Licensing, designing and reverse engineering computers in Hungary from the 1950s to the 1970s

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PROGRAMme Workshop, Lille, June 2019
Outline

- M-3, the first computer in Hungary
- Physics Research and PDP
- EMG 830, an original
- From CII to Ryad
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the attempt fails due to lack of experience
M-3

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it runs reliably from January 1959

(550 hours/month from 1960, 3 shifts/day)
M-3s around the world

Budapest, Minsk (26 units), Moscow, Tallin, Yerevan
not compatible with each other
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it becomes China’s first computer

from 1961, under the name DJS-1 (or 103),
36 units were built in Beijing
The impact of the M-3:
at the Academy of Sciences

CRG is reorganized as the Computer Centre
with an Economics and a Mathematics department

“the Academy's computing needs are satisfied for the next 5 years”
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The impact of the M-3: public perception

News article from January 1959:
30 operations per second did not sound impressive, but 100,000 per hour did
The impact of the M-3: public perception

1960 Budapest Industrial Fair
The impact of the M-3: public perception

1960 Budapest Industrial Fair

to engage the public:

a program “remembers”
your “secret number”
The impact of the M-3:
in education

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37 lectures in the series delivered to an audience of 10-20
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had to be repeated 3-4 times due to demand
about 50 participants in total
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in 1964 the M-3 is sold to Szeged, the first computer outside Budapest (in operation until 1968)
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The Central Physics Research Institute

founded in 1950
main focus: nuclear physics

Research Nuclear-Reactor, 1959
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Research Nuclear-Reactor, today(ish)
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Hungarian “speciality” within the CEMA

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TPA 1001 (1968)
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TPA 1001 Software

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serious software development by the Institute later
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= Stored Program Analyzer
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in total about 600 built and sold
TPA 70/25 (1970-1972)

entirely own design

70-80 built and sold (mostly for special purposes)
Question in the mid-1970s:
keep developing own designs OR clone PDP-11 series?
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(how to grant scientific degrees based on cloning?)
The use of TPA machines compatible with real-time CAMAC peripherals (Computer-Aided Measurement And Control)
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in total about 1600 TPA-s built between 1968 and 1990 (even though they were relatively expensive)
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EMG 830
DIGITÁLIS ELEKTRONIKUS SZÁMÍTÓGÉP

Az EMG 830 digitális elektronikus számítógép bár műszaki felépítésében a második generációs gépek csoportjába tartozik, szervezésében számos harmadik generációs tulajdonsággal rendelkezik. Ezek a tulajdonságok lehetőséget nyújtanak a felhasználónak arra, hogy a számítógépet optimálisan üzemeltesse mind az adatfeldolgozás, mind a tudományos-műszaki számítások, mind a folyamatirányítás területén.

Programkönyvtárának állandó fejlesztése az üzembe helyezés után is újabb és újabb lehetőségekkel bővíti a felhasználhstóságot.

A programozás SIMPLE assembler, EMG AUTOKÓD szimbolikus programnyelveken, a későbbiek során ALGOL és FORTRAN nyelven is végezhető.

A számítógép szervezése és viszonylag gyors működése, lehetővé teszi a gépen a multiprogramozást, és a folyamatirányításban nélkülözhetetlen valós idejű (real time) program futtatást is.

Programkönyvtára tartalmazza
— a különböző szubrutinokat (periériakezelés, rendező program, elemi függvények lebegővesszős és dupla szőhosszúságú műveletel stb.)
— hibakereső tesztprogramokat
— műszaki és ügyviteli programokat, valamint
— fenti programnyelvek fordítóprogramjait.

A számítógép felhasználását nagyban elősegíti, hogy az érdeklődőkkel való közvetlen kapcsolat útján az Elektronikus Mérőkészülékek Gyára Számítógép-értékesítési Főosztálya készséggel áll a felhasználó rendelkezésére.

A géppel való megismerkedés céljából az EMG különböző szintű tanfolyamokat rendez programozók, operátorok részére.
EMG 830
=Factory for Electronic Measuring Instruments

independently developed and designed computer family (4 sizes) between 1964 and 1968

head of design: Árpád Klatsmányi

architecture is typified by the modularity and the buses
designed with “business” applications in mind

SIMPLE assembly language
Autocode and later FORTRAN and COBOL compilers
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SIMPLE assembly language
Autocode and later FORTRAN and COBOL compilers

leads to the foundation of INFELOR
the first Hungarian "software house"
in total about 15 of them were produced between 1968-1970
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new model with integrated circuits, developed in 1972-1974

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still, EMG was considered as the company that manufactures computers in Hungary
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Looking for a License (1967-1969)

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Early 1968: meetings begin between the newly established French CII\(^1\) and NCTD and EMG about the license of the CII 10010 computer.

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\(^1\)Compagnie International pour l’Informatique.
• Kosygin’s letter to Comecon countries, early 1968.
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• Intergovernmental Commission on Computing Machinery (ICCM) is founded. It is independent from the Comecon bureaucracy.
Ryad

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In Hungary:

- NCTD founds SZTB, Interdepartmental Committee on Computing Technology.

- SZTB represents Hungary in ICCM.

- SZTB initiates and directs the Central Development Program for Computing Technology in Hungary.
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Hungary is allowed to build the smallest computer.

EMG buys the license on 24th of May 1969.
Ryad in Hungary

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The goal is to get the CII 10010 based computer accepted as a member of Ryad.

(i.e. a legal, license based computer instead of an IBM clone)
Ryad in Hungary

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  - imports, distributes and maintains the other Ryad computers
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- **SZÁMOK**, Computer Education Centre:
  - instructors trained in Frankfurt in 1970 (6-9 months) in a CDI² program
  - around 7000 people attend courses annually
  - 46,000 textbooks (12-14 titles) published annually

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²Control Data Institute, a vocational school created by Control Data Corporation (CDC).
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• 40% of the CII license was covered by software and hardware development (of CII 10010 and Mitra 15).
Manufacturing the R10

CII Mitra 15

R 10 (VT 1010)
Manufacturing the R10

• In 1970 employees of EMG were trained at CII in France.

• The first computers were assembled, using CII parts, under the EMG code 810 (based on CII 10010).

• By the end of 1970 EMG was ready to manufacture the 810 and produced a trial series that passed the quality control of CII.
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- Then suddenly the license was passed over to VIDEOTON on 4th of December 1970 by a governmental decision. (sources conflict on the reason)

- Árpád Klatsmányi, head of the computer development at EMG got dismissed.

- The computer development program at EMG shrunk and was terminated a couple years later.
VIDEOTON

- no experience with computer technologies before 1968
- main premises in Székesfehérvár
- VIDEOTON Pilot Plant 1969-1970
- VIFI, VIDEOTON Development Institute
  - founded in 1971 in Budapest
  - by incorporating EFKI, Electronic and Precision Mechanical Research Institute into VIDEOTON
- VIDEOTON Computer Factory is founded in 1971
VIDEOTON
R10

• VT 1010B based on CII 10010 (same as EMG 810), 1971.

• R10 = VT 1010 = EC 1010 = ES 1010 based on Mitra 15\(^3\) introduced in 1972 at Hungexpo, Budapest International Fair.

(The Mitra 15 was introduced at the Sicob\(^4\) in 1971 with the presence and assistance of SZKI employees.)

• The operating system is developed by INFELOR, called VIDOS (VIDEOTON Operating System).

• (The 2nd series of Ryad were IBM 370 clones, the Hungarian R15 computer was an IBM 370/115-125 clone.)

\(^3\)New version of CII 10010, originally called as 10010A.
\(^4\)Salon des industries et du commerce de bureau
VIDEOTON Peripherals

• VT 340 is an alphanumerical display (16 \times 80) developed by VIDEOTON independently, introduced in 1971.

• 600 were sold in 1973.

• From 1971-1989 VIDEOTON sold \sim 90.000 displays, 40\% on USD ($) based markets.
VIDEOTON Peripherals

VIDEOTON lineprinters:

based on Data Products license:\(^5\)

- VT 24000 from 1972, 80 characters/line, 1110 lines/min
- VT 25000 from 1974, 132 characters/line, 600 lines/min

(ES 7184/80 and 132)

independent, own development:

- VT 27000 from 1976, 136 characters/line, 900 lines/min

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\(^5\)Again, legal, Western license.
VIDEOTON Offices

After sale offices outside Hungary (established 1972-1975):

- Moscow, Kiev, Minsk (Soviet Union)
- Prague, Bratislava (Czechoslovakia)
- Warsaw (Poland)
- East Berlin, Erfurt (East Germany)
- Sofia (Bulgaria)
- Belgrade, Zagreb (Yugoslavia)
- Helsinki (Finland)
Standard R10 setting
Standard R10 setting

Console typewriter, ES-7070, Czechoslovakia
Magnetic tape computer data storage, ES-5052, Bulgaria
and ES-5060 Hungary
Changable magnetic disc driver, ES-5511, Soviet Union
Tape drive, ES-5010, Soviet Union
Magnetic tape storage, VT-42500, Hungary
Punch card reader, ES-6022 = VT CR600, Hungary
Punch tape reader, CT-2000, Poland
Paper tape puncher, ES-7191 = MOM PerfoMOM, Hungary
Paper tape puncher, ES-7122, Poland
Lineprinter, ES-7184/80 and 132 (characters per line) =
= VT 24000 and 27000, Hungary
Alphanumeric display, ES-7168 = VT 340, Hungary

\(^{6}\text{ES = EC in coding of Ryaad computers. VT is the code of VIDEOTON products.}\)
Physics RI vs Ryad through the 1980s

TPA series had a larger impact on the programming community in Hungary (though relatively expensive)
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Ryad was seen internationally as a failure (and it was), however it “created” the state backing, created institutional infrastructure and industry in Hungary.
Computer History Museum in Szeged, Hungary
Thank You for Your Attention!