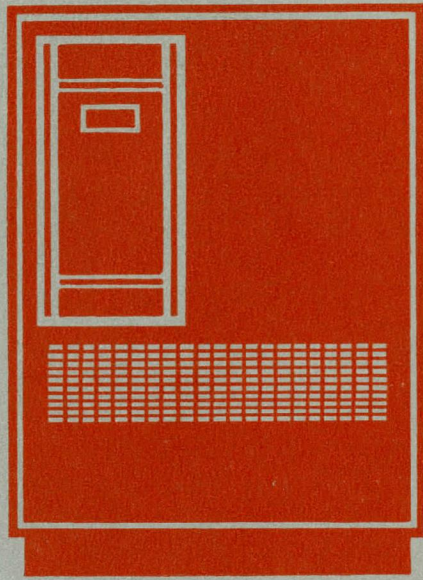


*Ernst Abildtrup*

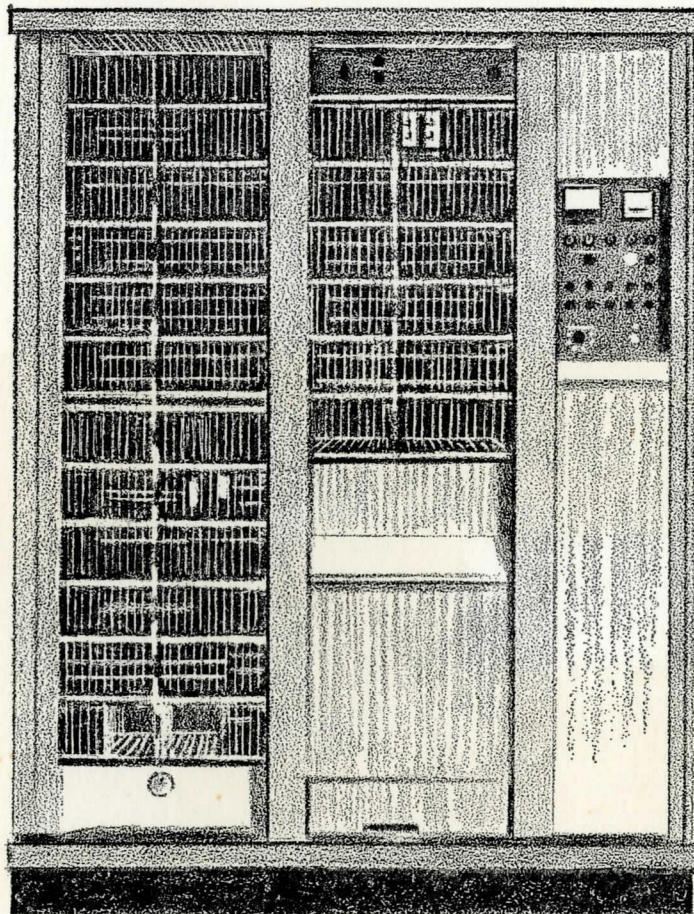


# GIER DISK

GIER ELECTRONICS

# GIER

**GIER** COMPUTER  
ELECTRONICS



GIER is a compact, general purpose digital computer equipped with a highly effective ALGOL 60 compiler (see reverse) and a flexible operating system.

The GIER Computer operates in the binary mode with a cycle time of 10  $\mu$ sec. There are 60 single address instructions including built-in floating point arithmetic. Instruction execution times range from 29  $\mu$ sec to 267  $\mu$ sec (fixed point division). The GIER word contains 42 bits, two of which are used for flagging.

GIER is equipped with a general purpose, two-way, 42-bit Data Channel and a 12-channel Interrupt System to facilitate connection of auxiliary devices such as magnetic tape stations or the Process Control Unit. Other peripherals, such as line printer or digital increment plotter, can be easily connected.

In the GIER-DISK the 1024-word immediate access core store is supplemented by the high-speed, random access Disk File with interchangeable Disk Kits that provide unlimited storage capacity. Disk File transfers take place independently of other operations. Additional Disk Files are available at option.

The BUFFER, a high-speed, 2nd-level store with a 4096-word core store, is optionally available to supplement immediate and random access storage and to accommodate magnetic tape transfers.

In the GIER STANDARD auxiliary storage consists of a random access magnetic drum of 12,800 words, extendible by two drums to give a maximum capacity of 38,400 words.

The GIER Computer is operated from the desk-like Console, which contains operating and display panels as well as the Basic Peripherals: the RC 2000 Paper Tape Reader, an input/output typewriter, and a paper tape punch. The Central Processor cabinet houses storage devices, micro-programming circuitry, power supply, and the like. Also available is an electric, off-line typewriter with ALGOL keyboard for producing punched paper tapes.

GIER, the Danish computer developed and produced exclusively by GIER Electronics, has been installed with associated peripherals at over thirty locations in seven European countries, and has found wide applications; besides administrative data processing, some of the important areas to be mentioned are: geodetics, nuclear physics, chemical engineering, astronomy, ship building, process control, statistics, and training.

# DISK

**ANELEX RANDOM ACCESS DISK FILE MODEL 80**

DISK FILE is high-speed storage device supplementing the immediate access store in GIER. By utilizing interchangeable Disk Kits, the random access Disk File can offer **unlimited** auxiliary storage capacity and fast access time, which together with balanced data packing provide maximum effectiveness in combination with the GIER Computer.

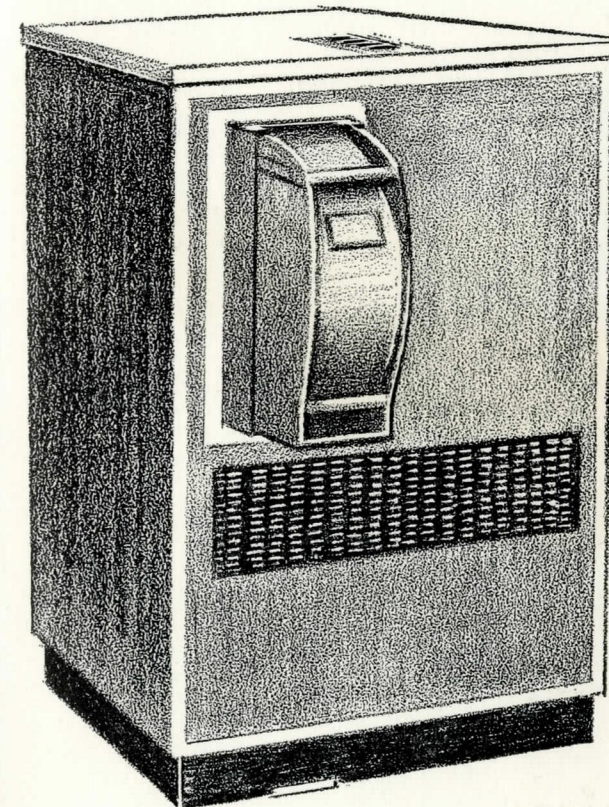
The removable Disk Kit, a modular package of six disks, is the basic unit of the Disk File, enabling direct, complete read/write interchangeability with the File. The efficient, self-encased Kits, which can quickly be inserted or removed for storing by the operator, protect the disks when not being used in the File, and obviate maintenance adjustments and control setting changes.

The File itself, housed in a compact, free-standing unit to ease operation and maintenance, contains the Head Array, control circuitry, and the mechanical unit that handles the Kit. When a Kit is inserted, the disks are automatically exposed to the Array; at the same time, the shaft for holding and revolving the disks is positioned.

Organization of data storage is in terms of blocks, surfaces, disks, and kits: a block contains 40 42-bit words; there are 800 blocks per surface, 1600 blocks per disk, and 9600 blocks per kit. The data on the recording surface is accessed by a single read/write head through positioner motion.

In the GIER DISK PRINTER a line printer is employed having a speed of 667 lines/min. There are 160 print positions, a character set of 64 characters, and print density of 10 char/inch horizontally, 6 (and 8) lines/inch vertically. The single-line printer buffer accepts computer output character-by-character and has a tabulation feature. Vertical format is controlled by special punched tape, and paper is skipped at 27.5 inches (70 cm) a second.

Other peripheral devices and auxiliary equipment, such as GIER Electronics' RC 2000 Paper Tape Reader and RC 3000 Converter, the magnetic tape station, card reader, paper tape punch, and digital increment plotter, are described in detail elsewhere in our sales literature.



# GIER DISK

## TYPICAL EXTENSION

### The GIER ALGOL Compiler

An outstanding aspect of the GIER Computer is the unusually capable ALGOL 60 Compiler, which accepts the entire ALGOL 60 language (except own array) and includes extensive programming possibilities, a wide variety of input/output procedures, comprehensive error detection, and ample provision for using machine code.

Compilation time is exceptionally fast: from 4 to 180 seconds per program. The Compiler occupies about 6000 words of the Disk File according to mode of use. Simple assignment requires 100  $\mu$ sec, multiplication 180  $\mu$ sec, and a go to statement 80  $\mu$ sec.

Not only does the Compiler facilitate the writing of programs, but with the specially adapted service routines available through the GIER System Library, up-dating of programs can be carried out within the abundant storage space of the Disk File without recourse to paper tape. Programs can accordingly be compiled from any specified area of the Disk File, while compiled programs can be stored in other selected areas ready for use, so that paper tape copies of such programs are only needed for documentation and similar purposes.

### The GIER System Library

Established as a centralized information service for users of the GIER Computer, the GIER System Library provides information about existing publications (descriptions and tapes of programs, procedures, and sub-routines, books, reports, and surveys) and forwards these publications to the user on request.

All literature and relevant program tapes in the Library are classified according to a decimal system. Currently there are eight primary subject groups, namely:

- |                           |                                 |
|---------------------------|---------------------------------|
| 0. General Information,   | 4. Mathematical Statistics,     |
| 1. Service Routines,      | 5. Operational Research,        |
| 2. Basic Data Processing, | 6. Science and Engineering, and |
| 3. Mathematics,           | 7. Business Applications.       |

A complete, revised Index of all publications in the Library together with five-line Abstracts of each publication, arranged according to the classification system, are published periodically.

While General Information, as its name implies, covers publications and books of general interest, Service Routines comprises the actual programs and their descriptions relevant for any GIER installation. Apart from the ALGOL Compiler, there is the HELP System, incorporating a symbolic loader program (SLIP) and numerous other debugging aids. Among other useful programs are those for test of hardware and a flexible program for introducing corrections into copies of paper tapes. The Basic Data Processing group includes procedures and subroutines for sorting and those catering for specialized input/output requirements. The remaining five subject groups cover differing applications of the GIER Computer to a large variety of problems. Topics of special interest are: mathematics, mathematical statistics, operational research, highway and railroad planning, and optical design.

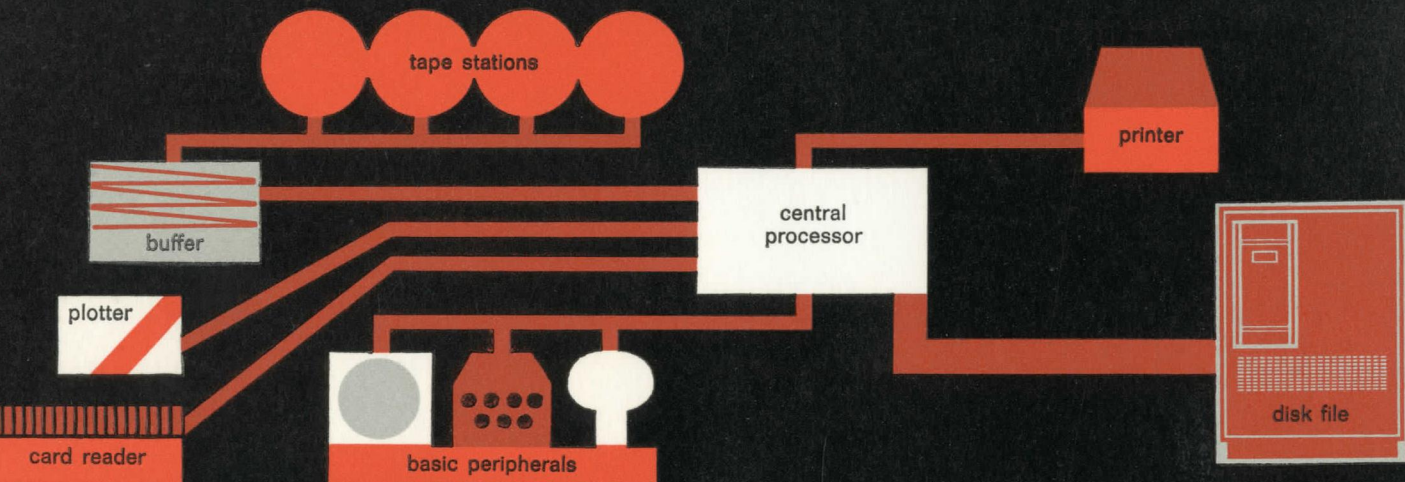
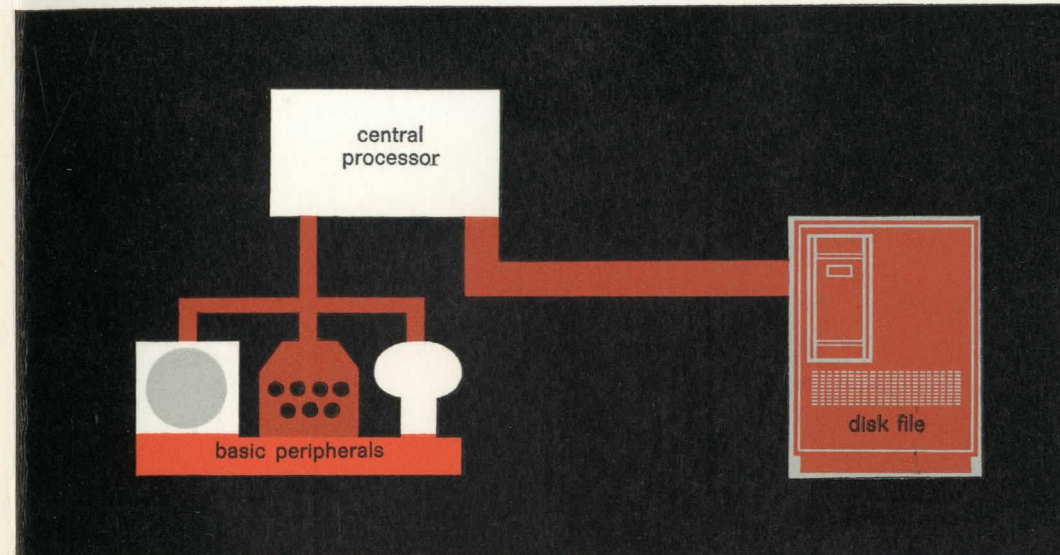
# GIER DISK

## TYPICAL CONFIGURATIONS

### DISK CHARACTERISTICS

#### DISK FILE

**Size of Frame** (less door panels)  
length 80.6 cm, width 68.3 cm, height 105.0 cm  
**Weight:** 227 kg  
**Power Supply** (50 Hz, 3 $\times$ 380 V)  
maximum power ..... 900 kcal/h  
maximum line current ..... 10 A (3  $\phi$ , 0, G)  
fuses in mains connection ... 10 A (3  $\phi$ )  
**Number of Movable Read/Write Heads**  
1 per disk surface - 2 per disk - 12 per complete unit  
**Positioning Time:** 85 mS  
**Rotational Speed:** 2400 rpm (nominal) or 25 mS/rev  
**Rotational Delay:** 12.5 mS (average)  
**Transfer Time:** ca. 3 mS/block



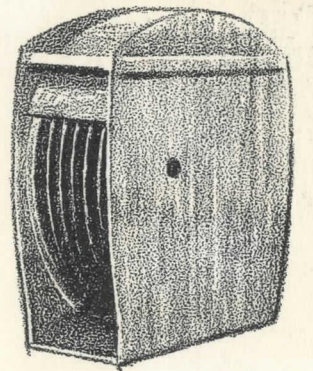
### DISK KIT

**Size:** length 40.0 cm, width 14.6 cm, height 41.1 cm  
**Weight:** 5.5 kg  
**Number of Disks:** 6  
**Number of Recording Surfaces:** 12  
**Number of Blocks:** 800 per disk surface  
**File Capacity**

words/block	40 or	1,680 bits (42 bits per word)
words/surface	32,000 or	1,344,000 bits
words/disk	64,000 or	2,688,000 bits
words/kit	384,000 or	16,128,000 bits

### ENVIRONMENT

**Air Temperature:** plenum or ambient 18-23° C  
**Cooling Air:** plenum or ambient 600 m<sup>3</sup>/h  
**Relative Humidity:** 40-70 %



### GIER CHARACTERISTICS

#### THE CENTRAL PROCESSOR

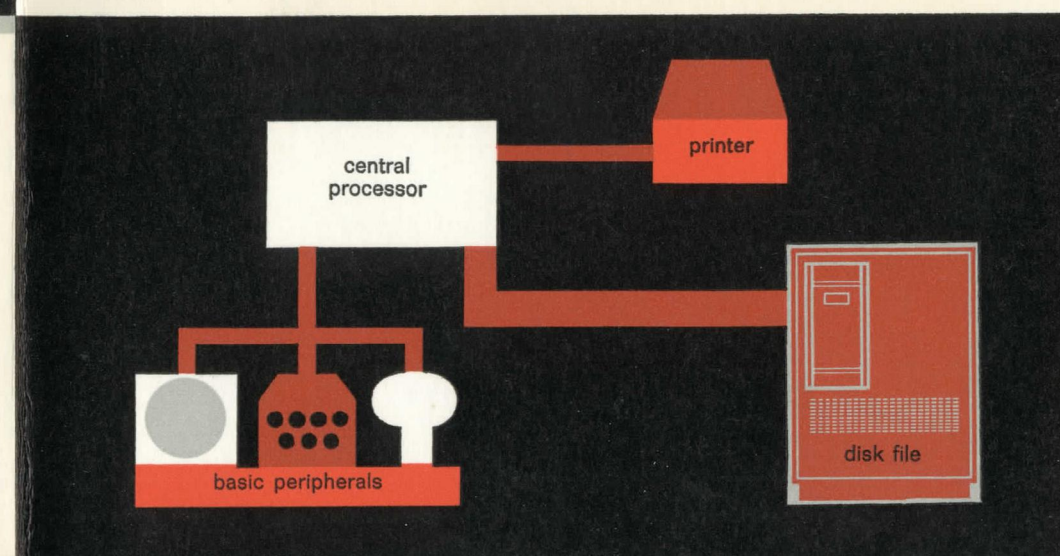
**Size:** length 144.6 cm, width 54.2 cm, height 192.7 cm  
**Weight:** 436 kg  
**Power Supply** (50 Hz, 3 $\times$ 380 V)  
maximum power ..... 1400 kcal/h  
maximum line current ..... 4.1 A (3  $\phi$ , 0, G)  
fuses in mains connection ... 6 A (3  $\phi$ )

#### TYPICAL INSTRUCTION EXECUTION TIMES

Operation Times	Addition	Multiplication	Division
fixed point	49 $\mu$ S	180 $\mu$ S	267 $\mu$ S
floating point	93 $\mu$ S	170 $\mu$ S	220 $\mu$ S

#### ENVIRONMENT

**Air Temperature:** plenum or ambient 18-23° C  
**Cooling Air:** plenum or ambient 600 m<sup>3</sup>/h  
**Relative Humidity:** 40-70 %



# GIER

ELECTRONICS

**GIER ELECTRONICS G. m. b. H.**  
3000 HANNOVER - SCHILLERSTRASSE 33  
GERMANY

**ING. UGO DE LORENZO & C.**  
VIA BELLARMINO 29  
MILAN - ITALY

**A/S REGNECENTRALEN**  
SALES DIVISION

**A/S SCANIPS**  
SORGENFRIGATE 11  
OSLO - NORWAY

FALKONERALLÉ 1  
COPENHAGEN F - DENMARK  
PHONE: FA 9911  
CABLES: RIALTOCENTRAL  
TELEX: 5468