Contact Patterns Using Miniature Radio Transmitters

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Tooth-contact pattern data have previously been collected using miniature radio transmitters in full dentures (A. A. Brewer and D. C. Hudson, *J. pros. Dent.*, **11**:62, 1961). This method was extended to subjects with one or two of their natural teeth missing, by employing a very small radio transmitter–battery combination, covered with plastic and inserted in the edentulous space as a one- or two-tooth partial denture. A squegging oscillator circuit was used. The components, 7 in number, were subminiature, and the finished unit broadcasted in the marine band (2–4 megacycles). The radio was provided with two gold bars, insulated from each other and connected in the circuit in such a way that only when they were bridged by a conductor was a radio signal broadcasted (Fig. 1). The conductor, a gold pin, was cemented in a hole cut in the tooth cusp opposing the gold bars of the transmitter. It was inserted in such a position that when the teeth were in contact in the

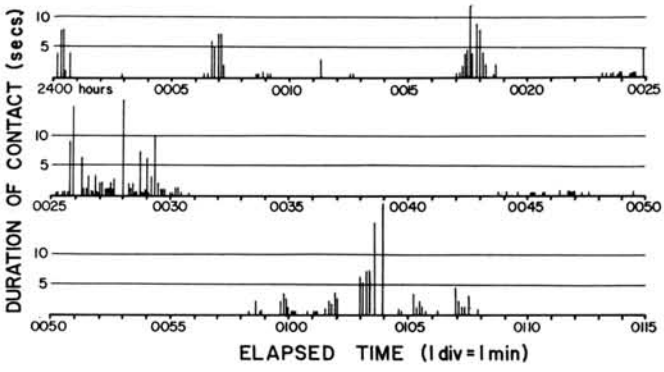

FIG. 1.—Radio transmitter, battery, and clasps potted in plastic. Note the two insulated gold bars.

FIG. 2.—Part of an all-night tooth-contact record of a bruxism sufferer. During the $1\frac{1}{4}$ hours from midnight, the subject made many contacts, some longer than 10 seconds. The contacts often occurred in sequences.

occlusal position being investigated, the gold pin bridged the two gold bars. Saliva or foodstuffs on the gold bars or the pin did not interfere with this mechanism. The radio transmitter then broadcasted a signal, thus indicating that the jaws were in contact in the jaw relationship being investigated. The transmitter provided an extremely sensitive method for indicating a predetermined jaw position, since a movement of less than 0.1 mm. in any direction from the signal position was sufficient to shut off the transmitter. The broadcast signal could be received up to several feet away on a simple transistorized receiver,* and permanent records could be made from it by using a tape recorder, or an ECG machine.

The method was used to study the tooth-contact patterns of a known bruxism sufferer, both awake and asleep (Fig. 2). The apparatus was also used to study the tooth contacts of subjects chewing various foods. Using a two-track tape recorder and recording simultaneously from a throat microphone and a radio receiver, it was found possible to study the correlation between tooth contact and swallowing activity. The work is continuing.

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* Channel Master Model 6514, Channel Master Corp., Ellenville, New York.

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