Cardiological examinations have been carried out in the Soviet Union for more than 20 years [1, 2]. The need for them is nowadays recognized universally, but the wide variety of instruments and methods of investigation that can be used still makes it difficult to compare results obtained by different workers. Moreover, the recommendations of the World Health Organization (WHO) do not always define the procedure of examination and the methods of interpretation of the results unambiguously, so that further disagreement is caused between the results and the value of the investigations is reduced. Only through the wide introduction of automation and electronic computers will it be possible to achieve strict uniformity of all components of the examination, so that the foundations can be laid for progress in cardiological research [3].

Several automatic systems for comprehensive mass medical examinations exist abroad. From the point of view of prevention of cardiovascular diseases, the mobile station for cardiological investigation created in the West Berlin Institute of Social Medicine and Epidemiology is of particular interest to us in the USSR. The results of an examination carried out at this station are recorded on punched tape for subsequent computer processing; the ECG is analyzed by the "Sicard" system (a product of the firm of Siemens), which has recently been tested at the All-Union Research and Testing Institute of Medical Engineering (VNIIIMT). As the tests showed, the "Sicard" system evaluates the medical features of the ECG quite well and makes the diagnosis with the aid of the code of the United States Public Health Service; however, the Minnesota Coding Programs of the ECG in this system do not work satisfactorily from our point of view. The apparatus advertised by the Japanese film "Chuo Electronics" for automatic interpretation of the ECG in the Minnesota Code appears interesting, but it is difficult to judge the effectiveness of this apparatus. It can simply be noted that automation of ECG analysis inevitably requires the investigator either to make arbitrary additions to the Minnesota Code or to refrain from using some groups of the Code.

At the present time an experimental automatic system for mass medical examination of the population has been produced at VNIIIMT with the object of early discovery of cardiovascular diseases, and which is capable of carrying out cardiological examinations. The creation of the system involves the direct participation of specialists from the A. L. Myasnikov Institute of Cardiology, Academy of Medical Sciences of the USSR, the Moscow Institute of Electronic Engineering, and the Minsk Medical Institute. The system is at present undergoing practical trials.

The measuring apparatus of the system is kept in a building at an annex to the No. 40 City Hospital in Moscow in five rooms. The information obtained is processed at the VNIIIMT Computer Center under "off-line" conditions. These processing conditions were chosen primarily because they do away with the need for lines of communication with the computer (the laying of which would be a difficult task because of the long distance between the measuring apparatus and the computer). "Off-line" conditions also make it possible to use the computer during the evening or night, when its work load is least, and the performance of the examinations is independent of reliable working of the computer and the communication line. The main drawbacks of these data-processing conditions are the absence of automatic control over the completeness and quality of the examination and inability to control the course of the examination in accordance with results already obtained.
The program of the examination follows basically the lines recommended by WHO [4]. A structural scheme of the flow of data and the flow of patients in the system is shown in Fig. 1. During experimental exploitation the system will be analyzed from the standpoint of economy, reliability, and so on, and the desirability of some degree of automation both of the measurements and of the recording of the results of an intermediate information carrier will be assessed.

The examination begins with registration of the patient's details. The patient is given an identification number and given the corresponding identification disk, of which more will be said below. The details are recorded on teletype, so that as well as being available in printed form, the data are also transferred to punched tape for subsequent computer processing. The following information is recorded on the registration form for the patient's personal details: current number, surname, Christian name and patronymic, date of examination, sex, year of birth, place of birth, nationality, home address, home telephone number, work telephone number, social position, family position, education, character of examination. The operator who records this information need know only how to operate the teletype apparatus and to study carefully the instructions on filling the form.

After the personal data have been recorded the patient moves to the biochemical laboratory. Here the urine is first analyzed for sugar by means of "Gluootest" indicator paper, which is a semiquantitative method of determining the sugar concentration in the urine. In the first stage of the examination all that matters is the presence or absence of sugar in the urine. Next, in a special room, a qualified laboratory assistant takes blood from the patient's vein for the determination of cholesterol, triglycerides, and sugar.