment,it is very important to think of the tropical circumstances.This should be indicated in the ordering specification and tropical construction should be demanded.

21./It is recommended to make service contract in every case, when a customer applies for repair to Centre III. If the customer is one of the departments or laboratories of Centre III, the service contract may be substituted by the Inter-Department Order(see ANNEX VIII).

22./Any time an instrument is received for repair it should be registered in the Job Register booklet(see ANNEX VIII),that is it should be given a job number.This identification number will accompany the instrument during the repairing procedure and will be indicated on (2),(4),(6) and (7) items of ANNEX VIII.

23./It is also possible and practical to enter into Lump-Sum Contract(see ANNEX VIII) with interested customers referring to a pre-determined instrument park for a limited period with the possibility of prolongation.

24./As far as either individual repairs and maintenances or lump-sum contracts are concerned,a rentability decision should precede the beginning of work,that is whether the cost exceeds a customer-determined limit or that reasonable one by

MRC's opinion based on precise fault-finding process.If the customer accepts the high repair cost a General Renewal Contract is to be made (see ANNEX VIII).

25./It is recommended to establish a mobile section providing R&M services at the customer.This mobile section may also help the co-operation between workshops of Centre III and outside partners.

26./Appropriate blankets and booklets are to be constructed for effective running of MRC(for drafts refer to ANNEX VIII).

27./ Taking into consideration the possibilities of other institutes, enterprises, mechanical workshops of the region, during the implementation of MRC co-operations are to be developed to make an optimum use of the resources available.

ACTIVITIES AND OUTPUT

Background

The Centre III is located in HCMC and bears the responsibility for executing the standardization, metrology and quality control.The administration, Electrical Metrology, Technical Services, Production of Standards and equipment are carried out in HCMC, while the Length and Mass Metrology and all testing facilities are established in the Industrial Estate of Bien Hoa, about 25 kms from HCMC centre in the neighbourhood of industrial companies.

In the period of 1979 - 1985 two UNDP/UNIDO projects were implemented in the South Region at Centre III:DP/VIE/76/013 and DP/VIE/81/006-- the latter divided to also assist to Centre I in Hanoi equipping several testing laboratories with up-to-date instrumentation. As a result of these, the Centre III has largely enhanced its activities and utilize the assets received in the international assistance on a high level in disseminating assistance further to industries. It gives concentrated support to provincial units, i.e., by supplying them with basic metrological standards and some measuring instruments (dead weights, balances, meter scales, etc.)

The individual items are designed by Centre III engineers and prototypes produced at the Centre III's workshop. Sets of these are subcontracted from local manufacturers, calibrated in Centre III and distributed to provincial authorities. Several instruments are also repaired by the technical staff in the workshops of the Centre III before they are admitted for calibration and verification.

One of the particularly important materialization of Centre III's improved activities was the initiation and foundation of VINATEST (1982), a voluntary (non-governmental) association of testing laboratories in the region uniting now about 75% (220) of them in this organization. VINATEST has no laboratories or instrumentation of its own, but its foundation was based on the recognition, that co-ordinated activities, organization of facilities will lead to higher efficiency in utilizing the available resources, laboratory instruments, measuring equipment, the experiences of the local experts, the skills and facilities in R&M of instruments.

The secretariat of VINATEST is run by Centre III and this gives accomodation for several of its fourteen organizational units (metallurgy, electricity/electronics, chemistry, textiles, etc., including the R&M unit established in 1985). In 1983 VINATEST has published a comprehensive, 188 page directory wherein it gives information each laboratory, specialization, available services, list of equipment, contact person name and telephone, thus giving a most valuable organization tool into the hands of the engineers and scientists to utilize the common knowledge and laboratory facilities in the Region.

Centre III has been playing a leading role in the instrumentation activities of the South Region, even so far. Not only through Vinatest Secretariat but via technical direction of Standardization, Metrology and Quality Control Institutes of 18 provinces, advices to the testing laboratories, arranging seminars for engineers about the issues of instrumentation etc.

While the two UN projects have provided a considerable number of testing, measuring and precision instruments to GDSMQC, it was an early recognition by Centre III (1982), that in longer terms its activities can not be secured, unless an effective, well equipped MRC gets operational, so as to keep their delicate instrumentation in perfect

condition. This recognition was of greater importance, since no professional services or repair centres exist in the region which could be entrusted to handle these tasks satisfactorily in their whole complexity, but practically no separate workshops are available either, which could perform above handicraft level works for fine mechanical, analytical or electronic instruments' repair.
So as early as 1981 a request was put forward by Centre III to SCST to establish a R&M Centre there, providing appropriate justification of their request. This was welcomed by the Government of Vietnam and assistance was requested from UNDP for a project allocating the residual funds of the previous cycle (USD 0.5 m) to this project (DP/VIE/85/009).

Centre III is located in three places:

a/ The main unit of laboratories is in Bien Hoa, some 25 kms from the centre of the city, which is linked with a highway giving excellent traffic possibilities to reach this unit. Centre III operates its own bus service for the employees, working there.

b/ The second place is at 8 Le Hong Phong Street -Q5, in the downtown area comprising a fenced yard with a small one story building and a garage. Here can be established the workshop for heavy equipment.
For this purpose 600 sq m is available on the two places above under a/ and b/.

c/ The head office is at 49 Nguyen Thi Minh Khai Street, in the centre of the city in a multistory building. Reception, offices, library, conference rooms, hall for lectures, and cafetaria are on the second floor. The electric and electronic metrology laboratories are located on the fourth floor, while the place for MRC is located also on the same floor. An area of about 400 sq m is provided on this floor, which can be expanded according to requirement on the other two places. The necessary facilities (water, electricity, etc.) are available.

The organization of Centre III follows its standardization, metrology and quality control activity. It consists of seven departments:

-Administrative&Material provision
-Planning & Legal advisor
-Standardization & Quality Control
-Testing
-Repair & Maintenance
-Metrology & Calibration
-Consultancy

The sections are organized according to the different fields (Light industry, Food production, Chemistry,etc.) or specialization (Electricity/electronics, Mechanics, temperature, etc). The Centre III is in continuous development to be able to meet the technical requirements.

The CENTRE III has been established to cover the tasks of standardization, quality control and verification of analytical, eletronic instruments belonging to companies, enterprises, scientific research institutes in 18 provinces of the South Region of Vietnam.

The CENTRE III has also been intended to provide repair. maintenance and calibration background in the fields mentioned above, as well. These activities are being done on two main settlements of CENTRE III: in HCM city and at Bien Hoa. The administrative centre is in HCM city. The present possibilities and status of the two institutes are very different with respect to their technical development. The laboratories, in the Bien Hoa section are working with good effectiveness as a result of earlier development projects.

In HCM city the following units are located at the present time:

- Metrology Department/pressure, temperature, electronics and electrical measurements/

- Repairing Workshop of analytical optical devices
- Mechanical workshop where weight kits and other kind of mechanical measuring devices are being made.
- Balance repairing workshop in the down-town.

These work-places are not equipped properly enough to perform effective activity, except Metrology Department where a low-level service-work is carried out on instruments which measure basic eletrical quantities /Resistance, DC-AC voltage, DC-AC current/.

The present technical staff in CM city consist of 10 electrical engineers, 7 mechanical engineers and 2 chemical engineers who studied both at home-land universities and abroad mainly in socialist countries. Many of them speak foreign languages Russian, English, German, Hungarian etc. The number of technicians is 13.

The basic activities of the other section in Bien Hoa are product testing and verification in the following fields:

- material testing /ultrasonic, magnetic, mechanical etc./
- chemical testing
- rubber testing
- seed and food stuff testing
- light industry product testing
- constructions material testing
- verification of mechanical standards (geometric, dimension, mass, force, hardness, volume, etc.)

These facilities are based on up-to date instruments and other testing devices, involving high sophisticated equipment.

Metre-sticks, pressure gauges and other mechanical "standards" are also being made at Bien Hoa and the manufacturing of big balances is foreseen, too.

The staff here is well qualified, speaking foreign languages, as well.

The present personnel of Centre III concerning the MRC:

a./ Metrology Department /Calibration/

- 4 electrical engineers,
- 3 technicians

b./ Mechanical Workshop /including balances and "standards" manufacturing and repairing section/
- 3 engineers
- 3 technicians

c./ Consultancy
- 1 engineer
- 1 technician

The condition of the testing, measuring and precision instruments

It can be stated, that the major part of the testing instruments in HCM city is obsolete, and that there are remarkable lacks of up-to-date testing and calibrating equipment/digital multimeters, high frequency oscilloscopes, frequency standard, universal high precision calibrator etc./.
The age of the available instruments amounts from five to thirty years.
In most cases the service manuals are missing, therefore if an instrument breaks down it is very difficult to come by the

spares necessary to repair it. It often happens that a repair procedure lasts for months or even years in the worst case.
The situation in Bien Hoa is much better, because the testing equipment there are in good conditions and of relatively new acquisitions. But in case of break-downs the outlooks of a successful repair are very bad.
The list of instruments concerning the most important R&M work of Centre III is fixed in Annex III.

In the South Region the situation in research institutes, testing laboratories, laboratories of enterprises is worse concerning the possibilities of the R&M. No testing and calibrating instruments, only little number of documentation and Service Manuals, no required skill and accessories with spares are available.

The possibilities of R&M
The present possibilities of MRC are not suitable to meet the requirements of repair and maintenance of high sophisticated equipment.
The obsolete testing equipment and the qualification of staff can provide only a low-level service activity.

Description of MRC
(See draft layout, organizational and flow-chart in ANNEX V. VII., and VII./a, respectively)

Taking into consideration the most important work of Centre III (see Annex III) the detailed list of testing, measuring, calibrating equipments can be found in the Annex IV together with the necessary spare parts, kits, attachments ,machine tools.
The draft layout and the furniture necessary for the work of MRC are detailed in Annex V and Annex VI.
Regardless of the proprietor of the instruments to be

repaired the reception of equipment will take place normally at the administration room. The equipment in question will be registered in the "Job Register" and given the proper job number. This identification number will accompany the instrument during the whole procedure of R&M and indicated on the Acknowledgement of Receipt given to the customer. The job number is specially constructed to include the most important information in coded form, that is whether the owner is CENTRE III itself or other customer and whether the R&M is carried out under guaranty conditions or not. Thereafter the instrument is forwarded to the competent laboratory for R&M. Prior to beginning the service activity a rentability decision is made whether, the repair cost exceeds a customer-determined limit, or that which is reasonable by MRC's opinion, based on precise fault-finding process MRC is also entitled to give suggestion for sorting out the equipment, but if the customer accept the higher repair cost MRC is obliged to carry out R&M.

During R&M the individual Service units keep close contact with the Store and take part intensively in completion of the stock, that is provide technical assistance for the store-keeper and the buyer, in addition.

After completion of R&M, the Service units send reports to the customer through the "Administration group".

On initiation of the Service units shipping orders are sent to the Mobile Section, if the customers need transportation.

After the customer has verified the receipt of instrument the "Adminstration group" send Calculation/Post Calculation Form to the Financial Department.

Parallel to R&M activity MRC maintains a consulting group with the aim to provide trainings to the personnel of MRC and consultation possibilities for customers.

The Mechanical Workshop supports R&M activity and produces special devices necessary in the testing, measuring technique. For detailed description of blanks and booklet refer to ANNEX VIII.

Measures taken by Centre III

The Centre III according to its present possibilities makes known its services among the customers through advertisements, Vinatest bulletin (which is a montly bulletin) seminars,etc. Just now its R&M capabilities are very modest so that type of measures which can be taken by the Centre III are only possible after implementation of project and acquiring the necessary skill, expertise and practice.

The R&M as an element of the instrumentation infrastructure

The principal task of instrumentation policy is that of ruling the instrument economy which uses and takes advantages of the available instruments to protect their conditions, extend endurance with quick and professional repair in case of failures, hereby utilizing the invested money the best. Further task is to promote development of available means and effective instrument usage by assurance of full utilization, as well as to assure economical instrument investments by preparing the necessary instrument purchases carefully considering local circumstances and measuring task.

Comprehensive instrument manufacture is not available in Viet Nam. As a consequence the country is forced to obtain instruments needed on several areas of national economy from abroad.

There are several reasons why instrument purchases are not co-ordinated so the chosen type is often incidental, unsuitable for local conditions (e.g. climate) or it does not fit into the technical infrastructure of the national economy.

The instruments should be protected and the efficiency of

further investments can be increased considerably by a complex national or regional level conception for the instrument economy. This purpose can be realized gradually by the instrumentation policy which can be implemented effectively in the framework of the ISC.
Some basic conditions that should be considered as essential for effective instrumentation management policy would include, for instance:
- well considered investment plans, possession of relevant information for making decisions on purchases (for instance which type of instrument from which manufacturers should be bought).
- By fulfilling the instrument requirements those aspects should be taken into account which make possible to get instruments without investment, for instance, by renting if the instrument is needed for a short period of time.
- Setting up a well-organized customer service background (material, spare parts and experts) to assure the operation and maintenance of the purchased instrument in warranty and after warranty period. For this purpose manufacturers can be involved through well-organized After sale services.

In order to make well-considered investments for avoiding unnecessary, parallel purchases and also for utilizing existing instruments better professional advice and background informations have to be provided not only for institutes and ministries but for enterprises, as well.
The analysis of the present situation in Viet Nam shows that the solving of the repair & maintenance needs of present instrumentation is not just as simple as equipping a workshop with necessary facilities as technical-minded people might face the temptation to think so.

To demonstrate the core of the problem, the question of spare parts is taken as a model and it is assumed that the needed workshop exists already. The question to be solved now is:

how should the stock of spare parts be continously refilled when operating the workshop:

1-which spare parts should be bought;

2-who should secure the funds (convertible currency) for purchasing.

Taking into account e.g. the volume and variety of spares to be imported for the variety of instruments, foreign trade activity of a rather high capacity must be implemented. (One should keep it in mind however, already in advance: since this being a trading activity, it does not mean that it is just a money "spending" activity. But, as any smoothly-working trading activity, it can - better to say must - have "incomes" (also in convertible currency as well).

The problem taken above, was intended to demonstrate what kind of problems can arise because of the lack of co-ordination.

The other set of questions is related to the diversity of instruments (types, manufactures, etc.), which means a serious problem for Viet Nam, as well. This situation is a historic fact, accumulated through time, as a consequence of the variety of sources, countries, institutions offering their assistance to Viet Nam, being in great need of it. It may be due, however, in recent times, to UN procedures which require accepting the bid for a type of instrument from that manufacturer who gave the best offer, provided that the recommended instruments have the same capabilities. This had the result that sometimes, even in a newly established laboratory, the origin-variety of instruments is greater than it seems necessary.

The task of the present is, however, how to avoid this for the future. Therefore, the question has to be put the other way round: those instruments should be purchased for the country for which conditions have already been secured for -

even if they might be more expensive, or even if they are not in all respects up to the highest requirements. Similary, the other question has to be asked, as well: which instrument proves or has proved to be the best in resisting the hard climatic conditions of Viet Nam. This problem cannot be solved effectively without comprehensive instrumentation policy.

To be able to put these questions this way implies that experience have been collected about all previously imported kinds and similar types, etc. Decisions based upon this information - which can only come from already established, well - operating instrumentation policy and ISC - will result, finally, in decreasing the variety of types, in more climate-resistant composition of instrumentation of the country, in decreasing servicing costs and increased operating hours of instruments.

To be able to make such selection, assumes that:
a./ The users should have the possibility of having a comprehensive review of all purchasing orders, and

b./ The authority has to supervise and reconsider purchasing orders from anyone from this point of view.

As summary, one could say without going into the details of other problems that the core of the problems lies in the scattered efforts. The solution, therefore, is to have a comprehensive and systemic approach in the country.

The R&M, the After Sale Service, the Consultancy are the elements of the instrumentation infrastructure. Besides them also important roles are played by the other elements, such as training, development of instruments, renting of instruments of short term requirement.
The ISC is that institution where all elements of

instrumentation infrastructure can co-operate.The basic functions of an ISC in case of developing countries are the following:

- Consulting activity;
- Prospectus leaflet collection and information service;
- Professional national instrument register;
- Department for maintenance and repair of the instruments;
- Managing of import of instruments and spare parts, as well as providing components for repair;
- Establishing nationwide after-sale services;
- Periodically and after repairs calibration of instruments;
- Calibration activity for other companies in case of need;
- Free instrument capacity register and cooperation renting to utilize free capacities of instruments better;
- Renting activity;
- Measuring technique service for instruments requiring special handling skills;
- Development and production of special purpose instruments which help the use of the instrument park;
- Training and education.

The organization can be realized step by step according to the requirements of the country. Of course all the listed and possible activities do not need to be realized. the order is not rigid either because the structure and manner of realization for the organization can be influenced very much by the number and qualification of trained people as well as by the financial resources available.

Besides basic functions listed above the following tasks are also needed for the organization:

- book-keeping;
- upkeep of the centre building;
- computing technique, and

- personnel and legal tasks.

Especially in Viet Nam where the national economy does not exceed the medium level the complex challange of the technical development can only be fulfilled if it is recognized very soon that beside bureaus of standards and metrology offices and quality control facilities ISCs also have to be involved in the infrastructure of the institutions.

These -if they run well - can be the basis of elaboration and realization for the policy of effective national instrumentation management whereby they can also be great help in the optimal utilization of the available financial, technical and personal resources.

UTILIZATION OF THE RESULTS OF THE ACTIVITY

The Centre III will finish the establishment of the necessary laboratories in HCMC from its own effort and sources in month 1 of the project. The laboratories and other administrative rooms are located on the 4-th floor and are being reconstructed. By destroying walls, rooms have been linked in order to practically enlarge the working space.

During the field mission the draft layout of the MRC was worked out (see ANNEX V) and the bulding works were continued according to that.
The electrical network, the air-conditioning, water supply and canalization will be carried out according to the same.

The work-benches in the laboratories and workshop can be of the same design, but in one of the analytical laboratories an appropriate stone plated bench should be placed with a desinfecting lamp above. Specially constructed work-benches are needed in case of heavy work in the down-town mechanical

section. (The design of work-benches was handed over to Centre III).

- The equipment that cannot be purchased in Viet Nam (see ANNEXES IV/1.) and expertise, training cannot be provided without foreign currency and co-operation with an institute having experiences in this field so these can be supplied, respectively, developed only through the project after its approval.

There are limited possibilities of co-operation with other institutes of the Region. In the first phase of development MRC may co-operate mainly in the fine mechanics, glass-blowing technique and electrical measuring technique. As for the calibration and verification concern the co-operation possibilities are not as favourable as those in the fields mentioned above, because the instruments which may be taken into consideration are applied in production lines or even in the continuous quality control.

CONCLUSIONS

1./ In lack of proper R&M of sophisticated electronic instruments of Centre III the smooth running of testing, quality control and standardization work of Centre III i.e. the use of sophisticated instruments provided through UNDP help is seriously hampered. Because some faulty instruments there are such testing activities which cannot be carried out for some years and this situation is to become more difficult if RMC is not established.

2./ The same situation can be found at other research institutes, testing laboratories of the South Region. In consequences of this large number of sophisticated electronic instruments - of about USD 2.7 million in value, - cannot work.

3./ According to the importance of the instrumentation infrastructure to improve the situation at Centre III and at the same time in the South Region complex systemic approach and step by step method is to be used.
In the first step the immediate help in R&M is needed for the instruments according to ANNEX III.
In this first step the basis of the Consultancy and After Sale Service is needed to develop from the elements of instrumentation infrastructure.

4./ In the Centre III beside its testing and verification, calibration activity using its very modest possibilities some R&M work is carried out presently, too. The Centre III is suitable institute to be developed, the basic expertise is, however, not enough for R&M of sophisticated electronic instruments, the necessary and suitable places for laboratories and the required infrastructure, strong-minded

and resolute management are available.

5./ The Centre III is playing even now leading role in the instrumentation infrastructure of the South Region through technical directing the standardization and testing activity of the South Region, organizing Vinatest activity, arranging seminars to familiarize and instruct the experts on new measurement methods and technologies so it is suitable to become the ISC of the South Region in a latter phase as an important part of the institution system to provide the ways and means of implementing the instrumentation policy of the South Region.

6./ Not only in Centre III but in other testing laboratories, research institutes beyond the lack of spare parts, accessories -with a few exceptions- the Service Manuals, necessary documentation for R&M are missing.

7./ The present capabilities of Centre III are not suitable for carrying out the necessary fine-mechanic and hard works required for R&M of sophisticated electronic instruments.

8./ Both in Centre III and in the South Region there is no real contact with instrument suppliers, manufacturers, no agreement exist which could assure the upgrading training of the experts, systematically.

9./ In the South Region there are already several enterprises research institutes having high precision sophisticated electronic instruments in their production lines, laboratories, respectively. There are possibilities just because of the leading role of Centre III in the South Region to establish co-operation concerning the usage of high precision instruments to make optimum use of resources. There are some possibilities of co-operation for the hard mechanic works, too.

10./ These co-operation possibilities may help to undertake After Sale Service of manufacturer under joint agreement of Centre III and its partner or in other case Centre III may afford its capabilities for an other institute to meet the requirements of the supplier of instruments for contracting its After Sale Service.

11./ In the South Region only very limited number of high sophisticated eletronic elements necessary for the precision instruments (LSI circuits) are available. Only RC elements and only parts for entertainment electronics can be purchased.

Annex I.

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

UNIDO

October 1987

JOB DESCRIPTION

DP/VIE/85/009/B/01/37/11-01

Post title	**Consultant on organization and management of maintenance and repair centre for instruments**
Duration	**2.5 months**
Date required	**February 1988**
Duty station	**Ho Chi Minh City with travel within Viet Nam and report/project preparation at home base**
Purpose of the project	**The purpose of the project is to:**

a) To assist in the preparation of establishing in Ho Chi Minh City at two locations of Centre III (i.e. at the main office and at Bien Hoa) a Maintenance and Repair Centre (MRC) for the UNDP-provided and the other equipment of Centre III itself, and of the high-accuracy measuring instruments of the quality control laboratories of the light and medium industry which come to Centre III for certified calibration, and

b) To familiarize responsible Government departments and senior staff of Centre III on the organization and work methodology of similar centres in developed and more advanced developing countries.

Duties

The Consultant will report to UNIDO and will be expected to prepare:

a) A comprehensive background report which will, among others, include:

- A detailed list of test, measurement and calibration equipment required for the repair, maintenance and calibration of equipment mentioned above;

- A list of commonly used spare parts, tool kits, fittings, attachments, etc. for general use in repair and maintenance work, and where feasible,

---

Applications and communications regarding this Job Description should be send to: Project Personnel Recruitment Branch, Department of Industrial Operations, UNIDO, Vienna International Centre, P.O. Box 300, A-1400 Vienna, Austria

spares identified for individual broken-down instruments which have been waiting for spares and/or special tools;

- A draft layout of MRC, that is, reception and delivery areas, stores, machine shop, documentation, library, administrative services, etc.;

- A draft layout and list of furniture, that is, workbenches, spare part cabinets, storage bins, technical and administrative documentation storage and filing cabinets for approximately 300 sq m of laboratory space in Ho Chi Minh City and 100 sq m of similar space at the Bien Hoa Centre;

- Models of necessary administrative blanks and booklets required for stores management and repair/maintenance/calibration record keeping;

- Recommendations on the composition, number, types and categories of personnel required for the MRC and scopé of relevant job descriptions of the main posts in the three main disciplines;

- Draft organizational chart of MRC;

- A preparatory project report with special attention on the measures to be taken by the Government for the effective implementation of the project.

b) Formulate and draft a project document on the establishment of a MRC, based on the findings of the background study mentioned above.

c) First drafts of the background report and project document will be submitted to UNDP/Hanoi and the Government for clearance before the Consultant leaves the field. Final versions of these documents will be submitted to UNIDO Headquarters not later than 15 days after the completion of field work by the Consultant.

Qualifications: Engineering university background with extensive experience in the organization and operational management of instrument repair and maintenance centres.

Language: English

Background information

The rapid technical development of Viet Nam resulted in the past years in a considerable increase of measuring and testing instrumentation in testing laboratories, scientific institutions, metrology centres, in industry,

agriculture, medicine, education, etc. This is significant not only as a consequence, but also a condition for further technical-industrial development. In addition to these up-to-date instruments a considerable number of older, in fact being 10 to 15 years old or older, instruments exist in various laboratories throughout the country. However, both "new" and "old" are concentrated mainly in the North, Hanoi Region, and in the South, Ho Chi Minh City Region.

Instruments, just as a rule, need maintenance and repair, even more so the delicate testing, measuring and precision instruments, many of them being high sophisticated to suit the requirements of measurement techniques highest precision. At the present stage of development, however, no effective maintenance and repair can be provided in the country for instruments, particularly not to cover the demand in respect of electronic, fine mechanic, and optical instruments. Beyond the acute lack of spare parts, materials and repair equipment, the reason for this situation is the lack of appropriate institution with relevant organization and purchasing conditions, which could take care of this nation-wide problem, and implement appropriate instrumentation policy. This has resulted in the fact that now about 15% of the "new" instruments, approximately US$2.7 million in value, are out of order because repair could not be made.

Therefore, to get this problem under control, the Government of Viet Nam has adopted a long-term policy to establish and operate through the country maintenance and repair activities for instruments. To establish maintenance and repair activities also in the South is a pressing demand in order to avoid further deterioration of instruments there. COSTMAS and the ongoing project VIE/80/039 in Hanoi, which gives the long-term framework to these activities, is not as far now that it could take over the responsibility for some years to establish maintenance and repair activities in the South also. Therefore, to avoid any further delay in establishing maintenance and repair activities and avoiding further losses in instrumentation there, the Government has decided to delegate these activities in the South to Centre III and asked for UNDP assistance to be implemented there (VIE/85/009). Centre III belongs to the General Department for Standardization, Metrology and Quality Control, being however, subordinate to the same agency of the Government, the State Committee for Science and Technology, as COSTMAS itself, thus the organization premises are secured as to give the proper coordination to activities running at both institutions.

At Centre III good conditions are available to establish/strengthen maintenance and repair activities and to absorb and utilize the requested UNDP Assistance.

In the period 1979-1985 two UNDP/UNIDO projects were implemented at Centre III: DP/VIE/76/013 and DP/VIE/81/006 —the latter divided to also assist Centre I in Hanoi. As a result of this, Centre III has largely enhanced its activities and utilizes the assets received in the international assistance on a high level in disseminating assistance further to the industries. It gives concentrated support to the provincial units, i.e., by supplying them with basic metrological standards and some measuring instruments (dead weights, balance, meter scales, etc.)

The individual items are designed by Centre III engineers and prototypes produced at the Centre's workshop. Sets of these are subcontracted from local manufacturers, calibrated in Centre II and distributed to provincial

authorities. Several instruments are also repaired by the technical staff and workshop of the Centre before they are admitted for calibration and verification. Just to indicate the volume and importance of this activity: about 1200 pressure gauges are repaired this way each year.

One of the particularly important materializations of Centre III 's improved activities was the initiation and foundation of VINATEST (1982) a voluntary non-governmental association of testing laboratories in the region, uniting now about 75% (200) of them in this organization. VINATEST has no laboratories or instrumentation of its own, but its foundation was based on the recognition that coordinated activities, organization of facilities will lead to higher efficiency in utilizing the available resources, laboratory instruments, the experiences of local experts, the skills and facilities in maintenance and repair of instruments. The secretariat of VINATEST is run by Centre III, and this gives accommodation for several of its fourteen organizational units (metallurgy, electricity/electronics, chemistry, textiles, etc., including the 1985 established maintenance and repair unit). In 1983 VINATEST has published a comprehensive, 188 page directory wherein it gives information on each laboratory specialization, available services, list of equipment, contact person name and telephone, thus giving a most valuable organization tool into the hands of engineers and scientists to utilize the "common knowledge" and laboratory facilities in the region.

Centre III has been increasingly approached by other laboratories in the region for assistance in maintenance and repair of instruments, facing the same problem of Centre III itself. The Centre's own very modestly equipped workshop (mainly with heavy machinery) cannot attend to all the needs. In view of the growing demand, considering the already achieved outputs and the good utilization of the available resources here, the decision of the Government was firm to establish the Maintenance and Repair Centre (MRC) in the framework of Centre III, and to ask UNDP to implement assistance for these purposes there.

Centre III is located in three places:

a) The main unit of laboratories is in Bien Hoa, some 25 km from the centre of the city. This compound houses the following laboratories: (i) metrology; (ii) physiochemistry and chemistry; (iii) textile and paper (light industry); (iv) foodstuffs; (v) mechanics; (vi) metallurgy; (vii) electricity (also HT); (viii) electronics; (ix) construction materials; (x) rubber and plastics (polymer), and (xi) seed testing

b) The second laboratory is in the outskirts of the downtown area. It is assigned to heavy equipment and serves also as a base for field work teams.

c) The head office is at 49 Nguyen Thi Minh Street, the centre of the city, in a multistory building.

An area of about 200 sq m is provided at present for accommodating the workshop of MRC which can be expanded to 350 sq m. The necessary facilities (water, electricity, etc.) are available. The suitable location of the ancillary units (store, technical documentation, etc.) have to be determined in the preperatory phase of the project.

ANNEX II

WORK PROGRAMME OF THE MISSION
VIE/85/009 DR. GYULA STOKUM

24.02.1988. Arrival in Hanoi

24 - 27.02.

a.) Visits: National Metrology Centre l., UNDP COSTMAS, and Instrument Services Centre.

b.) Meetings with: Mr D.E. Smith res. rep., Mr P. COEUR - BIZOT dep. res. rep., Mr L.S. Adermalm prgr. officer, Dr Doan Phuong director-general of GDSMQ, Mr Hoang Manh Tuan dep. director-general of GDSMQ, Mr Tong Cong Nhi director of National Metrology Centre, Mr Doan Xuan Son director of COSTMAS, Mr Ngo Huy Van dep. director of National Metrology Centre, Mr Tinh director of Instrument Services Centre (COSTMAS)

27.02. Round table conference in the National Metrology Centre

a.) Participants: managers and heads of Labs. in the National Metrology Centre and other institutions.

b.) Lecture: on the Hungarian Instrumentation Centre's activities (with Video programme), and the complex approach of instrumentation Policies with special emphasis on repair and maintenance.

c.) Questions and answeres

29.02. Arrival in HCMC

02.03. Work programme

To be finished and sent to UNDP Hanoi

01 - 31.03. Technical b. ;round report

To study the background documents to consider the local circumstances and continuous discussions with governmental people HCMC, technical background report must be finished by 31.03., which includes:

- A detailed list of test, measurement and calibration equipment required for the repair and maintenance of instrument;
- A list of commonly used spare parts, tool kits, etc. for general use in repair and maintenance work;
- A draft layout of Maintenance and Repair Centre (MRC);
- A draft layout and list of furniture, work benches, spare part cabinets, storage bins, technical and administrative documentation, storage and filing cabinets;
- Models of necessary administrative blanks and booklets required for stores management and repair (maintenance) calibration record keeping;
- Recommendations on the composition, number, typs and categorics of personnel required for the MRC and scope of relevant job descriptions of the main posts;
- Draft organizational chart of MRC.

02 - 20.03. Project formulation framework

Considering the new UNDP regulations and aspects mentioned above, the project formulation framework - after being discussed with governmental people HCMC - must be finished and sent ot UNDP Hanoi by 20.03.

20.03 - 13-04. Draft of the project doaument

Formulating and drafting a project document on the establisment of a MRC, based on the finding of the technical background report, and it must be prepared for the discussion in Hanoi with UNDP and governmental people by 13.04.

20.03 - 20.04. Instrumentation procurement policy

Through meetings and round table conferences familiarizing governmental people that beside the importance of repair and maintenance of instruments, how important is well-prepared procurements to

avoid unnecessary, parallel investments and how useful is a regional or national instruments register which in a short time can give up-to-date informations about the current istrumentation pool or in many cases how much more economical to rent the instrument than to purchase, etc.

25 - 27.04. **Final discussion in Hanoi**

on the draft the project document (with UNDP and governmental people)

27. 04. **Departure from Hanoi or HCMC**

02. 05. **Debriefing in Vienna**

02 - 14. 05. **Completion of final report**

Ho Chi Minh City
01.03.1988.

Dr. Gyula STOKUM
Consultant VIE/85/009

ANNEX III.

M R C MAIN OBJECTS

M and R capability of Centre III

No.	Equipment groups	Approx. Qty in region	Year capability of Centre III
		(Unit)	Time/unit
	A. Electrical and Electronic:		
1.	U, I, W, Cos φ , complex meters voltage and Current sources	20,000	315
2.	R, L, C, tg δ , Q meters	10,000	20
3.	Generators, oscillators, modulators	5,000	10
4.	Equipment for processing, observing and measuring signals	5,000	18
5.	V H F and U H F equipment	5,000	3
	B. Thermodynamic:		
6.	Electronic thermometers and controllers	3,000	85
7.	Pyrometers	20	8
8.	Pressure thermometers and controllers	2,000	3
9.	Pressure gauges	30,000	2,000

ANNEX III.
(Continued)

No.	Equipment groups	Approx. Qty in region	Year capability of Centre III
		(Unit)	Time/unit
	C. Mechanical		
10.	Hydraulic and pneumatic force measuring equipment	200	55
11.	Hardness testers	115	50
12.	Analytical and laboratory balances	600	18
13.	Industrial scales and balances		
	D. Optical		
14.	Microscopes	300	5
15.	Refractometers	100	20
16.	Optical systems in different equipment	400	10
	E. Analytical and Electronic based testing equipment:		
17.	Spectrograph (Vis, UV, flame, atomic, thermal, mass...)	300	10
18.	pH - meters and titrators	1,000	10
19.	Chemical analysers (Sulphur, Nitrogen, CO_2 ...)	100	-

No.	Equipment groups	Approx. Qty in region	Year capability of Centre III
20.	Chromatographs (gas, liquid ...)	200	10
21.	Optical-electronic testing equipment for fibre, paper ...	200	2
22.	Moisture meters	500	7
23.	Electronic tensile testers and balances	200	10
24.	Magnetic, ultrasonic, X-ray testing equipment	200	4
25.	Special equipment (agriculture, medical)	3,000	3
26.	General purpose laboratory equipment (furnaces, ovens, shakers, baths, stirrers ...)	10,000	40

Annex IV, .

U N D P INPUT

A. EQUIPMENT AND TOOLS FOR MRC

1. Equipment and tools for Maintenance Repair of electronic and analytical instruments.

Item No.	Description	Model No.	Qty	Unit	Manuf. order	Manuf or supplier	Approximate total cost complete (USD)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	A. Electronic equipment						
1	Digital Multimeter	PM 2528	3	EA	PM 2528/02	Philips	3,000
	- HF option	PM 9258	3	"	PM 9258		
	- HF probe set option	PM 9211	3	SET	PM 9211		
	- Peak voltage option	PM 9259	3	EA	PM 9259		
	- Analog output option	PM 9254/02	3	"	PM 9254/02		
	- Current shunt 30A option	PM 9244	3	"	PM 9244		
	- HT probe option	PM 9246/03	3	"	PM 9246		
2	VHF Oscilloscope 350 MHZ	PM 3295	2	"	PM 3295	"	3,000
	- Set of VHF attenuators	PM 9599	1	SET	PM 9599		
	- Long viewing hood	PM 9311	2	EA	PM 9311		
	- Collapsible viewing hood	PM 9310	2	"	PM 9310		
	- Passive probe with readout	PM 8924/20	2	"	PM 8924		

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
3	GHz Timer/Counter (including X-tal oscillator PM 9690)	PM 6672/4	1	EA	PM 6672/4	Philips	3,700
	- Battery unit option	PM 9693	1	"	PM 9693		
4	Logic analyser (with English main operating software PM 8883/00 and 32 channel logic pod PM 8860)	PM 3632	1	"	PM 3632	"	6,000
	- ROM-emulator modul (consist of RS 232 C comm.card PN 8880/20 and ROM emulator pod PM 8864)	PM 8880/00	1	"	PM 8880/00		
	- Disa ROM board	PM 8880/30	1	"	PM 8880/30		
	- Set up memory board	PM 8880/40	1	"	PM 8880/40		
	- Set up data memory board	PM 8880/50	1	"	PM 8880/50		
	- Video interface	PM 8880/80	1	"	PM 8880/80		
	- Serial data analyser pod	PM 8811/10	1	"	PM 8811/10		
	- 4 channel fast pod/glitch capture	PM 8862	1	"	PM 8862		
	- uP 8 bit personality pods	PM 8865 to 8870	1x6	"	PM 8865 to 8870		
	- uP 16 bit personality pods	PM 8874 to PM 8876	1x3	"	PM 8874 to PM 8876		
	- 8 channel probe set fixed	PM 8882/00	1	"	PM 8882/00		
	- 8 channel probe set disconnectable	PM 8882/10	1	"	PM 8882/10		
	- 24 channel probe set disconnectable	PM 8882/30	1	"	PM 8882/30		

Annex IV/1
(continued)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	- Probe set disconnectable	PM 8882/40	1	EA	PM 8882/40		
	- Flat cable and 40 pin Dil clip	PM 8882/60	10	"	PM 8882/60		
5	Programmable RF generator 1 GHz	PM 5390S	2	"	PM 5390S		2,000
	- Coaxial cable, BNC-BNC	PM 9075	6	"	PM 9075		
	- 50Ω termination, 1W	PM 9585	2	"	PM 9585		
6	Pulse generator	PM 5716	2	"	PM 5716		1,000
	- 50Ω feed through termination, 3 W	PM 9581	2	"	PM 9581		
	- 50Ω T-piece	PM 9584	4	"	PM 9584		
	- Coaxial cable set	PM 9588	2	SET	PM 9588		
	- 10 : 1 attenuator probe DC - 80 MHz	PM 8927	2	EA	PM 8927		
7	Function generator	PM 5313	2	"	PM 5313		1,000
	- Coaxial cable BNC	PM 9075	4	"	PM 9075		
	- 50Ω, 3W termination	PM 9581	2	"	PM 9581		
	- Adapter BCN, 4mm	PM 9051	2	"	PM 9051		
8	Automatic RCL meter	PM 6303	2	"	PM 6303		2,000
	- Four-wire test cable	PM 9541	2	"	PM 9541		
	- RCL test adapter	PM 9542	2	"	PM 9542		

Annex IV/1
(continued)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
9	100MHz transient storage oscilloscope (basic version)	PM 3266	1	EA	PM 3266		1,500
	- HF passive probe 10 : 1	PM 8928/00	1	"	PM 8928/00		
	- Passive probe 1 : 1	PM 8924/20	2	"	PM 8924/20		
	- Battery pack	PM 8901	2	"	PM 8901		
10	Color TV pattern generator	PM 5518	1	"	PM 5518	Philips	
	- RF cable and 300Ω trafo	PM 9539	1	"	PM 9539	"	
	- 75 ohm BNC - BNC cable	PM 9075	1	"	PM 9075	"	
	- Service manual	-	1	"	-	"	
11	Milliohm meter	Norma 1805-B	2	"	1805-B	Norma	300
12	Clip-on AC current meter	2433-11	2	"	2433-11	Yokogawa	400
13	Decade resistance box	2786-10	2	"	2786-10	"	1,800
	"	2786-20	2	"	2786-20	"	1,800
14	Transformer 220V/3A (lab)		5	"	2422 529 00007	Philips	500
15	" (panel)		3	"	2422 529 00008	"	500
16	Autotransformer (lab)		5	"	2422 530 03306	"	500

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
17	Line conditioner	PE 1414/202	2	EA	PE 1414/202	Philips	1,000
18	"	PE 1411/202	2	"	PE 1411/202	"	500
19	Power supply 0-20v/0-45A	PE 1643	1	"	PE 1643	"	800
20	Power supply 0-40v/0-3A	PE 1540	4	"	PE 1540	"	2,000
21	Portable hand driven insultation tester 2 KV/5 Gohm	2404-16	1	"	2404-16	Yokogawa	150
	B. Electronic tools						
1	Soldering iron 125/W/220V	Allied	5	"	709-0042	Allied	25
2	Soldering iron 65W/220V	"	20	"	709-0045	"	100
3	Soldering iron 25W/220V	"	20	"	709-3108	"	100
4	Soldering iron 125W/110V	"	5	"		"	25
5	Soldering iron 65W/110V	"	20	"		"	100
6	Soldering iron 25W/110V	"	20	"	972-7070	"	100
7	Soldering iron 15W/6V	"	20	"	C728-0220	"	100
8	Soldering iron for IC	"	20	"	972-6943	"	100
9	Soldering iron for IC	"	20	"	972-6982	"	100
10	IC extractor	"	20	"	972-6982	"	100
11	IC extractor	"	20	"	972-6983	"	100
12	Wire stripper	"	10	"	708-9600	"	50
13	Wire stripper	"	5	"	910-5803	"	25

Annex IV/1
(continued)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
14	Hollow shaft nut driver	Allied	5	EA	984-7832	Allied	20
15	"	"	5	"	984-7834	"	20
16	"	"	5	"	984-7835	"	20
17	Forceps, flat tip	Karl-Kolb	5	"	287-507	Karl-Kolb	10
18	Forceps, straight tip	"	5	"	287-585	"	10
19	Forceps, angular tip	"	5	"	287-520	"	10
20	Forceps, bent tip	"	5	"	287-516	"	10
21	Forceps, straight jaw	"	5	"	287-511	"	10
22	Forceps, Jewetton type	"	5	"	287-525	"	10

Annex IV/1
(continued)

2. Equipment and Tools for Fine-mechanic and Optic Maintenance and Repair Laboratory and Workshop

Item No.	Description	Type No.	Quantity
1.	Non-destructive portable X-ray material testing equipment	MG 321 L	1
2.	Precision high speed lathe Centre distance: 650 mm Centre height: 150 mm Spindle speed: 8, 55 to 2200 RPM Basic equipment: vee belt, hand stock, tail stock, gear, centres Vertical milling and drilling attachments.	E.M.E Maximat super II	1
3.	Victoria milling machine for economical and accurate milling of small components - Horizontal and vertical - speed range: 200 to 3600 RPM - spindle speed 7 - Quill travel 80 mm - Distance spindle to table 380 mm - spindle taper. 3M.T. standard accessories.	Model OO	1
4.	Drilling Machine - bench model capacity 13 mm in mild steel spindle travel 100 mm, spindle speed 5 - 500 to 400 RPM	Meddings LB 1/HRM	1

Annex IV/1
(continued)

Item No.	Description	Type No.	Quantity
5.	Hand operated bending and folding machine - capacity 2 mm sheet steel size 1000 mm max.	-	1
6.	Record bending machine - universal portable tube and pipe bender - capacity upto 20 mm for steel rod - with set of formers and guide, for light gauge copper and stainless steel - cat. No 3 FG 220M, 4 FG 220M, 5 FG 220M.	No-223	1
7.	Double ended bench grinder - wheel size 175 x 25 x 16 mm - motor speed 2880 RPM - 220V single phase - with carborundum wheels.	Gryphon Model G2	1
8.	Electric tools consist of:		
	- Industrial drill - Piston Grip Black and Decker	Gat.No GD 3094	2
	- Vertical drill stand - Black and Decker	SP 41	1
	- Sander grinder 100 mm wheel disc 11,000 RPM - Black and Decker	SAG10	1
	- Finishing sander - paper size 215 x 280 - No load speed 10.000 orbits / min - Black and Decker	HD 2120	1
	- Burgess powerline glass engraver	-	1

Annex IV/1
(continued)

Item No.	Description	Type No.	Quantity
9.	Electro plating equipment for small components	-	1
10.	Electric welding equipment: transformer, grip, wire	-	1
11.	MIGMASTER 2001 welding machine, open - circuit voltage 22-42 V current 40 to 170A - spot welding current 200A	A.R.O. Model 2001	1
12.	Hand tools: pliers, shear socket sets (metric, with.), eclipse chuck type pin vices, files, fine mechanic vices, pattern pipe wrenches, hex wrenches, watch-maker screw-driver set.	Japanese products	-
13.	Engineering equipment: abrasive disc, sheet, coil, wheels, drills.	-	-
14.	Machine tool equipment: vee blocks, turning tools, different shape of tungsten carbide and super weld high speed steel, Straight shank countersink 60^{o} and 90^{o}, quick change chuck, machine vices, medium size, milling cutter (long range cutters, slot drills / cutters, facing cutters and mills, small modul gear milling cutters).	-	-

Annex IV/1
(continued)

Item No.	Description	Type No.	Quantity
15.	Vacuum plating equipment for reflecting layers.	-	1
16.	Equipment and tools for maintenance and repaire of analytical balances:		
	Optical cleaning fluids	-	-
	Cutting, grinding and polishing tools for hard stone knife edge	-	1 for each
	Standard weight set 1 mg to 200 g	-	2
17.	Graver machine	-	1
18.	Tools and solution for cleaning optical parts (lenses, prismas, mirrors).		
19.	Copier and accessories	CANON 125	1

Annex IV/1
(continued)

B. ELECTRONIC COMPONENTS AND MATERIALS FOR MRC STOCK

Item No.	Type No.	Qty max.	Qty cut-off	Item No.	Type No.	Qty max.	Qty cut-off
	MICROPROCESSOR AND PERIPHERIAL CIRCUIT			28	Mostek 3880 (z80)	50	50
				29	" 3880 - 6	"	50
				30	" 38 P 70	20	10
1	Intel 8080 A-A	50	50	31	" 38 P 73	"	10
2	" 8085 AH-1	"	50	32	" 3850	50	50
3	" 8088	"	10	33	" 3870/10	20	10
4	" 8088 - 2	20	10	34	" 3870/20	"	"
5	" 8031	"	20	35	" 3870/30	"	"
6	" 8032	"	10	36	" 3870/40	10	"
7	" 8035 AHL	"	"	37	" 3873/22	10	"
8	" 8039 AHL	"	"	38	" 6502	20	10
9	" 8040 AHL	"	"	39	" 6800	"	"
10	" 8048 AH	"	"	40	" 68000 - 10	10	"
11	" 8049 AH	"	"	41	" 68200	"	"
12	" 8050 AH	"	"	42	Intel 80186	"	"
13	" 8051	"	"	43	" 80286 - 1	"	"
14	" 8052	"	"	44	Intel 8212	50	50
15	" 8278	"	"	45	" 8216/8226	"	"
16	" 8294 A	"	"	46	" 8218	"	"
17	" 8295	"	"	47	" 8219	"	"
18	" 8741 A	"	"	48	" 8224	"	"
19	" 8742	"	"	49	" 8228/8238	"	"
20	" 8748 H	"	"	50	" 8282/8283	"	"
21	" 8749 H	"	"	51	" 8284 A	"	"
22	" 8751 AH	"	"	52	" 8286	"	"
23	" 8086 - 2	10	"	53	" 8287	"	"
24	" 8096 - A4	"	"	54	" 8288	"	"
25	" 8096 - D4	"	"	55	" 8289	"	"
26	" 8396 - A4	"	"	56	" 8259 A	"	"
27	" 8396 - D4	"	"				

Annex IV/1
(continued)

Item No.	Type No.	Qty max.	Qty cut-off	Item No.	Type No.	Qty max.	Qty cut-off
57	Intel 8089	50	50	89	Intel 8274	50	
58	"	"	"	90	" 8344	"	
59	" 8257	"	"	91	" 8744	"	
60	" 82258	"	"	92	Mostek 3801 - 0	"	
61	Mostek 3883	"	"	93	" 3801 - 6	"	
62	" 3883 - 4	"	"	94	" 3884	"	
63	Intel 8253	50		95	" 3884 - 4	"	
64	" 8254	"		96	" 3884	"	
65	" 8255 A	"		97	" 3884 - 4/9/"		
66	" 8256 A	"		98	" MK - DART	20	
67	" 8279	"		99	" MK-DART-4	"	
68	Mostek 3881 - 4	"		100	" 68901	"	
69	" 3882 - 4	"		101	" 68564	"	
70	" 68230-10	"		102	Intel 82568	"	
71	Intel 8087	20		103	" 82501	"	
72	" 80287	"		104	Mostek 3891	"	
73	" 8231 A	"		105	" 68590	"	
74	" 8232	"		106	Intel 8291	50	
75	" 8089	50		107	" 8292	"	
76	" 8295	"		108	" 8293	"	
77	" 8202 A	"		109	" 8275	"	
78	" 8206	"		110	" 8276	"	
79	" 8207	"		111	" 82720	"	
80	" 8208	"		112	" 82731	"	
81	" 8271	"		113	Mostek 3807	"	
82	" 8272 A	"		114	PD 546 C - 186	"	
83	" 8155 H	"		115	Mostek 3853	20	
84	" 8185	"		116	" 3851	"	
85	" 8755 A	"					
86	" 8251 A	"					
87	" 8256 A	"					
88	" 8273	"					

Annex IV/1
(continued)

INTERFACE IC :

1	Mostek	48C 02-15
2	"	48C 02A-15
3	"	48C 02A-20
4	"	48Z 02-15
5	Intel	2816A - 25
6	"	2817 A - 25
7	"	2125 H - 1
8	"	2147 H - 1
9	"	2149 H - 2
10	Mostek	4801 A-55
11	"	4016 - 12
12	"	4116 - 2
13	"	4116 - 3
14	"	4516 - 10
15	"	4564 - 12
16	"	45H64 - 8
17	"	4556 - 12
18	Texas	4464 - 10
19	"	4257 - 10
20	Mostek	4856 - 10
21	Intel	1702 A
22	"	2708 - 35
23	"	2716
24	"	2716 - 1
25	"	2732 A - 2
26	"	2746 A - 1
27	"	27128 - 2
28	"	27128 A
29	"	27256
30	"	270256
31	"	25 p 16
32	"	P 2732 A-2
33	"	P 2764 A-2
34	"	P 27128 A-2
35	Intel	2816 A
36	"	2817 A - 2
37	Texas	18SA030
38	"	24SA10
39	"	28LA22
40	"	28SA42
41	"	28SA46
42	"	24SA41
43	"	28S86
44	"	28SA186
45	TRW	TDC 1005
46	"	TDC 1006
47	"	TDC 1080
48	Mostek	MK 4501-12
49	Texas	TMS 2150-4
50	"	TMS 4500A-12
51	"	TMS 4501A-12
52	"	SN 75491 A
53	"	SN 75493
54	Teledyne	TSC 700A
55	"	TSC 7211 A
56	"	TSC 7212 A
57	Texas	SN 75494
58	"	SN 75496 A
59	"	SN 75497
60	"	SN 75498
61	"	SN 75492 A
62	"	AC 5947
63	"	SN 75480
64	"	SN 75481
65	"	SN 75580
66	"	SN 75581 A
67	"	SN 75490
68	"	SN 75270
69	"	SN 75512
70	"	SN 75518

DIGITAL IC : 1. Selected complete series (with all type numbers of each functional group)
2. The quantity is shown for each type number.

Functional group	Texas SN 74 xx Standard TTL	Texas SN 74LS xxx Low Power TTL	Texas SN HC xxx CMOS Logic with TTL eq.	RCA CA 40 xxx (CMOS Logic)	Philips HEF 4000B Family LOCMOS Logic
Gates	200	200	100	300	100
Buffers, inverters	200	200	100	200	100
Bus drivers, tranceivers, receivers	50	50	50	50	50
Flip-Flops	100	100	100	100	100
Registers	100	100	100	200	100
Counters	300	300	200	300	200
Latches	300	300	200	300	200
Decoders, drivers	300	300	200	300	200
Multiplexers	50	50	50	50	50
Analog switches	-	-	100	200	50
Schmitt triggers	50	50	50	50	50
Multivibrators, timers	100	100	50	100	50
Oscillators	50	50	50	50	50
Memories	50	50	50	50	50
Arithmetic units	50	50	50	50	50
Special functions	50	50	50	50	50

Annex IV/1
(continued)

LINEAR IC.

1.	National	LM 323	500	31.	National	LM 324	200
2.	"	LM 345	500	32.	"	LM 709	200
3.	"	LM 325 A	500	33.	"	LM 741	200
4.	"	LM 326	500	34.	"	LM 747	200
5.	"	LM 317	500	35.	"	LM 725	300
6.	"	LM 337	500	36.	"	LM 4250	200
7.	"	LM 327	500	37.	"	LM 355	500
8.	"	LM 723	500	38.	"	LF 356	500
9.	Fairchild	MA 7805 A	500	39.	Texas	TL 061 BC	300
10.	"	MA 7806 C	500	40.	"	TL 062 BC	300
11.	"	MA 78L08 A	500	41.	"	TL 064 BC	300
12.	"	MA 7885 C	500	42.	"	TL 071 BC	300
13.	"	MA 78L10 A	500	43.	"	TL 072 BC	300
14.	"	MA 7812 A	500	44.	"	TL 074 BC	300
15.	"	MA 7815 A	500	45.	"	TL 091 C	300
16.	"	MA 7818 C	500	46.	"	TL 092 C	300
17.	"	MA 7822 C	500	47.	"	TL 094 C	300
18.	"	MA 7824 C	500	48.	Signetics	SE 5512	500
19.	"	MA 7905 C	500	49.	"	SE 5514	500
20.	"	MA 7906 C	500	50.	"	SE 5517A	300
21.	"	MA 7908 C	500	51.	"	SE 5534A	300
22.	"	MA 7912 C	500	52.	"	SE 5538	300
23.	"	MA 7915 C	500	53.	"	SE 5539	300
24.	"	MA 7918 C	500	54.	National	LM 306	
25.	"	MA 7924 C	500	55.	"	LM 319	
26.	National	LM 301	500	56.	"	LM 319	
27.	"	LM 308 A	500	57.	"	LM 339	
28.	"	LM 312	300	58.	Texas	TL 810	
29.	"	LM 318	300	59.	Signetics	SE 522	
30.	"	LM 321 A	300	60.	"	SE 529	

Annex IV/1
(continued)

Discrete Components

1. Opto elements
2. Transistors
3. Diodes (rectifiers)
4. Thyristors
5. Heating resistance
   Wire: Ø 2.8 mm 100 kg
   Ø 3.8 mm 50 kg
6. Thermocouple
   Wires:
   Pt No 24 gauge 0,51 mm diam. 200 mm
   Pt -10 $^{o}/_{o}$ Rh Bi 24 gauge 0.51 mm diam. 200 mm
   Ni-Cr wire No 8 gauge 3.25 mm diam 200 mm
   Ni-Al No 8 gauge 3.25 mm diam 200 mm

Hardware Spare Parts, Compounds and Solutions

	Quant.
1. Socket set Screws Knurded cup point	
With.cont 3/16 to 1/4	50 each
Metric M4 to M8	50 each
2. Mounted grinding wheels for finishing dies, cleaning casting polishing oil holes Group A and B Size 1/4 x 1 1/16 to 1/2 x 1/2	5 each
3. Rectangular type stones Silicon carbide abrasive, aloxide abrasive fine, medium, coarse	10 each
4. Soldering materials Ersin multi-core solder	
5. Adhesives:	
Araldite	1 Litre
Bostik - Contact	0,2 "
- Clear	0,2 "
6. Silicones RTV Flexible molding compounds RTV-662 series	5 Litre
7. Lubricants	-
8. Solutions	-

Annex IV/1
(continued)

C. Data handbook for MRC

1. Towers' International Transistor Selector.
2. " " FET Selector.
3. " " Op-Amp Selector.
4. " " Digital IC Selector.
5. " " Microprocessor, Memory, Interface Selector.

Philips purple series of data handbook.

6. Bipolar IC_s for Radio and Audio equipment (Philips data handbook)
7. " " " Video equipment
8. IC_s for digital systems in radio, audio and video equipment
9. Digital IC. (CMOS HE4000B family)
10. Digital IC. ECL1000 (GX family), ECL 10 000 (MX family), dedicated designs.
11. Professional Analogue IC.
12. Signetics bipolar memories
13. Signetics analogue circuits
14. Signetics TTL Logic
15. Signetics Integrated Fuse logic (IFL)
16. Microprocessor, microcomputers and peripheral circuitry.

Philips red series of data handbook.

17. Diode data book
18. Power diodes, thyristors, triacs
19. Small-signal transistors
20. Low-frequency power transistors and hybrid modules
21. High-voltage and switching power transistors.
22. Field-effect transistors
23. R.F. power transistors for hybrid circuits
24. Devree for optoelectronics
25. Power MOS transistors
26. Wideband transistors and wideband hybrid IC modules

Philips blue series of data handbook

Annex IV/1
(continued)

27. Tube of R.F. heating
28. Transmitting tubes for communications, glass types.
29. Klystrons, travelling-wave tubes, microwave diodes.
30. Special quality tubes, miscellaneous, devress
31. Magnetrons
32. Cathode-ray tubes
33. Gas-filled tubes
34. Picture tubes and components
35. Photo and electron multipliers
36. Camera tubes and accessories, image intensifiers
37. Microwave semiconductors and components
38. Philips green series of data handbook.
38. Assemblies for industrial use
39. Television tuners, video modulators, surface acoustic wave filters.
40. Ferrox cube potcores and cross cores
41. Ferrox cube for power, Audio/Video and accelerators
42. Electric motors and accessories
43. Piezoelectric quartz devices
44. Connectors
45. Non-linear resistors
46. Piezoelectric ceramics, permanent magnet materials
47. CMOS integrated Circuits
48. Digital integrated circuits
49. Interface integrated circuits
50. JFET transistors
51. Linear integrated circuits
52. Linear applications
53. Memory IC

54. Microprocessor manual
55. MOS IC
56. Optoelectronics Data Handbook
57. Special function analog and digital circuits
58. Transducers
59. Transistors

UNDP INPUT

Expendable	54.000 USD
Non-expendable	180.000 USD
TOTAL (A,B,C) Approx.	234.000 USD

Annex IV/2

GOVERNMENT INPUT

	A. Mechanical equipment	Price approx. (Mill VND)
1.	High-speed universal lathe and accessories - 12 FRANCE	5,0
2.	Surface grinding Machine KSUH 200 HUNGARY	1,5
3.	Shaping machine - VIETNAM	1,0
4.	Shaping machine, small size - USA	2,0
5.	Column Drilling Machine - VIETNAM	1,0
6.	Bench Drilling Machine - CHINA	0,7
	Bench Drilling Machine - VIETNAM	0,3
7.	Welding machine TRIND-WEST GERMANY	0,4
	" " - VIETNAM	0,2
8.	Electric Generator 75 KVA 70H11 - ONAN - USA	10,0
9.	Hand tools (Shears, pliers, saws, chinels, drills, reamers, thread-cutting, measuring equipment)	0,8
10.	Halogen welding equipment, Gas cylinders	0,4
11.	Air compressor USA	0,2
12.	Hack sawing machine, CHINA	1,0

Annex IV/2

B. Electronic Equipment

No	Description		
1.	Oscilloscope Dual Trace	Dumont 702	1,00
2.	Oscilloscope Heathkit	IO - 102	0,20
3.	Oscilloscope - " -	IO - 17	0,20
4.	Frequency counter	D 461	0,30
5.	Oscilloscope D 1910	D 1910	1,50
6.	RF Generator	SG-117	1,20
7.	Frequency counter	HP 5532	1,20
8.	V T V M (DDR)	URV-2	0,20
9.	Audio Generator	IG-18	0,04
10.	Capacitor checker	IT-28	0,03
11.	Harmonic distortion meter	IM-58	0,06
12.	VOM	TS 352	0,08
13.	Transistor tester	IT-18	0,08
14.	Tube Tester	3444	0,20
15.	Frequency meter (USSR)		0,15
16.	V T V M	IM-28	0,20
17.	Power supply	IP-17	0,10
18.	AC Current supply (DDR)	TST 280	0,4
19.	AC Voltage supply (DDR)	TST 175	0,4
20.	Millivoltmeter		0,03
21.	Relay Tester (DDR)	RFT-15	0,30
22.	Shunts set (DDR)		0,80
23.	AC Voltmeter (DDR)	316880	0,80
24.	Megohm-meter (DDR)	59991	0,20
25.	AC Voltmeter (DDR)	316301	0,05
26.	Battery Charger (USA)	HP - 6	0,05
27.	VOM HEW	MP - 6	0,03
28.	Wattmeter Simpson	3931	0,05

Annex IV/2
(Continued)

29.	Wattmeter DDR	-	0,10
30.	Wattmeter USSR	-	0,10
31.	Capacitance box. (USSR)	P25025	4,00
32.	- " - (DDR)	Ulrich 274	6,00
33.	Inductance box (DDR)	9207	4,00
34.	AC Regulator (USA)	4A 025	0,80

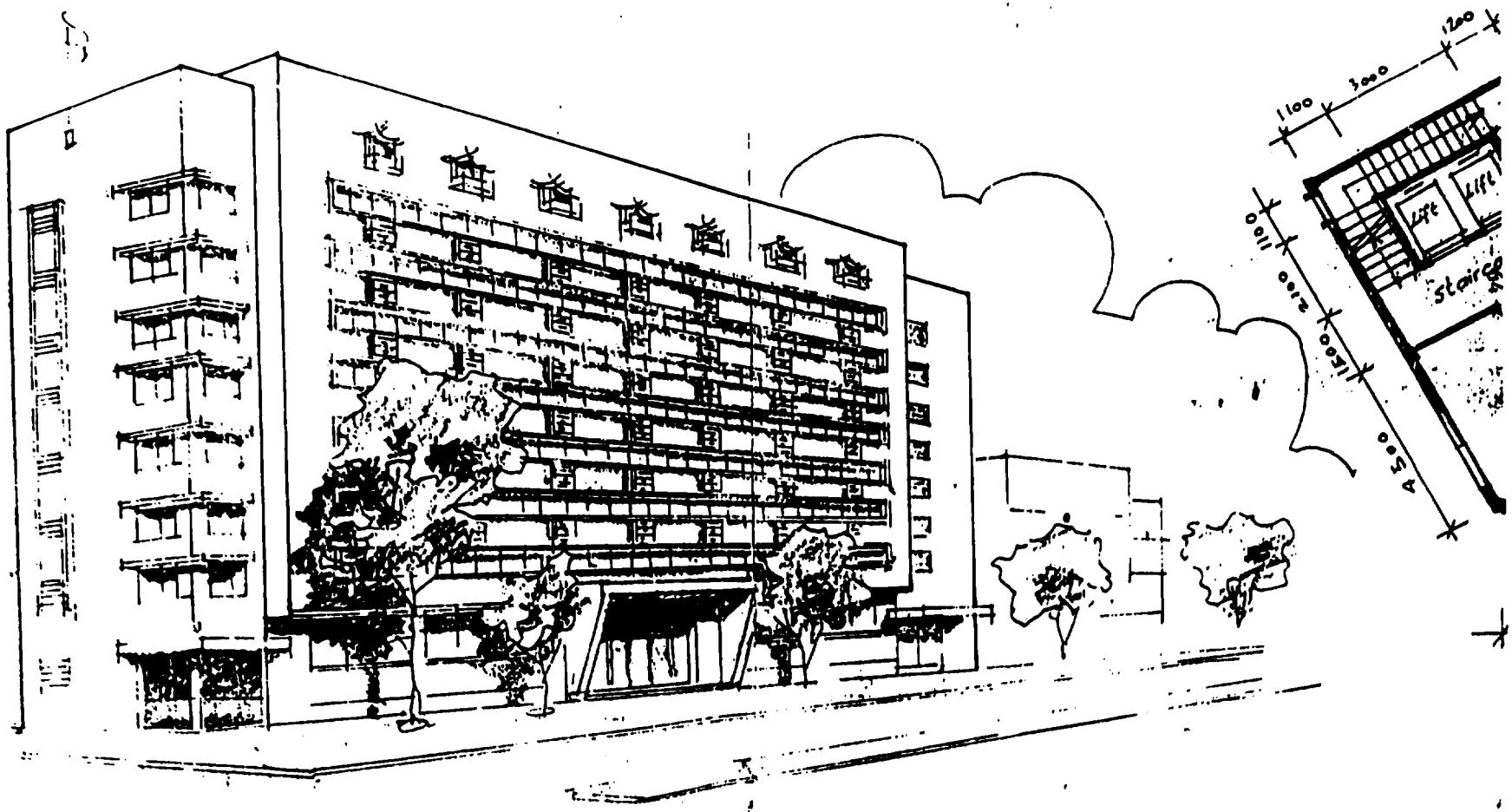
GOVERNMENT INPUT TOTAL 60 mill VND

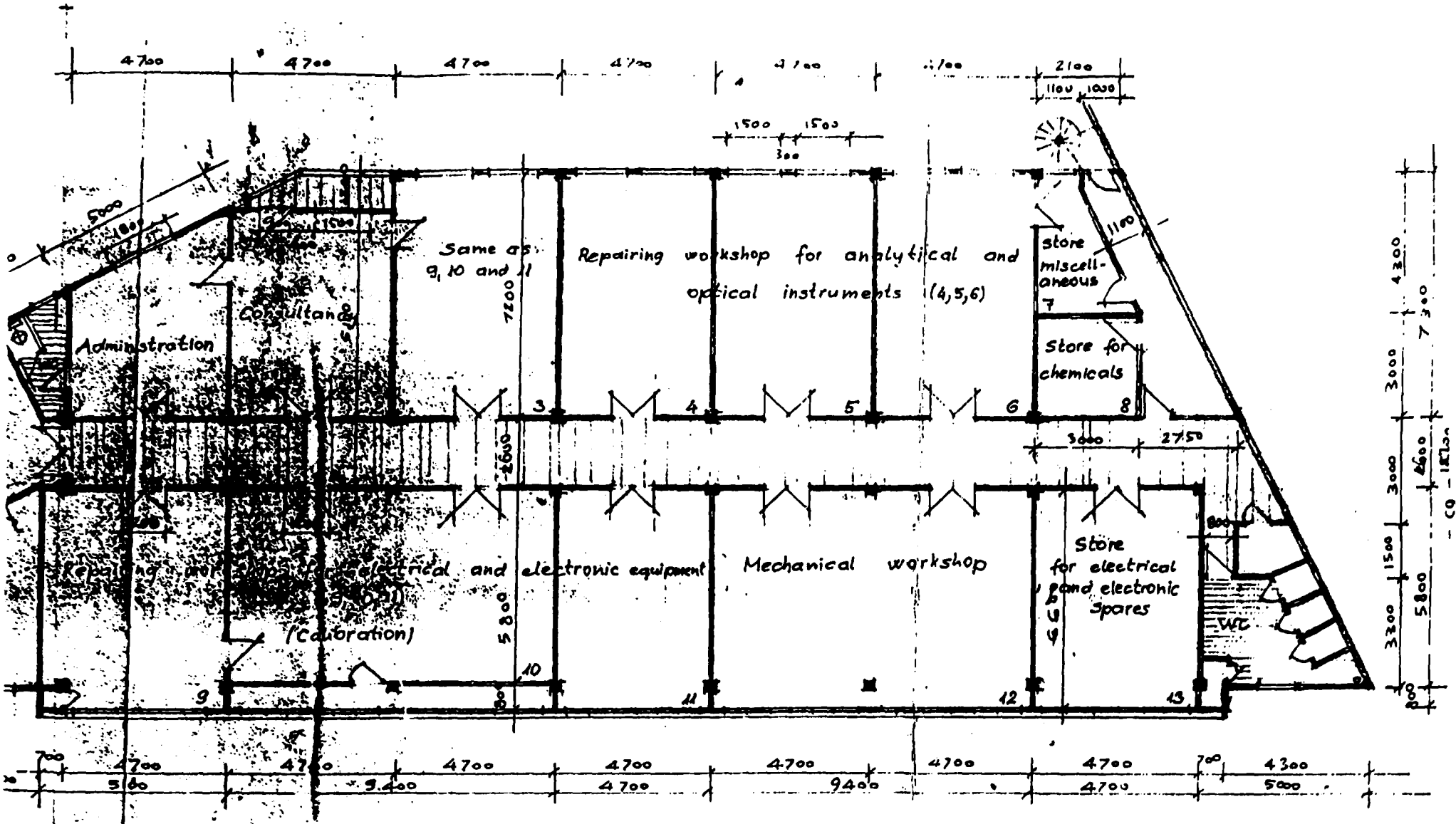
Droft layout of **MRC** Annex V

MAINTENANCE AND REPAIR CENTRE FOR TESTING AND MEASURING EQUIPMENT

DP/ VIE /85 / 009

OFFICE : 49 NGUYEN THI MINH KHAI STREET





4TH FLOOR scale 1/100

ANNEX VI.

LIST OF FURNITURE OF THE LABORATORIES, STORE AND MECHANICAL WORKSHOP

A. Furniture and fittings of the laboratories, administration area and library

Item	Denomination	Quantity
1.	Bench with lockers and shelves. Lockers should be equipped with compartments. On the front panel of the shelves there are min. 12 mains earthed receptacles supplied by 3 phases; protection against overload by phase. (fuse and automatic quick-break cut-out) On the front panel of the shelves a 3-phase receptacle (of 4 poles) should be installed with a separate fuse. Behind the front panel a step-down transformer is located with terminals of 6 V, 12 V, 24 V. These voltages can be reached through banana jack pairs. Central line voltage remover switch belongs to each bench and another one for the whole laboratory.	30

Item	Denomination	Quantity
2.	Table lamp (Goos neck type)	7
3.	Swivel chairs (állitható magasságu forgószék)	37
4.	Shelved cupboard with lock	
5.	Open shelves for instruments	
6.	Bookshelves	
7.	Closed dustbin (zárt szeméttartály fémből)	2
8.	Ladders (létra)	7
9.	Desinfecting lamp	2
10.	Bureau (desk)	[illegible]
11.	Shelves for documents	
12.	Typewriting table	1
13.	Typewriter	2
14.	Refrigerator	1
15.	Illuminated magnifier on angle-pois earm	8
16.	Argle poise lamps (karos lámpa)	30
17.	Wall-clock	1
18.	Pedestal fans (állványos ventillátor)	9
19.	Table fans	
20.	Instrument trucks	5
21.	Copying machine (for writings)	

B. Furniture and fittings of the store and its office

Item	Denomination	Quantity
1.	Cupboards with draws	
2.	Frame system for storing boxes	
3.	Fibre material stock	
4.	Panelboard stock	
5.	Trucks (trolleys)	1
6.	Bureau (desk)	1
7.	Typewriter	1
8.	Ladder	1
9.	File boxes	
10.	Cupboard for documents	
11.	Waste paper basket	
12.	Pedestal fans	1
13.	Table fans	
14.	Wall clock	1
15.	Swivel chair	2

C. Furniture and fittings of mechanical workshop

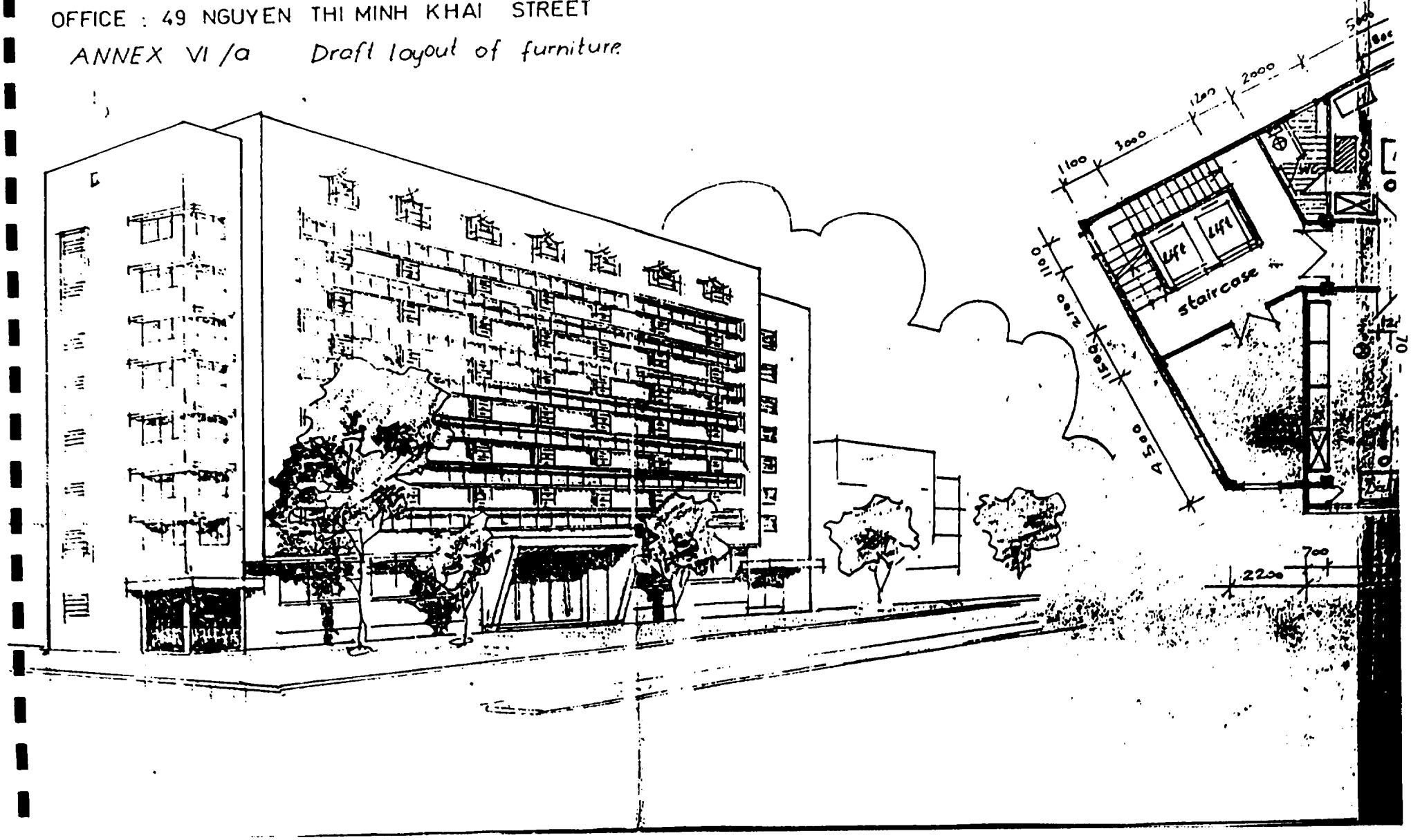
Item	Denomination	Quantity
1.	Work benches with lockers and shelves (zárható fiókos asztal)	4
2.	Bureau (desk)	1
3.	Swivel chair (állitható magasságu forgószék)	5
4.	Goos neck type lamps	1
5.	Shelved cupboard with lock	
6.	Open shelves for tools	
7.	Iron safe	1
8.	Container for litter	1
9.	Ladder	1
10.	Pedestal fans (állványos ventillátor)	1
11.	Trucks (trolleys)	1
12.	Wall clock	1
13.	Shelves for documents	

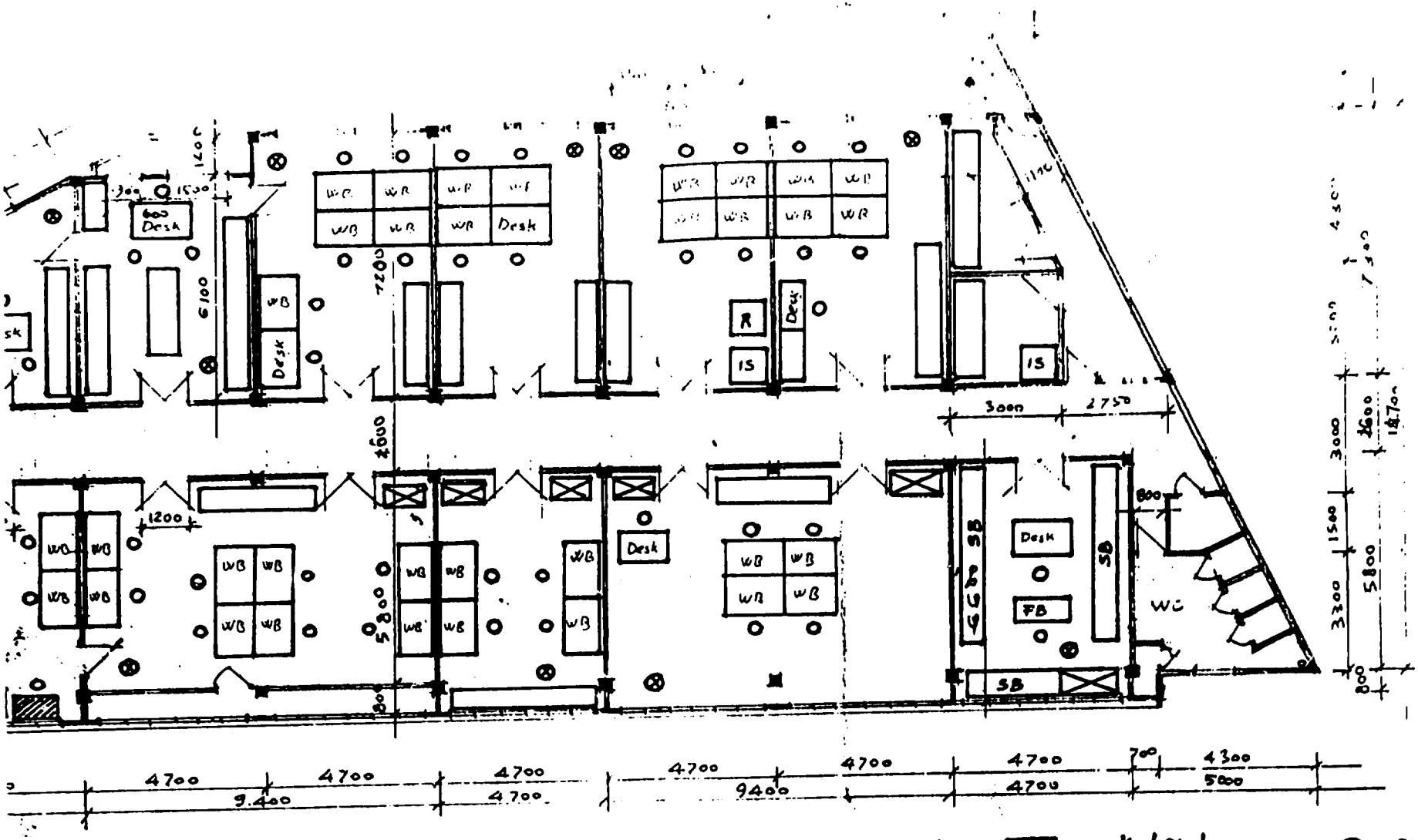
MAINTENANCE AND REPAIR CENTRE FOR TESTING AND MEASURING EQUIPMENT

DP/ VIE /85 / 009

OFFICE : 49 NGUYEN THI MINH KHAI STREET

ANNEX VI /a Draft layout of furniture





4TH FLOOR, scale 1/100

ANNEX VII

Draft organisational scheme and chart of MRC

The manager of MRC will be subordinated to the Director of GOSMQC and will direct and co-ordinate the activities of seven organisational units.

1. Repairing Workshop for Measuring Equipment:
It performs R&M and calibration on electrical and electronic instruments, partly including complex equipment.
This department includes temperature measurement and testing other mechanical quantities /pressure, volume, flaw/, as well.

2. Repairing Workshop for Analytical and Optical Instruments:
It provides for repairing and calibrating of high sophisticated analytical equipment, and optical instruments.

3. Mechanical Workshop
This section provides for mechanical repair, production of mechanical parts of instruments and balance-service facilities.

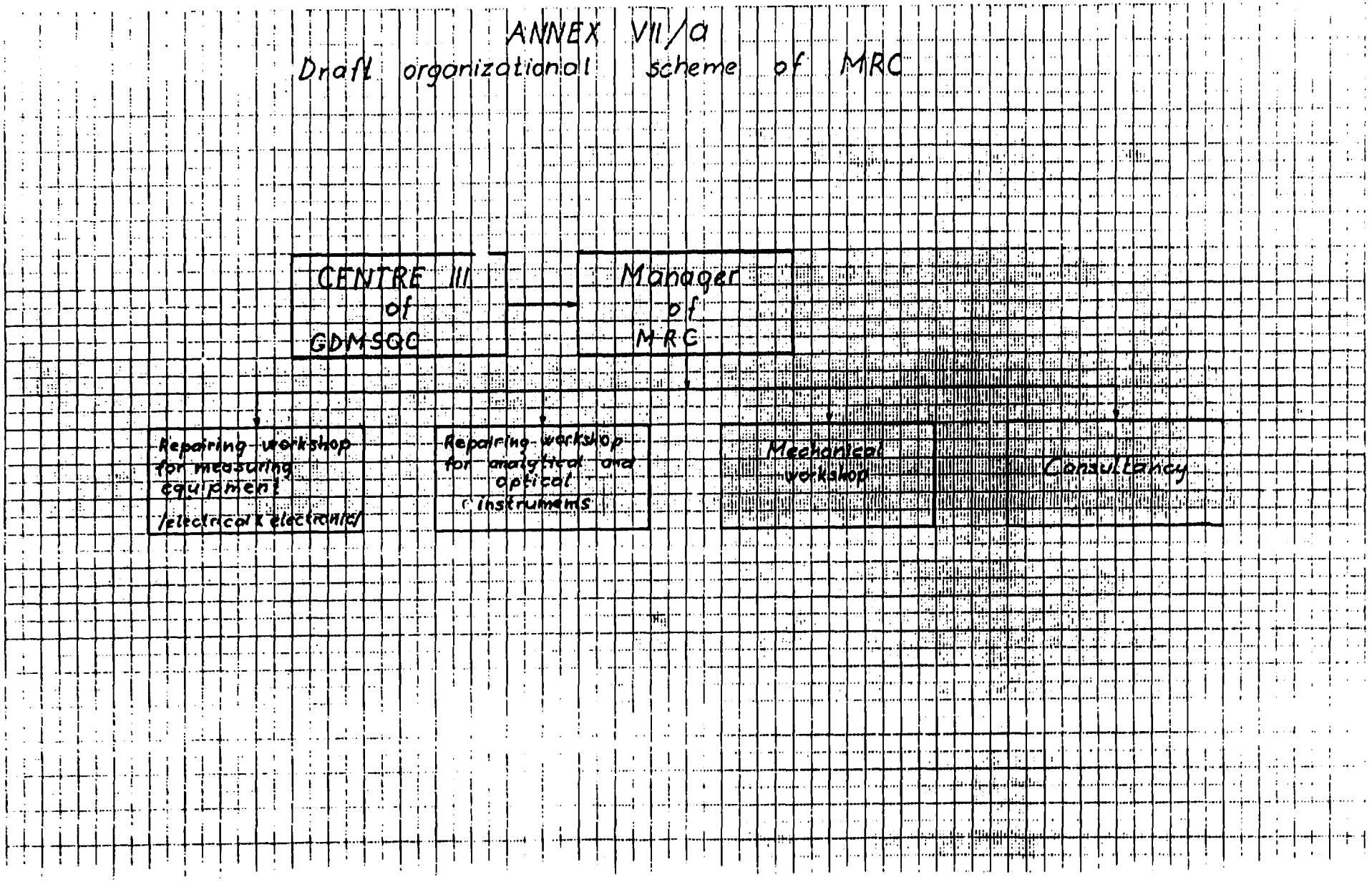
4. Consultancy
The aim of the unit is to provide trainings to the personnel of MRC, consultation possibilities for customers and advisory function, when investing new equipment.
This department arranges regular publications and periodical reports, as well.

The administrative, transportation, material supply, etc. background will be provided by Centre III.

Remark:
The draft scheme of MRC is detailed in ANNEX VII/a while the procedure of activity is drafted in ANNEX VII/b.

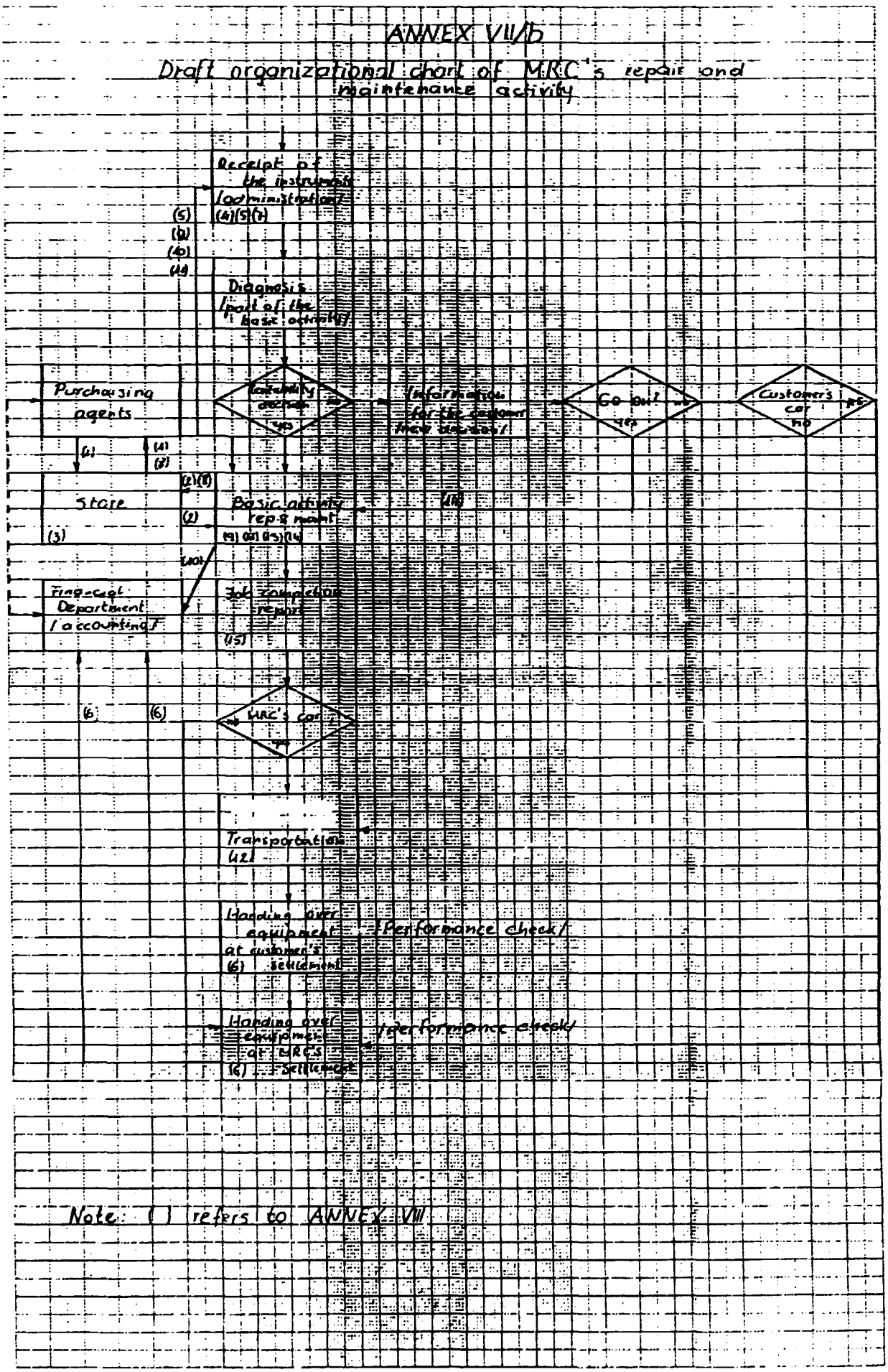
ANNEX VII/a

Draft organizational scheme of MRC



ANNEX VII/b

Draft organizational chart of MRC's repair and maintenance activity



Note: ( ) refers to ANNEX VIII

ANNEX VIII.

DRAFT MODELS OF BLANKS AND BOOKLETS FOR STORE MANAGEMENT AND REPAIR MAINTENANCE CALIBRATION RECORD KEEPING.

1. Material Receipt Sheet
2. Material Expenditure Sheet
3. Material Recording Card
4. Acknowledgment of Receipt
5. Job Register
6. Delivery Note
7. Job Ticket and Job Sheet
   (Inter-department Order)
8. Material Order Form
9. Repair and Maintenance Registration
10. Calculation form & Recalculation
11. Certificate of Calibration
12. Shipping Order
13. Contract for Maintenance and Repair
14. Overhaul Undertaking Contract

16. Instrument Registration Card
17. Datasheet A (Optional)
18. Datasheet B (Optional)
19. Instrument (Machine) Investment ORDER Form For Year... (Optional)
20. Import Material Order (Optional)
21. Import Order (Optional)
22. Reporting Sheet (Optional)
23. Reporting Sheet (Optional)
24. Filling out Instruction (Optional)
25. Certificate of Quality Reception (Optional)
26. Instrument Registration Card (Optional)
27. National Instrument Registry (Optional)

EXPLANATION

1. Models of necessary administrative blanks and booklets required for store management

For running the store a "Material Recording Card" (3) is very important. This indicates the data of consumption and stock complement resulting in a daily material balance.

The "Material Expenditure Sheet" (2) serves for taking out the necessary part from the store. When completion of the stock is necessary a "Material Order Form" (8) is to be forwarded to the purchasing agent, who buys the required parts according to (8). After having received the required part the storekeeper should indicate them on the "Material Receipt Sheet" (1) and in the "Material Recording Card" (3).

2. Models of necessary administrative blanks and booklets for repair/maintenance management

The repair/maintenance activity of MRC can be distinguished with respect to the customer:

2.1 any other enterprises, except CENTER III,
2.2 CENTER III itself and its institutes.

2.1 The customer hands over his instrument(s) to be repaired against and "Acknowledgement of Receipt" (4).

After completion of the repair, a "Job Completion Report" (15) is sent to the customer. Returning the instrument(s) to the customer is possible in two different ways:

- The customer takes it (them) by his own vehicle. A "Delivery Note/Delivery Certificate" (6) is attached to the instrument(s) and verified by the customer at MRC's settlement. The copy No. 1 with the headline "Delivery Order" is given to the customer as way-bill.

- MRC's own mobile section is used for instrument transportation on request of the customer against payment or free of charge. In this case the Service Department sends "Shipping Order" (12) to the mobile section of MRC. The "Delivery Note/Delivery Certificate" acts as way-bill in this case too, and will be verified in the same way.

In both cases, described above, the determined copy of "Delivery Certificate" gets to the Financial Department. It is possible and practical to enter into "Contract for Maintenance and Repair" (13) referring to a pre-determined instrument park, for a limited period with the possibility of prolongation.

As far as either individual repairs/maintenances or inclusive rate repairs are concerned, a rentability decision should precede the beginning of work, that is whether the repair-cost exceeds a customer-determined limit or that reasonable by MRC's opinion based on precise fault-finding process. If the customer accepts the high repair cost an"Overhaul Undertaking Contract" (14) is to be made.

2.2 The procedure can be the same as that under 2.1 Certain simplification can be done by introducing "Inter-department Order" (7), which may substitute the "Shipping Order".

As far as the transportation is concerned, both versions (see 2.1) are available. The role and form of (6) and (12) are the same as that in 2.1.

In both cases the instruments received for repair/maintenance will be registered in the "Job Register" giving job number to the said instruments. This identification number will accompany the instrument during the whole procedure of repair/maintenance, that is it will be indicated on (2), (4), (6) and (7).

On determining these job numbers distinction is to be made whether the repair/maintenance comes under guaranty conditions or not.

It is very reasonable and useful to fill in a "Repair/Maintenance Registration" (9) form when repairing instruments of CENTRE III's property. Each of the repair/maintenance events of the said instruments will be recorded on this form, from installation to sorting out, including recalibrations. In this case too, a previous rentability consideration should be made on the repair/maintenance work to be carried out. MRC should be entitled to give suggestion for sorting out equipment. After completion of repair/ maintenance "Calculation Form" (10) is sent to the Financial Department, which indicates the material consumption and working time-demand.

1. Name, sign of economic organization: .....
2. Ser.no.:
3. IN
4. Deliverer:
5. No. of delivery note:
6. Way of delivery
7. Pretender:
8. Financial voucher of purchase:
9. Order no.:
10. Seat of deliverer:
11. Sign of stock:
12. Material (consumable supply) to be taken in
13. Settling (purchasing)
14. New stock (after change)
15. Item serial no.
16. no., sign
17. denomination, size, quality
18. unit of quantity
19. quantity
20. unit price
21. value
22. Maker
23. Stock taking in
24. Stock register no.
25. Accountat
26. Supervisor
27. Quality inspector
28. Date
29. Signature

① A gazdálkodó szervezet neve, jele: _____ Sorszám: 1 929 375

(1)

③ **Be** | Szállító: ④ | ⑤ A szállítólevél száma: | A szállítás módja: ⑥

Igénylő: ⑦ | A beszerzési pénzügyi bizonylat: ⑧ | A rendelés száma: ⑨ | A szállító telephelye: ⑩ | A raktár jele: ⑪

⑫ A bevételezett anyag (fogyóeszköz)

⑯ száma, jele	⑰ megnevezése, mérete, minősége	mért. egysége ⑱	mennyisége ⑲	⑬ Elszámoló (beszerzési) egységára ⑳	értéke ㉑	⑭ Új készlet (vált. utáni készlet)	Tétel sorszám ⑮

㉒ Kiállító	Beszerzési raktár ㉓	Rakt. nyilvántartó ㉔	Könyvelő ㉕	Ellenőr ㉖	㉗ Minőségi átvevő

㉙ Aláírás

Sz. ny. 12–111/N. r. sz. - Anyag (fogyóeszköz) bevételezési bizonylat (8 tételes) - Pátria–Nyomdaip. 6266 - 115 200 - 6 01331 Pátria MSZ 3540

1. Name, sign of economical organization:
2. Ser. no.:
3. OUT
4. Denomination of costs bearing (product, task, etc.):
5. Denomination of working place (cost centre, department, pretender, etc.):
6. Sign of Stock:
7. No.:
8. No.:
9. Form of motion
10. The ordered material (consumable supply):
11. The taken out material (consumable supply):
12. no.,sign
13. denomination, size, quality
14. quantity unit
15. quantity
16. quantity
17. settling or average price
18. value
19. New stock (after change)
20. Item serial no.:
21. Maker
22. Assigned by
23. Issued by
24. Taken over by
25. Stock register no.
26. Accountant
27. Inspector
28. Date
29. Signature

① Gazdálkodó szerv neve, jele: _____ ② Sorszám: 1 [illegible]

③ Költségviselő (gyártmány, feladat, munka stb.) neve: Ki ④ száma: ⑦

Munkahely (költségh., osztály, igénylő stb.) neve: ⑤ száma: ⑧

Raktár jele: ⑥ Mozgásnem: ⑨

⑫ száma, jele	Az igényelt anyag: ⑬ megnevezése, mérete, minősége	mennyiségi egys. ⑭	mennyisége ⑮	A kiadott anyag: mennyisége ⑯	elszámoló v. átlagára ⑰	értéke ⑱	Új készlet ⑲	Hivatkozási szám ⑳
㉑	㉒	㉓	㉔	㉕		㉖	㉗	

	Kiállította	Utalványozta	Kiadta	Átvette	Rakt. nyilvántartás	Könyvelte	Ellenőrizte
Dátum	㉘						
Aláírás	㉙						

B. Sz. ny. 12—114/N. r. sz. - PÉNZ—Nyomdl. [illegible]

1. Register no.:
2. Chief account-book no.:
3. Page no.:
4. Denomination:
5. Size:
6. Quality:
7. Placing in stock:
8. Industrial Product Register no.:
9. Highest/Lowest stock
10. Quantity unit:
11. Unit (settling) price:
12. Sign of stock:
13. Voucher no.
14. Form of motion
15. From/to where
16. Receipt
17. Issue
18. Stock
19. Item no.
20. Date
21. Brought-over
22. Carry-over

III.

Nyilvántartási szám: 1428	Főkönyvi számlaszám: 47-6-10		Oldalszám: 1.
Megnevezés: Oldott oxigén elektróda gym: Horiba (U-7-hez)	Méret:	Minőség:	Raktári elhelyezés: MKFO
ITJ szám:	Legnagyobb/Legkisebb készlet	Mennyiségi egys.: db	Egység (elszámoló ár):	Raktár jele:

Kelt	Bizonylat-szám	Mozgás nem	Hivatkozás/Ellenérték/Ciklus	Bevétel		Kiadás		Készlet		Telelszám
			Áthozat:							
I.3.	23		AKADIMPEX		9				9	
IV.1.	249		7450101				1		8	
			Átvitel:							

B.S ny. 12–151. r. sz. · Anyag-, áru-, fogyóeszköz raktári fejlapja · Pátria–Nyomell. 1167
3 18 090 4 08. 18 Pátria Ny. (Fsz.: 3767) MSZ 16 146-74

1. Acknowledgment of receipt about instrument received for repair
2. Name of sender institution:
   Address of:
3. After repair to inform:
4. Name :
5. Phone:
6. Data of instrument:
7. Denomination:
8. Register no.:
9. Product:
10. Product no.:
11. Value:
12. Accessories:
13. ..../..../19...
14. Stock-keeper taking over

(1) Átvételi elismervény

javításra átvett műszerről

Beküldő intézmény neve: (2) címe:	Műszer adatai: (6)
	Megnevezése: (7)
	Nyt. sz.: (8)
	Gym.: (9)
Javítás elkészülte után értesítendő: (3)	Gysz.: (10)
név: (4)	Értéke: (11)
telefonszám: (5)	

Tartozékok: (12)

(13) Budapest, 19 _____ hó_____-n.

(14) (átvevő raktáros)

MTA KFSZ Sokszorosító

JOB REGISTER (5)

(Draft)

Item	Job number	Customer (address, phone, fax)	Instrument name (type, serial no., irradiator)	Claim	Date of receipt	Date of completion	Report by (engineer)	Other comments
1.								
2.								
3.								

1. DELIVERY NOTE
2. Deliverer (name, postal code, telex no., post office box, no. and denominaton of bank account):
3. Buyer (name, postal code, address, denomination and no. of bank account):
4. Delivered from works (stock).....
5. Serial no.:
6. Number, date, person in charge of order:
7. Denomination of addressee (name, postal code):
8. Route number:
9. Serial no.:
10. Article no., Industrial Product Register no.
    Standard denomination, code, quality, and other characteristic sign of goods
11. Quantity unit
12. Quantity
13. Unit price
14. Value
15. Date
16. Signature
17. Taking over notifications:
18. Acknowledgment of taking over (Stamp)

① SZÁLLÍTÓLEVÉL 3 124 309

A szállító (név, irányítószám, cím, telex, postafiók, bankszámla száma és megnevezése): ②	A vevő (név, irányítószám, cím, bankszámla száma és megnevezése): ③
④ Szállítva _____ telepről (raktárból)	⑤ Sorszám:
Megrendelés száma, kelte, ügyintézője: ⑥	Az átvevő megnevezése (név, irányítószám): ⑦
Járatszám: ⑧	

⑨ Sorszám	⑩ Cikkszám, ITJ szám, Az áru szabványos megnevezése, kódja, minősége és egyéb ismertetőjelei	⑪ Mennyiségi egység	⑫ Mennyiség	⑬ Egységár	⑭ Érték
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					

Kiállító: kelet ⑮	aláírása ⑯	Átvételi feljegyzések: ⑰
		Átvételi elismerése (bélyeg) ⑱

4 B. Sz. ny. 13—000/N. r. sz. - Pátria–Nyomdi. 10 970 - 20 140 - 4 04907 Pátria Ny. (sm 2765)
Szállítólevél egy mennyiség, egy egységár és egy érték oszloppal MSZ 16 292

1. JOB TICKET AND JOB SHEET
2. ...../...../19....
3. Serial no.:
4. Please to carry out the following job for dept:
5. Brief description of work:
6. Expectable cost : material
   : man hour
7. Work no.:
8. Expectable end date of job
   .../.../19...
9. Job is done by:
10. Carring out of job is permitted by
    .../.../19...
11. leader of techn.dept.
12. Date
13. Leader of dept.
14. Date
15. Job done by
16. Time
17. Material consumed
18. sort
19. quantity
20. Completion and taking over of the job is verified by
    .../.../19..
    ----
    foreman
21. Taking over of job is verified by
    .../.../19..
    ----
    leader of dept.
22. Cost of job should be charged to burden of.....
    .../.../19..
    ----
    leader for economy
23. Hour minute

(1) MUNKAUTALVÁNY ÉS MUNKALAP

(2) Budapest, 19 _____ hó _____ n.

(3) Sorszám: 0198

(4) Kérem _____ osztály részére a következő munka elvégzését:

(5) A munka rövid leírása: _____

(6) Várható költség: anyag _____ Ft

munkabér _____ Ft

(7) Munkaszám:

(8) A munka befejezésének várható ideje:

19 _____ hó _____ nap

(9) A munka elvégzésével megbízva: _____

(10) A munka elvégzését engedélyezem:

19 _____ hó _____ nap

(11) műsz. ell. v. vezető

(12) 19 _____ hó _____ nap. _____

(13) osztályvezető

(14) Kelet	(15) A munkát végzők neve	(16) Idő óra	Idő perc	(17) A felhasznált anyag (18) neme	(19) mennyisége

(20) A munka elvégzését és átadását igazolom.

19 _____ hó _____ n.

_____

művezető

(21) A munka kifogástalan átvételét igazolom.

19 _____ hó _____ n.

_____

osztályvezető

(22) A munka költs. elszámolandó _____ terhére

19 _____ hó _____ n.

_____

gazdasági vezető

MIA KISZ Sokszorosító

BA—0601

1. Company
2. Material order-form
3. Date of filling out: .../.../19..
4. Received by purchasing dept.
5. Requiring dept., workshop
6. Remark
7. Production (labour) number:
8. Product (labour)
9. Denomination
10. Drawing number:
11. Sample number:
12. Required delivery time-limit: .../.../19..
13. The required material's
14. Note of
15. Item number
16. Drawing and drawing or industrial product register number
17. number
18. quantity
19. unit
20. standard denomination and quality
21. size
22. material registry
23. purchasing dept.
24.
25. Enclosed:
26. Supervised, permitted by
27. material management
28. Seen by
29. overhead supervisor
30. material registry
31. purchasing dept.
32. signature of orderer

C № 001350

VáHalat: (1)

Igénylő (osztály, üzemrész): (4)

(2) Anyagszükségleti jegyzék
(27 tételes)

Kiállítás kelte: 19 (3)

Anyagbesz. beérk.: 19 (4)

Megjegyzés: (5)

Gyártás (munka) szám: (7)	Gyártmány (munka)	megnevezése: (9)	rajzszáma: (10)	Mintaszám: (11)	Kívánt szállítási 19 (12)
	(8)				

Tétsz. (15)	Rajz és Rajz vagy ITJ (16)	(13) A szükséges anyag: száma (17)	mennyisége (18)	egy- (19)	szabványos megnevezése és minősége (20)	mérete (21)	Anyag: nyilvántart. (22)	beszerzés feljegyzése (24)

(25) Mellékletek:

Ellenőrizte, engedélyezte (26)

(28) LÁTTÁK

(27) anyaggazd.	(29) részlegv.	(30) anyagigyi.	(31) anyagbesz.

(32) igénylő aláírása

Repair and Maintenance Registration

Recommended form of the "Repar/Maintenance Registration " sheet.

<table>
<tr><td colspan="2">Instrument name:

Manufacturer:</td><td colspan="2">Owner: (address,phon number, tx number)

Supplier:
(Dontract number)</td><td>Inventory code number:</td></tr>
<tr><td>Type number:</td><td>Senal number:</td><td colspan="2">Date of delivery:</td><td></td></tr>
<tr><td colspan="2">Space for the job number and fault symptom.</td><td colspan="3">Space for description of the repair and maintenance process and other comments.</td></tr>
</table>

I.

CALCULATION FORM

Labour number:

1. Name of customer:

Address of customer:

2. Subject of order:

3. Date of order: 4. Number of order:

5. Undertaking sum: 6. End time of delivery:

Calculating items

7. Direct material costs

8. Costs of comission work

9. Turnover tax

10. Central material managing costs,....%

11. Total of materiallike costs (7-10)

12. Direct wages

13. Tax on the wage fund ....% of wages

14. Commission wages (other personal costs)

15. Charge for instrument use, ...Ft/hour

16. Other direct costs

17. Musical fees

18. Delivery of collaborator works

19. Sum of direct costs

20. Dept. overhead costs

21. Operating costs without materials

22. Central management expense

23. Prime cost without material

24. Cover: .....%
Profit .....%

25. Calculated net price without material costs (23+24)

26. Total calculated net price (25+11)

27. Services of fixed prices

28. Import fee Ft.....%

29. Gross value of delivery

Date: .../.../19..

Invoices

I/2

33. No.
34. Date
35. Amount
36. Maintenance related to period:
37. Proportional undertaking sum:
38. Direct material costs:
39. Turnover tax:
40. Sum total:

II.

1. RECALCULATION
2. Labournumber:
3. Date
4. Man hour
5. Material
6. Comission work
7. Turnover tax
8. Central managing costs
9. Wages
10. Public dues
11. Commission wages
12. Charge for instrument use
13. Musical fees
14. Other direct costs
15. Delivery of collaborator works costs
16. Total
17. TotalL
18. Turnover tax
19. Code number:
20. Rate of tax
21. Value of material:
22. Basis of assessment
23. Tax

MTA Műszerügyi és Méréstechnikai Szolgálata

Fő- (önálló) osztály

Munkaszám: (2)

(1) KALKULÁCIÓS LAP

(3)	1.	Megrendelő neve: ____ címe:				
(4)	2.	Megrendelés tárgya:				
(5)	3.	Megrendelés kelte:	4. Megrendelés száma:			
(6)	5.	Vállalási összeg:	6. Szolgáltatás bef. időpontja:			
(7)		Kalkulációs tételek				
(8)	7.	Közvetlen anyagköltség				
(9)	8.	Bérmunka költség				
(10)	9.	Forgalmi adó				
(11)	10.	Közp. anyagigazg. ktg. %-a				
(12)	11.	Anyagjellegű klts. összesen (7-10)				
(13)	12.	Közvetlen munkabér ... óra. á: ..... Ft				
(14)	13.	Munkabérek közterhei. a bér ... %-a				
(15)	14.	Megbízási díj (egyéb személyi klts.)				
(16)	15.	Műszerhasználati díj ..... Ft/ó.				
(17)	16.	Egyéb közvetlen klts.				
(18)	17.	Zenei jogdíj				
(19)	18.	Társüzemi szolgáltatás				
(20)	19.	Közvetlen klts. összesen				
(21)	20.	Főosztályi ált. klts.				
(22)	21.	Anyagmentes szűkített önköltség				
(23)	22.	Központi igazgatási költség				
(24)	23.	Anyagmentes önköltség				
(25)	24.	Fedezet: ..... % Nyereség ..... %				
(26)	25.	Anyagmentes kalk. nettó ár (23 + 24)				
(27)	26.	Teljes kalkulált nettó ár (25 + 11)				
(28)	27.	Fix áras szolgáltatások: ____				
(29)	28.	Import illeték ..... Ft ..... %				
(30)	29.	A szolgáltatás bruttó értéke				

(31) Budapest, 19.....

(32) Számlák

Száma (33)	Kelte (34)	Összege (35)

....

....

(36) A karbantartás mely időszakra vonatkozik: ____ ____ ____ ____

(37) Az arányos váll. összeg: ____ ____ ____

(38) Közvetlen anyagköltség: ____ ____ ____ ____

(39) Forgalmi adó: ____ ____ ____ ____

(40) Összesen: ____ ____ ____ ____

....

....

① UTÓKALKULÁCIÓ ② Munkaszám:

Kelt ③	Munka óra ④	Anyag ⑤	Bér-munka ⑥	Forg. adó ⑦	Közp. anyagig. kts. ⑧	Munka-bér ⑨	Köz-teher ⑩	Megbí-zási díj ⑪	Műszer-haszn. ⑫	Zenei jogdíj ⑬	Egyéb közv. ⑭	Társ-üzemi szolg. ⑮	Összesen ⑯
⑰ Össz.:													

⑱ Forgalmi adó	⑲ Kódszám:	⑳ Adókulcs %	㉑ Anyagérték:	㉒ Adóalap	㉓ Adó

MTA Számítóközp.

(11)

CERTIFICATE OF CALIBRATION
(Draft)

Owner:

Job number: Date:

A. Equipment to be calibrated

Name:

Type:

Serial No.:

Accuracy rate:

Manufacturer:

B. Calibrating equipment

1. Name :

Accuracy rate:

Date of verification:

2.

3.

4.

5.

The calibration has been carried out at ...^{o}C ambient temperature and ...% relative humidity.
We certificate the equipment meets/does not meet the requirements of factory specification.

Detailed protocol:

STAMP

.....
technician

.....
head of section

1. SHIPPING ORDER-FORM
2. Register no.:
3. Denomination:
4. Name and address of recipient:
5. Person in charge :
6. Shipping address:
7. Requested date of shipping:
8. Period of hiring:
9. Hiring price:
10. Remark:
11. Date : .../.../19..
12. Filled out by .....

(1) Szállítási igénylőlap	Nr. 002951

Nyilvántartási szám: (2)	Megnevezés: (3)

Címzett neve és címe:
(4)

Ügyintéző neve:
(5)

Szállítási cím:
(6)

Szállítás kért időpontja: (7)	Kölcsönzés időtartama: (8)	Kölcsönzési díj: (9)

Megjegyzés: (10)

Budapest, 19 (11) .....

(12) Kiállította: .....

KK. – 3523 76 : 1065 SZSZ fénymás

2. SZÁLLÍTÁS PÉLDÁNYA

Executing department:

Labour number:

CONTRACT FOR MAINTENANCE AND REPAIR

On the one part of

(hereinafter called Customer)

on the other part of

(hereinafter called Contractor)

enter into a contract for fulfilment of the following services:

1. The Contractor is charged by the Customer with doing maintenance, repairing work - incidentally expert advice activity - with regard to equipment of type and product number specified below:

2. The Contractor undertakes the fulfilment of services of subject and specification defined in preceding point under the following conditions

2.1 Periodical maintenance and repairing work on site will be performed maximum on..... occasion pro year. The Customer can demand repair instead of periodical maintenance. But the repairing job performed within the frame of this contract cannot exceed the man-hour expenditure needed to maintenance job. The contract is not applicable for major repairing job or job of overhaul character.

2.2 The representative of Contractor presents himself by designate representative of Customer before begimning of the job, as well as, at finishing of that to discuss the technical and handling problems related to equipment.

2.3 According to wish of Customer the representative of Contractor gives professional advice to the designate person in connection with handling of equipment.

2.4 The Contractor divides the time of periodical jobs on site in equal proportions in the year and about this gives preliminary announcement required by Customer.

2.5 The right of fulfilment in advance or partly is reserved by the Contractor.

3. This contract, as undertaking defined in point 1 for fulfilment of services, is valid

from .../.../19..
to 31/ 12/19..

The contract becomes automatically longer for every calendar year, if no other arrangement is made by the parties with three monthes before the end of the year in registered letter.

4. It is fixed by the contractual parties that the cuntervalue of the services is flat rate bel nging to form of uncontrolled prices.

   The contractual parties define the undertaking fee in amount of

   Ft, that is Ft

   the Customer is bound to remit this amount to bank account no. of Contractor on basis of bill presented by the Contractor within 8 days following the presentation of bill.

   4.1 The Contractor dharges separated the value of materials (material + commission work + turnover tax) consumed for maintenance or repair of equipment.

   4.2 The Contractor has authority to present partial bill in case of part performance.

5. The Costumer is bound to make available - as intermediate cooperating services - the technical conditions (equipment, testing data of device, technical documents) for the Contractor to fulfill the services defined in point 1 of this contract and the workplace without hitch, as well as such data, the necessity of which cannot arise at conclusion of the contract, but the knowledge of those are necessary to obtaining of the undertaken result.

6. It is laid down by contractual parties if the Customer does not meet it cooperating engagements fixed in previous point, or meets those tardily or only in part respectively, so this can be accompanied with the unilateral modification of time appointed for fulfilment (partial fulfilment) or with termination of contract respectively.

7. Expenses arising by carrying out of services (workplace without hitch, providing a room, the operating of equipment, materials, other devices, etc.) charge the Customer.

8. The Contractor is responsible for damaging or destruction of devices taking over in favour of fulfilment of services only in that cases, if the damage is attributable to him.

9. The completion of services should be verified by signature and stamp of competent person authorized by the Customer.

10. The exclusive jurisdiction of Court ..... is bound by contractual parties to be a judge of litigation originated from present contract.

11. Authorized persons are - in connection of contract - to do administration, to make a statement or to verify:

On behalf or Customer:

Name :

Address:

Phone:

On behalf of Contractor:

Name:

Address:

Phone:

12. Regulations of .....
.....
are guiding principle in questions not regulated in present contract

This contract comes into force subsequently the signature of Customer and after having to send back 2 copies of contract for the Contractor.

The contract has made in 3 copies.

..../.../19..

Customer Contractor

Executing department:

Labour number:

OVERHAUL UNDERTAKING CONTRACT

On the one part of

(hereinafter called Customer)

on the other part of

(hereinafter called Contractor)

have entered into a contract, as follows:

1. In accordance with order of number .....dated on .../.../19.. of the Customer the Contractor undertakes the carrying out the overhaul jobs of device(s) of type and product number specified below:

The value of materials used for overhaul work will be accounted over this amount.

The Customer is bound to remit the amount of invoice made out on basis of fulfilment verified by the Customer to bank account no. of Contractor within 8 days subsequently rendering of accounts.

8. Regulations of ..... are guiding principle in questions not regulated in present contract.

9. The Contractor changes separated the value of materials (material + commission work + turnover tax) consumed for overhaul.

This contract comes into force subsequently the signature of Customer and after having to send back 2 copies of contract for the Contractor.

The contract has made in 3 copies.

..../..../19.....

Customer Contractor

1. No. and date of receipt note:
2. Denomination:
3. Accessories:
4. Product:
5. Product no.:
6. Register no.:
7. Value:
8. Quarterly hiring charge:
9. Serial no.
10. Ref. no. of hiring
11. Borrowing institution
12. Delivered
13. Time fixed
14. Prolongation
15. Ref.no. of Prolongation
16. Ref.no. of Prolongation
17. Ref.no. of Prolongation
18. Ref.no. of Prolongation
19. Ref.no. of Prolongation
20. Returned

Bev. jegy száma és dátuma:	② Megnevezés: ③ Tartozékok:	Nyilvántartási szám: ⑦
Törzskönyv sorszáma:		Értéke: ⑧
Gyártmány:		Negyedévi kölcs. díj: ⑨
Gyártási szám:		

Sor-sz.	⑩ K-szám	⑪ Kölcsönvevő intézmény	⑫ Kimenő	⑬ Határidő	⑭ Hosszabbítás	⑮ H. szám	⑯ Hosszabbítás	⑰ H szám	⑱ Hosszabbítás	⑲ H szám	⑳ Visszaérkezett

1. Accessories continued:
2. Date and number of letter
3. Ordering institution
4. Address of institution
5. Name of manager
6. Date
7. No. of hiring
8. Remark

Tartozékok folytatása: ①

② Levél kelte és száma	③ Igénylő intézmény	④ Intézmény címe	⑤ Igénylő neve	⑥ Dátum	⑦ K-szám	⑧ Megjegyz

A.

0. INSTRUMENTS AND MEASURING TECHNIQUE SERVICE
   OF THE HUNGARIAN ACADEMY OF SCIENCES
1. The data collection was ordered by General Secretary of
   Hungarian Academy of Sciences under no. 21 002/1976.
2. NOTIFICATION
   about inland putting into circulation of instruments, auxiliary
   equipment and accessories of high value
   Year....., Quarter.....
3. DATA SUPPLIERS: Home and foreign trade companies dealing with
   inland putting into circulation of instruments, auxiliary
   equipment and accessories of high value, as well as, other
   state enterprises and co-ops having authority to keep on such
   activities.
4. INSTRUMENTS TO BE REPORTED are all those the unit price of
   which exceeds the value of USD 2.000.-and their putting into
   circulation has taken place in the period of inquiry.
5. REPORTING SHEET NO.1.
6. DATA SUPPLIER'S
7. denomination
8. address
9. supervisory authority
10. code number
11. Mode of forwarding of notification
12. Number of copies
13. Address of data collector
14. Term of receipt
15. REPORTING SHEET NO.1.
16. 1 copy
17. REPORTING SHEET NO.2.
18. 1 copy per sheet
19. INSTRUMENTS AND MEASURING TECHNIQUE SERVICE OF THE HUNGARIAN ACADEMY
    OF SCIENCES
20. 15th of month following period of inquiry
21. ...pc(s) Reporting Sheet No.2 belong(s) to report
22. The data supplying is obligatory. Reporting of incorrect data,
    refusal of data supplying and delayed data supplying is punishable
    or there is committed a summary offence respedtively.

23. Date: .../.../19..
24. Please to leave bkank
25. L.S.
26. Leader of data supplying institution, phone number
27. name of responsible for filling in, phone number

(A)

(0) MAGYAR TUDOMÁNYOS AKADÉMIA MŰSZERÜGYI ÉS MÉRÉSTECHNIKAI SZOLGÁLATA

(1) Az adatgyűjtést a Magyar Tudományos Akadémia főtitkára 21 002/1976. sz. alatt rendelte el

(2) **BEJELENTÉS**

a nagyértékű műszerek, segédberendezések és tartozékok belföldi forgalmazásáról

19..... év ..... negyedév

(B) (3) **I. SZ. JELENTŐLAP**

(3) **ADATSZOLGÁLTATÓK:** a nagyértékű műszerek, segédberendezések és tartozékok hazai forgalmazásával foglalkozó külső- és belkereskedelmi vállalatok, valamint ilyen tevékenység folytatására jogosult egyéb állami vállalatok és szövetkezetek.

(4) **JELENTÉSI KÖTELEZETTSÉG ALÁ ESŐ MŰSZEREK** mindazok, amelyeknek egységára meghaladja a 100 000,— Ft-ot, és a tárgyidőszakban történt a forgalmazásuk.

(5) AZ ADATSZOLGÁLTATÓ		
(7) 1.	megnevezése	
(8) 2.	címe	
(9) 3.	felügyeleti szerve	
(10) 4.	számjele	

(11) A bejelentés továbbításának módja		
Példányszám (12)	(15) I. sz. JELENTŐLAP	(16) 1 pld
	(17) II. sz. JELENTŐLAP	(18) laponként 1 pld
Az adatgyűjtő címe (13)	(19) MTA Műszerügyi és Mérástechnikai Szolgálata	
Beérkezési határidő (14)	(20) A tárgynegyedévet követő hó 15.	

(21) A beszámoló ☐ db II. számú jelentőlapot tartalmaz

(22) Az adatszolgáltatás kötelező. Valótlan adatok közlése, az adatszolgáltatás megtagadása és a késedelmes adatszolgáltatás büntetendő, illetve szabálysértési rendelkezésekbe ütközik.

(23) Kelt: 19 .....év..... hó.....nap

(24) kérjük üresen hagyni ☐☐☐

(26) ..... az adatszolgáltató intézmény vezetője, telefonszáma

(25) PH

(27) ..... a kitöltésért felelős neve telefonszáma

A-1

1. Reporting sheet no.2./.....sheet
2. Please to fill out with typewriter or printed letter
3. Period of inquiry
   Year....., Quarter:
4. Data supplier's
   code number:
5. Only data for instrument above unit price of Ft 100.000.-
   should be reported!
6. Data of INSTRUMENT
7. Denomination
8. Type number
9. Factory
10. Country of origin
11. Data of buyer
12. Name
13. Address
14.
15. Date of sale .../.../19..
16. Quantity saled pc(s)
17. Unit price Thousand Ft/pc
18. Account no.
19. Please to leave blank
20. Signature of filling in person

A-1

(1) II. sz. jelentőlap/..... lap

(2) Kérjük írógéppel, vagy nyomtatott betűkkel kitölteni!

(3) Tárgyidőszak:
19.....év.....negyedév

(4) Az adatszolgáltató
számjele: [ ]

(5) Kizárólag
100 000,— Ft
egységárat meghaladó műszer forgalmazása jelentendő!

(6) A MŰSZER adatai

1.	Neve (7)	
2.	Típusszáma (8)	
3.	Gyártó cég (9)	
4.	Származási ország (10)	

(11) A VEVŐ adatai

5.	Neve (12)	
6.	Címe (13)	

(14) A FORGALMAZÁS adatai

7.	Az értékesítés dátuma (15)	19.....hó.....nap
8.	Értékesített mennyiség (16)	[ ] db
9.	A műszer egységára (17)	[ ] ezer Ft/db
10.	Számlaszám (18)	[ ]

Kérjük üresen hagyni (19)

[ ]
[1 . . . 0,1]
[. .]
[. .]
[. .]
[. .]

(20) ..... A kitöltő aláírása

1. INSTRUMENT (MACHINE) INVESTMENT ORDER-FORM FOR YEAR .....
2. Ordering branch:
3. Type of investment:
4. Keeping on level:
5. developing:
6. Denomination of instrument and its accessories
7. piece
8. Type
9. Price in original currency
10. Number of erclosures:
11. Total:
12. Name of manufacturing (delivering) firm:
13. Unit price in Ft:
14. Service is provided by local representation
15. is made by own experts of consumer
16. is made by other way, namely:
17. Planned utilization of ordered instrument (machine):
18. Filling out of declaration for exemption from duty:
19. is necessary
20. is not necessary
21. Remarks, special clauses by order:
22. Order is originated by

.../.../19..

23. By Instrument Board of ISC the planned investment
24. is suggested for granting
25. is not suggested for granting
26. other comments
27. .../.../19..
28. Financial cover guaranteed by

.....
Deputy director for economy

29. Investment permitted by

(1) **MŰSZER (GÉP) BERUHÁZÁSI IGÉNYLŐLAP ..... ÉVRE**

Az igénylő szervezeti egység: (2)

A beruházás jellege: (3) ☐ **szintentartó** (4) ☐ **fejlesztő** (5)

(6) A műszer (gép) és tartozékainak* megnevezése	(7) db	(8) Típusjele	(9) Ára eredeti valutában
A csatolt mellékletek száma: (10)		☒	**Össz.:** (11)
A gyártó (szállító) cég neve: (12)		**Egységára Ft-ban:** (13)	

☐ ***A szervizt*** **a gyártó cég hazai képviselete látja el** (14) ☐ **a felhasználó saját szakemberei végzik** (15) ☐ **egyéb módon végzik, éspedig:** (16)

Az igényelt műszer (gép) tervezett felhasználása: (17)

(18) **Vámmentességi nyilatkozat kitöltése:** ☐ **szükséges** (19) ☐ **nem szükséges** (20)

Megjegyzések, különleges kikötések a megrendelésnél: (21)

Az igénylést indította: (22) .. / .. / 19 ..

19 ....

A Szolgálat Műszerbizottsága a tervezett beruházást jóváhagyásra (23)

☐ **javasolja** (24) ☐ **nem javasolja** (25) ☐ **egyéb észrevétel** (26)

(27) 19 ....

A pénzügyi fedezet biztosított. (28)

.....

gazdasági ig.h.

A beruházást engedélyezem. (29)

.....

*A felsorolás szükség szerint külön lapon folytatható.

BA 0703

1. .....Order
2. We order the import materials listed below by you for delivery in year .....
3. Customer:
4. Person in charge:
5. Order no.:
6. Account no. of ....Bank:
7. Phone:
8. Serial number
9. Material
10. denomination, size, specification
11. Manufacturing company
12. quantity
13. Notification of Institute
14. Credit limit Ft.....provided for order above
15. Date.../.../19..
16. L.S.
17. Leader of institution
18. Leader for economy

AKADIMPORT

MAGYAR TUDOMÁNYOS AKADÉMIA
KUTATÁSI ELLÁTÁSI SZOLGÁLATA
Budapest I., Országház utca 30.

(1) ..... **megrendelés**

(3) Megrendelő:
(4) Ügyintéző: (7) Telefon:
(5) Rendelés száma:
(6) MNB számlaszám:

(2) Megrendeljük Önöknél .....évi szállításra az alább felsorolt import anyagokat

(9) Sor-szám	(9) Az anyag: (10) megnevezése, mérete, specifikációja	(11) gyártó vállalata	(12) mennyisége	(13) A Szolgálat feljegyzései

– 123 –

B.A. 0702 min. 65x2 példányban

) Fenti megrendelésre ..... Ft hitelkeretet biztosítottunk

(16) P. H.

) Kelt

(17) ..... az intézmény vezetője (18) ..... gazdasági vezető

1. ORDER-FORM
   for component parts and materials originated from import repaired
2. Name of ordering department .....
3. Denomination of instrument to be repaired.. .....
4. Manufacturing works.....Type .....
5. Owner of instrument .....
6. Purpose of consuming: repair under guarantee
   - service - own overhead - measurements
   - other repair
7. Indicating the labour number .....
8. List of accessories, materials to be ordered:
9. Manufacturing works(Delivering firm)
10. Accurate denomination, type (specification, maybe catalogue number)
11. Ordered quantities
12. If the order is needed for stock, brief justification of this:
13. Date: .../.../19..
14. Storage register no.
15. Stock quantity
16. Leader of dept.
17. Stock-keeper

(1) **IGÉNYLÉSI LAP**

import eredetű alkatrészekre és anyagokra

(2) 1. Az igénylő osztály neve .....

(3) 2. A javítandó műszer megnevezése - .....

(4) 3. Gyártóműve ..... típusa .....

(5) 4. A műszer tulajdonosa.. .....

(6) 5. A felhasználás célja: garanciális javítás — szerviz -- saját rezsi — mérések — egyéb javítás. (A megfelelő szöveg aláhúzandó.)

(7) 6. Munkaszám feltüntetése .....

(8) 7. A beszerző (megrendelendő) tartozékok, anyagok felsorolása:

(9) Gyártóműve (Szállítócége)	(10) Pontos megnevezése, típusa (specifikáció, esetleg cikkszáma)	(11) Az igényelt mennyiségek

(12) 8. Amennyiben a megrendelés készletre szükséges, annak rövid indokolása: .....

.....

(13) Budapest, 198 .....

(14) Raktári nyilvt. száma .....

(15) Készletmennyisége .....

(16) ..... osztályvezető

(17) ..... raktáros

I.

B-1

1. Reporting sheet no.2./....sheet
2. Please fill out with typewriter or printed letter!
3. Period of inquiry
   Year: Half-year:
4. Data supplier's full
   code number:
5. Only data for instrument above gross value of Ft 100.000.-
   should be reported!
6. Data of INSTRUMENT
7. Denomination
8. Type number
9. Product no.
10. Name of factory
11. Country of origin
12. Data of INSTRUMENT according to register of fixed assets
13. Number of industrial product register
14. Inventory no.
15. On what kind of stock change does the notification of instrument
    take place? (The appropriate word to be underlined!)PURCHASE-TAKING OVER-
    SORTING OUT.
16. Only in case of TAKING OVER should be filled out!
17. The new owner's
18. name
19. address
20. Date of taking over: .../.../19..
21. Only in case of SORTING OUT should be filled out!
    Date of sorting out: .../.../19..
22. Please to leave blank!

II.

B-2

1. Pleace to fill out with typewriter or printed letter!
2. Chief specification of instrument!
3. Date of purchase: .../.../19..
4. From whom was the instrument purchased?
   (Circle the appropriate one!)

   O from trading company, namely

   .....

   O directly from manufacturer

   O from other enterprise, namely
5. If the data supplier has several company seats, where does the instrument operate?
   (Fown, street, number)

   .....
6. Gross value of instrument according to registry : ..... Thousand Ft
   Attention! Only data for instrument above gross value of
   Ft 100.000.- should be reported!
7. Chief specification of instrument:
8. Consuming area of instrument:
9. Main accessories of instrument:
10. Remark:
11. Please to left blank!
12. Please to left blank!
13. legible sugnature of filling out person

B-1

① **II. SZ. JELENTŐLAP/____ lap**

② Kérjük írógéppel vagy nyomtatott betűkkel kitölteni!

③ Tárgyidőszak:
19.....év.....félév

④ Az adatszolgáltató teljes számjele: ☐☐☐☐☐☐☐☐☐☐☐☐

⑤ Kizárólag
100 000,— Ft
bruttó értéket meghaladó műszer adatai jelentendők!

⑥ A MŰSZER adatai		
⑦	1. Neve	
⑧	2. Típusszáma	
⑨	3. Gyártási száma	
⑩	4. Gyártójának neve	
⑪	5. Származási ország	

⑫ A MŰSZER állóeszköznyilvántartás szerinti adatai		
	6. ITJ száma ⑬	☐-☐-☐-☐
	7. Leltári száma ⑭	☐☐☐☐☐☐☐☐☐☐☐☐

8. ⑮ A MŰSZER bejelentése milyen állományváltozás kapcsán történik? (A megfelelő szó aláhúzandó!)

BESZERZES — ÁTADÁS — SELEJTEZES

⑯ Csak ÁTADÁS esetén töltendő ki!		
⑰ Az új tulajdonos		
⑱	9. neve	
⑲	10. címe	
⑳	11. Az átadás dátuma: 19.....év.....hó .. ..nap	

Csak SELEJTEZES esetén töltendő ki!	
㉑	12. A selejtezés dátuma: 19.....év.....hó.....nap

㉒ Kérjük üresen hagyni!

☐☐

1☐☐☐0,1

☐☐☐☐

☐☐☐

Kérjük fordítani!

B-2

(1) Kérjük írógéppel vagy nyomtatott nagybetűkkel kitölteni!

(2) Csak BESZERZES esetén töltendő ki!

(12) Kérjük üresen hagyni!

(3) 13. A beszerzés dátuma: 19..... év ..... hó ..... nap

(4) 14. A műszert kitől szerezte be: (A megfelelő kör áthúzandó!)

○ kereskedelmi vállalattól éspedig

.....

○ közvetlenül a gyártótól
○ más vállalattól éspedig

.....

(5) 15. Ha az adatszolgáltatónak több telephelye van, hol üzemel a műszer? (Város, utca, házszám)

.....

(6) 16. A műszer állóeszköz nyilvántartás szerinti bruttó értéke: [ ] ezer Ft.

Figyelem! Csak a 100e Ft bruttó értéket meghaladó műszer jelentendő!

(7) 17. A műszer fontosabb műszaki adatai:

(8) 18. A műszer felhasználási területe:

(9) 19. A műszer fontosabb tartozékai:

(10) 20 Megjegyzés:

(11) Kérjük üresen hagyni!

1	2	3	4	5	6	7	8

(13) a kitöltő olvasható aláírása

B.A.1421

B

1. INSTRUMENTS AND MEASURING TECHNIQUE SERVICE OF THE HUNGARIAN ACADEMY OF SCIENCES
2. The data collection was ordered by General Secretary of Hungarian Academy of Sciences under no. 21 002/1976.
3. NOTIFICATION
   about changes undergone in stock of instruments of high value
   Year: Half-year:
4. Attention! To be sent back filled out in case of negative report, too!
5. REPORTING SHEET NO.1.
6. DATA SUPPLIERS: organizations financed by state budget - except of armed bodies - state enterprises, co-ops and central offices of these.
7. INSTRUMENTS TO BE REPORTED are all those the gross price of which exceeds the value of USD 2.000.- and their purchase or sorting out have taken place in the period of inquiry or which have been transferred to other organizations in the period of inquiry, respectively.
8. DATA SUPPLIER'S
9. denomination
10. address
11. supervisory authority
12. full code number
13. name of responsible for instrument
14. Mode of forwarding of notification
15. Number of copies
16. REPORTING SHEET NO.1. 1 copy
17. REPORTING SHEET NO.2. 1 copy/instrument
18. Address of data collector MTA
19. Terms of receipts
20. 15th of August following every first half-year period of inquiry, or 15th of February following every second half-year period of inquiry, respectively
21. Did any change take place to be reported in connection with data supplying in the instrument stock?
    YES - NO
    (Please underline the appropriate one!)

(8)

22. ... pc(s) Reporting Sheet No.2. belong(s) to report
    (1 pc/instrument)
23. The data supplying is obligatory. Reporting of incorrect data, refusal of data supplying and delayed data supplying is punishable or there is committed a summary offence respectively.
24. Date: .../.../19..
25. L.S.
26. proper signature
27. name of responsible for filling in, phone number
28. Please to leave blank

(D)

(1) A MAGYAR TUDOMÁNYOS AKADÉMIA MŰSZERÜGYI ÉS MÉRÉSTECHNIKAI SZOLGÁLATA

(A/1) (2) Az adatgyűjtést a Magyar Tudományos Akadémia főtitkára 21 001/1976. sz. alatt rendelte el

(3) **BEJELENTÉS**

a nagyértékű műszerek állományában bekövetkezett változásokról

19 ..... év ..... félév

(4) Figyelem! Nemleges jelentés esetén is kitöltve küldendő vissza!

(5) **I. SZ. JELENTŐLAP**

(6) ADATSZOLGÁLTATÓK: költségvetési szervek — a fegyveres testületeket kivéve —, állami vállalatok, szövetkezetek és ezek központjai

(7) JELENTÉSI KÖTELEZETTSÉG ALÁ ESŐ MŰSZEREK mindazok, amelyeknek bruttó értéke meghaladja a 100 000,— Ft-ot és a tárgyidőszakban történt beszerzésük, vagy leselejtezésük, illetve a tárgyidőszakban lettek más szervnek átadva.

(8) AZ ADATSZOLGÁLTATÓ		
1.	megnevezése (9)	
2.	címe (10)	
3.	felügyeleti szerve (11)	
4.	teljes számjele (12)	
5.	műszerfelelős neve (13)	

(14) A bejelentés továbbításának módja		
Példányszám (15)	(16) I. SZ. JELENTŐLAP	1 pld
	(17) II. SZ. JELENTŐLAP	műszerenként 1 pld.
Az adatgyűjtő címe (18)	MTA Műszerügyi és Méréstechnikai Szolgálata 1052 Budapest, Pf. 58	
Beérkezési határidők (19)	(20) minden I. félévi tárgyidőszakot követő augusztus 15; illetve minden II. félévi tárgyidőszakot követő február 15.	

(21) Történt-e a jelen adatszolgáltatás kapcsán bejelentendő változás a műszerállományban?

IGEN — NEM

(Kérjük a megfelelőt aláhúzni!)

(22) A beszámoló ☐ db. II. számú kitöltött JELENTŐLAPOT tartalmaz (Műszerenként 1 db.)

(A/5) (23) Az adatszolgáltatás kötelező. Valótlan adatok közlése, az adatszolgáltatás megtagadása és a késedelmes ill. hiányos adatszolgáltatás büntető, illetve szabálysértési rendelkezéshe utközik.

(24) Kelt: 19 ..... év ..... hó ..... nap

(25) P.H.

(26) ..... cégszerű aláírás

(27) ..... a kitöltésért felelős neve, aláírása, telefonszáma

(28) kérjük üresen hagyni ☐☐☐

FILLING OUT INSTRUCTION

for filling out of forms no. 21001/1976 reporting a change taken place in stock of instruments of high value.

The notification should be performed on forms serving this purpose according to publication no. 1/1976 MTA of Hungarian Academy of Sciences.

The filling out of forms take place on basis of registries for fixed assets or other instrument registers, as well as, operating manual of instrument or information obtained from operating experts.

The function of head of forms (REPORTING SHEET No.1) serving for notification, named "NOTIFICATION about changes undergone in stock of instruments of high value" is the identification of notifier. The data supplier should fill out 1 copy on occasion of notifying in that case too, if no change has taken place in stock of instrument according to decree. The bifacial REPORTING SHEET No.2 refers to individual instruments, namely, filling out of separate REPORTING SHEET No.2 is necessary for each instrument.

The following explanations should be taken into consideration by filling out of head, named, NOTIFICATION (REPORTING SHEET No.1) serving identification of data suppliers:

a./ The (notifying) period of inquiry occuring in address should be given by the current year and the half-year in question with ordinal number.

b./ Filling out of field DATA SUPPLIER:

Lines (1)-(2): The accurate denomination (without abbreviation) of data supplier and address of its central office should be written in.

Line (3) : Under supervisory authority of data supplier should be meant the ministry, which exercises the control over the institution, or an organization with countrywide competence.

Line (4) : The full code number of data supplier is the same, which is used in statistical notifications. It should be left blank for lack of such code number (for example enterprises of local councils).
In case of filling out it shoud be written to the left shifted.

Line (5) : That person should be meant as responsible for instrument, who can be searched by the IC with questions in connection of information given or to be given about instruments of data supplier.
In each square of field being on forms may be written only one letter, between first name and family name one square should be left blank.

c./ Marking a change falling under the notifying obligation takes place by underlining the appropriate word of YES-NO.

d./ The number of enclosed and filled out REPORTING SHEET No.2 equivalent to number of instrument to be reported and this number should be written in the field shifted to the right (01-99).

In case of filling out of REPORTING SHEET NO.2 should be taken into consideration the following:

a./ Please write in the serial number of sheet on place left blank in title.

b./ The fields, named, "Period of inquiry" and "Data supplier's full code number" should be filled out on every sheet in order to identification. The filling out of both should be equivalent to filling out of rubrics of REPORTING SHEET No.1.

c./ Filling out of field, named. Data of INSTRUMENTS:

Lines (1),(2),(3),(4) and (5): The denomination, type number and product number of instrument can be given from operating manual of instrument, from instrument itself, possible from instrument register. Please to fill out these rubrics without abbreviation.

Line (3) : The product number can be given only in squares for code, as below:

M 2 3 2 1 / 7

d./ Filling out of field, named, Data of INSTRUMENTS according to register of fixed assets:

Line (6) : Number of industrial product register means the classification according to register of fixed assets. Please to give not more than 8 numbers, as below:

4 7 - 2 1 - 2 -

Line (7) : Inventory number of instrument is the number figuring in register of fixed assets of data supplier.

e./ Marking of change in stock:

Line (8) :Changeing stock is defined, as below:

PURCHASE : If the notification takes place about a new or used instrument of data supplier activated in the period of inquiry.

TAKING OVER: If an instrument was sold by data supplier for other institution or was transferred without countervalue or was given as a present to foreign partner in the period of inquiry.

SORTING OUT: If an instrument activated previously is qualified by data supplier unusable and is cancelled in stock of fixed assets (Also in such case, when the sorted out instrument will be occasionally sold or taken over.) This procedure is not equivalent to writing-off to zero value by annual depreciation!

Lines (9)-(10): Data of new owner should be given in case of TAKING OVER.

Line (11)-(12)-(13): Dates should be given correspondingly to registries of data supplier.

The page of REPORTING SHEET NO.2. should be filled out only in case of purchase.

Line (16): Gross value of instrument according to registry of stock assets should be understood the value determined by activation! It should be given in thousand Ft, as below
Thousand Ft 192: .....

Line (17): Let the expert operating the instrument supply the technical data (e.g. sensitivity, resolution, measuring ranges etc.) being important from point of view of utilization on basis of the manual or in lack of that according to his experiences.

Line (18): As utilization area let the expert denominate that concrete measuring-technical area(s), where the instrument is used by the data supplier.

Line (19): Accessories are those supplementary devices, equipment , which belong to instrument or auxiliary equipment, or can be added optionally and which expand the measuring range or usefulness of equipment.

Line (20): Those opinions formed in connection with operation get to rubric of Remark, which can give information for experts intending to purchase or to use an instrument of same type.

I.

1. CERTIFICATE OF QUALITY RECEPTION
2. Serial number
3. Data of instrument: a./ denomination:
4. Product no.: .....
5. Type:
6. Year of production:
7. Factory
8. delivery works:
9. Ordering no.:
10. cost price:
11. accessories: (continued on part V.)
12. II. Specification:
13. III. Result of quality inspection:
14. .../.../19..
15. signature of inspector
16. IV. Remarks of hiring for sake of registry:
17. Register no.
18. Precise denomination of instrument
19. Gross value
20. Date
21. Manager of Hiring Dept.

II.

1. V. List of accessories:
2. VI. Notes of stock:
3. Date of receipt on stock:
4. No. of receipt note:
5. signature of stock-keeper

I.

6290

sorszám (2)

(1) Minőségi átvételi jegyzőkönyv

(3) *I. A műszer adatai:* a) megnevezése:

(4) b) gyári száma: _____ c) típusa: (5) _____ d) gyárt. éve: (6) _____

(7) e) gyártómű megnevezése: _____

(8) f) szállítóműve/cége: _____ Megr. száma: (9) _____

(10) g) beszerzési értéke: Ft _____ Számla száma: _____

(11) h) tartozékok: (folytatása az V. részben)

(12) *II. A műszer specifikációja:*

(13) *III. A minőségvizsgálat eredménye:*

(14) Budapest, 19 .

(15)
_____
a vizsgálatot végző aláírása

(16) *IV. Műszerkölcsönzés feljegyzési nyilvántartás céljából:*

(17) Nyt. száma	(18) A műszer pontos megnevezése	(19) Bruttó értéke

(20) Budapest, 19

(21)
_____
Műszerkölcsönzési Főnökség vezetője

1. Beruházás példánya.

MTA KESZ Sokszorosító

II

(1) *V. Tartozékok felsorolása:*

(2) *VI. Raktár feljegyzései:*

(3) *a)* raktárra vételezés időpontja:

(4) *b)* bevételezési jegy sorszáma:

(5)

raktáros aláírása

1. Owner's organization:
2. Type:
3. Factory:
4. Product no.:
5. Instrument value:
6. Denomination:
7. Accessories:
8. By registry of hiring dept.
9. By registry of fixed assets:
10. Calibration:
11. DELIVERY
12. Date
13. Voucher
14. Taking over institution or person
15. RETURN
16. Date
17. Voucher
18. Stock-keeper's acknowledgment of receipt

II.

1. Accessories:
2. Remark:
3. DELIVERY
4. Date
5. Voucher
6. Taking over institution or person
7. RETURN
8. Date
9. Voucher
10. Stock-keeper's acknowledgement of receipt

Tulajdonos szerv:	Megnevezés: (2)	Nyilvántartásban: (4) Kölcsönzésnél
Telepü[illegible]	Tartalékok: (5)	Állóeszköz nyilvántartónál: (9)
Gyűjtőkör:		Hitelesítés: (10)
Cí[illegible]		

(11)	(15) RKEZÉS
(12) (6)	(16) Bizonylat (17) A raktáros igazolása az átvételről (18)

Tartozékok: (1)	Megjegyzés: (2)

(3) KIADÁS			VISSZAÉRKEZÉS (7)		
(4) Időpont	(5) Bizonylat	Átvevő intézmény vagy személy (6)	(8) Időpont	(9) Bizonylat	(10) A raktáros igazolása az átvételről

MTA KESZ Sokszorosító

INSTRUMENTS AND MEASURING TECHNIQUE SERVICE
OF THE HUNGARIAN ACADEMY OF SCIENCES

BP. XI., SZABADSÁG ÚT 69-71
H-1502 Budapest P O B. 68
SCIENCE 226936

Budapest

Our Ref. Board of experts

Re.: National Instrument Registry
completion of data supplying

We have established the fact, on basis of data supplying obtained from trading companies dealing with selling of instrument or from other institutions respectively pursuant to General Secretary Publications of No. 1/1976 MTA, that instrument listed below got into your stock of instrument and you left these out of consideration at your data supplying. We call your attention, that the listed instruments fall under notifying charge and so you should fill out the enclosed forms relating to these.

Denomination of instrument /Type/	Purchase price /Th.Ft/	Bought number of pieces	Date of purchase	Source of purchase

A N N E X I X

Personnel of MRC and job descriptions of main posts

Manager

Qualification : engineering university background with experience of ten years in the operational management of institute working with instrumentation

Duty : Management of MRC
Direction of implementation of MRC first, then elaboration and implementation of development of MRC to be ISC of the South Region.

Responsibility: The MRC should meet the requirements for R and M in the South Region in a growing extent according to the Project Formulation Framework.
The personnel of MRC should meet the requirements arisen from the tasks of MRC.

Chief engineers of Repairing Workshop for Measuring Equipment,
Repairing Workshop for Analytical and Optical Instruments
Mechanical Workshop
(Electronic engineers: 2; mechanical engineer: 1)

Qualification : Electronics/chemistry university background with experience of 5 years in their fields, management of engineers, and contracting activity.

Duty : Management of their department
Accomplishment of technical tasks of R and M work.
Provision with spare parts, accessories upgarding training of engineers, documentation necessary for the R and M activity.

Responsibility: Fulfilment of contracts income plans,
liabilities of their departments
Development of co-operation agreements of MRC

Chief engineer of Consultancy

Qualification : Engineering university background with experience of 5 years in management of engineers, comprehensive engineering.

Duty : Management of consultancy; Development of information system.

Responsibility: Correctness of data supplied; Technical level of conferences, symposiums.

Engineers (19)

Electronic, mechanical and chemical engineers are to be employed. They have to do fault diagnosis and t: uble shooting in high sophicated apparatus in the higher category of repair. They should be qualified to be able to work independently starting from basic principles on equipment which they have not handled earlier. They are responsible for the quality and correctness of the repair work having been carried out and the requirements of specs of the instruments being repaired.

Technicians (26)
Senior technicians:

They perform their work at the direction of the engineers. They have to supervise the technicians in doing the low level R&M and assist the engineers in trouble shooting work of delicate apparatus. They are responsible for the quality of their work.

Technicians:

They have to be electrical-or mechanical skilled fitters and they should be able to carry out under supervision electrical or mechanical repairs and maintenances on the equipment which do not need special care.
They are responsible for the quality of their work.

A N N E X X.

The places visited

HANOI

1. GDSMQC - Centre I
2. GDSMQC - Metrology Centre
3. COSTMAS
4. Maintenance and Repair Centre COSTMAS

HO CHI MINH CITY

5. GDSMQC - Centre III
6. VINATEST - Association of Testing Laboratories
7. Viet Nam Union Salvage Corporation
8. The Union of Sericultural Enterprises of Viet Nam
9. Geodesy and Design Factory

PERSONAL VISITS IN 1985

10. Applied Physics Department
11. Sun Energy Research and Utilization Centre
12. Medical Equipment Company
13. Institute for Tropical Technology and Environmental Protection

A N N E X X I .

Senior counterpart staff; their names and specialization.

A 3-as Központhoz tartozó Főosztályok és Osztályok.

Igazgató Dr. NGUYEN HUU THIEN
Igazgató helyettes Dr. HUYNH VAN QUANG

1. Személyzeti és Anyagellátási Főosztály	Főov.	Do Van Nam et.
1.1. Személyzeti és Pénzügyi osztály	o.v.	Do Van Nam et.
1.2. Anyagellátási Osztály	o.v.	Huynh Van Xuan et.
2. Terv és Jogi Főosztály	Fő.ov.	Tran Ainh Giai et.
	Főov.h.	Dinh Thi Huong
3. Szabványügyi és Minőségügyi Főosztály	Főov.h.	Nguyen Trung Nhat et.
3.1. Kohó- és Gépipari és Villamosipari MEO	o.v.	Nguyen Trung Nhat et.
3.2. Könnyüipari- Vegyipari és Épitőanyagok MEO	o.v.	Chu Hanh Phuo etnő
3.3. Mezőgazdasági Élelmiszer MEO	o.v.	Tran Van Dung et.
3.4. Érzékelő vizsgáló labor	labor vezető	Ngo Thi Hong Thu etnő
4. Minőségvizsgáló Főosztály	Fő.ov.	Lé Cam Nhung etnő
4.1. Kohó- Gépipari és Villamosipari szakosztály	o.v.	Dinh Van Tru et.
4.2 Könnyüipari és Gumiipari szakosztály	o.v.	Nguyen Xuan Hien et.
4.3. Kémiai- Fizikai szakosztály	o.v.	Mai Xuan Canh et.
4.4. Épitőanyagok szakosztálya	o.v.	Ng uyen Duc Dang
4.5. Mezőgazdasági élelmiszer szakosztály	o.v.	Huynh Thanh Dam etnő
4.6. Bienhoa adminisztrációs csoport		
5. Méréstechnikai Főosztály	Fő.ov.	Do Thi Mai etnő.
5.1. Nyomás és Hőtechnikai szakosztály	o.v.	Le Nghiem Trank etnő
5.2. Villamos és Elektrotechnikai szakosztály	o.v.	Do Thi Mai
5.3. Mechanikai szakosztály	o.v.	Nguyen Thai

6. Méréstechnikai és vizsgáló berendezésgyártó és javitó üzem	ü.v.	Nguyen Van Hung et.
6.1. Gyártóüzem	ü.v.	Nguyen Van Hung et.
6.2. Karbantartási és javitó csoport	cs.v.	Pham Quoc Tam et.
6.3. Suly és Mérleg szakosztály	o.v.	Le Thanh Van etnó
7. Müszaki Szolgáló Főosztály	Főov.	Ngo Thi Hong Thu etnó