AD-A046 864 FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO F/G 9/2
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FOREIGN TECHNOLOGY DIVISION

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by

Wojciech Lipko

EDITED TRANSLATION

FTD-ID(RS)T-1052-77 7 July 1977

MICROFICHE NR: FTD-77-C-000812

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English pages: 17

Source: Elektroniczna Technika Obliczeniowa Nowosci, Vol. 15, Nr. 1/2, 1976, pp. 22-27

Country of origin: Poland
Translated by: Linguistic Systems, Inc.
F33657-76-D-0389
Andrew Reymont
Requester: FTD/ETCK
Approved for public release; distribution unlimited.

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ODRA AND RIAD PILOT COMPUTER SYSTEMS

Much has been written, and far more said about compu-
-ter systems in recent years. Under discussion were huge tech-
-nical possibilities of the computers as well as their prac-
-tical application in various domains of the national economy.
Theoretically, almost everything is already known about what
a computer system is.

The present article will familiarise the reader with what hap-
-pens in the MERA-ELWRO* Code Machines Research and Develop-
-ment Center* before an agreement is reached at the MERA-EL-
-WRO - SERVICE General Supplies Bureau about the sale of the
ODRA 1305, ODRA 1325 or R-32 computer systems in the X confi-
-guration.

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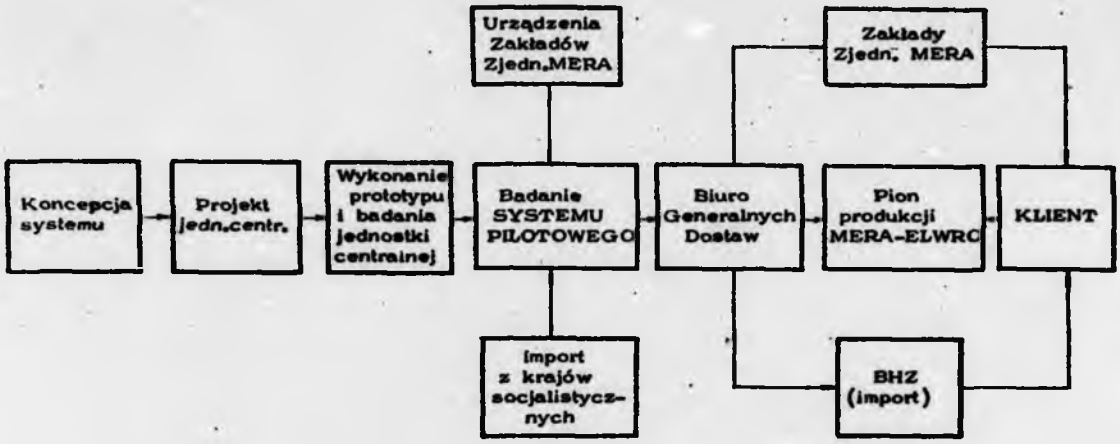
*At present: The MERA-ELWRO Research and Development Center
for Computer Automatization and Surveying Sys-
-tems

Within the compass of recent years there were many changes in the ELWRO computer systems constructors' workshop. These chan-
-ges came from the application of a new unit base as well as the introduction of a computer-assisted designing. First of all, however, it was the approach to the subject of the cons-
-truction that underwent major changes.

Everyone realizes that the work on respective components of the system (central unit, peripheral devices, external, tape and discus memories, remote operation appliances) can be con-
sidered completed when the equipment reaches a degree of per-
-formance such as to accept technical, system and utility pro-
-gramming.

The changes in the approach to the subject of the construction occurred in recent years when it was possible for the ELWRO-
-built central units and peripheral devices to be used in the construction of the computer systems in which there were prob-
-lems exceeding the sphere of activity of the designing cells.

The computer system creation process is illustrated on Fig.1.



Rys. 1. Schemat blokowy prac od koncepcji do przekazania systemu do klienta

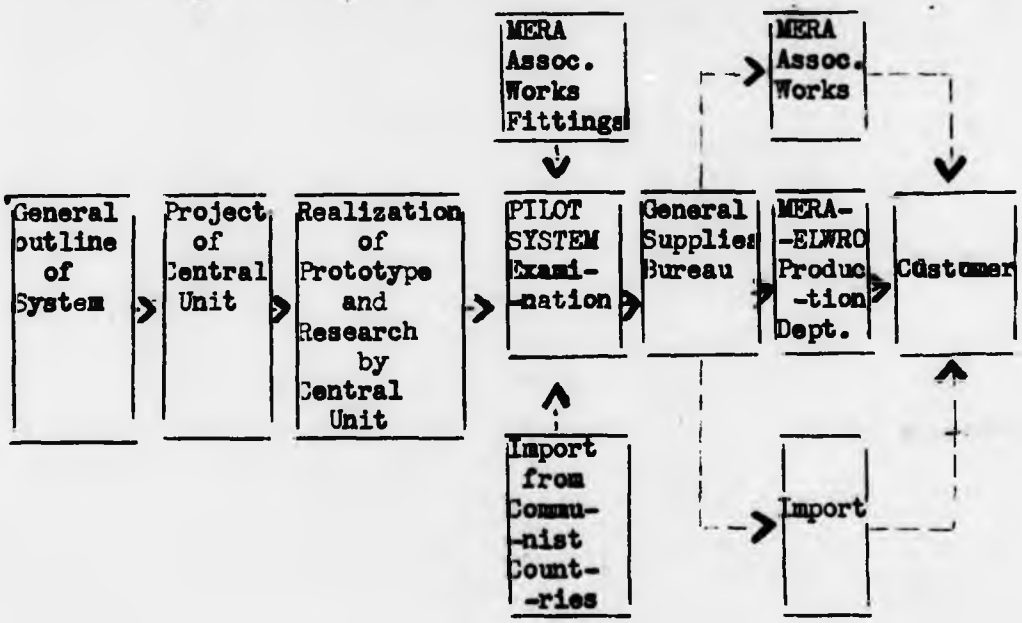


Fig. 1. Bloc scheme of work from outline to delivery of system to the customer

All the problems that have arisen must be defined and solved on the pilot computer systems before directing each element of the system to the production. This way, each one of the ele--ments being put into service, before being offered to the cos--tumer through the MERA-ELWRO-SERVICE General Supplies Bureau, undergoes a process of initiation and examination in the pilot computer system at the MERA-ELWRO Research and Development Center.

What is the pilot computer system ?

When a new model of the central unit is realized and equipped with a minimal set of external fittings, a configuration of the outfit comes to existence, which is base for a new series of com--puters. After the initiation and examination of the base confi--guration, some new elements of the system are examined and put into service, i.e. additional blocks of the operative memory, new input/output appliances, external memories, screen monitors and a teleprocessing outfit.

The base configuration, equipped with the maximum operative me--mory at a particular stage of the construction development, and various types of appliances together with the tests and the ope--ration system, are called a pilot computer system. This system is of assistance to the computer systems constructors who, along

with the test and operation systems experts working on each de-
-vice, remove all the irregularities in the work of the system,
thus bringing it to a full utility performance. The correctness
of all the jobs performed is shown in a documentary evidence pro-
-vided by the quality control specialists who participate in the
last phase of the introduction procedure. A positive research eva-
-luation makes it possible for the technologists to be given a con-
-struction working plan in order to start the production.

Purposes of the ODRA 1305 and 1325 pilot computer systems

The series of the ODRA 1300 computers corresponds to the series of ICL 1900 code machines, accepts a full list of orders of the ICL 1900 series and maintains the standard of connections between the central unit and the appliances, equal to the ICL standard.

The introduction stages of the pilot systems:

I - Otaining the acceptation of a technical and system program-
-ming of the ICL 1900 series through the ODRA 1300 local configu-
-ration in which all peripheral devices and external memories
were manufactured in Poland.

II- Extension of the local configuration developped in the first
stage by adding imported local appliances, for example discus
memories, local screen monitors and the ICL teleprocessing
outfit based on the ICL 7930 scanner as well as on the 7903
ICL 7903.

communication processor.
A satisfactory completion of the work has fully testified to the technical and program accordance of the ICL 1900 series with the ODRA 1300 series.

The users of the ODRA 1305 computers have obtained an equipment which can work along with the GEORGE 3 computer system, which has created the practical conditions for utilizing the high parameters and technical values of the ODRA 1305 central unit.

III - Creation of a system which would meet all the application requirements described in the second stage, and which would be based entirely on the domestic equipment and that from the communist countries. This refers predominatly to the screen monitors and teleprocessing outfit. It is the intention of the MERA-ELWRO works to introduce as soon as possible the MERA-LEZAB local screen monitors and the MERA-BLONIE final remote operation devices into the pilot systems. The license purchasing by the MERA made it possible for the ODRA 1305 and 1325 systems, being already in the customers' possession, to be supplemented with the appliances estending the performance range of the equipment that had previously been installed.

Purposes of the R-32 and EC-1032 pilot computer systems

The first Polish computer of the IRAD series, R-32, preserves a uniform logical architecture with the Uniform System machines developed within the C.O.M.E.C.O.N.. In this connection, there are possibilitied of creating the R-32 computer systems which would make use of

what has already been done in the field of ex-
-ternal appliances and discus memories in all communist countries.
This situation will be able to meet the user's needs as far as the
R-32 systems are concerned.

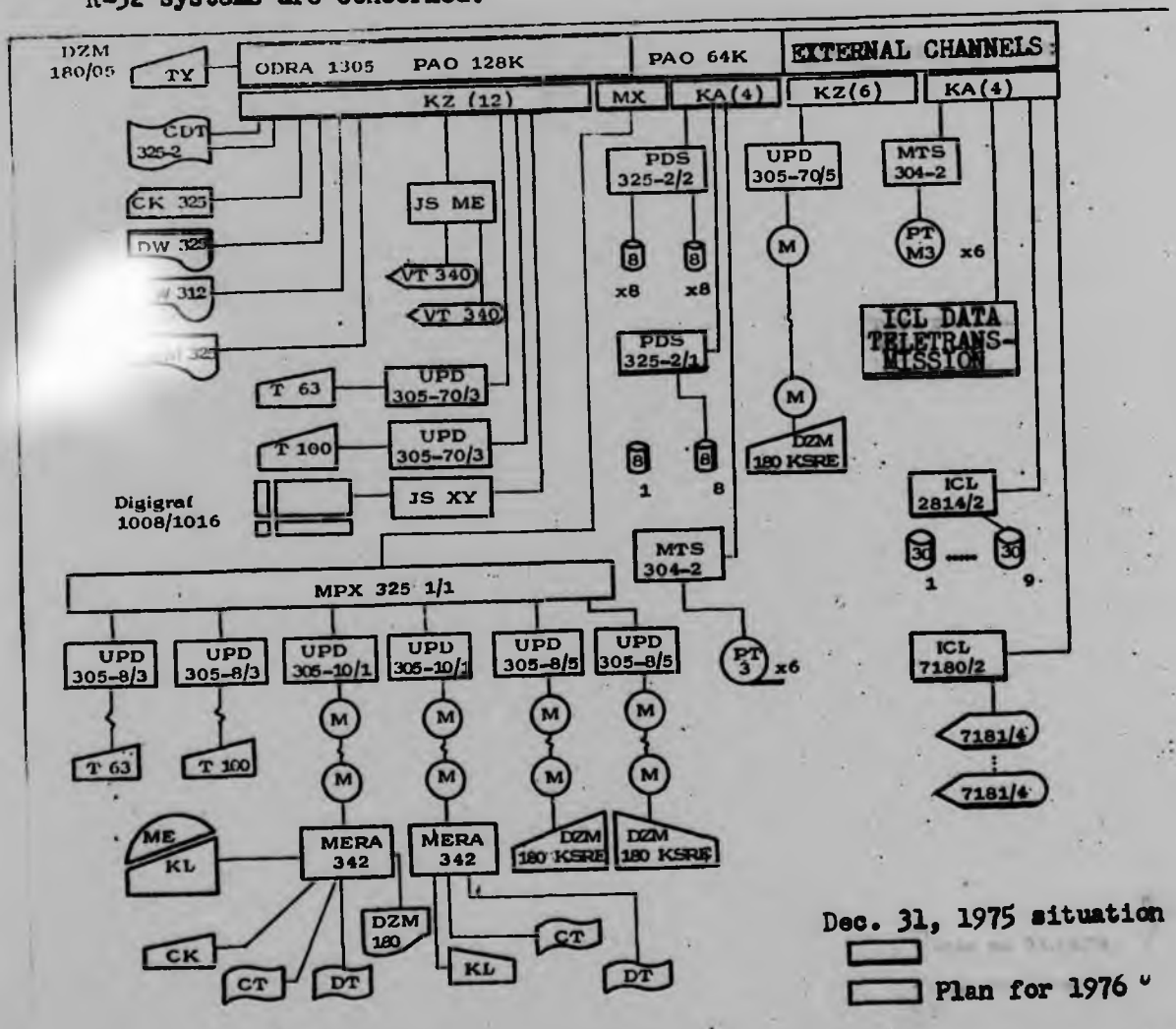


Fig. 2. The ODRA 1305 pilot computer system

The ODRA 1305 System is being developped in the following directions:

- Extension of the ODRA 1305 central unit in the operation memory up to 192k words, additional external channels and operator's con-sole, based on the DZM-180 sign-mosaic press mechanism;

- Setting up a synergic action of the ODRA 1305 central unit with new peripheral devices:
  - reader - CDT-325-2 paper tape punching press;
  - CK-325 card reader;
  - DW-325, DW-312 line presses;
  - DZM-325 mosaic press;
  - X-Y autographic recorder with the DIGIGRAF 1008/1016 mechanism;

- Setting up a synergy between The ODRA 1305 controlling unit and ex-ternal memories:
  - PT-3M tape memories with MTS-304-2 controlling unit;
  -8 ml. EC 5052 discus memories with the PDS-325-2 controlling unit;
  -30 ml, ICL discus memories with the ICL 2814/2 controlling unit;

- Setting up a synergy between the ODRA 1305 and local screen moni-tors:
  - Hungarian VT-340 screen monitors with the MERA-ELZAB-manufactu-red controlling unit;
  -ICL 7181/4 screen monitors with the ICL 7180/2 controlling unit;

- Setting up a synergic action of the remote operation devices with the ODRA 1305 central unit;

- T 63 and T 100 teletypes through UPD 305-70/3 or through MPX-325 multiplexer and UPD 305-8/3;
- DZM-180 KSRE sign-mosaic press with keyboard through UPD305-70/5 or through MPX-325 multiplexer and UPD 305 8/5;
- remote receiver's point with MERA 342 through MPX-325 and UPD 305-10/1;
- ICL data teletransmission devices;

The above-mentioned works are carried out according to the plan provided for the MERA-ELWRO Research Center. For clarity, the sta--te of tasks accomplished up to Dec. 31, 1975, and a plan for 1976 have been given. This means a successive work on the introduction subjects throughout the year 1976.

see Fig. 3 on next page

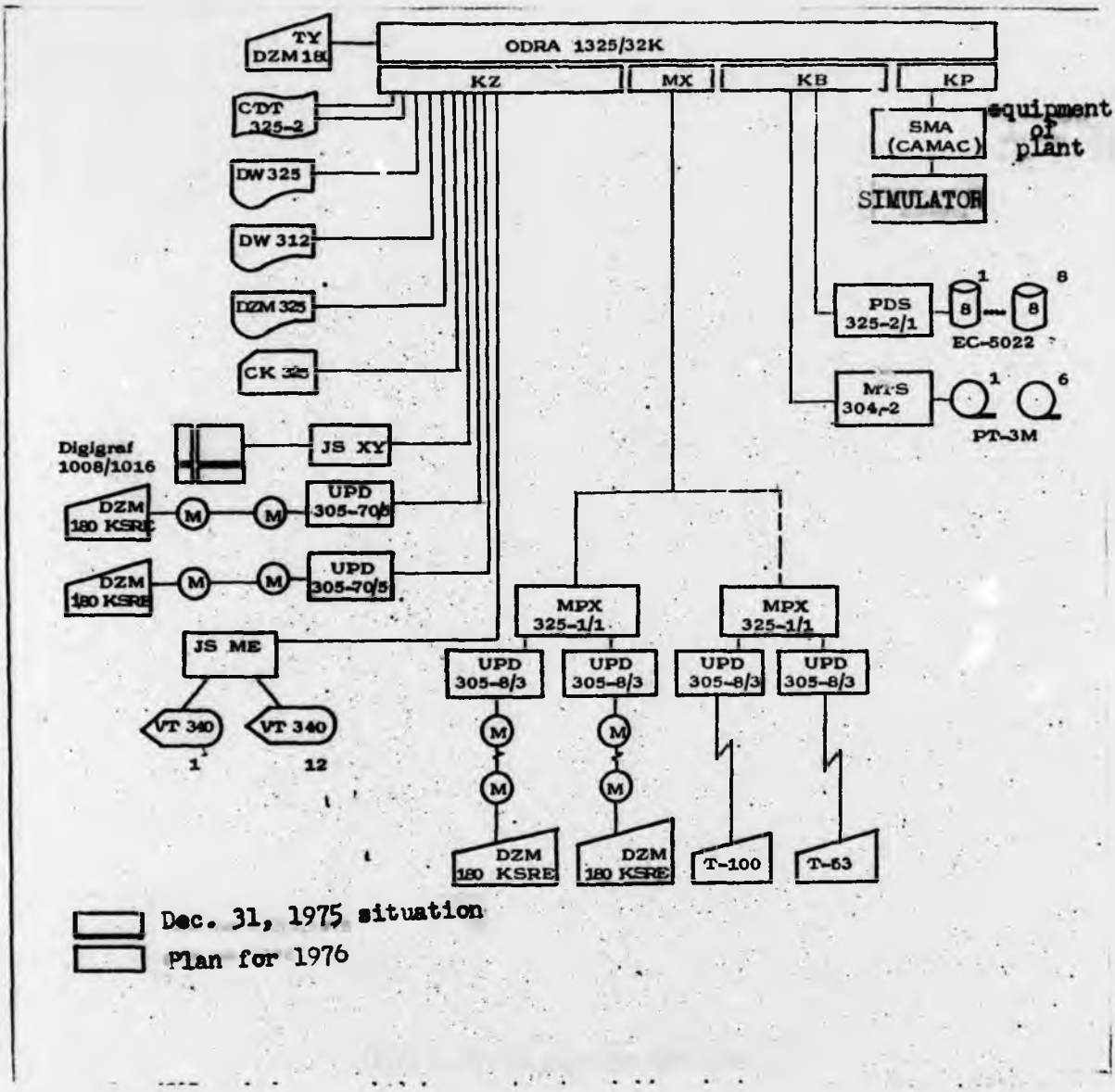


Fig. 3 . The ODRA 1325 pilot system

The ODRA 1325 system will be developped in the following directions:

- Replacement of the monitor console through substitution of the DZM-180 sign-mosaic press mechanism and keyboard for the FACIT li--cence mechanism applied up to the present;

- Setting up a synergy between the ODRA 1325 central unit and new peripheral devices which are:
  - reader - CDT-325-2 paper tape punching press;
  - DW-325 line press;
  - DW-312 line press;
  - DZM-325 mosaic press;
  - CK-325 card reader;
  - X-Y autographic recorder with the DIGIGRAF 1008/1016 mechanism;
- Setting up a synergic action of the ODRA 1325 central unit with external memories:
  - PT-3M tape memories together with MTS-304-2 controlling unit;
  - 8 ml. EC 5052 discus memories with PDS-325-2 controlling unit;
- Setting up a synergy between the ODRA 1305 and the local screen monitors:
  -Hungarian VT-340 screen monitors and the MERA-ELZAB-manufactured controlling unit;
- Setting up a synergy between the simulators of the units through an industrial channel and SMA;
- Setting up a synergy between remote operation devices and the ODRA 1325 central unit:
  -KSRE sign-mosaic presses with keyboard through UPD-305-70/5 or through the multiplexer and UPD-305-8/5;
  - T-100 and T-63 teletypes through the multiplexer and UPD 305-8/3;

The work on the R-32 pilot computer system introduction proceeds in the following three directions:

- Operative memory development;
- Extension of the system through the addition of the local devices and external memories;
- Extension of the system through adding a teleprocessing outfit;

At every stage, all the necessary program work is carried out on diagnostic tests and operation systems.
The operation memory is developped through joining additional memory cases, designed and manufactured by MERA-ELWRO.
Following a technical assembly and testing, a performance of the whole pilot system in full configuration is examined under the control of the operation systems by setting tasks to be solved from the sphere of the utility programming.

The completing of the pilot system is made possible by the supply of local devices and external memories from the MERA Association Works, for example BLONIE , ELZAB and the producers from the co-operating communist countries. Thus:

- 8×10^6 bayt and 30×10^6 bayt discus memories are imported from Bulgaria;
- card appliances - readers and card perforating machines are imported from Csechoslovakia;

- line presses and monitor consoles, based on the DZM-180 mechanism, are manufactured by MERA-BLONIE ;
- PT-3M tape memories are made by MERAMAT ;
- readers and paper tape perforating appliances as well as screen monitors are produced by MERA-ELZAB ;

The equipment being imported to the Research and Development Center is put into service by groups of specialists, who solve all the prob--lems on the R-32 pilot system, bringing the system to a full utili--ty performance. As a result of this work, possible suggestions ari--se as to changes in the construction of the central unit as well as other mechanisms. The plans for the nearest future provide for the installation of the teleprocessing outfit within the pilot system.

Organization of the pilot computer systems introduction work

Under the control of the Assistant Director of the MERA- ELWRO Re--search Center for Computer SYstems and Programming Development there is a section which runs the Pilot Computer Systems Initiation and Introduction Laboratory, responsible for the realization of the new introductions carried on with the use of the ODRA 1300 and R-32 pilot systems. At the same time, as far as The R-32 is concerned, the Lab functions as the Electronic Code Machines Uniform System Means Research Center, according to the Uniform System Construc--tor's General Council.

The Initiation Lab experts, when concentrating on a new subject, examine the merits and co-ordinate the activities of the working staff invited to carry the realization of the subject. The staff consists of the specialists from different MERA-ELWRO Research Center divisions. If the devices, which are to be put into service, come from other producers, their constructors are also included into co-operation. The working staff is composed of electronics specialists, logicians and planners, who are taking care of the technical and system programming. The working time of a particular group of experts depends on the degree of complexity of the subject and lasts from one week to several months. A collective work requires solving essentially difficult problems, which makes the whole task interesting. Each new subject provides new forms of an effective co-operation between the specialists of different fields of the computer science. Regardless of the organizational affiliations, all scientists are joined in a common effort aiming at a construction of the Pilot ComputerSystem, which would create possibilities of building utility computer systems designed for specific purposes.

The ODRA and RIAD computer systems in the year 1976

Fig. 1,2 and 3 show the equipment configurations realised in 1976. At present, all the subjects have been initiated, and the work on

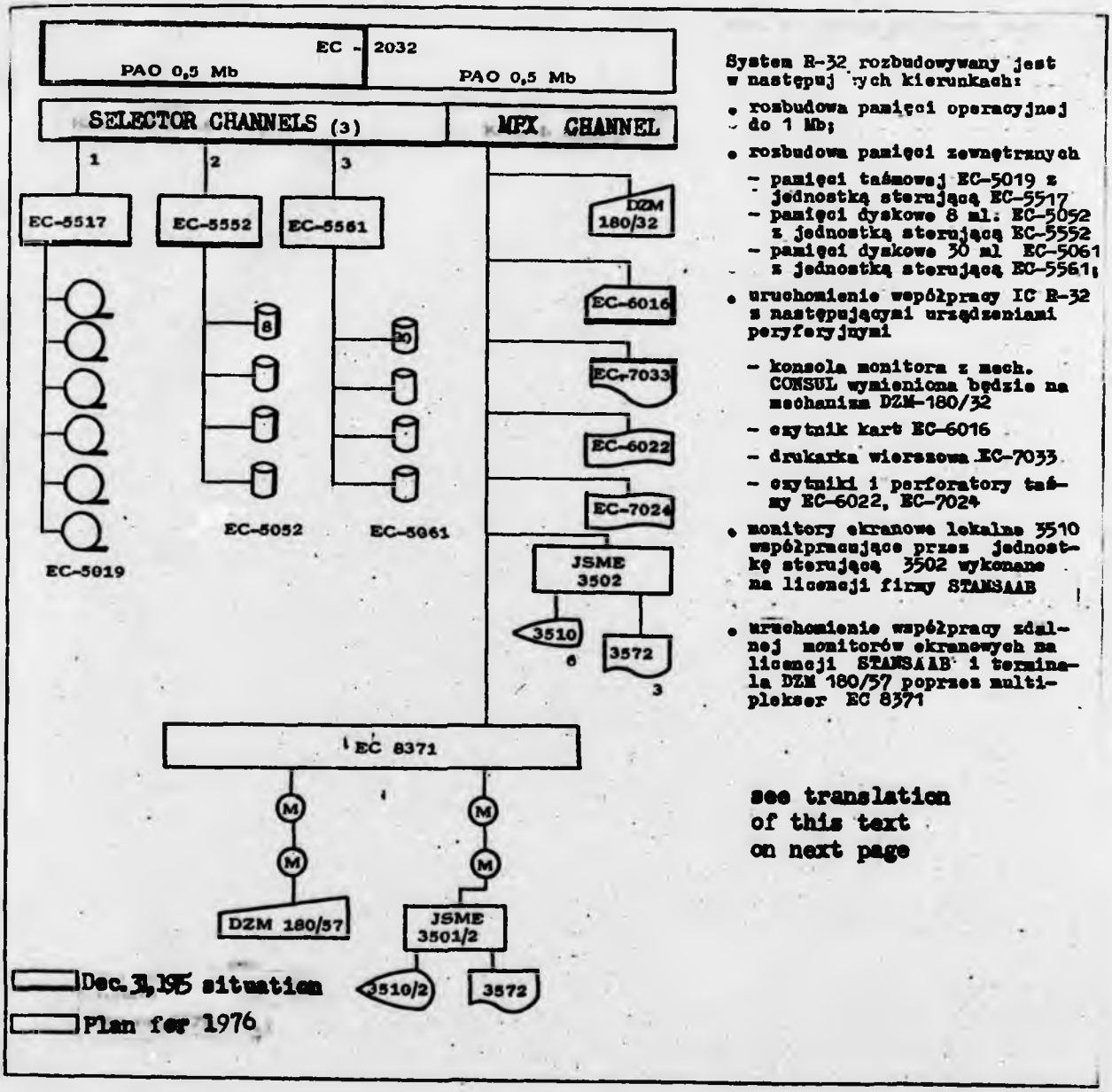
them has reached certain degree of advancement. The configurations shown on Fig. 1,2,3 allow a choice of the equipment together with the basic technical programming for a definite application.

For example:

- State-controlled economy units management;
- Technical calculations;
- Construction work automatization;
- Local and remote collecting of informations;
- Medical diagnostics;
- Multiaccessible systems for didactics;
- Meteorology prognostication;
- Cartographic work automatization;
- Data collecting on magnetic carriers;

The above-mentioned items do not exhaust all the possibilities of application, because as far as the definite configuration accepted by a given sphere is concerned, it is the utility programming that limits full possibilities of the equipment utilisation.

see Fig. 4. on next page



System R-32 rozbudowywany jest w następujących kierunkach:

- rozbudowa pamięci operacyjnej do 1 Mb;
- rozbudowa pamięci zewnętrznych
  - pamięci taśmowej EC-5019 z jednostką sterującą EC-5517
  - pamięci dyskowe 8 ml. EC-5052 z jednostką sterującą EC-5552
  - pamięci dyskowe 30 ml EC-5061 z jednostką sterującą EC-5561;
- uruchomienie współpracy IC R-32 z następującymi urządzeniami peryferyjnymi
  - konsola monitora z mech. CONSUL wymieniona będzie na mechanizm DZM-180/32
  - czytnik kart EC-6016
  - drukarka wierszowa EC-7033
  - czytniki i perforatory taśmy EC-6022, EC-7024
- monitory ekranowe lokalne 3510 współpracujące przez jednostkę sterującą 3502 wykonane na licencji firmy STANSAAB
- uruchomienie współpracy zdalnej monitorów ekranowych na licencji STANSAAB i terminala DZM 180/57 poprzez multiplekser EC 8371

see translation of this text on next page

Fig. 4. The R-32 pilot system

The R-32 system is being developped in the following directions:

- Extension of the operative memory up to 1 Mb;
- Extension of the external memories as follows:
  - EC-5019 tape memory with the EC-5517 controlling unit;
  - 8 ml. EC-5052 discus memories with the EC-5552 controlling unit;
  - 30 ml. EC-5061 discus memories with the EC-5561 controlling unit;
- Setting up a synergic action of the IC R-32 with the following peripheral devices:
  - monitor console with the CONSUL mechanism will be replaced by the DZM-180/32 mechanism;
  - EC-6016 card reader;
  - EC-7033 line press;
  - readers and tape perforating machines, symbols: EC-6022, EC-7024;
- Local screen monitors /3510/ co-operating through the controlling unit /3502/, manufactured on the licence of the STANSAAB company;
- Establishing a remote co-operation of the STANSAAB-licenced monitors and the DZM 180/57 terminal through the EC 8371 multiplexer;

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1. REPORT NUMBER FTD-ID(RS)T1052-77	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) ODRA AND RIAD PILOT COMPUTER SYSTEMS		5. TYPE OF REPORT & PERIOD COVERED Translation
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Wojciech Lipko		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Foreign Technology Division Air Force Systems Command U.S. Air Force		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE 1976
		13. NUMBER OF PAGES 17
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

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17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

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