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DESCRIPTION OF FILTERED VOICE KEY USED TO RECORD PSYCHOTIC SYMPTOMS

The voice key was constructed by Grason-Stadler Company, West Concord, Massachusetts, to meet our specifications. Their model number is L3499-Vocal Behavior Analyzer. It contains a fairly conventional compression amplifier with the band width restricted to the middle voice frequencies. Provisions are made for moderate to severe roll-off at low frequencies in order to get the best suppression of low frequency (non-vocal) noises in the room. A 4-inch intercom loud-speaker was used as a microphone to heighten this selective effect. The attack time of the compression circuit is approximately 10 milliseconds and the recovery time is approximately 2 seconds. There is a provision on this amplifier for connecting a monitor loud-speaker.

The rest of the circuit includes a comparator to compare the relatively slowly changing control voltage from the compression amplifier with the rectified output from the amplifier. This rectifier output is filtered in such a way as to have build-up and decay times of approximately 2 milliseconds and 50 milliseconds respectively. The comparator then senses the transient bursts (hopefully syllables) differentially to drive a wave squaring circuit. The square wave is in turn differentiated to pulse a relay on each burst. This relay is used to record the vocal responses. Provision is also made to drive a recorder to provide a record of the overall acoustic level if desired.

The intercom speaker which acts as a microphone is mounted in the ceiling on one of our experimental rooms behind a perforated metal screen where it is both protected and hidden from the patient's view. The walls of the room are painted cinder black and the floor is linoleum. The ceiling is covered with acoustic tile.

In this location, the device has the following characteristics. It records the majority of increases in the intensity of speech which might be called syllables or more accurately, grammatical stresses. A continued burst of speech above the preset level does not continually operate the relay, but merely pulses it once. The intensity response of the voice key can be set to respond to increases in the intensity of the vocal frequencies from 37 db to 51 db within the room. The noise level in the room with our exhaust fan on is 36 db. Therefore, the voice key can be set to respond to increases in the intensity of the sound in the band covering human speech from as small as a tenth of a decibel to as large as 14 decibels above the ambient noise level in the experimental room.

This device was placed in operation for six hours per week day in September, 1957. By August, 1961, after four years of daily operation, the device had not required servicing and at no time had been operating poorly. Also, calibration showed that its operating characteristics had not changed over this period of time.

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1 August, 1961