ROLE OF AN ELECTRONIC COMPUTER IN THE

VIET NAM ADMINISTRATION

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PREFACE

At the present time, serious economic problems confront the Government of Viet Nam.

The problems involved in establishing and controlling the national budget, administering the Treasury, defining import policies, setting up government payrolls, the assessment and collection of taxes, all can be satisfactorily resolved - and in turn encourage the economic growth of the country - only if a number of extremely complex factors are taken into consideration.

A study of these factors requires the establishment and examination of voluminous records, a task involving numerous experienced specialists. In Viet Nam such specialists are presently few. Training new ones requires time and expense. Moreover, qualified personnel might better be employed in the innumerable technical positions now awaiting them. These posts must be filled in the interests of the nation's prosperity.

Not only the Viet Nam Government but also the rapidly evolving modern world faces the same dilemma. The value and success of the Computer usage resides in the fact that it solves such problems in an extremely effective manner.

INTRODUCTION

The ways in which an electronic computer[1] might be used will now be discussed. Conceivable applications are:

1. The National Budget

2. Foreign Aid

3. Direct Taxation

4. The National Treasury --Budgetary Receipts

5. The Control of Imports -- National Inventories of Imported Goods -- Control of the Supply of Counterpart Funds

6. Government Payroll

7. National Purchasing Center -- Direct Aid -- General Government Inventory

8. Operational research and miscellaneous tasks

9. The Census

Each chapter will study, successively,

1. current operations and possible improvements,

2. the solution on the Computer, including the time of operations,

3. the advantages, and possible problems arising from conversion to electronic equipment

4. the measures which should be taken now, to facilitate this conversion.

It should be noted that, in a large number of cases, the operations studied herein are, at the present time, not mechanized, only partially mechanized, or have but recently been mechanized. Thus, volumes cannot be determined exactly, and the procedures to be followed have not always been precisely defined. It follows that the time estimates given are approximate. Discrepancies will, however, probably compensate one another, at least partially, so that the total load of the Computer will come close to our predictions.

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[1]The present study was originally based on an IBM 650 Data-Processing Machine.

Chapter I

THE NATIONAL BUDGET

I. **PRESENT SITUATION**

The budgetary control of receipts will not now be discussed. It
is included in the discussion on Treasury operations. (see Ch. IV)

Budgetary control of expenditures is, at present, completely mechan-
ized on standard punched-card machines. Credits, appropriations
and obligations are controlled by Title, Chapter, and Article.
Obligations, which cannot exceed appropriations, include allotments
to the provinces and fund advances.

Liquidations are usually controlled a priori by obligations. Dis-
bursements on fund advances, and provincial accounts are controlled
only in the aggregate by allotment. Liquidations are recorded by
ministry, department, function, and nature and purpose of the
expenditure.

A daily statement of transactions includes:

A. Credit, appropriations, obligations, and liquidated orders
    for payment journals,

B. Appropriation and obligation vouchers for provincial accounts,

C. Comparative statements for checking possible overdrawing.

Monthly statements include:

A. Comparative statements showing the current credit, appropriations
    and obligations position,

B. Brief and detailed summarizing statements,

C. Cash position statement,

D. Statistical statements.

Although the above procedures are satisfactory, they could be improved
by:

A. Eliminating the cross-checking of comparative statements,

B. Regrouping the information in the statements,

C. Reducing the number of cards used,

D. Speeding up the daily flow of operations,

II. SOLUTION ON THE COMPUTER

All budgetary entries will be recorded on magnetic tape. The
file will include:

A. the Titles,

B. within each Title, the Chapters,

C. within each Chapter, the Articles,

D. within each Article:

1. credits and appropriations at the beginning of the month,

2. appropriations for the month,

3. obligations of the month, outstanding obligations and cash,

4. under each obligation, the liquidations,

5. liquidation statistics for the month, and cumulative since
the beginning of the year, by purpose of expenditure.

The provincial accounts will not include an "obligations" record
on magnetic tape. The Computer will instead keep a permanent
account, "allotment for Province X", crediting obligations and
debiting orders for payment until a special card closes the account.

The permanent file will be up-dated once and for all by a daily pass
of the credit, appropriations, obligation, and orders for payment
cards, previously sorted in this order. These cards will be read on
the card-read punch, type 533, while the voucher cards are being
read on a connected tabulator. A single voucher card may contain as
many as six different items. Thus, the number of voucher, and the
number of orders for payment cards will be about the same.

The two connected tabulators will at the same time print three
statements in duplicate:

A. Liquidations Journal,

B. Budget Variances: excess obligations or liquidations, disagree-
ment between vouchers and orders for payment,

C. Credits and Appropriations Journal.

There will probably never be many credits and many appropriations
in any single day. If the number of appropriations is small, for
example, they can be stored in the memory while the credits journal
is printed. The appropriations journal is then printed automatically.

The information required in printing the obligations journal will
also be temporarily recorded on an extra tape. The tape will be rewound
automatically, and the obligations journal will be printed after the
liquidations journal.

The Computer prints an exception notice whenever budget discrepancies
occur. The notice is sent to the responsible department. Thus
the checking of comparative statements and the comparative statements
themselves are eliminated.

The Computer numbers each obligation and prints the number in the
journal. The orders for payment will have to be numbered before-
hand so they can be compared with the voucher cards. The Computer
can, however, check the numbering and point out discrepancies. The
orders for payment tape can be sent directly to the Treasury without
reproduction.

Daily operating time has been calculated from the following
figures:

Budgetary account designation, by Title, Chapter, and Article	3,600
Monthly obligations, liquidations, and renewed obligations	5,000
Obligations carried forward from previous months	5,000
Fund advances	500
Allotments to the provinces	500
Monthly orders for payment	115,000
Monthly voucher cards	17,000
Total number of code combinations	30,000

Computer operations will take no more than
half an hour daily

At the end of the month, the Computer again reads the tape and
prints the monthly statements. The statements are more meaningful
since entries are grouped by article, obligation and liquidation.

Entries stored only for the printing of the monthly statements can be deleted (e.g. liquidated obligations, monthly credits and orders for payment, etc.).

These operations will require approximately:
<u>5 hours a month</u>

III. <u>ADVANTAGES OF THE METHOD</u>

A. Rapid and precise budgetary control,

B. Elimination,

C. Comparative statements,

D. Effectively presented monthly statements,

E. A check of obligations and orders for payment numbers.

A fairly inflexible schedule may have to be adhered to, since it will not always be possible to postpone the other tasks of the Computer. The Computer automatically punches the voucher cards for all supply expenditures (see Ch. VII, National Purchasing Center), decreasing the work of the punching section.

THE NATIONAL BUDGET

DAILY OPERATIONS
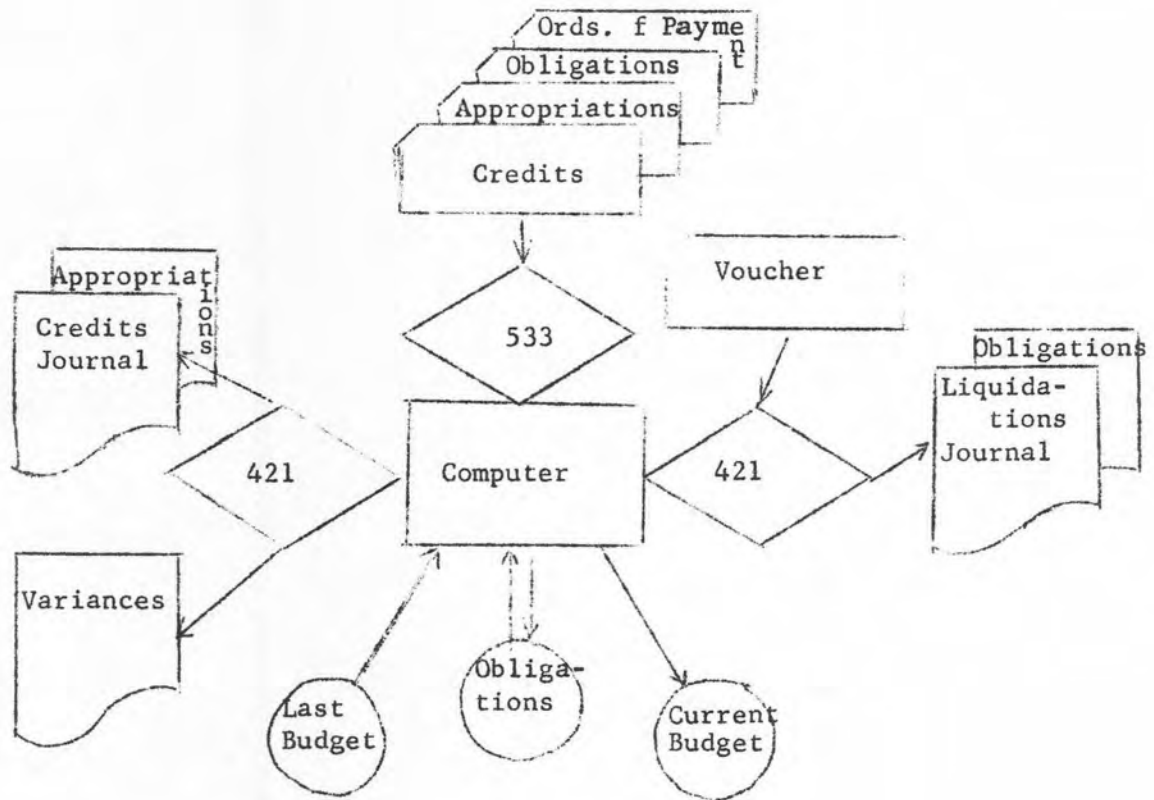
THE NATIONAL BUDGET

MONTHLY OPERATIONS

CHAPTER II

FOREIGN AID

Commercial American economic aid is discussed in this chapter. Direct
Aid is dealt with in Ch. VII (National Purchasing Center).
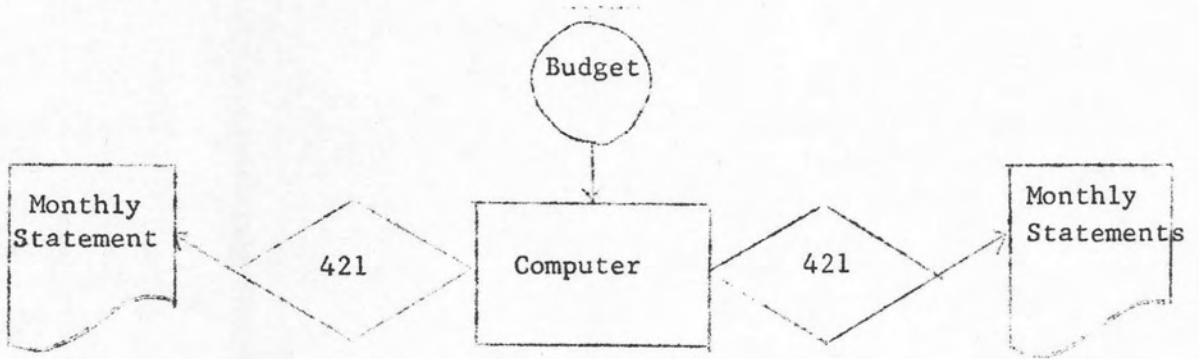
CONTROL OF PROJECTS

I. PRESENT CONDITIONS

The problem of budgetary execution in handling foreign aid is similar
to that of the national budget, and is mechanized in the same way.
The conclusions of Ch. I can therefore be considered applicable.

Credits are allotted by project, sub-project, and section. The obliga-
tions proposed by the ministries are controlled by section; however,
amounts exceeding the provided credits by 20 per cent, can be allotted,
provided that the credits allotted to the project as a whole are not
exceeded. USOM makes monthly allotments, by project on the basis of
overall commitment approvals. These allotments are in the form of a
transfer from the National Bank (Counterpart Funds) to the Treasury.
Liquidations are then controlled in relation to obligations and to the
remaining balance.

Liquidated orders of payment are statistically tabulated by program
(within a project) for purposes of a posteriori control. The daily
and monthly statements required are similar to those described in
Chapter I.

II. SOLUTION ON THE COMPUTER

This method is not described in detail because it is an exact copy of
the one used for the National budget.

Time for daily operations has been calculated from the following figures:

number of projects or sub-projects	300
number of headings	1,000
number of monthly obligations, obligations outstanding, allotments to the provinces, and fund advances	1,000
number of monthly liquidations	1,000
total number of statistical classifications	5,000

Daily operating time would be approximately:

<div align="center">

1/4 of an hour
</div>

Monthly operations will be accomplished in the same way as for the national budget. Since the volume is less, they would require approximately:

<div align="center">

2 hours a month
</div>

Note: To make efficient use of computer time, an automatic sequencing of the daily operations for both the national budget and for foreign aid is recommended.

A regrouping of the two files onto a single tape, and the use of the same forms for the two tasks is required. The former is not difficult; the latter calls for ruled column paper without headings. The Computer will print the requisite headings on each page.

In this way, total daily machine time will be reduced from 3/4 of an hour to 1/2 an hour.

III. ADVANTAGES OF THE METHOD

The method has the same advantages as those described in Ch. I:

A more rapid and precise control of expenditures

Elimination of comparative statements, and cross-checks

Reduction in the number of cards used

A more practical presentation of the monthly statements

Control of the numbering of obligations and orders for payment

Two additional advantages will be:

A simple control of excess expenditures within the 20 per cent limit under the different headings

The Computer can be relied on for all details of execution, and all special cases which, at the present time, make this aid administration more onerous than its volume warrants.

<div align="center">

CONTROL OF COUNTERPART FUNDS
</div>

This will be an integral part of the control of imports (see Ch. V).

CHAPTER III

DIRECT TAXATION

I. PRESENT SYSTEM: POSSIBLE IMPROVEMENTS

Under the Directorate of Direct Taxation, five departments make
assessments and receive declarations for:

- Real estate taxes
- Business licenses (patente)
- Business and commercial profit and income taxes
- Wages, salaries and personal income taxes
- Corporation taxes.

The departments verify a total of 70,000 constant rate levies (real
estate and business licenses) and approximately 90,000 annual declara-
tions and notices of ownership changes. The staff consists of 50
persons including a small number of competent secretaries. The shortage
of personnel is critical; this staff alone handles:

1. up-dating of permanent files (for the real estate and
    business license levies)

2. verification of all tax declarations, including those of
    corporations without means for systematic cross-check,

3. calculation of taxes, establishment of assessment rolls (in
    duplicate) and tax notices; cross-verification between these
    items.

This system is the cause of low returns from direct taxes in Viet Nam.

A system for mechanical calculation of real estate and business license
taxes is being installed on IBM conventional equipment at the present
time -- a step which promises much for the future.

Three principal areas in the system require modernization:

1. tax calculation, establishment of assessment rolls, and tax
    notification

2. regrouping of amounts owed by a single taxpayer, and establish-
    ment of a "taxpayer account" to facilitate collection.

3. facilitating control by:

    a. establishing a system for cross-checking all available
        documents, and, if necessary, payments made,

    b. collecting statistics to provide a simple and accurate
        means of comparing declarations among similar tax groups.

A. Assessment rolls and tax notifications

No problems are involved in this operation, either with a conventional machine or a Computer. The work will be accomplished by simultaneously consulting the permanent file (on cards or magnetic tape) and the "declaration" and "notification of ownership change" cards.

The use of tabulators having two sheets of paper provides, at one printing, two copies of the assessment rolls and the tax notification. In certain instances--real estate taxes, for example,--the Computer will print a single line, instead of two, for each taxable item. The documents will thus be easier to read. During this operation, consultation of the permanent file permits the detection of missing declarations (from registered taxpayers), and a payment reminder will be printed.

B. Taxpayer accounts

At the present time, the Treasury (Tax Collection Bureau) receives only the assessment rolls compiled by the Tax Directorate. Some listings are by address (real estate and business license tax), others, by name. A list of names is necessarily an approximation. Except in the few special cases requiring reference to the assessment rolls, no one knows the total amount due from the taxpayer under the various levies.' This state of affairs is undoubtedly largely responsible for the problems encountered in current tax collection.

There are only two possible criteria in a reclassification of of the assessment rolls: an alphabetical listing of names or a registration number. The registration number is, in fact, the only effective method. Such a system is, and, for a few years, will be almost impossible to achieve. But it should be emphasized that little progress in the validation and collection of taxes can be made without using a registration number. (This number might, for example, be of a type similar to the French Social Security number, except for a temporary registration system for people who, still today, have an undetermined civil status.)

The national registration number will appear on identification cards reproducible on important documents. It has advantages which remain unexplored even in the West. In addition to centralizing all fiscal operations, it will provide a rapid and accurate means of identifying individuals for:

1. family allowances

2. social security (which will eventually exist)

3. pensions and retirement benefits

4. deductions on orders for payment

5. payrolls (government employees or corporation employees)

6. control of all accounts in local banks.

Many items could be added to this list. However, attention should be drawn to the last item mentioned (centralization of overdraft notification by the local banks). Its significance for the economic health of the country escapes no one. Lacking an interbank register this check, if it is undertaken at all, is generally made in unfavorable conditions.

The temporary system of classification proposed for the re-grouping of taxes is by name in alphabetical order. Two difficulties arise: the alphabetical information to be sorted contains about twenty characters. However, a proper sorting can be made only by computer. Furthermore, inevitable spelling mistakes or name codification mistakes result in incorrect classification; these must now be corrected by a manual checking of the lists. After the lists have been corrected, each taxpayer will be given a classification number. This number, recorded in the magnetic files for the various taxes, will simplify future assessments, except for new taxpayers.

C. Cross-checking of fiscal documents

Examination of the procedures of the Ministry of the National Economy and the Ministry of Finances have indicated the importance of cross-checks in fiscal control. In most cases the theoretical possibilities of these cross-checks are known to the departments, but they are never systematically applied because of personnel and equipment shortages.

1. Wages and salaries: The employer's wage declarations, after verification, will be sorted by wage earner for purposes of comparison with the latter's own declaration, and for the detection of missing declarations.

2. Business and commercial profits and corporation taxes: The entries in these declarations can be compared with:

a. custom declarations, for partial check of amounts purchased,

b. monthly declarations of the production tax, in order to verify turnover,

c. monthly declarations made to the Directorate of Industry, for the same purpose,

d. business license tax to detect missing industrial and trade profit declarations, and to ascertain the creditibility of declared turnover,

e. real estate tax for the verification of declared real estate earnings,

f. property tax on rice fields for comparison with agricultural profits of owner-operators.

3. Income tax: These declarations will be controlled by comparison with:

a. bank declarations of interest income from securities,

b. declarations of dividend payments by corporations, and in turn the use of these declarations for verification of corporation tax declarations,

c. pension and annuity declarations furnished by the Viet Nam Treasury or the General Treasury of France.

4. Real estate tax:

a. up-dating rental values of commercial premises for comparison with the business license tax,

b. automatically up-dating the files by using bills of sale (transmitted by the notary or the prefect),

c. automatic up-dating of the files to include new construction by using construction licenses,

d. a once-and-for-all comparison of taxable properties with the cadaster (real estate survey) so as to discover properties not paying a land tax.

Of course, all these comparisons have a double purpose. Using business licenses to check business and commercial profits may well result in correcting the business licenses themselves.

The problems of the use of an alphabetical listing of names, as described above, is complicated because in the case of bank and business documents, the use of a classification number is impossible.

D. Control of purchases and of business turnover through company invoices

If the administration obtains copies of all invoices, or at least a summary statement--this can be done with standardized accounting procedures--the statements or invoices can be sorted, by client and compared with the purchase declarations. Discrepancies will lead to an investigation to correct the turnover declaration of seller or buyer.

It would be advantageous for machine usage if the present production tax were abolished and the turnover tax reinstated. This procedure would provide better legal grounds for the collection of invoices and summary statements. It would also provide more effective means for repressing fraud. In addition, the profitability of the machine would increase since by transferring these documents onto the machine, two operations will be performed simultaneously: a control of the collection of taxes and a control of the annual declarations of purchases and business turnover.

Once again, it should be pointed out that this task will be made more difficult so long as business men and industrialists are not registered by number and as long as this number does not appear on invoices. Variations in spelling of names will lead to mistakes in classification.

The National Institute of Statistics is not, at present, able to tell how many invoices would have to be annually processed. It is therefore impossible to study this project in greater detail at the moment.

It is, however, perfectly realizable. A similar system has been established in Italy where a turnover tax is levied on 40 million invoices a year. Half of these invoices represents almost all of the entire business turnover of the nation. Two cards are punched for each invoice (by duplication). The first card is considered a sales declaration, and the second, a purchase declaration. All the punched cards (40 million) are alphabetically sorted on sorters. Once the necessary corrections and checks have been made, a comparative list of sales and purchases for each business can be drawn up. Comparing these data to the tax declarations is an effective method of control.

There is no reason why this work cannot be begun in Viet Nam once an effective procedure for the collection of invoices has been devised. Since the population of Italy is about four times that of Viet Nam, an annual volume of 5 to 10 million invoices is to be expected.

E. Fiscal statistics

Statistics are a rapid, yet reasonably efficient, means of verifying the creditibility of profit declarations, balance sheets, and expenses incurred. For each enterprise liable to a profit tax, these statistics might cover the following items which would appear on documents attached to the declaration:

1. business turnover

2. gross profits (or losses)

3. net profits (or losses)

4. value of inventories

5. Inventories at the end of the fiscal year

6. purchases

7. inventories at the beginning of the fiscal year

8. payroll

9. depreciation on the balance sheet

10, depreciation during the fiscal year

11. required reserves

12. provisions

13. cash and bank balances, post office accounts

14. company capital and reserves

15. interest and dividends.

Three kinds of data will be calculated:

1. For each taxpayer, a percent of:

    a. gross profits relative to sales

    b. net profits relative to sales,

    c. gross profits relative to purchases

together with a comparison of each with the average percentages
for the same kind of business in a province.

2. Totals and averages of the items will be listed, by business,
province, respective province, etc. Enterprises can be classi-
fied according to size, or according to type of business.

3. Statistics should indicate by business and province, the
number of enterprises having a profit, the number with a loss,
and should be sub-divided according to the number of employees
or the business turnover, or the type of business, etc.

These data can be used for reasonably accurate forecasts of the
general trend of business of each enterprise. They will be in-
valuable in helping controllers check fiscal records; they can
also be used by the Computer to automatically detect serious dis-
crepancies.

II. TEMPORARY SOLUTION ON THE COMPUTER (without a general registration
of taxpayers)

Preliminary operations will include the manual establishment of an
alphabetical file of taxpayers. The files, each bearing a special

"taxpayer code," will be under guard so as to prevent changes in classification or theft. The establishment of this file will be described in detail in the paragraph, "Preliminary Operations and Conversion to the Computer".

A. Business license and real estate tax

A real estate business license file, classified by street name and, if possible, by cadastral number will be recorded on magnetic tape. For each taxable property item, there will be the following data:

1.	complete address	25 letters
2.	cadastral survey number	10 figures
3.	area) use)	10 "
4.	with or without building) rental value)	10 "
5.	owner's name and address	40 letters
6.	owner's taxpayer code	6 figures

In the instances in which a business is located on taxable real estate, there will also be indicated:

1.	company name) name of business)	15 letters
2.	name and occupation of operator	20 "
3.	taxpayer code of operator	6 "
4.	classification, by trade and by organization, of firm --	10 figures

The establishment of this file (a total of 5 tapes for the 100,000 entries for Saigon-Cholon) will require reference to the alphabetical list of taxpayers so as to duplicate the taxpayer code. Names of streets will also have to be codified. A strict cross-check with the cadaster will have to be made to insure that all plots of land are, in fact, listed in the files.

The magnetic tape will be kept up-dated with:

1. notices of realty sales

2. construction declarations

3. declarations of business openings or closures,

4. reports of assessors.

Once a year, the file will be read by the Computer, and the two connected tabulating machines will print the tax base of the real estate tax, and the tax base of the business license tax (by streets) which will be distributed among the assessors.

In addition, a central magnetic file will be eetablished, classified according to the taxpayer code, and including, for each taxpayer, the aggregate of his permanent -- or at least stable -- taxable properties:

1. taxpayer code   6 figures

2. complete name and address   40 letters

3. occupation   10 "

4. family status and number of
   dependents   3 figures

5. taxable property (if required, by item):

   a. complete address   25 letters

   b. cadastral number   10 figures

   c. area size)   10 "
      use   )

   d. with or without construction   10 "

   e. rental value   10 "

6. business license tax (if required, by tax):

   a. name of business   15 letters

   b. complete address   25 "

   c. cadastral number   10 figures

   d. type and kind of business   10 "

   e. area size   10 "

   f. rental value   10 "

7. Levy of the previous year:

   a. payroll   10 figures

   b. business and industrial profits 10 "

   c. income   10 "

This file (6 tapes) mainly reproduces, in a different order, all the items of the real estate-business license file. In order to insure that information in both files is identical, all up-dating recorded in the property-business license file will be simultaneously transcribed on magnetic tape, sorted by the Computer, and incorporated in the central file.

The reading of the central file by the Computer will simultaneously:

1. print on one of the tabulators the tax notices, assessment books, and business licenses (in duplicate)

2. formulate statistics on the business license tax

3. print, on the second tabulator, the tax notifications and assessment rolls for real estate taxes

4. punch a tax notice card (these cards will be sent to the Treasury and will be used as a control file when taxes are collected).

The central file is brought up to date by bringing the real estate-business license file up to date; thus, when the rental value of a business premise is changed in this file, it will be automatically recorded in the real estate and business license sections of the central file. These two taxes will thereby up-date one another simultaneously.

B. Taxes on wages and salaries, and industrial and business profit taxes -

At the present time, employers must file with the Office of Direct Taxation a detailed salary statement, for each employee, and a list of employees. Henceforth, they will be asked for:

1. a list of names giving an employeeonumber (attributed by the Directorate General of Taxes) and, for each employee, in addition to his name and occupation:

a. a classification number

b. a break-down of amounts paid, by type, during the year.

This statement will be filed directly with the Directorate of Direct Taxation, by 31 January (at the latest).

2. a form for each employee, which will simply show:

a. employee's name and occupation

b. employer number

c. classification number of the employee on the general list.

This form will be given to the employee who will attach it to his tax declaration. As soon as the general list of names is received, an "employer" card will be punched per line (except when the employer himself can provide the cards); the abbreviated name and occupation will also be punched. These cards will be immediately fed to the tabulator for a cross-check with the general statement, and for a printing of the summary card, "total salary expenditures", for each employer subject to a profit tax.

The tax declarations of individuals, including military personnel, paying a profit tax will be manually sorted by order of names. The taxpayer code taken from the alphabetical file will be recorded on each declaration.

The same procedure will be followed in the case of bank statements for interest income and corporation statements for dividend payments. Each declaration or form will be punched on a card before being placed in the taxpayer's file.

The cards "military taxpayers" and "individuals paying a profit tax" will contain:

    a. taxpayer's code

    b. abbreviated name

    c. family status

    d. items on the declaration

The cards "civilian tax payers" will, in addition, bear:

    a. the employer number

    b. the classification number on the employer statement.

This information will have been taken from the statement attached to the declaration.

The other cards will be punched to show:

    a. taxpayer's code

    b. abbreviated name

    c. total amount of interest payments or dividends.

The "Civilian" cards will be compared on the sorter and on the collator with the "Employer" cards in order to print the taxpayer code. For this to be possible in the case of an employee having had several employers, as many civilian cards will have to be punched as there are employers; this will be done by referring to the declaration.

All the "Employer", "Civilian", "Military", "Profit", "Interest" and "Dividend" cards, together with the "Pension" cards provided by the Treasury, are sorted by tax-payer code and sent to the Computer.

The Computer will read, together with these cards, the central magnetic file of taxpayers (cf. II para. A) where it will find: their name and address (recorded by code number), and their family status (for purposes of control). It will print on the connected tabulating machine the assessment rolls and tax notices (in duplicate).

Simultaneously, the Computer will punch one card for each tax notice, to be sent to the Treasury (where a file for the control of tax collections will be established). In addition, it will recalculate (without printing it) the total of the business license and real estate taxes, and will record on magnetic tape a "taxpayer account" showing for each taxpayer the total amounts due by type of tax.

Note 1: The comparison between "Civilian" and "Employer" cards will have a by-product: missing declarations, incorrect codification, etc. . . . The cards thus separated will give rise to an investigation where the magnitude so warrants; to decide this point the cards might, for example, be sorted on the sorting machine by order of total amounts.

Note 2: As the Computer prints the assessment rolls, it checks income taxes. In instances of serious discrepancy or where a declaration is missing--if the individual is taxable--the regular tax can be imposed or a "discrepancy" form showing all items on the declaration can be printed on a second tabulating machine. The form will be used for further investigation. In the case of non-taxable individuals nothing is printed, and the machine goes on to the next declaration.

The central magnetic file for taxpayers, which is referred to as the work progresses, to print addresses on tax notices, also contains the details of the business license and real estate taxes of these same taxpayers. A partial verification of declared profits can also be made:

      a. comparison of real estate and agricultural earnings with the rental value declared for the real estate levy

      b. comparison of business profits taxes with the business license tax to cross-check the type and kind of firm

      c. detection of missing declarations and eventual assessment at regular rates.

C. Tax notices and assessment rolls for corporations

For each declaration a card showing only assessable items will be printed. The Computer will print provisional notices and assessment rolls, awaiting control reports. This work can be

done in the same fashion--and at the same time-as the work of establishing the profit and salary assessment rolls. Some discrepancies can be discovered at the same time by consulting the records on the rental value of real estate property, and the paid business licenses.

D. Control of profit declarations and declarations of corporate taxes

Because of the complexity of the problem, we do not believe it possible to deal with it, in its entirety, on the Computer (as was done in the case of income and salary taxes). Only partial controls will be made, and statements to simplify the work of the assessors will be printed. The latter, being a rather lengthy task, should be performed after the establishment of assessment rolls described above.

After having duplicated on permanent records (giving the taxpayer code) the main entries from the balance sheets and profit and loss statements of enterprises, the following items will be punched on cards (two for each taxpayer):

1. business turnover

2. gross profits (or losses)

3. net profits (or losses)

4. value of inventories

5. inventories at the end of the fiscal year

6. purchases

7. inventories at the beginning of the fiscal year

8. payroll

9. depreciation on the balance sheet

10. depreciation during the fiscal year

11. provisions

12. cash and bank balance, post office accounts

13. required reserves

14. company capital and reserves

15. interest and dividends

The cards will be read on the Computer at the same time as:

1. the summary cards, "total salary expenditures"

2. the summary cards on custom entries

3. the summary cards on production tax declarations

4. the summary cards on declarations made to the Directorate of Industry.

These summary cards should cover the accounting year of the companies, and they should show the taxpayers' number. This can easily be done since the required information comes from government offices.

The Computer will compare these data with figures on purchases, sales, inventories at the beginning of the accounting year and inventories at the end of the year. If, for example, items on the customs declarations are listed under the same headings as those of the Directorate of Price Control, the maximum profit margin authorized for each category can be computed, and a sales figure--to be compared with that of the declaration--deduced from it.

Comparisons made by the Computer will permit:

1. the detection of serious discrepancies

2. the printing of tables providing helpful information to the controllers.

These data will eventually include figures obtained by checking invoices (see Ch. II, Art. I, para. D-1).

Simultaneously, the Computer will compute the statistics described in para. E-1 (Ch. III, Art. I) and will print tables of figures providing additional data for the controllers.

E. Time of operations

The time required has been calculated for Saigon-Cholon, on the basis of the following figures:

		Number	Cards to be Punched Manually
a.	taxpayers (real estate)	18,000	
b.	taxable items (real estate)	100,000	
c.	property transfers per year	5,000	10,000

		Number	Cards Punched Manually
d.	business license taxes	40,000	
e.	business license taxes: changes in ownership per year	15,000	30,000
f.	employer declarations (employees)	70,000	70,000
g.	declarations (civilian wages and salaries)	70,000	70,000
h.	declarations (military wages and salaries)	20,000	20,000
i.	taxpayers (wages and salaries)	25,000	
j.	declarations (industrial and commercial profits)	4,500	4,500
k.	taxpayers (industrial and commercial profits)	7,000	
l.	declarations (corporations)	600	600
m.	taxpayers (corporations)	350	
n.	interest and dividend payments	5,000	5,000
o.	military and civilian pensions	20,000	
p.	importers	1,000	
q.	taxpayers (production tax)	1,500	
r.	industrialists (declaration to the Directorate of Industry)	2,500	
			210,100

Two hundred and ten thousand cards plus 10,000 cards of fiscal statistics--assuming that each tax declaration requires only one card--are to be punched manually. Of these 220,000 cards, 180,000 are based on declarations filed between 1 January and 31 March. Four clerks for punching and four for checking, working full time for five months, will be required to complete this task within a reasonable time, between 15 January and 15 June.

Operations on standard IBM machines:

a.	type 082 sorter	74	hours
b.	type 077 collator	7	"
c.	type 513 reproducing punch	30	"
d.	type 421 tabulator	15	"

Operations on the Computer:

a.	up-dating of the business license-real estate file and printing of the tax base	35 hours per year
b.	sorting of business license and real estate property transfers	8 " " "
c.	assessments and notices: business license and real estate	40 " " "
d.	assessments and notices: salaries commercial and industrial profits, corporations, and income	20 " " "
e.	statistics and fiscal controls (excluding invoices)	7 " " "

110 hours per year

The sorting of changes in ownership mentioned above appears slow (8 hours for 20,000 changes), but it should not be forgotten that each change in ownership will be recorded in 2 or 3 different places in the central file. In addition, in the case of business licenses, items to be recorded will exceed 80 columns. Finally, this method of operation guarantees a permanent consistency between the business license-real estate file and the central file.

F. Validation by means of invoices

Assuming no national registration, the simplest solution would seem to be to recopy the taxpayer code on the invoices or summary statements by hand. This is not at all an impossible task provided that it is limited to a small number of important taxpayers or those whose returns seem questionable. Cards will be punched, sorted on the sorting machines, and totaled on the tabulators; summary cards will be sent to the Computer for processing as described above (para. D).

The first results will provide guidance for future procedure.

IIA.   ALTERNATE -- COMPLETE SOLUTION ON THE COMPUTER - (with a national
       registration)

The operations on the Computer remain unchanged, the national regis-
tration number is used instead of the taxpayer code. However, no
longer necessary will be the preliminary manual operations (sorting
of the files, and recopying of the taxpayer code) and the data-processing
(duplication of the taxpayer code on the employer cards). Invoices and
summary statements can be sent directly to the punching section. Only
a detailed list of amounts paid for each registration number--without
a separate form for each--will be required from employers (wages),
banks (coupons), and corporations (dividends).

A national registration number will make codification procedures for
new taxpayers unnecessary. In the interests of brevity, these pro-
cedures were not fully described because they apply only to small
volumes. They nevertheless represent an important and complex task.
In short, a national registration number would make the remaining manual
operations unnecessary. It would save money and time and provide more
reliable results. The staff thus liberated will, to the extent
practicable, undergo a period of training and be reassigned to the
verification of declarations.

III.   ADVANTAGES OF THE METHOD

The method is rapid and reliable: all notices can be sent by the end
of July, at the latest. Innumerable automatic cross-checks will permit
a fairer--and probably higher--levy. The outstanding advantage of the
method proposed is that, in addition to the work of the Computer, the
punching machines, and the comparators, only non-specialized staff--
coders able to read write, and sort--will be required for processing
correct tax declarations. Qualified staff members can therefore devote
all their time to questionable declarations set aside for them. They
will have at their disposal summaries prepared by the Computer providing
numerous means of verification, not now available or if available,
requiring investigations.

The greatest benefit brought by the use of the Computer will be the
considerable increase in the productiveness of the clerks already
trained and of those who will be trained in the near future. This
increased efficiency will be revealed in the larger number of declarations
processed. The time of operations calculated indicates that the
Computer can absorb the supplementary load without difficulty.

A final point, explained in greater detail in Ch. IV (the National
Treasury) should be made. Keeping an individual account for each
taxpayer, verification on the Computer account by account of tax
receipts, automatic printing of reminders and summonses in cases of
non-payment, the systematic imposition of penalties for delayed pay-
ments, all will increase the efficiency of collection and the
measures described above will thereby bear their fruit.

IV. OPERATIONS PREPARATORY TO THE CONVERSION ON THE COMPUTER

A. Real Estate - business license file

Before being transcribed on magnetic tape each entry from the real estate file and from the business license file should be given a codified address and a cadastral number--or, at least, one of the two. The codified address will simply consist of a street code and a house number. (A street directory will have to be established, and an arbitrary number assigned to each street.) For streets not having house numbers some kind of numbering system will have to be devised.

The duplication of the cadastral number will, no doubt, be possible only after modifying and updating the cadastre. This is an important task since only the cadastral register-- in addition to its usual purpose--can show whether or not the real estate tax does, in fact, cover all private realty. If the cadastral number is reasonably convenient and up-to-date, it can be used as the basic criterion in classifying the real estate-business license file (that is, in the classification of tax bases and assessments). In this case it will not be necessary to codify the streets. In the contrary case, the codified address will be used as the basis of classification; the cadastral number will then be used only for periodic checks, and will insure that in the subdividing of lands plots do not escape taxation.

In brief, the tasks to be accomplished include:

1. bringing the cadaster up to date

2. the establishment of a street directory for the Saigon-Cholon area

3. keeping this directory up to date

4. duplicating the cadastral number, the street number, and the taxpayer number on the real estate and business license tax cards

5. punching of these two files, listing and checking

6. sorting of the business license file by cadastral number, listing, and checking against the cadaster

7. sorting of the real estate and business license files, by codified address, listing and checking

8.. keeping this file up to date, if it is not stored in the Computer immediately.

B. Central taxpayers file

A form for each taxpayer having a file for each kind of tax, will have to be made. These forms may, for example, be filled by hand on punched cards. Maximum information (address, occupation, etc.) will be given on each card.

They will then be alphabetically sorted either manually or on the sorting machine, after punching the name. By visual comparison, multiple cards pertaining to one taxpayer can be eliminated, noting on the card kept the different taxes paid by a given tax payer.

Since it is important not to assign several different codes to the same taxpayer, this work will have to be done once more after the cards have been sorted by streets.

The remaining cards will then be numbered, alphabetically, or otherwise. Using different series for wage earners, industrial and trade profits, and companies is, however, recommended.

Government offices -- Customs, Indirect Tax Receipts, the Pension Service of the Treasury, the Directorate of Industry -- will be required to provide similar cards. These cards, will be used to complete the alphabetical file, and will then be returned giving the taxpayer number.

Employers will likewise be given, and informed of, their taxpayer number.

The central taxpayer file will then be kept and up-dated in alphabetical order. The forms can be directly consulted or mechanically printed lists can be made from them--if they are punched cards. This last solution seems the most desirable, but requires the up-dating of the lists.

Whatever the method used for the alphabetical file a card per taxpayer will have to be punched, and the cards will have to be sorted, by code, to be included in the magnetic file.

The manual file will be brought up to date each time a new taxpayer or a new "customer" of Custom Duties, the Directorate of Industry, Indirect Taxes or the Treasury (Pension Service) makes an appearance. All necessary precautions must first be taken so as to ascertain whether or not it is a question of a new taxpayer and not of a variation in name or address of an already listed taxpayer. Only then will a manual card, to which a number is given, be established.

C. National Registration

It goes without saying that a census will be required in order to establish this registry. The preceding paragraph described a survey procedure, by file. However, a more general method might be used.

The main difficulty requiring a thorough study by a specialist lies in the choice of the registration system. It must have three main qualities: universality, specificity, and convenience.

The registry must be <u>universal</u>, that is, any individual, employer, company, firm, in a word, any physical or juridical person or entity can be given a registration number.

Registration must be <u>specific</u> in that it is so conceived that it is impossible to give several different registrations to the same individual. (It should be noted that an individual may provide different information from one day to the next if he does not know his date of birth, for example.)

The criterion of convenience will be much more difficult to determine. It will require an investigation in relation with all departments or state bodies which may be called upon to use this code. This investigation will determine, if, for instance, the code should have a logical structure, and what this structure should represent. For example, should a simple reading of the register show that it is a question of a man or a woman, of what age, etc. . . . or is this unnecessary?

It should be noted that codes which are too descriptive are cumbersome, especially in the registration of firms. A change in type of business requiring a change in registration would be prejudicial to the best use of the files.

The choice of a registration system is of prime importance. An unfortunate decision at this stage may make the system lose the largest part of its value.

TAXATION

UP-DATING OF THE REAL ESTATE -- BUSINESS LICENSE FILE

Investigations
Sales
New Constr.
Declaration
of business
openings or
closures

CODIFICATION
Street No.
Cadastral No.
Taxpayer No.

Verifier,
Punch

Investigations
Sales
New Construction
Business
Openings and
closures

082   Sort by
Address

Changes

Real
estate
records

421   Computer   421

Business
license
records

Real
Estate-
Business
licenses

Changes

Real
Estate-
Business
licenses
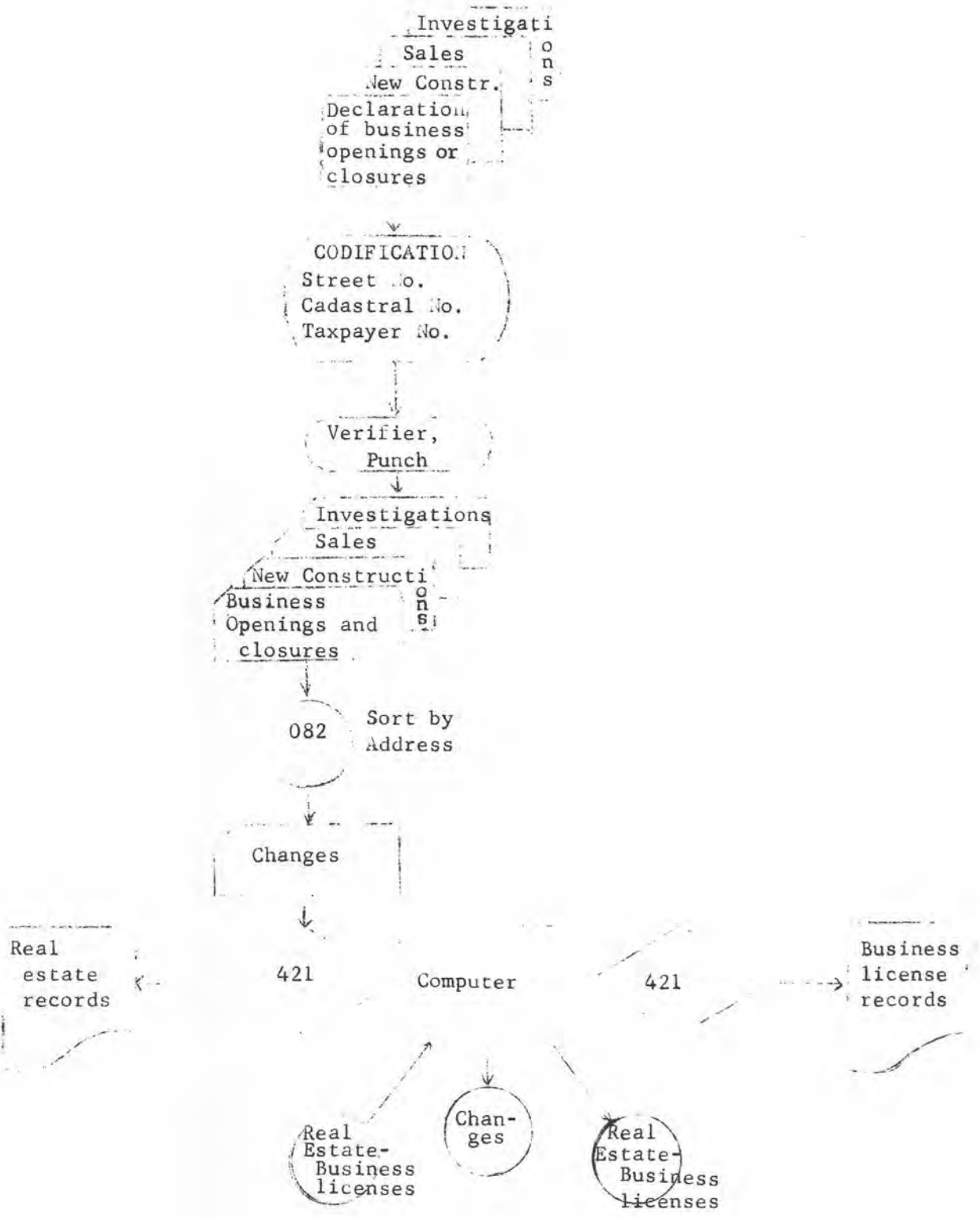
TAXES (REAL ESTATE AND BUSINESS LICENSE)

PRINTING OF LICENSES, ASSESSMENTS, AND NOTICES
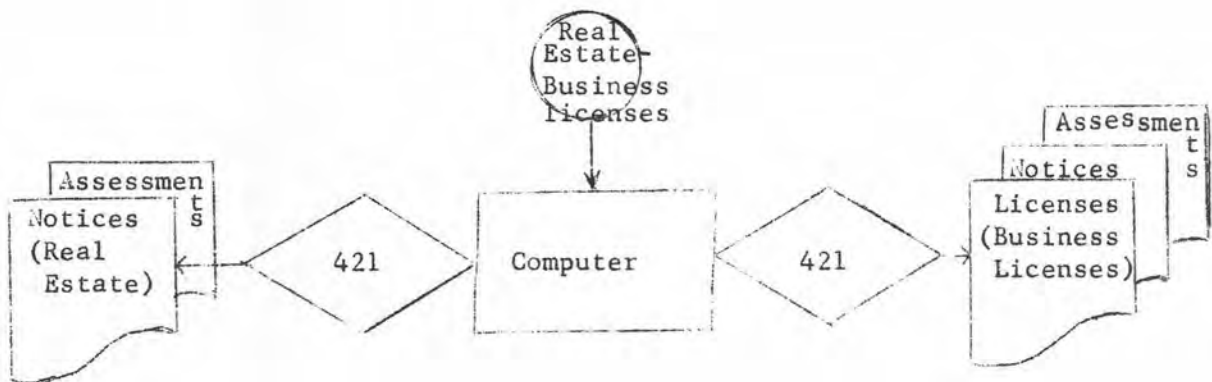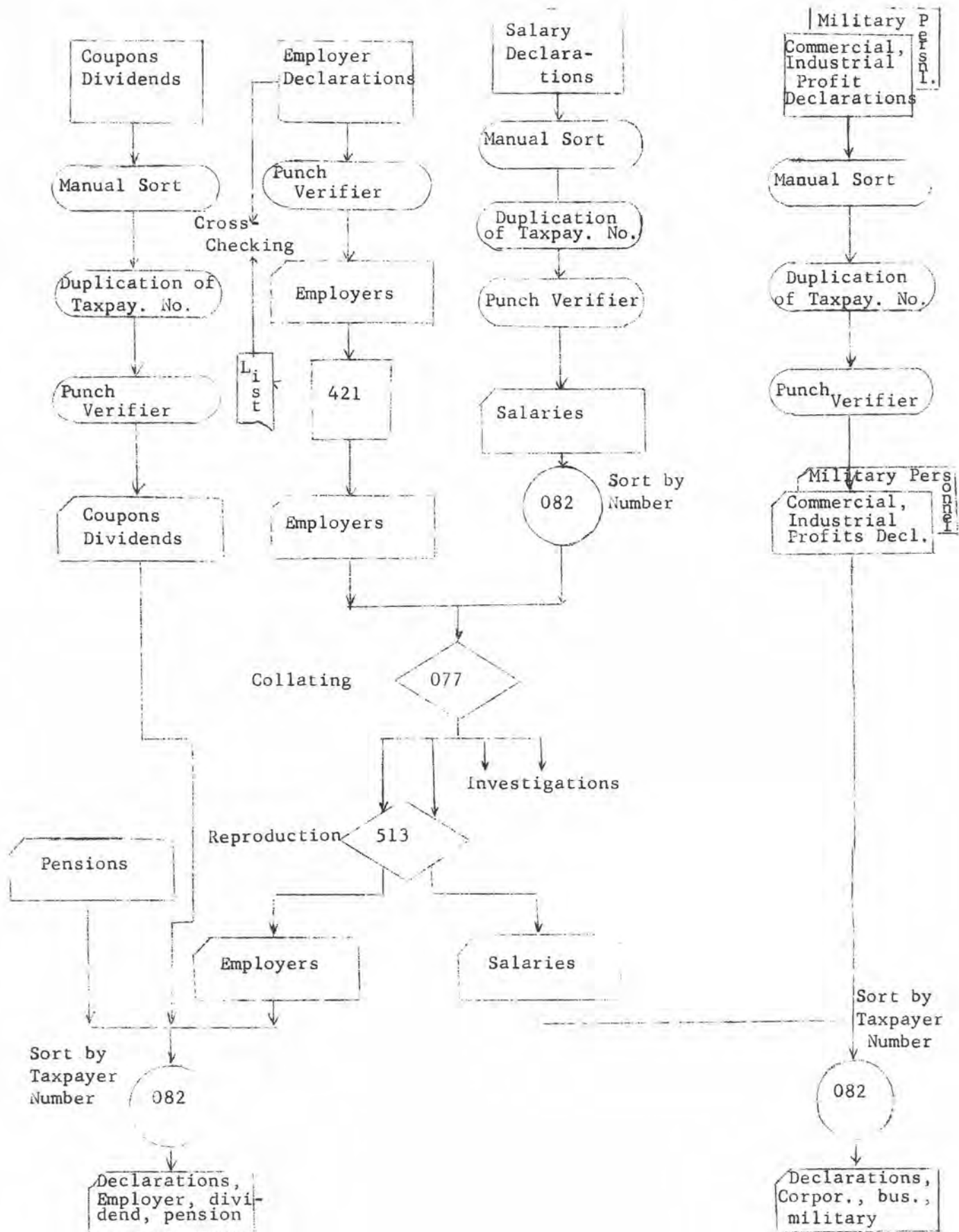
TAXES

UP-DATING OF TAXPAYERS CENTRAL FILE
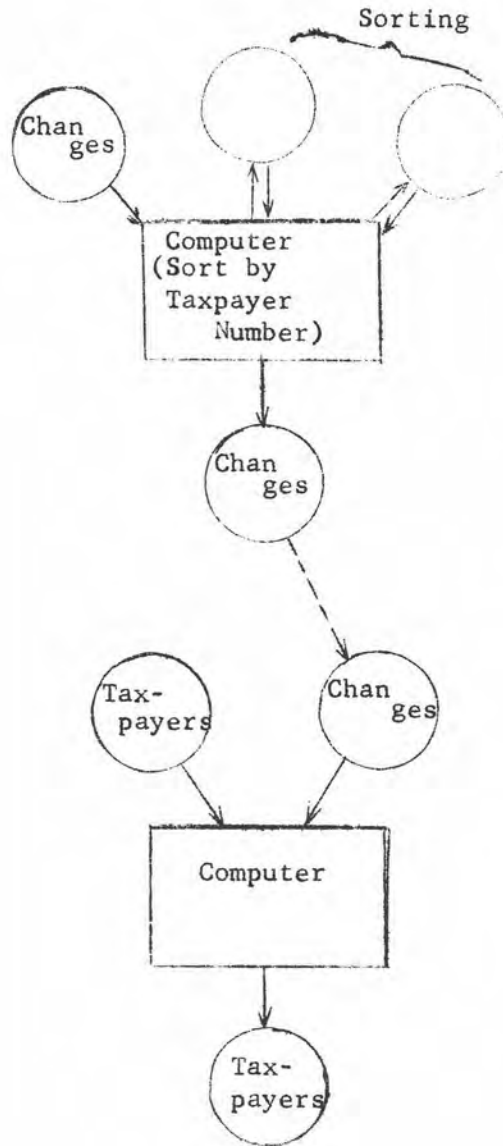
TAXES (SALARIES, INDUSTRIAL AND COMMERCIAL PROFITS, INCOME, CORPORATIONS)

PRINTING OF ASSESSMENTS AND NOTICES
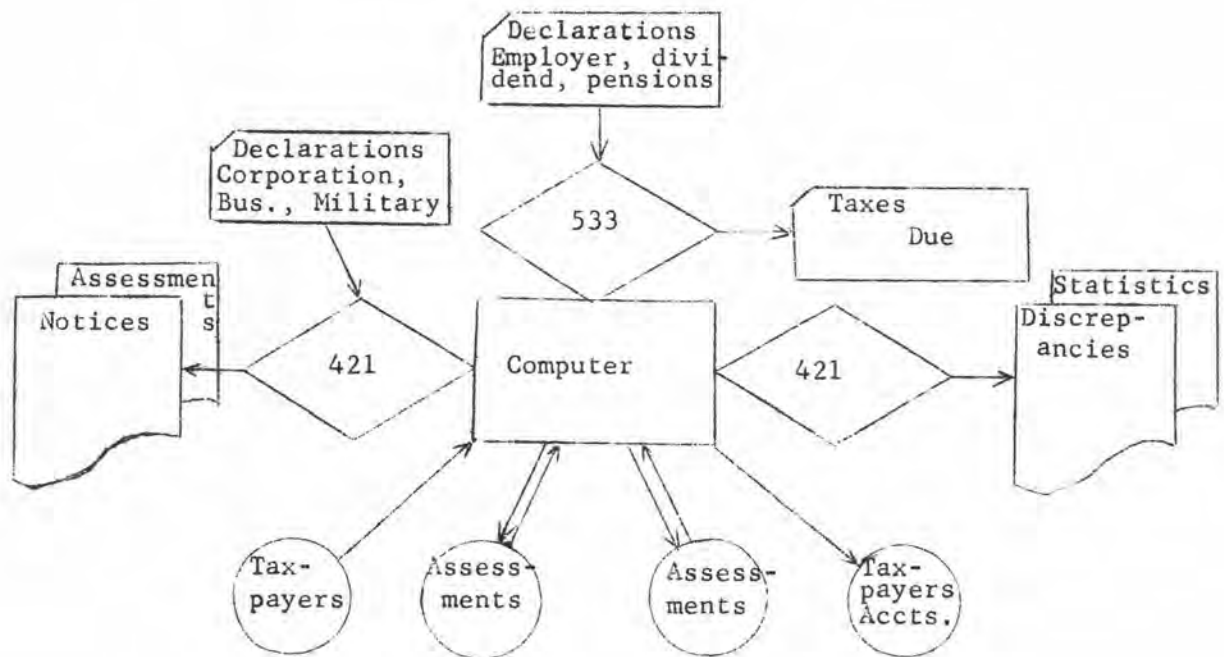
TAXES (INDUSTRY, COMMERCE AND CORPORATIONS)

CONTROL OF DECLARATIONS

Balance Shts

Profit and
Loss
Statements

↓

Duplication

↓

Punch
Verifier

↓

Industry and
Commerce

Salary statements

Customs

Production Tax

Directorate
of Industry

Industry and
Commerce

533 → Statistics

Tables ← 421 ← Computer → 421 → Discrepancies
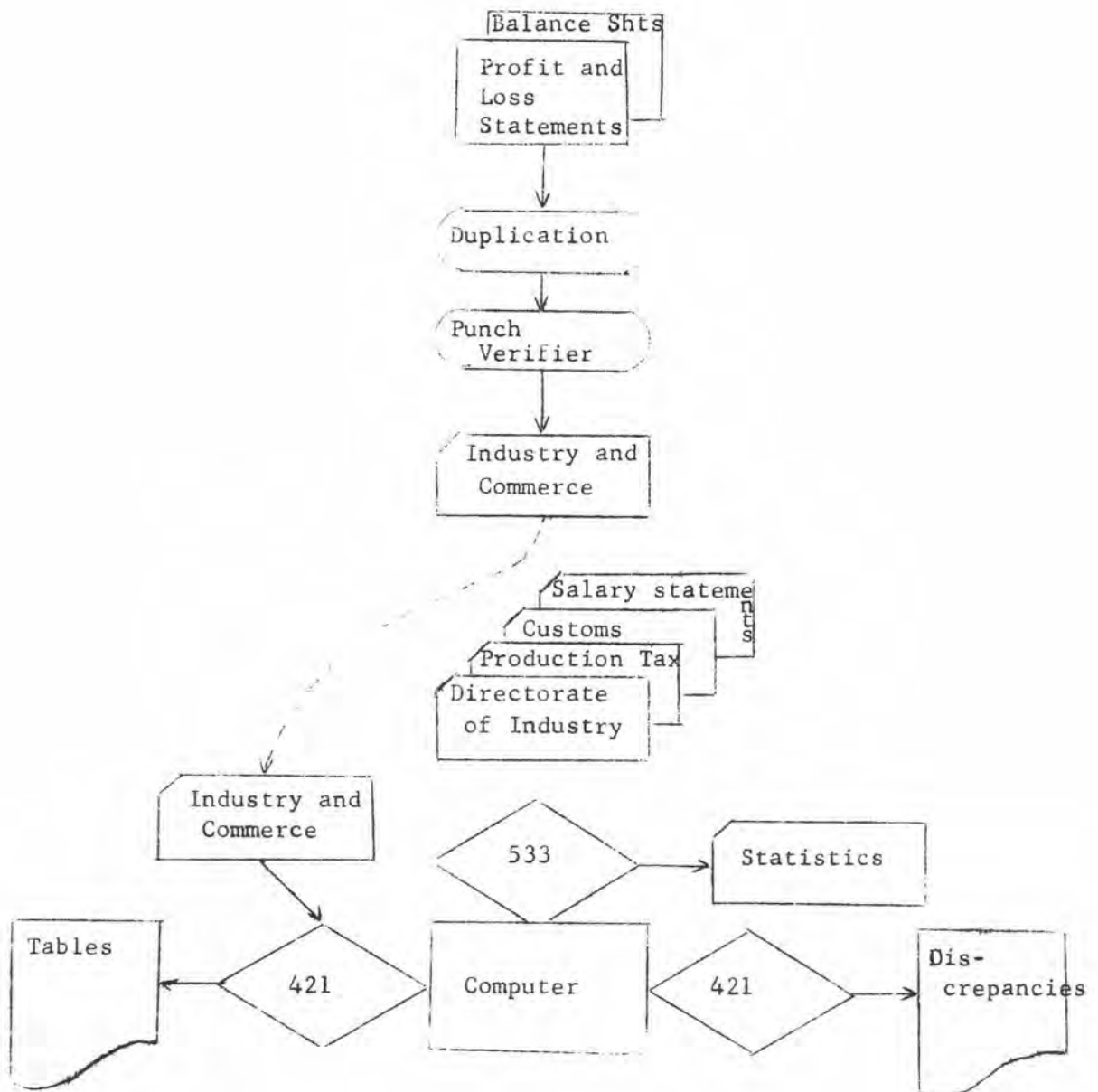
CHAPTER IV

THE NATIONAL TREASURY AND BUDGETARY RECEIPTS

I. CURRENT OPERATIONS: POSSIBLE IMPROVEMENTS

The Treasury is the State's accountant; as such, it is responsible for a centralized general accounting as well as the control, not only of budgetary receipts but also of budgetary and non-budgetary expenditures and provincial expenditures.

It is also a treasurer: collection of taxes, advances (précomtes), reconstruction lottery, pensions, and cash operations.

Finally the Treasury is a bank, with a third kind of responsibility: transfers, special funds and special deposits (caisse des dépôts et consignations).

At the present time, all Treasury transactions involve at least two actions: banking or treasury operations, done by the specialized department; then, centralized accounting.

The following operations are already partially mechanized on punched card machines:

1. special accounts

2. control of budgetary expenditures

3. pension payments

4. payroll

The collection of taxes is partially mechanically controlled. A more complete mechanization of initial operations is desirable. The punched cards might be used, by the centralized general accounting, with a consequent saving of money and time.

At the present time, the control of expenditures and collections requires periodic statements on unpaid balances. Since the volumes involved are large, it seems unlikely that this task can be satisfactorily performed, without the most modern equipment.

II. SOLUTION ON THE COMPUTER

The Computer will accomplish both of the above tasks in a single operations. The specialized departments are:

1. budget (receipts and expenditures)

2. non-budgetary transactions

3. account administrators (préposés)

4. collection of direct taxes

5. lottery

6. pensions

7. cash

8. transfers

9. special funds

10. special deposits

A single account title or a small number of titles in general accounting pertain to a given department, with but very few exceptions.

Additional accounts, particularly an account title on receipts due, and an account for sundry persons, would provide for these exceptions. The individual operations of a given department can be processed at the same time as the general accounts, by subdividing the account or accounts concerned into headings adapted to the nature of the operations.

A detailed description of all Treasury transactions would go beyond the scope of the present study. Three examples will be used to illustrate the Computer method: orders for payment, collection of taxes, and budgetary receipts.

A. Orders for payment.

Punched cards from the Directorate General of the Budget are filed after checking against invoices. As approved orders for payment are received, the cards are taken from the file and a secondary pass on the Computer confirms that credit is available. The cards are then stored "awaiting authorization". This second control operation has no reason to be, except at the beginning of operations to discover missing documents. The card corresponding to an approved order for payment is extracted from the the file and entered on the books:

DT National Budget - CR Reserved Funds

The debit entry is recorded on tape, under Ch. 8-01 (National Budget), under the title, Budgetary chapter "X". At the end of the month, under this heading, the total of all the orders for payment pertaining to budgetary chapter "X" during the month, and since the beginning of the year, will be given.

The credit entry will lead to the printing of a new heading, Orders for payment No. "X", in account 16-15 (Reserved Funds) If the order for payment is paid from Treasury funds, this operation results in a double entry.

     DT Reserved Funds   --   CR Cash

The debit entry will be made under the heading, Orders for payment No. "X", in account 16-15 (Reserved Funds). At the end of the month, since this account balances, the file record is erased.

Two series of headings, Budgetary Chapter "X" and Orders for payment No. "X" replace the present Treasury control of the budget and, at the same time, the required accounting entries are made.

B. Collection of direct taxes

Two new accounts will be established in the records of the Treasury: "Direct taxes due" and "Sundry persons" There is no reason why these should appear on the general balance sheet, if it is judged wiser to omit them.

A double entry is made for each tax notice:

     DT Sundry Persons   --   CR Direct Taxes Due

The debit entry will be recorded in the account Sundry persons. Under the heading corresponding to the taxpayer number, the total amount and the due date will be recorded on the tape, taxpayer accounts, as described in Ch. III (Direct Taxation).

The credit entry will be made in the account Direct taxes due. When the taxpayer pays his taxes, the clerk takes his taxpayer number from the tax notice or from the alphabetical file of taxpayers. With this number, he can find the pre-punched card giving the amount due and see if the cards next to it do not show other amounts owed by the same person. If the taxpayer makes a partial payment, the total paid will be recorded, then punched on the card. The card, fed to the Computer, initiates the following entries:

     DT Direct Taxes Due   --   CR Sundry Persons

     DT Cash   --   CR Taxpayer "X"

The first credit entry is recorded in the account Sundry persons, under the taxpayer heading, after a calculation of late penalties, if applicable.

The account title "Cash" does not have a special heading.

Finally, the credit entries are recorded under the different account titles according to the tax appropriation. The card gives the breakdown, in the case of full payment, or the Computer calculates it, in the case of partial payment. In cases of partial payment, a new card is automatically printed and inserted in the file.

This method eliminates the account "Receipts to be distributed" and keeps both the general accounts and a permanent account for each taxpayer. These accounts give amounts due by taxpayer; the Computer can immediately recalculate them, according to allotments. Advances can be made more readily than at the present time (provided one knows the taxpayer number).

But the main advantage of the system is that the Computer can periodically (monthly, for example) consult the file and when a a due date has been passed:

1. immediately print payment reminders and invoices

2. automatically calculate and apply late penalties.

C. Control of budgetary receipts

The system described for the collection of taxes can also be applied to budgetary receipts, provided one uses an additional account, "Budgetary receipts due". The account titles of the various warrants are entered as they are issued.

The issuance of a warrant initiates the double entry:

    DT Sundry Persons   -   CR Budgetary Receipts Due

If the payer is a taxpayer identifiable by taxpayer number, the debit entry can be duplicated under the appropriate heading in the account, Sundry persons; if not, additional headings can be established.

The credit entry will require an additional heading showing the warrant number in the account, Budgetary receipts due. This heading may show the budgetary allotment number.

At the time of collection, the Computer will make the following entries:

    DT Budgetary Receipts Due -- CR Sundry Persons

    DT Cash   -- CR National Budget

The first debit entry will result in a zero balance of the corresponding heading: at the end of the month, the list of non zero headings shows amounts still to be collected and the zero headings represent the collections of the month, which are then erased from the file. The first credit entry will up-date the sundry persons account (of taxpayers and non taxpayers).

The second credit entry will be made in the account "National budget". This account will be divided, on the receipt side, into headings corresponding to the Titles, Chapters, Articles and Paragraphs of the Budget (receipts). A reference to these headings will show, by budget allotment, monthly receipts and receipts since the beginning of the year. It may also provide the total value, by paragraph, of amounts still to be collected.

In brief, a solution of the other problems of the Treasury will involve subdividing the following chapters:

1. American economic aid (by project)

2. Funds for special programs (by program)

3. Treasury accounts (by departmental treasury)

4. Deposits made by contractors (by deposit)

5. Deposits of unrestricted village funds (by province)

6. Import-export compensation tax (by documentary receipt)

7. Amounts withheld from suppliers (by supplier)

8. Special funds (by depositor)

9. Pensions (by beneficiary)

10. Special deposits (by unpaid deposits), etc.
    (Caisae des dépôts et consignations)

All the accounts, and within each account all the headings listed above will be recorded in a file on magnetic tape. The file will be up-dated by "transactions" cards, sorted by account and heading: an entry up-dates an account. The up-dating of a heading is the control. A periodic list of the unbalanced headings will provide:

a. a statement of amounts due (compensation tax)

b. a statement of pensions paid

c. unpaid pensions

d. the balances of special accounts

e. the general balance of the special deposits account.

Whenever necessary, a detailed list of monthly transactions will be kept on magnetic tape, by account title or by heading. It will be used in making out monthly statements. It will also be used in printing balance sheets.

In practice, certain headings will rarely change: pensions (once a month or once a quarter), taxpayers (3 or 4 times a year), special deposits (a maximum of 3 or 4 changes during the life of one heading). It would be wasteful to include such headings on the magnetic tape read daily. They will be included in a supplementary file, read, controlled, and up-dated only once a month, at the same time as the daily file, and in the same manner as if all information were contained in the same file.

The time of operations and the results furnished are as follows:

1. Daily operations

Each daily input operation will result in a punched card containing:

      a. operational code

      b. address

      c. total value

      d. account number

      e. heading number

      f. cross-reference account (and the heading, if required)

      g. date

In certain cases (orders for payment and collections), the cards, instead of being manually punched, will be extracted from the pre-punched file. The cards will be sorted by title and heading, and listed on the tabulator. The lists will then be sent to the departments concerned and will be used as journals and check lists.

Each "operation" is now represented by a card which will lead to a double entry. The method described below may not be ideal but the accounting is absolutely reliable without the need for certification.

The cards are read by the Computer, transposing the account title and its cross-reference. (They may also be listed if

desired). Simultaneously, they are recorded in duplicate on magnetic tape. This tape now contains an itemized record of transactions awaiting entry. These are sorted by the Computer. A "transactions" tape (classified by account title and heading) is obtained.

The magnetic file "Accounts and headings" is duplicated on magnetic tape and up-dated by a simultaneous reading of the transactions tape. During this operation, the Computer prints:

    a. an up-to-date "Accounts and headings" tape (containing the list of transactions since the beginning of the month)

    b. a tape "transactions to be recorded" grouping the month's transactions under monthly headings

    c. journals, entry sheets, or lists on a connected tabulator, according to the legal requirements for the keeping of records

    d. the balance of certain headings (e.g., portions of special accounts), on the second tabulator.

2. Monthly operations

Once a month, the Computer will again read the "Accounts and headings" file to print, on a connected tabulator:

    a. for certain accounts, by headings: the list of monthly transactions: certified and validated orders for payment, corrected orders for payment, receipts, etc.

    b. for some accounts: the headings balance of amounts owed, amounts due

    c. for other accounts: list of Computer calculations (e.g., interest payments to special accounts)

on the second tabulator:

    a. the general monthly balance

At the same time, the Computer prints the "Accounts and headings" tape erasing the detailed record of the preceding month's transactions.

The Computer then reads the magnetic tape, Accounts for monthly up-dating (containing pensions, taxpayer accounts, and special deposit accounts) and updates it by a simultaneous reading of the tape containing the month's transactions for

recording. During this pass, the connected tabulators print statements similar to the ones just discussed:

a. pension statements and remittances

b. amounts owed on pensions of the preceeding month

c. records of changes in the pension file

d. tax totals, tax totals including penalties for late payment, amounts of penalties

e. taxes due

f. interest paid on special deposits

g. special deposits accounts closed during the month

h. general balance of special deposits (once a year)

The time of operations has been calculated on the basis of the following figures:

Number of accounts and headings	400
Number of headings: National Budget expenditures	120
National Budget receipts	1,000
orders for payment during the month (reserved funds)	15,000
orders for payment outstanding (reserved funds)	50,000
budgetary receipts due (current warrants)	10,000

Daily operations:

a. Taxpayers (Saigon-Cholon)	80,000
b. Compensation taxes (current)	4,000
c. Special funds	13,000
d. Pensions	20,000
e. Special deposits	15,000
f. Miscellaneous	20,000
Number of entries per month	150,000

Daily number of printed lines	6,000
Number of lines on monthly statements	60,000

These volumes, especially the number of lines, are very diffi-
cult to determine exactly from the present system. Moreover,
some of the procedures are complex. It is not possible at
this stage to precict detailed Computer procedures. Thus the
procedures described below are only estimates:

1. three thousand cards (500 of them, prepunched) for daily
use: 5 punch operators and 4 verifiers will be required

Daily operations on the Computer --

3 hours

Monthly operations on the Computer --

10 hours

Eventually when the number of Computer tasks increase, dupli-
cation and sorting can be done on standard equipment instead
of on the Computer. About half an hour per day can thereby
be saved. Once the staff has acquired sufficient experience
and discipline, there is little danger of error. In any case
the operations are controlled by the Computer.

III. ADVANTAGES OF THE METHOD

A. More reliable control of budgetary receipts.

B. Simple and rapid procedures in obtaining exact information
on amounts owed and amounts due

C. Rapid accounting procedures

D. Automation (which will release accountants--between 50 and 80--
to fill other posts which have remained vacant due to a shortage
of competent personnel)

E. Individual taxpayer accounts; automatic printing of reminders
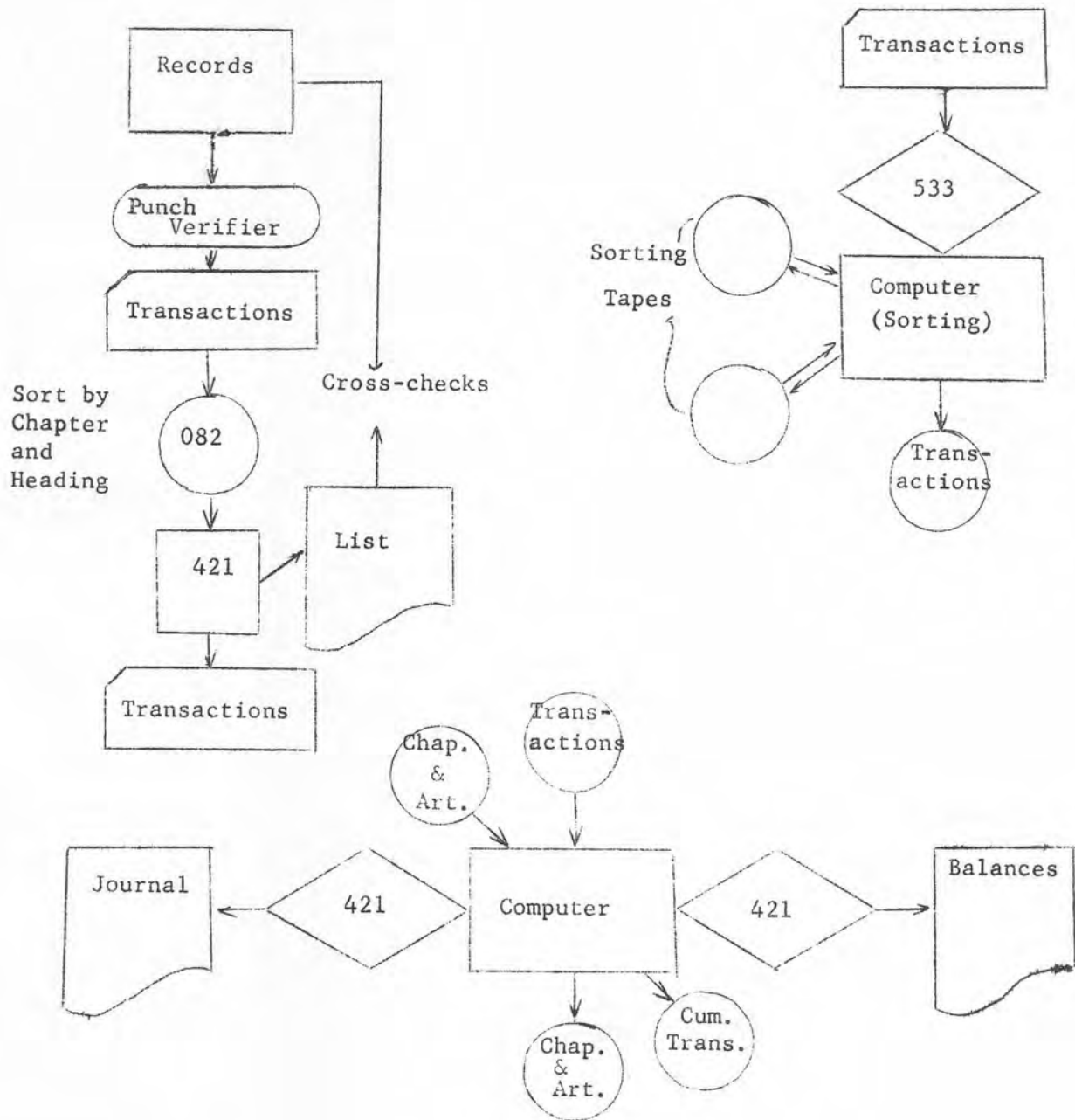and summonses for delinquent taxpayers; automatic calculation
of penalties.

Automation will also involve certain problems, particularly at
the beginning of operations. Since Computer operations are
simultaneous, the sequencing of these operations may not be the
most convenient for each of the related manual operations.

Programming has to be such that the Computer is able to cope with all possible contingencies in Treasury operations. In a word, the program will be extremely complex. It will take a long time to write and it will be difficult to finalize. Because of the large number of instructions, portions of the program may have to be stored so as to relieve the central drum memory.
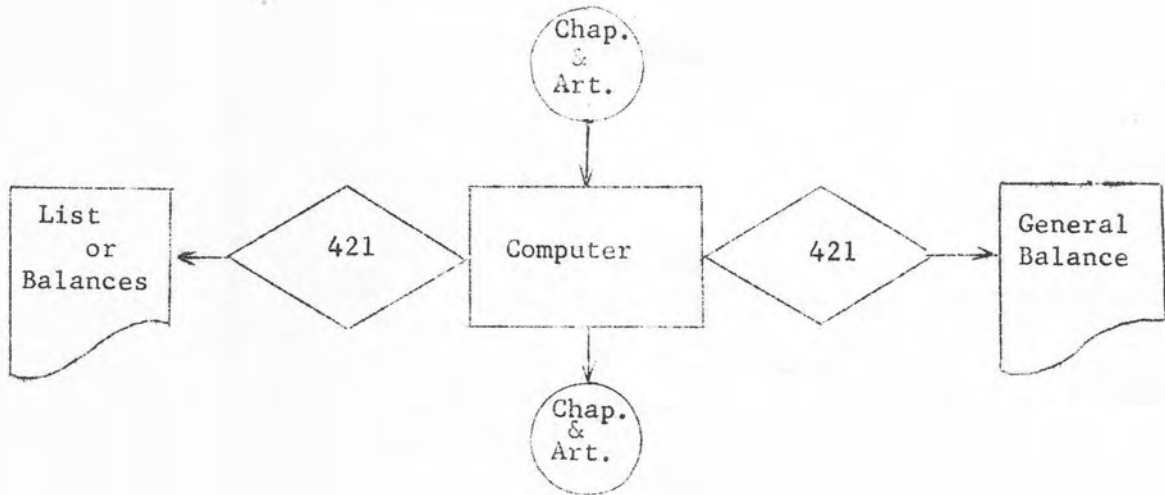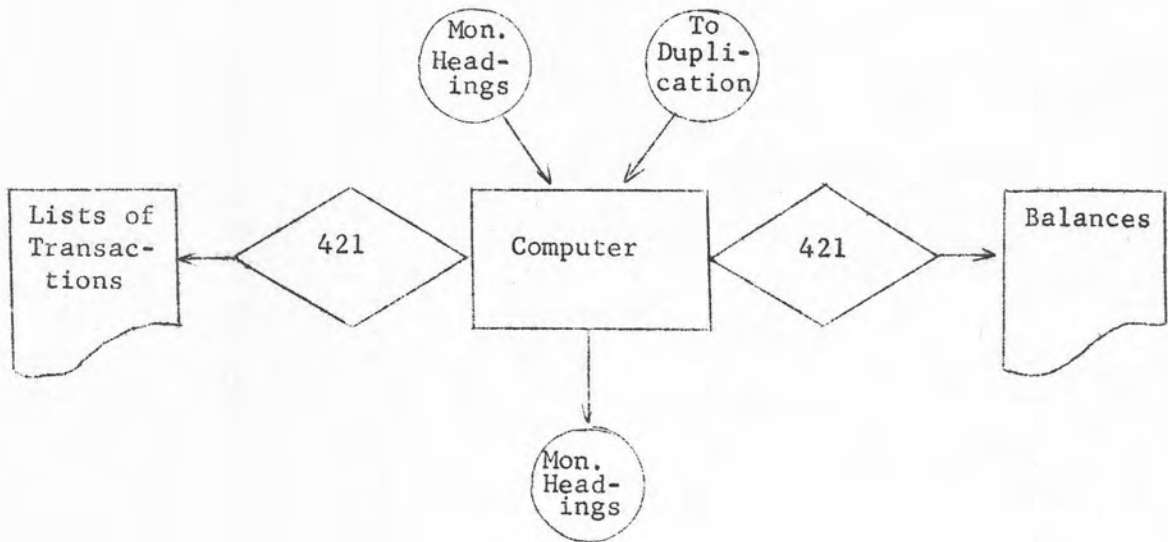
IV. OPERATIONS PREPARATORY TO CONVERSION TO THE COMPUTER

Computer programming requires an exact knowledge of the volumes involved and a detailed outline of procedures to be followed in each case. As soon as possible, the present Treasury operations must be mechanized on standard punched-card machines for effective programming. Four installations will be required. This question is studied in greater detail elsewhere.

THE TREASURY

DAILY OPERATIONS

THE TREASURY

MONTHLY OPERATIONS

Mon. Head-ings

To Dupli-cation

Lists of Transac-tions

421

Computer

421

Balances

Mon. Head-ings

Chap. & Art.

List or Balances

421

Computer

421

General Balance

Chap. & Art.

FRENCH MS. - pp. 59-73

Chapter V

IMPORT CONTROL - NATIONAL INVENTORY OF IMPORTS

CONTROL OF THE SUPPLY OF COUNTERPART FUNDS

I. CURRENT OPERATIONS: POSSIBLE IMPROVEMENTS

A. Directorate General of Commerce (formerly CNI)

When import licenses are issued there is a cross check by
procurement authorization and by name of importer. Appli-
cations for procurement authorizations, on the one hand, and
the rejection or acceptance of applications for a license,
on the other, are considered with regard to statistics
calculated on IBM machines by the National Bank of Viet Nam.

Despite the greatest care, it is almost impossible to insure
regular entry for each type of import. The Directorate
General of Commerce verifies the various items on the procure-
ment authorizations by reference to the licenses, but has no
way of verifying the "discharge" of the licenses by checking
against actual custom entries. The unaccounted-for items on
the procurement authorizations can only be checked on ICA
reports.

Improvements can be made:

1. the type of product code: the present 150 categories
should be increased to about 400, using a code consistent
both with ICA's and customs records.

2. Present statistics are still insufficient for these
needs.

3. Licenses should be cross-checked against actual entries.

4. The timing of import arrivals should be improved.

B. National Inventory of Imported Products

There are now few available statistics except for customs
arrivals. This is unfortunate because for several years to come,
large numbers of essential goods will be imported. Fluctuations
in their inventories have immediate and significant repercussions
on price levels. Price levels have been relatively unstable
in recent years.

Planned timing of import entries is therefore necessary for the economic health of the country. For certain vital products, it is even more crucial, e.g. a severe shortage of milk, antibiotics or vaccines, might cause incalculable damage.

Delivery of imports, requires time; planned timing can be effective only if it is soundly based on information on stocks and long term needs. A special effort must therefore be made to obtain such information.

C. Supply of Counterpart Funds

The supply of these are effectuated at the National Bank by an accounting method from which estimates cannot be obtained. It is necessary, however, that the Directorate General of the Budget and Foreign Aid have reasonably precise estimates of the amounts of Counterpart Funds expected.

II. SOLUTION ON THE COMPUTER

A. The Principle

The method described is not an ideal solution. More study is required. Nevertheless, the Computer can solve administrative problems by a new approach. An "imports" file on magnetic tape will be used. It will include all types of goods which might be imported (400 categories). A basic distinction will be made between two kinds of imports:

1. standard items for current consumption (wheat flour, sugar, condensed and powdered milk, antibiotics, tobacco, ordinary printed cotton material, gasoline, cement, laminated and sectional steels, etc.) for which it is easy to maintain inventory records by item.

2. other goods (chemical and pharmaceutical goods, manufactured articles, etc.) which can be listed only by general category.

3. For each article of current consumption, there will be recorded on the magnetic tape:

a. article number,

b. name,

c. maximum and minimum import price (by quality and country of origin),

d. resale mark-up allowed by the Directorate of Price Control,

e. currency total for the year,

f. total currency releases since the beginning of the year,

g. total value of licenses issued each month during the past twelve months,

h. goods entered during each of the last twelve months,

i. "inward entry norms": the quantities expected in Customs each month during the next twelve months and which are estimated to best satisfy the needs of the domestic market, (see below, Note 1),

j. total of inward entry norms for the most recent quarter,

k. current procurement authorizations (for imports on American aid) or currency released for the article, when other than United States currencies are involved. Each procurement authorization currency release will include:

(1) a number,

(2) total value,

(3) number of licenses pending,

(4) number of licenses refused,

(5) date of expiration,

(6) total amount (in piastres) credited to the Counterpart Fund for previous custom entries on this procurement authorization.

l. for each procurement authorization (or release), the import licenses, indicating on each:

(1) a license number,

(2) importer code,

(3) total value,

(4) quantity,

(5) expected delivery date (or delivery dates with expected quantities for each): month and year,

(6) expiration date of the license,

(7) quantites and values previously entering
customs under this license,

(8) country of origin.

The file will be up-dated when licenses are granted,
when goods arrive in customs, and when special investi-
gations are made.

When a new license has been granted, the Computer first checks
the credibility of the price indicated. It then compares the
inward entry norms to actual entries of the preceeding quarter to
discover if one is ahead or behind schedule. If necessary, the
excess shortage will be distributed over the norms of the following
succeeding months. By scanning the current licenses file, the
Computer can calculate inward entry estimates for each month,
compare them to the norms, and determine what quantities should be
added to the entry estimate for each month. Quantities and time
required for delivery shown on the license can then be judged
accordingly.. If necessary, some pressure might be applied on
the importer: by not acting on his license if the expected date
seems too close or, on the contrary, by giving the license an
imminent expiration date if the expected delivery date seems too
distant.

When an arrival is reported by Customs, the file will be up-
dated by adding the quantity received to the value of the
entries for the month, and by subtracting this quantity from
pending entries on the licenses. At the same time, the Computer
can note, first, the time lapse between the date of entry and
the forecasted entry date (for statistical purposes), and second,
entries after the expiration date of the license (for the
levying of penalties).

4. The Computer will publish daily statements. Monthly
statistical statements will be taken from the magnetic
tape. These will be similar to current statements, and
eventually, will be modified for more convenient usage.
In particular, the structure of the magnetic file makes
possible a printing of the previous year's record for each
month. Finally, this file will also provide detailed
information on the operation of the Counterpart Fund, and,
in particular, on:

a. credits already paid on current procurement
authorizations,

b. remaining unpaid amounts on current licenses,

c. remaining unpaid amounts on current procurement
authorizations (by expiration date of procurement
authorization,

d. the amounts yet to be paid under the annual program.

When a procurement authorization is terminated and all its licenses cancelled, the Computer will calculate the net balance of the procurement authorization and, before erasing from the procurement authorization and licenses file, will punch a card to record the net procurement authorization balance and the credits carried to the Counter - part Fund on terminated procurement authorizations. This information can be used with the assistance of the National Bank, for cross checking of errors and discrepancies between R O Ps (enroute) and actual custom entries.

There will also be a magnetic file of "importers", showing for each, in addition to his name, his importer number and taxpayer number. (It would be helpful if the latter two were both the same.) For corporations the date of the beginning of the accounting year will be given.

5. This file will be up-dated by licenses issued and by custom entries. It will contain the history (for a year, for example) of each license. It will be used:

a. to print a monthly importer sheet which will be manually up-dated until the end of the month,

b. to provide statistics by importer (including statistics of advances or delays in delivery to learn which importers retard the programs),

c. to provide at the end of the year, one or several punched cards showing, in addition to the taxpayer number, the total value in piastres of arrivals in customs during the year, broken down by the profit margin permitted by the Directorate of Price Control. These cards are used for fiscal control (see Ch. III).

Note 1: The present application is based essentially on the use of the inward entry norms. Most simply defined the inward entry norm for a month is equal to the forecasted consumption for the month (or for the following month if the time required for distribution is taken into account). It will be calculated from data on previous consumption (during the same month of the preceeding year for seasonal consumption and during the most recent recorded months for regular consumption). The methods of calculation will have to be decided, and may vary for different products:

(a) use of an expansion coefficient corresponding to country-wide increases or to increases in particular sectors,

(b) use of reduction coefficient for obsolescent articles,

(c) use of relevant data from other sources: building permits (for cement and construction materials), births (for food, clothes, or medicine for infants), etc.

Forecasted local production will be deducted from anticipated consumption. Declarations filed with the Directorate of Industry will be used for this purpose. Manufacturers' estimates may include serious inaccuracies; care is required. The optimum stocks for each article will also be calculated taking into account its average consumption, the regularity of consumption, its durability, its price, the implications of a scarcity, etc.

Actual stocks will be estimated from:

(a) importer declarations: articles sold, articles in stock, deteriorated products (e.g. antibiotics).

(b) anticipated repercussions of price fluctuations.

The spread between actual and optimum stocks will be distributed over the inward entry norms in order to approximate the optimum. The initial inward entry norms can be recalculated and adjusted by the Computer about once a month by using:

(a) the methods of calculation decided upon,

(b) the coefficient of general or sector expansion calculated,

(c) historical data accumulated by the Computer,

(d) monthly declarations filed by producers with the Directorate of Industry, or by importers,

(e) building permits, birth certificates, etc. . .

The Computer will require a permanent team of economists. The various data are subject to fluctuations - some of them regular; some irregular, resulting from economic changes, (e.g. the perfecting of synthetic fibers) and others having a psychological origin. Whether or not the methods of calculation of the inward entry norms are still valid, and whether the estimated stocks do, in fact, agree with actual stocks, should be regularly verified. For this purpose, the economists will refer to:

(a) historical data accumulated by the Computer (possibly presented in the form of graphs).

(b) their investigations on price fluctuations, the development of various manufactures, development programs, etc.

The results of these studies will be regularly read into the Computer in the form of coefficients, or new programs, or of adjustment of inward entry norms, etc.

Note 2: The above applies to itemized articles for current consumption. The principle remains the same for articles grouped in categories, but in a simplified form. Headings such as:

(a) purchase price

(b) national inventory

(c) monthly amount consumed

have no meaning; the discussion on inward entry norms is not applicable.

B. Computer: Operations and Statements

1. The punched cards representing:

a. new procurement authorizations

b. licenses requested

c. licenses refused

d. changes in the licenses

e. custom entries

are read by the Computer (by order of articles, procurement authorization, and license number) together with the magnetic tape "imports"; the latter is up-dated and the connected tabulators print by article and by procurement authorization:

(1) the number of licenses applied for, issued, refused, or in process,

(2) currency totals still available, licenses in process, and the quantities yet to be ordered during each of the next twelve months so as to approximate the norms,

(3) daily transactions.

Simultaneously, the Computer duplicates daily changes on the magnetic tape, having added all necessary data from the magnetic file.

2. The "daily transactions" file (approximately 300 transactions) is then printed (by importer) on magnetic tape, and then reread by the Computer to up-date the importer file.

3. Once a month, by a reading of the "imports" file the two connected tabulators can print all monthly statistics, according to product:

    a. list of licenses issued during the month,

    b. currency totals by country of origin,

    c. number and total value of licenses (for each of the last twelve months); entries during the last twelve months,

    d. statistics on licenses requested, issued, refused, or in process, by country of currency,

    e. monthly status of procurement authorizations, expected quantities for the twelve coming months,

    f. general situation: program forecasts, currencies released and releases under consideration.

The Computer will then print the balance of the Counterpart Fund:

    (1) procurement authorization credits used during the month,

    (2) cumulative and monthly credits for outstanding procurement authorizations,

    (3) credit allocations for current licenses (by month),

    (4) anticipated credits against current procurement authorizations.

4. Once a month, an additional reading of the "imports" file will make possible a printing, for ten per cent of the articles of current consumption, detailed tables or graphs showing the development, during the preceding year, of the inward entry norms, the licenses, the estimated and actual entries as well as projections for the next twelve months. This information will be available to the economists responsible for the control and up-dating of the programs as well as the various coefficients (see above).

5. Once a month, the Computer will read the "importer" file to print:

>   a. a sheet for each importer; the manual importer file will thus be up-dated monthly.
>
>   b. monthly statistics by importer: number of licenses, total value, and quantities permitted broken down by month and by article; quantities entering customs; average spread between stated and actual customs entry dates.
>
>   c. a letter of notification, and if required, the penalties levied each time an unused license expires.

6. Once a year, the "importer" file can be used to punch cards for the fiscal control described above.

C. Time of Operations

1. On the basis of the following figures:

> | | | |
> |---|---|---|
> | a. | number of product categories | 400 |
> | b. | number of licenses requested per month | 2,000 |
> | c. | number of licenses issued per month | 1,000 |
> | d. | number of outstanding licenses | 6,000 |
> | e. | number of importers | 1,200 |
> | f. | customs entries per month | 4,000 |

The time required by the Computer for these operations will be:

>   daily . . . . 40 minutes
>
>   monthly . . . . 3 hours

III. ADVANTAGES OF THE METHOD

A. Verification of the credibility of the price of certain articles for which licenses have been requested.

B. Control of reconciliation of procurement authorizations and of licenses.

C. Notices to importers whose licenses are not reconciled.

D. Statistics on the regularity of inward entries, by importer and by product.

E. Assistance to the office of Direct Taxation by providing data for the control of declarations: for the prevention of issuance of licenses to delinquent taxpayers.

F. Control of the supply of Counterpart Funds.

G. Information for essential articles on the spread between forecasted inward entries and the quantities required for a sufficient supply to the market for each of the following twelve months. This information can be used:

   1. to step up requests for procurement authorizations,

   2. to give ICA a basis for currency release of urgent procurement authorizations,

   3. to influence license-granting policies,

   4. to inform importers, and to influence license applications (as well as estimated delivery dates),

   5. to plan economic measures for general improvement.

H. Simultaneous execution of all controls relating to commercial imports, regardless of the currency source.

I. The structure of the files, as described above, is especially helpful for customs operations, i.e.:

   1. calculation of duties

   2. liquidation

   3. control of collections

   4. gathering of statistical data.

All this can be accomplished with little increase in time of operations. Nevertheless before deciding to have the Computer do these tasks, a supplementary study should be undertaken to learn if the constraints imposed on Customs actually permits the suggested reforms.

IV. OPERATIONS PREPARATORY TO THE CONVERSION ON THE COMPUTER

A. First, a detailed product code must be established. It will have to satisfy procedures and classifications of Customs, ICA, and the Directorate of Price Control. The new international customs code might be adopted eventually.
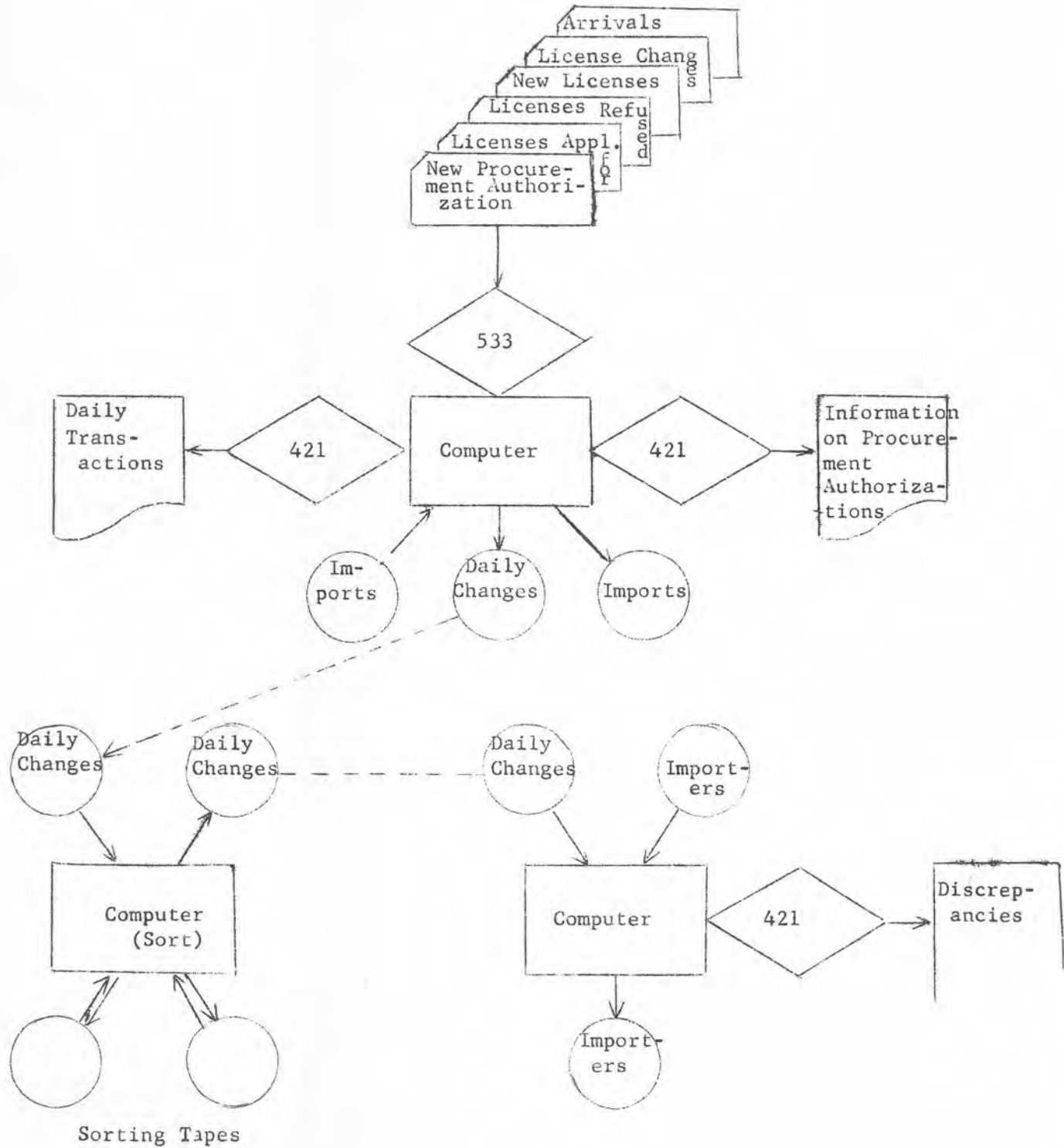
In addition, the economic import machinery should be studied in detail in order to determine:

1. the basic data required and the calculations necessary for accurate estimates of import needs,

2. the statistics required in quickly and efficiently evaluating the actual situation in relation to the desired optimum,

3. economic and other means of action available to improve conditions, in particular by modifying delivery dates on the basis of available information.

An economic investigation would permit a modification of the Computer tasks described above, and more precise - and effective - procedures may be developed.
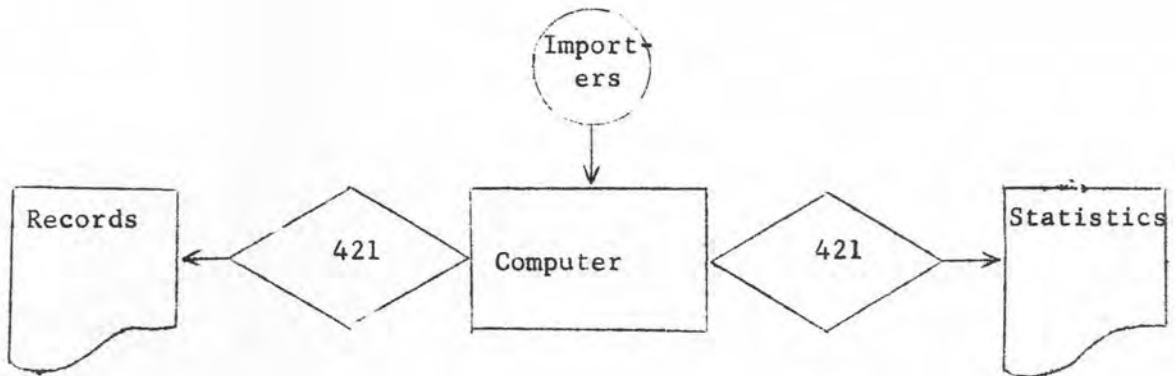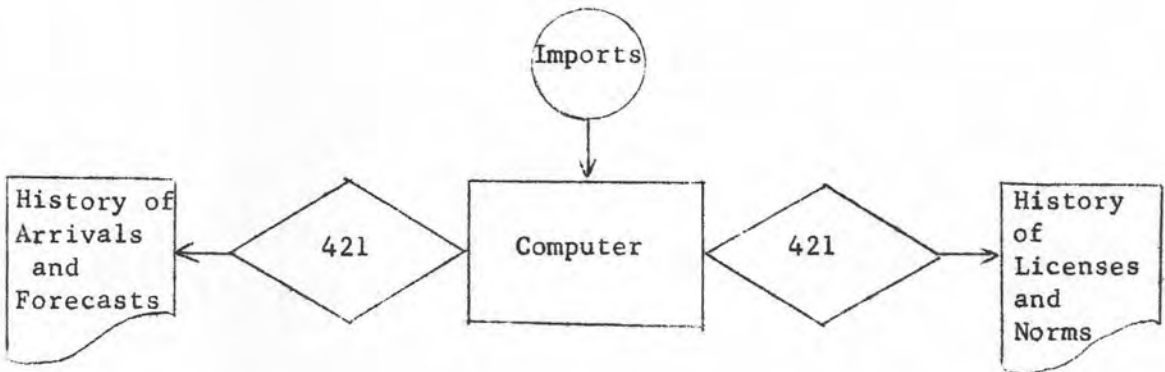
CONTROL OF IMPORTS

DAILY OPERATIONS

CONTROL OF IMPORTS

MONTHLY OPERATIONS

Imports

Statistics ← 421 — Computer — 421 → Statistics

Imports

History of Arrivals and Forecasts ← 421 — Computer — 421 → History of Licenses and Norms
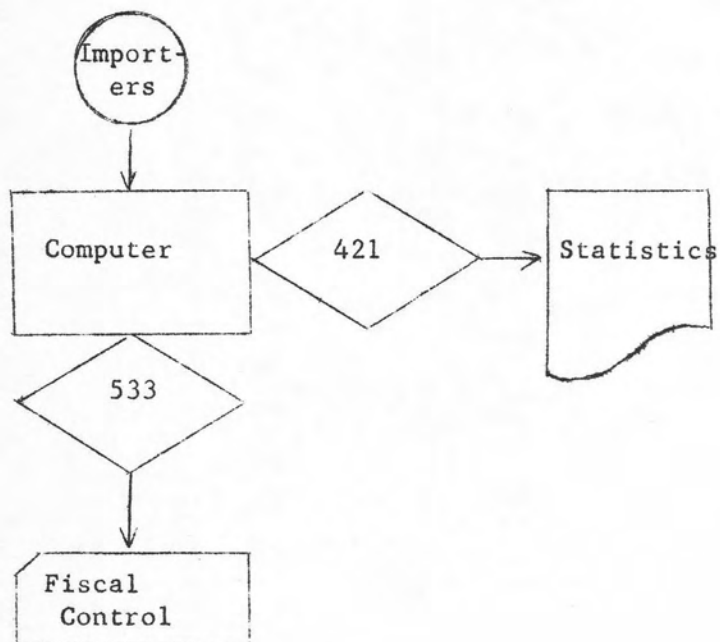
Importers

Records ← 421 — Computer — 421 → Statistics
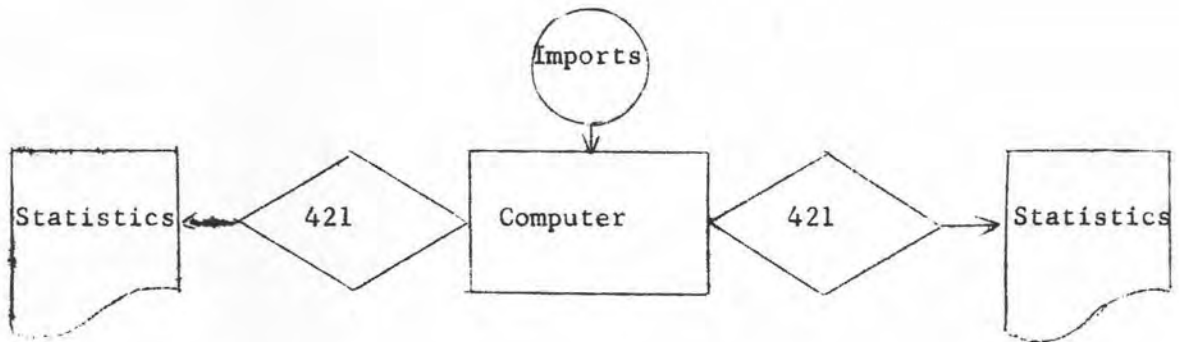
CONTROL OF IMPORTS

ANNUAL OPERATIONS

Chapter VI

GOVERNMENT PAYROLL

I. PRESENT SITUATION; POSSIBLE IMPROVEMENTS

    A. Payrolling in Viet Nam is simple. Its mechanization, now in process, has not changed it radically. It essentially consists of obtaining monthly:

        1. a salary statement (form D-3) by ministry, department, and method of payment; this statement gives for each employee the details of his salary, indemnities allocations and amounts withheld. It serves as a pay record, a voucher for orders for payment a control assuring discharge of commitments to employees.

        2. a pension statement showing for each employee the amounts withheld and the amounts added by the Government to the Pension Fund.

        3. summary statements which can be used on the one hand for purposes of control and to establish order for payment and voucher cards and, on the other, for providing income declarations for taxes.

        4. In this regard, the employee's family status must be carefully checked:

            a. wife

            b. age of children

            c. years in school, etc.

        5. Mechanization is proceeding satisfactorily. Further improvements should provide:

            a. easier verification of family status

            b. decreased time for printing pay statements with the most recent changes

            c. automatic printing of orders for payment.

II. SOLUTION ON THE COMPUTER

    A. There will be a "personnel" file on magnetic tape which will include the following for each employee (permanent or temporary):

        1. ministry code and department code

2. registry (taxpayer number)

3. name

4. date of birth

5. years in service

6. aptitudes, diplomas

7. function

8. rank

9. index

10. allowances: code and total value of each

11. salary and allowances totals since the beginning of the year

12. family status

13. for each child:

    a. first name

    b. date of birth

    c. year in school

In this file, about 8,000 employees will be described on a single tape.

B. Once a month, the file will be updated by comparing it on the Computer, with all the change cards of the month:

1. transfers

2. new diplomas

3. new allowances

4. recalls

5. changes in family status, etc.

C. Simultaneously, the two connected tabulators will print:

1. a journal of salary changes

2. a list of other changes.

D. The file will be immediately reread by the Computer for simultaneous printing of:

    1. the pay statement (D-3)

    2. the pension statement

E. To accomplish this task the Computer:

    1. reads the rank, the functions and the family status of each employee and calculates, from a table in the memory his gross pay, his pension deductions, amount paid by the government towards his pension, his net pay, his cost of living allowance and his family allowances. For this reason the latter information does not appear on magnetic tape.

    2. adds to the "personnel" file the amounts to be paid and the amounts previously paid for purposes of fiscal declaration.

    3. records on magnetic tape all information required for the printing of orders for payment. The orders for payment are printed last after the paper on the tabulator has been changed.

    4. punches an order for payment card as well as a voucher card for each order for payment.

F. By reading the "personnel" file, the Computer, in addition, can:

    1. print, at the end of the year, salary declarations, and establish an "annual salary" card -- or a record on tape -- for each taxpayer. (The use to which this information is put is described in Ch. III.)

    2. on request, print the list of employees having given qualifications (when there is a post to be filled) or the list of employees whose abilities do not suit their functions (to discover errors in assignment).

G. The time of operations has been calculated from the following data:

    1. number of employees   40,000

    2. number of dependent children   120,000

    3. number of monthly changes   8,000

    4. number of orders for payment   2,000

    5. average number of lines for each employee on the D-3 statement   2

H. The time of operations will be:

    1. up-dating of the file   3 hours

    2. printing of statements   13 hours

    3. printing of orders for payment   2 hours

III. ADVANTAGES OF THE SYSTEM

A. Speed in printing; changes can be made almost at the last moment.

B. Automatic printing of orders for payment.

C. Fewer cards required: summaries for the declarations are made on magnetic tape.

D. Quick and convenient verification of family status.

E. Reliability: all items of pay are on magnetic tape, and can be modified only by punched cards read into the Computer. At the same time, the Computer prints a journal of changes. Malpractice is therefore impossible.

F. The possibility without a significant increase in load of simplifying personnel administration, inasmuch as the file includes years of service, aptitudes and diplomas.

G. An operational link with the Directorate of Direct Taxation for purposes of fiscal control.

    Furthermore, the establishment of pay and pension statements is very simple, given present procedures, and can be done on standard tabulators.

    As a result, all the operations described in this chapter (with the exception of the control of personnel administration) can be performed with ordinary equipment at moderate cost. The government payroll alone would not justify acquiring a Computer. If, however, a Computer is decided upon on the basis of the other chapters in this report, it would be wise to profit from the advantages listed above, since an additional load of only 18 hours for the Computer would be involved.

IV. PRELIMINARY OPERATIONS FOR CONVERSION TO THE COMPUTER

A. The only problems involved in this transfer are:

    1. a regrouping of the information appearing in the file

    2. establishment of practical codes for aptitudes, diplomas, ranks, and functions

    3. a study of the best format for D-3 statements and for fiscal declarations to reduce the number of printed lines while providing clear documents and sufficient details for the calculation and automatic control of taxes.

PAYROLL

UP-DATING
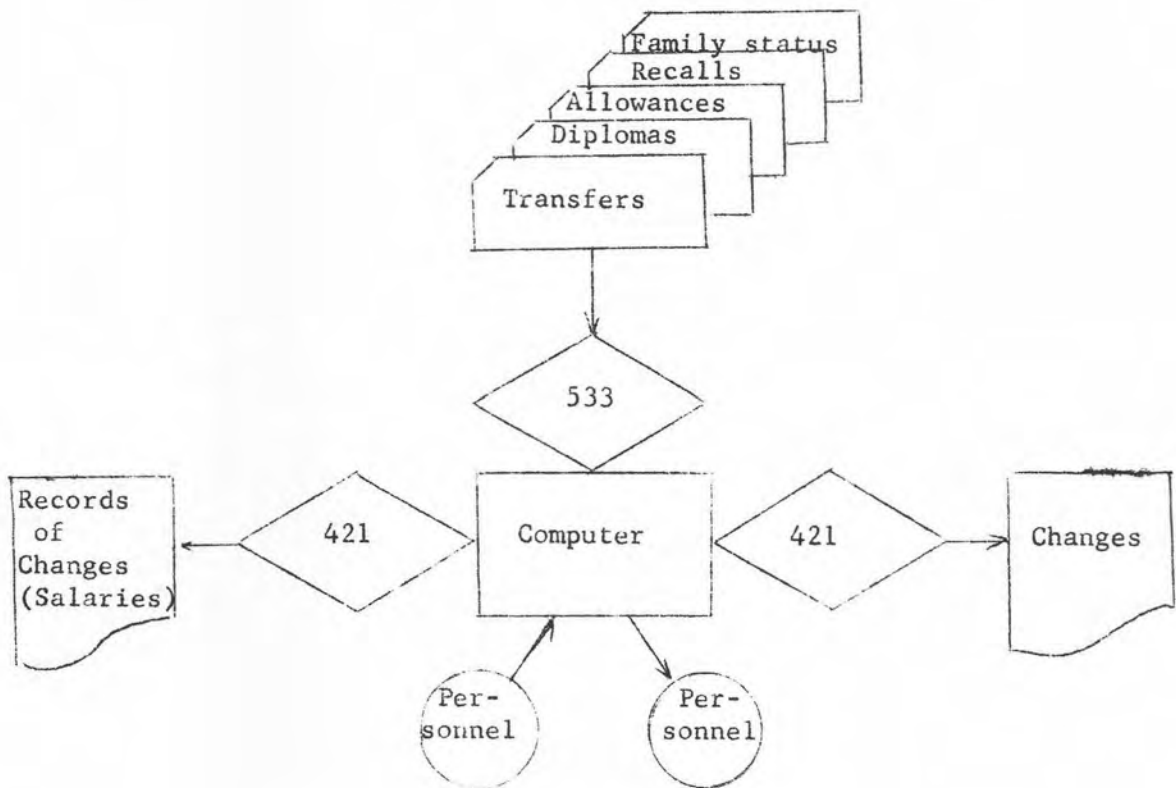
PAYROLL
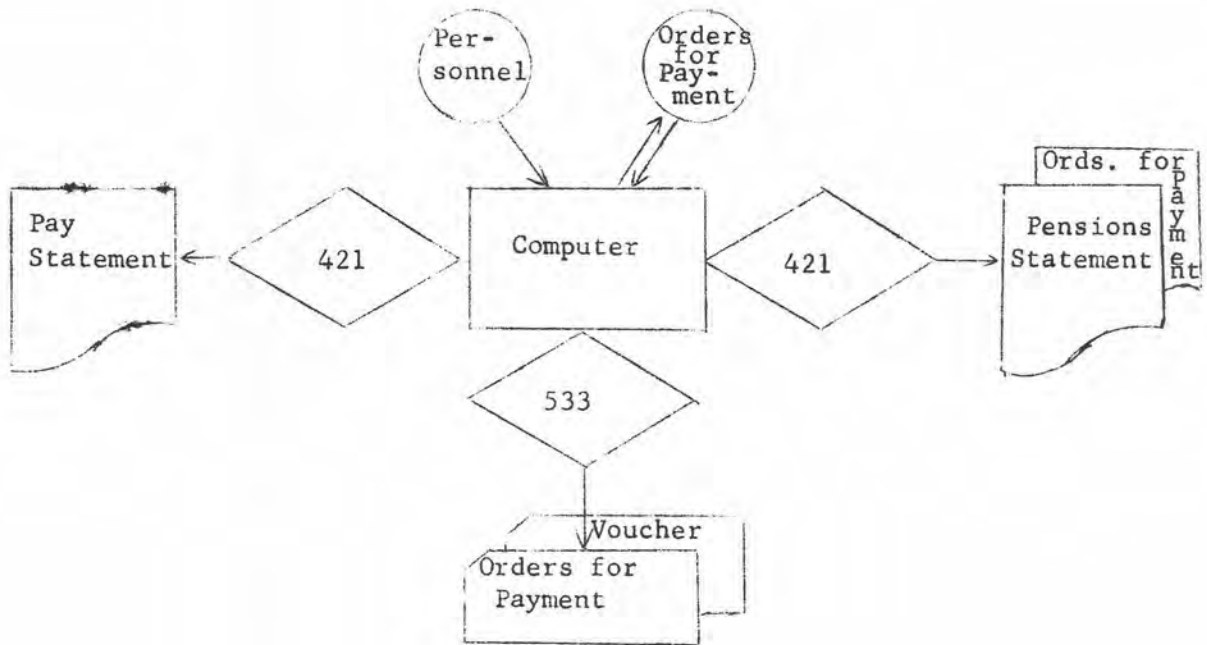
PAYROLL

ANNUAL OPERATIONS

CHAPTER VII

NATIONAL PURCHASING CENTER

DIRECT AMERICAN AID

GENERAL GOVERNMENT INVENTORY

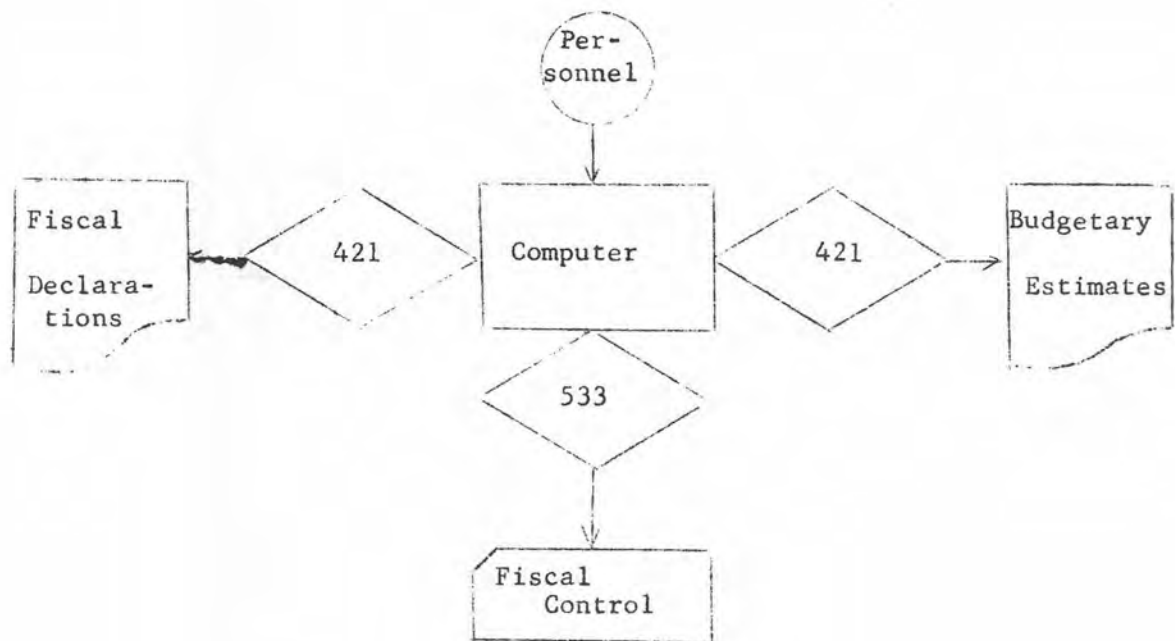I. PRESENT OPERATIONS; POSSIBLE IMPROVEMENTS

A. The National Purchasing Center does not yet deal with all Government purchases. It is mainly responsible for purchases financed by Direct American Aid.

B. Direct Aid operations are as follows:

Dollars are generally assigned to each Foreign Aid program (Project Agreement) for direct purchase abroad of goods and supplies. As the program develops actual allotments (PIO/C - Project Implementation Order / Commodities) are made.

C. Contracts signed by the National Purchasing Center or by ICA are charged against these allotments. This procedure generates a two-step currency control, similar to the control practices for commercial aid.

Once the contracts are recorded a check of deliveries is effected. Deliveries are usually made to a Foreign Aid warehouse (warehouse arrival receipt) where they are released to the department for which they were purchased (delivery notice). Deliveries are sometimes made directly to the receiving departments. The National Purchasing Center compares deliveries and contracts until the contract expires. It administers warehouse stocks to insure that goods move out within a reasonable time.

Only small volumes are involved in these transactions. The work is now being mechanized on punched card machines. It consists of printing Project Agreements, PIO/C's, and order journals. It also prints and cross-checks statements which compare PIO/C's with Project Agreements, contracts with PIO/C's, and deliveries (warehouse arrival receipts or direct delivery notices) with contracts. Periodically, a warehouse inventory will be made. Statements showing the net currency balances (available) on Project Agreements and PIO/C's, and on current orders will be issued.

D. Improvements to be made in these operations are all related to a centralization of Government orders:

1. central order file

2. administration of stocks for certain articles (or groups of articles)

3. comparison of deliveries and orders for payment

4. maintenance of a general machine-written inventory for the departments, and automatic inventory listing at the time of delivery.

II. PROPOSED SOLUTION ON THE COMPUTER

A. Budget operations related to Direct Aid:

Recording the Project Agreements and the PIO/C's, their journals, control of credits (PIO/C's in relation to Project Agreements, contracts and orders for payment in relation to PIO/C's). These will be executed at the same time as those of foreign commercial aid; the only modification in the flow of operations described in Ch. I and II is the recording of the required data on the magnetic file. Relations with suppliers, control of deliveries, administration of the central warehouse and the transfer of goods to the Directorates, -- and operations related to other adminis- trative purchases -- are jointly considered below.

B. Although the operations of the National Purchasing Center fall into three distinct subdivisions:

1. direct aid,

2. deliveries from permanent stock of the central warehouse,

3. orders to supply the various Directorates,

the Computer can deal with them simultaneously by means of a single "articles" file on magnetic tape.

In order not to lengthen operations unnecessarily, the file will contain one heading for each article (or group of articles) ac- cording to the importance of each. Thus, the "article" code will be an analytical code with subdivisions detailed according to particular needs.

C. There might be, for example, a code for each brand or type of typewriter, or, on the contrary, a single inclusive code for all the separate parts of a typewriter.

For each article code all or some of the following information will be recorded:

1. article code

2. description

3. depreciation period

4. description of orders (for articles of permanent stock in the central warehouse):

    a. normal date

    b. normal periodicity

    c. quantities for economical ordering

    d. average consumption

    e. consumption since the beginning of the month

    f. minimum safe level of stocks

5. normal suppliers with, for each:

    a. name and address

    b. number (taxpayer code, if possible)

    c. most recent price

    d. time of delivery

    e. special remarks

6. quantities requested, not yet ordered (for articles ordered for a Directorate), by Directorate:

    a. Ministry and Directorate code

    b. budget allotment code

    c. economic code

    d. detailed description (if necesssry)

    e. quantity

    f. estimated price

    g. requested time

7. current orders:

    a. order number

    b. supplier code

    c. date of order

    d. expected date of delivery

  e. unit price

  f. special conditions

 8. receiving departments:

  a. Ministry and Directorate code (or central warehouse code)

  b. quantity ordered

  c. budget allotment code

  d. economic code

  e. quantity previously delivered

  f. quantity received (by Directorate)

  g. date of most recent delivery

  h. quantity already paid for

  i. date of most recent invoice

9. total value of stock at the central warehouse by Directorate:

  a. warehouse or Directorate code

  b. quantities classified by age

  c. value of inventory (or unit price)

  d. annual depreciation

(Quantities in stock will obviously not be listed by Directorates for supplies or consumption goods.)

D. Requests for supplies --

All requests for supplies from Directorates will be sent to the central warehouse. I. there is a sufficient stock of the article, it will be delivered immediately, and a delivery notice will be issued (see below).

If the article is not in stock, or in stock in insufficient quantities, a "request" card will be punched including:

1. Ministry and Directorate code

2. article code

3. description

4. budget allotment code

5. economic code

6. quantity requested

7. time limit requested

8. estimated price (contract price)

The Computer will read this card at the same time as the "articles" file. The "articles" file is up-dated recording "quantities requested but not yet ordered." Before completion of this operation the Computer will print, a file for "requests for bids," to include information on the various suppliers. For purposes of information, this record can indicate the quantities already in stock or on order for this article for the given Directorate.

Without regard to administrative requests, the Computer will print periodic records for bids (or orders) on articles in permanent stock in the central warehouse. These records may appear regularly for each article, or as a function of the quantity in stock. They will list the normal suppliers along with their purchase conditions, as well as the quantities necessary for economical ordering.

E. Orders

1. The National Purchasing Center will therefore have detailed records on hand when it orders; an "order" card will be punched, by article, for each order. The card will contain:

    a. order number

    b. supplier code

    c. description of the article

    d. unit price

    e. special conditions.

    (Several cards may contain the same article code and different descriptions since a code sometimes represents a group of articles.)

    The Computer reads the "order" cards and up-dates the "articles" file by establishing an additional "order" record and by removing from the record the "articles requested but not yet on order." It will print an exception notice if the quantity ordered is less than the quantity requested.

F. Deliveries

1. Most of the time goods will be delivered to the central
warehouse. In all cases, a delivery report will be made from
which an "arrival" card, by article and by receiving department,
will be punched. This card will include:

a. supplier code

b. Ministry and Department code (or central warehouse
code)

c. quantity

2. These cards will then be used to print notices to the
receiving departments to take delivery of their supplies.
They will then be read by the Computer which will note, for
each article and each Directorate, the quantities delivered
on each order, and will verify that orders and deliveries
are in conformity with one another.

G. Control of invoices; issue of orders for payment

1. For each invoice from a supplier, a card "invoiced
article", by article code, will be punched, showing:

a. invoice number

b. order number

c. article code

d. quantity

e. price

In addition, one or several "invoice" cards will be punched
giving the total value and all other information required for
the issue of orders for payment. These cards will then be
read by the Computer. All the "invoiced articles" cards,
sorted by article number, will come first. The "invoice" cards
will be processed last.

The Computer consults the "articles" file to learn if the
invoiced quantities have, in fact, been delivered, and if the
price agrees with the price on the order. If they do, the file
is up-dated by showing the quantities paid for; a voucher card
is punched, and the total value is added on the drum with the
other totals on the same bill. In case of a discrepancy, an
exception notice is printed and the total is not added.

At the end of the operation the Computer reads the "invoice"
cards to verify that the total is the same as that calculated
on the drum, and then prints an order for payment. The order

for payment, attached to the voucher cards, tog ther with an order for payment card (which may be one of the "invoice" cards), will then follow the normal sequence. Budgetary control can be effected with the voucher cards when the order for payment relates to several budget allotments.

Note:
As in the case of cash advances for articles included in the permanent stock of the central warehouse the punching of the voucher card can be postponed until the articles leave the warehouse.

H. Delivery notice

1. A delivery notice is established each time an article is delivered by the warehouse.

2. For each delivery notice a card is punched, giving:

    a. Ministry and Directorate code

    b. article code

    c. quantity

    d. budget allotment code

    e. economic code.

By reading this card, the Computer if it is dealing with an article in permanent stock, can up-date the "articles" file for quantities in stock either in the warehouse or in the Directorates, and then punch a voucher card.

3. If the article is one ordered by a Directorate, the Computer up-dates the records of the quantity acquired. The punching of the voucher card, in this case, is connected with the issuance of orders for payment. For each article, it also provides an "on inventory extraction" card, giving:

    a. Ministry and Directorate code

    b. inventory number

    c. article code

    d. description

    e. date of installation

    f. purchase value

    g. period of payment

These cards will be sorted by Directorate in order to establish a record of goods taken from inventory and in order to up-date the "general inventory" file on magnetic tape.

For articles delivered directly to the Directorates from the supplier, the "arrival" cards (see para. F, Art. II, above) are punched with a special code, and the Computer simultaneously prints "arrival" and "extraction" cards.

I. Summary of operations on the Computer

1. These operations consist essentially in up-dating the "articles" file as has just been described. It requires the reading of the cards:

      a. request for supplies

      b. orders

      c. arrivals

      d. invoiced articles

      e. delivery notices.

These are sorted by article code, and followed by "invoice" cards. During this process, the Computer up-dates the various categories on the magnetic file and prints:

      a. the records of requests for bids

      b. exception notices

      c. orders for payment

      d. summary, by article code, of daily movements:

           (1) requests

           (2) orders

           (3) arrivals

           (4) deliveries

           (5) payments

During these operations the Computer will also punch voucher cards and "entered in inventory" cards. It removes from the magnetic tape the record of fully balanced orders. An order is considered fully balanced when all articles have been delivered, paid for, and taken over by the consignee.

Exception notices will cover the items specified above:

a. where quantities ordered are fewer than quantities requested,

b. when deliveries are not in conformity with orders,

c. when bills do not conform with orders or deliveries.'

The Computer as it systematically controls the content of the file will also print exception notices in the following cases:

a. request for supplies not followed by an order within the normal time,

b. significant delays in delivery,

c. invoices which have not been received,

d. goods not taken over by the consignee, within the prescribed time, etc.

Finally, by consulting the "articles" file the Computer can print the complete stock in the central warehouse for purposes of inventory control.

2. The "entered in inventory" cards will be sorted by Directorate as soon as they have been punched in order to establish an inventory ledger. They will then be held aside, and will be incorporated in the magnetic file, "general inventory" once a month or once a quarter.

This file will be classified by Directorate. It will include for each item extracted from inventory by a department the following information:

a. Ministry and Directorate code

b. inventory number

c. article code

d. description

e. first date of use

f. purchase value

g. depreciation time period

From this file lists for the control of inventory can be be made. If necessary, it can also be used to compile more detailed statistics on supplies in use than those which can be compiled from the "articles" file.

Operating time can be flexible because the number of articles handled and the periodicity of operations can vary at will. A priori it does not seem necessary to undertake daily the operations described above. They can be done every other day, or once a week. Articles may be divided into two classes, each having a file. One will be up-dated daily; the other, weekly.

The calculation of operating time is based on a complete up-dating of the "articles" file every other day and an up-dating of the "general inventory" file once a month. The following data were also used:

a.	Number of article codes	5,000
	(1) consumption goods	3,000
	(2) durable goods	2,000
b.	Number of Directorates	80
c.	Average number of Directorates having a given article in stock	40
d.	Number of movements per month:	
	(1) requests for supplies (remaining in the file for an average of a month)	2,000
	(2) orders (remaining in the file for 6 months, on the average)	1,000
	(3) consignees	2,000
	(4) in-coming items	2,000
	(5) invoice cards	2,000
	(6) voucher cards	2,000
	(7) outgoing items	2,500
	(8) discrepancies	1,200
	(9) entered in inventory	3,000

The "articles" file will require 3 tapes. Its up-dating, once every other day will require 2 hours, or, on the average:

<u>1 hour a day</u>

The inventory of the general warehouse can be printed once a month. This operation will require:

1 1/2 hours

The "general inventory" file will be up-dated once a month, requiring:

3 1/2 hours

(This file, describing 200,000 inventory numbers, will include 6 tapes).

A complete printing of the "general inventory" file will be made once a year. It will require 15 hours or on the average:
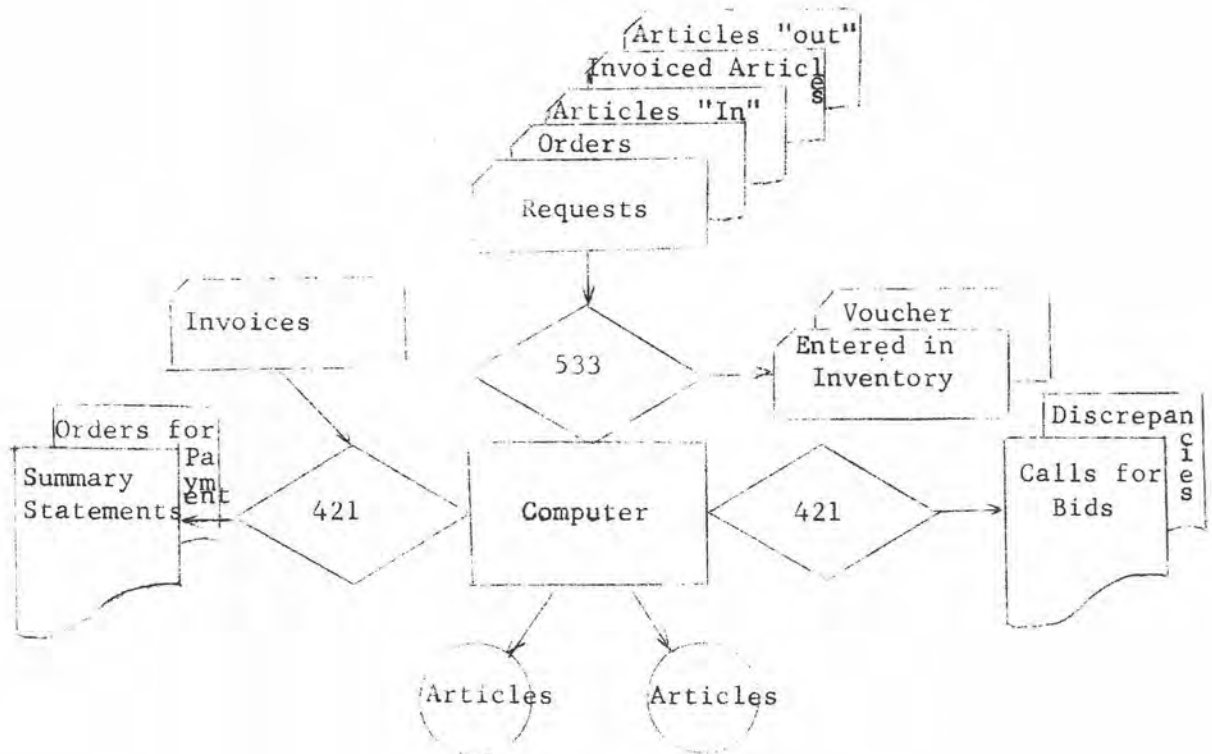
1 hour and 15 minutes a month

III. ADVANTAGES OF THE METHOD

    A. Centralization and rapid availability of records on suppliers and prices.

    B. Control for important articles of amounts held by each Directorate: these amounts are readily available when supplies are requested.

    C. Automatic control of the correspondence between orders, deliveries, and invoices.

    D. Systematic detection of delays of any kind: requests for supplies, not followed up by orders, delays in delivery or in invoicing, supplies not taken over by the consignee, etc.

    E. Completely automatic administration of the stock and drawing-up of orders for articles in permanent stock in the central warehouse.

    F. General inventory on magnetic tape: the tape is not bulky and is easily protected from deterioration or loss.

    G. Inventory listed by quantity and value with automatic depreciation.

    H. Printing of orders of payment and automatic punching of voucher cards for all expenditures on supplies.

IV. OPERATIONS PREPARATORY TO CONVERSION TO THE COMPUTER

    A. This will require:

        1. redefining the "article" code

        2. codifying and punching the present inventory as well as the available information about suppliers.

NATIONAL PURCHASING CENTER

OPERATIONS ON ALTERNATE DAYS

NATIONAL PURCHASING CENTER

MONTHLY OPERATIONS

Gen. Inventory → Computer

Entered in Inventory → 421

Computer → 421 → Inventory Records

Computer → Gen. Inventory

Articles ← Computer → 421 → Central Warehouse Inventory
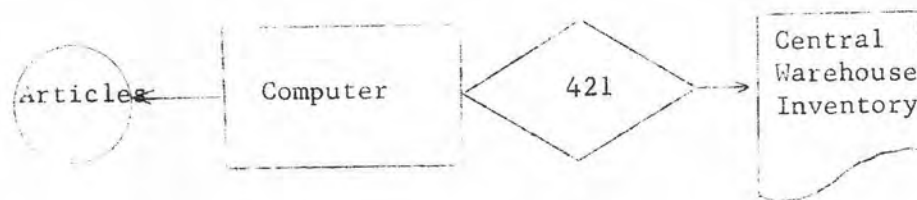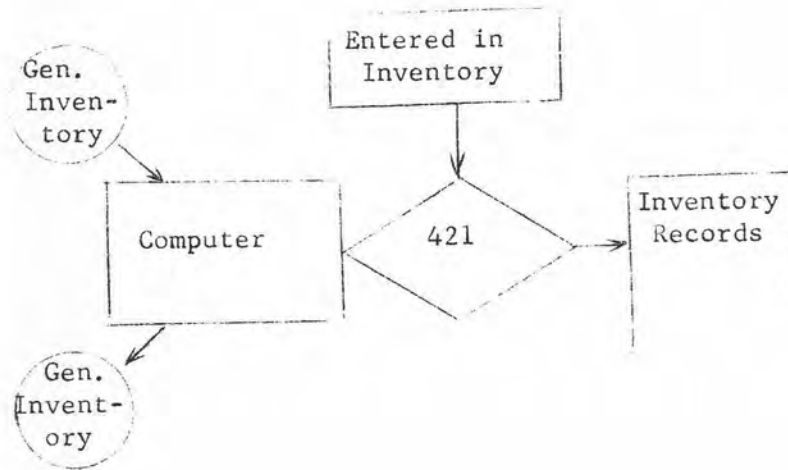
NATIONAL PURCHASING CENTER

ANNUAL OPERATIONS

Chapter VIII

OPERATIONAL RESEARCH AND MISCELLANEOUS TASKS

A program (a construction or equipment or transport program, etc.) can always be accomplished in a variety of ways, - the more complex the program, the greater the number of possible solutions. Methods of procedure will differ in detail, in point of departure, in the time required for execution, in the sources of supply, etc. . . All possible solutions cannot be envisaged. A few are studied and the one which seems best - from the point of view of economy, of rapidity, and of convenience is chosen. One cannot know if the solution decided upon is the ideal. Often a mediocre solution is better than no solution at all.

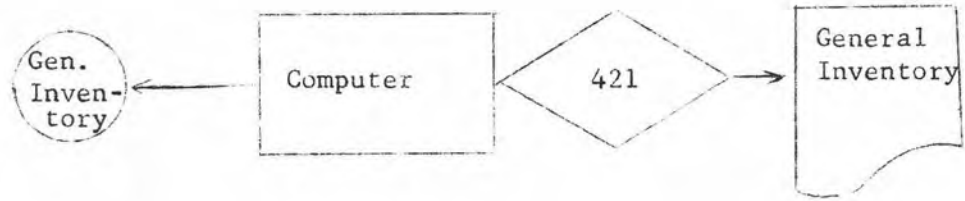The purpose of operational research is to find the ideal solution. The methods known and applied at the present time are not perfect. In certain cases, these methods achieve the best solution without error whereas in other cases they provide only approximate results.

In any case, given the innumerable elements involved, operational research requires complex calculations. These calculations were not possible before the invention of Computers. Previously they would have taken several years.

The dispersement of railway rolling stock provides an excellent illustration of this type of problem: the Nhatrang station needs an empty flat car. Assuming there are 1,000 cars of this type in the country, and no other traffic or other request for empty flat cars, the problem already has 1,000 possible solutions. Moreover, it is fairly easy to find the best solution by first learning what cars are available around Nhatrang. However, if one takes into account all requests from other stations for flat cars, and if one takes into account other estimated traffic, the number of possible solutions increases rapidly. It is no longer possible to know which is the best. Furthermore, this problem has been simplified; in studying each solution, one should learn the dispersement of the rolling stock at the end of the day in order to facilitate the planning of the next day's traffic and that of the following days.

The French National Railways are a typical example. Faced with serious bottlenecks, inefficient usage and with a serious shortage of freight cars, the French railways refused to increase the number of lines or buy additional cars. Through operational research, they were able to increase the traffic flow on existing lines and the efficient usage of existing cars.

The problems which operational research might profitably solve are innumerable. Moreover, these problems remain unnoticed because no practical means of solution exists; little thought is expended on their

resolution. For example, three areas where operational research and usage of the Computer for a few hours a year might save the Viet Nam Government several thousands or even millions of piastres, are:

- Public Works
- Personnel Administration
- Equipment programs.

A. Public Works

1. The Viet Nam Public Works Department possesses a limited amount of heavy equipment. Increased work would require the importing of additional equipment, or a difficult increase in the productivity of existing equipment. The Computer could, in a few hours a month, organize the work programs so as to obtain maximum efficiency with existing equipment.

This operation would be done monthly or quarterly in the following manner:

a. for each work program, a series of cards would be punched, showing:

(1) location
(2) priority
(3) distribution of work loads among the different types of equipment, number of hours, time of usage.

2. There will also be a file representing each machine (type, model, registration number) and a file of transportation costs from one location to another.

3. The most economic program, that is, the one which reduces, to a minimum, the off-time and transportation costs from one location to another will be arrived at on the Computer by:

a. printing a statement giving the initial and final dates of each project, and the order in which the various tasks will be accomplished.

b. a list of machines (with their registration numbers) used for each project, indicating the initial and final dates for the previous and following projects.

B. Personnel Administration

1. The Computer value vis-a-vis personnel administration was discussed in Ch. VI. The Computer can list employees whose aptitudes are not suited for their functions. It can provide, or request, a list of persons possessing clearly defined abilities.

2. Much more is possible. Each Administration and each department can be asked for a statement of personnel needs during the following year to include for each person:

    a. his exact functions (or the aptitudes required)

    b. diplomas required

    c. rank and classification suggested

    d. place of work.

3. In addition, economists will calculate the costs of bringing a person, having the specified aptitudes and degrees, to a give place. Assume, for example, that a statistician with the rank of department head is required in Dalat. Alternate solutions exist:

    a. if, in Dalat, there is a department head who is a statistician even though his present responsibilities do not utilize that competence, he can be transferred: the expenses will include costs for "settling in", and the cost of training his successor;

    b. a statistician, already a department head (or scheduled for promotion) working elsewhere can be transferred to Dalat. The cost will then be: the cost of moving of the official in addition to the costs of installment and the training of his successor;

    c. an individual who is neither a statistician nor a department head may be employed or transferred; the cost of the operation will then include:

        (1) expenses of hiring

        (2) moving costs

        (3) costs for training and education

        (4) costs of installment and the training of his successor (eventually)

        (5) additional salary expense which might have been avoided or postponed.

Every possible solution would be studied and the expense considered. A total of the "transfer expenses" will thus be obtained. With a knowledge of existing personnel and their aptitudes (from the personnel magnetic file), a knowledge also, of the desiderata of the different departments, and the various "transfer costs", the Computer can suggest a transfer plan.

d. The transfer plan will not simply be a useless list of names. It will show, for each person, where and how to select him, providing:

    (1) place of work

    (2) Directorate (or employer)

    (3) aptitudes and diplomas

    (4) rank and classification

    (5) training required before assignment.

e. The Computer will also provide a list of persons filling these requirements in order that a choice will be possible. The chief of personnel in selecting, will know that the resulting solutions are equally good, and he will merely examine the personal preferences of the candidates.

Such a problem can, of course, be solved efficiently only if it is programmed with a certain flexibility, because it is impossible to transform a human being into an equation. Despite this reservation, considerable savings are made possible by reducing employment and training expenses while at the same time, increasing the efficiency of those already employed.

C. Equipment Programs

At the beginning of a five year period, many investments might be considered productive on a national scale. However, they cannot all be made at once, because of the scarcity of sufficient credit, goods, competent personnel, etc.

For each undertaking, a specialist will define the capital, currency, material and personnel requirements. Economists will calculate the benefits to the country from each enterprise with information on the various investment opportunities in Viet Nam, the Computer can determine which are the most promising. It will also suggest alternate solutions in order to allow for choices based on political, social, or other considerations.

The three kinds of programs described above will consume little time on the Computer since calculations are required only once a quarter or once a year. The savings will be achieved almost without cost.

Chapter IX

THE CENSUS

I. AGRICULTURAL CENSUS

The coming agricultural census will only be described briefly because the National Institute of Statistics cannot now provide information on the volumes involved or the procedures to be followed.

The figures on each questionnaire should be carefully checked by hand before punching the cards, and all the tables should be compiled by a single passage of the cards, properly sorted, on a tabulator.

However, if the Institute of Statistics decides to check mechanically the consistency of figures on the same questionnarie (or if presenting the data in table form is a more complex project than now proposed) computing results may be more conveniently accomplished by a single passage of the cards on the Computer, at a minimum average speed of approximately 9,000 cards an hour.

II. POPULATION CENSUS

A. Punching - Verifying

The problem of punching is important and needs description. The Institute of Statistics expects about 13 million declarations for individuals, each requiring a card of 60 columns, and two million declarations for households, each requiring a card of 40 columns. Eight hundred sixty million columns in all will therefore have to be punched. This represents between 100,000 and 140,000 hours of punching depending on the dexterity of available personnel. If the work is to be completed in ten months, for example, 50 to 70 operators will be required. If the operators work in two shifts without interruption, about thirty punching machines will be required. The cards will then have to be checked; in all probability this implies that about twice the personnel and equipment mentioned above will be required.

For the compilation of statistical tables, the structuring of the population assumed is analogousto the census taken in 1950 in Costa Rica because the program to be used in Viet Nam is not yet known.

B. Compilation of Table 1

Included will be the population of each township, classified into four groups; men, women, urban, and rural populations. This

table will be compiled on a conventional tabulator after the
cards have been sorted, by province, administrative district
(caton) and township. On a single tabulator, type 421, this
operation will require 2,000 hours. If a sorter 101 is available,
it can perform the operation in 650 hours.

C. Compilation of Tables No. 2 to 15 and 17 to 23.

All of these tables can be compiled on the Computer by a single
run of all the "individual declaration" cards, previously sorted
by province, and, in each province, by age. The titles of the
21 tables are listed below, and for each the number of totals to
be simultaneously compiled. It is assumed that the maximum
number of administrative districts in a province is 20. Where
this is not the case, the operations on the Computer would be
facilitated by dividing the provinces into sub-provinces.

Table No.	Title	
2	Population by province and age group (showing: urban and rural, men and women)	4
3	Population by Administrative district and age group (showing: men and women)	40
4	Population by province and age group (showing: urban and rural, men and women)	4
5	Population by province (showing: urban and rural, men and women)	4
6	Residents, native born, and those born abroad (showing: men and women) by province and age group	4
7	Number of residents broken down by place of birth (province or foreign country, 125 cases) showing: men and women, urban and rural population, by province	500
8	Break-down, by province and age group of citizens at birth, naturalized and foreign citizens, showing men and women	6
9	Idem., all ages together	6
10	Breakdown, in each province of foreigners (men and women) by nationality (55 nationalities)	110

As each card is run, the Computer will calculate totals broken down into 1,422 words on the drum memory. For each change in age, age group, or province, the Computer punches the relevant number of totals on cards, each of which represents a line on the table. It will immediately reset the corresponding memories at zero.

The "results" cards (approx. 10,000) will then be sorted by the sorter and listed, under the contol of the Computer to obtain the final tables.

The total operating time will consist of the time required for a run-through of the cards in the reading storage 533, at an average speed of approximately 9,000 an hour, or a total of 1,450 hours.

D. Compilation of Tables 24 to 28

These tables will be calculated by another run-through of the cards on the Computer in exactly the same manner as for the previous tables.

It should be noted, however, that these tables deal only with the working population (about one-third of the total population) and that the corresponding cards will have been duplicated on magnetic tape during the previous run-through so that the present operation can be accelerated. The 5 tables under discussion are listed below, and for each, the number of break-downs required.

Table No.	Title	
24	Distribution of men and women by nature of work (9 types) in each province and by age group	18
25	As above, but not divided into age groups and showing for each economic activity, 4 distinct positions	72
26	Breakdown, by province, of men and women by occupation (11 possible cases) by economic activity (9 types)	198
27	Breakdown, by province, of men and women according to occupation (11) and grade(4)	88
28	Breakdown of men and women, in the country as a whole, according to occupation (with a more detailed code: 196 cases)	392
		768

The total time estimated for this operation on the Computer is 330 hours. There will be about 4,000 "result" cards.

E. Use of "Household Declaration" Cards

In Costa Rica, these cards are only used for table 16 (in each administrative district, break-down of the number of families by number of members in the family). In Viet Nam, these cards, in all probability, will be used for other tables as well. This would justify their run-through on the Computer.

All the tables will be compiled in 220 hours on the basis of an average speed of 9,000 cards an hour.

III. ADVANTAGES AND DISADVANTAGES OF USING THE COMPUTER FOR THE CENSUS

A. Summarizing, firstly, the operations required in organizing the data for the population census:

1. punching	130,000 hours
2. verifying	130,000 hours
3. sorting "individual" cards; they will be sorted twice on 4 columns, the "household" cards once; the "result" cards (15,000) once on 6 columns, or a total of 112 million passes on the 082	3,750 hours
4. off-line tabulator	2,000 hours
5. computer (total)	2,000 hours

The time of operations given above may be changed depending on the use to which the equipment is actually put. Furthermore, the work will probably be undertaken soon after the installation of the Computer. Because of the relative inexperience of personnel in the Computer office the numbers of temporary staff required for different tasks (investigation, codification, and punching) and because of the large volumes involved, it is possible that more time will be required.

If more conventional methods were applied in Census taking only the statistical card sorter (type 101) might be used. It is well adapted to counting operations with multiple break-downs. The use of tabulators is not advisable in this case; the load is too heavy. A study of the use of the sorter 101 might be undertaken once the data of the Viet Nam census tables are available.

To do the work within the same amount of time as with a
Computer, about a dozen machines would be required.

Since a sorter 101 costs about 20 times less than a Computer,
the question would appear to be decided. This is not the case,
however. A rational use of the sorter 101 for many tables,
as in the present case, requires fairly complicated organiza-
tion: printing of tables in a definite order; organization
of some tables in an altogether different form than in the
final presentation, necessitating complex changes; using of
totals from certain tables as bases for the calculation of
other tables: etc. . The resulting complexity of mechanical
operations is increased by virtue of the enormous volume of
moving cards and the relative inexperience of personnel. In
any case, all the tables established on the 101 must be
completely checked by competent statisticians who verify the
consistency of each, and cross-check it with all the others
in order to discover errors in the flow of operations and any
missing cards.

The Computer value is increased if the above points are considered.
In this case, as in others, it reduces the risks of procedural
errors, through internal checking (considerably reducing the
need for cross-checking), and through the need for a smaller
competent staff.

Undoubtedly, the advantages do not counterbalance the high
cost of the Computer as compared to the cost of a sorter 101.
Its acquisition for the next Population Census is not recommended.

However, if the Government of Viet Nam decides to buy a
Computer, because of its usefulness as previously described,
it can profitably be utilized for the Census instead of
buying a series of sorters. The specific nature of the sorter
decreases its usefulness for other types of operations.

Two thousand hours of work, for one operation, in this case,
Census, may seem a heavy load for a Computer. However, this is
an excellent way of initiating machine operations and training
personnel at a time when few programs will have been written.
Moreover, census operations aan be interrupted and resumed
without difficulty. They can even be performed at night in
order to give priority to other tasks.

The above arguments do not completely condemn the use of a
sorter 101. If the National Institute of Statistics acquires
this machine, it can profitably be used for smaller statistical

studies and investigations which arise almost daily. Moreover, it can replace the tabulators for the compilation of Table No. 1 (population by townships).

Finally, it will be invaluable for certain controls of the punched card files, after the Computer is installed, when the files are duplicated on magnetic tapes.

CHAPTER X

SUMMARY OF MACHINE OPERATIONS

This chapter is a summary of the preceding chapters as well as an overall view of the Computer work load. Personnel and installation problems will be reviewed in succeeding pages.

The table below is divided into two parts:

> a. the left side (punches and verifiers) lists the number of machines on the basis of 20,000 cards punched or verified per month and per machine;
>
> b. the right side lists the hours per month for daily and monthly operations, and the hours for annual or infrequent operations. Operations time has been calculated on the basis of a type 650 Computer supported by:
>
> > (1) a type 533 card-read punch
> >
> > (2) two type 421 tabulators
> >
> > (3) a magnetic core memory
> >
> > (4) four magnetic tapes

Their specifications will be detailed elsewhere.

	Number of Machines		Hours of work per month		
	Punches	Verifiers	Sorter 082	Separate Tabulator	650 Computer
National Budget - Foreign Aid	4	3	19	--	26
Treasury	5	4	25	15	85
Control of Imports	1	1	10	--	15
Government Payroll	1	1	6	--	18
National Purchasing Center	1	1	4	3	31
Miscellaneous	1	1	6	17	5
TOTAL	13	11	70	35	180*
Annual or occasional tasks:	4 (1)	4 (1)	82	15	110* (290)*
Direct Taxation Population Census	30	30		2,000 (2)	2,000

According to this table, the monthly load of the Computer is normal. Night work can be considered to speed up tax returns. The other machines required will be:

1. 13 keypunches (plus 4 extra from 15 January to 15 June)

2. 11 verifiers (plus 4 extra from 15 January to 15 June)

3. 1 type 082 sorter

4. 1 type 077 collator

5. 1 type 513 reproducer

6. 1 type 421 tabulator (not connected with the Computer)

If one of the two key punches is a printer, the tabulator need be used for taxes only about thirty hours a year. There is little justification in having it permanently in the machine section.

PART II - INSTALLATION

INTRODUCTION

Computers are often referred to as "electronic brains". This description
has delighted some who are convinced that, in this century, the machine
would ultimately assume not only men's physical tasks but also his
intellectual burdens; it has frightened others who feared that humanity
would be dispossessed of its unique privilege -- thought and would become
the slave of its robots.

These assertions are without basis in fact. The description at the
beginning of this study, although brief, clearly indicates that the main
function of a Computer is not to think, but to duplicate endlessly,
quickly and exactly a chain of logical thought no matter how complex.

The person using the Computer need not fear his machine's initiative;
on the contrary, he will have to do the thinking for the machine.
It is essential that the most careful preparations be undertaken long
before the beginning of operations, if maximum benefits are to be
derived.

Because the Computer is incapable of either intuition or initiative, each of
the operations required for each problem will have to be described to the
machine in the most complete detail. All possible or special cases - even
the most improbable - will have to be listed, and a solution planned for
each. The preparatory work, if it is to be efficient, should consist
of three stages:

    1. a survey and careful description of current procedures,

    2. a critical study of these procedures and, later, modifications
    to increase efficiency by reducing the number of manual operations,

    3. programming, a description in mechanical language understood
    by the Computer, of the procedures thus defined.

These three stages require:

    1. a knowledge of the operations of the particular department,

    2. a theoretical knowledge of the problem as a whole,

    3. an operational knowledge of the Computer,

    4. and methodical, logical, constructive, and creative intelligence.

It would be ideal if those involved in the development of the Computer operations could possess all these qualities. Since this is unlikely the personnel can be divided into three groups:

    a. experts (economists, fiscal, legal, etc.) responsible, when necessary, for a redefinition of aims and for suggested procedures to achieve them,

    b. a bureau of methods to define in detail all mechanical and manual operations required in solving the problem on the Computer; the expert's suggestions and the normal procedures will be taken into account,

    c. programmers who, on the basis of the preceeding work, will write programs for the Computer taking care that no special case is omitted.

These three groups will work in teams. Each of the three stages described above requires all their respective skills and knowledge.

Once the programs have been written and the instructions have been defined and transmitted to the staff, the period of conversion will begin. Its primary purpose is the duplication onto a magnetic tape of the files needed for Computer operations. This phase includes the establishment of the file, or its up-dating if it already exists, punching it on cards, and the duplication of the punched cards onto the magnetic tape. At the same time sorting, recasting and the various checks are undertaken.

During the period of trial runs a multitude of checks will be made to insure that there are no errors in principle and methods nor in the programming both for manual and mechanical handling. This phase may last one or two or three months depending on the difficulty of the problem and the expertness of the staff.

At the end of the trial runs, routine operations on the Computer will begin. The installation team can be assigned to other responsibilities. However, programming does not end completely once operations have begun. A smaller team will be permanently employed to make necessary modifications and bring the programs periodically up to date.

In the following pages the personnel, equipment, and scheduling needs for programming are reviewed.

CHAPTER I

EVALUATION OF OPERATIONS

The staff and equipment required for programming, programming tests, the
conversion itself, and lastly, for a transition solution with standard
machines, are reviewed in this chapter. Figures for the transition period
are based not only on theoretical considerations, but also on observations
of actual conditions in the machine sections. If circumstances delay or
actually prevent installation of the Computer itself, systematic efforts to
rationalize operations and to inform and train the staff in the machine
sections would after a time actually reduce the size of the machine sections.

The Computer load during programming tests and transfer operations has not
been estimated. However, a proper sequencing of operations will prevent
overloading.

I. NATIONAL BUDGET

    Punched card machines are already used for these operations.

    A. A study dealing with the following points should however, be
        made before programming -- in the strict sense of the word --
        begins:

        1. the various kinds of statements required, and for each, the
            information necessary, the number of copies, and the periodicity,

        2. the form of the statements,

        3. an analysis and solution of all possible special cases.

    This study will be made, in about three months, by the Budget
    Directorate specialist assisted by a programmer. P.ogramming,
    properly speaking, will begin immediately thereafter. Two pro-
    grammers working for 4 months will be required (trial runs
    included).

    The transfer period will be very short; the files are not large
    and are now kept up-dated on punched cards.

II. FOREIGN AID

    Inasmuch as this application is similar to the preceding one the same
    observations apply. The basic structure of the National Budget programs
    can also be used. However, special care is required in deciding upon
    the form of the various statements and in dealing with the special cases
    which will be numerous and complicated.

    The total work load, as for the preceding application, will require 2
    good programmers for 4 months, but after a three-months study.

III. DIRECT TAXATION

A. Study and Programming

No serious difficulties arise for the printing of the assessment
books and the tax notices. However, the problem is not simple.
For example, the tax on salaries is calculated by levying on
taxable total income a percentage varying with each segment,
according to the number of segments. This is easy to program but
is only a small part of the problem. At the present time, con-
trollers spend considerable time over the declarations with their
large numbers of segment listings, in order to judge if the total
taxable income has been correctly calculated. This task is actually
more lengthy and requires a greater degree of competence than does
the mere calculation of the tax. It is ideally suited for the
Computer, either in its entirety or if this is impossible, in part.
The same is .true for several other cases. The experts working as a
team with the Bureau of Methods and the programmers must therefore
make a thorough study of present, and possible methods of verification
of declarations and reanalyze completely:

1. items required of taxpayers

2. the form in which declarations are presented
   data to be punched from these declarations

3. the principles (and therefore, the programs) involved in
   the various controls in all possible cases

4. special cases which may arise in the calculation of the
   tax itself.

The up-dating of the business license-real estate file, the
establishment of the corresponding assessment rolls and the
up-dating of the central taxpayer file will cause only routine
problems. Verification by comparisons, in contrast, will in-
volve many delicate and basic questions concerning:

   a. which items are to be cross-checked'

   b. the cross-checking procedures (in the strict sense)
      (pay attention to special cases!)

   c. the measures necessary when discrepancies appear.

The details given in Part I, Ch. III are primarily a guide.
Therefore, a group of experts (in economics and fiscal areas),
a representative of the bureau of methods, and programmers will
devote considerable time to this task. At the same time, the
economists will decide what statistics should be derived from
the items on the declarations, in order to have meaningful
national income information.

5. These tasks could be accomplished by an 8-month preparatory period requiring:

    a. 1 fiscal expert

    b. 1 specialist from the Directorate General of Taxation

    c. 1 expert in economics

    d. 1 programmer

6. and by a year of programming and program testing with the help of:

    a. 1 specialist from the Directorate General of Taxation

    b. 4 programmers.

Because the problem is new and complex, because it covers a wide field, and because phenomena of psychological origin may arise, it would be appropriate that after the first calculation of the taxes by the Computer, a team of two or three persons (one fiscal expert, one specialist, one or two programmers) should spend up to ten months studying: the Computer's results, the evasions and discrepancies discovered, the difference between the calculated taxes and the estimate projected from statistics, etc. .. . . This work will lead, in certain instances, to new concepts and new programs which can be considered, grosso modo, as final.

B. Conversion

It requires, on the one hand, the establishment of the real estate-business license file and the central taxpayers file, and eventually, on the other, a national registration of all persons and enterprises.

1. Establishment of the central taxpayers' file

The following notices (in this case for Saigon-Cholon) would have to be compared and combined:

    a.   18,000 real estate owners
        40,000 business licensees
         7,000 earning industrial and commercial profits
     100,000 salaried persons (including all government employees and military personnel)
          600 companies
approximately 170,000 notices

The tasks undertaken will be:

b. Establishment and codification of notices
   (20 an hour per person): clerks   8,500 hours

c. Punching (100 an hour): punch operators   1,700   "

d. Verification (100 an hour): operators   1,700   "

e. Manual sorting (500 an hour): clerks   340   "

f. Cross-checking and elimination of
   duplicates (100 an hour): clerks   1,700   "

g. Second manual sorting (by address) and
   second cross-checking; elimination of
   duplicates: clerks   2,000   "

h. Codification (300 an hour): clerks   560   "

i. The number of hours of clerical work above,
   is only approximate. The time required
   will vary depending on the condition of the
   files. It would be wise, in the beginning,
   to time operations.

   With this reservation, the following personnel
   are required:

   1) 2 punch clerks for 4½ months

   2) 2 checking clerks for 4½ months

   3) 7 clerks for 9 months

2. Establishment of the real estate-business license file

There are 140,000 taxable units (100,000 for real estate and
40,000 for the business licenses) in Saigon and Cholon. Each
real estate item requires the punching of two cards and,
each business license requires the punching of three.

The tasks to be accomplished are the following:

a. Codification of records (with duplication, especially,
   of the street code, the cadastral number, and the
   taxpayer code):

   1) Clerks   7,000 hours

   2) Punching: punch operators   3,200   "

   3) Verification: operators   3,200   "

   4) Sorting by cadastral number: 082   140   "

   5) List: 421   80   "

b. Checking off from the cadaster and
the correction of errors (50 items an hour)

    1) Clerks   2,800 hours

    2) Sorting, by address: 082   200   "

    3) List: 421   80   "

c. Cross-checking and corrections (50 an hour)

Clerks: 2,800 hours

d. These operations will require a total of:

    1) 2 punch operators for   8 months

    2) 2 verifiers for   8   "

    3) one 082 for   2   " (twice)

    4) one 421 for   1   "   "

    5) 7 clerks for   9   "

(See reservation in para. III-B-1-i, above)

3. National registration

This task will require:

a. 1 expert for 6 months (to devise the system)

b. 1 punch operator for 5 months (approximately
100,000 cards)

c. 1 verifier for 5 months (approximately
100,000 cards)

d. 1 programmer for 4 months

e. 25 hours on the Computer

For codification, the programmer and the Computer are
replaceable by 3 clerks working for 8 months (at the rate of
25 taxpayers an hour). If this task is accomplished in
time, it will simplify and shorten the operations described
above (para. III-B, central file), but without basically
changing them.

C. Transition operations on standard machines

The transfer of tax calculation onto standard punches is now in process; it must be extended since it is the most effective means of defining the problem in all its details and of preparing for the utilization of the magnetic files.

On the basis of current figures, these operations will continually require:

1. 4 punch operators

2. 4 verifiers

3. 2 installations

IV. THE TREASURY

A. Study and programming

The operations are diverse. The Computer will be responsible not only for the work of the general accounting office, but also for that of the following departments, each having its own mode of operations:

1. Tax collections

2. Transfers

3. Cash

4. Special funds

5. Reconstruction lottery

6. Pensions

7. Special deposit
   (Caisse des dépôts et consignations)

8. Account administrators (préposés)

9. National Budget

10. Non-budgetary operations

The last department mentioned administers 70 accounts, each of which is, in practice, a complex special case (American Economic Aid, Budget of the Commercial Harbor,

A study of current procedures will therefore be lengthy and complex; it will require experts who will reduce the large number of different procedures, by making minor changes, to a smaller number of standardized procedures, with some variations.

It is estimated, on first analysis, that these tasks will be accomplished in two stages:

> study: 1 year
>
> > 1 financial expert
> >
> > 1 Treasury specialist
> >
> > 1 programmer
>
> programs and tests: 1 year
>
> > 1 Treasury specialist
> >
> > 4 programmers

This estimate is not precise since too many factors are involved. It will have to be verified after a few months of study on the basis of results observed on the standard machines (see below).

B. Conversion

1. The conversion calls for duplication onto magnetic tape of the voluminous file, "chapters and articles". The file consists of approximately 250,000 accounts, sub-accounts, and sub-headings. In this total, the headings listed below are already on machines and should be subtracted:

a.	National budget	66,000
b.	Civilian pensions	6,000
c.	Special funds	13,000

2. It is estimated that by the time of conversion, the following headings will also be processed on standard machines:

a. Military pensions

b. Pensions of the General Treasury of France

c. Taxpayers

3. About 70,000 headings will still require codification and cross-checking:

    a. Codification, cross-checking (25 an hour):

       clerks   2,800 hours

    b. Punching (100 an hour): punch operators   700   "

    c. Verification (100 an hour): verifiers   700   "

4. In *toto*, approximate requirements are:

    a. 1 punch operator   4 months

    b. 1 verifier   4   "

    c. 2 clerks   8   "

(This last figure will vary depending on the condition of the files being duplicated.)

C. Transition period on standard machines

As previously indicated, a part of the problem is already being solved with standard machines; as many more operations as possible must be mechanized in order to facilitate the installation of magnetic files and the writing of programs.

There are, at present, two complete sets of equipment in the machine section. The tasks which could be mechanized before the Computer gets into operation will require 4 sets of equipment.

V. CONTROL OF IMPORTS

A. Study and Programming

1. In Ch. V, Part I, the need for a more complete study of the functioning of the economy factors was indicated. This study might last 6 months involving one expert, one economist, and one programmer.

Upon completion of the study and adjustment of the outline proposed above, a team of two economists will, during the first year, organize the file on magnetic tape: Specifically, they will:

    a. decide which articles are to be listed individually and which will be listed in groups,

    a.   define for each article or group, the value of the items in the file: their import prices, actual stocks, optimum stocks, monthly consumption rates, coefficients for up-dating entry norms, etc.

Following the completion of that task the group will continue to function as a team. It was mentioned in the first part of this study (Ch. V) that the accuracy of the estimates calculated by the Computer for each article needs to be periodically checked. For this purpose, the estimates successively made by the Computer during the past year must be compared to the changes in the actual situation for a given product as determined by economic study. This comparison may lead to a modification of the constants recorded on magnetic tape or even of some procedures of calculation. These modifications are necessary, not so much because of initial errors in judgment, but because of constant fluctuations in economic conditions. The team of two specialists will therefore have to review them year after year.

B.   Conversion. The team of two economists mentioned in the preceeding paragraph does most of the work involved for transfer.

C.   Transition solution with standard machines. Improvements, using standard equipment, of the present methods seems improbable. Consequently, the National Bank can continue to perform this task until it is converted to the Computer.

VI.   GOVERNMENT PAYROLL

The starting of operations for this application is simple. Its study has already been completed.

Programming, in the strict sense, will require two persons for three months (after preliminary study by one specialist and one programmer, for two months) to determine the forms to be used. The magnetic file will be established by simply copying card files already existing. A few items, however, will have to be added (aptitudes and diplomas): the collection, codification, and punching of this information will require:

1.   1 specialist for   6 months

2.   1 punch operator for   2 months

3.   1 verifier for   2 months

These estimates are valid only insofar as mechanization now in process is gradually extended to cover all government employees. This will require a maximum of three standard sets of equipment.

VII.   NATIONAL PURCHASING CENTER

A.   Study and programming. Few problems are involved in the study preliminary to the programming. The present application is one of inventory administration, a classical subject whose problems are generally well understood.

      1. A team composed of:

         a. 1 specialist

         b. 4 programmers

can complete this task as well as the programming tests in about six months, bearing in mind the need for a short preliminary study requiring three months.

B. Conversion

1. The codification of articles for duplication in the magnetic file does not involve serious difficulties inasmuch as articles have relatively few categories. Moreover, a certain number of codes already exist. It is merely a question of the selection of one.

2. A more laborious task will be the up-dating and the punching of the existing inventory. If the inventory includes 200,000 articles, the estimated work load will be:

    a. Codification and controls (40 articles an hour):

Clerks	5,000 hours

    b. Punching: punch operators   2,000 "

    c. Verification: verifiers   2,000 "

                or:

    d. 2 clerks for   1 year

    e. 2 punch operators for   5 months

    f. 2 verifiers for   5 months

C. Transition solution with standard machines

Again, it is desirable to mechanize as much as possible. Since relatively small volumes are involved, one set of equipment should suffice.

VIII. POPULATION CENSUS

A study of the problem will not be discussed here. The study will be undertaken by the Institute of Statistics. Participation in this study by Computer specialists is almost without purpose since the staff of the Institute possess a knowledge of the equipment as well as experience in making population censuses. Programming, in the strict sense, and testing the programs should not last more than four months with the help of four qualified programmers.

Chapter II

INITIAL OPERATIONS PLAN

I. Carrying Out the Schedule

The graph attached as an Annex to this Ch. shows the time schedule
for the commencement of operations of the various applications. It
is, however, merely an example, a possible solution. Other solutions
may be developed, perhaps even more suitable.

The number of persons required for each phase was outlined in the
preceeding chapter. On organizing the schedule, the following
guidelines applied:

- To prepare a few easily transferable applications in order to
provide, in a short period, experience to the entire staff, and in
order to utilize the Computer from the very beginning for useful -
even if small - tasks. These applications will require that programs
be tested elsewhere prior to delivery of the machine; however, this
raises no difficulties.

- To begin as soon as possible the study of more difficult and time
consuming applications (e.g. taxation).

- To avoid assigning too large a team to one application (thereby
causing low productivity). However, when the time estimated for
setting up a program is long (e.g., more than eight months), it
becomes difficult to remain within the alloted time. In this case,
it is best to establish modest and intermediate goals.

- To forecast, whenever possible, the beginning date of each operation
as soon as the programming has been completed.

- To stagger the beginning of operations, because each one requires
considerable mental energies and additional work.

- To abide by the priorities established for the different appli-
cations.

In the following paragraphs, the personnel and equipment needs
resulting from this schedule of operations is studied in detail. In
order to reconcile the large amount of work planned with the
difficulties involved in keeping large numbers of specialized
personnel in Saigon, the work has been distributed over a three-year
period: 1959, 1960 and 1961 on the assumption that the Computer will
be delivered at the beginning of 1960.

3. For the control of imports:

a. 1 expert from January to June 1959.

C. Specialists

In contrast to the experts, specialists will be persons coming from government departments affected by the Computer installation. Although they will not be responsible for writing the programs, they should understand the Computer, and if possible, attend the programming courses. These specialists should be assigned full time to the study and programming teams and should also be relieved of all other responsibilities.

The specialists required are the following:

1. 1 specialist from the Directorate General of the Budget and Foreign Aid, from January to July 1959 (for the budget, foreign aid and the payroll).

2. 1 specialist from the Directorate General of Taxation from January 1959 to July 1961.

3. 1 specialist from the Treasury from October 1959 to October 1961.

4. 1 economist, a specialist from the Directorate General of Foreign Trade (formerly CNI) from January to June 1959.

5. 1 specialist from the National Purchasing Center from September 1961 to May 1962.

Finally, there is the team of two permanently assigned economists in the field of imports after July 1959. They should have had fairly advanced training and will receive even more training from January to June 1959, under the direction of an expert.

D. Bureau of Methods

1. A Bureau of Methods, comprising 4 persons, is suggested. The four staff members should have the following qualifications:

a. be good programmers,

b. have an advanced general education,

c. have worked, if possible, in an office or a department; if not, at least have the necessary qualifications. The recruitment of this staff must therefore be undertaken with extreme care.

2. The functions of the Bureau will be the following:

    a. to develop a precise and detailed model for the starting of operations, either derived or not derived, from the present model,

    b. to take all necessary steps to see that the schedule is respected; to modify it in cases of incorrect forecasting,

    c. to effectively direct the programming teams,

    d. to maintain constant contact with the various government departments especially in developing instructions to the personnel, after the initial transition period,

    e. to intercede whenever a modification of procedures is proposed or adopted during the programming period,

    f. to supervise and control operations during the transition period,

    g. to supervise initial operations; to maintain liaison with the departments concerned; and to intervene in all disagreements during this period.

3. Briefly: the Bureau of Methods will act as the general staff of the Director during the early operations of the Computer. After 1961, its staff will gradually be reduced to two assistants to the Director.

Their functions will then be:

    a. to establish and control the Computer's schedule,

    b. to change and up-date the programs used; (for this task, four programmers are available as stated above),

    c. to organize the study, the programming, and the implementation of new applications.

E. Director of Initial Operations on the Computer

1. The need for perfect functioning of the Computer, both before and after operations begin, cannot be overemphasized. The problems involved in starting operations, and in directing the large staff have already been discussed. Because of this, the Director of initial operations of the Computer should possess:

    a. an outstanding personality. He should therefore be appointed at the level of assistant director or an equivalent rank,

b. should be relieved of all responsibilities not related to the running of the Computer,

c. should be able to provide modern and dynamic leadership.

3. The Director will be responsible for:

a. the Programming Section, through the agency of Bureau of Methods (see above),

b. the Computer department (see below),

c. the codification, punching, and control sections, etc. when they are located next to the Computer.

F. Computer Department

1. This department will include:

a. a department head,

b. an assistant in charge, with the help of the Bureau of Methods of establishing and supervising the time table of the Computer,

c. an operator capable of operating the operator's console and able to direct all the operations required for each program,

d. three operators responsible for feeding cards and paper into the two tabulators and the connected punches.

e. two operators in charge of servicing the magnetic tapes and assisting in the various operations,

f. a "librarian" responsible for labeling the archives, and the use of the various files on magnetic tape,

g. one or two operators responsible for the running of the sorter, the collator, and the unconnected tabulator.

2. During the period of initial operations (1960-61), the last mentioned operator will be replaced by a chief operator directing a small section with the following standard machines:

a. 1 type 082 sorter,

b. 1 type 421 or 405 tabulator,

II. Personnel Requirements

A. Programmers

The graph in the appendix shows, for each month, the number of programmers required. Ten is the maximum number during 1959, 1960, and 1961. Eight programmers are scheduled for work by May of 1959. In other words, eight programmers, having completed their training, will have to be in Saigon by January 1st. The four months of operations on a smaller scale will also serve as additional training periods. Since this four month period is relatively short, at least four of the eight programmers should possess experience, and should have proved themselves during 1958. The four others may follow operator courses in October 1958, for example, and then continue, for a period, towards specifically perfecting their skills.

If, at the outset, all the programmers come from abroad, they should have a two to three year contract. Six or seven additional programmers might be hired in Saigon. They would take courses, and then be assigned as assistant programmers on the programming teams. By 1961 they will be ready to assume responsibilities.

The duties of the four persons on the graph after October 1961 will be to up-date and maintain the programs. This function will be a continuing need.

B. Experts

This term is used for individuals having, in addition to an education sufficiently broad to meaningfully participate in discussions with people of different fields, a theoretical and practical knowledge of a specialized field. They should also have up-to-date knowledge on the principles and methods used in different countries in dealing with the problems of that field. The experts required are:

1. For taxation:

a. 1 fiscal expert from January to August 1959,

b. 1 expert in economics from January to August 1959,

c. 1 fiscal expert from November 1960 to February 1961.

2. For the Treasury:

a. 1 financial expert from September 1959 to August 1960.

      c. 1 type 513 reproducer,

      d. 1 type 077 collator,

      e. 1 type 101 sorter,

      f. 1 operator,

      g. 2 assistant operators.

Lower rank personnel will be taken from existing machine departments. They will be trained in Computer operations under the direction of the programmers who will always run the program tests themselves.

The department head and his assistant should be appointed as soon as possible and should participate fully in the installation of the Computer. The head should undergo lengthy training in a place where a Computer is already in use.

The console operator - and an operator capable of replacing him - will be chosen among the Vietnamese programmers on the basis of competence and aptitude.

G. Punching - Verification

At the end of the first part of the present study, it was mentioned that 17 punches and 15 verifiers would be required permanently. This would require a staff of 35 persons, dispersed among the relevant departments. A portion of this staff is already at work. It will be increased as required for transition solutions on standard machines. For the transfer operations, 2 punch operators and 2 verifiers will be required from April 1959 to December 1960.

H. Miscellaneous Personnel

    1. A lecturer will be required to provide:

      a. information lectures on the Computer. The lectures should be varied in order to reach all levels of government personnel:

        (1) the higher and middle ranks in order to obtain effective cooperation,

        (2) clerks and employees to relieve their fears and avoid negative reactions to the Computer installation.

      b. courses for specialists working with the programmers and for the programmers hired in Saigon.

The lecturer might be the department head and assisted by the staff responsible for the initial operations of the Computer.

2. For conversion operations clerks will be required:

    a. 7 clerks from the Directorate General of Taxation (from February 1959 to July 1960),

    b. 2 clerks from the National Purchasing Center (from October 1959 to September 1960),

    c. 2 clerks from the Treasury (October 1960 to May 1961).

3. Lastly, there are two possible solutions to the problem of the Computer maintenance:

    a. maintenance by IBM France on a contract basis: IBM France will then be responsible for providing staff,

    b. maintenance by the Viet Nam Government; 2 specialists must be in constant attendance; therefore at least 3 must be available. IBM France can be responsible for training this staff.

III. Equipment Needs

    A. Punches - Verifiers

    Seventeen punches and 15 verifiers will be retained to work with the Computer. These machines will be in use with the standard equipment at the time of conversion.

    In addition, conversion operations will themselves require:

        1. 2 punches

        2. 2 verifiers - from April 1959.

    B. Standard Equipment

        1. At the end of 1959, the estimated needs for equipment are the following:

a.	National Budget and Foreign Aid	1 installation
b.	Taxation	2 installations
c.	National Treasury	4 installations
d.	Control of Imports	(National Bank)

e. Payroll   3 installations

f. National Purchasing Center   1 installation

g. Machine Section Appendant to the
Computer   1 installation

                                          12 installations

2. This equipment will be progressively released, according
to the following schedule:

a. 1 installation in May 1960   (Budget)

b. 3 installations in June 1960   (Payroll)

c. 2 installations in November 1960   (Taxation)

d. 1 installation in July 1961   (National Pur-
                                          chasing Center)

e. 1 (partial) installation in
November 1961   (Computer Annex)

f. 4 installations in December 1961   (Treasury)

CONCLUSION

The present study has described in detail the structure of the Government of Viet Nam. The basic principles involved in each operation and the role of the Computer, in improving them, has been described. In certain instances, new methods of work were discussed and the advantages of each were described in detail; in others, where only general principles were emphasized, leàd to a more thorough study of the problem of developing precise procedures.

The advantages discussed in earlier chapters will not be repeated here. In the broader view, the Computer centralizes all facets of the economic life in the Government and of the Nation:

1. Budgetary Control of Receipts and Expenditures,

2. Treasury Operations,

3. Control of Foreign Aid,

4. National Purchasing Center,

5. General Government Inventory,

6. Payroll, and Government Employee Records,

7. Granting of Import Licenses and Control of Custom Entries,

8. Control of the Regularity of the Supply of Imported Products,

9. Centralization of all the Economic Information Needed for the Control, the Assessment, and the Collection of Direct Taxes.

The Computer can do this:

1. because of the tremendous speed of operations of its electronic components,

2. because even the most complex problems can be programmed,

3. because of the use of magnetic tapes which make possible the regrouping, in composite files, of different kinds of information related to a given whole.

The Computer actually possesses an overall view of the economic life of Viet Nam. This is its essential quality; at the present time competent personnel is not available in sufficient numbers, and it would be impossible to train them within a reasonable time.

The innumerable characteristics which make the Computer profitable have been mentioned in their proper place. Among the more important are automation, the labor-saving of qualified staff, and the more efficient and accurate assessment of taxes. A brief exploration in the field of operational research was also made. This is not the main point.

A Computer will have far-reaching repercussions on the economic life of the country. By providing the Government with complete, precise, and accurate data the Computer will be of material assistance in the solution of economic questions especially those relating to the commercial and industrial development of Viet Nam.
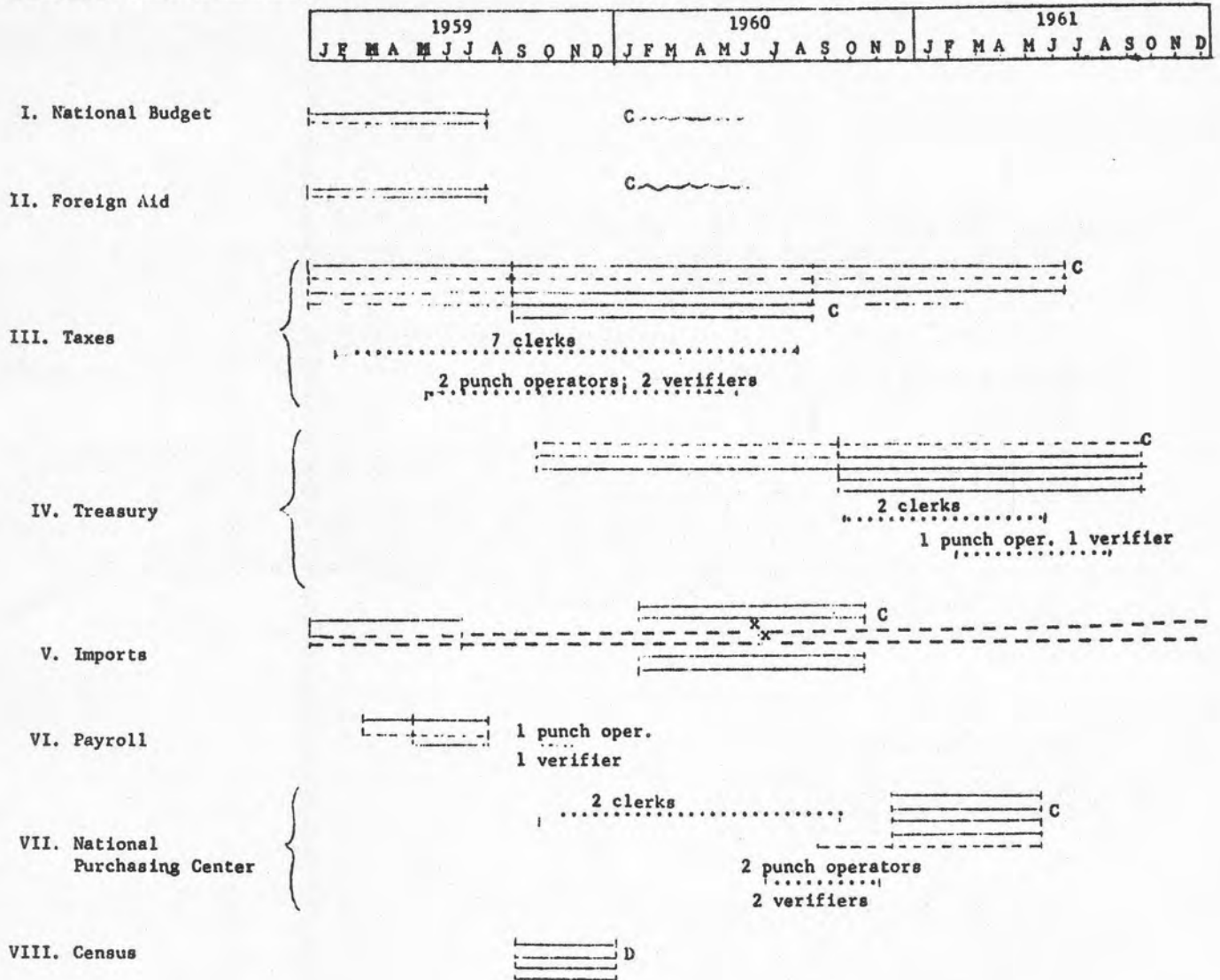
With its help, experts will no longer lose time in searching for the information and data they need. Computer provided data will be even more reliable. Planning for development will be facilitated.

Automation and a rational use of a Computer can thus be of greater benefit to the Government of Vietnam than to the countries of the West. The latter are already too large or too rigid in their administrative patterns to derive maximum benefits.

Thus, it is hoped that this study, made on the request of the Government of Viet Nam, will meet its expectations.

Sequence of Operations

	1959	1960	1961
	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D

I. National Budget   C

II. Foreign Aid   C

III. Taxes   C   C

7 clerks

2 punch operators; 2 verifiers

IV. Treasury   C

2 clerks

1 punch oper. 1 verifier

V. Imports   C

VI. Payroll

1 punch oper.
1 verifier

VII. National
Purchasing Center   2 clerks   C

2 punch operators
2 verifiers

VIII. Census   D

J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D
1959	1960	1961

Personnel Required

LEGEND

Programmer

Expert

Specialist

Other

Initial Computer
Operator

10
9
8
7
6
5
4
3
2
1

J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

Sequence of Initial Computer Operations

J F M A M J J A S O N D J F M A M J J A S O N D

I II VI VII   III   V   VIII   IV