OCCASION

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

DISCLAIMER

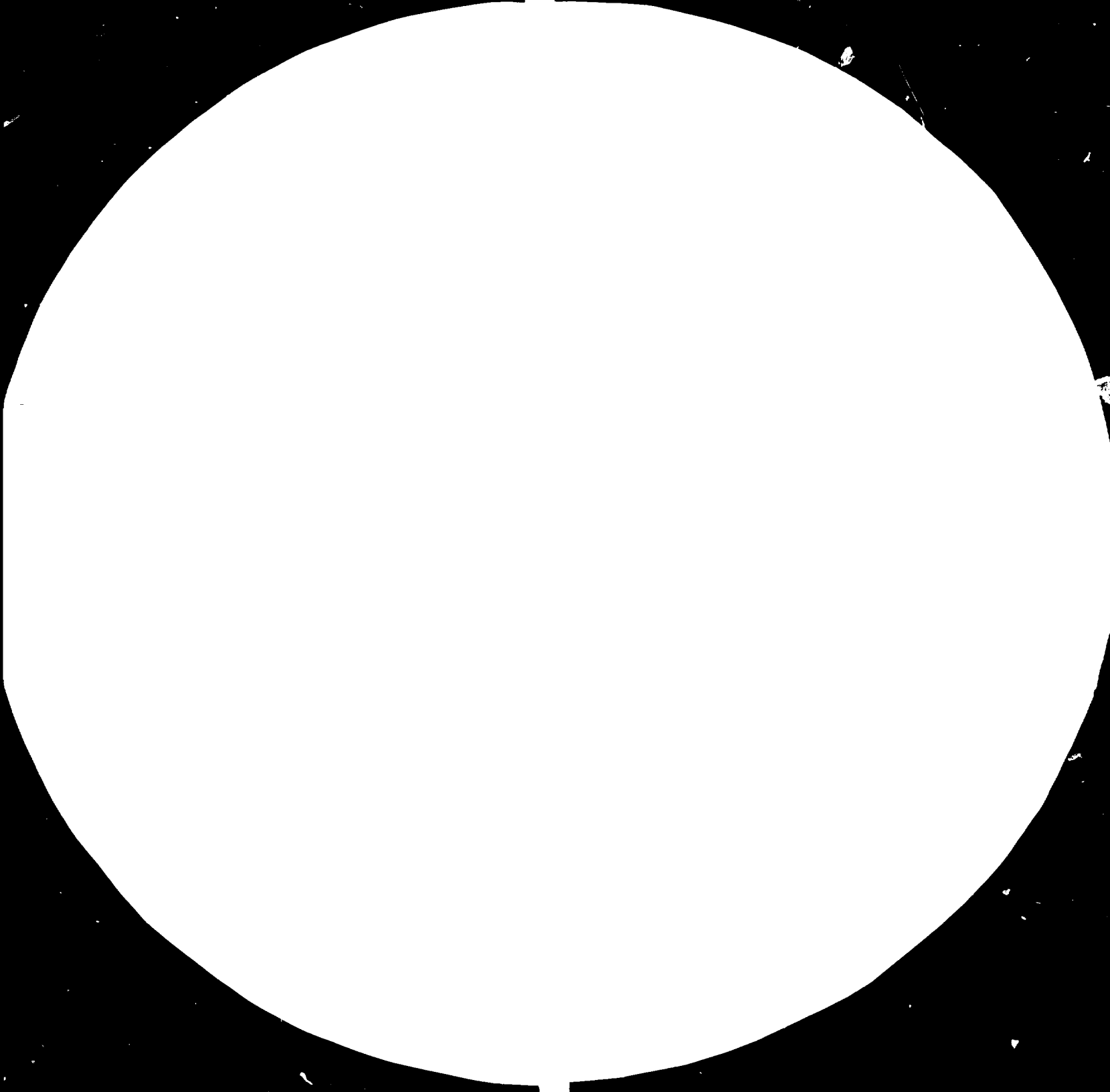
FAIR USE POLICY

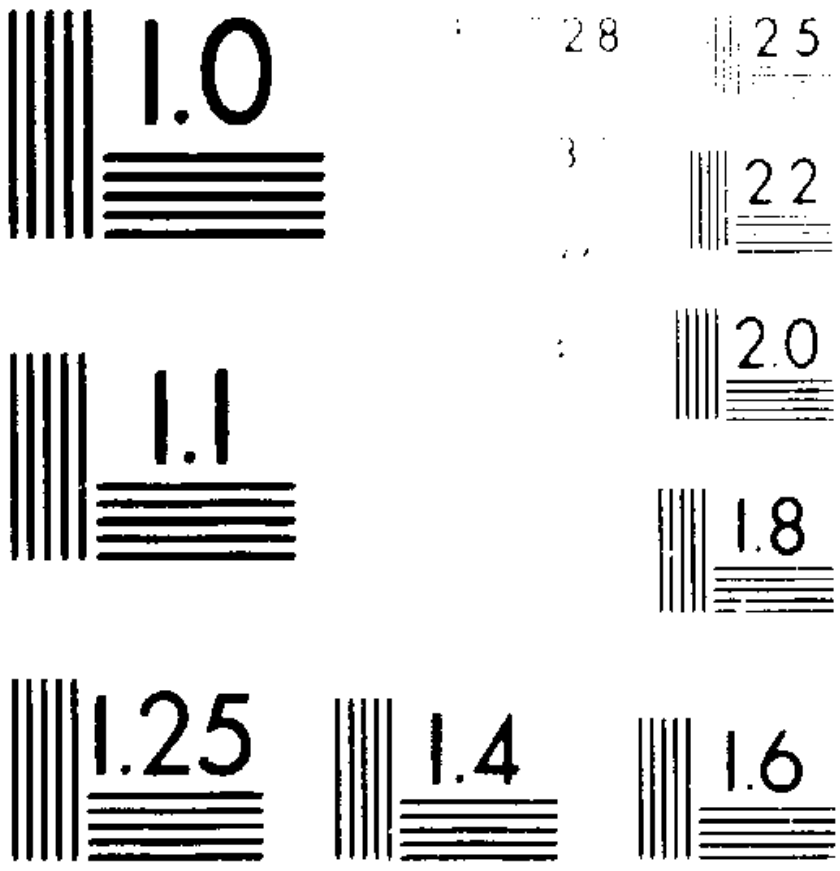
CONTACT

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

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

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





Distr.
RESTRICTED

UNIDO/IO/R.143
24 December 1984

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

ENGLISH

14176

COMPUTER MODEL FOR FEASIBILITY ANALYSIS AND REPORTING (COMFAR)

COMFAR, User's guide and reference manual*,

prepared by the

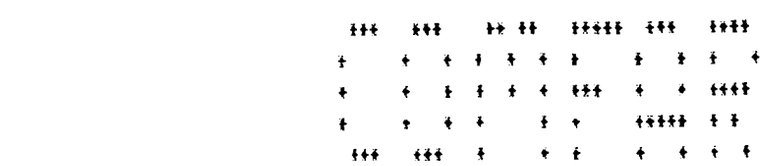
Feasibility Studies Section
Division of Industrial Operations

P.M. Hawranek

*This document has been reproduced without formal editing.

V.84-94603

Computer Model for Feasibility Analysis and Reporting



User's Guide & Reference Manual

Documentation 1.1
November 1984

Acknowledgement

The Computer Model for Feasibility Analysis and Reporting (COMFAR) was prepared by the Feasibility Studies Section of the Industrial Operations Division of UNIDO and is based on the UNIDO Manual for the Preparation of Industrial Feasibility Studies. The systems analysis and design of the model were made by P.M. Hawranek, who also supervised the programming work and testing of the software and prepared this COMFAR User's Manual. W. Smeulin outlined the systems design and assisted us in the selection of a suitable personal computer and programming language.
The model was written in PASCAL and implemented on an apple III personal computer by Ch.Heinze and Ch.Nowak and it is due to their efforts that this software package of some 25.000 programme statements could be made operable on a personal computer. Advice was also received from several colleagues and experts of the Industrial Division of UNIDO, for which great appreciation is expressed.

The updated COMFAR (1984) *has been released for the apple III* and the IBM-PC/XT personal computers. This release includes an extension of the finance and the production costs modules, and several small, however, useful amendments. The dialogue communication between the user and COMFAR has been further simplified, and the operation time is now significantly lower. Ch.Nowak, R.Novak and A.Scherney programmed the updating and implementation on the IBM computer and introduced a number of improvements of the system operation, the dialogues and algorithm.

DISCLAIMER OF ALL WARRANTIES AND LIABILITIES

The COMFAR programme package is licensed by UNIDO "AS IS", and is programmed to be executed on a modified Apple /// computer. UNIDO does not make warranties, either express or implied, with respect to this manual or with respect to the software described in this manual, its quality, performance, or fitnes for any particular purpose, or with respect to the Apple /// computer and its software. The entire risk as to its quality and performance is with the user. In no event will UNIDO be liable for direct, indirect, incidental, or consequential damages resulting from any defect in the software, even if UNIDO has been advised of the possibility of such damages.

Chapter 1

WHAT IS C O M F A R <c> ?

C O M F A R stands for Computer Model for Feasibility Analysis and Reporting. The programme package is an important tool for the project analyst, who wants to prepare and evaluate industrial investment projects, and to use computer power for the preparation of cashflow tables, balance and income statement projections, following the guidelines described in the UNIDO Manual for the Preparation of Industrial Feasibility Studies (1).

The computer novice can easily learn to use the full power of COMFAR because the programme package is designed to operate in a DIALOGUE mode and to guide the user through the three following phases:

* data entry,
* computation of results table, and
* printing of schedules (reports).

The programme will check data input and subsequent computations and warn in case of input errors. The programme may even stop operation in case of fatal errors and send a prompting message thus protecting the work against unintentional change or loss of data.

The COMFAR System is designed to be used on a microcomputer and operation and control are nearly as easy as on much larger computer systems.

COMFAR is a cashflow-oriented model and the user can simulate the inflows and outflows of cash of an industrial investment project in accordance with the methods described in the UNIDO Manual. During the DATA ENTRY phase COMFAR rejects wrong answers and ensures that all basic data required for subsequent computations are saved on an external data file (on floppy disk). This file can be updated or modified and used again for computation of alternatives and sensitivity analysis.

Starting from the data file COMFAR produces a complete cashflow-oriented result table, including:

* initial and current investment
* sales and production programme
* cost accounting
* scheme of financing
* balance and income statement
* cashflow discounting.

---

(1) Manual for the Preparation of Industrial Feasibility Studies, United Nations, New York, 1978, ID/206.

COMFAR is a very flexible tool for economic and financial analysis of industrial projects, and it includes features such as separate planning of local and foreign cashflows, distinction between local and foreign currencies, half-yearly planning of cashflows during the construction phase of a project, automatic computation of a finance scheme based on few essential input data .

During the REPORT phase COMFAR reads data from the results table produced by the module programmes, and produces schedules in accordance with the UNIDO Manual.

*

Chapter 2
COMPUTER SYSTEM

THE C O M F A R SYSTEM IS AVAILABLE ON MICRO COMPUTERS

UNIDO MANUAL

Since its publication in 1978, the UNIDO Manual for the Preparation of Industrial Feasibility Studies (ID/206) has been widely distributed and accepted by industrial development banks, consulting firms, equipment suppliers and universities. This Manual has so far been translated into more than ten languages, and over 50,000 copies have been printed.

COMFAR

In order to accelerate the numerous calculations required for economic, financial and sensitivity analysis as well as for the computation of project alternatives, a computer programme for industrial feasibility studies was planned. The structure of the Manual was therefore designed with this objective already in mind. UNIDO undertook to develop a computer programme which could be implemented on a micro computer, and after careful analysis of the objectives of project evaluation at headquarters and in the field, it was decided to have the COMFAR Programme Package written in PASCAL and to develop it on an Apple /// micro computer. This computer was selected, because it met best UNIDO criteria for the selection of hardware, which are e.g. price, available computer language, transportability (weight of hardware), ease of operation under difficult environmental conditions, service facilities.

MICRO COMPUTER

It is hoped that the UNIDO concept of using micro computers in order to accelerate the numerous calculations required for project analysis, is well received not only at UNIDO Headquarters in Vienna, but also, much more importantly, by consulting firms carrying out studies in the field or by UNIDO-sponsored Industrial Project Planning Centres set up in developing countries.

COMFAR has been released for APPLE /// (May 1983) and for the IBM-PC/XT (November 1984). On APPLE /// it runs under the SOS system in UCSD Pascal, on IBM PC under the MS/DOS Pascal system.

*

Chapter I

WHEN AND HOW TO USE THE C O M F A R SYSTEM

PRE-INVESTMENT STUDIES

The selection of sound investment projects has to be undertaken so as to ensure the optimal utilization of scarce human, natural and capital resources towards meeting social objectives, economic growth and improvement. Project selection and the decision for project implementation can only be based on carefully prepared project evaluation. The quality of pre-investment studies has not kept pace with the more elaborate demands made on them. The standard and depth of studies are often not of a sufficiently high level to ensure rational decision making at the successive stages of the pre-investment process. This deficiency has resulted in misallocation of resources, long gestation periods, investment cost over-runs, and the creation of excess capacities.

UNIDO MANUAL

The UNIDO Manual for the Preparation of Industrial Feasibility Studies has made a major contribution to the standardization of the applied methodology of pre-investment studies. The Manual describes the scope and contents of opportunity studies, pre-feasibility studies, and feasibility studies.

FINANCIAL+ ECONOMIC ANALYSIS

The format suggested by the Manual, allows a stage-by-stage analysis of the various components of a feasibility study, with the sets of figures generated for each component gradually converging to the most important totals. Although the Manual is chiefly concerned with project preparation, the need for the wider application of cashflow analysis in project evaluation prompted the addition of a presentation of discounted and simple evaluation methods applied in economic and financial evaluation. Thus each chapter of the Manual contains several proforma schedules suitable for data collection.

SCHEDULES

These schedules are designed in such a way as to serve also as the basis for the entry of economic and financial data into the COMFAR System. COMFAR processes these input data using, in principle, the same rules as described in the Manual (with a few amendments and extensions).

WHEN TO USE

The computer programme is in fact a simulation model and can be used for small or simple pre-investment studies, as well as for intensive economic and financial analysis of investment projects. One of its advantages is the building up of projects and the variation of project data for the analysis and evaluation of alternatives, as well as the analysis of project sensitivity to parameter variation (risk analysis).

THE USER

COMFAR has been developed to facilitate and accelerate the work of the economist and financial analyst when preparing and calculating industrial pre-investment studies of all kinds. COMFAR is designed to be transportable and to run on personal computers with the intention of utilizing it not only at headquarters, but also by consultants preparing studies in the field.

HOW TO USE

COMFAR is an interactive computerized model for economic and financial project analysis. The user is guided through the entire Data Entry, Calculation and Report/List programmes of the COMFAR Package. While it is not obligatory for the user to understand in detail the structure and composition of the COMFAR model when preparing simple feasibility studies, he should be acquainted with the concept if he wants to utilize the full power of COMFAR, which includes break-even analysis, multi-product projects and analysis of the contribution of each product to the economic and financial result of the project, etc.

Chapter 4
REFERENCE MANUALS

THE COMPUTER MANUALS AND THE COMFAR OPERATING MANUAL

COMPUTER MANUALS Together with your personal computer equipment manuals will be supplied. These manuals contain instructions beginning with unpacking and your "first steps", and unless your computer has been installed already and you are familiar with it, you should read the the corresponding chapters before you install or use the system.

COMFAR MANUAL Once your computer syster has been installed, you can continue with the COMFAR Manual, which will guide you through the use of the COMFAR System. Since COMFAR has been designed to operate in a dialogue mode, you will only have to follow the instructions displayed on screen. If something is not clear to you, consult the COMFAR Manual.

Although, the COMFAR Manual includes the most important instructions and explanations, essential for execution of the COMFAR System, it cannot go into all details. Therefore, the user should also become acquainted with the system commands and procedures described in the computer manuals.

SYSTEM MESSAGES The COMFAR System displays requests for entries, instructions and explanations, as well as various messages referring to normal or abnormal programme execution. These messages are explained in the COMFAR manual (part C). In exceptional cases the computer may display messages from the operating system. These are not described in the COMFAR manual, but in the corresponding computer manual.

COMFAR MESSAGES When the computer does not understand your entries (because of typing errors, or unexpected answers, or because of unexpected situations during programme execution) the computer will usually display a message on screen. The message may be a WARNING, telling you that COMFAR has encountered no data, where it exepected some, but has continued programme execution (assuming default values), or that failures (FATAL ERRORS) have caused premature programme termination.

COMFAR WARNINGS In case of warnings you should check whether the results produced will be affected; if so the corresponding corrections (mostly in the input table) must be made before COMFAR is started again.

FATAL ERROR If this message is diplayed, the computer will normally stop execution of COMFAR. If a reason for the premature termination of COMFAR is displayed, the programme can be started again from the beginning, after the required corrections have been made. However, if COMFAR execution has been stopped because of unexpected conditions (such as power failure, etc.), a coded error message may be displayed. In case of repeated premature termination of COMFAR and display of the same coded message, note this message and contact your supplier of COMFAR or UNIDO.

If you get stuck during execution of COMFAR, try to terminate through the commands offered in the COMFAR menus. In case this is not possible, try to interrupt the system ("CONTROLL C" on Apple, "CONTROL C" on IBM)

! NEVER TURN OFF THE POWER, WHEN THE COMPUTER SYSTEM IS IN THE PROCESS OF PROGRAMME EXECUTION !

Chapter 5
HOW TO USE THE MANUAL

HOW TO USE THE COMFAR MANUAL

THREE PARTS

Like the COMFAR System itself, this manual is intended to be a useful tool for economists and financial analysts, who may have different backgrounds and knowledge of computers and programmes. Whatever your previous experience with computers or economic and financial models, this manual will help you to use COMFAR easily and effectively. The manual is divided into three parts, part A is intended as a quick guide for operationg COMFAR, while part B contains two example cases and a detailed description of the COMFAR programme package and its use. Part C, finally, contains descriptions of the system commands, the structure and contents of both, the input and output tables, and a word index and glossary.

OBLIGATORY

For those who wish to start COMFAR without reading through the descriptions in part B of the COMFAR manual, we recommend using one of the example cases described at the beginning of part B, and following the instructions given in the short-cut operating guide (part A). However, before you turn on your computer, we strongly recommend reading through chapter 6 (Before Starting the Computer), and Chapter 7 (Getting the System Started), to avoid any damage to the system, disks or diskettes.

What to find where:

Part A

The SHORT-CUT OPERATING GUIDE is primarily intended for users who have not enough time to read through the detailed descriptions in part B, and prefer to become acquainted with COMFAR by using it, answering the questions displayed on the monitor screen. Those who have not used COMFAR for some time and need to refresh their memory before using the system again, may also find the short-cut operating guide very helpful.

Part B

EXAMPLE CASES AND COMFAR REFERENCES, is primarily a tutorial and explanatory section that lets you teach yourself to use the COMFAR System. For ease of reference a floppy disk containing the corresponding input data, is available from UNIDO. However, you can also establish the same input table files yourself with the data (input variables) described in Part B.

In Part B the COMFAR system, its concept and the structure of the programme package, are described in detail. If you want to know COMFAR and to use its full power, chapters 16 to 23 will guide you through the basic commands and the dialogue system controlling the operation of COMFAR, and explain the various possibilities COMFAR offers for modelling economic and financial interdepenencies of industrial investment projects. It is not necessary to read through part A (Short-cut Guide) - except for chapter 6 (Before Starting the Computer) - and you can begin with Chapter 14.

Part C

In the third part of the COMFAR manual you will find a list of the messages displayed during normal operation of the computer, as well as ERROR messages. We have not included all computer system messages, and if a message is displayed on the screen, which is not explained in the COMFAR manual, please see the computer manuals. Part C contains also detailed descriptions of the tables produced by COMFAR, and a word index and glossary.

BEFORE STARTING THE COMPUTER

KEYBOARD — The keyboard allows you to communicate with the computer, to enter your data and to control program execution. Each entry must be terminated by pressing the RETURN key. If you forget to press this key, the computer will not know that your entry has been terminated, and will wait for more input.

PRESS a KEY — While data (text and values) are "entered" into the system by typing the data AND pressing the RETURN key afterwards, the commands for program control are given by "pressing" the corresponding character key (letter, number or <return>).

DISK DRIVE — Your personal computer has at least one disk drive for floppy disks (diskettes), the APPLE /// needs two drives for COMFAR, the built-in disk drive and an external drive. To insert or remove a diskette, you must first open the disk drive door by lifting its lower edge (for details see your computer manual).

!> When the red IN USE light is on, you must not open the drive door or turn the computer off. Either of these actions could damage the diskette.

CARE OF THE COMPUTER — Treat your personal computer as carefully, as you would treat a good-quality electric typewriter. Keep the disk drive door closed. An open door is an invitation to dust and foreign particles which could degrade the performance of the disk drive.

VENTILATION — The APPLE /// computer has no ventilating fan, and the only way it can dissipate heat is through the cooling fins on the back and sides of the case. Always be sure your Apple /// has adequate ventilation, and that the ambient air temperature does not get too high.

CARE OF DISCETTES — Never let anything touch the brown or grey surface of the plastic disk inside the diskette package. Handle the diskette only by its black plastic cover. When a diskette is not in use, keep it in the paper envelope it came in. These envelopes are treated to minimize static build-up which attracts dust. It is best to store diskettes vertically when they are not in use.

DISCETTE LABEL — To write on a diskette label, use a FELT TIP pen or marker, never a pencil or ball pen. Do not press hard. It is best not to write on a label attached to a diskette: instead, write on the separate label, then attach it to the diskette.

MAGNETIC FIELDS — Keep diskettes away from magnetic fields. This means keep them away from electric motors and magnets; they should not be placed on top of television sets or other electronic devices. Don't leave them on top of the computer or monitor, the magnetic field generated by the transformer could erase information on the diskette.

HEAT, SUN — Diskettes are sensitive to extremes of temperature. Keep diskettes out of the sun, and away from other sources of heat which could cause them to warp.

PROTECT INFORMATION — If you want to protect the information on your diskette from accidental erasure by the computer, just stick one of the small adhesive tapes supplied with your diskettes over the rectangular notch on the right hand side of the diskette.

BACKUP COPY — It is a good practice to make copies of the data saved on a diskette. This enables you to re-install an input or output table for processing with COMFAR, in case a diskette containing input data or results are damaged. To produce a copy, read the table into the computer and save it on another diskette under the same name (or any other name, as you like).

SHORT-CUT OPERATING GUIDE

The short-cut operating guide is intended for users already acquainted with the personal computer and the COMFAR-System, who want to have all important instructions presented in a nutshell, easy to find and without detailed descriptions. The computer novice can also use the short-cut guide, once he has established his own input tables, or when following the example ("Case 1") as the basis for his first trials with COMFAR. When building-up his own case, the user should work with the instructions given later in part B (chapters 14 to 23).

Chapter 7
GETTING STARTED

GETTING YOUR COMPUTER STARTED

APPLE ///

Make sure that the monitor, the external disk drive, the hard disk (Profile) and the printer are properly connected to the Apple computer.

(1) Insert the COMFAR.1 diskette into drive one (built-in)
(2) Turn on the following power switches:
* Profile (hard disk) * Printer (Quae or Epson)
* Apple Monitor /// * Apple /// Computer
(3) Follow the message displayed, take-out the COMFAR.1 diskette and insert the COMFAR.2 (Pascal) diskette into the same drive, then press RETURN.

RESTART

If the power switch of the computer is on already:
(1) Make sure, the hard disk and the printer are "ON",
(2) Insert booting diskette "COMFAR1" into internal drive,
(3) Press simultaneously the "CONTROL, RESET"-keys
(4) continue as described above.

IBM PC/XT

Switch-on the computer (in case the hard disk is in the separate extension unit, switch-on the hard disk first and wait about a minute, until the disk is ready). If the MS/DOS system is installed on the hard disk, the computer will be ready after a short check-up period. Start COMFAR as described in your annex to the COMFAR Manual. Usually you will enter date, time and define on hard disk (C>) the directory containing COMFAR (e.g. C> CD \COMFAR). Then answer to C> by entering COMFAR again, the system would be started automatically. (If an automatical startup has been validated, the COMFAR system would start directly after the computer has been switched-on)

DATE ?

When COMFAR is ready, the current computer DATE is displayed. To change this date enter the new date, otherwise (or after the change) accept the date displayed and press RETURN.

Other Display

The normal response of COMFAR is the DATE request. In case any other message is displayed, see Chapter 15 of the COMFAR Manual, or in case the message is not found there, see Chapter 25 (system failures and error messages) or consult the computer manual.

COMFAR, NEW DATA INPUT AND TABLE UPDATING

Advice — It is good practice to write down your input data before a new table is established. Use the table description in chapter 27 and write your input data into each sub-table form sheet. Read the data from your input form during data entry with COMFAR. After termination of data entry, a complete LIST of your Input Table can be produced using the COMFAR REPORT System.

Menu — The Data Ent Menu displays the COMFAR control functions, as well as the name - the current sub-table, description of the item (value) to be entered, an eventually already existing current value. The current position in the input table is indicated by the current line and colum numbers.

Descriptions — If additional explanations are required, see Chapter 27 (description of the Input Table).

INPUT — Select from the COMFAR Menu the programme DATA ENTRY, and when COMFAR prompts the Data Entry Options, press <I> for INPUT.

UPDATE — Select from the COMFAR Menu the programme Data Entry, and when the Data Entry Menu is displayed, press <U> for UPDATE. This option allows updating of the contents of an "OLD" input table. New entries will replace data previously saved on diskette under the table name, other values will remain the same as before. Unless the previous version has been saved on another diskette, or on the same diskette, but under a different name, the old version will be lost and cannot be recovered again.

Table NAME — Determine a name for the new input table, and write it also on a label attached to the diskette (forgotten names can be retrieved using the systems utility programs, described in the computer manual).

TEXT VARIABLES — The corresponding menu allows entry of such text variables as, for example, project name, date, product names, etc. (for details see chapter 17).

GENERAL VARIABLES — Selection of the corresponding menu allows entry of variables such as currency exchange rates, discounting rates, etc. (for details see chapter 17).

ENTRY ENTRY: The menu displays the current line number and description of the input table, beginning with the first sub-table (initial fixed investment), line 1. The entry procedure is explained in the menu. The following alternatives for data entry are available:

RETURN: Accept the "current" value displayed, continue to the next column of the current line,

(value): Entry of a single value, press (return) to continue

(array): Entry of a set of values (array), the delimiter between each value must be a comma (,).

n*(value): Multiple entry, i.e. to repeat the same value n-times,

A(value): When A(ll) values of an array are constant, the option A(value), writes the same value into all columns of the current line, beginning with the current column, and continuing to the right end.

C(number): Jump to a specific column (C,number) of the current line,

N(ext): Jump to the next line,

L(number): Jump to the line specified (L,number),

Leave line: Jump to a specific line (e.g. the beginning of another sub-table), or return to entry of variables, or quit Data Entry

H(elp): Use the HELP option for explanations.

SAVE: This facility allows to intermediately save the Input Table on hard disk during Data Entry (to allow recovery in case of power failure).

Q(uit): Quit menu, to terminate data entry and to save the input table on diskette.

DELETE/RENAME: If the table name exists already on the diskette inserted into a disk drive, the following options are offered:

(1) use the same name and save on another diskette,
(2) use another name for the input table,
(3) keep the name, and delete all previously saved data saved already under this name.

COMFAR CALCULATION SYSTEM

The CALCULation System is composed of the following

MODULE PROGRAMMES

1 Initial Fixed Investment, and
Current Fixed Investment
* Sub-routine: Depreciation

2 Sales + Production Programme, by product
+ sum of products, direct costs

3 Production Costs, by product
+ sum of products and cost adjustments

4 Working Capital requirements, increase

5 Financing Initial Fixed Investment
* Sub-routines: loan + amortization, interest payable

6 Financing during Production
* Sub-routines: loan + amortization, overdraft

7 Consolidation (sum of foreign and local cashflows)
Completion of table, allowances, overdraft
+ Income, income tax, cashflows, CF-discounting
* Sub-routines: Net Present Value, Internal Rate of Return, Future Value, Corporation tax.

The CALCULation System starts with the data previously saved on an Input Table, and produces the results (dependent variables), which are written onto the Output Table.

OUTPUT TABLE

The Output Table is a matrix (sheet) of 248 lines and 18 columns, and it includes two additional separate tables: a table called TABW (for Working Capital) with 28 lines and 17 columns, and table TABC (for Production Costs) with 20 lines and 16 columns.

TABW,TABC

COMFAR also produces two auxiliary tables: TABW holds the working capital requirements (foreign and local) and is saved on diskette as part of the output table TABO. TABC is not saved on diskette, this auxiliary table is receiving the Production Costs for the product currently computed. The descriptions of the tables are shown in chapter 28.

RULES

The rules and assumptions underlying the COMFAR Model are described in chapter 19.

START CALCULATION is started when the COMFAR Start Menu is displayed and you press (C). The calculation sub-system either askes for a table name:

```
Calculate which table ?

         enter name  [     ]
```

or offers an input table if in the computer memory:

```
Calculate  input table [name  ] ?

          press <return> to accept job, or to change

          enter new name [     ]
```

The input table may be taken from the computer memory or from diskette:

```
Take input table [name  ] from memory (Y/N) ?  (or 0)
```

In case the answer is (N), or when no table with this name is in the memory, COMFAR prompts:

```
Mount diskette containing input table [name  ]

      when done press 0 ??
```

COMFAR copies the required Input Table from the diskette and displayes also the project name (text variable specified in th Input Table):

```
transferring [name  ] to memory

                 matrix correctly found
          text. generals correctly found


project name is [                                    ]
```

PRODUCTION COSTS TABLES, print of costs by product

PRINT TABC

The total production costs of each product (if specified in the subtable "Standard Production Costs") may be printed only during execution of the COMFAR CALCUL System.

```
print production cost tables during calculation (Y/N) ??
```

If <Y> is selected, COMFAR allows to specify which cost table should be printed.

COMFAR will indicate on screen which module is being processed, in case warnings are necessary they will be displayed at the end of the calculations.

```
Calculating  ( module name ..... )

             0 warnings in this module
             0 warnings in total
```

The calculations are terminated with the message:

```
calculation finished !


                    press <return> to continue
```

In case COMFAR encountered unexpected values in the Input Table, warnings are displayed after the line "calculations finished", or if there are too many warnings the system prompts the message:

```
errors and warnings detected in tabi                line  col
```

SAVE TABLE

The results of the calculations are now in an Output Table which is still in the computer memory (or on hard disk, depending on the type of hardware); the table MUST be saved on diskette, otherwise it may be lost !

In the event that table files with the file names specified by you earlier during the COMFAR CALCUL phase are already saved on the diskette mounted in the external drive, a corresponding message will be displayed by COMFAR, and you may choose between the options to REPLACE the old table or to CHANGE the diskette:

```
      Old output table [name  ] on diskette already !

      Replace old table (Y/N) ??
```

The answer: <N> would produce the preceeding menu again, if <Y> is selected, the old Output Table will be replaced be the new one.

After having sucessfully stored the Output Table COMFAR will return

to the main menu, which allows selection of any of the COMFAR systems displayed.

With this message the COMFAR Calculation is terminated and you may now choose between the following options (menu displayed):

LIST TABO — The contents of the complete Output Table (TABO), and of the Working Capital Table (TABW), or parts of these tables, can be listed using the COMFAR REPORT System (described in chapter 10).

SCHEDULES — To produce schedules in accordance with the standards defined in the UNIDO Manual, use the COMFAR REPORT System, which can also be used to list the contents of Input Tables, and to display them on the monitor screen.

REPORT PRINTING AND LISTING OF TABLES

The COMFAR REPORT System can be used to list Input and Output Tables, as well as to print of Reports (Schedules) as shown in the UNIDO Manual. The following menu allows to specify the job to be executed by COMFAR:

```
Press (return) to accept report job
               to change select T,P,M,D or Q

               T ... current table name [      ]
               P ... current printer    [ epson]
               M ... current mode       [display]
               D ... do                 [ schedules]

Your choice (T P M D (return) Q) ??
```

In case a table is in the computer memory, the name of this "current table" will be displayed in the corresponding field.

TABLE NAME — Press (T) to specify a table name.

PRINTER — Press (P) to change the printer,
two printers: [epson] and [qume] are validated.

MODE — Press (M) to change the mode,
two modes: [display] and [print] are available.

TABLES or SCHEDULES — Press (D) to change from [schedules] to [input table] to [output table] and back.

RETURN — Press (return) to tell COMFAR to execute the job defined (table name, printer, mode, tables or schedules)

SCHEDULES — If "schedules" are selected the following schedules are offered for display (or print):

```
Display schedules:

Press (return) to accept job, or
               to change select 1-9, Q

               1 Total initial investment      [yes]
               2 Investment during production  [yes]
               3 Total production costs        [yes]
               4 Working capital required      [yes]
               5 Source of finance             [yes]
               6 Cashflow tables               [yes]
               7 Net income statement          [yes]
               8 Balance sheet                 [yes]
               9 (reserved - not active        [yes]

Your Choice ??
```

STARTING YEAR — If (return) is pressed, COMFAR proposts the starting (calender) year and looks for the required tables (input and output tables)

WHICH TABLE? — In case COMFAR recognises a table already in the computer memory, it offers to work with this table, or to take another copy of that table from floppy disk, or to specify another table name.

```
Take input and output table [name  ] from memory (Y/N) ?   (or Q)
```

If the choice is (N), the system instructs the user to mount the corresponding diskette. (for the Apple /// computer the external disk drive, for the IBM-PC/XT the validated drive, usually drive A)

DISPLAY — If the option "display" was selected, COMFAR will display the requested schedules on screen. The top line contains the name of the schedule displayed and instructions how to continue:

MOVE — The two pointers <- and -> move the display if more than five columns (years or periods) form a schedule.

LEAVE — To leave to the NEXT schedule, press <L> for (L)eave,

QUIT — If no further display is wanted, press <Q> for (Q)uit

PRINT ? — After termination of the display job, COMFAR allows to print (all) the schedules displayed.

After the job (display or print) has been terminated, COMFAR offers to continue with schedules. <Q>uit brings the user back to the starting menu described already (completely new specification of table name, printer, mode and tables).

TABLES — *To display or print the contents of the Input Table or Output table*, the corresponding table must be selected by pressing <D>:

```
          M ... current mode      [print   ]
          D ... do             [ input table]
```

With (return) execution of the job described is started, the system offers three options:

```
          1 complete table
          2 subtables
          3 lines
```

DESCRIPTIONS — The contents of tables may be displayed and printed with column and line descriptions or without any descriptions, except for subtable headings, which are always displayed and printed:

```
          1 without description
          2 line description
          3 line and column description
```

COMPLETE TABLE
SUBTABLES — Either of these selections produces the display of a list of all subtables available (Input Table), only if a complete table was requested, the default is [yes] for all subtables, otherwise the

default would be [no]:

```
1 Text descriptions              [yes]
2 General variables              [yes]
3 Initial fixed investment       [yes]
4 Investment during production   [yes]
5 Production costs               [yes]
6 Production and sales           [yes]
7 Working capital requirements   [yes]
8 Source of finance              [yes]
9 Income, tax and cashflow       [yes]
```

LINES

Instead of selecting "complete" table or "subtables", line of the table can be printed (displayed) by pressing <3> when the corresponding menu is displayed.

Then again the selection for descriptions can be made, as described already. It is possible to define up to six line ranges (or single lines) during one job:

```
Display selected lines:

        from [   ] through [   ]
```

Either one line number or any range (two numbers) may be entered. The system continues, asking whether more lines are required:

```
        from [  2]

             more lines (Y/N) ?? (or 0)
```

PRINTER ON ?

If you choose to print, make sure the printer is SWITCHED ON and ready to operate (check paper and ribbon) !

OUTPUT TABLE

The dialogue for display and printing of output tables is the same as for the Input Tables, with the exception of the menu for selecting the subtables:

```
1 Initial fixed investment       [ no]
2 Investment during production   [ no]
3 Production costs, foreign      [ no]
4 Production costs, consolidated [ no]
5 Production and sales, foreign  [ no]
6 Production and sales, consol.  [ no]
7 Working capital                [ no]
8 Source of finance              [ no]
9 Income, tax and cashflow       [ no]
```

ALTERNATIVES AND SENSITIVITY ANALYSIS

BASE CASE — Copy the base case on another diskette, use this case as the original version for sensitivity analysis, and produce the required changes in an updated version. Then COMFAR CALCUL and REPORT may be executed followed by another change (update) of the base version (old version partially replaced).

UPDATE TABI — For the generation of alternatives use the COMFAR Data Entry System, option UPDATING, as described above. Locate the position of the input variable (parameter) to be varied, and address the place (item) of the Input Table directly by selecting the LINE NUMBER, and then the corresponding COLUMN.

SAVE OUTPUT — If the results produced are to be kept for later printing (with the Report System), save each Input Table (TABI) under a separate name. COMFAR CALCUL will produce Output Tables with corresponding names. The tables will be saved under these names on diskette, and may be printed at any time.

If updated versions and corresponding result tables are not to be saved, but replaced by the next version, the resulting Output Tables must be listed before the next version is computed with the same table name. If schedules are to be produced, change the diskette (keeping the same table name) or print the required schedules before computing the next version (with the same table name).

TABO — During analysis of project alternatives and sensitivity, usually few result items are of special interest. It is not necessary to list the full Output Table, or Schedules! Define the item of TABO to be listed, and select the corresponding line number(s) when executing the COMFAR REPORT System. A complete description of the line numbers of the Output Table is given in chapter 28.

Chapter 12
IN CASE OF TROUBLE

IN CASE OF TROUBLE

NO COMMUNICATION Sometimes you and your computer may not understand each other, you may not understand what ENTRY or COMMAND the computer expects from you, and the computer may not understand, what you want it to do. In this case, first read carefully the message or instructions displayed on screen, then check whether your answer to the computer request is in line with the format or syntax (you may have typed an "O" instead of a "zero", or entered your answer in lower case letters, when the computer requests upper case); or you may have simply forgotten to press the RETURN key after your entry (the cursor would then still be displayed on the screen).

UNEXPECTED RESULTS COMFAR may indicate a "normal termination of programme execution"; however, in your printed lists and schedules unexpected values may be found. If this is the case, check which input variables can influence the unexpected printed values. COMFAR may have assumed a default value, because of no corresponding data entry, or may have found divisions by zero. Since a micro computer does not have the equivalent checking routines of its larger brothers, the COMFAR programme could become completely lost in this case.

UNEXPECTED DISPLAY In this case something has gone wrong either with the COMFAR programme or with the computer system. Try to restart the COMFAR programme, or the computer, as described below.

NO RESPONSE Computers sometimes misbehave. This might be brought on by a room temperature that is too high or too low, a static electricity build-up caused by low humidity or synthetic rugs and fabrics in the office. The symptoms of reversible computer errors are a normal display but no response to the keyboard, or erratic operation. Here are some rules to follow, to maximize your chances of recovering the contents of the computer memory:

- FIRST: DON'T TURN THE COMPUTER OFF. Turning the computer off will destroy any memory contents not saved on disk, and may also leave open a file which has been set to writing mode on the hard disk (PROFILE). When such a file is not "closed" by the system, it cannot be read again.

- SECOND: Try to interrupt the system. (on APPLE /// use the "CONTROL 1"-keys, on IBM PC/XT use "CONTROL C"). If the system does not respond, it will have to be switched-off and restarted again; in this case data files on diskette and on the hard disk may have been damaged, the contents of the memory (perhaps also on the hard disk) will be lost.

POWER FAILURE In case COMPAR execution has been interrupted by a power failure, start the system again. Then use as a data source Input or Output tables, which were saved on diskettes before the power failure occured.

Chapter II

EXAMPLE FOR DEMONSTRATION OF COMFAR FACILITIES

This chapter contains two example cases for demonstration of the facilities of the COMFAR System. The first case is identical with the example described in the UNIDO Manual, the second case is derived from case 1 by introducing additional aspects of financial and economic project analysis. The intention of this chapter is twofold:

The case studies shall allow the analyst to whom COMFAR is new, to teach himself beginning with the data already saved in the input and output tables, on the diskette supplied with the COMFAR Manual. Secondly, the case studies shall demonstrate how the power of COMFAR, and the various features provided by the model, can be used by the analyst, when preparing feasibility studies.

CASE DISCETTE — Together with the COMFAR Manual a diskette is supplied, which contains the input tables and output tables for Case 1, and Case 2. It is recommended that the user does not write any data to this diskette (therefore it has been write protected), but READs the corresponding table into the computer during COMFAR execution, and saves any updated version of an input table, and the corresponding output tables on a separate diskette.

Case 1 — Case 1 uses the same data as described in the example of the UNIDO Manual. Only few figures differ slightly from these produced by COMFAR, due to rounding procedures in the UNIDO Manual. When the COMFAR model was designed, the question was discussed, whether the model shall already include amendments to the model described in the UNIDO Manual. It was then decided to include these amendments in the COMFAR Model, which will also be included in the second edition of the UNIDO Manual intented for the near future. Any differences to the example of the UNIDO Manual caused by these amendments are explained in the case study.

Case 2 — Case 2 is an extension of Case 1, its main objective is the demonstration of COMFAR features for multiproduct projects, assumption of technical depreciation for cost/price analysis, and of financial features.

START — To start with a case, mount the Case Diskette into the external disc drive, when requested by COMFAR. Then execute the programmes as you would do with your own new input table. You may also read the output table from the Case Diskette and print schedules, using the REPORT Sytem.

LIST TABLES — The contents of the tables for both case studies may be listed, using the REPORT System. Therefore, no lists have been included in the COMFAR Manual.

Test Variables **********

1 Project Name	[UNIDO Manual Test Case]
2 Date + Time	[16 November 1984
3 Remarks	[case from UNIDO Manual, with amendments
4 Accounting Currency is	[thousand US-dollars
5 Product names	(no entries)

General Variables **********

1 Foreign currency conversion rate	[1.0000]

(values entered in US$ into the input table (TABI). Output table (TABO) and schedules will be computed in US$, therefore the conversion rate is 1.0)

2 Local currency conversion rate	[1.0000]
3 Duration of construction, years	[2]
4 Planning during construction	[yearly]
5 Cashflow discounting rates	
Net Present Value, discounting rate (%)	[10.0]

Investment Costs ********** [UNIDO Manual, Schedules: 10-1, 10-2]

For the example case, it is asumed that the total initial fixed investment costs (schedule 10-1/1) are distributed (schedule 10-1/2)as follows:

		foreign-1	local-1	foreign-2	local-2	total
line 13:	1 Land	-	20	-	-	20
line 14:	2 Site preparation and development	-	50	-	-	50
line 15:	3 Structures and civil work a)	-	1000	-	-	1000
line 4:	b)	-	-	200	-	200
line 16:		-	-	-	2300	2300
line 5:	4 Incorporated	-	-	180	-	180
line 17:	fixed assets	-	430	-	120	550
line 8:	5 Plant and	1000	-	1500		2500
line 20:	machinery	-	500	-	500	1000
	Total	1000	2000	1880	2920	7800
line 11:	6 Pre-production	70	-	50	-	120
line 23:	capital expenditure (schedule 10-2/2)	-	230	-	150	380

Current fixed investment: in 8th year, i.e. in the 6th year of production:

line 44: 5 Plant and machinery: (colum 10): 1000

DEPRECIATION, Assumptions:
1) Straight-line depreciation at 10% p.a.; for total initial fixed investment, exept for "civil A" = 5 % (20 years)
lines as above, colum 1 and colum 4: value = 10, exept for line 15 (5%, 20 years); colum 2: value = 1 (straight line depreciation)
2) Salvage value 10% of machinery and equipment (lines: L8, L20 and L44)

Production Costs ********** [UNIDO Manual, Schedules: 10-3/1]

LOCAL/FOREIGN Except for "Imported material" and interest paid on foreign debentures, all costs are assumed to be local.

line 52: imported material: 0 (%) inflation in colum 1
cost values: 1265, 1785, 1840, 12*2300 (col 2 to col 16)

line 82: raw material A : 910, 1240, 1320, 12*1650 (col 2 to col 16)
line 83: raw material B : 275, 320, 400, 12*500 (col 2 to col 16)
line 84: utilities : 250, 340, 360, 12*450 (col 2 to col 16)
line 86: labour : 690, 940, 1000, 12*1250 (col 2 to col 16)
line 87: repair : 180, 260, 280, 12*350 (col 2 to col 16)
line 88: spare parts : 15*250 (col 2 to col 16)
line 89: factory overheads: 15*1350 (col 2 to col 16)
line 91: administrative.. : 15*500 (col 2 to col 16)
line 92: marketing, labour: 15*250 (col 2 to col 16)
line 93: marketing, non-l : 90, 115, 120, 12*150

DEPRECIATION
COSTS (line 78): total depreciation of total foreign and local assets is assigned to product A, line 78/C1: 100 (%) for foreign and in 78/C7: 100 (%) for local.

Sales and Production Programme [UNIDO Manual, Schedules: 3-1, 10-8/3]

Assumptions: Total sales (schedule 10-8/3) have been assumedto be local sales.

line 146: 6875, 9375, 10000, 12*12500 (col 2 to col 16)
line 147: col 1: = 0.0 (inflation rate)
col 2 to col 16: 15*1.0 unit price; (col 2 to col 16)

Working Capital requirements [UNIDO Manual, Schedules 10-B/1, 10-B/2]

MINIMUM DAYS
OF COVERAGE are entered for foreign (C1) and local (C2) products, separately.
Note: Because of the table structure, entries for "cash in hand" are requested in line 182, C3(foreign) and C4(local) !

C1: foreign, C2: local

line 182: accounts receivable: 30, 30,
line 182: cash in hand : 15, 15 (col 3, col 4)
line 183: inventory raw mat 1: 100, 20
line 184: inventory raw mat -: 100, 15
line 185: inventory utilities: 30, 30
line 187: spare parts: 180,180
line 188: work in progress : 9, 9
line 189: finished products : 14, 14
line 190: accounts payable : 18, 18

Source of Finance ********* [UNIDO Manual, Schedules 10-B/1, 10-B/2]

In case of no entries, equity finance will be assumed by COMFAR !

line 198: equity (o/local), 3300,2500 (col 1, col 2)
line 194: loan A (foreign), 3000 (col 1)
line 201: loan B (local), 1500, 0, 0, -600, -450, -450 (col 1 to col 6)

General variables:

equity (local): 'year disbursement starts ' [1]
loan A (foreign) 'year disbursement starts ' [2]
'amortization type ' [constant principal]
'amortization period years' [5]
'amortization paid ' [yearly]
'grace period ' [1]
'interest rate' [8.0] from [3] thru [7]
loan B (local) 'year disbursement starts ' [2]
'amortization type ' [profile]
'amortization paid ' [yearly]
'grace period ' [3]
'interest rate' [9.0] from [3] thru [7]

Assumption: interest paid during construction included in pre-production capital expenditures. No interest rate is defined during pre-production period.

INCOME, TAX ********** [COMFAR Manual, Schedules:10-8/3]

Line 205: income tax, col 1 : 0 (constant rate)
tax rate, col 2 : 50 (% p.a.)
tax holidays, col 3 : 5 (years)

Line 213: dividends paid: 15*202 (col 1 to col 15)

DESCRIPTION OF THE COMPUTER SYSTEM

HARDWARE

The COMFAR system uses the following hardware:

* Personal Computer with 256 KB (RAM) memory capacity and has been released on: APPLE /// (May 1983)
  IBM-PC/XT (November 1984)
* Monitor (display)
* External drive for diskettes (Apple /// only)
* Hard disk (winchester technology)
* Serial printer (QUME letter-quality printer)
* Parallel printer, type dot-matrix printer (e.g.EPSON FX/100, IBM Graphics Printer, Mannesmann-Tally MT160 or MT180, etc.)

UNPACK

To unpack and connect the equipment please consult the manuals supplied with the equipment.

**
** Before connecting or disconnecting ANYTHING on the Computer **
** t u r n o f f t h e p o w e r ! This is essential! **
**

LOAD COMFAR

The programmes of the COMFAR package must be loaded on the Winchester type hard disk before you can start the system (as described in chapter 15). In the event that your Personal Computer has been delivered with an empty PROFILE, the programme package must be loaded. For instructions please consult your COMFAR supplier.

KEYBOARD FUNCTIONS

KEYBOARD

Keyboard functions are explained in detail in your Equipment Manual. While running the COMFAR System, you are expected to answer only the questions displayed; however, during execution of COMFAR it is possible to interfere with the programme, accidentally or deliberately, through the use of certain keys. Keys effecting programme execution are explained later in chapter 16.

SYMBOLS,KEYS

The main keyboard has letters, numbers, and special symbols in traditional typewriter layout. During COMFAR execution the following special keys will be used:

SHIFT

If the SHIFT key is held down while pressing a character key, upper case letters and special symbols (e.g. $,*,?,) are entered into the computer.

ALPHA LOCK

The ALPHA LOCK key has the same function as the shift key, however it is valid for letter keys (upper case) only, and not for numbers or other special keys.

RETURN

The RETURN key must be used during execution of COMFAR, to terminate each ENTRY of data or commands. It signals to the computer that a respective entry is terminated, and that the programme can continue operation (the return key is not pressed, when the system request "to PRESS" a key is displayed). For the comfort of the user whenever possible, the PRESS-a-key function has been used for program control.

ENTER

The ENTER key on the numeric keypad has the same function as the RETURN key, and can be used when entering numbers from the keypad.

DISK DRIVES, APPLE ///: On the face of the Apple /// computer is the access slot for the built-in disk drive. This drive receives the BOOTING diskette (COMFAR 1), and after the booting operation it holds the PASCAL diskette (COMFAR 2) while the COMFAR System is in operation.
For the APPLE /// computer an EXTERNAL DISK DRIVE (2nd drive, connected to the computer) is used for reading or saving the Input and Output Tables produced by COMFAR.

DISK DRIVES, IBM-PC/XT: There is only one floppy disk drive required to run COMFAR on IBM. This drive is used for the disketts holding the Input and Output Tables.

DISPLAY — The Apple Monitor /// is connected to the computer. On the face of it are the power switch, the red control light, and a knob for setting the contrast on the screen. On the back of the monitor are two knobs for vertical and horizontal adjustment of the display on the screen.
Details about the IBM and any other Computer displays please find in the corresponding manuals.

HARD DISK — The hard disk holds the complete COMFAR programme package, and all data processed during execution of the COMFAR Sytem. It is required because of the size of COMFAR and to reduce the time for executing the program.

PROFILE /// — The Profile is the hard disk for the Apple /// computer, it is also connected to the computer. The power switch is at the back; the red control light (READY light) is located on the front of the device.

PRINTER — Usually one printer is connected to the system, either a QUME daisywheel printer (letter quality printer), or an EPSON Dot-Matrix printer, or any compatible and suitable printer (with graphics).
Before starting with COMFAR, you should carefully read the operating and maintenance instructions supplied with your printer.
!> when the COMFAR System is supplied, is has been adjusted for the Qume and the Epson printer.

SOFTWARE — The COMFAR Sytem is installed on the hard disk. It is composed of a number of Module Programmes controlled by a Master Programme. COMFAR is protected, as far as possible, against unintentional access which could destroy programmes. However, the Operating System of the computer allows some access, and producing such commands accidentally should be avoided. COMFAR should be operated using only the control facilities offered by the system's menus.

INSTRUCTIONS FOR STARTING UP THE COMPUTER SYSTEM

Before starting up the system make sure all external devices are connected to the central unit. The hard disk (Winchester disk) must already contain the COMFAR System. In the event that the hard disk has been supplied without COMFAR, please consult the separate description for installing the programme on disk.

SWITCHES — Location of switches (for details please consult the corresponding manuals)

APPLE /// * The power switch of the APPLE /// is on the back of the central unit, right next to the power plug. When it is on, an "ON" sign appears on the keyboard between the apple and the space bar.

* The power switch of the APPLE monitor /// is on the front. Next to it is a red control light.

* The power switch of the APPLE profile is on the back, next to the power plug. The READY light is on the front; it starts blinking after approximately one minute, when rotation of the disk has stabilized.

* For the location of switches on your printer see the corresponding printer manual.

IBM-PC/XT * There is one main power switch at the right side of the computer.

START UP — On the premise that all COMFAR programmes have already been loaded on the hard disk, COMFAR is started as follows:

IBM-PC/XT Please consult the attached instructions:
"COMFAR on IBM-PC/XT, Program Installation and System Startup"

APPLE /// Two diskettes are required to put COMFAR into operation - one diskette labelled "COMFAR 1" containing the operating system, and one diskette "COMFAR 2" with the PASCAL system and the start-up routines for COMFAR. For details please consult the attached instructions:
"COMFAR on APPLE ///, Programme Installation and System Startup"

!> Never remove the COMFAR 2 diskette (Pascal diskette) from the internal drive of your APPLE /// computer, while COMFAR is in operation !

*

CONTROL OF COMFAR EXECUTION

DATE

After having started the COMFAR system the following menu will be displayed, offering a current date and allowing to change it if required:

```
Computer's Date is  :11-20-84

Enter new Date or
press (return) to accept current Date

        (MM-DD-YY) ??
```

The normal procedure is to follow the instructions indicated on the screen and to type in answers corresponding to what you want COMFAR to do. Usually the system accepts only one of the answers indicated on the screen. If you enter an invalid answer it is ignored and the system repeats the request until you have entered a correct answer or command.

INTERRUPT

You may wish to leave the dialogue or interrupt excecution of COMFAR. In this case you use the commands offered on the menu, the (Q)uit command is valid in most of the menus. Avoid system control commands (which are still valid sometimes during program execution), since when used in a wrong moment, data files may be lost.

```
**                                                          **
**  NEVER use the POWER switch to terminate program execution  **
**  in COMFAR!   The power may only be switched off when the   **
**  starting menu or the  request for rebooting is displayed.  **
**                                                          **
```

TERMINATION of COMFAR Program Execution

The "normal" termination of program execution is guided by the COMFAR dialogue prompted on the monitor screen. If (Q)uit is not offered (and not accepted) by COMFAR, the instructions must be followed (e.g. specifying a table name, mounting a diskette, etc) to complete an action before termination is possible.

APPLE ///

Whenever you are stuck in the system and cannot exit from the programme by answering, try the CONTROL . command. Remember, however, that data produced during execution of that particular programme section may be lost or destroyed. Before starting again, check your data, and if in doubt, start again from a defined input file (TABI). During execution of the REGEN phase of COMFAR use of the [ ] will not destroy any data contained in your TABI and TABO tables.

!>

DO NOT USE OTHER CONTROL COMMANDS, AVAILABLE ON THE APPLE COMPUTER! these may eventually damage the COMFAR Programme Package !

IBM PC/XT

Please note the explanations given for the APPLE /// computer. The corresponding command on the IBM-PC/XT is the CONTROL C command. Consult the IBM PC/XT Manual for detailed descriptions.

POWER FAILURE

A power failure has the same (or worse) effect as turning off the power switch. See chapter 12 (In case of trouble) for instructions, should COMFAR be interrupted by a power failure. If power failures occur often, you should have a battery as a power supply. Contact the supplier of your personal computer for details.

Chapter 17
DATA ENTRY

DATA INPUT AND UPDATING

The COMFAR menu which is displayed after you have answered the date request, allows you to choose between the following sub-systems of COMFAR:

```
C O M F A R  S Y S T E M

CALCUL  ... Calculation System
REPORT  ... Report Generation and Listing
DATEN   ... Data Entry System

SAVE    ... Save Recovery Aid

          to escape from this menu press RETURN

Your Choice (C,R,D,S) ??
```

<D> Input of new data, or updating of an existing data file, called Input Table (TABI),

<C> Execution of computations to generate the results in the Output Table (TABO),

<R> Printing and/or display of schedules (tables) for your report, e.g. cashflow tables, balance and income statements, etc; and of your Input and Output Tables.

<S> Activates a dialogue to recover and Input Table previously saved on the hard disk. The corresponding saving procedure is described later in this chapter; it serves for fast intermediate saving of data before the final saving on diskette.

DATA ENTRY

In this chapter INPUT of new data and UPDATING of existing files (saved on diskettes) are described. The COMFAR Data Entry System is called "DATEN" and is the first of the three programme systems forming the COMFAR package.

To enter data, either using the INPUT or the UPDATE option. You can follow the dialogue displayed in the menu, which is very convenient if COMFAR is new to you, or if you have to enter data into most of the lines. However, when you only want to enter few data, which is often the case when UPDATING (e.g. when doing a sensitivity

analysis), you may wish to shorten the data entry procedure. In this case you can address directly the table line required.

INPUT TABLE — To find this line, use the index listed in the "Line Index of TABI" shown in chapter 27, where you will also find a description of the contents of each line array.

Advice — When COMFAR is new to you, we suggest you prepare a formatted table corresponding to the format and description of the input table, and fill in all values you wish to enter into the computer. The forms for the subtables of the Input Table can easily be prepared by yourself based on the table descriptions shown in detail in Part C of this Manual (Chapter 27).

Then read your entries from this sheet into the computer. This procedure will be very helpful, since at the beginning reading the messages displayed will require some concentration, and increase the possibility of data entry errors. The diskette with the example cases contains a complete list of the line descriptions of the input table (TABI), and you may print this list and use it for preparation of your input data sheet. After termination of data entry, a complete LIST of your Input Table can be produced using the COMFAR REPORT System.

FIGURES — Note: Figures MUST be entered as follows:

12.00 or 16612 or 0.152 or .152

invalid are: 12.300.00 or 12 300,00

The comma (,) is used as a delimiter and NOT as decimal point!

START ENTRY — Press "D" for "DATEN ... Data Entry System"
The system then prompts:

```
Data Entry Options:

        INPUT   to Produce a New Input Table
        UPDATE  to Update an Existing Input Table

Your Choice (I,U) ??
```

When you choose <I> for Input, COMFAR initializes a new Input Table, and when <U> for Update is selected, COMFAR will produce a COPY of an already existing Input Table.

INPUT

If the <I> key is pressed the system initializes an new Input Table which contains the default values defined for COMFAR and 0.0 values for most of the table items:

```
initializing empty table
preparing texts, generals, matrix
```

Then the menu to "Select for Entries" is displayed (see SELECT ENTRY below)

UPDATE

In the event that you want to change values contained in your input table (old TABLE), you choose the UPDATE option. This will be the case if you want to compute an alternative, or if you want to analyse the sensitivity of the project, or if you simply want to find a better solution.

If <U> is selected, the system request a table name, or in case a table exists already in the computer memory, this "current" name is offered. The name may be accepted (press RETURN) or changed (type new name and press RETURN). If a new name is entered, it will become the current name and will be displayed. Now press RETURN again to tell COMFAR to continue.

```
Update old input table

        enter name  [      ]
```

or, if a current table exists:

```
Update old input table  [name  ]

        press <return> to accept job, or to change

        enter new name [      ]
```

and

```
Take input table  [name  ] from memory (Y/N)  ??
```

If the answer is <Y> , the system displays the "Select for Entries" menu, otherwise it will ask for mounting the diskette containing the Input Table to be updated, as it also will do if no table exists in the computer memory:

```
Mount diskette for input table  [name  ]

      done, press D  ??_
```

Mounting of the diskette is checked by the system; it will only continue when the diskette is properly inserted, and the drive door is closed. If the table with the specified name is found, a copy will be transferred to the computer memory, otherwise an error message will be displayed with the instructions how to continue.

```
transferring Iname  I to memory

                matrix correctly found
          text, generals correctly found
```

SELECT ENTRY

All options described above finally lead to this menu:

```
------------------------------------------------- COMFAR Daten -

Select for entries

                    T ... Text variables
                    G ... General variables
               <return> ... Line   [  1]   of matrix
               <number> ... select  line  of matrix

                           (S)ave data on hard disk
                           (Q)uit data entry menu
-------------------------------------------------------------------

Your Choice (T,G,return,number,S,Q)  ??
```

TEXT VARIABLES

serve to keep some project key information saved on diskette together with the project data entered. Press the corresponding number keys and then type the text. By pressing RETURN this text will be entered and the next (or any other line may be selected)

```
Text variables                press <return> to accept variables, or
                              to change select 1-5, (Q)uit
  1 Project Name          [                                        ]
  2 Date + Time           [                                        ]
  3 Remarks               [                                        ]
  4 Accounting Currency is          [                              ]
  5 Product names
-------------------------------------------------------------------

Your Choice  (1-5,Q)  ??
```

If a number key from 1 to 4 is pressed, the curser jumps to the field of the corresponding line and allows to type any text. Press <return> terminates each of these text varibale entries.

If <5> is selected, the following menu is displayed:

```
Names of products:            press <return> to accept names
                              to change select A-F,Q

       Product A  [                                              ]
                B  [                                              ]
                C  [                                              ]
                D  [                                              ]
                E  [                                              ]
                F  [                                              ]

                Q(uit) to text variables menu
-------------------------------------------------------------------

Your Choice  (A-F,Q)  ??
```

GENERAL VARIABLES contain data (variables) required for the execution of COMFAR computations (the values displayed in a new table are default values)

```
General variables          press <return> to accept variables, or
                                to change select 1-7, (0)uit

      1 Foreign currency conversion rate     [      1.0000 ]
      2 Local currency conversion rate       [      1.0000 ]
      3 Duration of construction, years      [      1      ]
        - maximum 4 if half-yearly, otherwise 8 -
      4 Planning during construction         [ yearly      ]
      5 Cashflow discounting rates
      6 Equity / subsidy conditions
      7 Loan conditions
-------------------------------------------------------------------
Your Choice (1-7,0) ??
```

If a number from 1 to 3 is selected COMFAR allows entry of the corresponding values, if <4> is pressed the description in the field is changed, two options are available in COMFAR: "yearly" and "half-yearly" planning. The numbers from 5 to 7, if selected, allow to specify the discounting rates and conditions of financing.

CURRENCIES

The two conversion rates serve to convert values entered in any "input currency" into the "accounting currency" of the result tables (TAB0 and Schedules). The "foreign currency conversion rate" is used to multiply each value contained in the subtables (Input Table) of the type "foreign", the "local currency conversion rate" is used with the subtables (TABI) of the type "local".

!> The conversion rates are not identical with exchange rates:
If AC is the accounting currency, FC and LC the foreign and local currencies, FCR and LCR the corresponding conversion rates, the rules defined in COMFAR are:
value in AC = value in FC times FCR
value in AC = value in LC times LCR

COMFAR's default values for the two conversion rates are 1.0000

CONSTRUCTION

The minimum duration of the pre-production or construction phase is one year (default value in COMFAR)

DISCOUNTING

The discounting rates for the computation of the Net Present Values can be specified when number <5> is selected.

EQUITY

If <6> is selectec, the first year (begin) of funds disbursement can be defined:

```
General variables - Equity / Subsidy conditions

   Select 1-6 to change values, or press <return> to accept
                                    year disbursement starts

     1 foreign equity-c            [    1 ]
     2 foreign equity-p            [    1 ]
     3 foreign subsidy             [    1 ]

     4 local  equity-c             [    1 ]
     5 local  equity-p             [    1 ]
     6 local  subsidy              [    1 ]
-------------------------------------------------------------------
Your Choice (1-6,Q,return)
```

LOAN SELECTION

If <7> is selected, the loan conditions can be defined for each loan and for the overdrafts:

```
General variables - Loan selection

Select 1-8 to change loan conditions, or (Q)uit to general variables

         1 foreign loan A
         2 foreign loan B
         3 foreign loan C
         4 foreign overdraft

         5 local loan A
         6 local loan B
         7 local loan C
         8 local overdraft
-------------------------------------------------------------------
Your Choice (1-8,Q,return) ??
```

LOAN CONDITIONS

The following loan and overdraft conditions may be specified (for details, rules and assueptions underlying, see chapter19 and chapter 27):

```
General variables - loan conditions

[foreign] loan [ A ]            Select 1-6 to change values, or
                                press <return> to accept conditions

 1 year disbursement starts     [    1  ]
 2 amortization type            [profile          ]

 3 amortization period in years [    0  ]
 4 amortization paid            [yearly      ]
 5 grace period                 [    1  ]

 6 interest rate,  [         ] % yearly  FROM year [   ] THRU [   ]
                   [         ] % yearly  FROM year [   ] THRU [   ]
                   [         ] % yearly  FROM year [   ] THRU [   ]
 -----------------------------------------------------------------
Your Choice (1-6,<return>,Q) ??
```

and

```
General variables - loan conditions

[local] overdraft              Select 1,5,6 to change values, or
                               press <return> to accept conditions

 1 year disbursement starts    [    1  ]

 5 grace period                [    1  ]

 6 interest rate,  [         ] % yearly  FROM year [   ] THRU [   ]
                   [         ] % yearly  FROM year [   ] THRU [   ]
                   [         ] % yearly  FROM year [   ] THRU [   ]
-- ------------------------------------------------------------------
Your Choice (1,5,6,<return>,@) ??
```

VALUE ENTRY — To enter values into the matrix of the Input Table, select the required line number (either enter the line number or accept the number offered in the "Select for entries" menu.

(number) — Enter the number of the line, to receive values, or

RETURN — press the RETURN key to accept the line number displayed. The first number offered is line "1". The system will display the value entry menu:

```
------------------------------------------------ COMFAR Daten -

Initial Fixed Investment - foreig          position (L   1,C   1)

C   1       Depreciation rate in %

L   1       Land

                          ---------------
                         |               |
                         |         0.000 |
--------------------------|               |-----------------------
                          ---------------

    press <return> to accept current value, or
    enter new value


 ?? [                                          ]

(H)elp  (L#)ine  (C#)olumn  (@)uit
Entry Syntax: (value) or (value),(value),.. or A(value) or n*(value)
```

DESCRIPTION — On screen a complete description of each item to be entered into TABI is displayed for each line, including column headings. If the table contains a value already, this value is displayed. You may accept this value, then press <RETURN>, or replace it by entering a new value.

VALUES — are numerical values, as e.g. amount invested, depreciation in years, finance available, interest rate (% p.a.), etc.

ENTRY SYNTAX — The menu displays the current line number and description of the input table, beginning with the first sub-table (initial fixed investment), line 1. The entry procedure is explained in the menu. The following alternatives for data entry are available:

(value) — Entry of a single value (line #, column # displayed).

(array) — Entry of a set of values (array), the delimiter between each value must be a comma "," ; the maximum number of vector elements (separate values) is limited by the field available and is determined by the number of columns available to the right of the current column (including this column).

n*(value) — Multiple entry, when repeated entry of the same value is required. The syntax for the entry is: (n)*(value), where (n) indicates how many times the value is to be written into the line, beginning with the current column.

A(value) — The ALL option "A(value)", writes the value into all columns of the current line, beginning with the current column, and continuing to the right end.

Column — Jump to a specific column of the current line: C(number),

Line — Jump to a specific line of the Input Table: L(number),

Next line — Jump to the next line (no further entries into remaining columns): N(ext), or

Leave line — Leave from the current line to the Data Entry menu

HELP — Use the HELP option for explanations. Two menus will be displayed: the subtable ranges and the data entry sybtax descriptions.

SAVE — A power failure during the entry of data would cause loss of all data currently in the computer memory, unless these data are saved also on a permanent storage facility (i.e. on diskette or hard disk). The concept of COMFAR uses diskettes to store data. Whenever the data entry is terminated (by pressing <Q> for quit), the system guides the user to save the Input Table on diskette. The SAVE facility offers now a quick intermediate saving on hard disk of the current table in the memory. After each saving procedure the data entry can be continued. In case of an interruption of the power supply, the data entered before the latest saving can be retrieved with the :Save Recovery Aid" facility offered in the COMFAR main menu.

QUIT (Q) for quit menu terminates the data entry and produces the following instructions and messages:
In the case of the input option (new table):

```
! Save new input table on diskette
!
!      enter name [      ]
```

or, in the case of updating:

```
! Save your input table [name  ]
!
!      press <return> to accept job, or to change
!      enter new name [      ]
```

A new name would be transferred to the first line, then press <return> to continue with the job:

```
! Mount diskette for input table [name  ]
!
!       done, press D  ??
```

TABLE NAME You must then enter a name for your new input table (TABI). The system checks whether the name exists already on the diskettes. If this is the case then change the name (rename) or the diskette, however, you may also decide to REPLACE the "old" table by the "new" table; in this case keep the name and diskette unchanged and instruct COMFAR to replace the "old" table. Naturally the contents of the old table will be lost, unless it has been saved earlier on another diskette.

In case there is no diskette found (no diskette mounted, diskette not formatted, drive door not properly closed, etc) or when the diskette is full, the corresponding ERROR messages will be displayed. Follow the instruction to finally save your Input Table on diskette. If successful, the system will terminate with a message and go back to the COMFAR main menu (select D,C,R,S or <return>):

```
! [ Normal termination of DATEN System ! ]
! [ All functions performed ! ]
```

DEFAULT values For ease of reference DEFAULT values have been assumed, and are already contained in TABI. These allow you to run COMFAR with a minimum of data entry , at the beginning of your analysis, specially when you are building up your project case.

TABI For a detailed description of the structure and contents of the input table (TABI), see chapter 27.

COMPUTATION OF RESULT TABLES

The following phase of COMFAR is called the CALCULation System, and when it is executed computations are performed to produce the results or dependent variables which will be printed later by the third phase of COMFAR, the Report Generation Programme. Before you can start COMFAR CALCUL, you need a file with your input table and this table (TABI) must contain values for the input variables (the same as you would need to calculate the figures in the various schedules shown in the UNIDO Manual).

RULES

The rules and assumptions underlying the COMFAR Calculation Sytem are described in detail in chapter 19.

START

CALCULATION is started when the COMFAR Start Menu is displayed and you press <C>. The calculation sub-system will start with the message

```
Starting COMFAR: Calculation System

        [Computer is working  -  please wait]
```

and if no table name exists already on the computer memory COMFAR will continue with the request for the name of the Input Table to be used:

```
Calculate which table ?

        enter name  [      ]
```

the name of the table must be typed (it appears in the field, then press <return>. Names must be valid, otherwise error messages will be displayed.

```
 Calculate  input table [name  ] ?

          press <return> to accept job, or to change

          enter new name [      ]
```

If the name is correct, press <return> to continue with the job defined. In case there is a current table in the memory, its name is offered and may be changed or accepted.

```
Take input table [name  ] from memory (Y/N) ?  (or Q)
```

In case the answer is <N>, or when no table with this name is in the memory, COMFAR prompts:

```
Mount diskette containing input table [name  ]

     done, press D ??
```

COMFAR copies the required Input Table from the diskette and displaves also the project name (text variable specified in th Input Table):

```
transferring [name  ] to memory

                    matrix correctly found
              text, generals correctly found


project name is [                                        ]
```

PRODUCTION COSTS TABLES

PRINT TABC

The total production costs of each product (if specified in the subtable "Standard Production Costs") may be printed only during execution of the COMFAR CALCUL System. During computation of production costs, COMFAR will accumulate these costs for each product if data for more than one product have been entered into the input table. Therefore, by the COMFAR REPORT System only the corresponding sum of cost items of all products can be produced.

```
print production cost tables during calculation (Y/N) ??
```

If (N) is selected, COMFAR continues preparing empty tables for the results, otherwise (Y) the printer must be specified. A default printer name is offered:

```
print production cost tables on [dot matrix] printer

      press (return) to accept, or
                     to change press P

 Your Choice ??
```

After the printer described is accepted (press (return)), COMFAR allows to specify which cost table should be printed:

```
press (return) to accept job, or
               to change press   A-F

                  Product

                  Product A      [yes]
                  Product B      [yes]
                  Product C      [yes]
                  Product D      [yes]
                  Product E      [yes]
                  Product F      [yes]

Your Choice (A-F,(return))  ??
```

With (return) the calculations are starts:

```
preparing empty TABO,TABW
```

Then COMFAR will indicate on screen which module is being processed, in case warnings are necessary they will be displayed at the end of the calculations.

```
Calculating  ! module name ..... !

             0 warnings in this module
             0 warnings in total
```

The calculations are terminated with the message:

```
calculation finished !


                    press <return> to continue
```

In case COMFAR encountered unexpected values in the Input Table, warnings are displayed after the line "calculations finished", or if there are too many warnings the system prompts the message:

```
errors and warnings detected in tabl                line  col
```

SAVE TABLE

The results of the calculations are now in an Output Table which is still in the computer memory (or on hard disk, depending on the type of hardware); the table MUST be saved on diskette, otherwise it may be lost !

```
Mount diskette for output table [name  !

     done, press J  ??
```

In the event that table files with the file names specified by you earlier during the COMFAR CALCUL phase are already saved on the diskette mounted in the external drive, a corresponding message will be displayed by COMFAR, and you may choose between the options to REPLACE the old table or to CHANGE the diskette:

```
     Old output table [name  ] on diskette already !

     Replace old table (Y/N) ??
```

The answer: <N> would produce the preceeding menu again, if <Y> is selected, the old Output Table will be replaced be the new one.

!> Note: You may save your input table and your corresponding output tables on the same diskette. COMFAR will inform you if the space left on the diskette is insufficient to store the table.

After having sucessfully stored the Output Table COMFAR will return to the main menu, which allows selection of any of the COMFAR systems displayed. With this message the COMFAR Calculation is terminated.

DESCRIPTION OF THE COMFAR MODEL

The COMFAR Programme Package is composed of a number of MODULE programmes, each of which executes a specific data processing procedure. The modular structure has various advantages for programming, for programme maintenance, and for further development. Basically, the module programmes fall into three parts:

D ... Data Entry System,
C ... Calculation System, and
R ... Report Printing and Listing.

In this chapter the module programmes are described and explained in the logical order of programme execution.

DATA ENTRY

The Data Entry System is started by pressing "D" (for DATEN) to the request displayed in the COMFAR Menu. The system then requests entry of data (input variables) from the keyboard and writes the input into the INPUT TABLE (TABI), after carrying out a plausibility check. Data entries not within the limits defined in the COMFAR Programme will be rejected. In addition to entry of values into the input table, the system requests also the entry of TEXT VARIABLES, such as the project name, product names, etc. and entry of GENERAL VARIABLES, such as duration of construction, currency exchange conversion ratios, conditions of financing, discounting rates, etc.

CALCULATION

The Calculation System is started by pressing "C" (for CALCUL) to the request displayed in the COMFAR Menu. The system requests entry of the NAME of the Input Table containing the data to be processed by CALCULATION, and will then produce a complete Output Table.

REPORT

The REPORT System allows display and printing of the SCHEDULES defined in the UNIDO Manual, such as Balance Sheets, Income Statements, Production Costs, Cashflow Tables, etc., as well as listing of Input and Output Tables. The schedules are produced from the data saved in the respective Output Tables.

TABLES

Execution of the COMFAR System always requires at least two tables (TABI and TABO) which must be created by the user by naming the Input Table. The Output Table is named after the Input Table.

TABLE NAME

The table name is the full name by which the computer identifies a file in general and a table in particular. A table is saved and retrieved under this name. It is not possible to save two tables on the same diskette under the same name, however, COMFAR can distinguish between Input and Output Tables, because it automatically adds a suffix before saving the table. Therefore, the same name is used for the Input Table and the corresponding Output

Table.

LIST TABLES — Both the Input and the Output Table can be listed or displayed on screen by the REPORT System.

DATEN

** ** ** ** ** I. THE DATA ENTRY SYSTEM

The Data Entry procedure is described in chapter 17. Input data are grouped into Text Variables, General Variables, and Values.

TEXT VARIABLES — The Option "Text Variables" can be selected when the Data Entry Menu is displayed. The following entries are possible, but not obligatory:

1 Project Name: enter any text up to 40 characters,
2 Project Date: any format is acceptable,
3 Remarks : enter any text up to 40 characters,
4 Accounting Currency: enter currency units and currency,
1) the accounting currency is the currency used for the Output Tables and Schedules (input is allowed in different currencies; the corresponding conversion rates must be defined as general variables, see below).
5 Product name: for naming select a character from A to F
COMFAR allows to name up to six products

GENERAL VARIABLES

CURRENCY ENTRY — COMFAR allows you to distinguish between foreign and local cashflows. Foreign and local costs and sales, or cashflows, respectively, may be entered in different currencies, which are called the "foreign" and the "local" currency. For the Output Table and the Schedules only one currency can be used, it is called the "accounting currency"; the latter may be the foreign, the local or any other currency. To allow such computation the currency conversion rates must be specified. In the absence of any user's entry COMFAR assumes a rate of 1.00 (foreign = local = accounting currency)

1 Foreign currency conversion rate [1.0000]
2 Local currency conversion rate [1.0000]

DURATION of CONSTRUCTION — The construction phase is, by definition, the pre-production period. COMFAR allows to specify a variable construction phase from one to eight periods, the minimum duration is one year, the maximum is either eight years, or if planning of cashflows is half-yearly the maximum is four years. Enter the duration in years (the default value is 1).

HALF-YEAR PLANNING — You may wish to plan cashflows half-yearly during the pre-production

phase. In this case press <4> to change the description. The default value offered by COMFAR is 'yearly'. The System will later check the entries and reject it if the duration exeeds eight periods.

3 Duration of construction, years [2]
4 Planning during construction [yearly]

DISCOUNTING For cashflow discounting COMFAR uses the following concept: the first year of the construction phase production is - by definition - the reference year (year 0), cashflows are discounted in this year. All net cashflows in the following years (construction and 15 years of production) are discounted, using the correspondig discounting factor (IRR and NPV-rate raised to power). Cashflows from recovery of assets (net) and net working capital are assumed to occure in the year following the 15th year of production. Press <5> for specifying

5 Cashflow discounting rates

this will display :

1 Discounting rate (%) for Net Present Value [0.0]
2 Compound interest rate (%) for Future Value [0.0]

NET PRESENT VALUE The rate entered is used for computation of the net present value of the total net cashflow array.

FUTURE VALUE For investment (cashflow) during pre-production the 'current' or 'future value' is computed in COMFAR if an interest rate (for compound interest) is entered. The future value of funds used during pre-production is computed by adding all interests paid on debts during this period.

EQUITY/SUBSIDY CONDITIONS Select (press) <6> of the General Variables menu to specify the year(s) when disbursement of each fund (three local, three foreign) shall start. Then press the corresponding number to open the field for entry.

LOAN CONDITIONS Select (press) <7> to call a loan selection menu (three foreign, three local loans and foreig / local bank overdraft. The following conditions may be specified for each foreign and local loan:

1 year disbursement starts [1]
2 amortization type [constant principal]

3 amortization period, years [0]
4 amortization paid [yearly]
5 grace period [1]

6 interest rate [ ] % yearly FROM year [ ] THRU [ ]
[ ] % yearly FROM year [ ] THRU [ ]
[ ] % yearly FROM year [ ] THRU [ ]

AMORTIZATION Press <2> to change from "constant principle" to "annuity" and

"profile" and back. If "profile" is selected, COMFAR expects negative values in the corresponding line of the Input Table. If "constant principal" or "annuity" is selected, the system needs also a specification of the amortization period to be able to compute the annual instalments.
Press <4> to select between "yearly","half-yearly","quarterly"

GRACE PERIOD Press <5> to specify any grace period in years.
<> The System does not allow a request to compute repayment during construction, however, it is acceptable to specify a type "profile" and enter negative values for disbursement (= funds outflow) already during construction.

INTEREST Up to three interest rates may be specified. In case an amortization type "annuity" is selected, only the first valid interest rate is used in COMFAR (the others are ignored)

INPUT TABLE The Input Table is a matrix or sheet of 213 LINES and up to 19 COLUMNS. Each value entry is ascribed to a defined place (item) on the matrix. The Data Entry DIALOGUE displays the name of the sub-table and the description of the "current" ITEM (by LINE and COLUMN) for the value to be entered. When the system offers a DEFAULT value, or displays the current value (when updating), you may accept this value by pressing the RETURN key, or change it, by entering the new value.

SUB-TABLES Following the standards defined in the UNIDO Manual, the Input Table is divided into the following sub-tables containing values of the same type:

		sub-table ranges
(1) Initial Fixed Investment	foreign:	line 1 to 12
	local :	line 13 to 24
(2) Current Fixed Investment	foreign:	line 25 to 36
	local :	line 37 to 48
(3) Production Costs	foreign:	line 52 to 78
	local :	line 82 to 107
(4) Production Programme and Sales . . .	foreign:	line 110 to 145
	local :	line 146 to 181
(5) Working Capital Requirements	foreign and local :	line 182 to 190
(6) Source of Finance	foreign:	line 191 to 197
	local :	line 198 to 204
(7) Income, Tax, Cashflow		line 205 to 213

DESCRIPTION A detailed description of all items of the Input Table is given in chapter 27 of this manual.

ENTRY SYNTAX *The syntax for data entry is as follows:*
Each line receives values and descriptions of the respective values, where necessary, as specified in the corresponding column descriptions.

Example: The investment costs in periods 1,2,3 and 4 may be 12300, 500, 0, and 1057.70 . These values (called an array) may either represent

four half-year periods, or four years, depending on your choice when specifying the "planning periods per year" (General Variables menu)

The same line also receives a description of the investment:

- The depreciation rate valid for all values entered in the same line,
- The type of depreciation (in this version of COMFAR only "straight-line depreciation"),
- The salvage value (in % of original investment), if any, at the end of total depreciation, and
- The depreciation period in years (required for all types of depreciation).

The complete line entry is therefore an array, e.g. " 20, 1, 10, 5, 12300, 500, 0, 1057.70". Although you could enter complete vectors for each line, this is not obligatory, and you may enter values itemwise, as requested and described in the Data Entry menu.

OPTIONS

The options INPUT and UPDATE, available for data entry, are described in chapter 17.

CALCUL

** ** ** ** ** II. THE CALCULATION SYSTEM

The Calculation System is the heart of the COMFAR System, it is composed of the following module programmes:

MODULE PROGRAMMES

1 Initial Fixed Investment, and
Current Fixed Investment
* Sub-routine: Depreciation

2 Sales + Production Programme, by product
+ sum of products, direct costs

3 Production Costs, by product
+ sum of products and cost adjustments

4 Working Capital requirements, increase

5 Financing Initial Fixed Investment
* Sub-routines: loan + amortization, interest payable

6 Financing during Production
* Sub-routines: loan + amortization, overdraft

7 Consolidation (sum of foreign and local cashflows)
Completion of table, allowances, overdraft
+ income, income tax, cashflows, CF-discounting
* Sub-routines: Net Present Value, Internal Rate of Return, Future Value, Corporation tax.

The CALCULation System starts with the data previously saved on an

Input Table, and produces the results (dependent variables), which are written onto the Output Table.

OUTPUT TABLE — The Output Table is a matrix (sheet) of 248 lines and 18 columns, and it includes two additional separate tables: a table called TABW (for Working Capital) with 28 lines and 17 columns, and table TABC (for Production Costs) with 20 lines and 16 columns.

Sub-Tables — Similar to the Input Table, the Output Table is divided into sub-tables, receiving the results during execution of the COMFAR Calculation System. For a detailed description of the sub-tables, see chapter 28.

TABW,TABC — COMFAR produces also two auxiliary tables, a table receiving the PRODUCTION COSTS (TABC) for the product currently computed, and a table for the WORKING CAPITAL requirements (TABW). TABC is practically identical with the corresponding sub-table of the Output Table (TAB0), which receives the accumulated production costs only. A description of TABW is given in chapter 28. This table is also saved on diskette and may be displayed and listed, using the REPORT System.

LIST TABLE — The contents of the Output Tables, including the Working Capital Table (TABW), can be displayed on screen or be listed on your printer, by using the COMFAR REPORT System. They can be listed at any time by inserting the corresponding diskette into the external drive and executing the COMFAR REPORT System.

TABC
PRODUCTION COSTS — This table can be listed during programme execution only. The table is used for intermediate storage of production costs computed separately for each product. Since the results are accumulated in the main Output Table, before the Production Costs Table is cleared to receive the results for the next product, the consolidated production costs (for all products) are saved on the Output Table. If the values for each product are of interest, the option "print production costs tables" must be selected when executing the COMFAR CALCULATION System.

DESCRIPTION OF THE COMFAR CALCULATION MODULES

1. Initial Investment and Investment During Production

Investment costs can be entered for up to eight planning periods, either years or half-years. The values are transferred from the Input Table to the Output Table and are partly aggregated (see table descriptions in Chapters 27 and 28).

DEPRECIATION — At present COMFAR offers a programme routine for straight-line depreciation only (default). The format for data entry (Input Table) has already been designed to implement other depreciation routines, later.

LINEAR type 1 — The annual depreciation is computed:

(initial total value of asset) * (%rate) / 100
Assets are depreciated during the "period" specified only and not below the "salvage value" defined.

LINEAR type 2 — The annual depreciation is computed:

(initial total value of asset - residual value. * (%rate) / 100 ,or

(initial total value of asset - residual value) / years

Note: if the annual depreciation rate (%) is entered, the period (years) is computed by COMFAR, any entry of the year is ignored in this case.

ACCELERATED (type 3) The annual depreciation is determined by the annual depreciation rate in % and the duration in years, annual depreciation is computed:

depreciation (j) = (book value in (j-1)) * (%rate) / 100 ,and

book value (j) = (book value (j-1) - depreciation (j) ,where

COMFAR switches to linear depreciation type 1 when the current book value of the geometric function becomes greater than the book value of the linear function.

Initial Investment is accumulated during the pre-production period, and depreciation starts with production. Annual depreciation is computed separately for each line of TABI, following the specifications in columns C1 to C4 of the respective lines.

Investment during Production — Computation of annual depreciation starts in the year following the year of investment.

SALVAGE VALUE The salvage value is computed:

(Initial total value of asset) * (%rate) / 100

Fixed assets are depreciated until the salvage value specified in TABI is reached (unless the period defined is too short); this value is kept until the end of the production period an finally added to C18 of the respective table line (investment item).

ALLOWANCES Usually depreciation will follow the fiscal rules, however, it is possible to specify depreciation for the technical or technological life time of equipment. In this case any additional depreciation for tax purposes may be entered into TABI, sub-table "Income, Tax and Cashflow", lines 207. This annual allowance serves to reduce both: assets and gross profit before tax. The sum of all depreciable allowances will be finally deducted from the total salvage value accumulated for all assets. The programme does not ckeck for negative assets in the balance sheet, therefore, entries in TABI line 207 must be check for any such unwanted effects !

The non-depreciable investment allowance (entered in TABI Line 206) may be used to reduce the taxable gross profit. It has a tax savings effect but does not effect the value of the annual depreciation and assets.

2. Production and Sales Programme

ASSUMPTIONS COMFAR assumes that the total production of each year will be sold. Any stock built up - as specified for Working Capital Requirements - is assumed to be the same at the end of each year (it may vary over the year). In case it is necessary to overcome the problem that income from sales (cash inflow) is lower due to products in stock, it is suggested to reduce the unit prices of the corresponding products, so that the adjusted sales income is produced by COMFAR.

LOCAL,FOREIGN COMFAR allows separate entry of data for foreign and local sales (quantity and unit price) for up to six products (A to F), and produces total consolidated sales and costs, expressed in "accounting currency", i.e. overall foreign and local cashflows for the sum of all products. The Output Table also holds sales and direct costs by product,

To analize Cost/Benefit separately for each product, select the option PRINT TABC when executing the COMFAR CALCULATION System and use the listed tables for a Cost/Benefit analysis of the respective product(s).

PROFIT CENTRES There is a way to use COMFAR for detailed computerized Break Even and Cost/Benefit Analysis for each product separately. Assign all respective cashflows, to the corresponding product; investment, finance, etc., i.e. treat each product as a separate cost and profit centre. Use COMFAR for computation of each partial project, and consolidate finally all figures to produce also the cashflows, and

schedules for the overall project.

STANDARD CAPACITY The standard (reference) capacity specified in TAB1 for each product, is usually the nominal or licensed production capacity for each product. In the case of a multi-product factory it will reflect a standard or reference profile for the production programme. The standard capacities specified, are taken by COMFAR to compute the annual production costs for each product, valid (and planned) for each year.

STANDARD COSTS These are the annual costs of production , when the plant is producing at "Standard Capacity".

SALES VOLUME COMFAR computes annual gross sales, as well as sales net of sales tax and direct costs of sales. The results are written to TAB3, separately for each product. Total local and total consolidated sales are written to the corresponding sub-table of TAB8 (lines 56 to 105).

GROWTH+
INFLATION The product price, sales tax, and "other direct variable and non-variable costs of sales and distribution" can be inflated, by defining an annual %-rate in the Input Table. COMFAR will use this rate (as specified for each table line) to compute a growth function. Each corresponding item will be multiplied by

$$[\ (100 + \%)/100\ ]^{(year)}$$

This function can be used for modelling growth of product sales, and inflation of prices and costs.

DIRECT COSTS, SALES
and DISTRIBUTION may be entered into the Input Sub-table "Sales + Production Programme" or into the Sub-table "Production Costs" as convenient (be careful not to enter costs twice!).

3. Production Costs, Cost Adjustments, Standard Costs

SUB-TABLE
STRUCTURE The first part of the table (line 52 to 63, foreign and line 82 to 93, local) is used for the definition of annual costs by cost item; while the second part (line 64 to 77, foreign and line 94 to 107, local) is used for the definition of Standard Costs by cost item and product. Line 78 serves to specify the distribution of foreign and local depreciation costs.

Entry of COSTS The "Sub-table Production Costs" receives foreign and local total annual costs for each year of production and for each cost item (raw materials, utilities, labour, etc.). In case the

Standard Costs facility is used, the Production Costs sub-table may be used for cost adjustments by cost item and year.

STANDARD COSTS The "sub-table Standard Production Costs" receives foreign and local total annual costs for one year and for the "Standard Capacity". Cost are entered by cost item and may be defined for each product separately.

COST ITEMS and ADJUSTMENTS The following cost items may be entered into the Input Table for foreign and local costs, separately:

- Raw material (first) ! quantities consumed each year
- Raw materials (others) ! and unit prices for each year
- Utilities, annual costs
- Energy, annual costs
- Labour (direct), annual costs
- Maintenance, repair, annual costs
- Spare parts, annual costs
- Factory overheads, annual costs
- Administration, annual labour costs
- Administration, annual non-labour costs
- Marketing, distribution, annual labour costs
- Marketing, distribution, annual non-labour costs

VARIABLE COSTS Each entry of planned Standard Costs must be accompanied by a description of the proportion of variable costs included. The descriptor is named VARIATOR and any value from 0.0% to 100.0% may be entered, indicating the percentage of costs being variable. The default value assumed by COMFAR in case of no entry, is 0.0 (zero). COMFAR compares the actual production of a product with the "Standard Capacity" and computes the proportional costs valid for the respective actual production of each year; finally the fixed costs are added to the annual variable costs to produce the corresponding total costs for each cost item.

NON-PROPORTIONAL costs can be simulated by using the proportionality function of COMFAR and adjusting the computed total manufacturing costs in each year by adding (positive or negative) values defined in the Input Table in LINES 52 to 63 (foreign), and LINES 92 to 93 (local). The cost adjustment may be made for each cost item, but for the sum of the products only.

INFLATION COMFAR allows definition of inflation rates (% per year) for each cost item and for foreign and local production costs. Entry of negative %-rates (cost decrease) is allowed.

DEPRECIATION The annual depreciation is computed by the COMFAR Module Investment Costs (results in TABO line 165 and 130). To include the total annual depreciation in the computation of the total production costs, the cost distribution must be specified in (TABI) line 78. The default values are 100% for product A in columns C1 and C7 (100% of foreign depreciation costs and 100% of local depreciation costs to be borne by product A). To distribute the costs over more than one product the corresponding %-rates must be specified in line 78 in column 1 to 6 (foreign) and 7 to 12 (local).

4. Working Capital

GENERAL The working capital requirements are computed based on mean days coverage, as defined in TABI for foreign and local requirements.

ASSUMPTIONS Since the limited computer capacity is insufficient to save and load again each sub-table produced by COMFAR during computation of the Production Cost tables (TABC), the values for the "minimum days of coverage" entered into the Input Table (foreign andlocal) for each item, are assumed to be valid for ALL products. The WORKING CAPITAL requirements computed by COMFAR are mean values, and the user should therefore choose the values for "days of coverage" so as to produce a realistic figure for the total working capital requirements of the project.

RULES COMFAR computes the working capital requirements for each item of the sub-table (TABW), according to the rules described in the UNIDO Manual (Chapter X.). An abstract of the rules governing the COMFAR Working Capital Module, is given below:

"Accounts receivable" are computed separately for foreign and local costs, as follows (costs per year):

"Factory costs" (TABO), foreign, local
+ "Administrative overheads" (TABO)
+ "Indirect sales costs (marketing, distribution)
+ "Direct sales costs" (gross sales less net sales)

---

divided by the "Coefficient of Turnover"

"Finished Products" are valued at factory costs.

"Cash-in-hand" is computed :

"Total operating costs (= before depr.+ interest)
- "Raw material costs"
- "Utilities"

---

divided by the "Coefficient of Turnover"

"Accounts payable" are computed:

"Total operating costs"

---

divided by the "Coefficient of Turnover"

5. Financing of Initial Fixed Investment

GENERAL The model for computation of "Funds required" has the following characteristics:

* The user can specify both foreign and local funds, and for each:
  Equity (ordinary and preference capital),
  Subsidies or grants,
  three different loans, (overdraft during production only)

* Each fund is characterized by:
  the year the first disbursement starts
  the type of amortization (constant principal, annuity, profile)
  the amortization period in years
  payment of amortization (yearly,half-yearly,quarterly)

  the period of grace in years (starting from the last disbursement)
  financial costs in % of the outstanding debt balance:
  three different interest rates may be defined for
  three consecutive periodes

* The value(s) of annual financial flows:
  positive values are taken as disbursements (cash inflows),
  negative values (for equity, subsidies/grants, loan profiles
  and overdraft only) are taken as re-payments (cash outflows)

FINANCE FUNCTIONS are available in COMFAR for computation of amortization and interest:

INSTALMENTS Interest and repayment may be computed for yearly, half-yearly and quarterly amortization (instalments) of loan capital.

AMORTIZATION There is a choice between the types of amortization:
* constant installments (constant principals)
* constant annuity (annual sum of amortization and interest)
* free definition of any repayment profile

INTEREST When the amortization period is defined, COMFAR computes annual amortization and interest payable on outstanding debt balance at the end of each year. If a loan repayment profile is defined, interest is computed on the outstanding debt balance (end of year)

1) During construction, for computation of interest, COMFAR determines the mean debt, i.e. outstanding balance at the beginning of the period + balance end of year, divided by "2", assuming that funds are used at a constant rate.

ANNUITY When constant annuity over the amortization period is requested, COMFAR computes the loan repayment profile and the interest payable on the outstanding balance. The sum of annual amortization and interest will be constant (annuity)

!> If more then one interest rate is defined, COMFAR takes only the first valid rate for computations and ignores any following rates defined.

ASSUMPTIONS COMFAR computes "finance required" yearly, separately for foreign and local cash outflows (investment). Then it determines the foreign and local "funds available", and compares requirements with availability. In case any foreign deficit is found COMFAR tries to cover this deficit by any local surplusses (or local deficits by foreign surplusses, respectively); if no such surplusses exist (or when they are not sufficient to cover the deficits found) COMFAR assumes that more EQUITY will be paid in to cover the deficits.

After computation of funds, interest is calculated. It is assumed that funds are used at constant rates during each year; interests are computed from the mean debt of each period. Any deficit arising from interest payment is not automatically covered. The user would have to increase the funds inflow (if loans are increased, the corresponding increase in interest must also be considered).

RULES "Funds available" - as defined in the Input Table - are assigned to the corresponding year (column) of the Output Table, in accordance with previously (TABI) defined starting year of disbursement.

!> For the definition and computation of finance the two arrays: construction and production are chained. Therefore, a disbursement in the first year means always the first year of construction. Counting of years is then continued up to a maximum of 23 years (up to eight years for construction and 15 years of production), any higher year is ignored or even rejected when entered (general variables).

END of DISBURSEMENT The system finds the last year of disbursement by searching for the first positive value from right (15th year of production) to left (1st year of production). The pre-production phase is not checked!

GRACE PERIOD The grace period is the phase between the end of disbursement and the begin of re-payment. In COMFAR the minimum period of grace is one year (default value), meaning that re-payment would start in the year following the end of disbursement.

BEGIN of RE-PAYMENT The system computes principals and annuities automatically only when the user specifes re-payment during production. However, a negative disbursement is accepted also before production has started. If the amortization type "profile" is defined for a loan, there is no such limit, because COMFAR simply accepts the values (positive or negative) defined for each year.

6. Financing During Production

GENERAL

Disbursement of any funds may start during construction or during production, with one exception: bank overdraft cannot be disbursed before production has started. (any overdraft defined during the pre-production phase is ignored by COMFAR). Disbursement may start during construction and may be continued during production.

RULES and ASSUMPTIONS

The rules and assumptions are identical with the model described above for "Finance during Pre-production", including computation of interests, repayment (amortization), but excluding any automatic increase of equity funds in case of a deficit, as described above.

EQUITY RETAINED PROFIT

In case of a cash deficit COMFAR will NOT increase automatically the equity funds paid-in, as it is done for the construction phase, therefore, the user would have to make the necessary data entries in case a deficit must be avoided or reduced; (re-run COMFAR after updating).

Any cash surplus arising from profit not distributed, are assumed to be available for self-financing.

7. Consolidation of the Output Table (TABO)

GENERAL

The Output Table in general contains the cashflows for each period in each column. There are exceptions for funds, which are also shown as accumulated cashflows (debt balance), and for "accumulated" profits, and net cashflows. A further exception is the table for Working Capital Requirements (TABW), which shows the actual total capital requirements for each year. The increase or decrease in overall working capital (i.e. the annual cashflow) is shown in lines 13, 26 and 28.
The consolidation module of COMFAR first consolidates foreign and local cashflows to replace the "local" values by consolidated (foreign and local) values. Then it computes annual profits, distribution of profits, taxation, net income after tax, as well as current cashflows from operation and financial cashflows including cashflow discounting.

INCOME TAX

The gross profit (line 221) may be corrected to produce the taxable profit (line 224); corrections are entered in lines 206 and 207 of the corresponding Input Table. COMFAR allows constant tax rates or variable rates (entry of an array with annual tax rates). The TAX routine includes tax holidays, carrying forward of losses, deferred tax payment (tax credit). Annual adjustments of the income tax may be made, the increase or deductions are specified in the Input Table, line 208.

DISCOUNTING

NET PRESENT VALUES are computed for the equity outflow and return on equity (net profit after income tax) and for the overall investment. The discounting rate is defined in the "General Variables" part of the Input Table. The internal rates of return (equity and total investment) are computed for the whole period (construction and production phase), including recovery of investment in the year following the 15th year of production. The Net Present Values are written to column two (C2) of lines 235 and 239, the internal rates of return are written to column three (C3) of lines 235 and 239.

ASSUMPTIONS

COMFAR assumes for cashflow discounting (like in most models) that all cashflows, (inflow and outflow) occur on the last day of each period. All cashflows are discounted to the first year of the pre-production period (the cashflows in that first year are not discounted, for the following years the corresponding discounting factors are used).

PRINTING OF SCHEDULES (REPORTS) AND TABLES

REPORT

The third COMFAR System is the REPORT System, and it is used to print schedules such as cashflow tables, balance sheets, income statements, etc. using the values computed in the CALCULation phase, which are saved in your output table (TAB0). You may also obtain a complete print-out of your TAB0, and/or the corresponding TABI. When you have selected the REPORT System, the following menu is displayed:

```
Press <return> to accept report job
               to change select T,P,M,D or Q

               T ... current table name [      ]
               P ... current printer    [parallel]
               M ... current mode       [ display]
               S ... show               [ schedules]

Your choice (T,P,M,S,<return>,Q) ??_
```

In case a table is in the computer memory, the name of this "current table" will be displayed in the corresponding field.

TABLE NAME

If <T> is pressed to change the current table name, the menu is amended:

```
               T ... current table name [_     ] < enter table name
```

Type the name of the input (output) table, you want to be listed, or processed by the COMFAR Report System for printing of schedules, and then press <return>

PRINTER

If <P> is pressed, the current printer is changed;
two printers: [parallel] and [serial] are validated.

DISPLAY/PRINT

If <M> is pressed, the current mode is changed;
two modes: [display] and [print] are available.

If <S> is pressed, the job is changed;
available are: [schedules], [input table], [output table]

If <return> is pressed, COMFAR Report executes the job defined (table name, printer, mode, tables or schedules)

SCHEDULES If "schedules" and "display" are selected, the system continues with the menu

```
Display [selected] schedules

Press <return> to accept report job
               to change select 1,2 or 0

               1 all schedules
               2 selected schedules

Your Choice ??
```

If <1> is pressed, the first line changes to:

```
Display [  all   ] schedules
```

If <return> is pressed, a menu for selecting schedules is displayed. When "all schedules" was selected, COMFAR offers to display/print all schedules and the user may delete in the following menu those not required by pressing the corresponding number key.

```
Display schedules:

Press <return> to accept job, or
               to change select 1-9, 0

               1 Total initial investment      [yes]
               2 Investment during production  [yes]
               3 Total production costs        [yes]
               4 Working capital required      [yes]
               5 Source of finance             [yes]
               6 Cashflow tables               [yes]
               7 Net income statement          [yes]
               8 Balance sheet                 [yes]
               9 (reserved - not active        [yes]

Your Choice ??
```

If <6> is pressed for example, the line of the menu will be changed to

```
               6 Cashflow tables               [ no]
```

.pm0

If <return> is pressed, the schedules requested will be displayed and/or printed, after the following additional entries have been made:

BEGIN YEAR The calender year may be defined for the first construction year:

```
Pre-production starting with year [1984]

    Press <return> to accept or
                   to change enter year [_   ]
```

For printing of schedules, both the Input and the Output Table are necessary, therefore COMFAR asks you twice to mount the

corresponding diskettes in the corresponding disk drive, unless copies of the tables are already in the computer.

WHICH TABLE? In case COMFAR recognises a table already in the computer memory, it offers to work with this table, or to take another copy of that table from floppy disk, or to specify another table name.

Take input and output table [name] from memory (Y/N) ? (or Q)

If the choice is <N>, the system instructs the user to mount the corresponding diskette. (for the Apple /// computer the external disk drive, for the IBM-PC/XT the validated drive, usually drive A)

DISPLAY If the option "display" was selected, COMFAR will display the requested schedules on screen. The top line contains the name of the schedule displayed and instructions how to continue:

MOVE The two pointers <- and -> move the display if more than five columns (years or periods) form a schedule.

LEAVE To leave to the NEXT schedule, press <L> for (L)eave,

QUIT If no further display is wanted, press <Q> for (Q)uit

PRINT ? After termination of the display job, COMFAR allows to print (all) the schedules displayed:

do you want to print now on [parallel] printer ?

Your Choice (Y,N) ?? (or Q)

NO PRINT The answer (N)o produces the question:
do you want more schedules of table [name] ?

Your Choice (Y,N) ?? (or Q)

YES If the answer is (Y)es, the system checks whether the printer is operable, (if the printer is not ready, an error message and an instruction - what to do - are displayed).

After the job (display or print) has been terminated, COMFAR offers to continue with schedules. <Q>uit brings the user back to the starting menu described already (completely new specification of table name, printer, mode and tables).

TABLES To display or print the contents of the Input Table or Output table, the corresponding table must be selected by pressing <D>:

M ... current mode [print]
S ... show [input table]

With <return> execution of the job described is started:

```
Print [subtables] of input table    [name  ]

Press <return> to accept report
               to change select 1,2,3 or 0

               1 complete table
               2 subtables
               3 lines

Your Choice ??
```

By pressing the corresponding number, the message in the first line will be changed.

DESCRIPTIONS The contents of tables may be displayed and printed with column and line descriptions or without any descriptions, except for subtable headings, which are always displayed and printed:

```
Print complete input table     [name  ]
     [without] description

Press <return> to accept report job
               to change select 1,2,3 or 0

               1 without description
               2 line description
               3 line and column description

Your Choice ??
```

COMPLETE TABLE
SUBTABLES Either of these selections produces the display of a list of all subtables available (Input Table), only if a complete table was requested, the default is [yes] for all subtables, otherwise the default would be [no]:

```
Print subtables:

Press <return> to accept job, or
               to change select 1,2,3 or 0

               1 Text descriptions           [yes]
               2 General variables           [yes]
               3 Initial fixed investment    [yes]
               4 Investment during production [yes]
               5 Production costs            [yes]
               6 Production and sales        [yes]
               7 Working capital requirements [yes]
               8 Source of finance           [yes]
               9 Income, tax and cashflow    [yes]

Your Choice ??
```

LINES Instead of selecting "complete" table or "subtables", line of the table can be printed (displayed) by pressing <3> when the

corresponding menu is displayed:

```
Print [lines] of input table
```

Then again the selection for descriptions can be made, as described already. It is possible to define up to six line ranges (or single lines) during one job:

```
Display selected lines:

        from [   ] through [   ]
```

Either one line number or any range (two numbers) may be entered. The system continues, asking whether more lines are required:

```
        from [  2]

             more lines (Y/N) ??   (or Q)
```

PRINTER ON ? If you choose to print, make sure the printer is SWITCHED ON and ready to operate (check paper and ribbon) !

OUTPUT TABLE The dialogue for display and printing of output tables is the same as for the Input Tables, with the exception of the menu for selecting the subtables:

```
Display subtables:

Press <return> to accept job, or
               to change select 1-9, Q

               1 Initial fixed investment      [ no]
               2 Investment during production  [ no]
               3 Production costs, foreign     [ no]
               4 Production costs, consolidated [ no]
               5 Production and sales, foreign  [ no]
               6 Production and sales, consol.  [ no]
               7 Working capital                [ no]
               8 Source of finance              [ no]
               9 Income, tax and cashflow       [ no]

Your Choice ??
```

COMPUTATION OF ALTERNATIVES, SENSITIVITY ANALYSIS

One of the greatest advantages of a computer model for feasibility analysis is the fast computation power, allowing the calculation of various alternatives of an investment project at practically no cost. In this manual the term "alternative" is used for all kinds of variations of one investment project. These may be versions of a project draft which is being drawn up, different versions computed when searching for the optimal project, or the numerous versions computed when varying one parameter (e.g. sales volume, unit prices, currency exchange rates, discounting rates, etc.)

TABI — Take one Input Table as the BASE CASE from which the alternatives are derived, and save also a backup copy on a separate diskette. Before starting COMFAR, decide which parameter(s) are to be changed. When drawing up a project you may change as may data as you like. However, when carrying out a risk or sensitivity analysis, do not change too many parameters at the same time!

Option UPDATE — Use the Option UPDATE to change data, and to enter new data in your TABI. The new input table must be saved under the name of the alternative. If the various input tables are not needed later, you may list the LINES updated, and after execution of the COMFAR CALCULation System you may print or display all LINES of the corresponding output table effected by the updating. Then you may update again the previous version of your input table and continue computation.

SAVE TABI — It is better to save the most characteristic updated versions, and delete them only when you are sure they are no longer valid for you study.

SENSITIVITY — For sensitivity and risk analysis single parameters are varied systematically, to determine how dependent variables are effected by the change of these parameters. The analysis may include variation of the "general variables", e.g. currency exchange rates, discounting rates, as well as variation of any parameter of the Input Table (delay in start-up, missing target production, changes of cost/benefit structure, etc).

COMFAR CALCULATION SYSTEM, SPECIAL FEATURES

STANDARD MODEL The COMFAR Calculation System offers a variety of standard procedures, such as depreciation, financing of investment, loan amortization, computation of income tax, cashflow discounting, etc. When entering data during the COMFAR DATEN System, you may either define how the standard routine will be used, or accept the version offered by COMFAR as a DEFAULT version. The routines are described in chapter 19.

SPECIAL FEATURES You may wish to analyse interdependencies between input and output variables which cannot be described directly with the existing COMFAR programme routines. In this case the COMFAR Model provides possibilities for cashflow adaptation for:

- flow of FUNDS (equity, loan),
- outflow during production (adjustment of manufacturing costs, originally computed by the standard cost routine),
- distinction between technical and financial depreciation (for computation of salvage values after technical depreciation and cashflow after income tax)
- income taxation systems with non-linear tax rates.

EQUITY Cashflow for equity capital, subsidies, and grants.
You may enter any cashflow array; positive values for cash inflows, negative values for outflows.

LOAN AMORTIZATION The user may select as amortization type either "constant principal" or "annuity" (where COMFAR computes the annual repayment) or define the repayment profile for each loan.

MANUFACTURING COSTS If the manufacturing costs computed automatically by COMFAR, need to be adapted, use LINES L52 to L63 (foreign) and L82 to L93 (local) of TABI, to increase or decrease the annual costs (by cost item and year) as required.

DEPRECIATION COMFAR offers the following types of depreciation: straight line (linear) depreciation of "type 1" (annual depreciation = % of initial value); linear depreciation "type 2" (annual depreciation = % of (inital values less salvage value)'); and accelerated depreciation "type 3" (annual depreciation = % of book value). In addition, the following feature for adaptation of the automatically computed annual depreciation of fixed investment (assets) already exists:

Depreciable Allowances

Depreciable (initial) allowances (line 207 of TABI) are usually available as a fiscal investment incentive, and are written off in the first year. The remaining book value of the asset is then written off during the remaining project life time (or fiscal depreciation period). Be careful when using this feature and check overall depreciation to avoid negative residual book values. When computing annual depreciation of investment, COMFAR does not check whether any other allowances have been defined in lines 206 and 208 of your input table!

A possible solution is to define for the standard depreciation routine a salvage value higher than (or equal to) the additional depreciable allowances. COMFAR would then compute annual depreciation as increased by these allowances, and produce a correct residual or salvage value of the assets.

Annual Allowance Annual allowances (line 206 of TABI) are considered for tax computation only. They do not reduce the assets (book value), or the salvage values recovered, respectively.
With these features technical (technological) depreciation for cost accounting and product pricing can be computed. The array in line 208 of TABI can be used for producing any depreciation array, but only as an overall figure (for all depreciable assets). You may also find it useful to run COMFAR twice, once for cost accounting purposes (technical depreciation) and a second time to produce balance sheet and income statement projections.

TAX ADJUSTMENT You may enter an array with values for annual income tax adjustments into line 208 of TABI (annual fiscal allowance). These values will increase the annual income tax computed (negative values are accepted).

INCOME TAX In most cases the annual tax rates are constant and eventually, a tax holiday period is granted. With COMFAR you can also define a period over which losses are carried forward and - if applicable - a deferred tax payment schedule (tax credit).

APPLE /// SYSTEMS UTILITIES USED FOR COMFAR

THIS CHAPTER will tell you how to FORMAT blank diskettes (you can only write data on previously formatted diskettes) and how to copy and delete files (Input and Output Tables).

For operations on devices and files you need the APPLE /// SYSTEM UTILITIES diskette, supplied with the Apple /// System Software. This COMFAR Manual describes only the operations for:

- formatting of diskettes (also called VOLUME);
- copying the contents of a diskette; and
- deleting the contents of a diskette.

A detailed description of the use of the Apple /// System Utilities is given in the OWNER's GUIDE (Chapter 4, The Utilities Diskette).

BLANK DISKETTES You need diskettes to store information, such as your Input Tables and the corresponding Output Tables. Before the Apple Computer and the COMFAR Program can store any information on a (new) blank diskette, you must first format the diskette. [When a diskette is manufactured, it contains no information at all, it is like a blank recording tape. Formatting the diskette prepares it for use by dividing up its surface into standard-size blocks where information can be stored.]

VOLUME The general term VOLUME is used in the Apple instructions and displays on screen, for any form of mass-storage medium, including DISKETTES. Whenever the Utilities System uses the term VOLUME, it means also DISKETTE.

REFORMAT You may reformat a diskette (volume) that isn't blank, but reformatting will erase its previous contents !

HOW to FORMAT a diskette (volume):

(1) Mount the Apple /// System Utilities Diskette in the internal disk drive.

(2) Boot the System, either switch on the power (cold boot), or press simultaneously the CONTROL and RESET keys (warm boot).

The system will display the Utilities Main Menu.

(3) Choose the option "D - Device handling commands" by typing the letter D.

The system will display the Device Handling Commands Menu.

(4) Choose the option "F - Format a volume" by typing the letter F.

The system will display the Format Volume Command menu, indicating:

! Format the medium of the volume:

: S.D2 :

(5) Mount the diskette to be formatted in the external disk drive (.D2) and press the RETURN key to accept the drive suggested by the system.

The system will respond with the message:

: with the new volume name : [BLANK99 : (any number from 0 to 99)

(6) You may accept the new name (then press RETURN), if you have a name in mind for the diskette, type it and press RETURN.

IF the diskette inserted is not blank, the formatting program will now ask

: Is it okay to destroy all the contents of BLANK99? [Y/N]

Note: It is very easy to get into the habit of answering Y whenever you see a message like the one above. For this reason, it is wise to use the default names BLANK00 to BLANK99 for blank diskettes, and to rename any diskette that is no longer blank.

(7) After you type Y, the computer will make a short rattling sound, then whir and tick for a while as it formats the diskette. When it has finished, it will display:

: Format successful

(8) Remove the diskette from the drive, and write the name on the label. If something goes wrong during the formatting process, the program will display an error message, informing you of what went wrong. You may try to format the same diskette again, if the error message appears again, your diskette may be damaged. An explanation of the error messages is given in the Owner's Guide, Appendix A.

FILE HANDLING

For the Apple computer your input and output tables are FILES, they are identified by names. When you wish to list the files saved on a diskette, or to copy or delete files, use the File Handling Commands of the Utilities System.

For copying all files contained on a diskette it is more comfortable to use the Device Handling Commands System (Option C - Copy a volume).

THE FILER

First boot the system with the Utilities diskette, as described above for the formatting process. With the Main Menu on screen, type F for File Handling Commands. The File Handling Commands Menu will be displayed on the screen. Now you may select one of the options:

L - List files
C - Copy files
D - Delete files
R - Rename files,
etc.

When working with COMFAR files (tables) you may use the command LIST FILES, to obtain a list of all files (tables) contained on a diskette. For copying or erasing (deleting) files you may select the corresponding command displayed; however, it is necessary that you understand the system of table name suffixes used by COMFAR, before you copy or delete single files (tables).

COMFAR TABLE (FILE) NAMES

TABLE NAME

The name entered by the user for the INPUT TABLE is used by COMFAR for naming all tables depending on this Input Table. COMFAR produces names for dependent tables by adding the letter Z to the name until the name is seven characters long (since the name given by the user is limited to six characters, at least one Z is added), the output tables are characterized by the suffixes O or W and the number of the alternative.

The name entry TEST would produce the following file names: TEST and TESTZZZ for the input table and TESTZZZO1, TESTZZZW1, TESTZZZPAR for the output tables.

BACK-UP COPY

To obtain a back-up copy of an input table, you may use the COMFAR Data Entry System, or the FILER program on the Utilities diskette which is described in the Owner's Guide. It is sufficient to COPY the two input table files: (name) and (name)Z, (e.g. TEST and TESTZZZ), because the output tables can be produced by COMFAR at any time.

> BACK-UP COPY with COMFAR:

1. Start the COMFAR System, select the DATA ENTRY System,
2. Select the option UPDATE
3. Enter the name of the table to be copied,
4. Mount the diskette with the input table to be copied,
5. QUIT Data Entry
6. Enter the name of the table copy (may be the same name),
7. Dismount the diskette with the original table,
8. Mount the diskette to obtain the copy, the copy will be written on the diskette.
   (COMFAR warns you if the name exists already on the diskette),

> BACK-UP COPY with the FILER (System Utilities)

Boot the APPLE System Utilities diskette,

Select the File Handling System
Use the Copy Option of the Filer (described in the Owner's Guide)

DELETE TABLES

When tables saved on a diskette are no longer needed, you may either:

Delete the input table and all tables related to it, or

If all tables saved on a diskette are to be erased, you may either delete all files, or use the FORMATTING process to produce a blank diskette.

To delete specific files (tables), use the FILER of the Utilities System, described above.

SYSTEM MESSAGES NORMAL OPERATION

IN THIS CHAPTER the most important messages displayed during a normal operation are shown. These messages inform the user about progress in COMFAR program execution. Normally they do not require any entry from the user, as is the case when menus are displayed.

NAME means a Table Name, i.e. the name of an input or output table.

DATA ENTRY SYSTEM Messages

!) When the red light of the external drive is on, the system is accessing the discette mounted in the drive. Do not open the door of the external drive. In case of a POWER FAILURE during this operation the contents of the table currently processed will usually be completely lost, and you will have to start again with a back-up copy of this table, or in case the SAVE option was used, the copy (saved during DATEN) may be recovered from the hard disk, using the "Recovery Aid" of COMFAR.

If the space left on the discette mounted in the external drive is not sufficient for saving the results, the system will request you to mount a new discette.

[Normal Termination]
[All Functions Performed]
:the system then prompts the COMFAR menu

[User termination request!]
:is displayed, when NO normal termination of COMFAR execution has occurred. This is the case, when using the CONTROL . command. The system will continue with the display:

[System re-initialized!], followed by the COMFAR menu

CALCULATION SYSTEM Messages

[Calculating]

[Calculating ....(name)]
:The system has started calculations and is currently executing the program module indicated with the (name) displayed.

[(number) ....Warnings]
: the system has found exceptional data, which may cause irregular program execution, or which although not effecting program execution may lead to wrong results. Check your input data if error or warning messages are displayed. However, the

message:

[0 warnings]
:does not necessarily mean that your input was correct, it indicates only that COMFAR has not found anything unexpected!

REPORT SYSTEM Messages

[Calculating (name)] The system is executing the module described.

[Print/display (name)] The system is printing the schedule described.

Chapter 25
SOS ERROR MESSAGES

APPLE SOS ERROR MESSAGES

RETRY

The disk boot failed. Either there is no diskette in the internal (built-in) drive, or the diskette is not a booting diskette (COMFAR 1), or the diskette is not inserted straight, or the diskette is damaged.

SOS-KERNEL NOT FOUND
I/O-ERROR

When either of these messages is displayed during booting with the COMFAR 1 diskette, you may either have inserted a wrong diskette, or the diskette is not inserted straight, or the diskette is damaged.

NO FILE (file name)

When a message of this type is displayed while the COMFAR 2 diskette (PASCAL diskette) is in the internal disk drive, check whether:

- the PROFILE disk is properly connected to the computer,
- the COMFAR System on the PROFILE disk may have been partially or completely destroyed,
- the PROFILE disk may by physically damaged (hardware failure)

For other SOS Error Messages, consult the APPLE /// OWNER's GUIDE

COMFAR ERROR MESSAGES

[Computer is waiting, until profile is ready to operate !]

: The PROFILE /// disk is not ready, either it has not been switched on, or its rotation has not stabilized. (see chapter 15)

[Incorrect name => (name)]
[message]
:The name entered is not accepted by COMFAR, the message tells you why.

[No OLD TABI named : (name)]
:The computer cannot find the table specified!

[..., invalid input !]
:Your entry is not within the range accepted by COMFAR! The input is rejected.

[SYNTAX ERROR !]
:your entry is not understood by the system
press H for HELP to display syntax for valid entries

[NO OR WRONG DISKETTE INSERTED]

:COMFAR could not write data onto a diskette, this will cause program interruption, data stored in the memory will be lost!

[WRONG I/O -- DAMAGED DATA STRUCTURE IN (file name)]

:COMFAR cannot access the indicated file (table), this may be because the table file was not correctly closed, due to power failure during data entry, or any other physical interruption of the COMFAR procedures during diskette access.

CALCULATION SYSTEM Messages

[invalid input !]

[there is not enough space on diskette]

[Table (name) is not accessible !] [[choose between D,N,S]

[change menu]
[No table named (name) available !] [Choice=D,N,Q]

INDEX OF COMMANDS

SOS COMMANDS	Apple System Commands are not valid during execution of COMFAR, except for the CONTROL Backslash (^\ command which interrupts program execution at any time. You should not use other system CONTROL commands, available on the computer, because the COMFAR program may go out of control and you may damage the program package or parts of it. Therefore use the CONTROL Backslash Command only when a normal termination from the menus is not possible !
MS/DOS COMMANS	In general the MS/DOS system commands are not valid once the execution of COMFAR has been started. However, CONTROL C (and other commands) may be executed while a COMFAR program module is being executed. In this case the program may be damaged! Therefore, CONTROL keys shall not be used in COMFAR.
COMFAR COMMANDS	The execution of COMFAR programs is controlled by entries requested from the user. The COMFAR accepts only entries described in the current menu.
RETURN Key	Each entry MUST be followed by pressing the RETURN key, except when you are asked to PRESS a key or the SPACE BAR, to continue program execution. In some cases you are requested to press a key only, to continue (no previous entry of any characters), e.g. to continue after an error message or warning has been displayed.
(number)	When the menu displays numbers together with a description of a computer activity, press the number key corresponding to the activity you want COMFAR to execute.
(Q)UIT	When given the choice, you may enter Q to QUIT a menu or a program.
(H)ELP	During entry of values into the input table, you obtain a display of the sub-table line ranges and an explanation of the control commands valid for the value entry, by entering the letter H for HELP (followed by pressing the RETURN key).
D,C,R,S,Q	The three systems, DATa ENtry, CALCULation and REPORT are obtained by entering the corresponding first letter, D,C or R when the main menu is displayed; S starts the dialogue to recover a table from the hard disk (if previously saved during data entry, using the (S)ave option). Q is used to terminate the work.
(D)ONE	Each mounting or dismounting of a diskette (external drive only !) must be followed by the command <D> (press key). The computer will then check whether the drive and the diskette are ready before continuing with program execution.

Chapter 27
TABI DESCRIPTION

DESCRIPTION OF THE INPUT TABLE

DO NOT SKIP — the next few paragraphs, they are important for understanding the COMFAR Data Entry System !

This chapter describes the purpose of the input table, its size and general structure, the division into "Sub-tables", and each line/column or item of the table.

DATA ENTRY — All data to be processed by the COMFAR Calculation System must be previously saved in a formatted Input Table (with a size of 213 lines and 19 columns). When designing the COMFAR Program Package, we had to decide between a formatted data entry (where you would have to place each entry correctly into a specified formal, and a dialogue data entry system, where the computer places each entry where it should be, and where it can be found during data processing.

DIALOGUE — We selected the DIALOGUE data entry system, where the system displays on screen the request for each entry, including a brief explanation. COMFAR will check your data entry, to see whether the values entered are within the lower and upper bounds allowed (plausibility check). Your entry will be rejected by COMFAR, if the entry syntax is incorrect.

INPUT, UPDATE — Two data entry options are available in COMFAR, option INPUT for establishing a new Input Table, and option UPDATE for changing data in an already existing table (table updating).

QUICK ENTRY — When you know which line to address, you can speed up the entry procedure considerably, by jumping to the next row to receive your input. This is very important if you only want to change a few values (option UPDATE), or if you enter few data, as is the case when preparing a pre-feasibility study. A detailed description of each line and column is given in chapter 27.

Advice — Although, the COMFAR DATEN dialogue serves as a guide during data entry, we would advise you read through the following paragraphs, describing the structure of the input table (TABI), before starting with your own data. For description of the data entry procedure, see chapter 17.

SAVE Option — In case of a power failure during data entry the contents of the computer memory is lost. It is advisable to make a permanent backup copy of the table in the memory, using the SAVE option, and retrieve the table if required from the hard disk using the RECOVERY.AID system.

CONTENTS OF THE INPUT TABLE

The complete input table holds the following data:

(1) Text variables
(2) General variables
(3) A sheet (matrix) containing values

TEXT VARIABLES serve to save on diskette text information together with the values contained in the table (matrix)

1	Project Name	[ ]
2	Date + Time	[ ]
3	Remarks	[ ]
4	Accounting Currency	[ ]
5	Product name (up to 6)	[ ]

GENERAL VARIABLES are valid throughout the input table, they describe the following values (The values shown are offered by COMFAR as default values)

1	Foreign currency conversion rate	[1.0000]
2	Local currency conversion rate	[1.0000]
3	Duration of construction, years - minimum duration is 1 year - maximum 4 years, if half-yearly, otherwise 8 -	[1]
4	Planning during construction	[yearly] or half-yearly
5	Cashflow discounting rates	
6	Equity / subsidy conditions	
7	Loan conditions	

STRUCTURE OF THE INPUT TABLE

TABLE SIZE — The Input Table (TABI) has a size of 213 lines and 19 columns. It is segmented into the following sub-tables:

			sub-table ranges
TABI	(1) Initial Fixed Investment.	foreign ...L	1 to 12
		local ...L	13 to 24
	(2) Current Fixed Investment,	foreign ...L	25 to 36
		local ...L	37 to 48
		empty	49 to 51
	(3) Production Costs,	foreign ...L	52 to 77
	depreciation, f/l	...L	78
		empty	79 to 81
		local ...L	82 to 107
		empty	to 109
	(4) Production + Sales Program,	foreign ...L	110 to 145
		local ...L	146 to 181
	(5) Working Capital Requirements,	foreign and	
		local ...L	182 to 190
	(6) Source of Finance,	foreign ...L	191 to 197
		local ...L	198 to 204
	(7) Income, Tax, Cashflow,	...L	205 to 213

DISPLAY,HELP — The sub-table headings and line ranges can be displayed during Data Entry, by using the HELP function (enter H).

LINES, COLUMNS — Each line contains a data array, and each column (item of a line) represents one element of this array. A line contains parameters used for program control (e.g. type of depreciation), descriptive values valid for this line (e.g. depreciation rate, inflation rates, tax rates, etc.), as well as cashflow values, and cost/benefit figures for the project period analysed with COMFAR.

COLUMN HEADINGS — The column headings are the same during a complete sub-table, (foreign and local), with the exception of the sub-tables "Production Costs" and "Income, Tax, Cashflow", which fall into different sections with different column headings. The column headings (column description) are always given before the description of the line headings.

DESCRIPTIONS — The REPORT system allows to print and display line and column descriptions of the tables together with the values (items) of the tables.

DESCRIPTION OF THE INPUT TABLE (TAB1)

INVESTMENT

INITIAL FIXED INVESTMENT

****

Sub-table: line 1 to 24, column 1 to 12
(UNIDO Manual, schedules 5-,6-, and 10-1, 10-2)

COLUMNS for line 1 to line 24
description of depreciation + investment (cashflow array)

C1	Depreciation rate in % per year
C2	Type of depreciation, 1 = straight line (default), 2 = linear to residual value 3 = accelerated depreciation
C3	Scrap value, salvage value in % of investment
C4	Depreciation period in years (rate and type valid for this period)
C5 to C12	Amount invested, by period "P", (P1 to P8)

1) You may plan investment by half-year periods during pre-production. In this case the duration of construction is limited to 4 years
Enter values beginning with C5. Length of pre-production phase is optional, maximum is eight periods (years or half-years).

LINES for column 1 to 12
depreciation C1 to C4, investment items C5 to C12

(f)oreign L1 to L12, (l)ocal L13 to L14

(f)	(l)	
L1	L13	Land
L2	L14	Site preparation and development
L3	L15	Structures and civil engineering (a)
L4	L16	Structures and civil engineering (b)
L5	L17	Incorporated fixed assets (a), construction,transport
L6	L18	Incorporated fixed assets (b), technology, startup
L7	L19	Incorporated fixed assets (c), others
L8	L20	Plant machinery and equipment ...(a)
L9	L21	Plant machinery and equipment ...(b)
L10	L22	Auxiliary and service facilities
L11	L23	Pre-production expenditures
L12	L24	Inventory

Note: You have the possibility of distinguishing between different types of CIVIL ENGINEERING, and other assets, which is very useful if different depreciation periods must be computed.

* * *

INVESTMENT during PRODUCTION

****

Sub-table: line 25 to 48, column 1 to 19
(UNIDO Manual, schedules 5-,6-, and 10-1, 10-2)

COLUMNS for line 25 to 48
description of depreciation + investment (cashflow array)

C1	Depreciation rate in % per year
C2	Type of depreciation, 1 = straight line (default) value, 2 = linear to residual value 3 = accelerated depreciation
C3	Scrap value, salvage value in % of investment
C4	Depreciation period in years (rate and type valid for this period)
C5 to C19	Amount invested each year (Y1 to Y15)

LINES for column 1 to 19
depreciation C1 to C4, investment C5 to C19 (15 years)

(f)	(l)	(f)oreign L25 to L36, (l)ocal L37 to L48
L25	L37	Land
L26	L38	Site preparation and development
L27	L39	Structures and civil engineering (a)
L28	L40	Structures and civil engineering (b)
L29	L41	Incorporated fixed assets (a), construction, transport
L30	L42	Incorporated fixed assets (b), technology, startup
L31	L43	Incorporated fixed assets (c), others
L32	L44	Plant machinery and equipment (a)
L33	L45	Plant machinery and equipment (b)
L34	L46	Auxiliary and service facilities
L35	L47	Pre-production expenditures
L36	L48	Inventory

Note: You have the possibility of distinguishing between different types of civil engineering, construction, and other assets, which is very useful if different depreciation periods must be computed.

* * *

PRODUCTION COSTS

****
Sub-table: line 52 to 63 and line 82 to 93; column 1 to 16
(UNIDO Manual Schedules 10-3/2; /10-12/)

COLUMNS — for line 52 to 63 and for line 82 to 93
Inflation rate (%), annual costs (or cost adjustments)

C1 . . . . Annual inflation rate (%): The values entered may be negative or positive.
C2 to C16 Total cost or cost adjustment in each year (15 production years)
You may enter positive (increase) or negative (decrease) values in any specific year (column).

LINES — for column 1, inflation rate; column 2 to 16, annual costs

(f)oreign L52 to L63, (l)ocal L83 to L93

(f)	(l)	
L52	L82	Raw material (first)
L53	L83	Raw material (others)
L54	L84	Utilities
L55	L85	Energy
L56	L86	Labour (direct)
L57	L87	Maintenance, repair
L58	L88	Spare parts
L59	L89	Factory overheads
L60	L90	Administration, labour costs
L61	L91	Administration, non-labour costs
L62	L92	Marketing, labour costs (indirect costs)
L63	L93	Marketing, non-labour costs (indirect costs)

STANDARD COSTS of PRODUCTION

****
Sub-table: line 64 to 77, 78, line 94 to 107; column 1 to 12
(UNIDO Manual, Schedule 10-3/2)

RULE

This sub-table allows you to specify foreign and local costs by cost item and product only once, i.e for a STANDARD production capacity. COMFAR will compare the planned total production in each year with this standard (reference) capacity specified for each product and compute the corresponding annual costs automatically, assuming that the portion of fixed costs stays constant, while the portion of variable costs is assumed to be direct proportional to the effective production.

In case you don't want to use this facility, enter costs by item into the sub-table described above. In case the linear function for variable cost is not fully applicable, you may use the cost adjustment possibility above.

STANDARD COSTS are the total annual costs for each item (for raw materials, the quantities or costs) valid for the standard (or reference) capacity.

STANDARD CAPACITY This is usually the designed or licensed annual production capacity. The value for each product must be specified in the sub-table Production and Sales Program in COLUMN 1 of lines 146,152,158,164,170 and 176 (omitted only if no production costs are specified for a product)

VARIATOR The variator (%) specifies how much of the standard cost is variable. The variator can have any value from 0 up to 100.

COLUMNS for line 64 to 77, and line 94 to 107
Standard costs for each product: colum 1,3,5,7,9,11
Variator in % (100 = all variable): colum 2,4,6,8,10,12
for Line 78: % of depreciation born by product: colum 1 to 12

		Value (annual cost)	Variator (%)
C1, C2	Product A	colum 1	colum 2
C3, C4	Product B	colum 3	colum 4
C5, C6	Product C	colum 5	colum 6
C7, C8	Product D	colum 7	colum 8
C9, C10	Product E	colum 9	colum 10
C11,C12	Product F	colum 11	colum 12

C1 to C6, L78: products A to F, % of depreciation, foreign investment
C7 to C12, L78: products A to F, % of depreciation, local investment

LINES for colum 1 to 12
Standard Costs / Variators for each product
L78: % of total depreciation of f/l investment, born by product

(f)oreign L64 to L77, (l)ocal L94 to L107

(f)	(l)	
L64	L94	Quantity of raw material (first) ! set unit price = 1, if
L65	L95	Unit cost of raw material (first) ! raw material cost is entered
L66	L96	Quantity of raw material (others)! instead of quantity
L67	L97	Unit cost of raw material (others)! consumed !
L68	L98	Utilities costs per year
L69	L99	Energy costs per year
L70	L100	Labour costs per year (direct costs in factory)
L71	L101	Maintenance, repair costs per year
L72	L102	Spare parts used (costs) per year
L73	L103	Factory overheads (costs) per year
L74	L104	Administration, labour and wages, costs per year
L75	L105	Administration, other costs per year
L76	L106	Marketing, distribution, labour and wages, costs per year
L77	L107	Marketing, distribution, other costs per year

(f)oreign in C1 to C6, (l)ocal in C7 to C12

L78 Enter % of total depreciation to be borne by each product, beginning with foreign : C1=A, C2=B, ... C6=F, and local C7=A, ... C12=F
') default in TABI is C1=100 (%), C7=100 (%)

L108, L109 are not used for input

* * *

PRODUCTION, SALES

PRODUCTION and SALES PROGRAM ##########
Sub-table: line 110 to 145, line 146 to 176; column 1 to 16
(UNIDO Manual Schedules, 3-1; 3-3)

Assumptions COMFAR assumes that the total production of each year will be sold. Any stock built up - as specified for Working Capital Requirements - is assumed to be the same at the end of each year (it may vary over the year). In case it is necessary to overcome the problem that income from sales (cash inflow) is lower due to products in stock, it is suggested to reduce the unit prices of the corresponding products so that the adjusted sales income is produced by COMFAR.

STANDARD CAPACITY ----------

COLUMNS for L146, L152, L158, L164, L170, L176
Standard (reference) capacity, for products A, B, C, D, E, F

LINES for C1 only

L146	Standard capacity for product A
L152	Standard capacity for product B
L158	Standard capacity for product C
L164	Standard capacity for product D
L170	Standard capacity for product E
L176	Standard capacity for product F

NOTE: The standard capacity for each product is expressed as the corresponding TOTAL annual production of a product, for which the foreign and local standard costs have been specified !

INFLATION ----------

COLUMN 1 annual inflation rate (%), values may be also negative

LINES Lines 111..115,117..121,123..127,129..133,134..138,140..145
Lines 147..151,153..157,159..163,165..169,171..175,177..181
for colum 1 only, line descriptions below

PRODUCTION + SALES
COST of SALES

COLUMNS for lines 110 to 145, lines 146 to 181
annual productions + sales, direct annual costs of sales by product
C1 to C12 values for each production year by product and item
C1 = 1st year of production, C2 = 2nd, ..

LINES L110 to L145: Production exported (foreign sales, direct costs)
L146 to L181: Production sold locally, sales and direct costs)

Product A (L110,C1 = empty; L146,C1 = standard capacity)
(foreign Lines 110 to L145, and (local Lines 146 to L181)

(F)	(I)	
L110	L146	Quantity produced / sold per year
L111	L147	Unit price of product sold
L112	L148	Sales tax, total value per year
L113	L149	Other direct costs of sales, total variable costs per year
L114	L150	Other direct non-variable costs, total costs per year
L115	L151	- thereof labour cost, (included already in other direct costs)

Product B (L116,C1 = empty; L152,C1 = standard capacity)

(F)	(I)	
L116	L152	Quantity produced / sold per year
L117	L153	Unit price of product sold
L118	L154	Sales tax, total value per year
L119	L155	Other direct costs of sales, total variable costs per year
L120	L156	Other direct non-variable costs, total costs per year
L121	L157	- therof labour cost, (included already in other direct costs)

Product C (L122,C1 = empty; L158,C1 = standard capacity)

(F)	(I)	
L122	L158	Quantity produced / sold per year
L123	L159	Unit price of product sold
L124	L160	Sales tax, total value per year
L125	L161	Other direct costs of sales, total variable costs per year
L126	L162	Other direct non-variable costs, total costs per year
L127	L163	- therof labour cost, (included already in other direct costs)

Product D (L128,C1 = empty; L164,C1 = standard capacity)

L128	L164	Quantity produced / sold per year
L129	L165	Unit price of product sold
L130	L166	Sales tax, total value per year
L131	L167	Other direct costs of sales, total variable costs per year
L132	L168	Other direct non-variable costs, total costs per year
L133	L169	- therof labour cost, (included already in other direct costs)

Product E (L134,C1 = empty; L170,C1 = standard capacity)

L134	L170	Quantity produced / sold per year
L135	L171	Unit price of product sold
L136	L172	Sales tax, total value per year
L137	L173	Other direct costs of sales, total variable costs per year
L138	L174	Other direct non-variable costs, total costs per year
L139	L175	- therof labour cost, (included already in other direct costs)

Product * (L140,C1 = empty; L176,C1 = standard capacity)

L140	L175	Quantity produced / sold per year
L141	L177	Unit price of product sold
L142	L178	Sales tax, total value per year
L143	L179	Other direct costs of sales, total variable costs per year
L144	L180	Other direct non-variable costs, total costs per year
L145	L181	- thereof labour cost, (included already in other direct costs)

* * *

WORKING CAPITAL

WORKING CAPITAL REQUIREMENTS , ********** Line 182 to 190; column 1 and 2; for line 182 also C3 and C4 (UNIDO Manual Schedules 10-3/1, 10-3/2)

COLUMNS C1,C2 (C3,C4) for L182 to L190
Coverage in Days

C1 coverage in days, foreign products & costs
C2 coverage in days, local products & cost
C3,C4 for line 182 only (cash in hand) coverage in days

Note: In the present version of COMFAR, there is no input of for coverage for each product, because COMFAR cannot "remember" each separate COST sub-table (TABC) for computation of working capital. Therefore, values entered should correspond to (mean) total requirements for total production and sales.

LINES for C1, C2, and for L182 also C3,C4
Minimum Days Coverage

	foreign	local	
L182	C1	C2	Accounts receivable
L182	C3	C4	Cash in hand
L183	C1	C2	Inventory, raw material (first
L184	C1	C2	Inventory, raw material (others)
L185	C1	C2	Inventory, Utilities
L186	C1	C2	Inventory, Energy
L187	C1	C2	Inventory, Spare parts
L188	C1	C2	Inventory, Work in progress
L189	C1	C2	Inventory, Finished Products
L190	C1	C2	Accounts payable

* * *

FINANCE

SOURCE OF FINANCE, ++
Sub-table: line 191 to 204, colum 1 to 19
(UNIDO Manual Schedules 10-B/1, 10-B/2)
DISBURSEMENT and (if required also) any repayment profile may be entered into this sub-table for:

EQUITY, GRANTS + SUBSIDIES
Line 191 to line 193, (f)oreign funds
Line 198 to line 200, (l)ocal funds

LOAN CAPITAL
Line 194 to line 197, (f)oreign funds
Line 201 to line 204, (l)ocal funds

CONDITIONS The conditions for disbursement, amortization and interest payable are to be specified in the part called GENERAL VARIABLES (please refer to the beginning of the table description)

FLOW of FUNDS ----------

COLUMNS for line 191 to 204
C1 to C19 Annual cashflows

The value in C1 will be assigned to the starting year specified in the General Variables block, following values will be assigned to the corresponding year following the starting year.

LINES for C1 to C19 (19 periods)
annual cashflows
positive values = disbursement (financial inflow)
negative values = repayment (financial outflow)

Equity, subsidies, grants: (f)oreign, (l)ocal

(f)	(l)	
L191	L198	Equity (ordinary shares)
L192	L199	Equity (preference shares)
L193	L200	Subsidies, grants

Loans, overdraft: (f)oreign, (l)ocal

(f)	(l)	
L194	L201	Loan A- (AF = foreign, AL = local)
L195	L202	Loan B- (BF = foreign, BL = local)
L196	L203	Loan C- (CF = foreign, CL = local)
L197	L204	Overdraft during production,
	!)	disbursable and repayable during production only !

* * *

INCOME, TAX AND CASHFLOW

****

Sub-table: line 205 to 213, column 1 to 19
(UNIDO Manual Chapter X)

COLUMNS for line 205
description of income tax

Income tax descriptors

LINE / COLUMN		
L205	C1	constant tax rate, enter 0, (default value) variable tax rate, enter 1, and annual rates (%) in L209
	C2	enter tax rate (% per year), if rate is constant (default = 0)
	C3	tax holidays (production phase) in years (default = 0)
	C4	years, losses can be carried forward (default = 0)
	C5	tax credit (deferred tax payment) (default = 0)
	C6	difference in tax rate (%), if additional tax payable on profit distributed LOCALLY (default = 0)
	C7	difference in tax rate (%), if additional tax payable on profit distributed, FOREIGN (default = 0)

COLUMNS for line 206 to 213
annual cashflows, income tax rate (if variable),
dividends, profit distributed annually (foreign, local)

C1 to C15 each column represents one production year, beginning with
C1= 1st year, etc

LINES for column 1 to 15
Allowances, variable tax rate, profit

L206	Annual investment allowance (deducted from gross profit only)
L207	Annual depreciation allowance (initial allowance)
L208	Annual adjustment of income tax
L209	Tax rate (%) applicable in each year (if variable, see L205)
L210	Profit distributed on foreign equity (pref.) values per year
L211	Profit distributed on local equity (preference) values per year
L212	Profit distributed on foreign equity (ordinary) values per year
L213	Profit distributed on local equity (ordinary) values per year

DESCRIPTION OF THE OUTPUT TABLE

TABLE SIZE — The complete output table holds the results computed by COMFAR-CALCUL, and has a table size of 248 lines and 18 columns. The table is divided into the following sub-tables:

TABO — The output table (TABO) is devided into sub-tables and two annexed tables (a total production cost table: TABC and a working capital requirements table: TABW).

SUB-TABLES		sub-table ranges
(1)	Initial fixed investment, foreign	L 1 to 10
	consolidated	L 11 to 20
	total, foreign/local	L 21 to 22
(2)	Financing of initial fixed investment, foreign.	L 23 to 34
	local	L 35 to 46
	consolidated	L 47 to 54
	empty	L 55
(3)	Sales for each product, foreign	L 56 to 73
	total, foreign . . .	L 74 to 76
	Sales for each product, local	L 77 to 94
	total, local	L 95 to 97
	Total sales, consolidated	L 98 to 105
(4)	Production costs, total, foreign	L 106 to 124
	total, consolidated	L 126 to 144
	total, local	L 146 to 148
	marketing & distribution . .	L 149 to 150
(5)	Investment during production, foreign	L 151 to 165
	consolidated	L 166 to 180
	local	L 181 to 182
	depreciable allowances, consolidated	L 183
		L 184 empty
(6)	Financing during production, foreign	L 185 to 199
	local	L 200 to 214
	consolidated	L 215 to 220
(7)	Income and taxation, consolidated figures . . .	L 221 to 230
	Cashflow, consolidated figures	L 231 to 245
	Tax rate by year, tax paid (cash outflow) . . .	L 246 to 247
	Total investment costs by year (cashflow) . . .	L248

CF-discounting — Results of cashflow discounting procedures (NPV and IRR) are in lines 235 and 239 (column 2 and 3).

PRODUCTION COSTS, print for each product :

TABC The sub-table serves for intermediate storage of results, computed for each product separately. These intermediate results are accumulated in the main table (TABO) before TABC is cleared again (all values set to zero) to receive the figures for the next product. The contents of the TABC is NOT saved and can be listed only during execution of the CALCUL COMFAR programme module (enter Y when the following menu is displayes:
print production cost tables during calculation (Y/N) ??

COLUMNS C2 to C16 Annual cashflows

	line nuaber	TABC	TABO		
LINES	1	Raw aaterial (first)	106	126	
	2	Raw aaterial (other)	107	127	
	3	Utilities	108	128	
	4	Energy	109	129	
	5	Labour	110	130	
	6	Maintenance, repair	111	131	
	7	Spares	112	132	
	8	Factory overheads	113	133	
	9	Sub-total, factory costs	114	134	
	10	thereof variable	115	135	
	11	Administration	116	136	
	12	Marketing, distribution, indirect	149	150	
	13	thereof variable	117	137	
	14	Operating costs, (a)	118	138	
	15	Total before interest	120	140	
	16	Interest	121	141	
	17	Total production costs	122	142	148
	18	thereof variable	123	143	146
	19	Total labour	124	144	147
	20	Depreciation borne by product	119	139	

(a) Total before depreciation and interest)

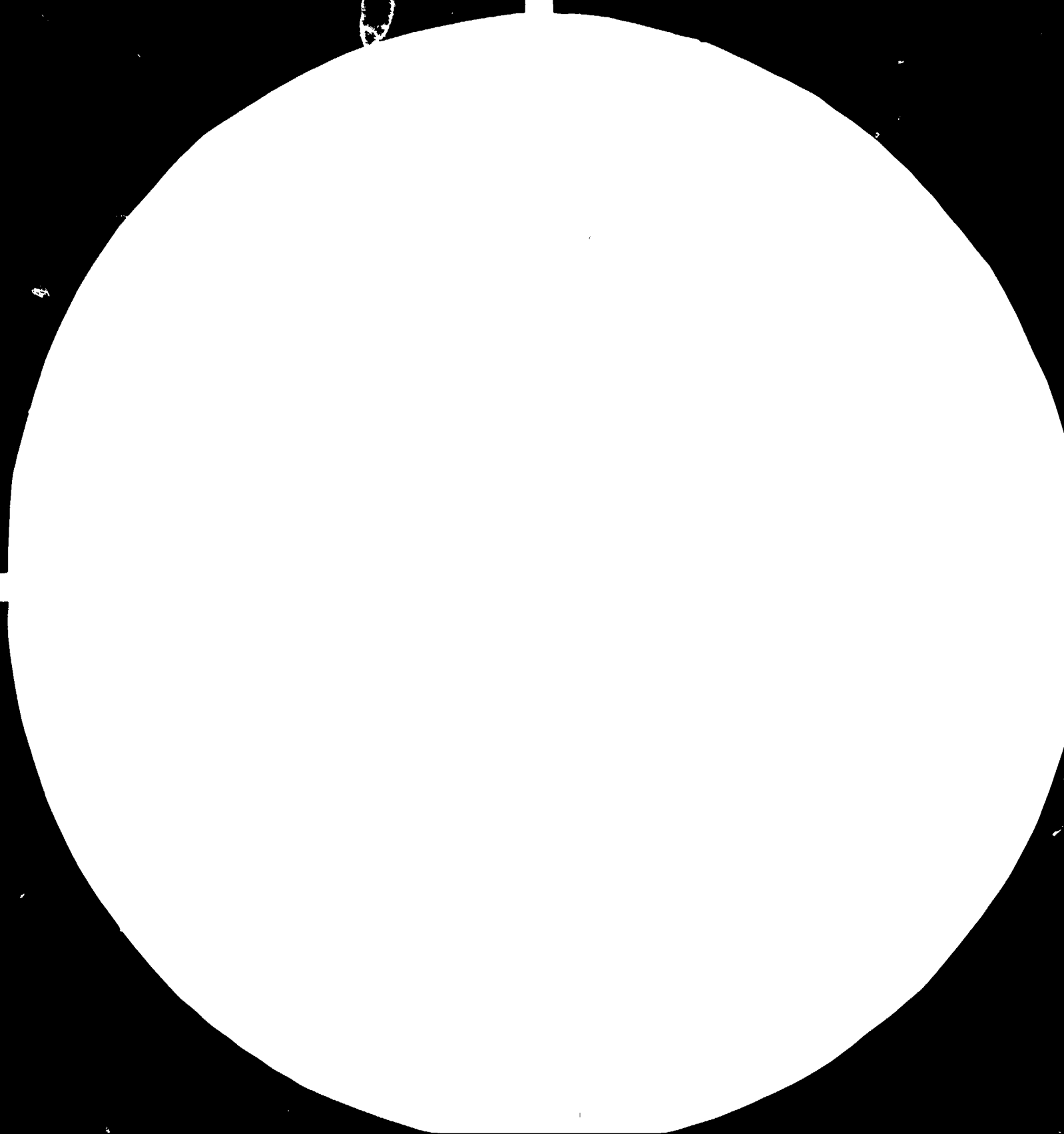
WORKING CAPITAL REQUIREMENTS

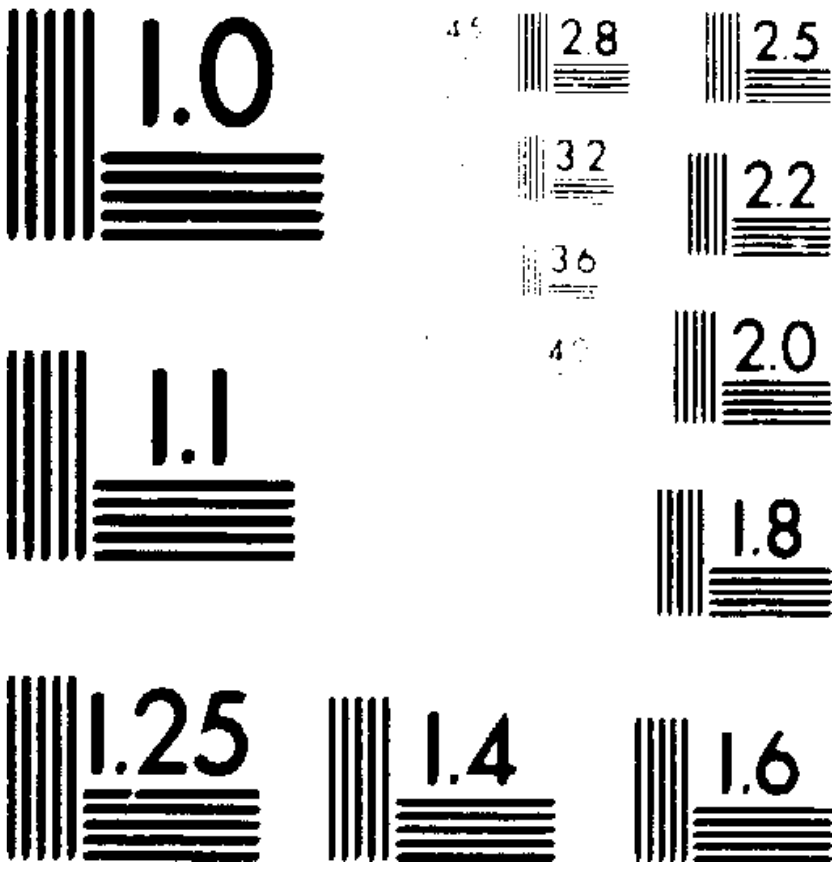
TABW — Working capital requirements are computed during execution of COMFAR-CALCUL, and the results are recorded on a separate output table, called TABW. Contrary to TABC, this table is saved on discette and can be listed using COMFAR-REPORT system (display / print output table, subtable: working capital)

TABW of TABO — ********** Line 1 to 28, column 1 to 17;

COLUMNS	C1	Minimum Days Coverage
	C2	Coefficient of Turn-over
C3	to C17	Annual Capital Requirements

LINES (f)	(l)	(f)oreign L1 to 13, (l)ocal L14 to 26, (c)onsolidated L27,28
1	14	Accounts receivable
2	15	Raw material (first)
3	16	Other raw material
4	17	Utilities
5	18	Energy
6	19	Spare parts
7	20	Work in progress
8	21	Finished products
9	22	Accounts payable, current liabilities
10	23	Cash in hand
11	24	Current assets
12	25	Net Working Capital (NWC)
13	26	Increase in Net Working Capital (= annual cashflow)
(c)	27	Consolidated Net Working Capital (= foreign + local)
(c)	28	Consolidated increase in NWC (= annual cashflow)





DETAILED DESCRIPTION OF THE OUTPUT TABLE

INVESTMENT

INITIAL FIXED INVESTMENT

********** Sub-table: line 1 to 22; (f)oreign, (c)onsolidated, (l)ocal

COLUMNS C1,C3 Total of line,
C2,C4 Future Value of total of line,
C5 to C12 Actual investment (cashflow), yearly or half-yearly
C18 Total salvage value recovered after end of production

LINES (f)	(c)	description
1	11	Land, site preparation and development
2	12	Civil A+B, buildings, civil work
3	13	Equipment A+B, plant machinery, equipment
4	14	Equipment C, auxiliary and service
5	15	Incorporated fixed investment
6	16	Pre-production expenses, (+interest accrued)
*** 7	17	Total fixed investment
8	18	Inventory
9	19	Receivables (net), accounts receivable less accounts payable
*** 10	20	Total assets, pre-production
21	-	Total assets foreign, C5 through C12
-	22	Total assets local, C5 through C12
21	-	column 1 Grand total of investment
		column 2 Future value of grand total
column 3	line 21	Total foreign (including interest accrued)
	line 22	Total local (including interest accrued)

FINANCING

FINANCE, INITIAL **
FIXED INVESTMENT Sub-table: line 23 to 55, column 1 to 4 and 5 to 12, C18
annual flow of funds

COLUMNS C1,C3 Total of lines
C2,C4 Future Values
C5 to C12 Actual cashflows by period

LINES	(f)	(l)	(f)oreign, (l)ocal, (c)onsolidated
	23	35	Equity (ordinary shares), paid-in
	24	36	Equity (preference shares), paid-in
	25	37	Subsidies, grants, paid-in
	26	38	Loan A (AF=foreign, AL=local), paid-in
	27	39	Loan B (BF and BL), paid-in
	28	40	Loan C (CF and CL), paid-in
***	29	41	Total funds (cashflow), foreign/local
	30	42	Current debt, Loan A (accumulated cashflow)
	31	43	Current debt, Loan B (accumulated cashflow)
	32	44	Current debt, Loan C (accumulated cashflow)
***	33	45	Total debt (accumulated cashflows)
	34	46	Total debt, % of total funds (foreign/local)

LINES		(c)	Consolidated funds, pre-production
		47	Total EQUITY paid-in, (cashflows)
		48	Total LOANS (cashflows)
	***	49	Total FUNDS (cashflows)
		50	Total debt, % of total funds
		51	Total INTERESTS (paid annually), foreign
		52	Total INTERESTS (paid annually), local
	***	53	Grand total, interests paid during pre-production
		54	Total of subsidies and grants, consolidated
		55	empty, not used

SALES

ANNUAL SALES **********
Sub-table: line 56 to 105, column 1 to 16;
sales for each product: foreign, local;
total sales: foreign, local, consolidated

COLUMNS 2 to 16 Annual cashflows (for 15 production years)

LINES Note: 3 lines are used for each of the six products:
1st line: for annual gross sales
2nd line: for annual sales net of sales tax
3rd line: for annual net sales after tax and direct costs

LINES (f) Foreign sales by product (A to F)

	56 to 58	Product A, foreign sales
	59 to 61	Product B, foreign sales
	62 to 64	Product C, foreign sales
	65 to 67	Product D, foreign sales
	68 to 70	Product E, foreign sales
	71 to 73	Product F, foreign sales
	74	Total gross sales (foreign)
	75	Total sales net of sales tax (foreign)
	76	Total sales net of tax + direct costs (foreign)

sequence:
- gross sales
- net of sales tax
- net of tax + direct costs

LINES (l) Local sales by product

	77 to 79	Product A, local sales
	80 to 82	Product B, local sales
	83 to 85	Product C, local sales
	86 to 88	Product D, local sales
	89 to 91	Product E, local sales
	92 to 94	Product F, local sales
	95	Total gross sales (local)
	96	Total sales net of tax (local)
	97	Total sales net of tax + direct costs (local)

sequence:
- gross sales
- net of sales tax
- net of tax + direct costs

LINES (c) Sales, sales tax, labour, consolidated

***	98	Total annual sales before sales tax, consolidated
***	99	Total annual sales net of sales tax, consolidated
***	100	Total annual net sales after tax and direct costs
	101	Total sales tax, foreign (paid on exports)
	102	Total sales tax, consolidated
	103	Total labour (included in direct costs), foreign
	104	Total labour (included in direct costs), local
	105	Total labour,(included in direct costs), consolidated

COSTS

PRODUCTION COSTS ********** Sub-table: line 106 to 150, colum 2 to 16; costs per annum

Note: COMFAR computes the production costs for each product separately, and writes the costs for all foreign and local products into a utility table (TABC), before accumulating the costs in the (main) output table. TABC has the same structure as the sub-table of the output table (TABO), and cannot be saved, but it can be listed during execution of the CALCUL system. For details see the COMFAR description in chapter 19.

COLUMNS 2 to 16 Annual cashflows (for 15 years of production)

LINES (f)	(c)	costs: (f)oreign, (c)onsolidated lines of (TABC)	
106	126	Raw material (first)	1
107	127	Raw materials, (other)	2
108	128	Utilities	3
109	129	Energy	4
110	130	Labour	5
111	131	Maintenance, repair	6
112	132	Spares	7
113	133	Factory overheads	8
*** 114	134	Sub-total, factory costs	9
115	135	thereof variable	10
116	136	Administration, overheads	11
117	137	thereof variable	13
*** 118	138	Operating costs	14
119	139	Depreciation	20
*** 120	140	Total before interests	15
121	141	Interests	16
*** 122	142	Total production (manufacturing) costs	17
123	143	thereof variable	18
124	144	Total labour (of total production costs)	19

LINES (local)		lines of (TABC)	
	146	Total variable costs	18
	147	Total labour costs	19
	148	Total production (manufacturing) costs	17
	149	foreign marketing and distribution (indirect costs)	
	150	consolidated marketing and distribution costs	

!) direct marketing and distribution costs in subtable Sales

INVESTMENT

INVESTMENT ##
during Sub-table: line 151 to 182;
PRODUCTION costs per annua

COLUMNS C1 Total carried forward from pre-production
C2 to C16 Annual cashflows
C17 not used
C18 Salvage values recovered after end of production

LINES (f)	(c)	Investment: (f)oreign, (c)onsolidated
151	166	Land, site preparation and development
152	167	Civil a+b, buildings, civil works
153	168	Equipment a+b, plant machinery, equipment
154	169	Equipment c, auxiliary and service
155	170	Incorporated fixed assets
156	171	Pre-production expenses (no interest accrued)
*** 157	172	Total fixed assets (investment)
158	173	Construction in progress
159	174	Inventory
160	175	Accounts receivable
161	176	Cash in hand, bank
*** 162	177	Total current assets (investment)
	178	Loss to be carried forward
*** 164	179	Total assets (investment), production
165	180	Total depreciation

LINES	(1)	TOTAL INVESTMENT (local) during production
***	181	Total fixed assets (investment)
***	182	Total current assets (investment)
	183	Total depreciable allowances, (from TABI L207)
	184	empty

FINANCING

FINANCE DURING PRODUCTION
Sub-table: line 185 to 220
annual flow of funds

COLUMNS C1 Totals carried forward from pre-production
C2 to C16 Annual cashflows

LINES (f)	(l)	funds: (f)oreign, (l)ocal, (c)onsolidated
185	200	Equity (ordinary shares) paid-in
186	201	Equity (preference shares) paid-in
187	202	Cashflow balance (retained)
188	203	Cashflow: profit distributed
189	204	Loan A (AF=foreign, AL=local), (cashflow)
190	205	Loan B (BF and BL), (cashflow)
191	206	Loan C (CF and CL), (cashflow)
192	207	Debt A (accumulated cashflow ! outstanding
193	208	Debt B (accumulated cashflow)! balance
194	209	Debt C (accumulated cashflow)!
195	210	Subsidies, grants (cashflows)
*** 196	211	Total equity and reserves (cashflow)
*** 197	212	Total longterm loan (debt balance)
198	213	Bank overdraft + current liabilities
*** 199	214	Total funds (cashflow) available/required

LINES (c)	FINANCE DURING PRODUCTION, consolidated
215	Total equity paid-in
216	Net worth, = total equity and reserves (cashflow)
217	Total long-term loan (cashflow)
218	Total short-term loan/overdraft (cashflow)
219	Total funds available (required)
*** 220	Total repayment (loan amortization)

INCOME,TAX

INCOME, TAX **
Sub-table: lines 221 to 230, colum 1 to 16

COLUMNS C1 Totals carried forward from pre-production
C2 to C16 Annual cashflows

LINES (c) (c)onsolidated

---

221 Gross profit (after depreciation, depr.allowance + interests)
222 thereof foreign contribution
223 Tax allowance (no depreciation of assets)

*** 224 Taxable profit
> 225 Income tax, payable on taxable profit
*** 226 Net income after tax
227 Additional income tax, payable on profit distributed
228 Net profit distributed (net of income tax)

229 Accumulated net income after tax
230 Accumulated net income + interests paid on debt

CONSOLIDATION

CONSOLIDATED ************.**
CASHFLOW Sub-table: line 231 to 248, colum 1 to 17

COLUMNS C1 is used for accumulating cashflows from pre-production
C2 to C16 contains annual cashflows during production
C17 is used for cashflows in the year following production

LINES (c) annual cashflows: (c)onsolidated

---

231 Outflow during production, (current CF, interests = outflow)
232 Inflow during production, (current CF, excl.financial flow)
*** 233 Net cashflow, production (current net CF from operation)
*** 234 Accumulated net cashflow (including net CF pre-production)
235 Discounted return on equity, C2= NPVE, C3= IRRE
*** 236 Net cashflow (line 233) in % of total sales
*** 237 Net cashflow (line 233) in % of total investment
238 Net cashflow (line 233) interests added back
239 Discounted cashflow (excluding financial CF) C2=NPV, C3=IRR
240 CF-array for computation of NPV and IRR in line 239

LINES 241 Total outflow, production ! including cashflows arising from
242 Total inflow, production ! financial operations
243 Total net cashflow, production (CF for financial planning)
244 Accumulated total net CF (including CF from pre-production)
245 Total depreciation, including depreciable allowances
246 Variable Tax rate in %, (if any)
247 Effectiv income tax, cash outflow (if tax credit specified)
248 Total investment costs (cashflow)