Hungary's Early Years in the Ryad

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Ryad

- By the mid 1960s Eastern European countries lagged 5-10 years behind the West in computer technologies.
- In 1968, Alexei Kosygin[1] initiated a cooperation among the Comecon[2] countries to develop a Unified System of Electronic Computers (Ryad, ES or EC).
- Upward-compatible series of computers by cloning of IBM's 360 system (introduced in 1964).
- Different countries develop different members of the series and peripherals.
- Hungary makes the smallest member of the series, the R10, which *did not* have a corresponding IBM 360 computer.

[1] Chairman of the Council of Ministers of the Soviet Union

[2] Council for Mutual Economic Assistance (also CEMA or CMEA)

Outline

- 2nd generation computers (developed) in Hungary before Ryad:
  - TPA 1001
  - EMG 830

- Economic and historical context.

- Institutions of Ryad in Hungary.

- SZKI (Institute for the Coordination of Computing Technology).

- Manufacturing the R10.

TPA 1001
KFKI (Central Research Institute for Physics)

TPA 1001

- TPA = Stored Program Analyser (Tárolt Programú Analizátor).
- Clone of DEC PDP-8 mini computer. (Compatible with it)
- Developed in 1966-1968 at KFKI[3] under the direction of Zsolt Náray.
- KFKI was not allowed to purchase one as a consequence of the COCOM[4] embargo.
- DEC published and made its Small Computer Handbook available for free.
- Different versions in production until 1990. (TPA 70 independent development; TPA 1100s are PDP-11 and Vax 11 clones, ~600 TPA 1001, ~80 TPA 70, ~800 TPA 1100s were sold)

[3]Central Research Institute for Physics, Központi Fizikai Kutatóintézet.

[4]Coordinating Committee for Multilateral Export Controls.

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 felhasználhatóságot.

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 (perifériakezelés, rendező program, elemi függvények lebegővesszős és dupla szóhosszúságú műveletei 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

- Independently developed and designed computer family.
- At EMG[5] in 1964-1968 under the direction of Árpád Klatsmányi.
- Its architecture is typified by the modularity and the buses.
- 25000 operations/second, maximum main memory capacity: 32 Kword (21 or 24 bit/word, depending on the model).
- SIMPLE assembly language, Autocode and later FORTRAN and COBOL compilers. (ALGOL planned but never realized)
- ~15 of them were produced between 1968-1970.
- EMG 840 with integrated circuits, developed in 1972-1974. (Only one ended up in commercial use)

[5] Factory for Electronic Measuring Instruments, Elektronikus Mérőkészülékek Gyára.

Hostile atmosphere

- Stalinist SU was hostile towards cybernetics and computers:
  "giant-scale campaign of mass delusion of ordinary people"
  pseudo-science
  whim of fashion of the West

- The attitude in Hungary in the 1960s was not as drastic, but:

  -neither TPA 1001[6] nor EMG 830[7] was called a computer

  -naming the computer society (founded in 1968) after von Neumann was suspicious

  -widely believed on the governmental level that computers cannot be profitable in the civil and economic sphere.

[6]Stored program analyser.

[7]Process controlling module system.

New Economic Mechanism

- Economic reform introduced on January 1, 1968.
- A limited, artificial internal market is introduced.
- Larger freedom is given to enterprises and the 'command' or 'planned economy' is relaxed to a large extent.
- "[E]nterprises were left to their own devices in deciding what products to manufacture, consistent with their market position and demand."
- "[T]he character of state ownership was not affected at all: top managers of state enterprises continued to be officials of the state, appointed and dismissed by the ministries or local authorities."
- Leads to an "interest in numbers" (demand for computers).

Looking for a License (1967-1968)

- In the second half of the 1960s the leaders of OMFB, National Committee of Technological Development[8] were aware that computers will play an increasing role in society.
- In 1967-1968 OMFB decided to acquire a computer license and cautiously started to look for a partner among Western countries: Great-Britain, France, West Germany, Italy, Sweden, and Denmark
- Early 1968: meetings begin between the French Délégué à l'Informatique and OMFB and the newly established CII[9] and EMG about the license of the CII 10010 computer (and its updates).
- Lengthy vacillation on governmental level, due to the general aversion towards computers. As a consequence, the license was not signed in 1968.

[8] Árpád Kiss chairman (with ministerial rank) and János Sebestyén vice chairman.

[9] Compagnie International pour l'Informatique.

Ryad - Unified System

ES 1035

Ryad

- Kosygin's letter to Comecon countries, early 1968.
- Intergovernmental Commission on Computing Machinery (ICCM) is founded. It is independent from the Comecon bureaucracy.

In Hungary:

- OMFB[10] founds SZTB, Interdepartmental Committee on Computing Technology.
- SZTB represents Hungary in ICCM.
- SZTB initiates and directs the Central Development Program for Computing Technology (SZKFP).

[10] National Committee of Technological Development.

Ryad in Hungary

- Hungary wants to build the smallest computer, as it has experience with:
  -PDP 8/TPA 1001, mini computer
  -EMG 830, small to mid size computer
- Negotiations about CII 10010 mini computer already.
- Hungary is allowed to build the smallest computer.
- EMG buys the license on 24th of May 1969.
- 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

- SZKI, Institute for the Coordination of Computing Technology is founded late 1968. The main institution of Ryad in Hungary.
- NOTO-OSZV,[11] National Enterprise of Computer Technology, founded in 1973.
  -imports, distributes and maintains the other Ryad computers
- SZÁMOK,[12] Computer Education Centre:
  -instructors trained in Frankfurt in 1970 (6-9 months) in a CDI[13] program
  -around 7000 people attend courses annually
  -46.000 textbooks (12-14 titles) published annually
- INFELOR: operation systems; MOM:[14] peripherals

[11] Országos Számítógéptechnikai Vállalat.
[12] Számítástechnikai Oktató Központ
[13] Control Data Institute, a vocational school created by Control Data Corporation (CDC).
[14] Hungarian Optical Works.

SZKI[15]

- Náray, former head of the TPA program at KFKI becomes the CEO of SZKI.
- Náray represents Hungary in the Council of Chief Designers.
- Although the primary goal was developing and coordinating the production of the R10, the SZKI attended to research and innovation tasks as well.
- 40% of the CII license was covered by software and hardware development (of CII 10010 and Mitra 15).
- SZKI has to finance itself from 1969. (effect of NEM)
- Náray (surprisingly) achieves that SZKI can keep 50% of its Western currency income. (effect of NEM)

[15]Institute for the Coordination of Computing Technology.

SZKI[15]

- Units of the institute are called laboratories:
  - -Hardware Laboratory
  - -Hardware Systems Engineering Laboratory
  - -Computer Laboratory (Computer Center)
    - -Software Application Laboratory
    - -Software Application Development Laboratory
  - -Design Automatization Laboratory
  - -Software Systems Engineering Laboratory
  - -Mathematical Laboratory
  - -Theoretical Laboratory
- Laboratories are almost independent, have different projects.
- Laboratories have their on budget and have to finance themselves.

[15] Institute for the Coordination of Computing Technology.

SZKI[15]

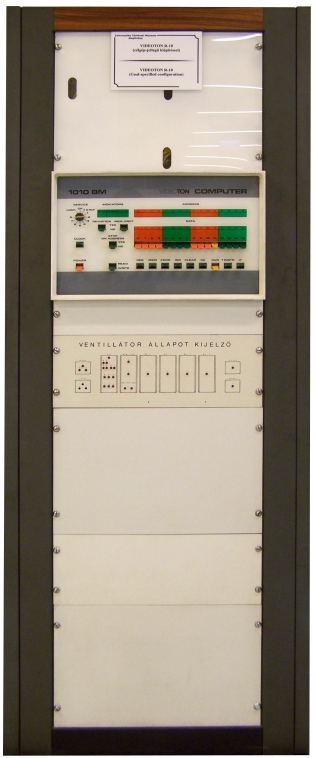
- Computer Center buys a Siemens 4004/45 computer in 1969, it was partially payed for in software developing commissions. This lead to a long-term cooperation between Siemens and SZKI as a software developer.
- Work for Ericsson, Messerschmidt, Kienzle.
- ~1974-75 SZKI had a Siemens 4004/150, which was modified to a 4004/151 to test the new Siemens time-sharing system for the first time (first time-sharing in Hungary as well).
- From late 1970s, image processing at Mathematical Laboratory (license plate recognition, space program etc).
- Automatization of the main East-West railway line of Hungary and carriage administration.

[15] Institute for the Coordination of Computing Technology.

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.
- 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[16] introduced in 1972 at Hungexpo, Budapest International Fair.

  (The Mitra 15 was introduced at the Sicob[17] 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.)

[16] New version of CII 10010, originally called as 10010A.

[17] Salon des industries et du commerce de bureau

VIDEOTON Peripherals

VT 340

VIDEOTON Peripherals

- VT 340 is an alphanumerical display (16×80) developed by VIDEOTON independently, introduced in 1971.
- 600 were sold in 1973.
- From 1971-1989 VIDEOTON sold ~90.000 displays, 40% on USD ($) based markets.

VIDEOTON Peripherals

VIDEOTON lineprinters:

based on Data Products license:[18]

- 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

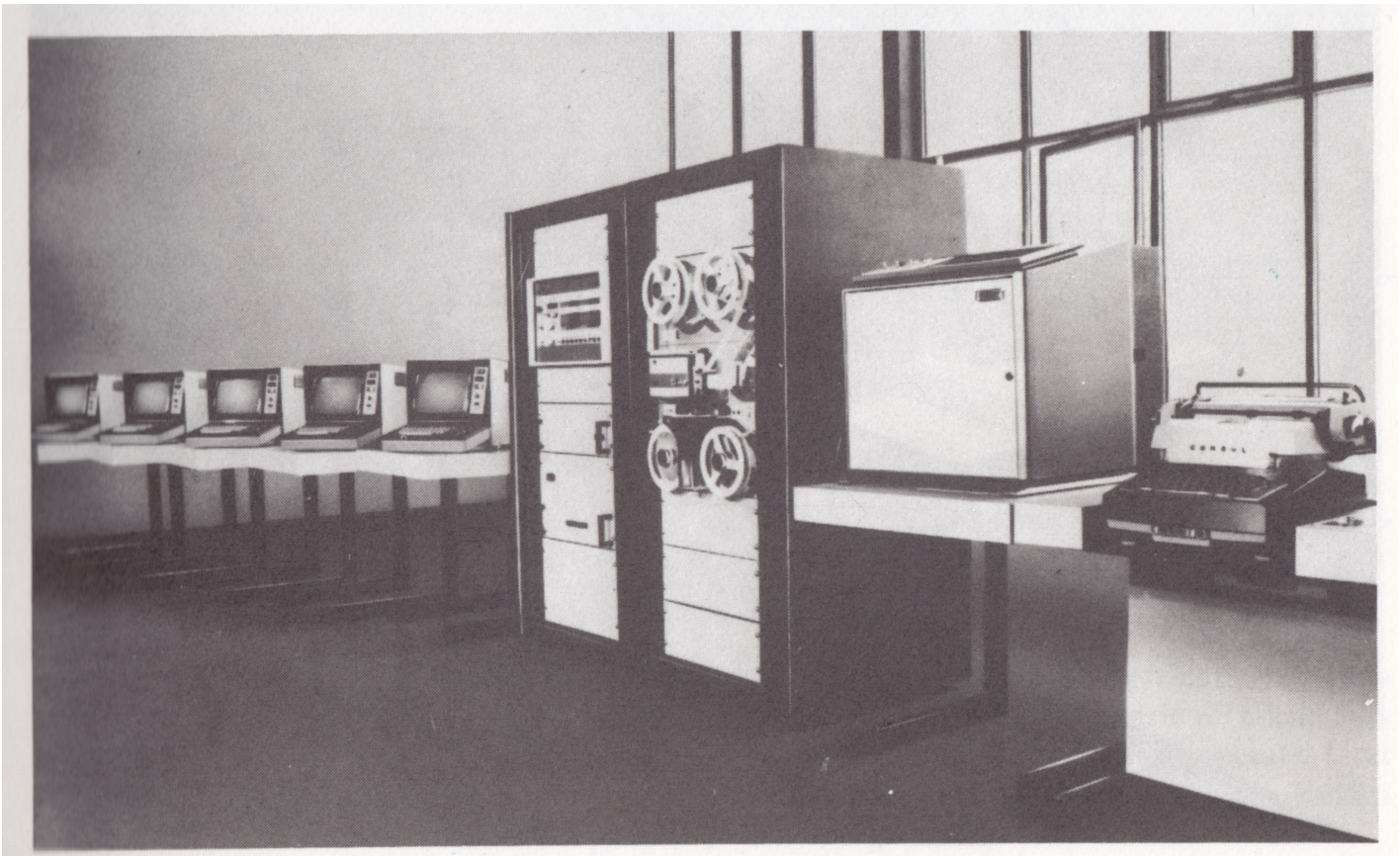
[18] Again, legal, Western license.

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[19]

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

[19] ES = EC in coding of Ryad computers. VT is the code of VIDEOTON products.

Thank You for Your Attention!