has stimulated an interest in automatic audiometry, which allows the subject to operate the only manual control of the test instrument required during the test When the test is started the intensity of the signal tone increases automatically The subject has been instructed to press a button when he first hears the signal This button operates a switch which reverses the direction of the signal intensity, thus decreasing the signal strength When the subject no longer hears the signal he releases the button and the signal again increases in intensity The procedure is continued for a set interval during which the subject may "cross" his own threshold as many as ten or fifteen times When the proper time has elapsed the audiometer output automatically shifts to the next frequency and the procedure is repeated The test continues until an arbitrarily chosen number of frequencies has been tested

A record of the test may be made with any of several devices which record the continuous change in output level of the signal as it crosses and recrosses the subject's threshold level Automatic audiometers have been variously adapted to record the test on specially designed cards, on IBM cards, by automatic typewriter, or by an adding machine In principle all automatic audiometers are much the same the intensity of the output signal is regulated through a switch which is controlled by the subject Its validity has been well established

The usefulness of automatic audiometry depends upon the conditions under which it is to be used As far as the subject is concerned, automatic audiometry does not save time as most automatic instruments run for six to ten minutes to complete a test, about the time required to complete a test with a manual instrument As far as the tester is concerned, however, the instrument makes audiometry less tedious and it does save a significant amount of time When large numbers of audiograms must be made, two, three, or perhaps four automatic audiometers can be operated by one technician who has only to load and start each instrument, the rest of the test being completed automatically It is possible for one technician to keep several instruments in continuous operation

Automatic audiometry has been very successfully used in several large industrial plants It is not, however, a general solution to the problem of hearing tests in industry Its success depends strictly upon the existence of the proper conditions, and before a decision is made to install automatic audiometers several things should be considered Perhaps the principal consideration is the higher cost of the instrument If several automatic audiometers can be used at one time, the most efficient use of the technician's time may compensate for the excessive cost If tests are to be made with several automatic audiometers, a test booth is required for each instrument because tests cannot be performed in groups except with special equipment

Automatic audiometers do offer the attractive possibility of using less well trained personnel When automatic instruments are used, the operators need only be instructed for a few minutes about the mechanical operation of the instrument itself, and training in threshold or screening techniques is not necessary

What Is Noise?

The usually accepted definition of noise is "any unwanted sound" the last speaker on a long program, the yowl of cats at midnight, a cough during a concert or play

The intensity of sound or noise is ordinarily expressed in terms of decibels (dB) A decibel—unlike inches—is not strictly a unit It is derived from a ratio between two pressures, a measured sound pressure and a reference sound pressure The reference for sound pressure level (SPL) in dyne/sq cm is 0 0002 It is expressed by the following equation

$$dB = 20 \log_{10} \frac{P_1}{P_2}$$

where P_1 is the measured pressure and P_2 the reference pressure Zero to 120 dB is an intensity ratio of 1 to 1,000,000 The counterpart of intensity with reference to the ear is loudness which is measured in sones The frequency of sound or noise is measured in cycles per second, one cycle being produced by one positive and one negative change in pressure The number of these cycles per second determines the frequency of the sound, which in turn determines the sound pitch by international agreement, 440 Hz is