Parallel with the gradual mastering by testers of “orthodox methods” of manual testing in the course of the years, went the development of continuous and automated testing installations (cf. [586]). The purpose of these installations is to relieve the examiner not only of the often tiresome guiding of the probe, but also of the constantly required, and in the case of mass tests exhausting, subjective decision making by observing fleeting screen displays. A testing installation should evaluate the test result “objectively”. Naturally, this requires that the program, according to which the installation arrives at the decision “good” (“accept able”) and “bad” (“reject”), is first worked out on test blocks or test pieces containing flaws of known size, or on the basis of an adequate fund of experience. Test blocks, as already mentioned in Chapter 18, are used
for general adjustment of a testing installation in the widest sense and for checking these adjustments. Suitable test blocks will be discussed in their relationship with the various testing problems. If no, or unsuitable, test blocks are used for adjusting a given testing installation, this may put the entire subsequent test in doubt.

In tests carried out by hand the examiner can make immediately the decision: “good”, “bad”, “doubtful”, or “recheck specimen”.

In the following the possible evaluation devices which, in the case of continuous and automated testing installations process the test data and make decisions, will be briefly summarized. Figure 19.1 shows schematically the elements of an ultrasonic testing installation: the “testing machine” which scans the specimen, the ultrasonic instruments and monitors, the evaluation device, and the conveyor for the specimens.

The evaluation device, based on a more or less complex program of data processing, can make provision for

signalisation of flaw,

identification of defective specimens or
documentation of test result.

These three groups cover several variants:

A given flaw indication can either be announced simultaneously with its appearance, by an arbitrary optical or acoustical warning signal, or by a flaw display of limited duration. This flaw display can either be realized, for instance, by an image storing tube, a lamp board, or luminous digits.

Defective specimens can be identified either by marking or sorting. The test material can be marked either with paint, mechanically by grinding, or by spot magnetization. The identification marks can either simultaneously indicate the position of the flaw, or be of a general nature, applied at an arbitrary spot on the specimen. The specimens can be sorted either by being ejected into various containers or troughs, or they can be shunted by means of controlled deflecting gates and separate conveyors to various processing stations.

The documentation of the test results can be realized in many different ways (cf. 10.7). Apart from recording the test data by direct