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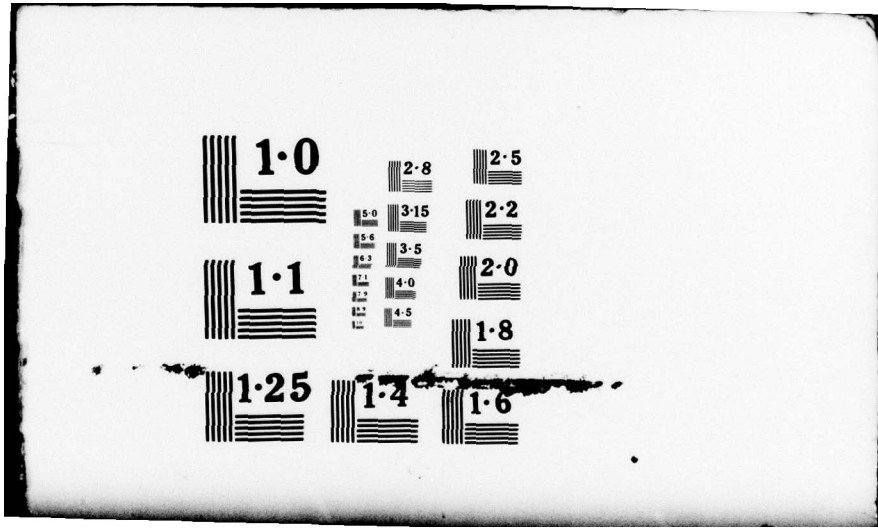
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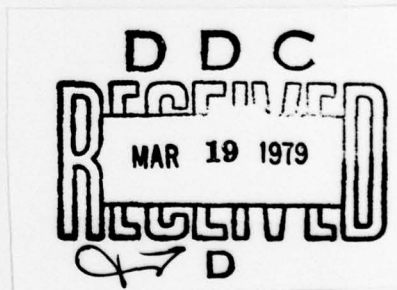


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FOREIGN TECHNOLOGY DIVISION



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# EDITED TRANSLATION

FTD-ID(RS)T-0043-78

13 February 1978

MICROFICHE NR: *FD-78-C-000238*

AWARDS FROM THE MINISTER OF SCIENCE, HIGHER  
EDUCATION AND TECHNOLOGY

English pages: 4

Source: Wiadomosci Telekomunikacyjne, Vol. 17, No.  
2, 1977, pp. 55-57.

Country of origin: Poland  
Translated by: LINGUISTIC SYSTEMS, INC.  
F33657-76-D-0389  
R. Van Emburgh

Requester: RCA  
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AWARDS FROM THE MINISTER OF SCIENCE,  
HIGHER EDUCATION AND TECHNOLOGY

THE MODEM 600/1200 AND AUTOMATIC CALLER AW-1

The Minister of Science, Higher Education and Technology has awarded a prize to a team of workers at the Telecommunications Electronics Institute of the Warsaw Polytechnic and the TELETRA Greater Poland Telecommunications Electronics Plants for devising a data transmission system with a medium modulation rate of 600-1200 bauds and for developing and initiating production of equipment for this system, viz.: 600-1200 baud modem units and automatic calling units for automatic contact establishment in data transmission. The award involves a 22-person team and the principal researchers in this work were: docent Zenon Baran, Dr.Eng., and docent Marian Dabrowski, Dr.Eng. from IT-PW and Stanislaw Sitek, M.Eng., and Ryszard Jankowski, Eng. from WZT TELETRA.

The work has gone on since 1971 and the formal date for its conclusion was in December 1975 at which time a test series for the above-mentioned equipment was conducted in final verification. The newly developed equipment was checked by local organizations and then by the International Commission for Testing Telecommunication Processing Equipment since it [the equipment] is incorporated into the RIAD Uniform Computer System as equipment which operates directly with computers.

The data transmission system provides for mutual cooperation of the equipment according to the block diagram shown in Fig. 1. It permits the addition of external data transmission equipment (the so-called terminal) to a data processing center and the transmission of sequential binary signals along telephone lines at a rate of 600-1200 bauds. The possibility of operation by means of single-line commutator telephone lines or fixed lines in a single- or two-line

system is foreseen. A computer at a data processing center can be connected for transmission without the use of operating personnel and binary information can be transmitted after converting it in the modem through analog telephone lines to a distant data transmission subscriber station.

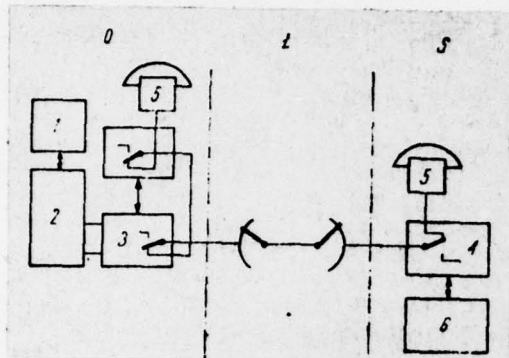


Fig. 1. Block diagram showing cooperation between a data transmission station and data processing center. 0 - data processing center; L - commutator lines; S - data transmission subscriber station; 1 - computer; 2 - multiplexer; 3 - automatic caller; 4 - modem; 5 - telephone; 6 - remaining subscriber data transmission equipment

The modem is manufactured with silicon transistors and integrated circuits in the form of a free-standing desk installation or in panel form for mounting on a stand. Fig. 2 shows an exterior view of the modem. In the case of single-line telephone operation, either single-direction transmission <sup>or</sup> of alternating two-way transmission is possible. For various uses and various operational conditions the modem can be equipped with different linear units. The equipment is adapted for synchronic or asynchronous data transmission. The modem is equipped with a return channel that can operate simultaneously with the in-coming channel, during which time the information is transmitted through the return channel at a modulation rate of up to 75 bauds.

The modem 600/1200 precisely meets the requirements of the Uniform Computer System and the recommendations of the International Advisory Committee for Telephone and Telegraph Communications (CCITT), and thus can be used in the networks of different countries.

The AW-1 automatic caller, similar to the modem, is built in free-standing or panel form. The electronic components are mounted

on plates with two-sided printed circuits and with metallized holes. Self-contained [integrated] systems, silicon transistors, monolithic capacitors, etc. are incorporated as electronic components.

The primary functions of the automatic caller are the following: calling a distant subscriber station and identifying it, making the connection, connecting the telephone line to the modem and disengaging after the information has been transmitted. The automatic caller, upon receiving a command from the computer, simulates the picking up of the handset and signals the computer that a steady current is flowing in the line. The computer supplies the digits of the telephone number in sequence in binary form and the automatic caller converts them into decimal form and simulates dialing. After establishing contact via a center with the called subscriber and receiving an acknowledgment from it, the automatic caller transmits an intermittent signal of 1300 Hz which informs the station being called that this is a connection for data transmission. The subscriber station gives an answering signal (2100 Hz) and the automatic caller then informs the computer that a connection has been established and places the line at the modem's disposal.

The data transmission system developed is a novelty in this country, since the previously developed equipment did not fully meet the international requirements and accepted conditions of operation. Its introduction in Poland and the development of the basic equipment for this system permits the growth of our national telephone information network without the need for purchasing the necessary equipment abroad. The modem and automatic caller will be a supplement to the equipment of a subscriber station for its cooperation with a data processing center: the basic equipment of such a subscriber station can be, e.g., a printer such as the DZM-180 which the BLONIE Precision Mechanics Plants have started to manufacture.

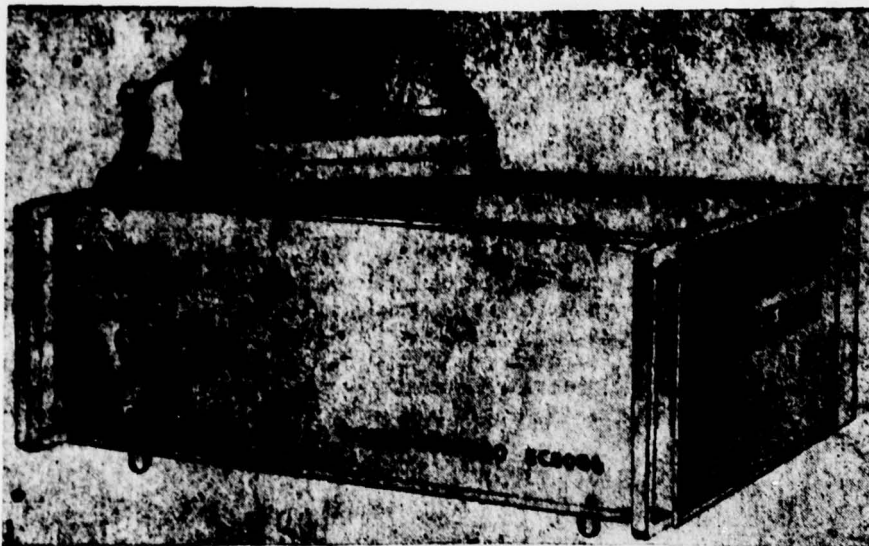


Fig. 1. Modem 600/1200,  
external view

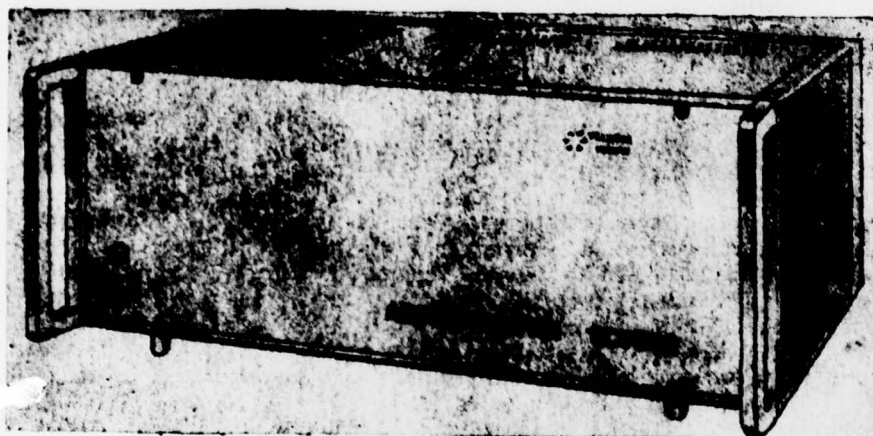


Fig. 2. AW-1 automatic  
caller, external view

Plans to expand the telephone information network both for governmental information systems as well as for public or plant systems foresee that by 1980 about 1200 modems for medium data transmission and 600 automatic callers will be needed; considering the price of these units in Western markets (about \$2000 for the modem and about \$13,000 apiece for the automatic caller) the initiation of production by the TELETRA Greater Poland Telecommunication Electronics Plants represents a savings of 10 million foreign exchange zloty in this area. Poland has also been ensured production specialization for modems and automatic callers within the COMECON countries.

L. H.



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